(GRAY Barn

He lectured on Temperance at 17.
Was involved in a suit (while drug
clerk) for dispensing whiskey in
a dry town. Result cleared.

Cause - His story.

For a gal. of whiskey he dispensed
he put in a gal. of water -

"And judge all the whiskey in
the barrel would not affect you or
the jury in the least."

(Laughter.)

Jury gone in 6 few minutes, re-
turned a verdict of not guilty.

And his [illegible] ended
dischar[illegible] that
the [illegible] testimony

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Dr. D. H. Beckwith gave
me this book and while
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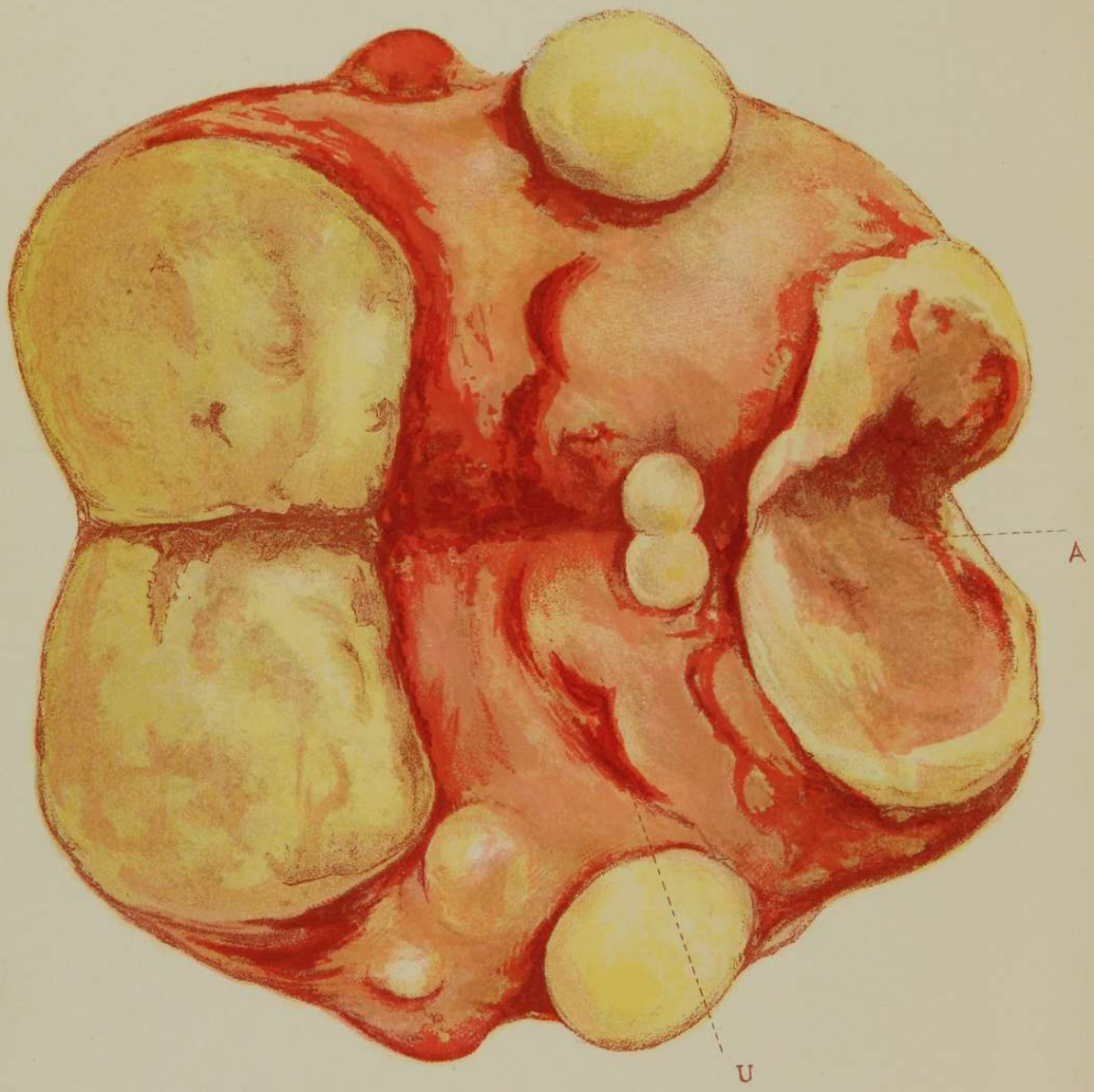
PLATE I.



MULTIPLE MYOFIBROMATA OF THE UTERUS. (*Wood.*)

The uterus is split laterally from below upwards. U, Uterine cavity; A, Sarcomatous degeneration of one tumor.

A TEXT-BOOK

OF

GYNECOLOGY

BY

JAMES C. WOOD, A. M., M. D.

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SECOND EDITION, REVISED AND ENLARGED.

WITH TWO HUNDRED AND NINETY-FIVE ILLUSTRATIONS IN TEXT AND THIRTY-SEVEN COLORED AND HALF-TONE PLATES.

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T. B. & H. B. COCHRAN,
PRINTERS,
LANCASTER, PA.

To

The Homeopathic Medical

Profession of America and Great Britain

This Book is Dedicated by

The Author.

"*The Resources of Surgery are Rarely Successful When Practised on the Dying.*"—W. T. Lusk.

PREFACE TO THE SECOND EDITION.

I desire to thank the profession, both of this country and of Great Britain, for its cordial reception of the first edition of this work. I wish also to express my gratitude to the several reviewers of that edition, who were most lenient and kind in their criticisms. In the preparation of the present edition it has been my effort to profit by the criticisms then made, as well as by the advice of many friends in the profession whose opinions I value highly.

The following pages have been thoroughly revised, it having been my aim to bring the work up to date. While the task involved may not seem great to one not familiar with work of the kind, I have devoted to it, in hours not required for professional labor, eighteen successive months. Inasmuch as the first edition was adopted as the leading text-book on the subject in nearly every homeopathic college in the country, the revision has been made with a heightened sense of responsibility.

To a greater or less extent every chapter, and almost every page, has been altered. Some material has been expunged and much has been added. The chapters on "Electricity," "Antisepsis and Asepsis," "Pelvic Abscess," "Malignant Diseases of the Uterus," and "Injuries Resulting From Childbirth" have practically been rewritten. A chapter devoted to those obstetric operations which the abdominal surgeon is so often called upon to perform has been introduced. In making these changes and additions I have drawn freely from various essays of my own, without deeming it necessary to mar the text by repeated references to the same.

I have also increased the number of *Illustrative Cases* in lieu of statistical tables. This I have done only after having received the assurance of many general practitioners that the clinical feature of the work greatly enhances its value for those who cannot repeatedly avail themselves of the advantages offered by large hospitals and post-graduate schools.

One hundred and twenty-three new illustrations have been added,

the most of which, with the exceptions of a few anatomical plates and cuts of instruments, have been obtained from my own practice. The illustrations include thirty-seven half-tone and colored plates. I am indebted to Dr J. H. Kellogg, of Battle Creek, for plates II, III and IV; to Mr. W. B. Saunders for plates VII and XXI; and to the F. A. Davis Co. for plates VIII, XXIII and XXVI. I am also indebted to Dr. William Schneerer for photographing specimens; to Miss Emma Lane for the drawings from which the chromo-lithographs were made; and to Dr. Albert Seidal for several drawings. Messrs. Tiemann & Co., Max Wocher & Son and the McIntosh Co. have kindly loaned me the electrotypes of instruments, batteries, etc.

Owing to the want of time it has been impossible for me to do more than supervise the proof reading. A few typographical and rhetorical errors have consequently crept in, but as none of these destroys the meaning of the text I deem it unnecessary to append a list of *errata*.

In conclusion, I desire to thank Messrs. Boericke & Tafel for their hearty coöperation in bringing out the present volume. They have given me carte blanche as regards the number of illustrations, chromo-lithographs, etc.—hence the responsibility for whatever shortcomings the book may reveal rests entirely with the author.

JAMES C. WOOD.

CLEVELAND, *February 1, 1898.*

PREFACE TO THE FIRST EDITION.

When, four years ago, the publishers of this volume, Messrs. Boericke & Tafel, requested me to write a text-book on gynecology, I consented to undertake the task only after receiving assurances from them that their views were in entire harmony with my own regarding the field to be covered by such a work. An ideal text-book, according to my conception, was one which should not only embody in concise form for the specialist the most advanced teachings of the American and European schools of gynecology, but should present these teachings in such a way as to enable the student of medicine and the non-specialist to obtain at least an intelligent knowledge of the subject without exhaustive research. That I have fallen far short of this high ideal in the succeeding pages is apparent to no one more plainly than to myself: yet I have had it constantly in mind. An experience of nine years as a teacher of gynecology has convinced me that minutiæ are essential to the successful teaching of this most important branch of medicine. I have, therefore, endeavored to lead the student on, step by step, into the broad field of the specialty, first dealing with those preliminaries without which he is ill-fitted to proceed further. I have devoted much space to diagnosis, especially to the diagnosis of abdominal tumors, believing most emphatically that *blind gynecology* has been the curse of womankind. I have introduced more than the usual number of illustrations and clinical cases, a feature which, I think, will aid the reader greatly in comprehending the text. Finally, I have endeavored so to present the treatment of the various affections dealt with that the busy practitioner may, without unnecessary loss of time, bring to his gynecological patients those agents and methods which have been devised and are now being employed by the leading specialists of both schools.

With the foregoing objects in mind I have largely eliminated historical data and profitless discussion of theories, at all times referring the reader for more extended information to special literature. I have also omitted the usual chapters devoted to diseases of the breast and diseases of the rectum, subjects which, although essentially gynecological, have come to be treated in various special works devoted to them.

I cannot but feel that the profession will appreciate the large number of illustrations from the Museum of the Royal College of Surgeons, London. I am not aware that any American specialist has before utilized that splendid pathological collection for this purpose. All of the photographs of these specimens, as well as photographs and drawings obtained from my own cases, were taken under my personal supervision.

In the several series of *Illustrative Cases*, it has been my aim to introduce only those which serve to illustrate or emphasize the points dealt with in the text. Whenever such points are better illustrated by unsuccessful cases I have not hesitated to record my failures.

In conclusion, I desire to acknowledge my indebtedness to the publishers of "The Annual of Universal Medical Sciences," in providing me references and advanced proof-sheets of that most excellent publication; to Mr. Frederic S. Eve, Curator of the Museum of the Royal College of Surgeons, for his kindness in granting me unusual privileges in photographing specimens; to Messrs. Geo. Tiemann & Co., for having prepared for me new electrotypes of the instruments illustrated; and to my assistants, Drs. Mary Denison, Ida C. Woolsey, Evelyn S. Pettit, and C. M. Thurston, for having rendered me invaluable service in the way of research, proof-reading, translating, etc.

JAMES C. WOOD.

CLEVELAND, *January 15, 1894.*

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A TEXT-BOOK

OF

GYNECOLOGY.

CHAPTER I.

THE CAUSES OF GYNECOLOGICAL DISEASES.

Until our knowledge of pathology shall have become more accurate, no classification of the DISEASES OF WOMEN can be perfect. With the full consciousness of this fact I offer the following:—

ETIOLOGY OF GYNECOLOGICAL DISEASES.

I. *Congenital.*
   (*a*) Inherited feebleness of constitution;
   (*b*) Defects in or absence of development.
II. *Acquired.*
   (*a*) Acquired feebleness of constitution;
   (*b*) Reflex functional disturbance and nervous disorders;
   (*c*) Development of new growths and malignant diseases;
   (*d*) Uterine displacements.
III. *Inflammatory.*
   (*a*) Cellulitis;
   (*b*) Peritonitis;
   (*c*) Metritis, ovaritis, salpingitis, cystitis, etc.
IV. *Accidental.*
   (*a*) Injuries resulting from pregnancy and parturition—
      1. Lacerations and cicatricial deposits;
      2. Relaxation of the pelvic floor;
      3. Uterine inversion;

4. Fistulæ, sloughing, closure of the os uteri, vagina, etc.;
5. Ectopic pregnancy;
6. Abortions;

(*b*) Hematocele.

Inherited Feebleness of Constitution.—The Americans are notoriously a nervous people. There are many reasons for this, the most potent undoubtedly being our peculiar climate which, in certain localities at least, tends to stimulate the nervous system unduly. It is true that within the domain of the United States the climate is most variable, but this fact only adds force to the statement adduced. My own observation leads me to believe that the residents of the warmer regions of this country are less nervous than those who reside in the more rigorous and changeable sections. Emmet calls attention to the fact that archæological research shows conclusively that races now extinct have inhabited this hemisphere, and it is not unreasonable to presume that the climate has had much to do with the decay of these races.

Quiet and recreation are unknown to the great majority of our population. The growth and development of a new country and the almost insane desire to amass wealth, afford the average American but little time for relaxation and enjoyment. Unfortunately the husband is not the only victim in this warfare of civilization. He cannot, or does not, close his office door and lock his business behind, and his wife and family participate in his anxieties and ambitions. As he ascends in the financial scale, new social obligations and demands force themselves upon them; if reverses come, the mental worry and distress are still more injurious than the excitement incident to success. A child born under these circumstances is the inevitable victim of them. If the parents have inherited a constitution free from bias or disease the ante-natal influences may be overcome in after life; if, on the contrary, the parental impression is derived from organisms feeble and diseased, the offspring suffers from the inexorable law of heredity. With a girl the odds will be against her from birth to the grave. Climate, social customs and education, unless her guardians are wiser than their age, will combine to stimulate her nervous system at the expense of her physical, and leave her ill-fitted to meet the demands of puberty, maternity and the climacteric.

Defects in or Absence of Development.—Under this head come the various anomalies of development with which the gynecologist every now and then meets and which are dealt with in detail in other

chapters. Such anomalies are clefts of the urethra; double vaginæ with single or double uterus; arrest of uterine growth in embryo with or without a corresponding arrest of the ovaries; defects in the shape of the vagina and cervix; imperviousness of the hymen; entire absence of the vagina and the uterus; and distortions of the clitoris.

The development of the uterus is much more influenced by the growth of the ovaries than are the ovaries by the uterus. (Emmet.) Unless the ovaries are sufficiently developed to permit of ovulation, the uterus is not properly stimulated, and an arrest of growth may occur at any time before this organ is fully developed. Later in life, our knowledge of the influence upon the uterus exerted by the ovaries or, according to Lawson Tait, the tubes as well, enables us to arrest hemorrhage and the growth of fibroids by their removal.

Acquired Feebleness of Constitution.—Until the age of puberty there is but little difference, so far as physical functions are concerned, between the boy and the girl. When this period is reached the role of the two sexes is no longer the same. That played by the male in the processes of reproduction is comparatively insignificant. The girl, on the other hand, quickly passes from childhood into womanhood and her distinctly reproductive life closes with the cessation of menstruation. The epochs of puberty and the menopause profoundly impress her system either for good or for evil. While, with the exception of certain catarrhal diseases, the female generative organs are rarely the seat of disease previously to puberty, the utero-ovarian functions after this period, especially the processes of gestation, expose her to innumerable diseases and lesions. This is oftener the case if any of the etiological factors about to be enumerated remain operative long enough to leave their impress upon the system.

The *causes* of acquired feebleness of constitution may be enumerated as follows:—

1. Deficient air and exercise;
2. Improper dress;
3. Exposure during menstruation;
4. Improper care during and after parturition;
5. Prolonged and undue emotional stimulation;
6. Marital irregularities.

Deficient Air and Exercise.—The standard of health formerly depended in no small degree upon the social stratum into which a girl was born or circumstances in after life carried her. Until comparatively recently the imperious Goddess of Fashion demanded a fair face and fair hands, two things imcompatible with fresh air and proper

exercise. The young girl as she approached her teens was prohibited from taking the requisite amount of exercise because it was not considered genteel. If out-door sports were permitted they were not of such a character as to develop her physical system. As a result she passed into womanhood poorly fitted for the responsibilities which maternity imposed upon her. The birth of her first child often left her an invalid, if, indeed, some form of local disease superinduced before marriage did not make her sterile.

During the last five years, however, the bicycle has wrought a wonderful change in the girls and women of all civilized countries. The most casual observer cannot fail to note the physical transformation it has brought about in American women. Under the older règime physical exercise was largely confined to the lower walks of life. Now it is the "fad" to ride the wheel, and thousands of anemic, soft fibered and hysterical women have been changed by it from a state of "innocuous desuetude" to one of comparative robustness. While cycling is a form of exercise which should be cautiously prescribed for many women, it has proved a God-send to the American race. It has given an impetus to outdoor sports of all forms and has, directly or indirectly, left its impress for good upon our civilization. Like all forms of exercise cycling can be abused, but this fact should not deter medical men from recommending the wheel in suitable cases.

Improper Dress.—Corsets, low-necked dresses and high-heeled shoes are responsible for many gynecological diseases. Dr. J. H. Kellogg, of Battle Creek, has conducted a series of pneographic tracings for the purpose of showing the evils attending constriction of the waist. I am indebted to Dr. Kellogg for the subjoined plates, which speak more eloquently than mere words on the subject under consideration. (Plates ii, iii and iv.)

As a result of tight lacing, the function of respiration is interfered with, the pelvic organs become displaced, the abdominal muscles atrophy, and freedom of movement is restricted. Add to this the injurious effects of high-heeled shoes, and the fashionable woman of the period will do well if she escape the penalty so often produced by causes constantly at work. The lower extremities are at no time properly protected, and in evening dress the chest is likewise exposed. Prevailing fashions in dress and common customs, therefore, exert a most potent influence for good or for evil, which extends to all walks of life and grades of society.

Exposure During Menstruation.—There is no physiological function imposed upon the female organism which is so liable to become patho-

PLATE II.

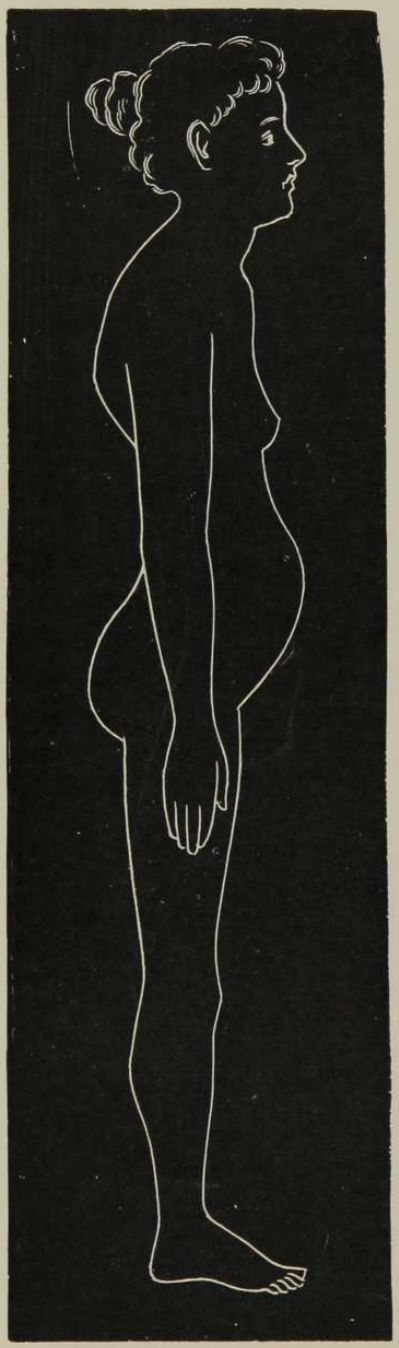


FIG. 1. Effects of corset and tight lacing.

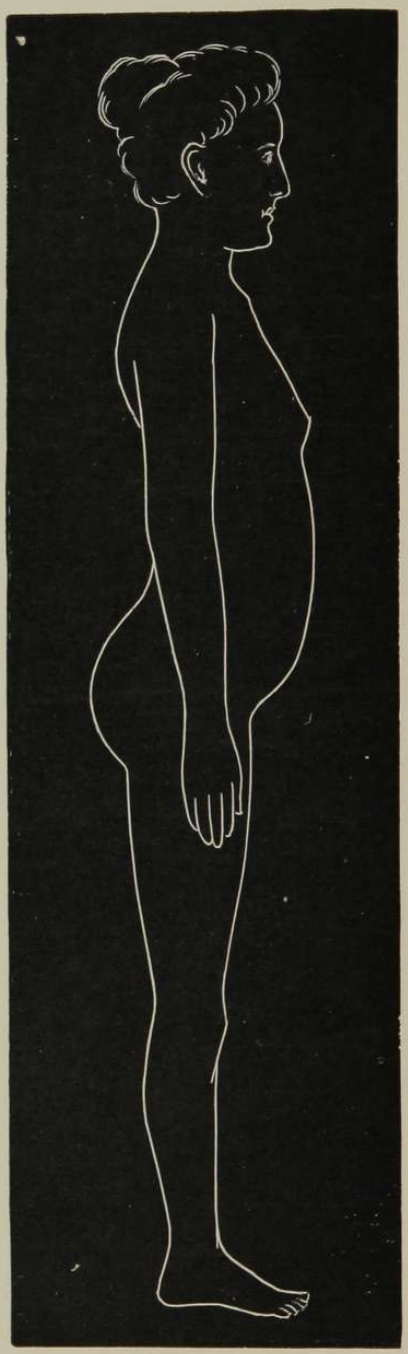


FIG. 2. The same person after training.

PLATE III.

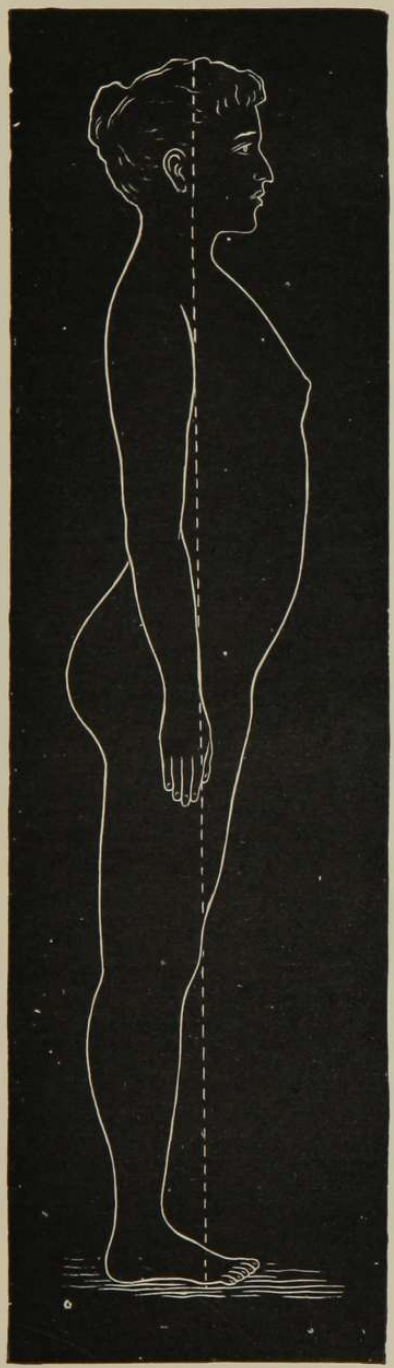


FIG. 1. A German peasant woman.

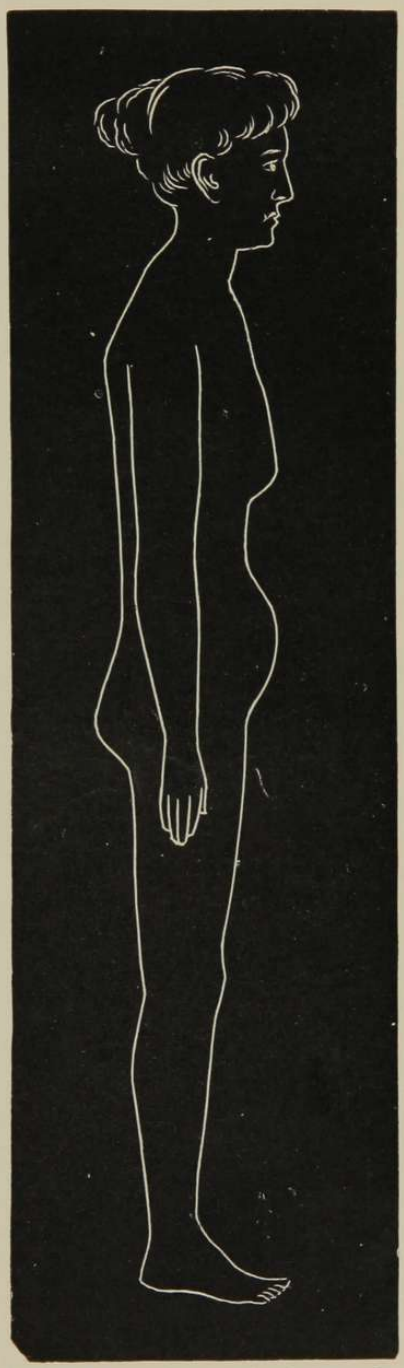


FIG. 2. Effects of corset and tight bands, on an American woman of same age.

logical as is menstruation. This is not as it should be, yet is in keeping with the refining and depressing influences of modern civilization. Menstruation should be as painless and normal as defecation; and so we find it as we descend in the scale of evolution. The Indian girl, and, we are told, the negress in her native abode, do not suffer in the least, notwithstanding the fact that at all times they are subjected to the most severe exposure and exercise. Their systems have become inured to hardships by the environs which have exerted a hardening influence, not only upon them, but upon their ancestors, through countless generations. Indeed, evidence is to be had proving that the menstrual discharge was absent in their ancestors; and that it developed with time because of a failure to gratify the reproductive instinct, and then became a habit. (Roussel, Auber.) Whether this statement be true or false, the influence of hard work and simple fare upon the quantity of hemorrhage is incontestable. The girl or woman reared properly and endowed with a constitution such as she is entitled to as a birthright, can stand exposure during menstruation which would be decidedly hazardous to her more delicate sister.

It is but a step from physiological to pathological congestion, and the next succession in the train of pathology is inflammation. At each menstrual period a physiological congestion occurs, and in the great majority of women is associated with phenomena due to disturbed innervation and circulation. The system is in a susceptible state, and the congestion and irritation may extend to various parts of the body. If, either through necessity or recklessness, a menstruating woman goes lightly or improperly clad during the most inclement weather, the seeds of permanent disorder may be sown. The inflammatory diseases frequently originate in this way; oftener a serious dysmenorrhea dates from such exposure. Certainly ordinary prudence suggests that during a time when all of the pelvic organs are intensely engorged, when the escaping ovule from the ovary has broken its surface, the woman should observe at least reasonable precaution. Nevertheless menstruation does not keep the average girl from the ball-room, even though it has to be suppressed by artificial means. To her the pleasures and conquests of a night are of greater importance than future health and happiness. Parenchymatous disease often follows an inflammation thus excited, resulting in sterility and menstrual disorders which, acting through the sympathetic system, influence and deprave nutrition.

Improper Care During and after Parturition.—Uterine contractions, from the very onset of labor, have a physiological mission other than the expulsion of the child. They consume the cell-elements of the

enlarged uterus, and by compressing the nutrient vessels deprive them of oxidized protoplasm, which inaugurates fatty degeneration. These contractions continue even after the uterus is emptied, and give rise to the so-called "after-pains." The protein substances resulting from the degeneration of the muscular fibers are converted into fats, which are absorbed. Eventually new cells appear upon the external layer of the uterus, from which a new organ is developed (Schroeder). With the growth of new cells the old and enormously enlarged ones of pregnancy entirely disappear. In the course of six weeks the uterus becomes normal in dimensions and weight, although remaining somewhat larger and more rounded than in nulliparæ (Spiegelberg). This process is called *involution*, upon the proper performance of which the woman's future health in no small degree depends.

The phenomena appertaining to involution and to the puerperal state would, under different circumstances, be considered pathological. Associated with the degeneration of muscular cells, thrombi are formed in the enlarged and torn vessels and the decidua is exfoliated. The size of the lymphatics is also exaggerated, which, together with the traumatism almost never absent, predisposes to septicemia, cellulitis, emboli, etc. These effects are *immediate* and must be dealt with accordingly. The *remoter* and more permanent ones have to do with perfect involution, which is only insured by proper care during the lying-in period. Uncleanliness during and after labor, and dragging the placenta from the uterus instead of expressing it by the more scientific method of Credè, are responsible for many of the sequelæ attending childbirth; failure to close rents and torn surfaces is equally reprehensible; and the prescribed nine days for "getting up" is a relic of the dark ages. Every woman is a law unto herself and should be so considered; what one may do with impunity may be the death of another. The size of the uterus, the persistence of the lochia, and the strength of the patient are the only scientific guides by which to gauge the period of absolute rest in bed. So long as the parturient womb can be felt above the pubes by external examination, just so long is it unwise and unsafe for her to assume the erect posture. The increased weight will cause it to descend, thus interfering with the pelvic circulation, which, in turn, gives rise to congestion or inflammation and often to permanent uterine displacement. The time is not far distant when the physician's success as an accoucheur will be judged, not by the length of time during which he keeps his patient at rest, but by the completeness of her recovery.

The mammæ and uterus are sympathetically and almost mysteriously

PLATE IV.

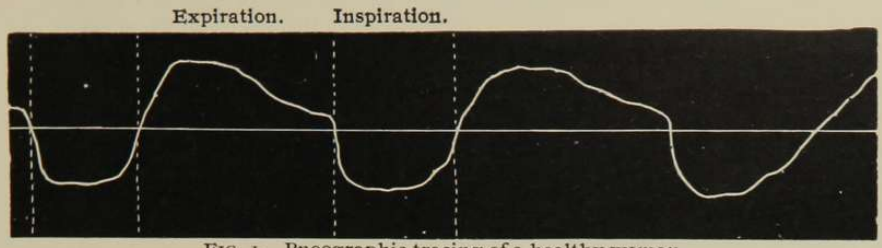


FIG. 1. Pneographic tracing of a healthy woman.

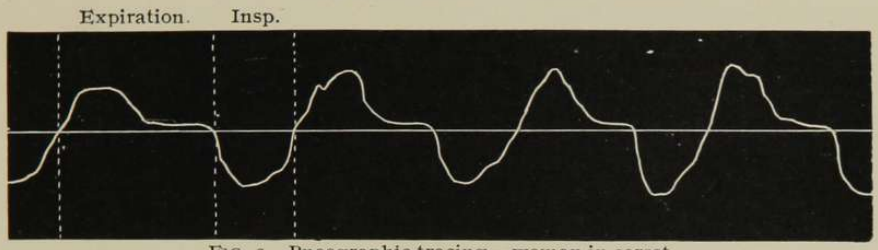


FIG. 2. Pneographic tracing — woman in corset.

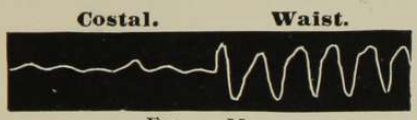


FIG. 3. Man.

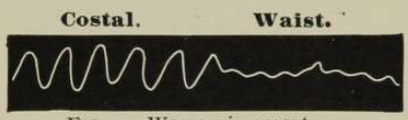


FIG. 4. Woman in corset.

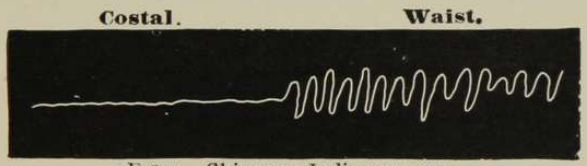


FIG. 5. Chippewa Indian woman.

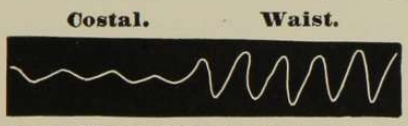


FIG. 6. Woman who never wore a corset.

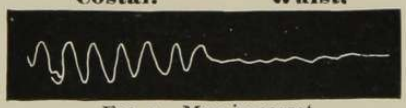


FIG. 7. Man in corset.

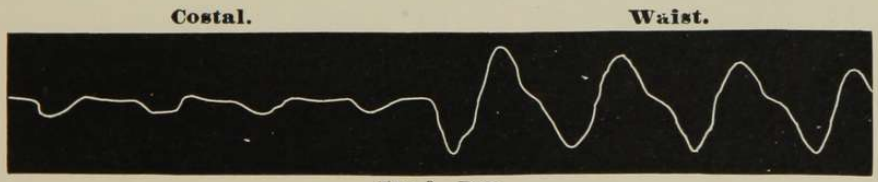


FIG. 8. Dog.

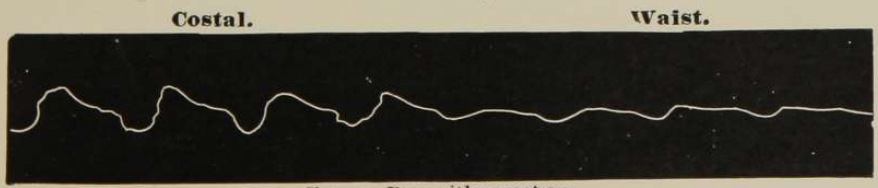


FIG. 9. Dog with corset on.

BREATHING MOVEMENTS IN MAN AND DOG.

connected. This connection is one of the most useful designs of nature, and through it uterine involution is promoted. The application of the child to the breast excites uterine contraction, and if this stimulation is withheld involution is apt to be incomplete. In the upper circles there is a tendency to relegate babes to wet-nurses and rubber nipples, and nature imposes her penalty for so doing. The system is soon taxed with the menstrual function, which should remain dormant for at least twelve months after confinement. Unless subterfuges, far more injurious than pregnancy itself, are resorted to, conception is liable to occur before the system has fully recovered from the previous labor. From a purely physiological standpoint, every mother should nurse her child unless insuperable obstacles prevent; if it seems unwise to continue lactation during the usual period, it should at least be continued while puerperal involution is going on, if the counter-indications are not imperative.

It will be seen that the best means of securing and promoting uterine contraction are vital and not mechanical. What is true of the uterus is also true of the over-stretched abdominal muscles and their coverings. The comeliness of the figure cannot be regained or preserved by a tight bandage—the curse of the lying-in chamber. Healthy muscles, whose function it is to contract under the command of the will, were never made stronger by non-use. The abdominal muscles are no exception to this rule, and if their movements are restricted by tight bandaging, atrophy is apt to result. Again, a bandage improperly applied over an unnatural compress forces the enlarged uterus into the pelvis and backward, causing a temporary if not a permanent displacement. This more often results if the dorsal posture is persistently maintained instead of permitting that position which is the most comfortable. When abdominal distention has been very great, and a moderately tight bandage affords a sense of relief, there can be no objection to applying it for a few hours or a few days; however, the practice of compressing the abdominal and pelvic organs for days and even weeks is not only an exploded superstition but an actual injury.

Reflex Functional Disturbances and Nervous Disorders.—The ganglionic system of nerves in women is more developed than in man, the great centre being the solar plexus. The generative organs are surrounded by a reticulation of blood-vessels, the smallest capillaries of which are in intimate contact with sympathetic nerve filaments. Each ganglion is in direct communication with the cerebro-spinal system through the spinal filaments which enter it. These two great nervous systems, though each is complete in itself, are, nevertheless, dependent

one upon the other. They should work harmoniously together, and so they do if unmolested. An afferent impulse starting from the reproductive organs will induce, through the central nervous system, vasomotor changes which will affect the pelvic circulation either favorably or unfavorably (Foster). It is in this way that many reflex phenomena are induced. When normally exerted, the influence of the sympathetic system on nutrition is a healthy stimulus to organic life. If, on the other hand, the stimulus becomes impaired, owing to local disease or irritation, reflex functional disturbance in some part of the body at once ensues. The morbid impression received by the sympathetic system is transmitted through the spinal nerves to the brain, which, in turn, transmits it to the special ganglion of the affected organ. The spinal nerve passing from this ganglion will convey pain to the seat of its distribution. (*v.* Chapter VIII.)

These physiological facts, briefly stated, explain many symptoms occurring in women which would otherwise remain enigmas. The extent of the reflex mischief produced by a local lesion depends less upon the nature of the lesion than upon the impressionability of the cerebro-spinal system. Every practitioner has met with many instances where women have gone for years with uterine displacements, cervical lacerations, etc., without the least inconvenience. In others, the slightest local disturbance may impress the system in the most profound manner. Insomnia, hysteria, and even insanity result in this way; and pain in any and every part of the body may have its origin in the pelvis. Conversely, lesions in other parts of the body may react upon the generative organs. If there be a due proportion existing between the development of the nervous system and the muscular, the equilibrium is not readily disturbed and local disorders may make little or no systemic impression (Emmet).

With this knowledge of cause and effect as related to the diseases of women, much should be accomplished in the future in the way of prophylaxis. Our system of education tends to create large brains and small bodies. The curricula, even in schools especially created for women, make no provision for either puberty or menstruation; and in co-educational institutions the average girl is stimulated to excel her boy associates.* The result is that too often she exchanges a good

* Let the reader remember that this chapter is devoted to the causes of *gynecological* diseases. My connection for some years with one of the largest co-educational institutions in the world leads me to speak with much emphasis. Nevertheless, I am not blind to the fact that the evils of existing systems leave their impress, to a greater or less extent, upon both sexes. I am a thorough believer in co-education. However, it should and can be inseparably associated with a system of physical culture which will develop brain and body simultaneously.

constitution for a meaningless diploma. Such an education makes her ill-fitted to assume the responsibilities of maternity, and "conjugal onanism" is resorted to. If the marital couch is persistently defiled, the pelvic organs are left congested and the nervous system remains unappeased. Inflammation of the uterus and appendages, with displacement and erosion, is a frequent sequela of this practice. Should pregnancy accidentally occur the omnipresent abortionist stands ready to do his nefarious work. The marriage relations bring pain instead of pleasure, and the mental distraction resulting therefrom is the cause of more than one separation and divorce. It is impossible to discuss the etiology of the diseases of women without touching upon this evil, which is as insidious as it is far reaching.

All writers dealing with the diseases of women deprecate the use by young girls of emotional and improper literature. It is generally conceded that literature of a certain kind is responsible for much mischief, both morally and physically. I am not, however, aware that the injurious effect of music upon certain temperaments has been noted by gynecological writers. The fact that music has the power of exciting in certain women erotic tendencies was made the basis of Tolstoi's now famous novel, the "Kreutzer Sonata." The distinguished Russian author has been much condemned, and justly, for exposing in this work only the bad side of human nature. I am, nevertheless, convinced that music of a certain type does tend to create sexual excitement in some women and girls. I have had several confessions made to me which go to prove this statement. I do not for a moment contend that music under normal conditions is injurious. On the contrary, I believe that its study and influence are refining to an extreme degree. Usually when it stimulates the sexual faculties there exists some abnormality either of the central nervous system or of the genital organs. In my opinion, therefore, especial care should be observed in the musical education of delicate, high-strung girls who are naturally emotional.

Development of New Growths and Malignant Disease.—We possess but little or no definite knowledge bearing upon the causation of most neoplasms, and particularly of those attacking the uterus (Gusserow). Virchow, Winckel, Cohnheim, Senn, Emmet and many others have put forth theories, all of which are imperfect. We are able to study the circumstances under which new formations develop; beyond this point we have not up to the present time succeeded in going, unless, indeed, the micro-organisms more recently found in malignant growths prove to be the cause of cancer. Such circumstances include environs,

nutrition, habits, age, race, state, etc., which will receive due consideration in other chapters.

I shall, at this time, but briefly allude to the theory of congestion and hypertrophy so ably championed by Emmet, because it bears directly upon much that has already been said. According to this author, any cause that will keep up a more or less persistent congestion of the uterus will in due time excite a congestive hypertrophy of this organ; that, as a result, the nutrition of the parts becomes faulty and exaggerated; and as a consequence of this faulty nutrition new growths originate, in the form of fibromata or myofibromata. Or, when the ovaries cease to perform their function, nutrition is diverted from the pelvis to other parts of the body, with resulting fatty degeneration of the uterus. Nutrition is now no longer occupied in the formation of new structures, but in the removal of the old. If some previous injury exists it may be misdirected in its efforts to remove the product of such injury (hyperplasia, cicatricial tissue, etc.) and a neoplasm develops, frequently an epithelioma. Reasoning from analogy, this theory is the most plausible of any yet promulgated. It involves much pertaining to the habits of life which have already been discussed. In studying carcinoma of the uterus I shall discuss the embryonic theory of tumor formation.

Uterine Displacements.—Uterine displacements may be congenital as well as acquired. The congenital displacements are usually associated with some defect in the development of the organ, and the only bad symptoms resulting therefrom are connected with the menstrual function or with generation. The acquired forms result from accident, congestion, inflammation, pregnancy, etc., and cause more or less local and general distress, depending upon circumstances. It is probable that the mere malposition of the uterus in itself gives rise to but little if any suffering, unless the displacement is the result of accident, and that the suffering is due to secondary changes within the uterus and the pelvis Such changes are congestion, chronic inflammation, hyperplasia, and displacement of the ovaries, all of which often excite reflex phenomena of the most distressing character. Disorders of the rectum and bladder are likewise frequently due to uterine displacements.

Inflammatory: Accidental.—The inflammatory and accidental causes do not demand at this time *seriatim* consideration. There is nothing obscure about them and since, as causative factors, they are recognized by all authorities, I will briefly present only a few general considerations.

Salpingitis and the diseases of the Fallopian tubes have attracted much and wide attention during the last ten years. The importance of

gonorrhea as an exciting factor in the production of inflammation of the genital tract cannot be overestimated and is dealt with in detail in the chapters devoted to vaginitis and to acute pelvic inflammation. That the ovaries and tubes are responsibe for much mischief, I am certain; and that many normal or curable ovaries and tubes have been sacrificed by over-zealous operators, I am even more certain. Unalloyed good rarely results from bold innovations made by men like Battey, Tait, and Hegar. Operators with a reputation to make require *material*, and inexperienced diagnosticians too often ascribe obscure pelvic affections to the uterine appendages, which are accordingly removed. It is well that some of the older men have raised a protesting voice, for a beneficent operation is liable to fall into disrepute when performed with unwarranted frequency.

The injuries resulting from *pregnancy and parturition* are countless. The more serious rents, uterine inversion, fistulæ, adhesions, etc , force themselves upon the attention of all physicians. Cicatrices and relaxations on the pelvic floor, on the contrary, have not as yet received the attention which they deserve. It will require another decade before the profession, as a whole, will have learned sufficient of cause and effect fully to comprehend the significance of the more obscure injuries within the pelvis.

This brief survey of THE ETIOLOGY OF GYNECOLOGICAL DISEASES shows conclusively, I think, the importance of the subject. Woman is subjected to those general diseases attacking both sexes indiscriminately; she is also a victim of special lesions peculiar to her sex, many of which are avoidable, to be sure, but many of which she cannot escape. Specialists will, therefore, ever be in demand; and the day is long past when the general practitioner can successfully "get on" with a mere smattering of gynecology.

CHAPTER II.

THE ANATOMY OF THE FEMALE PELVIC ORGANS.

EMBRYOLOGY.

I deem it unnecessary in a practical text-book on gynecology to discuss at length the subject of embryology. It is one belonging to obstetrics rather than gynecology. The following schema, prepared for my classes in obstetrics, shows the successive steps in the early development of the ovum and the structures from which various organs are derived. It will, therefore, prove useful in explaining some of the anomalies of development with which the gynecologist has to contend. The four layers formed by the blastodermic vesicle, viz.: The ectoderm, two strata of mesoderm, and entoderm, are supposed to have the relations to the ulterior development of the body indicated in the schema, though some points bearing upon the subject are as yet unsettled.

DEVELOPMENT OF THE OVUM, SHOWING SUCCESSIVE CHANGES FOLLOWING FECUNDATION.

1. Contact of spermatozoa with ovum, probably in the Fallopian Tube.
2. Disappearance of germinative vesicle.
3. Segmentation forming *morula*.
4. Changes in MORULA—formation of *blastodermic vesicle*.
5. BLASTODERMIC VESICLE FORMS.
   - I. *Ectoderm.*—Developing hair, nails, glandular structure of skin; the brain, spinal cord, organs of special sense, and genito-urinary organs.
   - II. *Mesoderm.*—
     - (*a*) OUTER STRATUM.—Developing corium, muscles of trunk, and bony framework.
     - (*b*) INNER STRATUM.—Developing muscular and fibrous tissue of digestive tract, the blood, blood-vessels, and blood-glands.
   - III. *Entoderm.*—Developing epithelium lining walls and glands of intestine.
6. AREA GERMINATIVA, composed of (*a*) area pellucida, (*b*) area opaca, in which appears the *embryonic spot*.

7. EMBRYONIC SPOT.—Bisected by *primitive trace.*

8. PRIMITIVE TRACE, from which are developed.—
   - (*a*) Dorsal plates, forming tubus medullaris, in which is developed the central nervous system.
   - (*b*) Chorda dorsalis, around which are formed the vertebræ.
   - (*c*) Abdominal plates.

EXTERNAL GENITALS.

The external genitals consist of—

1. Labia Majora;
2. Labia Minora;
3. Clitoris;
4. Vestibule;
5. Vaginal Orifice;
6. Hymen;
7. Fourchette;
8. Fossa Navicularis.

The hymen, strictly speaking, does not belong to the external organs of generation, for it is the anatomical division separating them from the vagina. The urethral orifice, for convenience of study, is described with the external genitals, though a part of the urinary system.

The **Labia Majora** (Fig. 1, *bb*) form at their anterior commissure the **Mons Veneris**, and at their posterior commissure the **Fourchette**. They consist of thick folds of skin enclosing blood-vessels, fat and dartos.

The **Labia Minora** (Fig. 1, *c*) are two small folds of skin, each blending posteriorly with the corresponding labium majus at about its middle. Anteriorly they divide into two small branches, the upper forming the prepuce of the clitoris, and the lower its suspensory ligament.

The **Clitoris** proper (Fig. 1, *d*) consists of two crura which spring from the rami of the ischium and pubis. The *glans clitoridis*, covered by its prepuce, lies at the apex of the vestibule.

The **Vestibule** (Fig. 1, *g*) is a triangular, smooth, mucous surface lying between the clitoris, labia minora, and upper border of the vaginal orifice. At its base, in the middle line, is the dimple of the urethral orifice (Fig. 1, *f*).

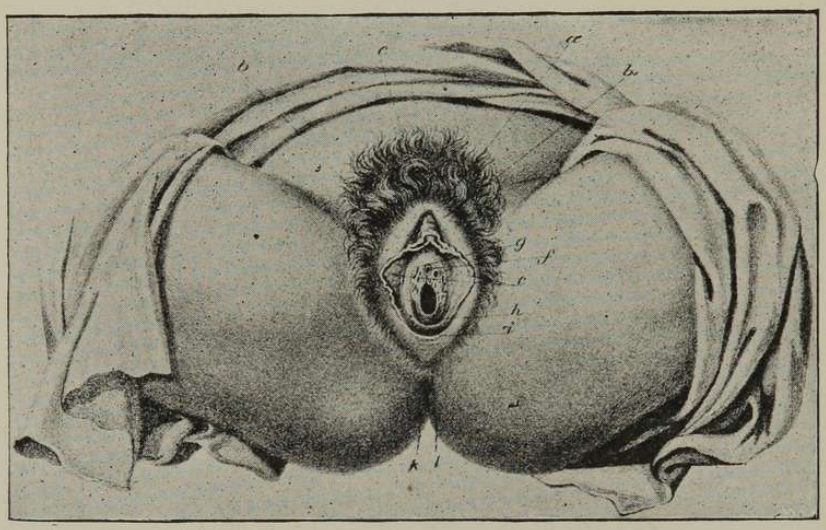
The **Vaginal Orifice**, guarded by the *hymen* (Fig. 1, *h*) is bounded anteriorly by the base of the vestibule, and posteriorly by the fossa navicularis.

The **Hymen** (Fig. 1, *h*) consists of a thin fold of mucous membrane

enclosing blood-vessels, connective tissue, and probably nerves. Its opening, when perforated, may be crescentic or diaphragmatic in shape. Sometimes it is imperforate.

The **Fourchette**, or posterior commissure (Fig. 1, *i*), is formed

FIG. 1.



EXTERNAL GENITALS.

a. Mons veneris; *b*, *b*. Labia majora drawn apart; *c*. Labia minora; *d*. Clitoris; *e*. Preputium clitoridis; *f*. Urethra; *g*. Vestibule; *h*. Hymen; *i*. Fourchette; *k*. Anus; *l*. Perineum. (*Martin*.)

by the posterior junction of the labia majora. At this point the labia majora are mere folds of skin.

The **Fossa Navicularis** is a boat-shaped cavity lying between the hymen and the fourchette when the latter is pulled down by the finger. The hymen and the fourchette are in contact unless artificially separated.

Note the following points: In the nude, erect female both the labia majora and minora occupy a plane nearly parallel to the horizon. Only the mons veneris is seen. In the well developed organs the labia minora are always in contact, as are the inner surfaces of the labia majora, except when the knees are widely separated.

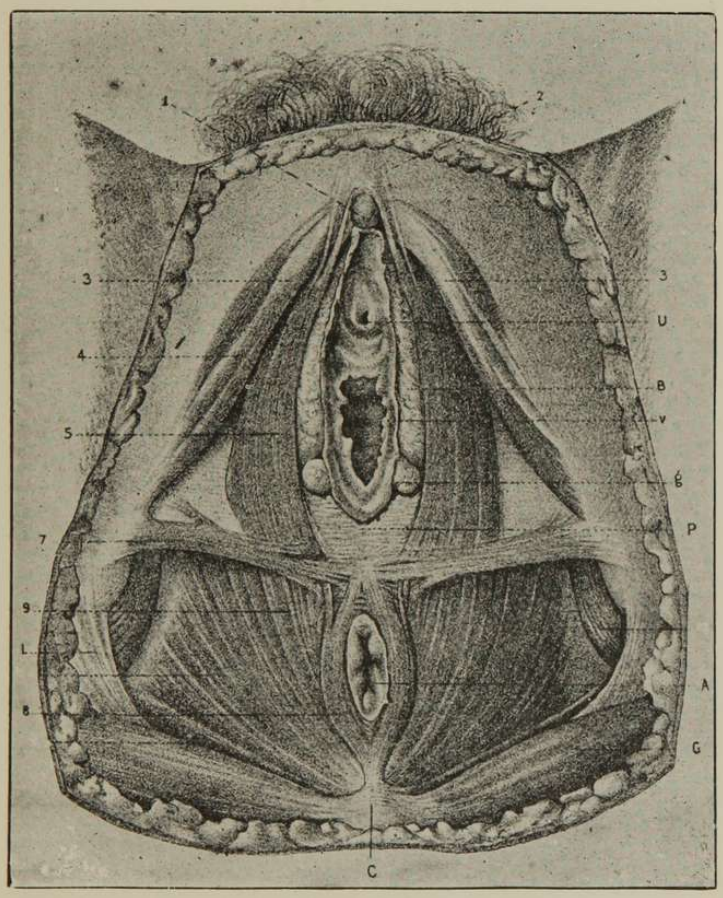
MUSCLES OF THE FEMALE PERINEUM.

The **Perineal Body** (Fig. 2, *P*) is a pyramidal, wedge-shaped body occupying the space midway between the anus and the posterior vulvar commissure. It is the centre of attachment for the *transversus perinei muscle;* the anterior end of the *superficial sphincter muscle;* the

ligamentum ischio perinei—formed by the union of the superficial perineal fascia with the inferior border of the perineal septum; the median fibers of the *bulbo-cavernosus muscle* the *perineal septum* below the vagina; and the inner median fibers of the *levator ani muscle.*

By a great accession of elastic tissue these several structures are fused together without altogether losing their identity, thus forming

FIG. 2.



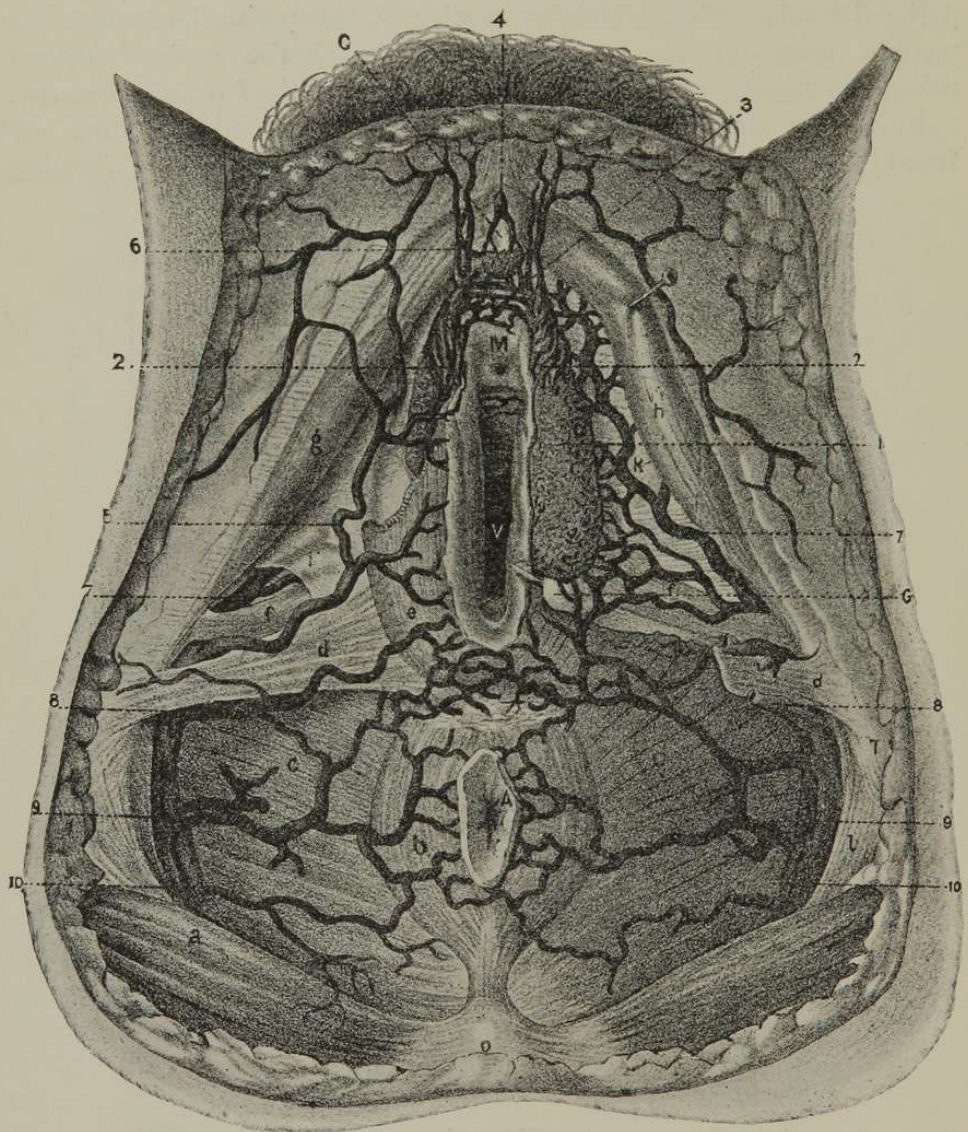
DISSECTION OF PERINEAL REGION. (*Savage.*)

A. Anus; B. Bulb of vagina; C. Coccyx; L. Large sacro-sciatic ligament; P. Perineal body; v. Vaginal aperture; U. Orifice of urethra; g. Vulvo-vaginal glands. 1. Clitoris; 2. Its suspensory ligament; 3. Crura clitoridis; 4. Erector clitoridis muscle; 5. Bulbo-cavernosus muscle; 7. Transversus perinei muscle; 8. Sphincter ani externus; 9; Levator ani.

the perineal body. It measures 1½ inches vertically, the same transversely, and ¾ of an inch antero-posteriorly. (Hart.)

The so-called **Perineal Muscles** are three in number on each side

FIG. 2½.



THE SUPERFICIAL VEINS OF THE PERINEUM AND PERINEAL PORTION OF THE ERECTILE VENOUS SYSTEM IN THE FEMALE. (*Savage.*)

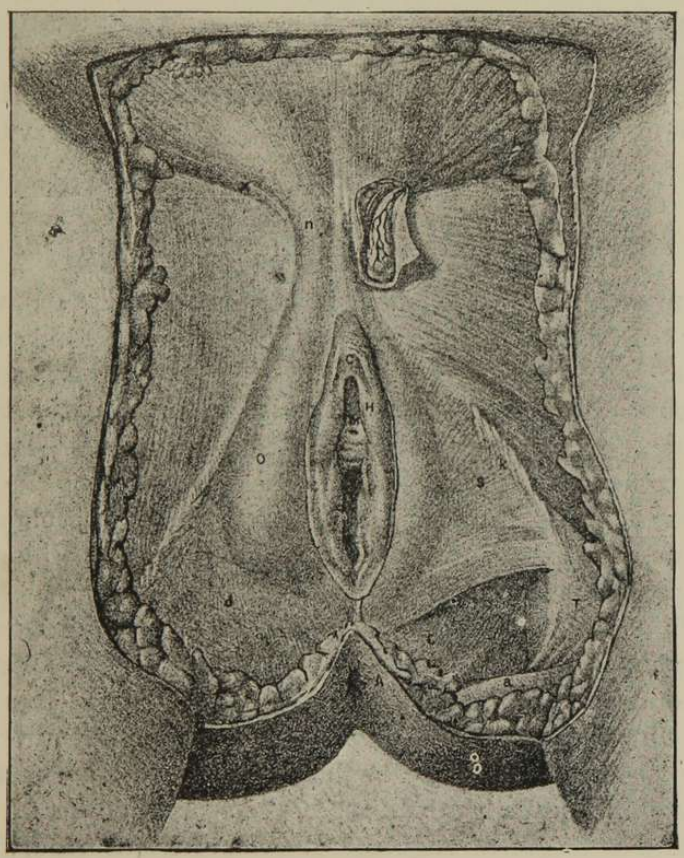
V. Vagina; C. Corpus clitoridis; h. g. Crura clitoridis. 1, 2, 3. Corpora spongiosa urethræ; G. Vulvo-vaginal glands; 5. Superficial perineal and obturator vein; 6. Veins of communication with superficial epigastric veins. M. Urethral meatus; A. Anus; O. Coccyx; a. Anterior border of gluteus maximus muscle; b. Superficial sphincter ani-muscle; c. c. Pubo- and Obturator-coccygeus muscle; L. Larger sciatic ligament; d. d. Superficial perineal muscles; e. Bulbo-carvernous muscle; f. Lower border of perineal septum; i. Anterior aponeurosis and k. posterior aponeurosis of perineal septum; e. Bulbo-cavernosus muscle.

of the vaginal orifice, the *transversus perinei* (Fig. 2, 7), the *bulbo-cavernosus* (Fig. 2, 5), and the *erector clitoridis* (Fig. 2, 4).

The **Transversus Perinei** arises from the ramus of the ischium and from the anterior aponeurosis of the perineal septum, and is inserted into the perineal body.

The **Bulbo-cavernosus** (Fig. 2, 5) arises below from the perineal body and from the anterior aponeurosis of the perineal septum. It

FIG. 3.



SUPERFICIAL PERINEAL FASCIA; ANTERIOR VIEW. (*Savage.*)

A. Anus; M. Urethral meatus and urethro-vaginal tubercle; H. Nymphæ; C. Clitoris; T. Tuberosity of ischium; c. Levator ani muscle; a. Anterior edge of gluteus maximus muscle; n. Neck of pudendal sac; O. Pudendal sac.

passes forward partially covering the bulb of the vagina, and is inserted into the corpus cavernosum of the clitoris, the posterior surface of the bulb and the mucous membrane between the clitoris and urethral orifice. (Henle.)

The **Erector Clitoridis** (Fig. 2, 4), which has nothing to do with the structure of the perineal body, and is only considered at this time for convenience of study, arises from the ramus of the pubis and the ischium and is inserted into the back and sides of the crus clitoridis.

The **Bulbi Vaginæ** (*corpora spongiosa urethræ*) lie on each side of the vaginal orifice resting on the triangular ligament and partly covered by the bulbo-cavernosus muscle. They consist of masses of erectile tissue about ¾ of an inch long, and anteriorly each blends with its fellow, this *pars intermedia* becoming continuous with the clitoris (Fig. 2, *B*. Fig. 2½).

The **Vulvo-vaginal Glands** (Bartholinian glands) lie in front of the posterior layer of the triangular ligament and close to the posterior end of the bulbi vaginæ. Each opens by a long duct at the sides of the hymen. (Fig. 2, g.)

THE FASCIÆ OF THE PELVIC FLOOR.

The **Superficial Fascia** of the pelvic floor consists of two layers—an *upper one*, which lies beneath the skin, more or less loaded with fat and is the continuation over the pelvic floor of the same structure which covers the abdomen, nates, and thighs; an *under one*, or deep layer, which forms a resisting membranous investment. The *deep layer* of the superficial facia descends from the abdomen over the pubis and covers the anterior perineal triangle down to its base, becoming attached to the outer margins of the ischio-pubic rami and to the lower margin of the septum or triangular ligament.

The **Pudendal Sac** (Fig. 3, O) commences at the margin of the external inguinal ring and is formed by the deep layer of superficial fascia and the outer layer of the triangular ligament. It receives at its neck (*n*) the terminal fibers of the round ligament of the uterus. These sacs, one on each side of the vaginal orifice, usually contain more or less fatty tissue, and with their cutaneous coverings present themselves at the vulva as the *labia majora*. Inguinal hernias readily find their way into them and are then known as *labial hernias*.

DEEPER FASCIÆ.

The **Ischio-perineal ligament** is formed by the union of the deep layer of superficial fascia with the lower border of the perineal septum. It is attached by its outer end to the ramus of the ischium and blends insensibly with other structures in the perineal body.

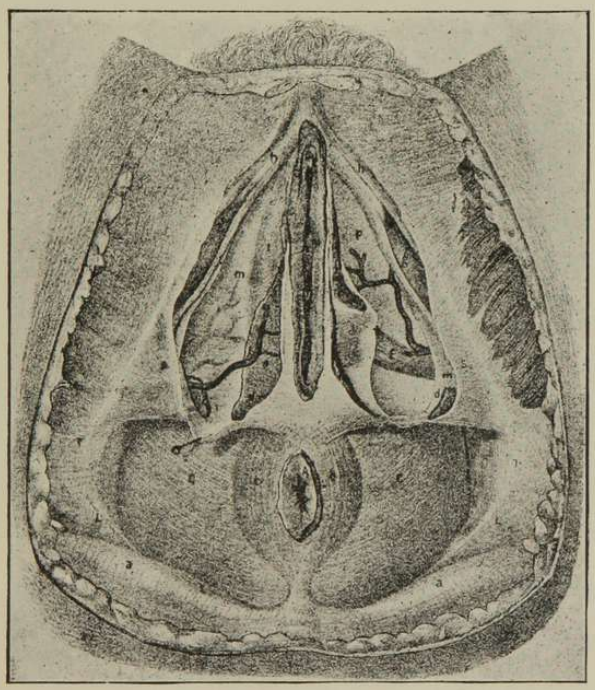
The **Perineal Fasciæ** enclose the following structures from without inward:—

Between the Skin and Superficial Fascia: Superficial perineal arteries and nerves; superficial hemorrhoidal vessels and nerves.

Between the Deep Layer of Superficial Fascia and Anterior Layer of Triangular Ligament: Erector clitoridis; bulbo-cavernosus; transversus perinei; bulbs of the vagina; pudendal sacs; transverse perineal blood-vessels and nerves; venous plexuses; dorsal artery, and vein of clitoris.

Between the Layers of Triangular Ligament; Urethra—in part; compressor urethræ; vagina—in part; pudic vessels and nerves.

FIG. 4.



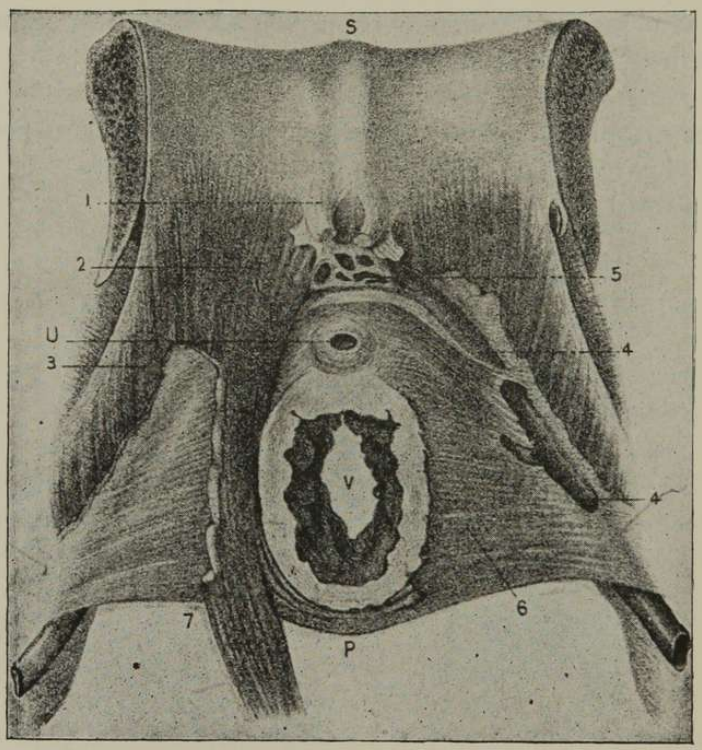
DEEPER FASCIÆ OF THE FEMALE PERINEUM (TRIANGULAR LIGAMENT OR PERINEAL SEPTUM). (*Savage.*)

a. Gluteus maximus muscle; L. Large sacro-sciatic ligament; T. Tuber ischii; c. Levator ani muscle; A. *Anus*, surrounded by b, *Sphincter* externus; d. e. *Transversus perinei* and *bulbo-cavernosus* muscles crossed by a branch of pudic vein; both muscles partially removed to anterior aponeuroses of the *perineal septum*, *m*, and membranous investment of the *bulb*, *l;* g. Anterior (lower) portion of *Erector clitoridis* muscle; *n*. Aponeurotic expansion of the upper portion on the crus; C. Clitoris and its musculo-membranous covering; M. Urethral meatus; v. Vaginal aperture; f. Muscular fibers belonging to perineal septum; l. Bulb partially cut away.

THE PERINEAL SEPTUM, OR TRIANGULAR LIGAMENT.

Note the Following Points.—The *triangular ligament*, or *perineal septum*, fills in the pubic arch and consists simply of two layers of fascia. These are termed anterior and posterior. They are attached

FIG. 5.



PERINEAL SEPTUM, POSTERIOR VIEW, TOGETHER WITH THE PELVIC ATTACHMENTS OF THE LEVATOR ANI MUSCLE. (*Savage.*)

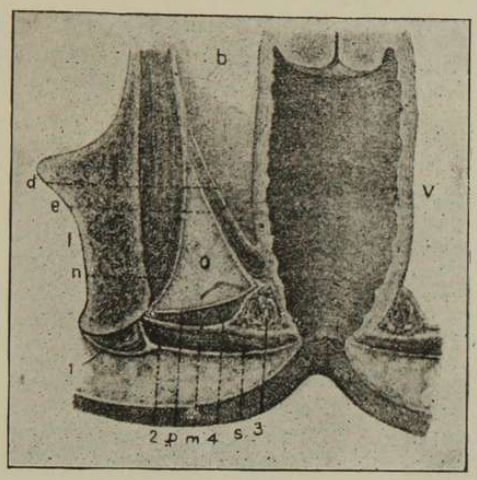
S. Inner surface of *pubic symphysis;* U. Urethra; V. Vagina; 1. Pubic attachment of bladder; 2, 3. Pubic attachment of levator ani; 4. Pudic vein; 5. Urethro-pudal venous plexus; 6. Posterior face of the septum; 7. Median portion of levator ani, some of its inner fibers passing inward under the vagina, where, with the lower edge of the septum, they are comprehended in the perineal body.

externally to the greater part of the osseous margin of the pubic arch extending from the sub-pubic ligament in front to the beginning of the ischial tuberosity posteriorly. *The upper fibers join those of the opposite side, so as to inclose the urethra.* (*Fig. 5, U.*). *The lower fibers join those from the opposite side, below the vagina.* The remainder of the septum resembles the coats of the vagina. In the reparation of injuries

of the pelvic floor the triangular ligament plays an important role.

In Fig. 6 the pelvic fasciæ and their function are clearly shown by a perpendicular transverse section.

FIG. 6.



PERPENDICULAR TRANSVERSE SECTION OF PELVIS THROUGH THE MIDDLE OF THE VAGINA. (*Savage.*)

V. *Vagina* and its posterior column; O. *Ischio-rectal fossa*, filled with fatty process of superficial perineal fascia; I. *Ischial tuberosity*, section of; *b*. Inferior pelvic space; *d*. Recto-vesical layer of pelvic fascia; *e*. Inferior or perineal layer of levator ani fasia; *n*. Obturator fascia; *p*. Posterior aponeurosis of perineal septum; *m*. Anterior aponeurosis of same; *s*. Deep layer of superficial perineal fascia covered by fatty superficial layer; 1 Cross section of right crus clitoridis, including erector muscle; 2. Superficial transverse perineal muscle; 3. Bulb of vagina; 4. Muscle of perineal septum.

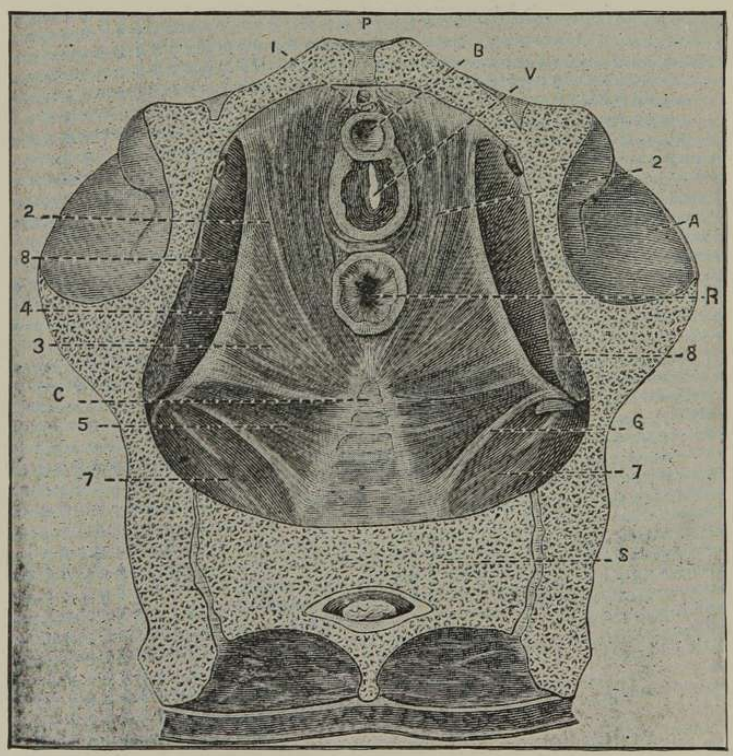
THE PELVIC FLOOR DISSECTED FROM ABOVE.

In Fig. 7 the **Pelvic Floor** is seen from above, showing its internal concave or peritoneal aspect. The peritoneum and underlying connective tissue is removed, together with the nerves and blood-vessels, exposing the so-called diaphragmatic muscles of the pelvis, viz.: the *levator ani* and the *coccygeal*. These muscles, together with their investing fascia, form by all odds the most important support of the pelvic floor.

The **Levator Ani** (2, 3, and 5, Fig. 7) has an extensive origin (the *pubo-coccygeal* and *obturator coccygeal* muscles of Savage). It arises from the posterior aspect of the pubis near the symphysis in front, from the posterior surface of the ischial spine behind, and between

these points from the "white line" of the pelvic fascia (Fig. 7, 4). From these attachments it sweeps downward and inward to become firmly attached to the walls of the vagina and the rectum and to the tip of the coccyx. Between the tip of the coccyx and the rectum it blends with its fellow of the opposite at the raphé. The series of fibers turning beneath the rectum and vagina, intermixing with the lower circular fibers, form the "internal sphincter" and the retractor vaginæ." (Luschka.)

FIG. 7.



DISSECTION OF PELVIS FROM ABOVE. (*Savage.*)

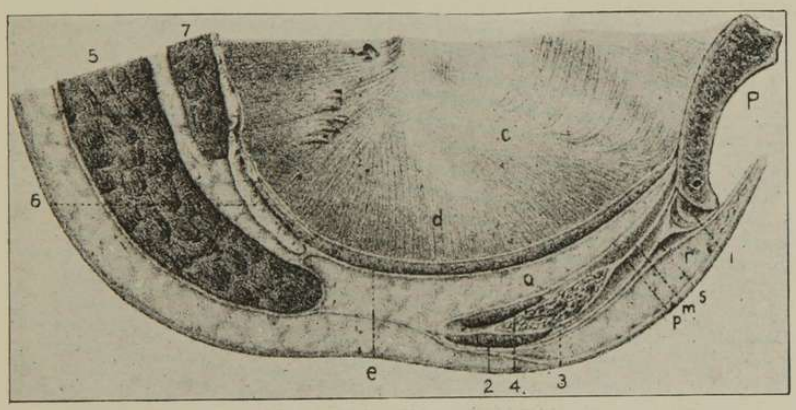
B. Neck of bladder; P. Symphysis pubis; V. Vagina; R. Rectum; C. Coccyx; S. Sacrum; A. Acetabulum; 1. Anterior vesical ligaments; 2, 3. Levator ani; 4. Ilio-pubic line of the latter; 5. Coccygeal muscle; 7. Pyriformis muscle; 8. Obturator muscle.

The **Coccygeal Muscles** (Fig. 7, 5), one on each side of the pelvis, take their origin from the spine of the ischium. They pass inward, gradually expand into broad, thin laminæ, which are inserted into the lateral borders of the lower segment of the sacrum and to the sides and front of the coccyx.

FASCIAL COVERINGS OF THE MUSCLES OF THE PELVIC FLOOR.

The **Pelvic Fascia**, as viewed from above, is attached anteriorly near the lower border of the symphysis pubis; laterally to the pelvic bone; and posteriorly to the spine of the ischium. At and between these attachments it follows the origin of the obturator muscles, is attached to the membrane of the obturator foramen, and posteriorly sends out a thin lamina that covers the sacral plexus and pyriformis muscle. From the "white line" the fascia extends downward and inward and is known as the "recto-vesical fascia." This recto-vesical process covers a corresponding surface of the levator ani muscle, becoming firmly attached to the vagina and the rectum, and giving off from its under surface fibrous sheaths which surround and follow these tubes downward. (Quain, Heath.) To the bladder processes are given off, which

FIG. 8.



PERPENDICULAR SECTION, FROM BELOW UPWARD, TO THE LEFT OF THE PUBIC SYMPHYSIS, DIVIDING THE LABIUM THROUGH THE MIDDLE OF THE PUDENDAL SAC (*Savage.*) *Vide* text.

extend from the back of the pubis to the neck of the organ, forming the anterior ligaments; and fascial bands which are attached to the posterior lateral border of the vesical base, forming the lateral vesicle ligaments.

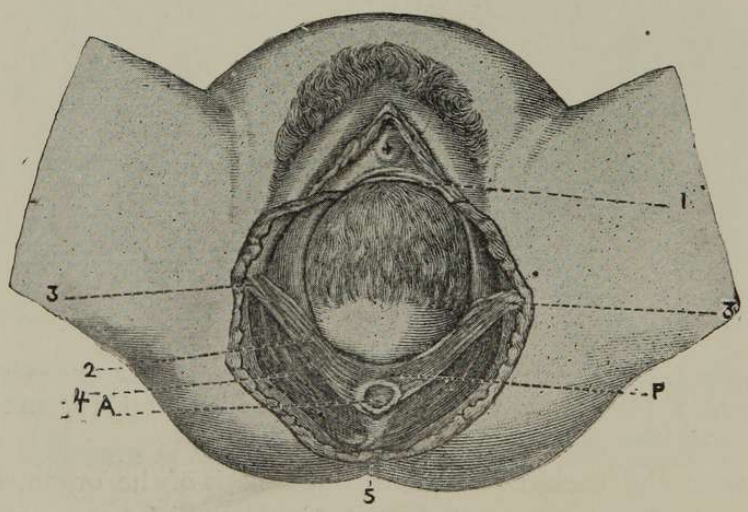
If the student will now turn to Fig. 8 he will see, diagrammatically, every detail of the construction of the pelvic floor. In studying this diagram he should bear in mind that the female floor is pierced by the vagina and the rectum, which tends to weaken it. He should remember however, that the vagina *is a mere mucous slit in the pelvic floor, whose walls are in apposition.* In the upright posture it makes

an angle of about 60° with the horizon, which is nearly parallel to the pelvic brim.

P is the section of the body of the pubic bone; *c* is the pubo-ischiatic line (white line, Fig. 7) between the pelvic fascia and obturator fascia, to which the levator ani is attached laterally; *d* is the recto-vesical fascia covering the levator ani muscle; *p* is the posterior layer of the triangular ligament (perineal septum); *m*, anterior layer of triangular ligament; *s*, under layer of superficial perineal fascia; *o*, ischio-rectal extension of *r*, mass of fatty tissue filling pudendal sac, and receiving the termination of the round ligament, and fatty layer of superficial perineal fascia.

1. Sheath of deep layer of superficial fascia surrounding the crus clitoridis and its erector muscle; 2. Transverse perineal muscle; 3. Bulb of vagina; 4. Lower muscular fibers of perineal septum extending between *p* and *m;* 5. Gluteus maximus muscle; 6. Ischio-sciatic ligaments; 7. Pyriformis muscle.

FIG. 9.



THE RELATIONS OF THE MUSCULAR FLOOR OF THE PELVIS TO THE PRESENTATION AT THE LAST STAGE OF PARTURITION.

1. Upper margin of the vaginal ring; 2. Infra-vaginal portion of triangular ligament and transversus perinei muscle; 3. Their attachments to the tuberosity of the ischium; 4. Lower part of levator ani muscle; P. Perineal body; A. Anus.

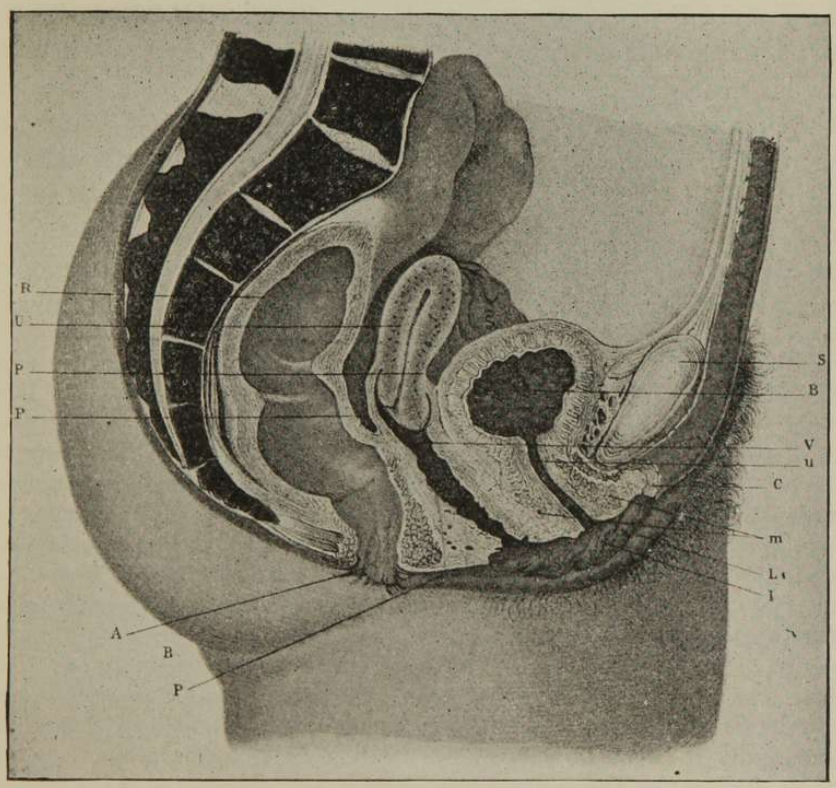
The relation of the muscular floor of the pelvis to the presentation at the last stage of parturition is well shown in Fig. 9. It will be seen from this illustration how it is possible to have those structures of the pelvic floor which afford its main support—the diaphragmatic muscles,

their fascia, and the triangular ligament—relaxed and separated without any external injury to the perineal body. Unless the student fully comprehends this fact he cannot intelligently repair injuries of the pelvic floor.

The Relations of the Female Pelvic Organs with the Pelvis and with One Another.

Fig. 10 represents a median perpendicular section of the pelvis from front to back, and shows both pelvic spaces. For the purpose of illustration, the urethra, bladder, vagina, and rectum are represented with their walls separated. This is erroneous, for when empty the walls of all of these organs lie in apposition.

Fig. 10.



Median Perpendicular Section of Pelvis. (*Cazeaux.*)

S. Section of *pubic symphysis;* B. *Bladder*, moderately distended; in front its outer longitudinal coat passes off to the inferior edge of the pubic symphysis and to the ligamentous process of the levator ani muscle, where it is attached; it bridges over the urethro-pubic venous plexus, separating that space from the the vesico-pubic space above, which in turn is bridged over by the vesical liga-

PERITONEUM.

The Pelvic Peritoneum Traced from Before Backward.—At a point a little above the symphysis pubis the peritoneum of the anterior abdominal wall is reflected to the bladder (Fig. 12). From the fundus it dips down between the bladder and the uterus to a point corresponding to the internal os; thence over the anterior surface of the uterus. It forms between the bladder and the uterus the *vesico-uterine pouch* and the *vesico-uterine ligament.*

From the anterior surface of the uterus it passes over the fundus, covering completely the posterior surface and descending for about one inch (variable) on to the posterior vaginal wall. From this point it is reflected over the anterior surface of the rectum, forming the *pouch of Douglas.* (Figs. 10 and 11.)

The Pelvic Peritoneum at the Sides of the Uterus.—The two layers of peritoneum covering the anterior and posterior surface of the uterus lie nearly in apposition at the sides of the uterus, from which point they extend on either side outward and somewhat backward to the sacro-iliac synchondrosis; at this point they pass to the side walls of the pelvis. These two layers of peritoneum form the *broad ligaments.*

The **Broad Ligaments** enclose between their two laminæ of peritoneum, lymphatics, blood-vessels, connective tissue, and unstriped

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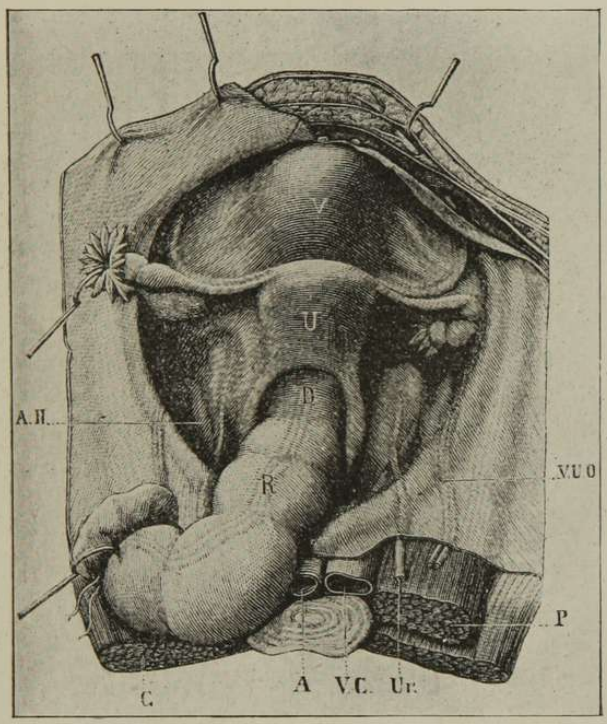
ments formed by the *urachus* and two remnants of the hypogastric arteries. The internal circular muscular coat of the bladder is well shown. The internal mucous folds loosely adhere to the lining membrane and cover the lattice-like projections of the inner circular coat into the vesical cavity The entrance of the left ureter is indicated by a black point. *u. Urethra.* The inner longitudinar muscular coat is surrounded by *m, m, outer circular coat.* The muscular layers at *u. constitute a true compound sphincter, composed of organic and voluntary muscular fibers.* C. Section of *clitoris;* L. *Left labium;* I. *Left nympha;* V. *Vagina.* Its muscular coats blend with the tissues of the uterine neck. The long axis of the uterine cavity is nearly at right angles with that of the vagina. P. *Perineal body.* The many small vessels are indicated by black dots. The anterior sections of the lower muscular fibers of the rectum (internal sphincter) are immediately behind it. A. *Anus,* showing the columns of Morgagni; R. *Rectum,* showing the valves of Houston projecting into its its cavity. All of the coats of the rectum are included in these folds; they disappear entirely upon slight distention. The internal sphincter (inferior circular fibers) are indicated by minute circular markings; the posterior half of the external sphincter is indicated by lines near the coccyx. U. Left half of *uterus* retrodisplaced. Its central and more vascular portion is indicated by black dots around which are its internal and external muscular coats. P, P. *Vesico-uterine* and *recto-uterine* (Douglas's pouch) peritoneal folds.

muscle. The Fallopian tubes are placed just within their upper face margin. At the outer margin of the ligament there is a portion (one inch) not occupied by the Fallopian tube, which is the **infundibulo-pelvic ligament** of the ovary. The ovary projects through the posterior lamina of the broad ligament; enclosed in the two laminæ, between the ovary and ampulla, is the **Parovarium,** (Fig. 13.)

FIG 11.



HORIZONTAL SECTION OF THE ABDOMEN, SHOWING THE PELVIC ORGANS FROM ABOVE AND THE PELVIC CAVITIES.

V. Fundus of bladder moderately distended; U. Uterine body; A. H. Hypogastic artery; D. Cul-de-sac of Douglas; A. Aorta; V. C. Vena cava; Ur. Ureter; P. Psoas muscle; R. Rectum. (*Auvard*)

At the uterine end of the broad ligament, near its upper angle, there is a longitudinal fold of peritoneum into which the unstriped muscular fibers of the uterus are prolonged. It extends from the upper angle of the uterus to the inner end of the ovary (one and one-fifth inches) and constitutes the **Ovarian Ligament.**

The Pelvic Peritoneum Reflected from the Sides of the Pelvis.—At the sides of the pelvis the peritoneum descends and is reflected on to the lateral surfaces of all of the pelvic organs. At the lower lateral

part of the body of the uterus it forms two folds which extend outward and backward toward the second sacral vertebra. These folds contain connective tissue and unstriped muscular fibers, and constitute the **Utero-sacral ligaments.** (Fig. 11.)

Practical Points Concerning the Pelvic Peritoneum.—1. There is no break in the continuity of the peritoneum, although described in sections.

FIG. 12.

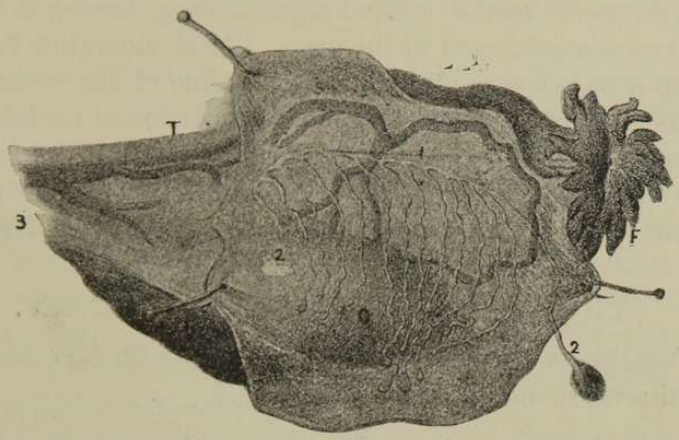
FROZEN SECTION, SHOWING PERITONEUM, WHICH IS INDICATED BY DOTTED LINES.

a. Anus; *b*. Vagina; *c*. Bladder; *d*. Uterus; *e*. Below Douglas's pouch; *f*. Symphysis pubis. (*Furst.*)

2. In operations involving the posterior vaginal fornix it is an easy matter to open into the peritoneum. There is no operation involving the anterior fornix which especially endangers the peritoneum.

3. When the bladder is distended, and during parturition, this organ can be penetrated above the pubis without injuring the peritoneum.

FIG. 13.



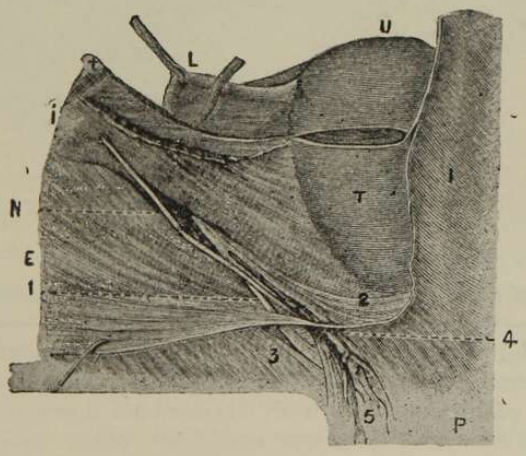
SHOWING PAROVARIUM OR ORGAN OF ROSENMÜLLER, (*Savage.*)

T. Fallopian tube or developed duct of Müller; 1. Remnant of the Wolffian duct; 2, 2. Remnants of the upper and lower sets of the cæcal tubes of the Wolffian body; (2.) Hydatid of Morgagni projecting from the cæcal end of the duct of Müller.

THE ROUND LIGAMENTS OF THE UTERUS.

The **Round Ligaments** are the only uterine ligaments not described in tracing the peritoneum. They vary in length from four to five inches.

FIG. 14.



PUBIC TERMINATION OF ROUND LIGAMENTS. (*Savage.*)

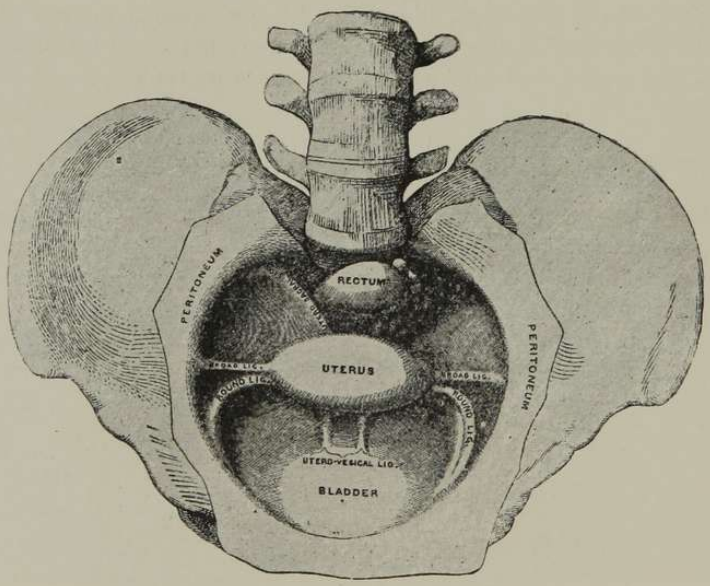
U. Fundus uteri; P. Pubis, where covered by pubic portion of aponeurosis of int. obliq. muscle; L. Uterine extremity of round ligament; E. Aponeurosis of ex.

Within the pelvis they are attached immediately below and in front of the Fallopian tubes. A portion of each ligament is included in the anterior fold of the broad ligament, from which it passes, enveloped in a fold of peritoneum, to the internal inguinal ring, having the same relations as the spermatic cord in the male. After emerging from the external ring it passes very close to the outer side of the pubic spine, into the fibrous tissue of the mons and the upper portion of the labium majus. Before passing into these structures it is broken up into several fine strands. (Fig. 14.) A number of operations upon the round ligaments have recently been devised for overcoming uterine displacements.

THE PERITONEAL PELVIC POUCHES.

The **Vesico-uterine Pouch** lies between the bladder and the uterus and contains no small intestine. (Fig. 15.)

FIG. 15.



THE POUCHES AND REFLECTIONS OF THE PELVIC PERITONEUM. (*Hodge.*)

obliq. muscle; *i.* Internal oblique muscle; *l.* Rectus muscle; N. Genital branch of genito-crural nerve; 1. External terminating fibers of round ligaments into outer pillar of internal ring near Gimbernat's ligament; 2. Internal terminating fibers into conjoined tendons of int. obliq. muscle and transversalis muscle near pubis; 3. Middle terminating fibers into upper part of external ring; 4. Internal pillars of external ring; 5. Vessels of round ligament, nervous filaments, and middle terminal fibers of round ligament descending into pudendal sac.

The **Paravesical Pouches** lie one on each side of the bladder in front of the broad and infundibulo-pelvic ligaments. They probably contain intestine when the fundus is diverted to the front, and certainly do when it is displaced posteriorly. The Fallopian tubes also lie in these pouches.

The **Lateral Pouches of Douglas** are bounded in front by the broad ligaments; laterally by the pelvic walls; and posteriorly by the utero-sacral ligaments.

The **Pouch of Douglas or Posterior Cul-de-sac** is bounded anteriorly by the uppermost inch of the posterior vaginal wall and posterior aspect of the supra-vaginal portion of the cervix; superiorly and laterally by the utera-sacral ligament, and posteriorly by the sacrum and rectum with their peritoneal investment. When the uterus lies in front it is partially filled with intestine, which is crowded out when it is retroverted or retroflexed.

The depth of the pouch of Douglas varies. Normally it descends for about one inch on to the posterior aspect of the posterior vaginal wall. It is greater on the left side than on the right. Pirogoff has made a section in which the peritoneum dips down on the posterior vaginal wall till within an inch from the vaginal orifice. I have elsewhere recorded a similar case passing under my observation. This occasional anomaly should be borne in mind by the operator.

CELLULAR OR CONNECTIVE TISSUE OF PELVIS.

This includes the *fascia*, which is described in connection with the muscles of the pelvic floor; and the loose *cellular or connective tissue* througout the pelvis.

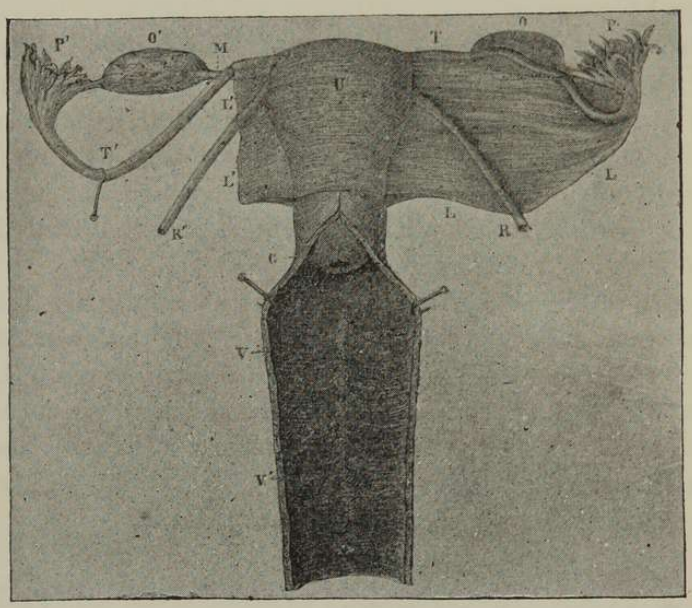
The **Cellular Tissue** fills in the spaces between the bladder, uterus and rectum above, and surrounds the vagina and rectum below, spreading out between the layers of the broad ligaments. It passes by continuity from the bladder and uterus upward into the iliac fossa, along the surface of the psoas muscle posteriorly, and between the peritoneum and transversalis fascia anteriorly. It is very scant between the anterior and posterior surfaces of the fundus and its peritoneal covering, but at the sides of the cervix exists as distinct, loose tissue. It is most abundant between the folds of broad ligaments.

The pelvic cellular tissue acts as a cushion in breaking the force or jar which otherwise would be felt with every step. It steadies the pelvic organs, and from its peculiar web or sponge-like formation permits the blood-vessels and nerves to pass through it to their distribution.

It admits, also, of much displacement of the pelvic organs either upward or downward (as in pregnancy and prolapsus) without injury to the structures which pass through it. This tissue is of the highest importance pathologically, because of its liability to inflammation.

THE UTERUS AND ITS ANNEXIA.

Fig. 16.



UTERUS AND ANNEXIA.

C. The uterine neck; L, L. Left broad ligament; L′. L′. Part of right broad ligament; M. Right ovarian ligament; O′. Right ovary; P′. P. Fimbriated extremities of Fallopian tubes; R′. R. Round ligaments; T′. T. Fallopian tubes; U. Anterior surface of uterine body; V′. V. Vagina.

THE UTERUS.

The **Uterus** is placed between the bladder and the rectum. Its anterior surface is almost straight, and its posterior, convex at its upper part. It is divided into body and cervix.

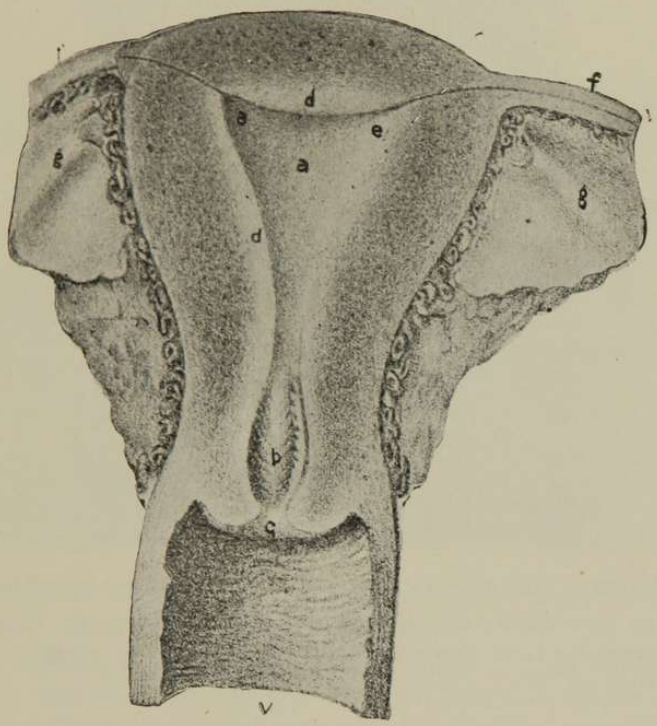
On making a coronal section (Fig. 17) the uterine cavity is best seen. The *cavity of the body* is a triangular slit with its apex downward. It is lined with mucous membrane and contains three openings —those of the Fallopian tubes and the os internum.

The **Cavity of the Cervical Canal** is conical or spindle-shaped, and has two openings into it—the os externum from below, and the os internum from above.

The average length of the unimpregnated uterus, from the os externum to the exterior of the fundus, is three inches. The average length of the uterine canal, from the os externum to the interior of the fundus, is two and a half inches.

The **Cervix** is divided into a vaginal and a supra-vaginal portion.

FIG. 17.



CORONAL SECTION OF UTERUS THROUGH FALLOPIAN TUBES. (*Savage.*)

a. Uterine cavity; *b*. Canal of the cervix and its peculiar folds of lining membrane; *d*. Internal uterine coat; *c*. Os externum; *e*. Uterine aperture of Fallopian tubes; *f*. Fallopian tubes; *g*. Broad ligament; V. Vagina.

The vaginal portion lies within the vagina. Upon digital examination the os externum is felt as a mere dimple in virgins; in women who have borne children it is transverse and fissured.

In *structure* the uterus is composed, from without inward, of peritoneum, unstriped muscular fibers, and mucous membrane.

The structure of the mucous membrane of the body is shown in (Fig. 18). The mucous membrane of the cervix is thrown into numerous folds which are known as arbor vitæ. That of the body is lined with columnar epithelium. The arbor vitæ of the cervix are

lined with ciliated epithelium; between them it is of the columnar variety.

FIG. 18.

VERTICAL SECTION THROUGH THE MUCOUS MEMBRANE OF THE HUMAN UTERUS.

e. Columnar Epithelium, the Cilia are not represented; *g.g.* Utricular Glands; *ct. ct.* Interglandular Connective Tissue; *v. v.* Blood-vessels; *m. m.* Muscularis Mucosæ ($\frac{450}{1}$). (*Turner.*)

THE FALLOPIAN TUBES.

The **Fallopian Tubes** (FIG. 19) run sinuously from the upper angle of each side of the uterus, and are inclosed in the upper free margin of the broad ligaments. They vary in length from four to six inches, the right being usually the longer of the two.

Each tube is composed of three parts—the *isthmus*, the *ampulla* and the *pavilion*.

The **Isthmus** is the uterine end of the tube. It is narrow and straight, and its lumen will barely admit a bristle.

The **Ampulla** is curved and thick, with a lumen sufficiently large to admit an ordinary sized sound.

The **Pavilion** (fimbriated end) is expanded into a funnel-shaped extremity.

In *structure* the Fallopian tube is composed, from without inward, of peritoneum, longitudinal and circular unstriped muscular fibers, and mucous membrane lined with ciliated columnar epithelium.

The Ovaries.

The **Ovaries** are two oval-shaped bodies which project through the posterior layers of the broad ligaments one on either side of the uterus.

Fig. 19.

View from Behind of the Lateral Angle of the Uterus, with Part of the Left Broad Ligament, Ovary and Parovarium. (*Henle.*)

a. Uterus; *b*. Isthmus of Fallopian tube; *c*. Ampulla; *g*. has Parovarium to the right, and fimbriated extremity of Fallopian tube and ovarian fimbria just below it; *e*. Ovary; *f*. Ovarian ligament; *i*. Infundibulo-pelvic ligament.

They vary in weight from sixty to one hundred and thirty grains, and in length from one to one and one-half inches. The *ovarian ligaments* have been described with the peritoneum.

In *structure* the ovary is composed of peritoneum, connective tissue, unstriped muscular fibers, blood-vessels, nerves and lymphatics. The *peritoneum* is of a dull luster and is covered with an epithelium made up of columnar nucleated cells, which is known as germ-epithelium.

The *connective tissue* consists of two layers—the cortical and the medullary. The cortical lies beneath the peritoneum and the medullary near the hilum. Throughout the connective tissue are innumerable **Graafian Follicles** varying in size from $\frac{1}{100}$—$\frac{1}{30}$ in. As they advance toward and bulge from the surface they become much larger than this and in due time rupture. (Fig. 21.)

The *Graafian follicles* consist of—

(*a*) A tunica fibrosa (Ovicapsule);

(*b*) A membrana propria;

(*c*) A layer of nucleated columnar epithelial cells — (Membrana Granulosa); and

(*d*) Liquor folliculi.

The **Membrana Granulosa** projects into the liquor folliculi at one point, which is known as the *discus proligerus*. The discus proligerus contains the ovum, which has the following structure:—

(*a*) Zona pellucida, or external envelope;

(*b*) Yelk protoplasm;

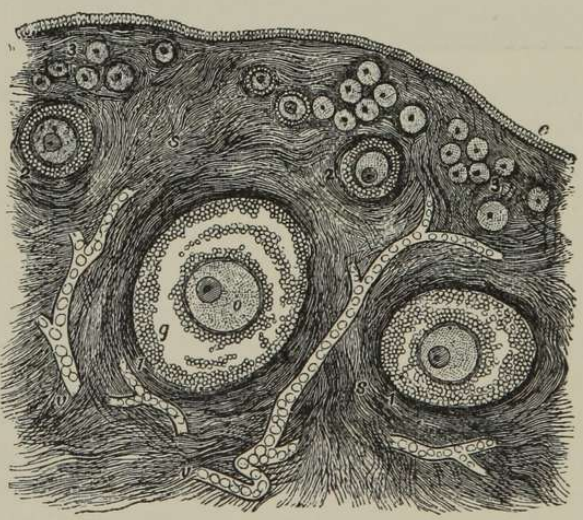
(*c*) Germinal vesicle ($\frac{1}{700}$ in. diameter).

(*d*) Germinal spot ($\frac{1}{3000}$ in. diameter).

The Vagina.

The **Vagina** connects the external and internal organs of generation, and extends from the hymen to the cervix uteri. It is bounded anteriorly by the bladder and urethra, and posteriorly by the perineum, rectum and lower inch of the cul-de-sac of Douglas.

Fig. 20.



Section Through the Cortical Portion of the Ovary.

e. Germ epithelium; *s*, *s*. Ovarian Stroma; *1*, *1*. Large sized Graafian Follicles; *2*, *2*. Middle sized, and *3*, *3*. Smaller sized Graafian Follicles; *o*. Ovum within Graafian Follicles; *v*. *v*. Blood-vessels in the Stroma; *g*. Cells of Membrana Granulosa. (*Turner*.)

The **Anterior** and **Posterior Vaginal Walls** are continuous at

their sides and lie in opposition, so that the vagina is a mere slit in the pelvic floor. In the upright posture it is nearly parallel to the pelvic brim (Fig. 21).

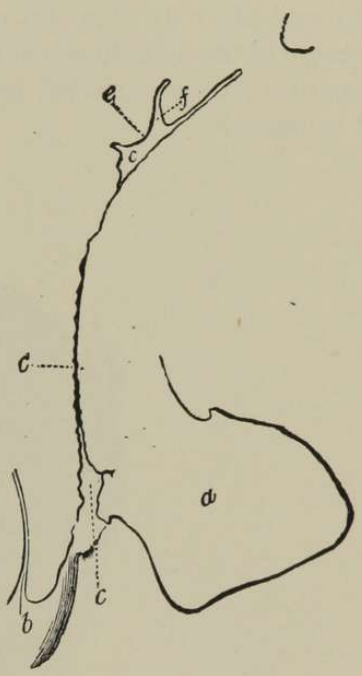
The **Anterior Vaginal Wall** is from 2 to 2½ inches long, forming at its junction with the cervix the *anterior vaginal fornix*. It is separated from the posterior wall of the bladder by loose connective tissue, but it is closely incorporated with the urethra.

The **Posterior Vaginal Wall** is more than an inch longer than the anterior, forming at its junction with the cervix the *posterior vaginal fornix*.

In **Structure** the vagina consists of mucous membrane, and two layers of unstriped muscular fibers surrounded by loose connective tissue, which contains its outer venous plexus. The mucous membrane is made up of unstriped muscular fibers, elastic tissue, connective tissue, and epithelium (squamous and cylindrical).

The **Bladder, Urethra** and **Rectum** are well shown in Fig. 10. The relation of the *ureters* to the uterus and bladder cannot, however, be shown in either a vertical or horizontal section of the pelvic organs. Since vaginal hysterectomy has become a popular and frequent operation a knowledge of the exact location of the ureters is very important (Fig. 22). In the upper part of the pelvis they lie nearly parallel until they cross the iliac arteries. The left ureter lies behind the sigmoid flexure and the right behind the lower end of the ileum. After crossing the iliac arteries they extend along the lateral walls of the pelvis downward, backward and outward, nearly to the spine of the ischium. At this point they bend forward and inward, behind the uterine vessels, and pass beneath the base of the broad ligaments, entering the bladder from one-half to three-quarters of an inch in front of and below the cervix.

FIG. 21.

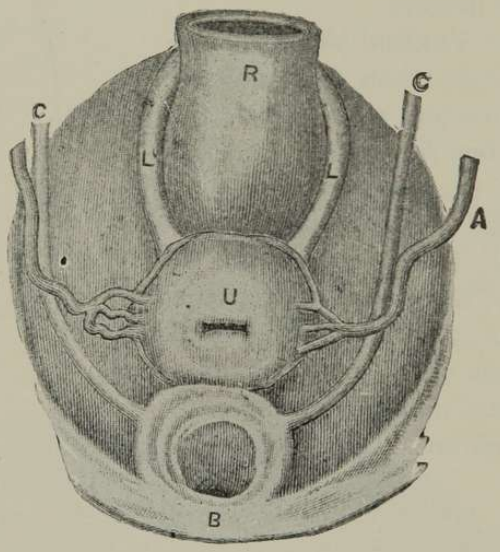


VAGINA IN VERTICAL SECTION. (*Hart.*)

a Perineum; *b*. Urethra; *c*. Vagina; *e*. Anterior lip of cervix; *f*. Os uteri. The axis is not normal at its upper part, as the uterus was drawn back.

There are three openings into the bladder—the orifices of the two ureters and the internal orifice of the urethra—dividing it into neck, base and body. The ureteric openings are separated from each other by an inch or an inch and a half. All above these openings and the centre of the symphysis is the *body;* all below is the *base;* and that triangular portion bounded by them and the internal urethral orifice is the *trigone.*

FIG. 22.



RELATIONS OF THE URETERS AT THE LEVEL OF THE OS INTERNUM, AS SEEN FROM ABOVE. (*Polk.*)

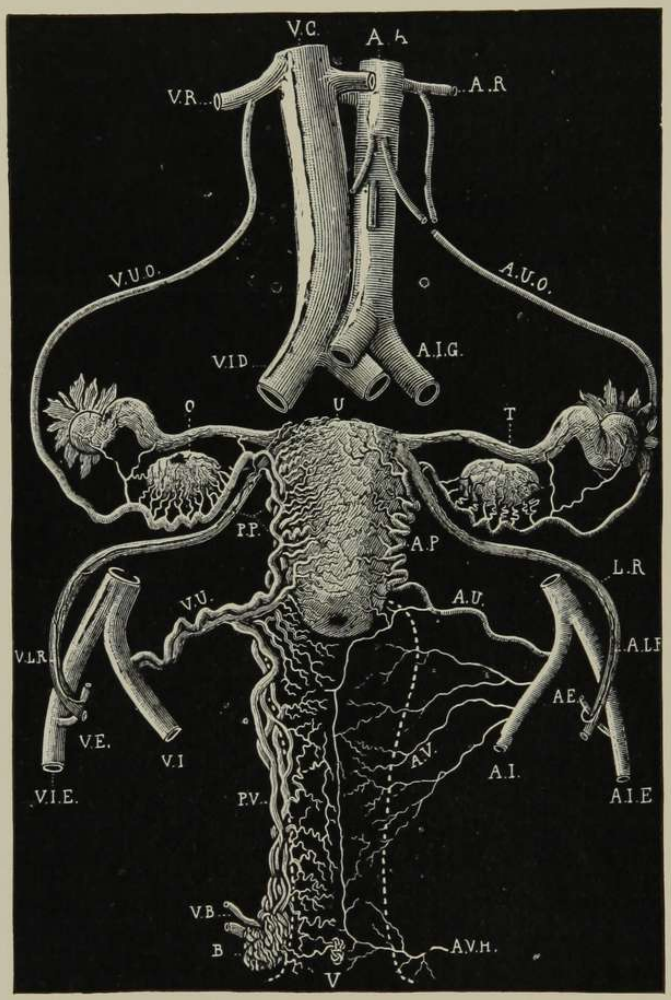
U. Uterus; B. Bladder; R. Rectum; A. A. Uterine Arteries; C. C. Ureters; L. L. Utero-sacral ligaments.

Practical Observation: In vaginal hysterectomy, and in all operations involving the broad ligaments, there is but little danger of injuring the ureters in securing the base of these ligaments, if the operator applies the ligature or clamp close to the cervix.

THE BLOOD-VESSELS, LYMPHATICS AND NERVES OF THE PELVIS.

Blood-Vessels.—(*v.* Plate VI). The entire blood supply of pelvic organs and perineum is derived from the ovarian, uterine, vaginal, and internal pudic arteries. The ovarian is a branch of the abdominal aorta; the last four are all branches of the anterior division of the

PLATE V.



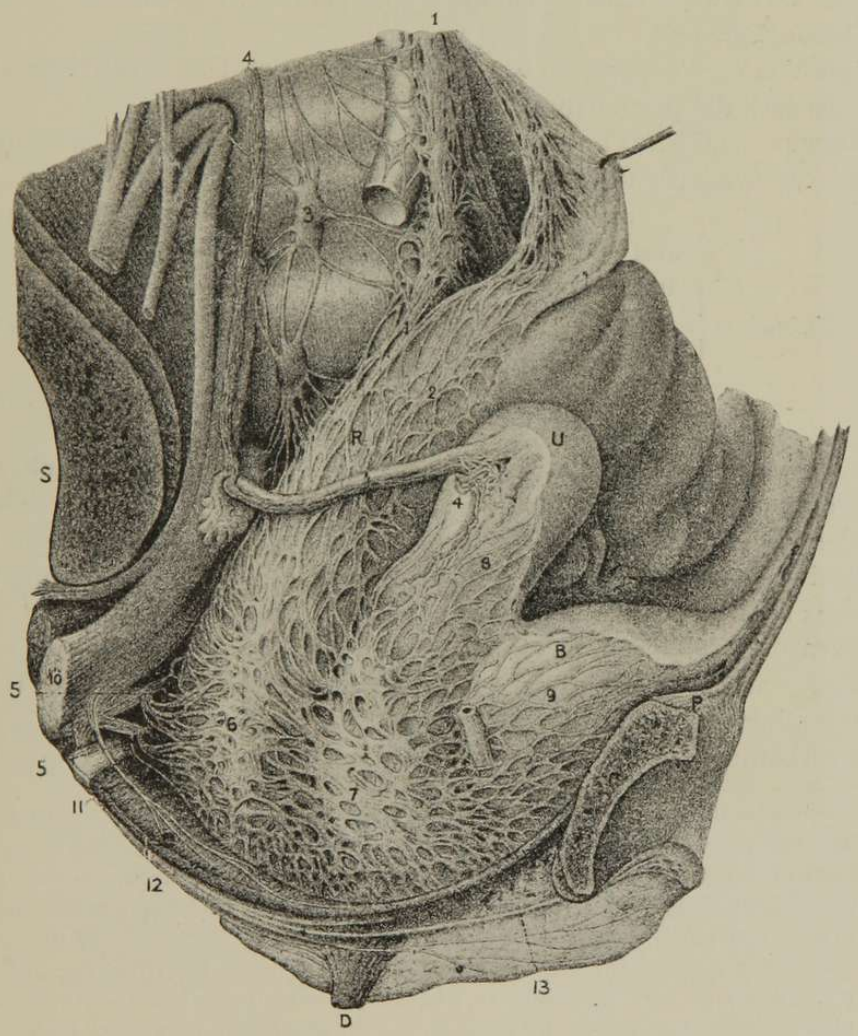
SCHEMA OF THE GENITAL CIRCULATION (*Auvard and Devy*).

A. A. Aorta. V. C. Inferior Vena Cava. A. R. Renal Artery. V. R. Renal Vein. A. U. O. Ovarian Artery. V. U. O. Ovarian Vein. A. I. G. Left Common Iliac Artery. V. I. D. Right Common Iliac Vein. A. I. E. External Iliac Artery. A. I. Internal Iliac Artery. V. I. E. External Iliac Vein. V. I. Internal Iliac Vein. A. E. Epigastric Artery, giving off A. L. R., Artery of the Round Ligament (L. R.). V. E. Epigastric Vein, receiving V. L. R., Vein of the Round Ligament. A. P. Puerperal Artery. P. P. Pampiniform Plexus. A. U. Uterine Artery. V. U. Uterine Veins. A. V. Vaginal Arteries. P V. Vaginal Plexus. A. V. H. Vulvo-Vaginal Branch of the Internal Pudic Artery. V. B. Veins emptying into the Internal Pudic Vein and also into the External Hemorrhoidal Veins. B. Bulb of the Vagina. V. Vulva. U. Uterus. T. Fallopian Tube. O. Ovary.

internal iliac. At the isthmus of the cervix a special branch of the uterine joins with its fellow to form the *circular artery*.

The *venous supply* is very abundant, and consists of numerous and freely communicating plexuses. These plexuses are located as follows:—

FIG. 23.



NERVES OF THE UNIMPREGNATED UTERUS. PERPENDICULAR SECTION OF THE UTERUS FROM BEFORE BACKWARDS. (*Hirschfeld*)

1. Hypogastric plexus (infer. aortic plexus) lying on the bifurcation of the abdominal aorta. 2. Rectal br. of the inferior mesenteric plexus, receiving constant br. from the division of the hypogastric plexus of the same side. 3. One of the lumbar ganglia of the sympathetic, all of which give branches to the hypogastric plexus. 4, 4. Spermatic plexus, derived from the renal and upper

The **Vesical Plexus**, external to the muscular coat of the bladder.

The **Hemorrhoidal Plexus**, below the mucous membrane of the lower part of the rectum.

The **Vaginal Plexuses**—one outside of the muscular coat and one in the sub-mucous tissue.

The **Uterine Plexus**, in the muscular structure of the uterus.

The **Ovarian Plexus** (pampiniform plexus), between the folds of the broad ligament.

Vast Venous Plexuses lie between the layers of the broad ligaments and beneath the peritoneum.

Nerves. (Fig. 23). The pelvic organs are supplied with both spinal and sympathetic nerves, as follows:

a. Spinal.
1. Inferior hemorrhoidal branch of pudic and fourth and fifth sacral and coccygeal nerves supply the levator and sphincter ani muscles.
2. The fourth and fifth sacral and coccygeal supply the coccygeal muscles.
3. The pudic supplies muscles of the perineum and the clitoris.

b. Sympathetic.—Inferior hypogastric plexus gives off branches to the vagina, uterus, Fallopian tubes, and ovaries.

The nerves terminate in the muscular layers of the uterus in the neuclei of unstriped muscle (*Frankenhäuser*). Those supplying the mucous membrane end in ganglia. (*Hart.*)

Lymphatics.—The lymphatic system of the pelvic organs is very extensive and very important. The vessels are arranged in a network surrounding the various structures and organs, and freely communicate with the inguinal and pelvic glands. Figs. 24 and 25 give the

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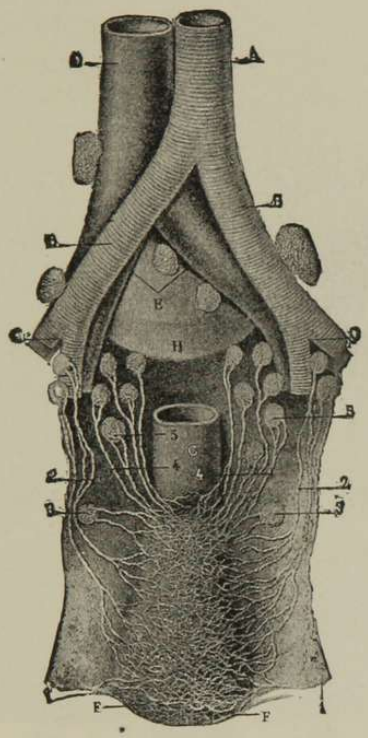
aortic plexus; it supplies the Fallopian tube, the ovary, and upper part of the uterus. 5. Br. from the third and fourth sacral nerves, assisting the foregoing to form, 6 and 7, the right inferior hypogastric plexus. Ganglia, cervical ganglia (Robert Lee), which are not found in any part of the hypogastric plexus (1), are constantly met withat the points marked 6 and 7. 8. Uterine filaments. The lower part of the uterus is supplied by anterior br. from the inferior hypogastric plexus; the middle by distinct prolongations from the hypogastric plexus (infer. aortic (1); the fundus by the spermatic plexus, and filaments from the two former sources. 9, Vesical plexus and br. 10. Trunk of great sciatic n. 11. One of the muscular br. (levator ani br.), from the fourth sacral nerve. 12. Trunk of pudic nerve. 13. Continuation of the latter into dorsal nerve of the clitoris. R. Rectum; U. Uterus; B. Bladder; D. Trans. perinei m. cut across section. 5 of the ilium.

student a much better idea of the pelvic lymphatics than could be given in an entire chapter of reading matter.

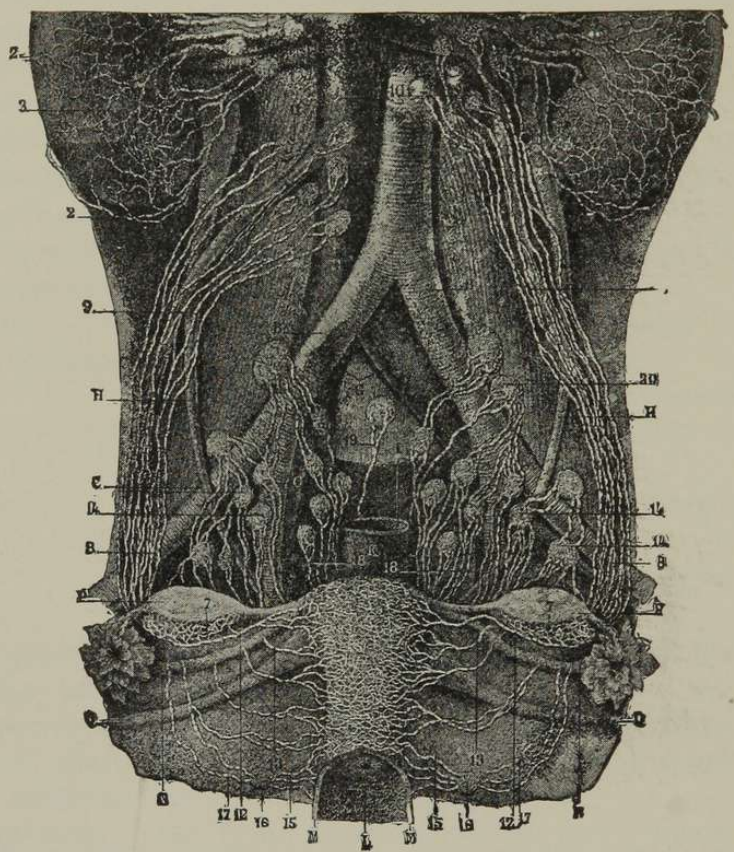
FIG. 24.



LYMPHATICS OF THE UTERUS, WHICH HAS BEEN TURNED FORWARD. (*Sappey.*)

A. Aorta; B. Common iliac; C. Bifurcation into internal and external iliacs; D. Vena cava inferior; E. Common iliac veins; F. Uterus toppled forward; G. Rectum; H. ligament uniting sacrum with fifth lumbar vertebra; 1. Lymphatic vessels passing under ovaries to follow the course of ovarian vessels; 2. Lymphatics from body of uterus, which end in lymphatic glands accompanying the iliac vessels; 3. Lymph glands receiving the lymph vessels of mucous membrane of cavity of body; 4. 4. Lymphatics from lower portion of surface compare uterus, going to the glands behind internal iliac vessels, which glands (5) vary in number and volume.

FIG. 25.



LYMPHATICS OF THE PELVIC VISCERA AND THE ABDOMEN. (*Sappey.*)

B. Common iliacs; C. External and internal iliacs; D. Vena cava inferior; G. Common iliac veins; H. Ureters; I. Rectum; K. Uterus; L. Cervix; M, M. Section of vagina; N, N. Fallopian tubes; O, O. Ovaries; Q, Q. Round ligaments. 2. Superficial renal lymphatics; 3. Converging trunks of same, emptying into lymph glands (4); 7, 7. Lymphatic plexus of the ovaries; 8, 9. Trunks receiving ovarian plexus following course of utero-ovarian veins; 10, 11. Glands receiving the lymphatics from ovaries; 12. Lymphatics from fundus, joining ovarian plexus with same termination; 14. Glands receiving (13) trunks from surfaces and borders of body of uterus; 15. Lymphatics originating in lower part of cervix, mucous membrane of uterine cavity and vaginal fornices; 16. Lymph glands occurring along the course of these vessels; 17. Efferent vessels of these glands taking their course to the glands beneath external iliac vessels; 18. Lymphatics which proceed from the posterior surface of the cervix, terminating in the glands accompanying the internal iliac; 19. Exceptional lymph trunk from cervix passing to gland in front of fifth lumbar vertebra; 20. Another exceptional lymph gland and vessel situated along the course of the common iliac.

CHAPTER III.

CASE TAKING.

Systematic inquiry should precede a local examination of the female pelvic organs. It is, however, unwise for the physician to restrict the patient's narrative by confining her to one of the many case records now in existence. A voluntary history is of more value than one obtained by a series of cross-questions. The average patient's imagination is influenced by set questions. She should be permitted first to relate her own story, and as much of it as the physician deems important he should note. This will afford him a superstructure upon which to base a more systematic examination. A faultless *clinical record* has not yet been published. For the last five years I have used Miner's, and, although imperfect, it possesses the merit of preventing the examiner from confining himself to one set of organs, for the general schedule is very complete. The gynecological form, which Mr. Miner had me arrange for him, is as follows:

MENSTRUAL DATA.

First Menstruated at—

Character of pains at this time (*a*) before flow; (*b*) during flow; (*c*) after flow—

(*d*) Became regular after—

(*e*) Duration of flow; (*f*) quantity—

(*g*) Time of change to more pain; or (*h*) less pain—

(*i*) Time of flow when most pains—

(*j*) Character of pains—

(*k*) Quantity increased at this time; or (*l*) diminished; (*m*) flow lasting—

PRESENT CONDITION.

Development of Present Symptoms—

Known Causes—

Nervous Derangements—

Present Menstrual condition, (*n*) Interval; (*o*) duration of flow; (*p*) quantity; (*q*) time of most pains—

(*r*) Character of pains;

(*s*) Special remarks—

Irritability of Bladder—

Constipation—

Special pains, locality and degree—

MARRIAGE DATA.

No. of children and ages—

No. of Miscarriages—

Last Miscarriage occurred—

Last Labor lasted—

Special incidents of this or any other Labor—

Character of Recoveries—

PHYSICAL EXAMINATION.

Vagina—Size and tenderness—

Prolapse of Walls—

Erosions of—

Vaginal vault—

Cervix Uteri—

Size and position—

Laceration of—

Density—
Secretion—
Abrasion—

Ulceration of

Inflammation of—

Os, size of—

Uterus—Mobility—
Position—

Flexure—
Enlargement—
Ovaries—
Tubes—
Broad ligaments—

Pelvis—

Vaginal discharge—
(*a*) Character, (*b*) amount, (*c*) persistence; (*d*) duration—

GENERAL.

Diagrammatic outlines of the pelvis, so arranged that special lesions can be quickly indicated, add greatly to the value of a gynecological record, and are provided in the Miner case book.

THE SIGNIFICANCE OF PAIN IN DIAGNOSIS

One or all of three general symptoms usually induce the non-pregnant female to submit to a local examination These are some unnatural discharge from the generative tract, disordered menstruation and *pain*. Pain, as an expression of disease, may mean much or little, and the importance of interpreting its significance correctly is self-evident. For the convenience of study, it may be classified as follows:—

As Regards Location.—1. Lumbar region; 2. ovarian region; 3. hypogastric region; 4 sacral and coccygeal region; 5. vulvar region; 6. lower extremities; 7. general.

As Regards Function.—1. Menstruation; 2 defecation; 3. micturition; 4. coition.

As Regards Posture.—1. Erect; 2. sitting; 3. reclining.

As Regards Location.

Lumbar Region.—Pain in the back is a symptom which is perhaps oftener complained of in uterine disease than any other. It may be the only manifestation of such disorder and is, probably, except when the uterus is greatly enlarged, purely reflex. That it is not due to pressure is evident from the fact that it is found when the fundus is directed forward as well as backward, and in various lesions of the pelvic organs giving rise to no pressure. It nevertheless occurs oftener in retro-displacements and particularly in retroflexion. Expulsive efforts of the uterus will likewise excite lumbar pain, hence it is a symptom of the obstructive form of dysmenorrhea, and occurs whenever the uterus contracts upon any foreign body or substance. Prolapse of the ovary and lesions of the cervix and endometrium may also cause a most persistent backache.

Lumbar pain is to be differentiated from—

1. Lumbago;
2. Disease of the vertebræ;
3. Disease of the kidneys;
4. Abdominal aneurism.

In *lumbago* muscular effort is painful; the patient finds it difficult to stand erect, and even impossible to stoop forward. The onset is often sudden and it is uninfluenced by either emotion or menstruation.

The clinical history in *disease of the vertebræ* is important; that of traumatism or constitutional bias is rarely absent. There is usually tenderness upon pressure over the affected part, and other local evidences of deformity and disease are rarely wanting.

When *kidney disease* is suspected the only safe guide is a careful examination of the urine.

Abdominal aneurism is a disease of middle life and occurs more often in males. The physical signs of aneurism are rarely wanting.

Finally, *menstruation aggravates nearly, if not all, pelvic lesions*, but does not influence the other affections under consideration.

Ovarian Region.—Few authors agree with Hewett that pain in the groin is, in ninety per cent. of all cases, due to anteflexion. It is more probably due, in the vast majority of instances, to irritation or inflammation of the ovary. In character it is stinging or burning, sometimes aching, more or less persistent, and usually confined to one side—oftener the left. It is particularly distressing a day or two previous to menstruation, during exercise and after congress. Not infrequently it can be traced to sexual irregularities and is, therefore, often met with in prostitutes. Sometimes it occurs at regular intervals between the menstrual periods, the result, according to Priestly, of "intermenstrual" ovulation. Bermetz, DeMerie, and Noeggerath believe gonorrheal infection to be a prominent causative factor. In certain instances uterine displacements and lesions will cause reflex pain in the ovarian region, though oftener it is the result of ovarian congestion and inflammation which follow in the train of such lesions.

Hypogastric Region.—Pain in this region varies greatly in character. It may be—

1. Bearing-down ;
2. Intermittent ;
3. Persistent ;
4. Inflammatory ;
5. Pain with symptoms of shockand collapse.

Bearing-down pain located in this region is suggestive of one of several conditions, and, if presistent, calls for an exploration of the pelvic organs. The most frequent cause is, undoubtedly, the contraction of the uterus upon something within its cavity or walls, when it is expulsive as well as bearing-down. Fibroid tumors, polypi, retained menstrual blood, and a detached ovum all excite the uterus to an unnatural contraction. Any disease of the uterus involving change or shape of the organ may likewise cause a bearing-down pain. Such are the various forms of displacement, particularly descensus with or without vaginal prolapse; hypertrophic elongation of the cervix; and hyperplasia of the uterine body. Hematocele as a cause of bearing-down pain will be considered under another head.

The most typical *intermittent pain* is that of normal labor. It then comes and goes at regular intervals, with a decided period of intermission. Pains simulating those of labor occur in abortion and are not infrequently present in the non-pregnant. For diagnostic purposes we may consider: (*a*) Pain resulting from restrained menstrual discharge; (*b*) pain due to the expulsion of an ovum or retained fetal membranes; (*c*) pain due to retention of urine; and (*d*) pain due to tumors of the uterus.

In pain resulting from *retained menstrual discharge*, the history will usually assist us in forming an intelligent conclusion. In young girls the escape of blood externally may never have taken place. If the menstrual discharge is retained, all the symptoms of menstruation will recur at regular intervals, *minus* the flow. The suffering is usually great, hysterical phenomena are rarely absent, and, in due time, enlargement of the uterus may be felt. A local examination will reveal an atresia, either of the cervix or vagina, which is usually congenital. In women who have menstruated the symptoms are similar, but the obstruction, which may be temporary or permanent, is generally acquired. If temporary, persistent contraction will overcome it; the uterus will then be emptied and the pain will cease until the organ is again distended. This type of obstruction is often the result of flexion.

Intermittent pain due to the *expulsion of an ovum or retained fetal membranes* has a history which, if elicited, will rarely mislead a careful examiner. The patient will state that the menses have been suppressed for one or more periods. With such a history, and the discharge of blood suspiciously excessive, a vaginal examination is imperative. The discharges should be carefully examined for the products of conception, though it must be remembered that in very early abortion these may be entirely overlooked. Velpeau detected an ovum of about four-

teen days, which was not larger than an ordinary pea. It is entirely possible for both conception and abortion to occur between two menstrual periods, when the diagnosis would be exceeding difficult, if not impossible.

Retention of urine has caused intermittent pains, simulating those of labor (Sedgwick). In the majority of instances such retention follows labor, and is due to paralysis of the walls of the bladder. In Dr. Sedgwick's case, however, it occurred in a young woman supposed to be in labor.* She denied pregnancy, but violent bearing-down pains, with short interval, were present ; the abdomen was enlarged to the size of a nine months' pregnancy. Catheterization removed an incredible amount of urine from the bladder, and the diagnosis became plain. I have seen the bladder quite as much distented, but the patient was moribund from puerperal septicemia.† Both of these cases show most emphatically the danger of relying solely upon subjective symptoms.

Intermittent pains resulting from *tumors of the uterus* are usually of a bearing-down character, and have already been described.

Persistent pain in the hypogastric region has its origin in cystitis and is accompanied with more or less dysuria. The pain of cystitis is subject to exacerbations and remissions, but is, nevertheless, persistent. The degree of suffering is influenced by the extent and severity of the inflammation. Cystitis gives rise to variable quantities of ropy pus in the urine.

Fibroma and Carcinoma Uteri and Flexions, may give rise to persistent pain. The pain of *cancer*, when persistent, is peculiar, although not pathognomonic. It does not occur until the peri-uterine tissues are involved, when it is of a dull, aching, sickening character, and may be burning or darting, seemingly transfixing the whole pelvis (Rigby). Pains of this character, particularly if associated with a suspicious discharge and cachexia, demand of the examiner an immediate exploration of the parts. But it should not be forgotten that cancer may progress even to ulceration through and into the bladder with little or no pain, and absolutely no perceptible constitutional disturbance. Such a case presented herself at my clinic during the winter of 1888. The patient sought relief because of the discharge of urine through an ulcerated opening into the bladder. An examination revealed a broken-down scirrhus of the cervix, involving the base of the bladder.

**Hewitt*, 4th Edition, Vol. II, p. 448.

†*Transactions of the American Institute of Homœopathy*, 1889, p. 676.

There had been no pain, and the features were those of a most vigorous woman.

The pain of *inflammation* as a subjective symptom is not pathognomonic. It is acute in character, is usually traceable to some definite cause, and constitutional symptoms are present; the pulse is increased, the temperature is elevated, and there is more or less tenderness of the affected parts. Chilliness or a decided chill usually ushers such an attack. The severity of the sufferring varies according to the extent of tissue involved and the constitutional impression made.

Pain with symptoms of shock and collapse, is always of serious import. It is suggestive of rupture or perforation of some one of the pelvic viscera, with an escape of its contents or of blood into the peritoneal cavity. Such an accident follows a ruptured *ectopic pregnancy cyst*—according to Lawson Tait this is the chief if not the only cause of hematocele—when the severity of the shock depends upon the direction of the rupture: if between the folds of the broad ligament, it is not necessarily very great; if, on the contrary, it occurs in the free peritoneal cavity, there is nothing to limit the quantity of blood discharged and the symptoms at once become profound, if death does not speedily ensue. The ordinary symptoms of pregnancy may have preceded such an attack, but unfortunately the history often affords no clue as to its cause. Hematocele due to causes other than ectopic pregnancy is more apt to occur during or near a menstrual period. In all forms of hematocele the presence of the effused blood frequently excites much tenesmus and bearing down.

Rupture of an *ovarian cyst* and of a *gravid uterus* give rise to shock. The symptoms of a ruptured uterus do not differ from those of a ruptured ectopic pregnancy cyst, except that the cause is obvious, and if the accident happens during labor the child will recede from the examining finger. The character of the contents of an ovarian cyst will determine the symptoms after rupture, if bland and unirritating the symptoms are not marked; if purulent, fatal peritonitis may quickly follow unless the abdomen is speedily opened.

The symptoms of shock, whatever the cause, are much the same. It is characterized by prostration, fainting, feeble or nearly imperceptible pulse, great paleness, pinched features, cold, clammy perspiration, nausea and vomiting. Whenever the foregoing symptoms present themselves they demand of the physician immediate and unremitting attention.

Sacral and Coccygeal Region.—Pain in this region may be due to actual disease of the bones or periosteum, to a displaced uterus, to pres-

sure exerted by inflammatory exudates, or it may be purely reflex. A persistent pain in the sacral region always gives rise to a suspicion of *retro-displacement of the uterus*. Involvement of the retro-uterine cellular tissue will excite an obstinate sacral pain. I have often found it present when the utero-sacral ligaments were contracted by cellulitis. Mundé observes that adenitis and angioleucitis—inflammation of the lymphatic glands and vessels of the pelvic cellular tissue—are many times the cause of sacral pain. When the coccyx is implicated this bone should be carefully examined for the evidences of injury or necrosis. Often the cause is entirely obscure, and for the want of a better explanation the symptoms are relegated to the domain of "neuralgia."

Vulvar Region.—Pain in the external genitalia usually has its origin in some form of specific or non-specific inflammation in the region of the labia or the introitus vaginæ. Disease of the Bartholinian glands may likewise excite vulvar pain. When vulvar pain is complained of an inspection of the parts should be made before indagation is practised.

Lower Extremities.—Pressure upon the sacral plexus of nerves is the usual intra-pelvic cause of pain in the lower limbs. Tumors, inflammatory deposits, and retro-displacements exert such pressure, when the pain is confined to the posterior surface of the limbs. Painful cramps in the calves of the legs, like those occurring during labor, may result from pressure of any kind.

When the pain is confined to the anterior part of the thigh another set of nerves is involved, and pressure is not the cause, unless it is exerted by a psoas abscess, or by an anteflexed uterus. Usually pain in this region is due to anteflexion ; in other instances the pain may be purely reflex. From whatever cause, it may manifest itself in any portion of the limb to which the involved nerve or nerves are distributed. I have seen a pain limited to a very small portion of the anterior tibial region, which had persisted for three years, disappear immediately upon repairing a lacerated cervix. Irritable carunculæ, lesions of the rectum, bladder, and urethra, may give rise to pain in the lower extremities and even to paraplegia (Thomas).

General.—The general symptoms of uterine disease are innumerable. In the chapters devoted to the Hystero-Neuroses they are treated of in detail. It is sufficient at this time to observe that any and every part of the body may be the seat of disturbance whose origin is within the pelvis. This may be the result of pain directly reflected, or secondary to depraved nutrition, which follows in the train of disordered

digestion and malassimilation. The stomach, the liver, and the intestinal canal are frequently affected in a reflex way, giving rise to dyspepsia, cardialgia, nausea, vomiting, anorexia, jaundice, diarrhœa, constipation, etc. Persistent pain in the occiput or vertex, worse during menstruation, is almost pathognomonic of uterine disease. So also is pain in the left infra-mammary region. Spinal irritation is a part of the general "neurasthenia" which supervenes as the nutrition suffers. In short, the entire system is often profoundly and permanently impressed by utero-ovarian lesions.

As Regards Function.

Menstruation.—Dysmenorrhea is the term by which painful menstruation is designated. Few women are absolutely free from pain during menstruation. By observing the character and the circumstances under which it appears, it is possible to form a very intelligent idea of the cause of the suffering. Pains radiating from the uterine region, occurring in paroxysms, and terminating with a more or less profuse discharge of blood from the vagina, suggest an obstruction to the exit of the blood. Pain in the ovarian region for two or three days preceding the onset of the flow, and usually relieved by it, would direct attention to the corresponding ovary as the probable seat of mischief. If the flow is uninterrupted, the pain is sharp and fixed, or comes and goes in quick succession, and the patient is of a neuralgic or gouty diathesis, the cause is probably systemic and there will be an absence of local lesions. If it appears suddenly during menstruation, followed by suppression and constitutional disturbance, acute congestion or actual inflammation is the usual cause. Or if the pains resemble those of labor and occur simultaneously with the flow, ceasing upon the expulsion of a clot whose nucleus is a piece of membrane, the symptoms are probably due to membranous dysmenorrhea. (*v.* Chapter xviii.)

Defecation.—From the standpoint of both physiology and pathology the female pelvic organs are a unit, and the gynecologist can no longer ignore the influence which the rectum and the bladder exert upon the generative organs. Painful defecation may be the only symptom of which the patient complains. It may be due to one or more of the following causes: Cancer, stricture, fissure, hemorrhoids, polypi, prolapse of the ovary, pressure exerted by a sensitive fundus or cervix, pelvic exudation, fistula, rectocele, and proctitis. From the character of the pain alone we can only surmise the nature of the lesion. For accurate diagnostic purposes a local examination is imperative.

Micturition.—Only the factors concerned in painful micturition are

to be mentioned at this time. These are: Inflammatory diseases of the bladder and urethra, malignant disease of the bladder, vascular tumors and eversion of the mucous membrane of the urethra, abnormal positions of the uterus, vesical calculi, disease of the ostium vaginæ, and abnormal conditions of the urine.

Inflammation of the bladder and urethra may be either acute or chronic. If limited to the bladder pain is present more or less constantly, and especially during micturition. The inflammation in both instances may be due to a number of causes.

In the rare instances of idiopathic malignant disease of the bladder the pain is worse immediately following micturition. Turbidity of urine, with or without blood, is a symptom of carcinoma of the bladder. In hematuria the source of the blood can only be determined by a careful, and perhaps, repeated examination of the urine. The cystoscope, in experienced hands, is very useful in diagnosing vesical lesions.

Vascular tumors of the urethra, unlike urethritis, cause a persistence of the pain during and after micturition which lasts for an indefinite time. Eversion of the mucous membrane, in both young girls and married women, may excite dysuria. Benecke has reported three cases of prolapse of the urethral mucous membrane in young girls. I have seen, in an elderly woman, a similar prolapse as large as a pigeon's egg, which was the cause of very painful micturition.

Abnormal positions of the uterus are more apt to cause difficult than painful micturition. However, I have often seen both difficult and painful micturition caused by retraction of the utero-sacral ligaments, drawing the cervix and the base of the bladder backward.

The pain resulting from vesical calculus is worse immediately after the bladder is emptied, and is caused by the contact of the bladder walls with the stone. Calculi almost invariably excite, sooner or later, cystitis.

Any disease of the ostium vaginæ causing it to be inflamed or ulcerated, will excite more or less pain after micturition. Such are the various forms of inflammation, and specific and malignant forms of ulceration. Excoriation of the vaginal outlet is not infrequently due to abnormalities of the urine.

Coition.—Painful sexual intercourse, or dyspareunia, may be the one and only symptom for which the gynecologist is consulted. The causes are many and may be enumerated as follows: Pelvic congestion from any cause; inflammation of any of the generative or pelvic organs; ovarian tenderness or prolapse; irritable caruncles; fissure or ulcers of the vulva, urethra, or anus; neuromata of the vulva; coccygodynia;

simple hyperesthesia without evident lesion; and atresia or stenosis of the vulva or vagina.

As Regards Posture.

Erect.—The bearing-down pains, pains in the lower extremities, and those caused by inflammation, are aggravated by the erect posture, and especially by walking. The distress incident to relaxation of the pelvic floor with uterine and vaginal displacements is often felt only in this posture.

Sitting.—If the female perineum is pressed upon in the direction of the axis of the pelvic brim, there will be more or less bulging of the hypogastrium. (Duncan.) Although the perineum is protected by the tuberosities of the ischia, a certain amount of pressure is exerted upon it in the sitting posture, which pressure is communicated to the deeper parts. The bowels and the pelvic organs are, therefore, in a measure "squeezed" while the woman is sitting, and, if inflamed or tender from any cause, pain is liable to result. A prolapsed ovary may be impinged upon in no other posture. Disease or displacement of the coccyx and of the rectum may make sitting painful or impossible. When coccygodynia is present the pain is excruciating during defecation and while the patient is rising from the chair.

Reclining.—There are few if any gynecological diseases made worse by the reclining posture. When the spinal cord is secondarily involved, either in a reflex way or from nutritive changes, Hammond gives a diagnostic point worth noting. It is this: If the pain in the back be due to anemia of the cord it is made better by lying upon the back, when the blood will gravitate to the cord and its membranes, thus temporarily overcoming the anemia; if, on the contrary, the pain be due to congestion it will be aggravated in the dorsal posture.

The therapeutist will many times be able to base his prescription upon the numerous and varied expressions of pain which has its origin within the pelvis. To him it will be "significant" both from a diagnostic and a therapeutic standpoint. Nevertheless, the careful diagnostician and therapeutist will weigh carefully the value of purely subjective testimony. Pain, as a symptom, will prove most serviceable to him who holds pathology and drug pathogenesy to be inseparable.

CHAPTER IV.

THE SIGNIFICANCE OF DISCHARGES IN DIAGNOSIS.

LEUCORRHEA.

In a physiological state the mucous membrane of the genital tract, extending from the ostium vaginæ to the fimbriated extremity of the Fallopian tubes, secretes only enough fluid to lubricate its opposed surfaces.

Over the inner surface of the labia, the clitoris and the nymphæ are sebaceous follicles which secrete sebaceous matter containing butyric acid. The vulvo-vaginal glands, and numerous muciparous follicles, are located at the side of the vaginal aperture, from which is poured a viscid mucus, which is increased during the sexual orgasm. The secretion from the vaginal mucous membrane is transparent and, under the microscope, shows variable quantities of broken-down epithelium.

The *arbor vitæ* of the cervix contain many glands of the racemose type, dilated at their extremities and extending deeply into the connective tissue. (Ruge and Veit) These are exceedingly numerous and from them is poured a tenacious, viscid secretion of an alkaline reaction. When in a state of activity the quantity may be enormous. Microscopically, it contains epithelium of the columnar variety and mucous corpuscles. The cervical discharge rarely preserves its characteristic appearance when it escapes from the vagina; after the secretion from the cervix and the vagina commingle, the effect is a white, soapy or creamy fluid.

PATHOLOGY.

No perfect division based upon the physical character of the discharges can be made, for rarely is the discharge, as it escapes from the vagina, derived from one source. The following classification is, therefore, made solely for the convenience of study:

1. Mucous;
2. Purulent;
3. Watery;

4. Sanious ;
5. Offensive ;
6. Hemorrhagic.

The character, source, and significance of these several discharges are contrasted in the succeeding table.

DISCHARGES.

Character and Properties.	Source.	Significance.
Mucous.—Contains oil globules and epithelial débris. If from the cervix, may resemble unboiled white of egg. If from the vagina, curdy looking and of acid reaction.	Cervical canal Uterine cavity. Fallopian tubes (Rare.)	Exaggeration of normal secretion after menstruation and during pregnancy. Early stage of inflammation, either specific or non-specific. Anemia, chlorosis, Bright's disease, etc. When plugging the cervical canal it may be the cause of sterility.
Thick, creamy, and of acid reaction. Frequently white or yellowish white and at times almost membranous in character. Epithelial cells and oil gobules are also present.	External surface and lips of cervix.	Cervical metritis and endometritis. Cystic degeneration.
Acid mucus. Occasionally parasites and fungi (Trichomonas vaginalis ; Leptothrix buccalis).	Vagina.	Inflammation, either specific or non-specific Aphthous ulceration.
Purulent.—May be thick or thin, profuse or scanty fetid or odorless, and sometimes tinged with blood.	Fallopian tubes (Rare) Uterine cavity.	Pyosalpinx or chronic endometritis, the result of either specific or non-specific inflammation. If specific, gonococci are usually present. Suppuration of retained membranes after abortion. Carcinoma. When the quantity is considerable and non-continuous, probably due to partial cervical obstruction.
Same as above. May be sanious or, if gonorrheal, thick and yellow.	Cervix. Vagina. Vulva	Carcinoma. Chronic inflammation—specific or non-specific. Syphilitic ulceration.
Same as above. Quantity great.	Suppurating cyst. Pelvic abscess.	Opening either into uterus or vagina. History of tumor or pelvic inflammation. Symptoms abate after discharge of pus.
Watery. — Quantity variable, may be great. Hydatidiform bodies often expelled with fluid.	Uterus.	*Pregnancy.*—From the amnion. *Hydatidiform mole*—rapid enlargement of uterus with absence of the usual symptoms of pregnancy.
Dirty yellow or pale yellow, clear, watery, or mixed with blood. Quantity may be very great.	Cervix.	*Tubercle.*—Very rare ; secondary to general tuberculosis. *Polypi* (*v.* Note 2). Cauliflower excrescence. (Ramsbotham.)
Ovarian fluid.	Abdomen	*Contents of ovarian cyst escaping*

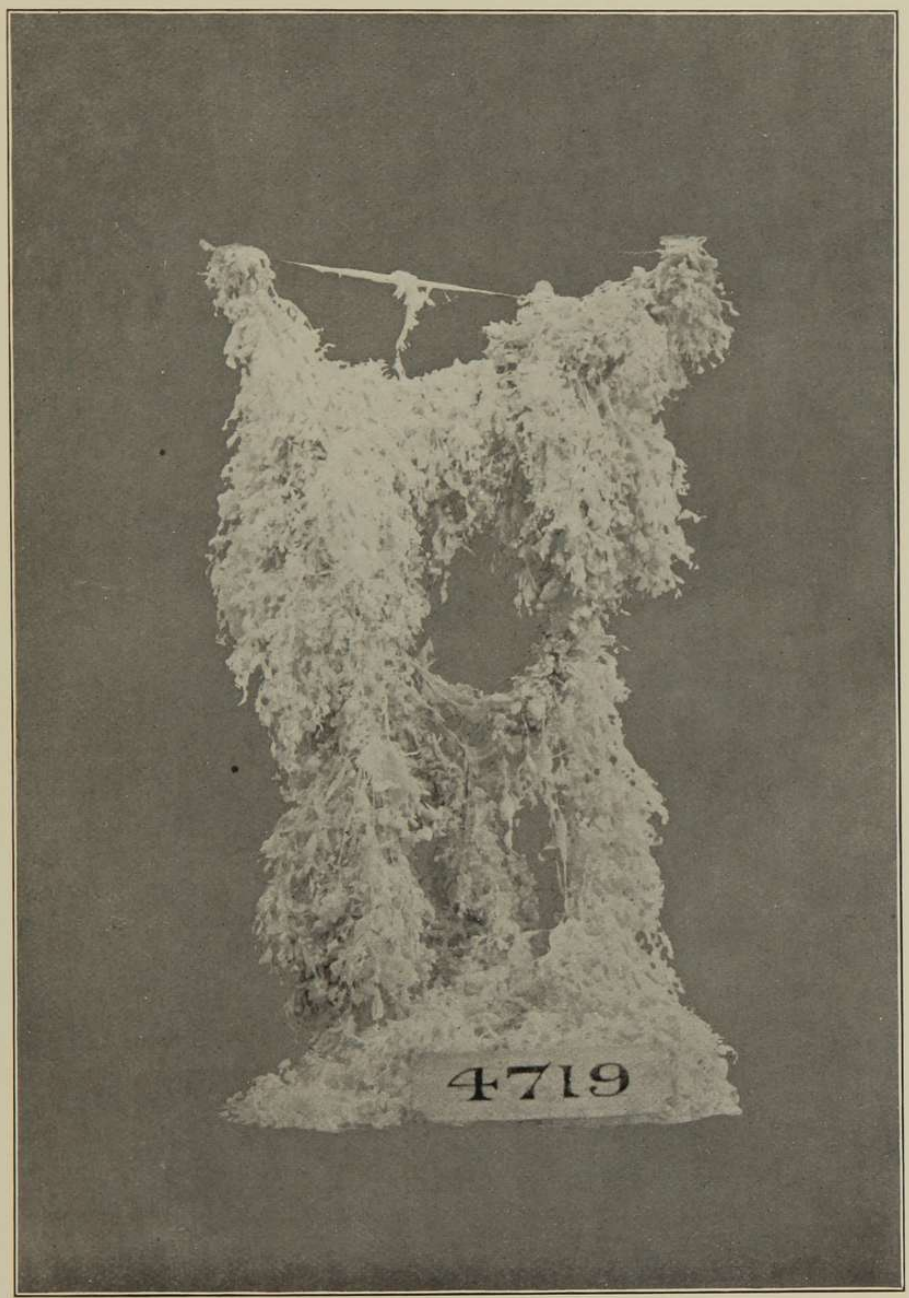
Urinous odor	Bladder.	*into Fallopian tube or uterus.*—History of abdominal tumor with sudden diminution. (Rare.) *Vesico-vaginal or vesico-uterine fistula. Frequently involuntary while laughing or coughing.*
Sanious.—Leucorrhea apt to be profuse.	Uterine cavity.	Associated with menorrhagia, polypi, and fibromata. Discharge alternates with actual hemorrhage. Fungoid or granular endometritis.
Discharges modified by character of lesion.	Cervix.	Abrasion or ulceration.
Blood-tinged pus. Quantity usually great	Pelvis.	*Hematocele.*—Previous history of shock, collapse, and inflammation.
Offensive—Variable in quantity. Frequently sanious.	Uterine cavity. Cervix. Vagina. Vulva.	*Retained products of conception.*—History of pregnancy. *Sarcoma.*—Not offensive until necrosis of tissue occurs; peculiar discharge resembling washings of fresh meat. *True carcinoma.*—Not offensive until necrosis of tissue occurs; (Characteristic odor of malignancy) *Retained menstrual blood*:—Want of cleanliness.
Hemorrhagic.—Bright or dark, thin, thick, or clotted. Contains débris of uterine tissue, fatty and oil particles, mucous corpuscles, or the products of suppuration and inflammation.	Uterine cavity.	*Excessive menstruation* due to uterine disease (endometritis, fibromata, etc.) *Displacements. Menopause.*—Age. *Tumors.*—Quantity does not depend upon size. (Usually metrorrhagia and menorrhagia.) *Hematocele.*—Shock and collapse.
Variable; usually much degenerated.	General.	*Constitutional*—Purpura, tuberculosis, Bright's disease, syphilis, plethora, malaria, exanthemata, disorders of the heart, lungs, and liver. NERVOUS. (*a*) *Centric.*—Emotional. (*b*) *Reflex.*—Ovarian, vesical, rectal, and mammary irritation.
When due to constitutional causes—venous. When due to traumatism—arterial.	Cervix. Vagina. Vulva.	*Constitutional.*—Same as above. *Traumatism.*—Surgical, accidental, varicosis, thrombosis, vascular excrescences. *Malignancy.*—Pain, leucorrhea, cachexia
Venous and arterial.	Rectum.	Congestion, polypi, fissure, malignant and non-malignant ulceration, traumatism, hemorrhoids.

DIAGNOSIS OF BODIES EXPELLED FROM THE VAGINA.

CHARACTER.	SOURCE.	SIGNIFICANCE AND DIAGNOSIS.
Early ovum.	Uterus.	If any portion of the fetus be found the diagnosis is conclusive. Examine carefully for: (*a*) decidua materna; (*b*) decidua reflexa; (*c*) chorionic villi; (*d*) umbilical cord.
Vesicular moles.—(Cystic degeneration of the chorionic villi) Cysts simple.	Uterus.	*Always a product of conception.*—Early death of fetus, which dissolves and disappears; villi of chorion become distended with fluid. *Symptoms* (*v.* "watery discharges" and Figs. 26.)
True Hydatids. — Cysts complex, *i. e.*, closed sacs, one within another.	Abdomen. Uterus.	*Not a product of conception.*—Microscope shows echinococci * heads and hooklets. (Very Rare.)
Membranous bodies. Dysmenorrheal membrane.	Uterus.	*Not a product of conception.*—Rough and slightly flocculent externally, smooth internally. May be cast off *en masse* or in pieces. No evidence of chorionic villi Repetition each month. Pathology obscure.
Vaginal Membrane—Entire mucous lining may be cast off. (Rare.) Thin, translucent flakes	Vagina.	Inflammation and sloughing. Microscope reveals characteristic squamous and cylindrical epithelium.
Mucous membrane of bladder. Mucous membrane of kidney pelvis.	Bladder. Kidney.	*Cystitis and Pyelitis.*—The shape of the membranes, the history of bladder or renal trouble and the composition of the urine must be studied.
Fleshy Moles. — (Ovum with blood effused between the membranes, which becomes organized.)	Uterus.	*Always a product of conception.*—Examine for chorionic villi. History of pregnancy.
Placenta. — (May remain for an indefinite time without decomposition.)	Uterus.	Expulsion usually preceded by an offensive discharge. Early placenta about the size of a pigeon's egg Examine for umbilical cord, chorionic villi, etc. A positive diagnosis may be impossible.

* *Vide London Obstet. Trans.*, vol. xii, p. 237.

PLATE VI.



A Chorion covered with minute Pedunculated Cysts. (*M. R. C. S. Photographed by the Author.*)

Fibrous polypi. Fibroid tumors. Cancerous masses.	Cervix. Uterus.	Absence of all evidences of conception Microscope will reveal true character. History of menorrhagia. Fibroid tumors may become calcified.
Blood Polypi.—Surface may be dense, grayish, or fibrinous looking. If from the vagina, large.	Uterus. Vagina.	Occurs more often in connection with abortion. Due to some obstruction either in the uterus or the vagina. When recent, easily broken down. Microscope will show blood-corpuscles.

The Microscope.—This instrument is invaluable in the examination of suspicious discharges, curettings, adventitious growths, etc. Its ap-

FIG. 26.

VESICULAR OR HYDATIDIFORM MOLE. *Museum R. C. S.* (*Photographed by Author.*)

plication is often the only reliable test in the early stages of malignancy. Since the discovery of the gonococcus, the microscope is relied upon more than ever as a means of diagnosis. While the matter is yet *sub judice* the weight of evidence tends to the belief that the presence of gonococci in pus is pathognomonic of gonorrhea, though failure to find them does not necessarily signify its non-gonorrheal origin. Bearing upon this question the series of observations made by Aubert are the most recent and valuable. The importance of this subject from a medico-legal standpoint is very great. Aubert's method of examination is as follows:*—

A drop of pus is placed upon a glass slide, spread very thinly with another slide, and allowed to dry. This is then stained with an alcoholic solution of methyl violet diluted with water Exposing the specimen for a few seconds, it is then washed with water, left a little moist, covered with a thin cover glass, and placed under the microscope. The gonococci appear in stained, scattered or grouped granules, either within or outside the pus cells.†

**Lyon Medical*, February, 1889.

†NOTE 1.—Aubert summarizes his conclusions as follows:—

1. A search for the gonococcus should always be made when an accurate diagnosis is important, and when found should be considered characteristic of blennorrhagic (gonorrheal) pus.

2. The micro-organisms must be grouped in the protoplasm of the pus cells and around the nuclea in order to be characteristic. While a single well defined cell may be sufficient, full dependence cannot be placed upon cocci, scattered or in groups, outside the pus-cells.

3. Dependence should not be placed upon a search for gonococci unless the pus is obtained directly from the secreting surface and immediately spread out and dried. The staining and examination can then be made at leisure.

4. It is impossible, at the present time, to determine positively as to the presence or absence of gonococci from the examination of dried purulent discharge on linen, because of the disintegration of the pus corpuscles, and the want of characteristic grouping of the microbes.

5. Too much confidence should not, at present, be placed in the cultures made from linen stained for some time with gonorrheal pus.

6. The numerous sources of accidental contagion should be remembered; therefore, while the presence of gonorrhea may be determined in a given case, its source, particularly in little girls, should be made a matter of independent proof at the judicial inquiry.

NOTE.—2.—Case.—"Sarah W——, October 27th, was admitted as an out-patient of the Lying-in Hospital ——. Has had eleven children. Was confined with last child one year ago. The labor was a favorable one. but there was some adhesion of the placenta, which required the introduction of the hand for its removal. She had had constantly some discharge ever since her confinement. Until the last month the discharge has been chiefly of a watery character, and so abundant as

Gram's method: 1. Aniline-water, gentian-violet, three to five minutes 2. Iodide-iodine solution, one to two minutes (iodine, 1 gramme; potassium iodide, 2 grammes; water, 300 cubic centimetres, mixed). 3. Rinse off stain in alcohol. 4. Dry and mount.

The gonococcus, when treated by this method, is decolorized almost instantly when rinsed off in 95 per cent. alcohol, five to ten seconds at the most being the time necessary for complete decolorization.

CONCLUSIONS.

1. An abnormal discharge or hemorrhage from the genital tract is but a symptom of some abnormal condition, either local or general. It is the first duty of the physician to determine the *cause* of this symptom.

2. When a continuous or exaggerated discharge of the blood from the uterus is not controlled by ordinary measures, a careful examination, per vaginam, becomes imperative. Failing to discover the cause by this method, dilatation and exploration of the uterus should always be made.

3. If any symptoms of malignancy of the fundus exist, the uterus should be curetted and the products examined by an experienced microscopist; or, if the cervix is involved, and proper treatment does not affect the induration, a section should be excised for microscopic examination.

THE GENERAL TREATMENT OF LEUCORRHEA

In all instances the treatment of leucorrhœa, or of any abnormal discharge from the genital canal, should be directed to the cause, whatever that may be. It is necessary at this time only to refer to a few general principles, and to give the indications for some of the chief remedies in the treatment of leucorrhea.

In nearly all cases the vaginal douche is useful. It is used both for its cleansing and its thermic properties. If acute inflammation of the vagina, uterus, or of any of the pelvic organs is responsible for the discharge, a large, hot douche should be administered from one to three times a day. (*v.* Chapter x.)

On the other hand, if the condition is one of simple catarrh, and the

---

to soak *four or five napkins* each day, but scarcely to color them. * * * On making an examination per vaginam I found a tumor the size of a small hen's egg, insensible to the touch, occupying the upper part of the vagina, the os uteri, and apparently attached to the inner surface of the cervix uteri."—*Obstetrical Transactions." Vol. I, p. 112.*

discharge is irritating in character, it is not necessary to use the water in large quantities, nor is it wise to have it too hot. My experience leads me to believe that in chronic catarrhal conditions, with relaxation, hot vaginal douches frequently repeated may do harm instead of good. When relaxation of tissue is a marked symptom, the water should be tepid and in certain instances cold. It may be medicated as the indications require. If the discharge is of a tenacious character, the Aqueous Extract of Hydrastis is a most useful remedy; if it is purulent the Aqueous Extract of Calendula is indicated. If the external genitalia are irritated by the discharge, the parts should be protected by applying to them some of the cerates recommended for puritus vulvæ. (*v.* Chapter XXIII.) If the discharge is offensive the water may be medicated with permanganate of potash, carbolic acid, creolin or thymol. (*v.* Chapter X)

One of the following formulæ may be used if indicated:

℞. — Creolin, - - - - gtt. xxx
Ex. Hydrastis fl - - f℥iiss.—M.

Sig. Dilute in one pint of water and inject at night. (When the discharge is tenacious and offensive.)

℞. — Acid boracic, - - - - ℥vi.
Aq. Ferventes, - - - Oi.—M.

Sig. Use at one injection. (When discharge is irritating.)

℞. — Acid tannic, - - - - ℥iv
Glycerinæ, - - - - f℥xvi.—M.

Sig. A tablespoonful to a quart of tepid water and inject. (When there is much relaxation of tissue.)

℞. — Zinci sulphatis.
Aluminis sulphatis, - - - - aa. ℥iss.
Glycerinæ, - - - - - - f℥vi.—M.

Sig. A tablespoonful to a quart of hot water, as an injection. (In chronic gonorrhea.)

Applications may be made direct to the diseased parts, according to the methods recommended in Chapter X.

Under all instances, the general health of the patient should be looked into carefully. It must constantly be borne in mind, that many times leucorrhea is due to constitutional causes—such as anemia, chlorosis, plethora, malaria, and general debility. The bowels should be kept open and the diet and exercise carefully regulated. While, as a rule, outdoor exercise is beneficial, it should always be taken short of fatigue. Of course the condition of the patient will suggest the amount and kind of exercise. Running the sewing machine is pernicious, as is standing for too long a time behind the counter. Leucorrhea is very common among sewing and shop girls. The sexual

habits should also be looked into. Many cases of leucorrhea are the result of measures used to prevent conception.

THERAPEUTICS.

Alumina.—Profuse, transparent and mucous leucorrhea. Leucorrhœa occurs either before or after the menses; it is acrid; relieved by washing.

Arsenicum.—Leucorrhea burning, corroding; weak persons, old women, nervous restlessness.

Sepia.—Especially useful during the climacteric and pregnancy. Frequent desire to urinate, and itching of the genital organs; sense of pressure and bearing down in the pelvis.

Pulsatilla.—Burning discharge, thin and acrid, or milky and thick, without pain; inclination to looseness of the bowels.

Mercurius.—Leucorrhea always worse at night. It may be itching, burning, smarting or corroding in character; sensation of rawness, but the symptoms are always worse at night. (Guernsey.)

Silicea.—A painful, smarting leucorrhea after taking acids; discharge during micturition.

Sulphur.—Leucorrhea smarting like salt; burning and painful leucorrhea, making the vulva sore; burning in the soles of the feet, and heat in the crown of the head; vulva sore, burning and smarting.

Helonias.—GENERAL ATONY; anemia and torpid condition of the system; leucorrhea, with pain in lower part of the back; soreness and tenderness of the breast and nipples, particularly at the catamenial period.

Hydrastis.—Leucorrhea of a very tenacious character, *threads or pieces in it;* erosions and superficial ulcerations of the cervix, uteri and vagina; great sinking and prostration at epigastrium, with prolonged and continued palpitation of the heart.

China.—Bloody leucorrhea, with occasional discharge of black, yellowish or purulent matter, with itching; spasmodic contraction of the inner parts; GREAT WEAKNESS FROM LOSS OF BLOOD.

Calcaria carb.—Leucorrhea like mucus, or like milk; too early and too profuse menstruation; paleness of the face; weak feeling in chest, especially when talking; constant cold, damp feet.

Kali sulph.—Discharge of yellow, greenish, slimy or watery leucorrhea.

Consult: Agaricus, Cantharis, Lachesis, Gelsemium, Kali bich., Lycopodium and Secale cor.

CHAPTER V.

PHYSICAL EXAMINATION.

INSTRUMENTS AND APPLIANCES NECESSARY FOR DIAGNOSIS.

1. Table or chair.
2. Specula: (*a*) Vaginal, (*b*) rectal, (*c*) urethral.
3. Dressing forceps.
4. Uterine sound and probe.
5. Uterine dilator.
6. Tenacula or volsella forceps.
7. Curette.
8. Aspirator.
9. Stethoscope.
10. Tape measure and pelvimeter.
11. Thermometer.
12. Microscope.
13. Inhaler for anesthesia.

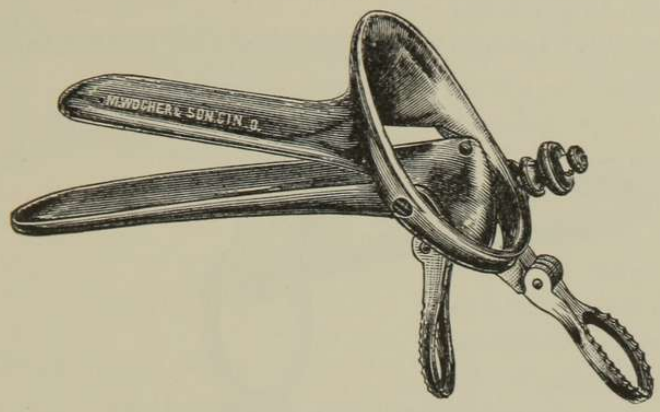
Table or Chair.—For ordinary office work I much prefer a gynecological chair to a table. There are so many good chairs on the market as to make it necessary for the purchaser to put himself out in order to find a poor one. Personally, I prefer the Harvard. It possesses nearly all of the requisite good points and but few that are bad. The mechanism, while simple and durable, is such as to permit of any desired position of the patient. The gynecological positions afforded by this and other chairs require no extended description.

Specula.—Of the innumerable *vaginal specula* there are but three general types now in use: (*a*) expanding, which are either bi-, tri-, or quadri-valvular; (*b*) uni-valvular, or Sims's; and (*c*) the cylindrical or tubular.

In America bi- or tri-valve specula are in more general use by the non-specialist. The specialist, with an assistant at his command, will ever prefer the Sims or some of its modifications. The cylindrical is still very popular with many practitioners, particularly in England.

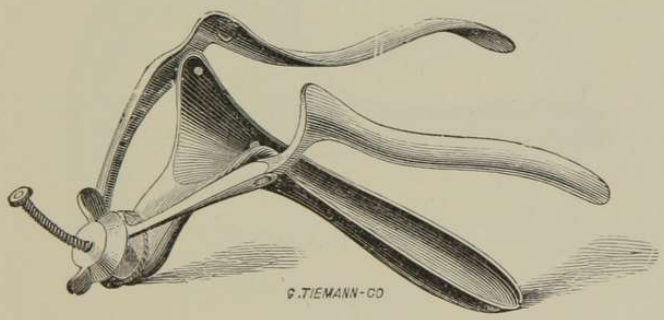
In selecting a bi- or tri-valve speculum both shape and simplicity should be considered. The blades should not be too long, nor the

FIG. 27.



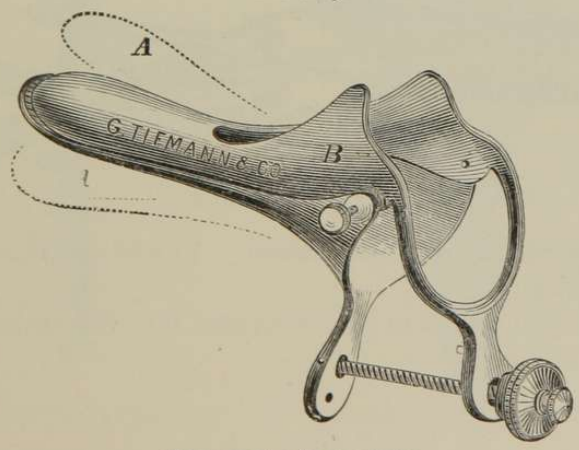
WOCHER'S MODIFICATION OF CUSCO'S SPECULUM.

FIG. 28.



NOTT'S VIRGIN SPECULUM.

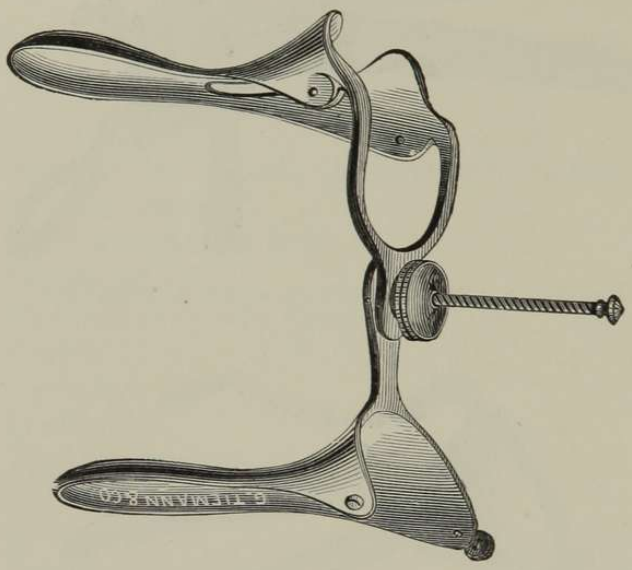
FIG. 29.



BREWER'S SPECULUM.

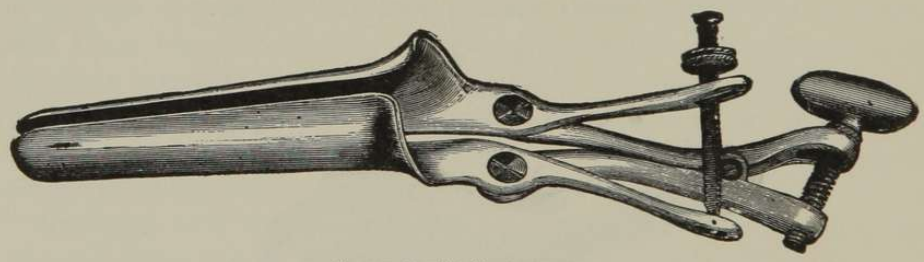
circumference great enough to cause pain. I have had in constant use for years a Wocher's of ordinary size (Fig. 27) and a Nott's Virgin (Fig. 28). Each possesses both merit and demerit, as do the Brewer (Fig. 30) and the Goodell (Fig. 31). The Brewer can be converted into a uni-valvular speculum—a poor substitute for the original Sims.

FIG. 30.



BREWER'S SPECULUM USED AS A SIMS.

FIG. 31.



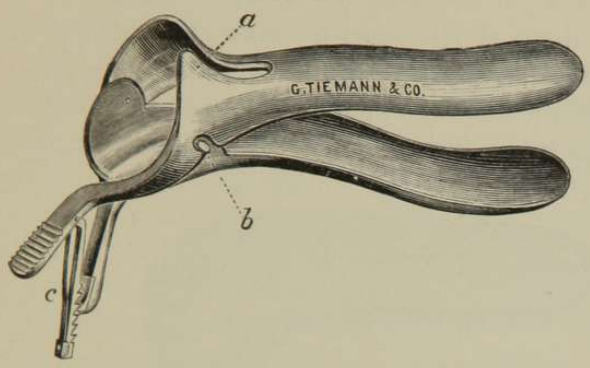
GOODELL'S SPECULUM.

Fig. 32 represents my own instrument. The advantages claimed for it are the following:

1. It is so constructed as to pass with ease into the posterior vaginal

fornix without causing pain at the ostium vaginæ, which so often results from efforts to pass the tip of an ordinary bivalve instrument, particularly in virgins, when the cervix is directed backwards.

FIG. 32.

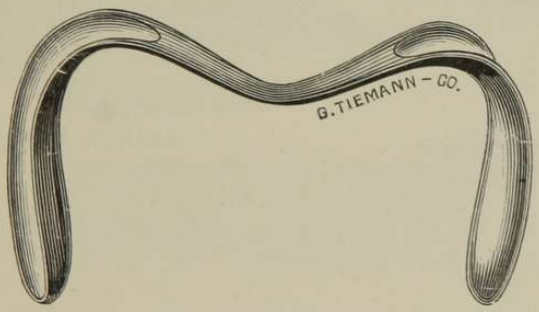


THE AUTHOR'S SPECULUM.

2. Its peculiar shape makes it perfectly self-retaining.

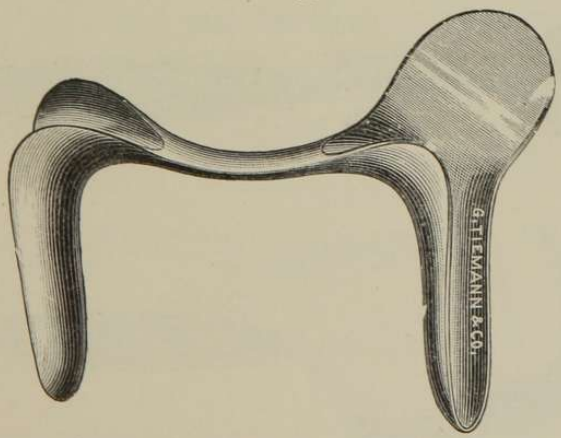
3. The only joints are at *b*, and these can be unlocked in an instant, making it aseptic and convenient to carry. The blades are fixed by the ratchet, *c*.

FIG 33.



SIMS'S SPECULUM.

FIG. 34.



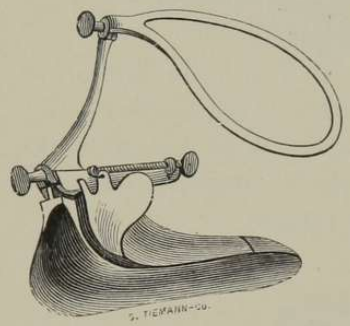
MUNDÉ'S MODIFICATION OF SIMS'S SPECULUM.

4. By means of the fixed handles the blades are under the perfect

control of the operator, and can be depressed or elevated so as easily to expose the cervix. There being no set-screw, the separation and closing of the blades requires but one hand.

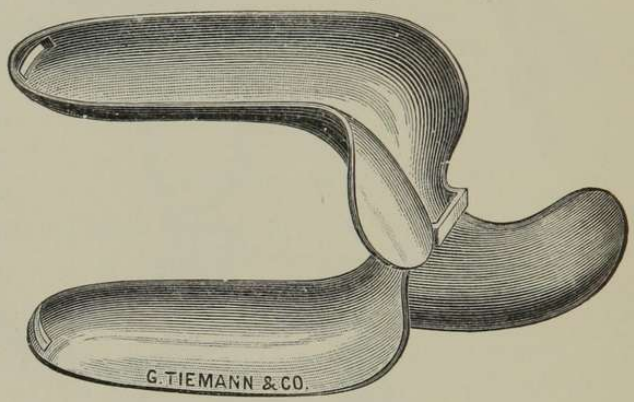
There are many modifications of the *Sims speculum*, though but few of these are an improvemeut upon the original design. (Fig. 33.) The most important modification is the expansion, made by Mundé, of one blade at its upper edge into a flange to prevent the buttock from

FIG. 35.



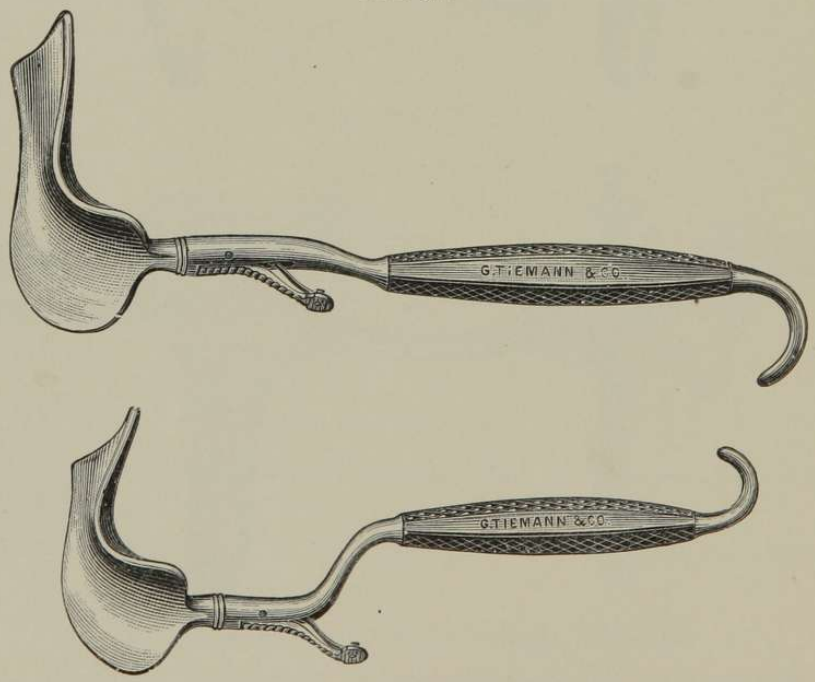
EMMET'S SELF-RETAINING SIMS'S SPECULUM.

FIG. 36.



CLEVELAND'S SPECULUM.

FIG. 37.



SIMON'S SPECULA.

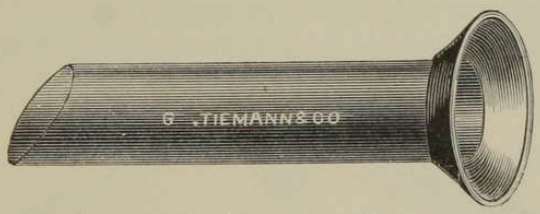
obscuring the view when no assistant can he had. (Fig. 34.) The blades of the average Sims speculum are too long and, particularly for operating purposes, too narrow. A virgin size makes an excellent rectal speculum as well.

Many self-retaining uni-valvular specula have been invented, the most useful being Emmet's (Fig. 35) and Cleveland's (Fig. 36), the object being to make an assistant unnecessary. These manifestations have never become popular and, probably, never will. With an assistant there is no vaginal speculum equal to the Sims; without one some form of expanding instrument is infinitely more convenient and useful for diagnostic purposes.

Simon's specula (Fig. 37) are uni-valvular, like the Sims, but are used with the patient in the dorsal posture. The upper blade has been made hollow, to which is attached a stop-cock so that it can be connected with an irrigator (Frisch's modification).

The *cylindrical specula* come in sets of five each (Fig. 38), and are made of wood, metal, glass, gutta-percha, hard rubber, or horn. They

FIG. 38.

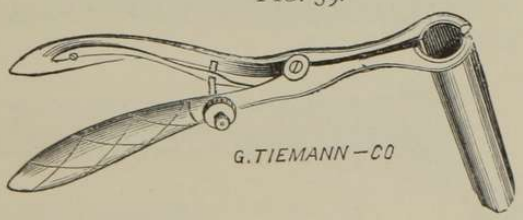


FERGUSON'S SPECULUM, TUBULAR.

vary in diameter from one-half to two inches, and in length from four to six inches. One longer than five inches is impracticable. Tubular specula are not to be compared with a good bivalve.

As already intimated, a small Sims's, or rather two Sims's, specula make a very good *rectal speculum*, particularly after divulsion and when

FIG. 39.



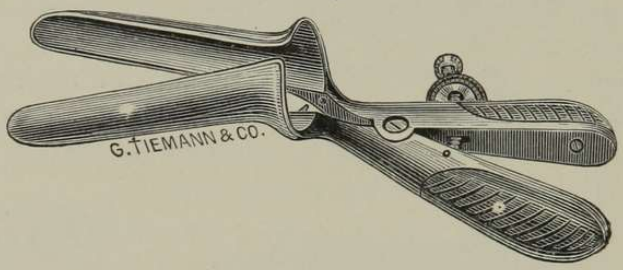
BI-VALVE RECTAL SPECULUM.

the patient is under anesthesia. For examination at other times an

expanding instrument is more useful. Very good ones are shown in Figs. 39 and 40. Pratt's bi-valve is also an admirable instrument, especially for operative purposes.

The use of *urethral specula* is necessarily more or less unsatisfactory. Expanding instruments of any kind will expose the outer third of the canal without any difficulty. One of the most popular specula constructed upon this principle is Skene's (Fig. 41), though the tips of dressing forceps, or, better still, an expanding ear speculum, will do

FIG. 40.



WILLIAMS'S RECTAL SPECULUM.

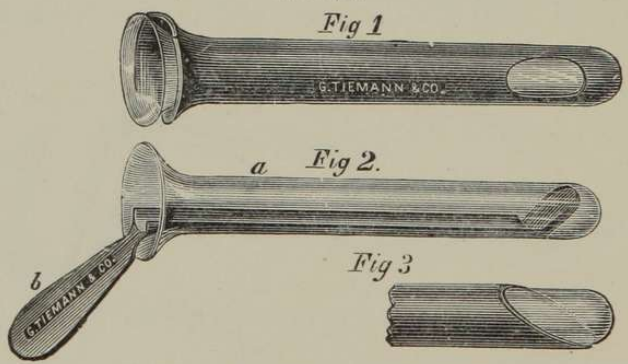
very well. For examining the deeper portion of the canal or the walls of the bladder an endoscope or a cystoscope is necessary. Skene's

FIG. 41.

SKENE'S URETHRAL SPECULUM.

endoscope (Fig. 42) and the cystoscope of Nitze & Leiter (Fig. 44) have been in use for some years. To use either of these two instru-

FIG. 42.

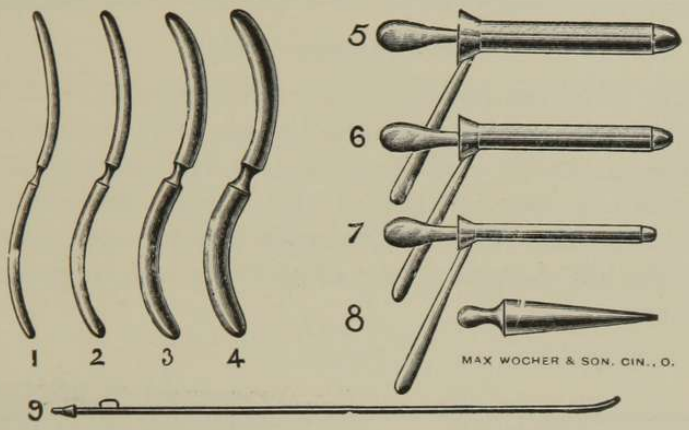


SKENE'S URETHRAL ENDOSCOPE.

ments with success much practice is required.

Kelly's method of exploring the interior of the bladder has now supplanted the older one. The instruments shown in (Fig. 43) are required for this method.

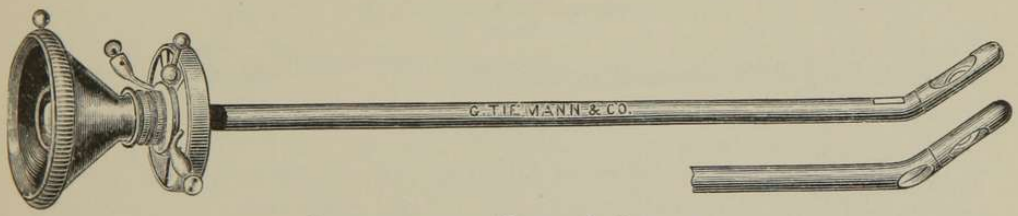
FIG. 43.



KELLY'S SOUNDS AND CYSTOSCOPES.

At least two **Uterine Sounds**—one stiff and one flexible—should be in the possession of every physician who is called upon to make gynecological examinations. Of the *stiff sounds*, Simpson's is the most

FIG 44.



CYSTOSCOPE OF NITZE & LEITER.

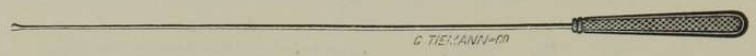
popular (Fig. 45). Although sufficiently stiff to retain its shape and curve despite any ordinary force, it is flexible enough to be moulded by the finger. It is graduated in quarter inches and inches, and at a distance of two and a half inches from the tip there is a small knob indicating the normal depth of the uterine cavity.

FIG. 45.

SIMPSON'S UTERINE SOUND.

Of the flexible sounds or probes, Sims' (Fig. 46) is typical. Very flexible silver probes, bending at the slightest impediment, are frequently required in penetrating the uterine cavity when its canal is

FIG. 46.



SIMS'S FLEXIBLE PROBE.

constricted or impinged upon by intra-uterine growths. Elastic whalebone or hard rubber probes of similar size are often necessary.

Tenacula are made in different shapes, the best for all purposes being that represented in Fig. 47. The handle, for aseptic reasons, should be of metal. **Volsella Forceps** may be used instead of the tenaculum for the purpose of fixing the cervix during examinations and operations.

FIG. 47.

LONG ANGULAR TENACULUM.

Nott's Depressor (Fig. 48) is used to push the anterior vaginal wall forward in using the Sims speculum.

FIG. 48.

NOTT'S DEPRESSOR.

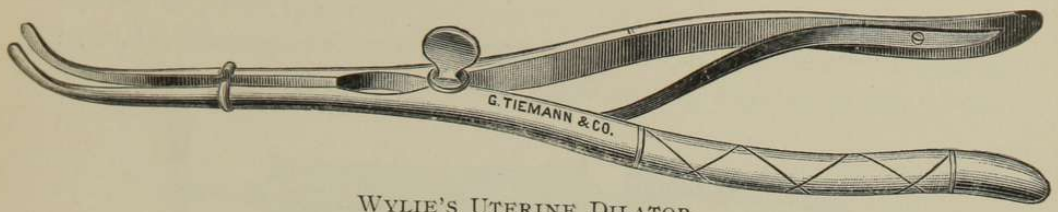
Hank's hard rubber **Uterine Dilators** are inexpensive and answer very well for diagnostic purposes. The graduated steel dilators (Pratt's) are, however, for aseptic reasons, to be preferred. They

FIG 49.

HANK'S HARD RUBBER UTERINE DILATORS.

come in sets of six each, thus giving twelve sizes. For rapid dilatation a steel instrument is necessary (Fig. 50).

FIG. 50.

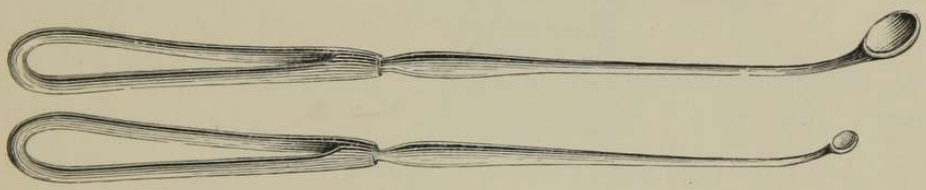


WYLIE'S UTERINE DILATOR.

The **Curette** is used in diagnosis to remove tissue for microscopical examination; therefore a sharp instrument (Simon's) is ordinarily preferable (Fig. 51). When the sharp curette is deemed unsafe, Thomas' dull wire instrument may be used instead (Fig. 52).

A large **Hypodermic Syringe** with a long needle can be advantageously utilized as an *aspirator* when only enough fluid is desired to

FIG. 51.

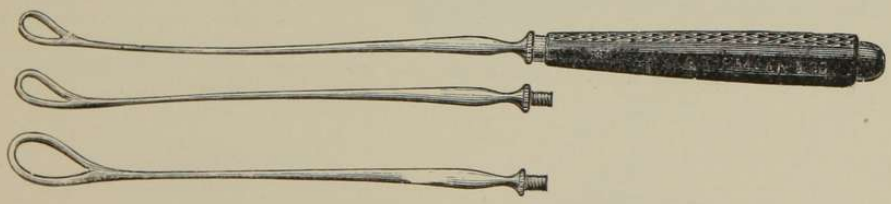


SIMON'S SPOON CURETTE.

ascertain its character. The most serviceable aspirator for all purposes is Potains. (Fig. 52.)

Dressing Forceps are indispensable to the gynecologist. I prefer a long, straight instrument made upon the principle of the ordinary dissecting forceps. The late Professor Dunster devised such an instru-

FIG. 52.



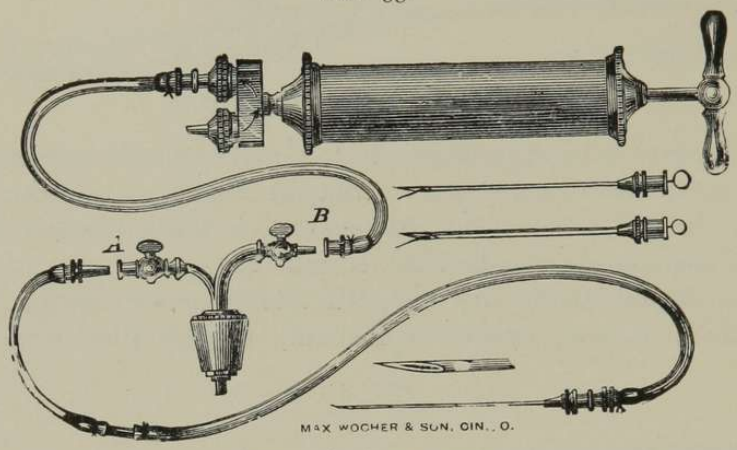
THOMAS' DULL WIRE CURETTE.

ment. Bozeman's dressing forceps is also a very useful instrument and can be used as an applicator as well. (Fig. 55.)

The **Stethoscope** is used in differentiating sounds within the abdominal cavity.

The dimensions of the external surface of the abdomen and the size

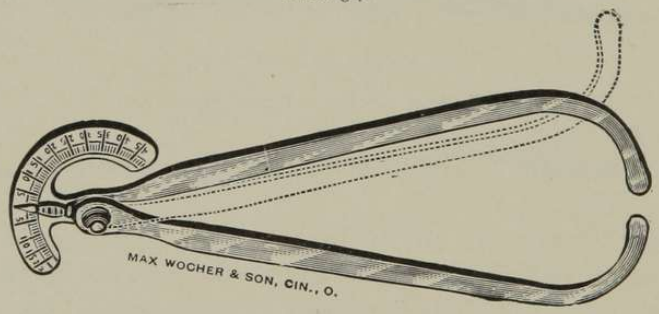
FIG. 53.



POTAIN'S ASPIRATOR.

of the pelvis are determined by the **Tape-Measure** and the **Pelvimeter.** (Fig. 54.)

FIG. 54.



COLLINS'S PELVIMETER.

The use made of the **Microscope** in diagnosis is discussed in Chapter IV.

A good **Clinical Thermometer** is a *sine qua non* in gynecological

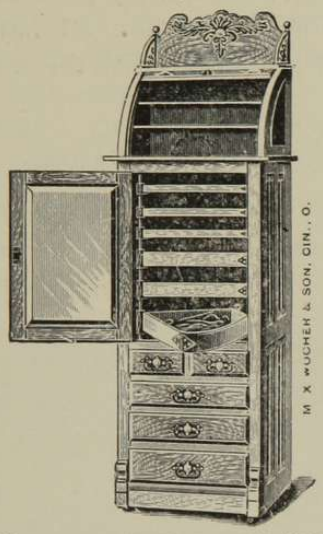
FIG. 55.

BOZEMAN'S DRESSING FORCEPS.

work. Only by its use is it possible to determine actual systemic disturbances, thus differentiating between pain due to purely functional trouble and that resulting from pus or inflammation.

An instrument cabinet (Fig. 56) is of great convenience in office work. The bottom of the trays and drawers, for aseptic reasons, should be made of glass.

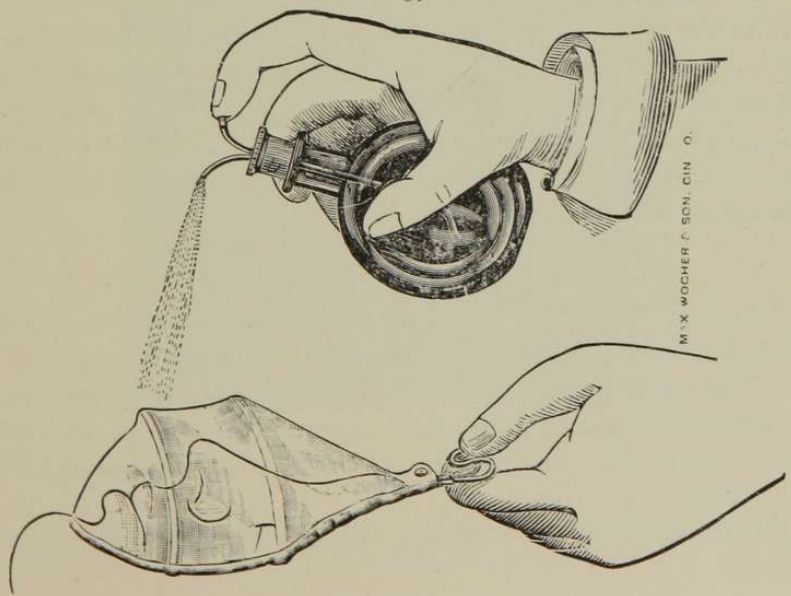
FIG. 56.



THE HARVARD INSTRUMENT CABINET.

Anesthesia.—An examination without anesthesia is rendered unsatisfactory or impossible under the following circumstances:

FIG. 57.



ESMARCH'S INHALER.

(*a*) When the abdominal walls are unusually tense or tender; (*b*) when phantom pregnancy is suspected; and (*c*) in young girls when the parts are exceedingly tender. When used for diagnostic purposes chloroform is the preferable anesthetic. Under all circumstances, before an anesthetic is given, the urine should be examined for the evidences of renal insufficiency. An improvised ether cone, made from a towel enclosing a folded newspaper, is infinitely preferable to the elaborate and costly special inhalers on the market. I have discarded entirely all chloroform inhalers which interfere with the free admixture of air with the chloroform.

Positions for Examination.

1. Dorsal recumbent { (*a*) *level-dorsal*, (*b*) *gluteo-dorsal*, (*c*) *lithotomy-dorsal.*
2. Lateral.
3. Latero-abdominal, or Sims's.
4. Abdominal.
5. Genu-pectoral.
6. Erect.
7. Trendelenberg.

It may be necessary in a given case to utilize more than one, or, indeed, all of these positions. In America the *dorsal posture* is usually the first resorted to for inspection and for digital or ordinary specular examination. If the Sims speculum is used, the patient is then placed in the *latero-abdominal position*. In England the *lateral* or *latero-abdominal* is the usual one for both digital and specular exploration. The patient's person should be protected as much as possible with a sheet possessing an opening a little below its middle, through which the abdomen and genitalia can be exposed and the hand or instruments passed. Gentleness and tact are requisites without which no physician can become a successful gynecologist.

1. Dorsal Recumbent.

(*a*) **Level Dorsal** —In this position the pelvic viscera are at rest and the diaphragm exercises a minimum of displacing power upon them. The knees are flexed so that the thighs are almost at right angles with the abdomen ; the head, shoulders, sacrum, and soles of feet are on nearly the same plane. In digital and bimanual examination it is the best position.

(*b*) **Gluteo-Dorsal.**—The thighs are acutely flexed upon the abdo-

men with the knees touching the thorax and separated as widely as possible. This position is utilized when the vagina is unusually long or when the perineum or abdominal walls are exceedingly rigid. In it the symphysis is greatly elevated while the sacral promontory is correspondingly depressed, so that it is more easily reached with the finger. The vagina is directed almost perpendicularly downward and, per rectum, the posterior surface of the uterus is accessible. Palpation is, in this position, facilitated because of the complete relaxation of the abdominal walls and the diminished intra-abdominal pressure.

(*c*) **Lithotomy-Dorsal.**—This position is much more comfortable for the patient than the gluteo-dorsal. The shoulder and thorax are so elevated that the trunk rests upon an inclined plane at an angle of

FIG. 58.

LATERO-ABDOMINAL OR SIMS'S POSTURE. (*Skene.*)

about 20°, the feet remaining upon a horizontal plane with the sacrum. Intra-abdominal pressure is increased by the elevation of the thorax,

hence this position is less adapted than the gluteo-dorsal for bimanual examination.

2. Lateral.

The patient lies upon either side, preferably the left, her head supported merely by a pillow. The shoulders and hips are perpendicular to a horizontal plane, the hips down to the edge of the table and the thighs flexed at right angles to the body. The lateral and posterior portions of the pelvis are more accessible to the examining finger than in the dorsal positions. Thus a slight perimetric exudation, or a dislocated ovary which escaped observation while on the back, may be detected. It is the usual position for explorations of the rectum. However, nearly, if not quite, as much information can be gained with the patient either upon her back or in the latero-abdominal position.

3. Latero-abdominal, or Sims's.

While other forms of specula can be introduced in this position, it is chiefly used for the introduction of the uni-valvular or Sims's. In it the abdominal viscera gravitate forward and downward away from the pelvic cavity. By admitting air into the vagina and separating the labia the whole vaginal tract is exposed. The correct position, together with the proper method of holding the speculum, is beautifully shown in Fig. 58. The patient lies upon her side, usually the left, her head supported by a low pillow, and on a perfectly flat, hard table. The left arm is thrown out behind and hangs over the edge of the table, or is folded upon the back, while the left shoulder, the lower half of the chest, and the left hip touch the table. The thighs and knees are flexed at right angles to the body, the right knee slightly overlapping the left. A lateral or downward inclination of the table greatly facilitates the examination. The position is unrivaled for ocular examination, and is imperative in many operative procedures on the cervix and vagina.

4. Abdominal.

In this position the abdomen and thorax rest upon the examining couch. To the gynecologist it is useful only when it is deemed necessary to examine the spine, the posterior wall of the pelvis, and the back.

5. Genu-pectoral.

As the name implies, the patient rests upon her knees and chest. One side of the face is supported by a low pillow. Her thighs are at right angles to the pelvis, the knees somewhat separated, and the feet

slightly projecting over the edge of the couch. In this position intra-abdominal pressure is practically suspended. If the introitus is not too narrow the vagina fills spontaneously with air and becomes ballooned. The uterus and pelvic contents sink toward the abdominal cavity and the fundus, unless crowded into the hollow of the sacrum or attached, falls forward.

This position is useless for digital examination, because the vagina becomes greatly elongated. When a retro-displaced uterus cannot be restored in the ordinary way it is invaluable. Small incarcerated fibroids and ovarian tumors with long pedicles can be more readily pushed out of the pelvic cavity in this position. Pessaries and tampons are often advantageously introduced before the patient turns upon her side.

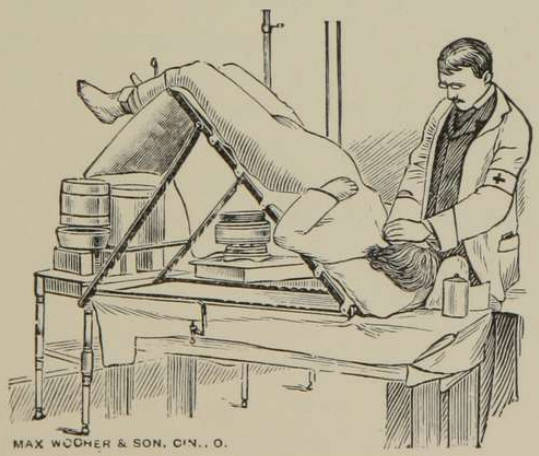
6. Erect.

In the erect posture intra-abdominal pressure is increased to its maximum, so that the pelvic contents sink lower than in any other position. For esthetic reasons it is not resorted to when, many times, valuable information might be obtained by so doing. It is particularly desirable to make an examination while the patient is erect after fitting a pessary. Excessive obliquities of the pelvis and deformities of the spinal column are made more conspicuous while the patient is standing.

7. Trendelenberg.

The *Trendelenberg* position (Fig. 59) is rarely used for purposes of examination. Its chief advantage consists in permitting of ocular in-

FIG. 59.



TRENDELENBERG POSTURE OBTAINED BY KRUG'S FRAME.

spection of the pelvic cavity and its contents through an abdominal incision. The pelvis and hips are elevated sufficiently high to cause the abdominal viscera to gravitate downwards, thus leaving the pelvic organs exposed. The position can be improvised by elevating the foot of an ordinary table, or by means of a chair. However, special tables and frames are now to be found in all modern operating amphitheatres. Of the latter, Krug's is the most popular.

CHAPTER VI.

PHYSICAL EXAMINATION.—(Continued.)

GENERAL CONSIDERATIONS.

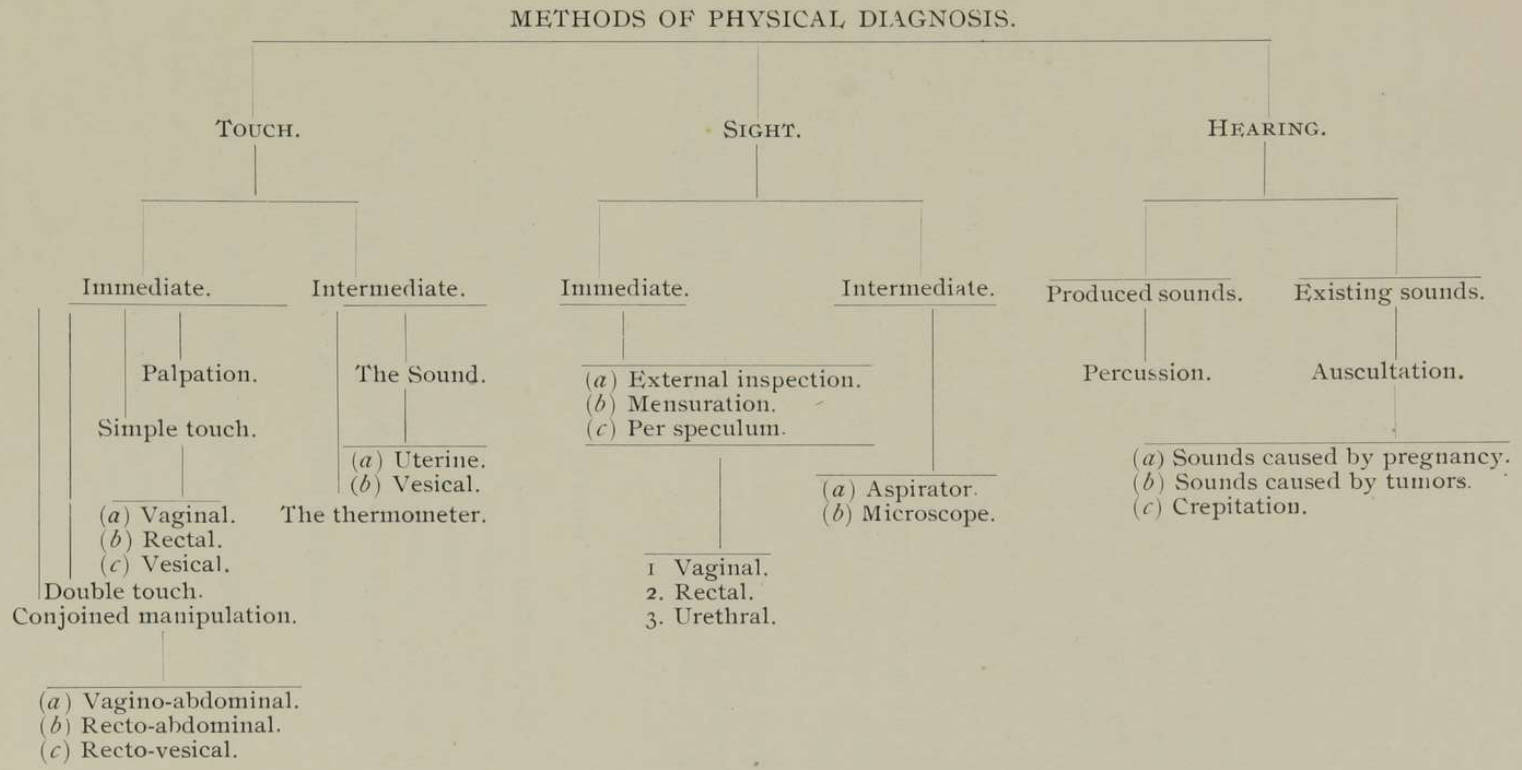
In the schema given on the following page the senses of touch, sight, and hearing are the only ones given for purposes of physical examination. The sense of *smell* is also quite imporant. From the odor of vaginal discharges we can at least suspect malignant disease or the retained products of conception when they become decomposed.

I. Immediate Touch.

Palpation.

Position.—Palpation may be performed in any position, but inasmuch as its gynecological use is usually restricted to palpating the abdomen, the *level-dorsal* and *gluteo-dorsal* are the most satisfactory ones.

Method.—Both hands should be well warmed and laid gently upon the abdomen, with the palmar surface down, and the whole area manipulated between them. The pressure must at first be light and then gradually increased; unless this point is observed the contraction of the abdominal muscles will make the procedure useless. By engaging the patient in conversation muscular tension can often be overcome. Deep inspiration with prolonged expiration will likewise suspend voluntary resistance. (Mundé.) Hegar and Kaltenbach recommend that the bladder and rectum be filled with water and rapidly emptied for the purpose of producing immediate relaxation. Anesthesia is often necessary. So-called phantom tumors will disappear as if by magic when the patient is anesthetized. The fingers should be spread out and the whole abdominal surface uniformly palpated. By going over region after region, it is possible to detect any abnormalities which may be present. In the supra-umbilical region the finger tips should be directed upward and backward; in the umbilical, backward; and in the infra-umbilical downward and backward into the pelvic cavity. In normal conditions the sensation is not unlike that of manipulating plastic fluid. Thickening of the skin, circumscribed areas of resist-


METHODS OF PHYSICAL DIAGNOSIS.
TOUCH.
SIGHT.
HEARING.
Immediate.
Intermediate.
Immediate.
Intermediate.
Produced sounds.
Existing sounds.
Palpation.
The Sound.
(a) External inspection.
(b) Mensuration.
(c) Per speculum.
Percussion.
Auscultation.
Simple touch.
(a) Uterine.
(b) Vesical.
(a) Aspirator.
(b) Microscope.
(a) Sounds caused by pregnancy.
(b) Sounds caused by tumors.
(c) Crepitation.
(a) Vaginal.
(b) Rectal.
(c) Vesical.
The thermometer.
1 Vaginal.
2. Rectal.
3. Urethral.
Double touch.
Conjoined manipulation.
(a) Vagino-abdominal.
(b) Recto-abdominal.
(c) Recto-vesical.

ance, nodules, tumors, fluid collections, etc., should be looked for and mapped out.

Regions of Abdomen.— For diagnostic purposes the abdomen is divided into regions, which are shown in Fig. 60.

The following structures are found in these regions:—

Right Hypochondriac.—Right lobe of liver; gall bladder; hepatic flexure of colon; part of duodenum; part of right kidney; suprarenal capsule.

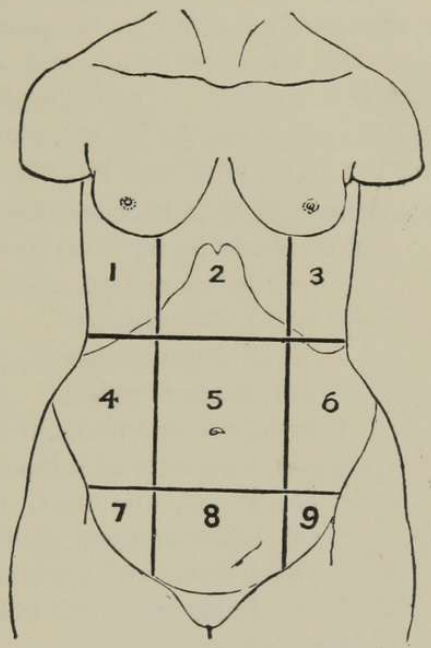
Epigastric.—Right half of stomach; pancreas; liver.

Left Hypochondriac.—Spleen and narrow extremity of pancreas; cardiac end of stomach; the splenic flexure of colon; upper part of left kidney; left suprarenal capsule; occasionally a part of left lobe of liver.

Right Lumbar.—Part of the duodenum and jejunum; the ascending colon; lower half of right kidney

Umbilical.—Part of the omentum and mesentery; lower part of the duodenum, with some convolutions of the jejunum and ileum; transverse part of colon.

FIG. 60.



REGIONS OF ABDOMEN.—(*Edis.*)

1. Right hypochondriac.
2. Epigastric.
3. Left hypochondriac.
4. Right lumbar.
5. Umbilical.
6. Left lumbar.
7. Right iliac.
8. Hypogastric.
9. Left iliac.

Left Lumbar.—The descending colon; lower half of left kidney with part of the jejunum.

Hypogastric.—The uterus when in the gravid state; convolutions of the ileum; the bladder if distended.

Right Iliac.—The termination of the ileum; the cecum, with the appendix vermiformis.

Left Iliac.—The sigmoid flexure of the colon.

Vaginal Touch.

Position.—Preferably the *level-dorsal* for routine examination.

English specialists prefer the lateral or latero-abdominal. It is often advantageous to practise touch in several positions.

Method.—The index finger of either hand may be used. It should be scrupulously clean and the nail reasonably short. Pure castile or antiseptic soap of some kind is the best lubricant. The vaginal orifice is most easily reached by sweeping the finger forward from the buttocks over the anus, perineum and fourchette. Avoid contact with the clitoris if possible. The lax vaginal orifice in multiparæ makes it easy to find, and often the introduction of two fingers is necessary. In passing the finger or fingers into the vagina the examiner should note:

1. *Vulva.*—If pain is caused by an attempt to introduce the finger the parts should be inspected for—
   - (*a*) Inflammation, abrasions, or ulcerations;
   - (*b*) Labial abscess;
   - (*c*) Urethral caruncle;
   - (*d*) Eczema vulvæ.

   Protrusions or tumors at the ostium vaginæ may be due to—
   - (*a*) Cystocele or rectocele;
   - (*b*) Procidentia uteri, the cervix presenting;
   - (*c*) Inversio uteri, the fundus presenting;
   - (*d*) Uterine and vaginal neoplasms;
   - (*e*) Imperforate and bulging hymen.

2. *Hymen.*—Observe—
   - (*a*) Carunculæ myrtiforms. Their presence indicates parturition at or near term;
   - (*b*) Whether perforate or imperforate.

3. *Vaginal Walls.*—Observe the degree of moisture and heat, the presence or absence of rugæ, fistulæ, foreign bodies, length and diameter of canal.

   Length.—The walls are increased in length by—
   - (*a*) The ascent of the uterus into the abdominal cavity, as in ovarian or fibroid tumors.

   They are shortened by—
   - (*a*) Prolapsus uteri, with cystocele or rectocele;
   - (*b*) Ante- or retro-uterine displacements;
   - (*c*) Inflammatory adhesions and cicatricial bands;
   - (*d*) Congenital atresia, partial or absolute.

   Capacity.—There is diminished capacity in—
   - (*a*) Any of the conditions affecting the length;
   - (*b*) Vaginismus;
   - (*c*) Tumors within the pelvis, or vaginal walls.

4. *Cervix.—Position.*—It is lower than normal in the vagina in—
   (*a*) Prolapsus uteri;
   (*b*) Hypertrophic elongation.

   Direction.—The direction may be nearly if not quite normal in flexions of the uterus. It points in—
   (*a*) Retroversion, directly forward;
   (*b*) Anteversion, directly backward;
   (*c*) Prolapsus, directly downward.

   Length.—The normal length is nearly one inch. It is shortened physiologically in—
   (*a*) Pregnancy (apparent) and immediately before and during labor;
   (*b*) Multiparæ;
   (*c*) Advancing age.

   It is shortened pathologically in—
   (*a*) Super-involution;
   (*b*) Non development;
   (*c*) Parametric exudations, obliterating vaginal fornices.

   It is increased in—
   (*a*) Hyperplasia, or hypertrophic elongation;
   (*b*) Prolapsus.

   Consistence—It is hard in—
   (*a*) Senile atrophy;
   (*b*) Fibroid and malignant degeneration;
   (*c*) Inflammation.

   It is soft in—
   (*a*) Pregnancy;
   (*b*) Early stage of subinvolution.

5. *Os Uteri.—Shape and Size.*—It may be—
   (*a*) Circular and smooth, as in nulliparæ;
   (*b*) Transverse and irregularly notched, as in parous women.

   In *patency* it varies in size from admitting a small probe to half an inch, or even an inch, in diameter. It is increased—
   (*a*) During menstruation (slightly);
   (*b*) In subinvolution;
   (*c*) In lacerations with erosions and eversions;
   (*d*) In ulceration, either malignant or non-malignant;
   (*e*) Shortly after labor and abortion;
   (*f*) During the protrusion of some body—polypus, ovum, clot, inverted fundus, etc.

6. *Vaginal Fornices—Posterior Fornix*—After carefully examining the

cervix and *os* the finger should be carried around the cervix into the vaginal fornices. Normally, the posterior fornix has a feeling like that of the inside of the angle of the mouth (Hart). When felt from below it is concave. Pathologically, it is rendered convex by any body or mass projecting through the pouch of Douglas. Such are—

(*a*) *Feces in the Rectum.*—Fecal accumulations pit upon pressure, and if there is any doubt as to their character the bowel should be thoroughly emptied.

(*b*) *A Retroverted or Retroflexed Fundus Uteri.*—Bimanual examination will fail to find the uterus in front. Unless pregnancy is suspected the sound may be used.

(*c*) *Acute or Chronic Inflammatory Deposits.*—The history is that of inflammation with more or less immobility of the uterus.

(*d*) *Hematocele.*—The history is that of shock and collapse, followed by the sudden formation of a tumor and inflammation.

(*e*) *A Prolapsed Ovary.*—It may be adherent or non-adherent. If the latter, it can be pushed upward out of the pouch. The ovary is often beneath a retro-displaced fundus. It will be recognized by its size, shape, and above all, its exquisite tenderness upon pressure.

(*f*) *Small Fibroid Attached to Posterior Wall.*—Absence of any history of inflammation or shock. The bimanual will show the fundus to be in front. The sound will indicate increased thickness of the posterior uterine wall.

(*g*) *Ascitic Fluid.*—All of the fornices are impinged upon by a pressure which is non-resisting. Abdominal percussion and palpation will detect free fluid within the peritoneal cavity.

Anterior Fornix.—Except feces, any or all of the bodies or substances felt in the posterior fornix may be felt in the anterior. The fundus uteri is often felt in front and is recognized by the sound and bimanually. Blood and inflammatory exudates rarely gravitate into the utero-vesical pouch unless the quantity is great, because the pouch of Douglas is the most dependent part of the pelvis. The normally located uterine fundus can always be felt through the anterior fornix by practising the bimanual.

Lateral Fornices.—The most frequent pathological condition felt

through the lateral fornices is an effusion of either blood or the exudates of inflammation. Dilated Fallopian tubes are felt laterally, but rarely without the bimanual.

In withdrawing the finger from the vagina after completing vaginal touch, the state of the perineum and pelvic floor should be noted. The perineal body may be partially or completely destroyed by laceration, or, there may be relaxation of the pelvic floor without any injury to the perineum. If so, a finger placed in each lateral sulcus of the vagina, and separated, will detect the divided ends of the deep muscles and fascia beneath the mucous membrane. The character of the discharge on the finger should also be noted when it is withdrawn.

Rectal Touch.

Indications.—In all instances where there is pain upon defecation the rectum should be examined. When vaginal obstructions exist, particularly in young girls with the hymen intact, a rectal examination may be the only one permissible. The retro-uterine structures and posterior wall of the uterus can best be explored through the rectum. I make it a rule to examine the rectum of every patient who consults me for the first time.

Method.—The bowel should be thoroughly emptied by enemata. Wash the hand which has been used in the vaginal examination for fear of infection. Lubricate the examining finger with soap; fill the space under the finger nail with the same material by drawing the nail over a piece of hard soap. This is done to keep fecal or other matter from being introduced under the nail. The *lateral position* is the most convenient one.

As the finger passes the sphincter, observe—

(*a*) The resistance of the sphincter;

(*b*) The presence or absence of tumors, fissures, etc.;

(*c*) The presence or absence of strictures, malignant ulceration, etc.

After the finger has penetrated the rectum there will be detected a thick conical body projecting into the anterior wall, which is the cervix. The posterior wall of the uterus, the intervening pouch of Douglas, the sacral excavation, and the posterior rectal wall should all be touched. By exerting traction upon the cervix, per vaginam, the parts are much more accessible. The introduction of more than one finger is rarely necessary. For a thorough examination anesthesia and dilatation are often required. It may be necessary to balloon the rectum by placing the patient in the knee chest posture, when by means of Kelley's or

Martin's tabular specula, and reflected light, the entire descending colon can be inspected.

Vesical Touch.

Indications.—Immediate vesical touch partakes of the nature of an operation, and hence is not resorted to except in the most urgent cases. Indeed, owing to the great danger of incontinence following digital exploration of the bladder, the practice has fallen into pretty general disuse. It is safer and easier to enter the bladder, when necessary, through the incised vesico-vaginal wall. Intermediate vesical touch with the sound is, however, frequently practised.

Double Touch.

Method.—In *double touch* the index finger is introduced into the vagina and the thumb into the rectum; or, conversely, the thumb into the vagina and the index finger into the rectum; or the middle finger may be substituted for the thumb. It is useful in examining the recto-vaginal pouch and wall, as the structures coming between the fingers can thus be accurately appreciated.

Conjoined Manipulation

In the schema three varieties of conjoined manipulation are given. These are: (*a*) *Vagino-abdominal*, (*b*) *recto-abdominal*, (*c*) *recto-vesical.*

Vagino-Abdominal.—This is by all odds the most important. The patient should be placed in the *level-dorsal* position with her abdominal walls as much relaxed as possible. This is best accomplished by drawing the knees up and slightly elevating the head and shoulders.

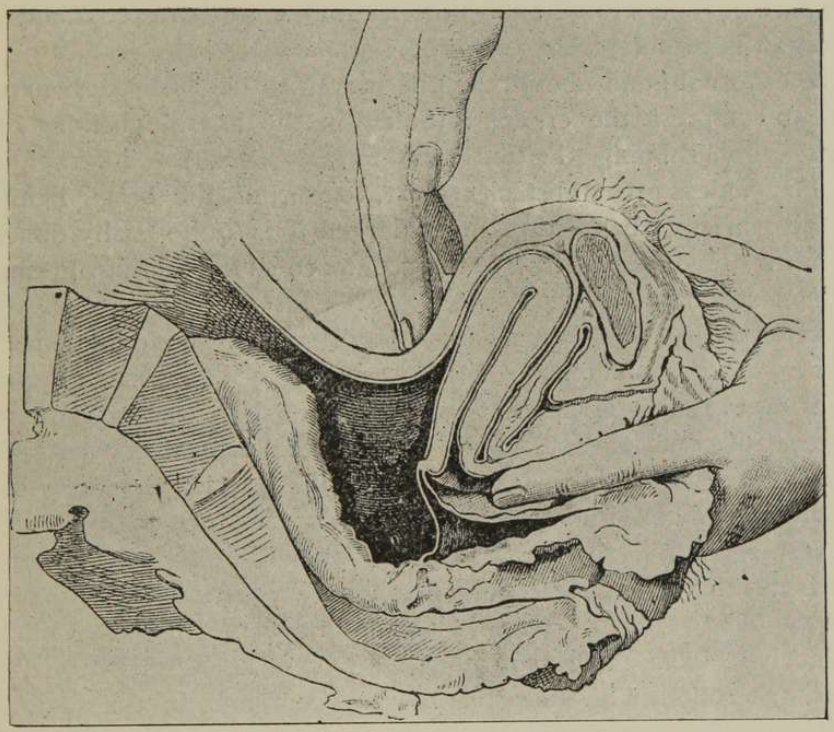
The finger or fingers should not be removed from the vagina after practising simple touch until the bimanual has been performed. Simple touch is but the first step of a bimanual. The position of the two hands is well represented in Fig. 61. With the internal fingers the uterus and annexa, together with the pubic segment and anterior vaginal wall, are lifted up toward the brim. The whole abdominal area over the pelvic brim should be palpated with the external hand, which is gently but not spasmodically depressed.

The first object of the examiner should be to locate the fundus uteri. Its normal position is about two inches above the border of the symphysis. By lifting the uterus upward with the internal fingers and pressing downward in the direction of the pelvic brim with the external hand, it will be, if in front, within the grasp of the two hands. If

retro-displaced, the two hands will approach each other with nothing intervening except the abdominal and vaginal walls.

The normal virgin uterus is pear-shaped although compressed antero-posteriorly. Its entire length is three inches, of which nearly one inch is intra-vaginal. At the fundus it is nearly two inches wide and about an inch thick. Through the abdominal and vaginal walls all intra-

FIG. 61.



CONJOINED MANIPULATION.

abdominal bodies seem larger than they really are. Nevertheless, in favorable cases an experienced examiner ought to detect even a slight increase in the size of the uterus, although he may not be able to determine its cause. Such enlargement may be the result of—

1. *Pregnancy.*—The uterus has a regular, spherical outline, with an apparent equality of all diameters. There is a peculiar feel, even in early pregnancy, which must be felt to be appreciated. The cervix is soft and velvety. Vaginal and vulvar discoloration is present. The uterus is freely mobile.
2. *Subinvolution or Areolar Hyperplasia*—The uterus is more or less

tender. Menstruation is not interrupted and is usually profuse. The cervix is not softened and is apt to be gaping.

3. *Small Fibroid Tumors.*—There is no tenderness, and menstruation is oftener profuse than otherwise. The uterine walls are irregularly thickened.

In suspected pregnancy it is unwise to introduce the sound. Let the physician be cautious in giving a positive diagnosis in early pregnancy. The best diagnosticians are liable to be mistaken, and *time* is the only safeguard. It must not be forgotten that conception may occur when the organ is pathologically enlarged.

The external hand should now be moved to one side and an effort made to compress the organs situated in the lateral portions of the pelvis. By rubbing the external fingers over the internal, it is possible, unless great obstacles exist, to outline the broad ligaments and the ovaries; when either are enlarged it is quite easily done. If the tubes are distended they are recognized as fluctuating, "sausage-like" masses on one or both sides.

Successful *bimanual examination* requires skill and experience. A *tactus eruditus* results only from long practice. When once acquired it will bring to its possessor that which in no small degree goes to make a successful gynecologist. It is much more satisfactory with some women than with others. Tenderness, rigidity and thickness of the abdominal walls are interfering factors The first two can be overcome by anesthesia; in dealing with thick abdominal walls, all that can be done is to relax them as much as possible by a favorable position.

Recto-Abdominal.—What has been said concerning the information derived from rectal touch will apply here. The external hand presses the contents of the pelvis toward the finger in the rectum, so that the posterior surface of the uterus and the contents of Douglas's pouch are more readily reached. By this method, too, retro-uterine tumors may be easily grasped from above; and a distended sigmoid flexure is more clearly determined.

Recto-Vesical examination is described by some authors as though it were perfectly easy and safe. Personal experience teaches me that the urethra cannot be dilated so as to admit the index finger with impunity. Then, too, the movements of the finger within the bladder are so restricted as to make touch unsatisfactory. Its greatest utility lies in determining the absence of the uterus; and even here very nearly, if not quite, as much information can be gained with the sound in the bladder and the finger in the rectum.

CHAPTER VII.

PHYSICAL EXAMINATION—(Continued)

II. INTERMEDIATE TOUCH.

Uterine Sound.

Indications.—Unless counter indications exist it is the duty of the physician to employ every means at his command which will afford him information concerning his patient. *The use of the uterine sound is, therefore, called for in those instances in which previous oral, bimanual and specular examinations have not furnished satisfactory information, providing no counter indications exist.* The examiner who has mastered the art of making the bimanual will have occasion to resort to the sound less often than he who has not.

Counter Indications.—1. It is not to be passed if there is any possibility of pregnancy; if menstruation is delayed for a few weeks, or even for a few days, the sound should not be employed.

2. It is not to be passed in cases of acute pelvic inflammation, and the greatest caution must be observed in subacute or chronic inflammation.

3. With certain limitations it should not be passed during ordinary menstruation.

4. It should not be passed in advanced malignant disease of the cervix or body of the uterus.

Dangers.—Observing due precaution, Mundé, in fifteen thousand cases in which he has used the sound, has not had to contend with results more serious than slight shock and uterine colic. Nevertheless, it must not be forgotten that some uteri, even though apparently healthy, react upon the slightest provocation, and thus serious trouble may follow. Besides inflammation, the student should guard against—

1. *Perforation of the Fundus Uteri.*—This is apt to occur when the organ is softened by disease or during the process of involution after labor or abortion. The accident has happened repeatedly, but fortunately it has not been followed by bad results. I have accidentally perforated the uterus with the sound on three different occasions.

2. *Hemorrhage.*—When an unnatural hemorrhage from any cause has existed, or is still present, there is danger of re-exciting or increasing it by the use of the sound.

3. *Abortion.*—The examiner should never rely absolutely upon the patient's testimony, especially if there exist reasons for deception. As a safeguard against passing the sound into a pregnant uterus he should—

(*a*) Always ask when menstruation last occurred;

(*b*) Always examine the abdomen for signs of advanced pregnancy; and

(*c*) Always perform the bimanual previous to its introduction.

Even with these precautions there are few men of extended experience who have not, during their career, unwittingly induced an abortion.

Method of Employment.—Place the patient in the *level-dorsal* posture, well down to the end of the table. The cervix and fundus are previously located by digital and bimanual examination. The speculum may or may not be employed. By relying solely upon the sense of touch the direction of the uterine canal can be ascertained and any obstacles to the advancement of the sound more readily overcome. On the other hand, if the speculum is used, the vagina and cervical canal can be freed from septic matter—an important consideration; and by fixing the cervix with a tenaculum the operator can see exactly what he is doing. I therefore prefer, with a few exceptions, to introduce the sound through the speculum.

When no Speculum is Used.—Pass the index finger of the right hand, properly lubricated, into the vagina, and touch the anterior lip of the cervix (Fig. 62). Grasp the sound in the left hand and guide it, with its concave surface directed toward the concavity of the sacrum, into the internal os. Then—

1. If the uterus is retro-displaced it is gently pushed onward with the concavity still directed backward until the internal os is reached. When the handle is elevated toward the symphisis the point of the sound will pass into the uterine cavity.

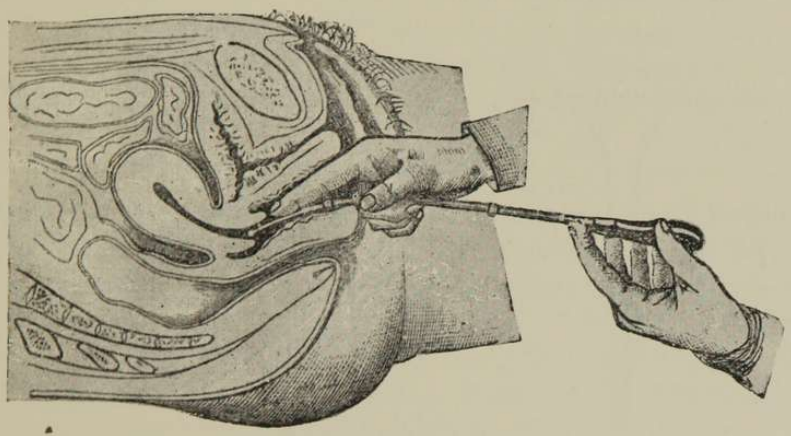
2. If the uterus is in normal position or ante-displaced, the concavity of the sound, after the point has passed into the cervical canal, is turned forward, when the handle is depressed toward the perineum.

When the Speculum is Used.—If the *bi-valve* is used place the patient in the ordinary level-dorsal position; if the Sims, in the semi-prone. Wipe the vagina and cervix thoroughly with a 1:1000 mercuric solution. Apply to the cervical canal impure carbolic acid. Next gently fix the cervix with a tenaculum and pass the sound as directed

above. Probes should always be introduced through the speculum. Previous to introduction the sound should be given a curve corresponding to that of the uterine canal, as ascertained by the bimanual. *Absolutely no force is to be used in its introduction.* The tip of the handle is lightly grasped by the thumb and the first two fingers of the right hand, and the point, instead of being pushed, is rather coaxed and insinuated onward

In turning the sound, either within the cervix or the uterine cavity, observe the following facts: If the handle is twisted on its long axis the

FIG. 62.



METHOD OF INTRODUCING THE UTERINE SOUND. (*Hart.*)

tip will be forced to sweep around the arc of a semi-circle, as shown in Fig. 63, and serious injury to the uterus may result. If, on the contrary, the *handle* is made to traverse the arc of a wide semi-circle, the point remains fixed or nearly so, and no injury will ensue (Fig. 64).

Information to be Gained by the Use of the Sound.

1. *The caliber and permeability of the cervical canal.*

Normally it should admit the sound without difficulty. The caliber is diminished in—

(*a*) Infantile cervices;

(*b*) Acute flexions. (The stenosis is usually at the os internum.)

(*c*) Mucous polypi blocking up the cervical canal.

2. *The length of the uterine cavity.*

In determining the length of the canal keep the finger upon that portion of the sound corresponding to the external os when the instrument is withdrawn.

The length of the normal uterine cavity, from the os externum to the fundus, is two and a half inches. It is increased in—

(*a*) Subinvolution;

(*b*) Metritis and endometritis;

(*c*) Tumors attached to the uterus, and polypi;

(*d*) Pregnancy;

(*e*) After labor or abortion.

It is diminished in—

(*a*) Infantile uteri;

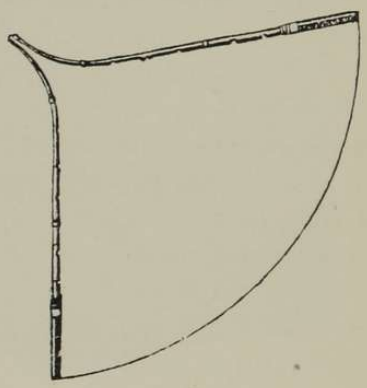
(*b*) Super-involution;

(*c*) Senile atrophy.

FIG. 63.

INCORRECT METHOD OF TURNING UTERINE SOUND. (*Hart.*)

FIG. 64.



CORRECT METHOD OF TURNING UTERINE SOUND. (*Hart.*)

3. *The direction of the uterine axis.*

Normally it is inclined forward It is altered in—

(*a*) Retro-flexions and versions;

(*b*) Ante-flexions and versions;

(*c*) Lateral displacements (usually the result of cellulitis);

(*d*) Various degrees of prolapse.

4. *The mobility of the uterus.*

In health it is freely movable and without pain. It is oftener fixed as a result of inflammation, but fixation may be due to many pathological conditions.

5. *The connection existing between the uterus and certain tumors.*

Such are—

(*a*) Small tumors found in the anterior and posterior fornices of the vagina. If the tumor is the fundus uteri the sound will

penetrate it, and, if not adhered, lift it out of its unnatural position.

(*b*) Large tumors within the pelvic or abdominal cavities. The sound will show whether or not such tumors are intimately attached to the uterus.

6. *The differential diagnosis between an inverted uterus and a polypus projecting into the vagina.*

The length of the cavity is increased in polypi; in inversion it is nearly, if not quite, obliterated, so that the sound penetrates the uterine cavity but a short distance. Bladder and rectal exploration are sometimes necessary.

7. *The condition of the endometrium.*

It is roughened in inflammation and cancerous degeneration. Hemorrhage often follows its introduction when these conditions exist.

Vesical Sound.

Indications.—Its most frequent use is to explore the bladder for calculi or suspected morbid growths. In amputation of the cervix, or in vaginal hysterectomy, the sound should always be passed to determine the relation of the bladder to the uterus. With the sound in the bladder and the finger in the rectum the presence or absence of the fundus uteri above the superior pelvic strait can be determined. A medium-sized male sound should be used for this purpose.

III. IMMEDIATE SIGHT.

External Inspection.

Observe first the figure, the color of the face and lips and the expression of the eyes. This will give some information as to the temperament and general health. By examining the tongue and gums existing disorders of the digestive organs and blood can be detected.

For inspecting the abdomen place the patient upon her back with the clothing perfectly loose. Note—

(*a*) The size and shape of the abdomen;

(*b*) The condition of the umbilicus, whether prominent, flush, or retracted;

(*c*) The presence or absence of pigmentation;

(*d*) The presence or absence of lineæ albicantes. These may result from distension of the skin due to any cause, and may be absent in women who have borne children;

(*e*) The contractions of the uterus;

(*f*) The movements of the fetus;

(*g*) Irregularities upon the surface.

In all cases when suspicions of pregnancy exist inspect the breasts. Observe—

(*a*) Their size, whether plump or flabby;

(*b*) The areolæ and enlarged veins;

(*c*) The nipples, whether full formed or retracted;

(*d*) The secretion. In doubtful cases a slight secretion is of but little value for diagnostic purposes.

Previously to making a digital examination inspect the vulvar region, particularly if the presence of specific disease is surmised. Observe—

(*a*) The situation, whether normal or too far back;

(*b*) The color and size of the labia;

(*c*) The condition of the perineum and the gaping of the vulvar orifice;

(*d*) The size of the clitoris, and the presence or absence of adhesions.

(*e*) The color of the introitus vaginæ; it is increased in pregnancy;

(*f*) The appearance of the meatus urinarius—presence or absence of caruncles;

(*g*) The character of the discharge; and

(*h*) Eczematous eruptions.

FIG. 65.

DIGITAL EVERSION OF RECTUM (*Mundé*).

Digital Eversion of the Rectum for Inspection—. Place the patient in the dorsal or latero-abdominal position, introduce one or two fingers into the vagina and press the tips in the direction of the rectum. It is possible to expose in this way the mucous membrane of the edges of the sphincter and a portion of the anterior rectal wall. Fissures and other lesions involving this region of the anus are thus exposed without the aid of a speculum. (Fig. 65.)

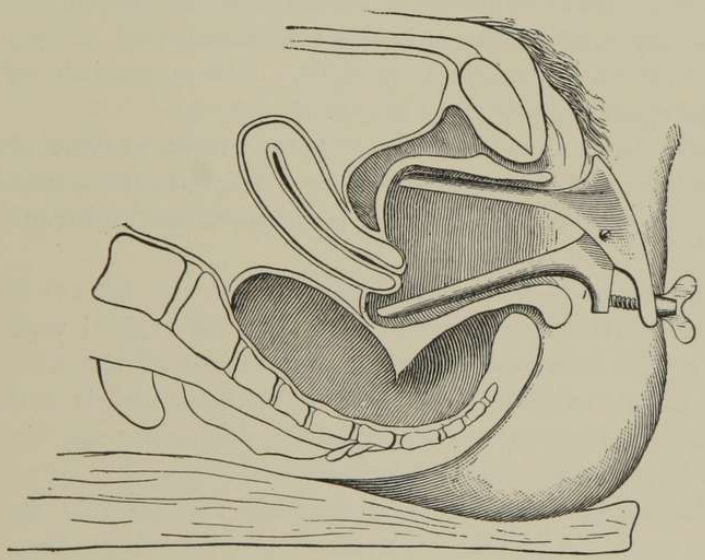
Per Speculum.

Vaginal Specula.

Specular examination of the vagina is by no means necessary in all cases. It should, however, be made when previous digital examination reveals any condition, the exact nature of which is uncertain. Such are: Hyperplasia of the cervix with or without lacerations; carcinoma; abrasions and ulcerations; granular vaginitis, etc. It is usually wise to resort to the speculum when the patient consults the physician for the first time, unless counter indications prevent.

Counter Indications.—Atresia vaginæ; acute inflammation; imperforate hymen; hyperesthesia. In malignant disease it should be used as seldom as possible and then with much care.

Fig. 66.



Bi-valve Speculum Introduced. (*Byford.*)

Bi- and Tri-valve Specula.—Place the patient in the *level-dorsal posture* with the feet supported in stirrups. The instrument can also be introduced in the lateral posture. Grasp the speculum, well lubricated, in the right hand and press the rounded point of the closed blades into the vulvar cleft, which has been previously opened by the left hand. The transverse diameter of the blades should correspond to the antero-posterior diameter of the vulvar cleft. When the latter is penetrated, turn the speculum so that the handles will be directed downward and gently push it into the vagina in the direction of the cervix. The handles are now expanded in such a way as thoroughly to expose the

cervix, and fixed with the set screw or ratchet. It may be necessary to fix the cervix with a tenaculum. By greater expansion it is possible to expose the entire vaginal vault. (Fig. 66.)

The speculum should be gently withdrawn, care being observed not to pinch the vaginal mucous membrane between the blades

Uni-valve or Sims's.—Much pains must be taken to secure the proper *latero-abdominal* position. Unless this is done the use of this speculum will be disappointing. It is necessary to have intra-abdominal pressure almost, if not quite, suspended.

Method of Introduction.—First locate the cervix by digital exploration. Select a blade of proper size and lubricate its convex surface. Grasp the end to be introduced in the right hand and gently lift the upper labium with the left hand. Introduce the point of the blade and the finger into the vaginal orifice, keeping the point directed well backward into the posterior fornix. With the left hand steady traction is now made backward, and slightly upward so as to elevate the upper buttock and admit more light. The proper method of holding the speculum is shown in Fig. 58.

The table must be so placed as to permit light to enter the vagina: *i. e.* the buttocks should correspond very nearly to the center of a side window while the head of the table is drawn about eighteen inches to the right.

When an assistant is present, she may lift the labium during the introduction of the speculum. If the anterior vaginal wall obscures the view of the cervix, it must be pushed out of the way with the depressor. This will rarely be the case if the patient is in the correct position and the speculum properly held. The cervix can, if necessary, be drawn into position with a tenaculum.

Tubular or Cylindrical.—In England, where this speculum is most often used, the patient is placed in the lateral position, with the buttocks close to the edge of the couch. It may, however, be introduced in any position.

The exact location of the cervix must be carefully noted by previous indagation. Separate the labia with the forefinger and thumb of the left hand. The speculum, previously lubricated, is now grasped in the right hand and its tip introduced between the labia. Keep it well pressed against the fourchette so as not to pinch the tissues in front by crowding them against the unyielding pubic bones. With the side of the speculum corresponding to the tip in contact with the posterior vaginal wall, push it onward in the direction of the vaginal axis until the

vaginal roof is reached. Upon depressing the distal end the cervix will project into it. Very often a tenaculum is necessary.

The Sims speculum affords the most perfect and natural view of the cervix, vault of the vagina, and anterior vaginal wall. By it alone is it possible to appreciate correctly cervical lacerations and eversions. Both the bi-valve and tubular specula act as expanding instruments, and consequently the parts are put upon the stretch. This is well shown in Fig. 66. The principle of the Sims is entirely different, and there is no pressure exerted to congest or distort the tissues. For operations upon the anterior vaginal wall it is indispensable.

What to observe in using a speculum. Note—

(*a*) The color and condition of the vaginal mucous membrane;

(*b*) The position of the vaginal walls;

(*c*) The character of the discharge from the vagina and cervix;

(*d*) The condition of the cervix and cervical canal. Look for congestion, inflammation, abrasion, ulceration, induration and laceration;

(*e*) If there is laceration hook a tenaculum in either lip, separate them and then endeavor to roll the parts in. In this way the extent of the laceration and the amount of cicatrical deposit can be determined.

Rectal Specula.

Indications.—A specular examination of the rectum is called for in all instances when previous digital examination and eversion have not afforded necessary and precise information. This is usually the case when the disease is deep seated. Such are, strictures, fistulous openings of a pelvic abscess, recto-vaginal fistulæ, proctitis, and internal hemorrhoids. Any or all of these lesions are not infrequently associated with pelvic and uterine disturbance.

Method.—If the bi-valve is used place the patient in the lateral posture. First insert the finger through the anus to overcome the resistance of the sphincter. After the distal ends of the blades are introduced push the instrument inward and backward until the handles or hilt approach the anus. So place the blades before introduction that, when opened, the diseased area will be exposed. *Never turn the speculum within the rectum;* to examine the walls obscured by the blades withdraw and reintroduce it. Care should be taken not to pinch the rectal mucous membrane in withdrawing the instrument.

Anesthesia is rarely necessary for the above examination. If a more thorough one is desired, the patient should be anesthetized and the

sphincter dilated. This is done in the following manner: Pass the two thumbs completely into the rectum with the four fingers of either hand resting upon either natis. Steadily but forcibly separate the thumbs until the fibres are felt to tear, or until they are arrested by the tuber ischii on each side; or the divulsion may be made with a larger bivalve speculum (Pratt's). The rectal mucosa can now be examined with perfect ease as the canal is converted into a yawning cavity. The walls are best separated by two Sims specula, or with a large expanding instrument. As a therapeutic measure dilatation will again be referred to in considering the treatment of constipation.

Urethral Specula.

Indications.—Disordered micturition, when causes outside of the urethra are not discovered, calls for urethral inspection. The urethal lesions are: Fissure, ulceration, caruncles, and other neoplasms. The only *counter-indication* is acute or recent inflammation of the urethra.

Method.—The patient may be either upon her back or side. A reflected light will afford the best view. First pass a sound and locate any sensitive point; no pain should be caused by passing a sound into a healthy urethra. Now introduce the speculum or urethroscope so that the diseased area will be exposed. Gentleness and skill are imperative in exploring the deeper portions of the canal.

Kelly's Method of Vesical and Urethral Exploration.

Instruments required: Nos. 8 to 14, dilators, and Nos. 10 to 13, specula (Fig. 43); a simple suction apparatus; a urethral catheter; a urethral searcher; long delicate forceps for carrying pledgets of cotton into the bladder; and small pledgets of cotton.* The patient should be placed in the dorsal decubitus with the hips elevated from eighteen to thirty centimeters above the table. The urethra is then dilated and the bladder completely emptied with the suction apparatus. A suitable speculum is next introduced, and the interior of the bladder illuminated by means of a head mirror and a good light. By this means it is possible to inspect the entire bladder mucous membrane. The speculum is now withdrawn until the eye rests on the trigone. By a slight lateral inclination either ureteral opening can be exposed and a catheter or kidney sound passed up the ureteral canal.

*Johns Hopkins Hospital Bulletin, Jan. and Feb., 1894.

IV. PRODUCED SOUNDS.

Percussion.

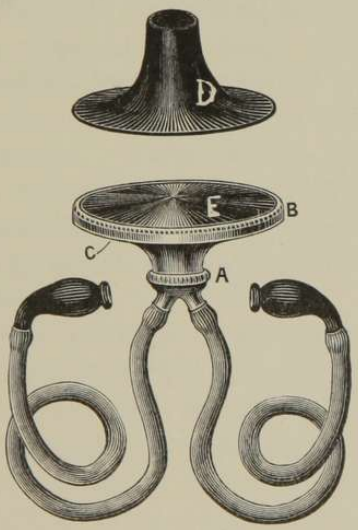
To practice percussion, the patient may be placed in any position, depending upon the surface to be percussed. In gynecological examinations it is practiced over the abdomen oftener than over any other region, hence the patient is usually placed upon her back. The middle finger of the left hand is placed flat upon the abdomen, at one time lightly at another firmly. With the tips of the middle fingers of the right hand strike the second phalanx distinctly. The sound elicited will indicate whether air or solid material lies underneath the finger.

V. EXISTING SOUNDS.

Auscultation.

Auscultation may be either immediate or intermediate. Its chief usefulness in gynecology is in differentiating pregnancy from other

Fig. 67.



The Phonetiscope.

causes of abdominal enlargement. The sounds caused by fibroids are due to the large arteries which they contain. Crepitation results from peritoneal roughness and adhesions. Sometimes loose ascitic fluid within the abdomen can be detected by a splashing sound induced by the patient suddenly changing her position. The new phonetiscope will be found infinitely superior to the older stethoscope.

Mensuration, the use of the *aspirator*, and the *clinical thermometer* do not require special consideration. The uses of the *microscope* have been defined in Chapter IV.

Conclusion.

The schema of the *Methods of Physical Diagnosis* included in this chapter has been so arranged simply for the convenience of study. A limited number only, or all of the methods therein contained, may be necessary in any given case. It is not intended that the student shall proceed with his examination in the order given. The usual sequence of methods is as follows:—

1. External inspection. It may not be wise to inspect the external genital organs until after vaginal touch is practiced;
2. Digital examination of the vagina followed by the bimanual;
3. Inspection per vaginal speculum;
4. Introduction of the uterine sound;
5. Palpation, percussion, mensuration, and auscultation, if deemed necessary;
6. Examination of the rectum and the urethra if deemed necessary;
7. The use of the clinical thermometer, particularly during exacerbations of pain;
8. The application of the aspirator and the microscope as final tests.

CHAPTER VIII.

THE GENERAL PATHOLOGY OF GYNECOLOGICAL DISEASES.

PRELIMINARY CONSIDERATIONS.

Many points bearing upon the *pathology of gynecological diseases* are as yet unsettled. Indeed, the greatest difference of opinion prevails concerning the importance of local lesions as disturbing factors. Cause and effect are constantly being mistaken the one for the other. As a result we have in the profession two distinct parties:—

1. Those of the first party relegate to the sexual system of the female, when it becomes diseased, the power to affect the whole organism in a morbid way. This influence, it is maintained, is exerted through the sympathetic and cerebro-spinal nervous systems; and, accordingly, the only way in which the symptoms resulting therefrom can be permanently relieved is by curing the local lesion.

2. Those of the second party, on the other hand, attribute the local trouble to systemic causes. They believe that the sexual organs exert but little, if any, influence on the general organism; and that by directing the treatment to the general and constitutional symptoms the patient can be restored to health in most instances without local interference of any kind. (Byford.)

Again, those of the first party are by no means unanimous as to the importance and significance of certain local lesions. Thus Bennett and his followers gave to inflammation and ulceration an exaggerated importance; according to this school, sympathetic phenomena rarely occur except when the uterus is inflamed or ulcerated. Hewett and Hodge undertook to establish a special uterine pathology, based upon displacements, considering inflammation and ulceration of little, if of any, importance as primary factors. Cervical lacerations constitute the foundation of a pathology promulgated by men who revel in minor operative treatment. Disease of the uterine appendages is, by not a few, considered the chief cause of the ills which afflict woman-kind.

The foregoing theories are the natural result of looking upon the female sexual organs as anatomical entities instead of but part of a

series which, in their totality, constitute the organism. No restricted pathology has been, or will be, able to survive the rapid strides of gynecology. The physician who to-day ignores local lesions in the treatment of gynecological diseases is quite as culpable as he who would treat an amenorrhea due to phthisis or chlorosis by stimulating the uterus. It may not always be possible to determine the order, but symptoms occur in pathological succession, and effects never precede their causes.

Nervous and Bloody Supply of the Pelvic Organs.

Organs developed from a common primordial structure possess nerve communications whereby impressions originating in one may be transmitted to others of a like structural evolution. (Oliver.) From the temporary organs named Wolffian bodies, the reproductive and urinary organs are developed by a process of gradual evolution. There is, therefore, a perpetuation of direct nerve influence between the sexual and urinary organs. Indeed, there is a nervous and vascular connection existing between all of the pelvic organs. The same system of vessels and nerves supply largely the genital organs from the ovaries to the perineum, and these several organs are presided over by the same genito-spinal center. Consequently, all are involved to a greater or less degree in any physiological requirement which nature may impose upon any one. They participate alike in ovulation, menstruation, conception, pregnancy, parturition, and involution. (Byford.) A pathological process involving one organ is also likely to implicate others. So, too, the rectum and the bladder are physiologically and pathologically affected by similar influences; or if primarily involved, may reflect any irritation originating in them to the genital organs.

Thus we see that derangement of any one organ within the pelvis may involve all; or, acting through the genito-spinal center, may exert a powerful influence for evil upon the whole organism. Any system of uterine pathology, therefore, which ignores the unity of the pelvic organs, and of the entire organism, must necessarily be imperfect.

How Distant Organs are Involved.

Assuming, then, that distant organs are frequently affected by pelvic disease, it becomes the duty of the physician to study the *modus operandi* by which such affections are induced. I agree with the older Byford that *hyperemia* and *hyperesthesia* of the pelvic organs are essential factors in producing reflex symptoms in distant parts. That is to say, without hyperemia or hyperesthesia, no matter what the local lesion

may be, there are no reflex symptoms. In proof of this statement I cite the fact that displacements, lacerations, and tumors of the uterus may exist for years without causing the least general disturbance, unless increased sensitiveness or increased vascularity ensues. Again, the reflex symptoms starting from the pelvis are nearly all made worse by menstruation, at which time the hyperemia and hyperesthesia are increased. It would not be correct, however, to infer from this that reflex symptoms inevitably result from hyperemia and hyperesthesia of the pelvic organs. On the contrary, every gynecologist meets with many cases where both are present, and in which no reflex phenomena whatever occur.

Nature of the Local Lesion Causing Reflex Symptoms.

Ovarian and uterine disease,—displacements, lacerations, inflammation, subinvolution, congestion, etc.,—furnish the starting point of reflex symptoms oftener than other pelvic lesions. (Hegar, Schroeder.) Those of the urinary tract, the rectum, the coccyx, the perineum, and the anus are also frequently responsible for such symptoms; in the latter list are fissures, lacerations, carunculæ, vaginismus, and coccygodynia. In these various lesions both hyperemia and hypersensitiveness may present themselves, either alone or combined.

Forms of Hyperemia.

Hyperemia rarely exists except as a result of some definite cause, and in order to cure it the cause must necessarily be removed. According to Byford, it occurs in three forms:—

(*a*) *Active Hypertrophic Hyperemia*, as in fungoid degeneration of the uterine mucous membrane, in fibrous tumors, in pregnancy and in conditions of subinvolution.

(*b*) *Passive, Venous or Congestive Hyperemia*, as when the blood is confined to the uterus by some obstruction to its return. Obstruction giving rise to this form of hyperemia may result from uterine displacements, from cervical lacerations, or from peri-uterine effusions.

(*c*) *Inflammatory Hyperemia*, caused by inflammation.

The Sequelæ of Hyperemia.

Active Hypertrophic Hyperemia, if this theory be correct, gives rise to hypertrophy of the organ involved, because of the exaggerated local nutrition. It is seen physiologically in pregnancy and pathologically in fibrous tumors, fungoid endometritis, and subinvolution.

Passive and Inflammatory Hyperemia gives rise to fibrinoplastic effusion, which becomes organized. This contracts and cuts off the capillary circulation of the parts involved. The natural structure of the uterus is supplanted by the connective tissue thus formed, with resulting condensation and induration. This is *hyperplasia* (Virchow). When it is once established, congestion and inflammation may entirely subside while hyperesthesia remains. This is probably due to the fact that the terminal nerve fibers are involved in the condensation of tissue, reflex symptoms frequently resulting therefrom.

The reflex symptoms in cervical laceration may result (*a*), primarily, from the involvement of terminal nerve fibers distributed to the cervix by the cicatricial deposit; and (*b*) secondarily, from the hyperemia and congestion caused by the laceration and deposition of cicatricial tissue.

The inflammatory form of hyperemia will account for those circumscribed points of induration so often found in the cervix and in the walls of the fundus. They result from protracted vascularity of the part or parts involved (Byford).

Abrasion and ulceration of the cervix may follow in the train of hyperemia and inflammation. Abrasion is a frequent sequela; true ulceration from this cause alone is exceedingly rare. Both abrasion and ulceration result from impaired nutrition of the mucous membrane because of the hyperemia of the fibrous structure of the cervix. So-called granular and cystic degeneration of the cervix has for its basis hyperemia and inflammation (Cazeaux).

The Neuroses.

We have seen that in the condition called *hyperplasia*, hyperemia may be absent. In these instances the pain is readily accounted for by the unnatural deposit of hyperplastic tissue. There are many cases, however, where the genital organs are exquisitely sensitive and yet where the most careful examination fails to reveal the evidences of disease. Congestion, inflammation, abrasion, displacement—all are absent, and yet there is pain and sensitiveness in one or all of the pelvic organs, and reflex symptoms are innumerable. The form of dysmenorrhea known as "neuralgic" frequently occurs in connection with these symptoms. The older authorities called a uterus thus affected "irritable." The term is quite as comprehensive as is "neurosis." Both describe a condition, without defining its cause, and both are used to hide our ignorance. Patients rarely, if ever, die from this disorder, and if it has a pathology it is so chameleon-like in character that it has not yet been defined.

How General Symptoms are Induced by Local Disease.

Disease of the genital organs gives rise to general symptoms in one of two ways: (*a*) by reflex irritation; or, (*b*) by depraving nutrition. An irritation is conveyed to the genito-spinal center, and thence reflected to all organs with which this center communicates. In this way the stomach, bowels, liver and nervous system become implicated. That the stomach is oftener involved than any other organ, is shown by the nausea and vomiting so often present in early pregnancy. If the cause, other than pregnancy persist, digestion is interfered with and sooner or later the nutrition is compromised. The depraved blood does not carry to the nerve centers that which they need to sustain them and they become anemic. Exhaustion soon supervenes and often becomes profound, giving rise to nervous prostration and neurasthenia, a condition receiving detailed attention in the chapters devoted to the Hystero-Neuroses and to General Treatment.

How Local Disease is Induced by Systemic Disturbance.

Since nutrition may be affected from many causes, so-called nervous prostration frequently occurs when the pelvic organs are perfectly healthy. This condition is nearly always attended with circulatory disturbances. We know that the vaso-motor system presides over the circulation. It dilates and contracts the caliber of the blood-vessels, and wear and repair depend upon the proper adjustment of this function. If the equilibrium of the ebb and flow is disturbed, local anemia or local hyperemia takes place. The cheeks are affected in this way when they become pale as a result of fear, or when they become reddened as a result of shame. This is physiological. The flushes of heat so frequently present during the climacteric period is another example which borders upon the pathological.

If this equilibrium of the circulation is destroyed from any cause whatever, the internal organs are as often affected as is the skin. Such a cause may be mal-nutrition, nervous shock, or indeed anything that profoundly impresses the system. If the brain is involved, either insomnia or drowsiness occur, depending upon whether the brain is hyperemic or anemic. Flatulence, gastralgia, and nervous dyspepsia result when the stomach is similarly affected. The womb and the ovaries are oftener implicated than any of the internal organs, and become hyperemic or anemic as the case may be. If the former, congestion with all its concomitant symptoms,—menorrhagia, leucorrhea, tenderness, etc.,—occur without any local cause; if the latter, amenorrhea or scant menstruation. (Engelmann.)

Hyperemia, congestion, and anemia of the uterus are likewise frequently caused by those general or organic diseases of the body which tend either to deprave the blood or to obstruct the pelvic circulation in a mechanical way. The disorders especially tending to deprave the blood are enumerated in the succeeding section. The diseases of the lungs, liver and heart may congest the pelvic organs mechanically. Menorrhagia, amenorrhea, and ovarian irritation, or any other pelvic lesion, may therefore be due to general as well as to local causes.

Temperament and Constitutional Bias.

In dealing with gynecological diseases, the *temperament* and *constitutional bias* cannot be ignored. One patient will, without suffering the least inconvenience, go through life with a pelvic lesion which, in another, would give rise to the most distressing symptoms. It is this fact which is responsible for much of the confusion which now prevails regarding the significance of the many pelvic affections. The constitutional bias presents itself in various ways. Any one of the several forms of dyscrasiæ may retard the convalescence. These are: tuberculosis, scrofulosis, syphilis, Bright's disease, the various blood disorders, malaria, etc. The innumerable symptoms which have long been defined by that now indefinite term, scrofulosis, are legion. It also has long served as a convenient name under which to conceal much ignorance. Were it possible to trace so-called scrofulosis to its original source, it is probable that the importance given by Hahnemann to syphilis, psora, and "sycosis," using these terms in their broadest sense, would be better appreciated. At any rate, there often exists an obscure element which perpetuates indefinitely local lesions, especially the catarrhal diseases of the genital tract. In whatever form this element presents itself, it can be reached only by proper constitutional treatment.

It is, then, clearly the duty of the physician, in dealing with the many gynecological affections, to differentiate cause from effect, when it is possible so to do, and to conduct his treatment accordingly.

CHAPTER IX.

GENERAL TREATMENT OF GYNECOLOGICAL DISEASES.

GENERAL CONSIDERATIONS.

I have endeavored in Chapter VIII. to show the important part played by malnutrition in the causation of the diseases of women. The reflex symptoms are as numerous and varied as the figures of a kaleidoscope; hence, while they may serve as guides in selecting a remedy, they are too changeable to justify the physician in discarding other methods of treatment. Many of these symptoms can be relieved by local treatment alone, especially if they are not of long standing; often they will vanish under the administration of a properly selected remedy; but not infrequently it is absolutely necessary to combine with specific and local medication certain methods of dietetic, hygienic, and general treatment in order to relieve symptoms which may be either the result or the cause of pelvic disease.

The *general* symptoms requiring special attention are the following:—

1. Indigestion;
2. Constipation;
3. Nervous prostration.

1. Indigestion.

The stomach, as we have seen, is one of the first organs to become deranged in a reflex way. Under certain circumstances, as in some cases of pregnancy and hysteria, the stomach apparently rejects almost every particle of food taken into it, without seriously involving nutrition. In the vast majority of instances, however, prolonged disordered digestion leads to inanition and malnutrition, for, unless the patient can digest and assimilate the proper amount and kind of food, depraved nutrition is inevitable. The treatment of *indigestion* is considered under the sections devoted to *constipation* and *nervous prostration*.

2. Constipation.

I am inclined to believe that the evils of constipation are underestimated in the homeopathic school. Too much reliance is placed by

many upon the indicated remedy, and too little upon certain adjuvants which are both useful and harmless. Constipation begets indigestion, headache and local congestion. It is many times impossible to cure an irritable ovary or a congested uterus without first regulating the action of the bowels.

The frequency of constipation in women is proverbial. It is much more common than in men, because of sedentary habits, confinement in ill-ventilated rooms, and, above all, improper conveniences. Habit in no small degree controls every function of the body, and especially defecation. If Nature's commands are ignored, she soon ceases to give them. In due time there is a sensory paralysis of the mucous membrane of the rectum, and the feces accumulate in large quantities without exciting the involuntary mechanism. Finally, the hardened feces give rise to fissure or hemorrhoids, and when pain becomes a factor defecation is postponed as long as possible. America has much to learn from Europe in making proper public provision for the accommodation and protection of women when away from home.

In the *treatment* of constipation the first and essential requisite is to secure the coöperation of the patient. Without this all measures are futile. The *habit* must be reëstablished, and this often requires much time and perseverance. She should direct her thoughts to the necessity of the act at a certain hour each day before retiring to the closet, which should be done with clock-like regularity, whether the desire be present or absent. This is indispensable. The best time for making this effort is when the peristalsis is excited by a meal—preferably immediately after breakfast. Fullness of the abdomen favors defecation, and a glass of water shortly before the act aids in producing a feeling of distention. Severe effort at straining should be avoided. The sense of leisure resulting from a proper position will encourage gentle instead of violent effort.

The diet and ingesta are of equal importance. As constipation is so often associated with indigestion, it becomes necessary to select the diet accordingly. In doing this there are several indications to be fulfilled: (*a*) the articles selected should not distress the stomach; (*b*) they should be such as the patient can afford; and (*c*) the *cause* of the constipation should be borne in mind, *i. e.*, whether due to deficient secretion or to deficient peristalsis.

Fruits are almost always advantageous. The kind of fruit should depend in a measure upon the cause of the constipation. They act by increasing the distention; by increasing the secretion because of their

juices and acids; and by increasing peristalsis because of the fibers, rinds, seeds, etc., which drop into the intestinal canal (Byford).

Apples are almost always to be had in this country and fulfil the first two indications; if the rind is left on they excite peristalsis as well. They should be eaten in the fore part of the day—before or after breakfast. The acid increases the intestinal secretion, and they are therefore especially useful when the stools are dry and hard. Oranges and lemons act in the same way. Peristaltic action, when there is great torpidity of the bowels, is quickened by fruits containing many seeds, as figs and the various small fruits. Most of the berries improve the function of the bowels because of the combined action of the seeds and acids—hence they are particularly useful in season. Canned fruits are apt to be too sweet, so that the uncooked varieties are at all times preferable when they can be had. Stewed prunes and baked apples are, however, often useful, and possess the advantage of being inexpensive. Many patients cannot take bananas because of the distress which they excite. Where this is not so they are very useful, oftentimes acting as a cathartic. On the whole, I much prefer acid to sweet fruits, because they increase not only the intestinal secretion but the hepatic as well.

The coarser breads are always beneficial, and the more bran or hull of the grain they contain the better. Bran crackers, such as are used in most sanatoriums, fulfil the indications nicely. In the absence of these, and when the stomach will tolerate it, I have often seen a teaspoonful of bran in a glass of water, drunk the first thing in the morning, act in a most satisfactory manner. Pop-corn is often most efficacious, and in the constipation of pregnancy, with nausea and vomiting, will sometimes relieve the stomach symptoms when everything else fails. Oatmeal and cornmeal gruels are likewise useful in exciting peristalsis. Almost any kind of broiled fish may be taken. Sardines in oil, if the stomach will tolerate them, are also useful. Such vegetables as boiled onions, spinach, salads with oil, lettuce, asparagus, tomatoes and celery, may be partaken of freely. The patient should especially eschew pork, veal, hard boiled eggs, liver, salt meats and fish, nuts, pineapples, beans, new bread, pastry, pickles, cheese, milk and spirituous liquors.

If there be spasm of the sphincter ani muscle, with fissure or hemorrhoids, nothing short of dilatation under ether will prove of much avail. I know of nothing in the practice of gynecology more satisfactory than this operation, when indicated. The sigmoid should also be carefully dilated.

Displacements of the uterus and ovaries may act in a mechanical way

and obstruct the bowel. Indeed, mechanical causes should always be looked for in the treatment of costiveness in women. Rectal stricture may act in the same way, but organic strictures rarely occur in the female. I have had more than one case brought to me with a diagnosis of stricture made because of the constipation and the difficulty with which the inexperienced sometimes meet in penetrating the "third sphincter." In these cases forcible dilatation does much good.

In great torpidity of the large intestine massage is very useful. Beginning at the right groin, and with a definite idea of the anatomy of the parts, the whole colon can be kneaded and squeezed in such a way as directly to stimulate its fibers to contract. This is best done just before an effort is made to move the bowels. At first this manipulation will excite much distress, unless practised with great gentleness, but after a few treatments it is not in the least disagreeable. I have succeeded in exciting intestinal peristalsis when other measures failed by electricity. A medium sized metal rectal plug serves admirably for one pole; or a large bulbous electrode may be carried into the sigmoid. The other is placed over the abdomen. Either the faradic or the interrupted galvanic current may be used, as strong as the patient can bear it, and repeated two or three times a week.

In hydropathic institutions much reliance is placed upon water compresses over the bowels. I have no doubt of their utility under certain circumstances.

If the bowels absolutely refuse to move in spite of the best directed general and local treatment, enemata will have to be resorted to. If there are evidences of impaction, some solvent may be used with the enema. Glycerin, olive oil, and ox-gall are the best agents for this purpose. The latter should be diluted with water (℥j–Oj). I desire, however, to enter my protest against the indiscriminate use of enemata. It is quite as easy to make a "pauper of the rectum" by the use of the syringe as by the use of cathartics. Of the two evils the former is the lesser, though in non-surgical cases enemata are rarely necessary. In gynecological practice cathartics are still more rarely called for, except in abdominal surgery. They are then used in the form of saline preparations for the purpose of promoting drainage through the intestinal canal. Of the various mineral waters used for cathartic purposes the Crab Orchard, Hunyadi, Carlsbad and Kissingen are the most popular. Pure water, either hot or cold, should be taken freely.

Therapeutics.

Hydrastis Can.—Constipation with headache and hemorrhoids;

AFTER STOOL, PAIN IN THE RECTUM FOR HOURS; especially useful after purgative medicines; colicky pains, with sensation of goneness, faintness and heat in the intestines. Much prostration.

Collinsonia.—Constipation with hemorrhoids and a sensation as of sticks in the rectum; stools consist of dry balls of fecal matter; prolapsus uteri; flatulence and distention of the abdomen; heat and itching of the anus, with portal congestion; HABITUAL CONSTIPATION.

Sulphur.—Abdominal plethora and passive congestion of the venous system, causing a sensation of tightness and fulness in the abdomen, with feeling of repletion after partaking of but a small quantity of food (Farrington); constant urging to stool; pressing on the rectum as if it would protrude; *rush of blood to the head;* cold feet; faintness, especially at or about 10 or 11 A. M.; stools hard and knotty; general dulness of mind and body.

Nux Vomica.—*Constant ineffectual urging to stool;* alternate constipation and diarrhœa; sedentary habits; use of highly-seasoned food; stools black, hard and often streaked with blood; hemorrhoids; RELIEF AFTER STOOL.

Lycopodium.—ABDOMINAL PLETHORA IN ELDERLY WOMEN, WITH CONSTIPATION; *large accumulation of gas in the bowels;* desire and inability to expel the stool, with painful constriction of the rectum and anus; URIC ACID DEPOSIT IN THE URINE; irritable and restless in the afternoon.

Podophyllum.—Constipation, with descent of the rectum from a little exertion; feces hard, dry, and voided with much difficulty; flatulence and headache; MORNING AGGRAVATION OF ALL INTESTINAL SYMPTOMS; weakness and soreness of the back; hemorrhoids.

Consult:—**Alumina, opium,** bryonia, graphites, anacardium, conium, **plumbum,** sepia, *silica*, platina, pulsatilla, **æsculus hip.,** calcaria carb.

3. Nervous Prostration.

The terms *nervous prostration* and *neurasthenia* have, in America at least, become almost household words. There are many factors capable of producing the state designated by these terms. Sometimes it is met with when hematosis and nutrition are seemingly unaffected; it is then usually due to nervous shock, or strain, or to deficiency of the menstrual discharge. Oftener mal-nutrition is prominent, which may be due to disordered digestion, loss of fluids, or nervous shock.

The pathological succession frequently occurs in the following order: A pelvic lesion involves the stomach in a reflex way, and diges-

tion becomes impaired; improper or insufficient food is taken, and in due time nutrition is compromised; anemia and chloro-anemia succeed as a matter of course, and not infrequently are made worse by excessive menstruation. The nerve cells are starved, as it were, for the want of proper nourishment, and the nervous system is thereby rendered unduly impressionable. If a woman thus affected be subjected to mental shock, or undue mental strain and worry, or sexual excesses, she is liable to become the victim of nervous prostration.

Any or all of the symptoms studied under the head of the Hystero-Neuroses may be present in nervous prostration, and their relative importance is there considered. In the treatment of this state it becomes necessary to recognize the important fact *that the patient's nutrition is depraved*, and if she is to be raised from a state of chronic invalidism to robustness, this must be improved. The backache, the leucorrhea, the menstrual irregularities, the pain in various parts of the body, the paralyses, and the psychoses are to receive due attention in a symptomatic way. But the local trouble and the general disturbance resulting from depraved nutrition must not be ignored. With the loss of appetite there comes wasting of fatty tissue, and the patient takes to her bed, where, unless she can be made to eat and take on flesh, she is likely to remain.

The profession is indebted to Drs. Weir Mitchell and Geo. M. Beard, more than to all others, for defining the principles upon which the successful treatment of nerve prostration is based. These principles may be summarized as follows:—

1. **Seclusion and Rest.**—The patient should be removed from home or other accustomed environments for at least six or eight weeks, placed in bed, and only allowed to sit up gradually.

2. **Massage.**—This is to be applied in a most thorough manner by an experienced masseuse, the *séances* lasting for half an hour at first, the time being lengthened until the full limit—an hour and a half—is reached.

3. **Electricity.**—The interrupted current is used twice daily, and so applied as successively to work nearly all of the muscles of the body twice daily.

4. **Diet.**—Milk is given every hour, at first in small quantities, then gradually increased until, under the action of massage and electricity, the patient is able to take large quantities.

Dr. Mitchell practically ignores internal medication. From a somewhat extended experience in this class of cases in both hospital and private practice, I am satisfied that much good is to be derived from

properly selected homeopathic remedies. It is surprising how quickly, under this treatment, the strength improves the lost adipose tissue returns, as well as the lost vitality and the power of locomotion. The following case, recorded by Playfair,* I quote in full, because of the acknowledged eminence of the author, and also because it demonstrates most forcibly the utility of the treatment even in the most desperate case. It is, too, a remarkable instance of the multiform phenomena so characteristic of neurotic disease:—

CASE.—"The case must be well known to many members of the profession, since there is scarcely a consultant of eminence in the metropolis who has not seen her during the sixteen years her illness has lasted, besides many of the leading practitioners in the numerous health-resorts she has visited in the vain hope of benefit. My first acquaintance with the case is somewhat curious. About two months before I was introduced to the patient, chancing to be walking along the esplanade at Brighton with a medical friend, my attention was directed to a remarkable party at which every one was looking. The chief personage in it was a lady reclining at full length on a couch, and being dragged along, looking the picture of misery, emaciated to the last degree, her head drawn back almost in a state of opisthotonus, her hands and arms clenched and contracted, her eyes fixed and staring at the sky. There was something in the whole procession that struck me as being typical of hysteria, and I laughingly remarked, 'I am sure I could cure that case if I could get her into my hands.' All that I could learn at the time was that the patient came down to Brighton every autumn, and that my friend had seen her dragged along in the same way for ten or twelve years. On January 14th of this year I was asked to meet my friend, Dr. Behrend, in consultation, and at once recognized the patient as the lady whom I had seen at Brighton. It would be tedious to relate all the neurotic symptoms this patient had exhibited since 1864, when she was first attacked with paralysis of the left arm. Among these—and I quote from the full notes furnished by Dr. Behrend—were complete paraplegia, left hemiplegia, complete hysterical amaurosis; but from this she had recovered in 1868. For all these years she had been practically confined to her bed or couch, and had not passed urine spontaneously for sixteen years. Among other symptoms I find noted awful suffering in spine, head, and eyes, requiring the use of chloral and morphia in large doses. For many years she had convulsive attacks of two distinct types, which were obviously of

* "Nerve Prostration and Hysteria," Playfair, p. 101.

the character of hystero-epilepsy. The following are the brief notes of the condition in which I found her, which I made in my case-book on the day of my first visit: I found the patient lying on an invalid's couch, her left arm paralyzed and rigidly contracted, strapped to her body to keep it in position. She was groaning loudly at intervals of a few seconds from severe pain in her back. When I attempted to shake her right hand she begged me not to touch her, as it would throw her into a convulsion. She has now many times daily, frequently as often as twice in an hour, both during the day and night, attacks of sudden and absolute unconsciousness, from which she recovers with general convulsive movements of the face and body. She had one of these during my visit, and it had all the appearance of an epileptic paroxysm. The left arm and both legs are paralyzed and devoid of sensation. She takes hardly any food and is terribly emaciated. She is naturally a clever woman, highly educated, but, of late, her memory and intellectual powers are said to be failing.

"It was determined that an attempt should be made to cure this case, and she was removed to the Home Hospital in Fitzroy Square. She was so ill, and shrieked and groaned so much on the first night of her admission, that next day I was told that no one in the house had been able to sleep, and I was informed that it would be impossible for her to remain. Between 3 P. M. and 11:30 P. M. she had had nine violent convulsive paroxysms of an epileptiform character, lasting, on an average, five minutes. At 11:30 she became absolutely unconscious, and remained so until 2:30 A. M., her attendant thinking she was dying. Next day she was quieter, and from that time on her progress was steady and uniform. On the fourth day she passed urine spontaneously, and the catheter was never again used. In six weeks she was out driving and walking, and within two months she went on a sea-voyage to the Cape, looking and feeling perfectly well. When there, her nurse, who accompanied her, had a severe illness, through which her ex-patient nursed her most assiduously. She has since remained, and is at this moment, in robust health, joining with pleasure in society, walking many miles daily, and without a trace of the illness which rendered her existence a burden to herself and her friends."

There is another and large class of neurasthenic women who are well enough to be about, and the causes of their disease can be corrected by fresh air and exercise. These cases exhibit the entire range of mild mimetic and hysteric symptoms. Moral advice, resolute will, and proper hygiene are often all that is necessary. Cycling judiciously followed, combined with the calisthenics, is often of the greatest utility

in these cases. Hysterical joints frequently present themselves in this type of patients. They are much more easily dealt with than the "habitually bed-ridden, couch-loving invalid," of whom Dr. Playfair's celebrated case is a typical example.

The amount of nourishment taken under the conditions described is marvelous. Patients who are able at first to take almost nothing at all, and as a result have become pale, anemic, and wasted, will soon consume at each meal a quantity of food which is simply astonishing. In one of Dr. Playfair's patients the treatment was commenced on October 16th with three ounces of milk every third hour. On October 30th the following was consumed with relish: "5 A. M., ten ounces of raw meat soup; 8 A. M., cup of black coffee; 9 A. M., plate of oatmeal porridge, with a gill of cream and a tumbler of milk; 12:30 P. M., milk; 1:45 P. M., whiting, bread and butter, rump-steak, cauliflower, omelette, and a tumbler of milk; 4 P. M., milk; 5 P. M., milk and bread and butter; 7 P. M., fried haddock, chicken, cauliflower, apple and cream, and a glass of Burgundy; 9:30 P. M., milk; 11 P. M., raw meat soup. (The milk between 8 A. M. and 9:30 P. M. amounted to two quarts.)"

It is possible for this amount of food to be consumed by a nervously prostrated woman only under suitable conditions By *seclusion* she is cut off from all harmful sympathy and excitement; by *rest* she conserves all her energies; and by *massage* and *electricity* passive exercise is substituted for exertion without any of its evils.

Proper seclusion can rarely be had at home because of the close proximity to sympathetic relatives and friends. It is certainly impossible without a thoroughly good nurse—one possessing sufficient will-power to keep from the invalid's room all who exert a harmful influence. A greater degree of liberality may be admitted in dealing with patients who retain the power of self-control.

Massage, to be thoroughly done, should be applied by a trained masseuse It can, however, be easily learned by any intelligent person who is sufficiently strong. With the patient lying in a blanket, the masseuse begins at the feet by taking up the skin and thoroughly pinching it all over. The toes are twisted in all directions and the small muscles kneaded with ends of the fingers and thumb. The large muscles of the legs are grasped alternately with both hands. Dr. Mitchell recommends smearing the parts with some nutrient lubricant, preferably cocoa butter. Striking the large muscles very often with the palms of the hands constitutes an important feature of massage. The hands and upper extremities are manipulated in the same way,

working upward. In working the abdomen the patient should lie flat on her back with the knees drawn up. Commencing with the skin, it is pinched all over and the walls are firmly grasped, first with one hand and then with the other. The hands are now placed one on each side just below the ribs, and the flesh drawn forward in the direction of the colon. This part of the treatment is particularly important if the patient is suffering from indigestion. The posterior surface of the body is gone over in the same way, the patient lying flat upon her face and abdomen. The whole of the back is treated, commencing at the nape of the neck and passing downward on each side of the vertebral column.

The skin and muscles are pinched and the two fingers of the right hand, one on each side of the vertebræ, are made to sweep downward the entire length of the spine. This is to be repeated a number of times. If there is spinal irritation there will be some difficulty in doing this, but by gradually approaching the sore spots they can be thoroughly treated, the local sensitiveness being in time entirely destroyed. This is true in hyperesthesias of other regions, and with perseverance and patience, even ovarian irritation can be made to vanish. For the first two or three days the *séances* should not be longer than twenty minutes, but by the end of a week they may be continued from one to two hours twice a day. The patient must be taught to relax all of the muscles by remaining perfectly passive.

The use of electricity comprehends the application of the slowly interrupted induction current to nearly every muscle of the body within reach. By this means they are thrown into active contraction. This gives decided exercise to the muscles and greatly supplements the action of massage. Finally, the tonic effects of electricity are obtained by passing for ten or fifteen minutes, from the neck to the feet, a mild current with rapid breaks. The static bath, especially if there exist marked hyperesthesia of the nervous system, is often of marked service.

When fat and anemic women become victims of nervous prostration it is Dr. Mitchell's practice to put them at rest, and "under-feed" them with milk until the flesh is materially reduced, when they are subjected to the usual treatment already described.

The wisdom of local interference before placing a patient under the rest cure must depend upon circumstances. As a rule I believe it wise always to make a thorough examination, unless the patient's nervous system is liable to be greatly shocked by so doing. If, in married women, there are tears of the cervix or perineum, which evidently play an important part in the prostration, and if the degree of prostration is not such as to prohibit it, an operation is indicated at once. This is

emphatically so if excessive hemorrhage can be controlled by repairing the tears or by curetting. On the contrary, in the unmarried, when the local symptoms are not urgent, it is best to ignore local measures, other than the hot douche, until the patient has regained sufficient strength to enable her to undergo such treatment as may be necessary. There are but few instances where the hot douche, judiciously given, does not act beneficially.

The remedy most homeopathic in nervous prostration will, in the majority of instances, be one capable of profoundly impressing the system when given in health. The various phases of hysteria are covered by the milder acting remedies, but when emaciation becomes marked, and hematosis seriously disturbed, it is necessary to select a remedy profound in its action. If properly selected it should not be repeated too often, nor should it be changed until it is evidently no longer indicated. I prefer to base the prescription in these cases upon constitutional symptoms, *i. e.*, actual tissue changes, controlling, if necessary, urgent nervous outbreaks or manifestations of pain with intercurrent remedies. However, if the chief remedy is properly selected, the intercurrent one will rarely be called for.

Therapeutics.

Arsenicum album.—Great fear, trembling, cold sweat, RESTLESSNESS, and PROSTRATION; expression anxious and distressed; face pale, yellow, waxy, with edematous swelling; dryness of the mouth, with red streak down middle of tongue and redness of tip; loss of appetite, with INCREASED THIRST; long-lasting nausea, with fruitless retching; VOMITING IMMEDIATELY AFTER EATING OR DRINKING; menses too early, too profuse, and very exhausting; WARMTH ALMOST ALWAYS RELIEVES THE PAIN.

Calcaria.—Depression and melancholia; apprehensive mood; face pale, bloated, with blue rings around the eyes; after milk, nausea and some eructations; water brash; after eating, pressing pain in the stomach, as if from a load or stone; hard distention of the abdomen; MENSES TOO EARLY, TOO LONG, AND TOO PROFUSE; membranous dysmenorrhea; oppression of the chest; tendency to tuberculosis; COLD HANDS AND COLD FEET; relaxation of the tissues, with goneness and weakness. Calcaria is oftener indicated in fleshy, anemic women than in the emaciated.

Ferrum.—Nervous, hysterical feeling; pettish; least contradiction angers; throbbing pain on top of head when moving suddenly; FACE ASHY PALE OR GREENISH, BECOMING FIERY RED UPON THE LEAST EX-

CITEMENT; face pale, with red spots; paleness of all the mucous membranes; vomiting as soon as food is taken; diarrhea, with undigested food, or constipation, with stools hard and expelled with difficulty; menses too late, long lasting, and profuse; PALPITATION OF THE HEART, WITH THROBBING OF ALL THE BLOOD-VESSELS; anasarca. The more clearly homeopathic iron is to any given case, the smaller the dose required to accomplish the desired end. This is true of any remedy, but preëminently so of iron. The fact remains that in certain cases of anemia iron as a pabulum will do much to improve the patient's condition when specific indications do not present. Five or ten drops of *ferrum dialysatum*, twice or thrice a day with meals, will often work wonders when the smaller doses fail entirely. This dose is not large enough to precipitate hemoptysis and subsequent phthisis, which has been done by full doses.*

Iodium.—Excessive excitability; face pale, yellow, sallow, and distressed; EATS FREELY, YET LOSES FLESH ALL THE TIME; alternate canine hunger and loss of appetite; constipation alternating with diarrhea; mammæ dwindle away and become flabby; induration and swelling of the uterus and ovaries.

Ignatia —Desire to be alone; nervous prostration following excessive grief or joy; *clavus hystericus*, relieved by lying upon the painful spot; head feels sore and bruised; choking sensation extending from stomach into throat (*globus hystericus*); spinal irritation; stiffness in the nape of the neck; paralysis after great mental emotion.

Phosphoric acid.—Cerebro-spinal exhaustion from overwork; "The least attempt to study causes heaviness, not only in the head, but in the limbs."—*Farrington*. "Hysteria in women of dark complexion during the change of life."—*Hering*. Meteoristic distention of the abdomen with rumbling and gurgling; painless stools; urine looks like milk (*phosphatic*), or clear and passed in large quantities; menses too early and too long; amenorrhea; ovaritis and metritis from debilitating influences.

Silicea.—Patient dreads any exertion either of mind or body; numbness of the toes, fingers, and back; spinal irritation; VIOLENT PERIODIC HEADACHE IN VERTEX, OCCIPUT, OR FOREHEAD, BETTER BY WRAP-

* "The treatment of anemia by iron is one of the few satisfactory and certain things in modern medicine, and we who believe in the supreme value of the homeopathic method may not neglect it because it does not seem conformable thereto, unless we can do better. That we cannot is the general confession; we must, therefore, give our anemic patients the iron they need, in whatever quantity may be necessary."—*Hughes*.

PING THE HEAD UP WARMLY; constipation, due to inactivity of the rectum; profuse, acrid, corroding leucorrhea; increased sexual desire with spinal affection; night sweats.

Sulphur.—Face pale and eyes sunken; menses suppressed or too late and of short duration; bearing down in pelvis toward genitals; BURNING OF SOLES OF FEET AND WANTS THEM UNCOVERED, or feet cold and sweating; heavy, unrefreshing sleep; skin rough, scaly, or scabby, with itching; worse in a warm bed.

Kali phos.—Feels pains very keenly; better during standing or walking and pleasurable excitement; nervous affections excited by impatience, irritability, dwelling upon grievances, etc.

Magnesium phos.—Spasmodic dysmenorrhea; spasmodic pains in all parts of the body; indigestion with spasmodic cramping pains in stomach, with a clean tongue; very sharp, shooting, boring and shifting pains in nape of neck; photophobia; inability to urinate from spasmodic contraction.

Consult:—**Lachesis**, pulsatilla, sepia, **aurum**, **picric acid**, china, cocculus, hyoscyamus, and lycopodium.

CHAPTER X.

LOCAL TREATMENT OF GYNECOLOGICAL DISEASES.

GENERAL CONSIDERATIONS.

That local gynecological treatment has been and is now much abused cannot be denied. This, however, is no more reason why it should be discarded *in toto* than that internal medication should be discarded because it has been and is now abused. This statement is made with a consciousness that there yet exists a small party in the homeopathic school who not only deny the necessity of any local treatment or measures whatever in the treatment of the diseases of women, but even contend that local examinations are unnecessary and reprehensible. I do not desire to take issue with those who honestly hold this view, other than to state that it does not seem to me, from personal observation, that the interests of the school are best subserved by such unlimited faith in the efficacy of the homeopathic remedy. More than once I have had patients come to me from the hands of physicians who ignore local examination and treatment, with cancer advanced beyond the operative stage, or with long-existing local lesions which were readily cured by local measures. I therefore do not hesitate to affirm it as my belief that the physician who to-day, with our knowledge of reflexes and malignant disease, refuses to grant his patient the benefit of local measures when general ones have failed, or declines to make a local examination if there is the least suspicion of malignancy, is culpably remiss in his obligations and should be held legally responsible for his neglect.

THE VAGINAL DOUCHE.

Only since the thermic properties of the vaginal douche have been appreciated has it been systematically employed as a therapeutic agent. It has long been used, however, for cleansing purposes, and although Dr. Emmet published some twenty years ago the advantages to be derived from using large, hot douches, there are yet many in the profes-

sion who do not comprehend, simple as it is, the technique of a properly administered douche.

The simile used by Emmet is a good one for the purpose of impressing the patient with the importance of using much water and having it hot. It is the well-known blanched appearance of the hands of a washerwoman after having them in hot water for some time. When first immersed they become red because the primary (temporary) action of the heat is to dilate the vessels and capillaries, thus causing congestion; in a short time the heat contracts the vessels, drives the blood from them, and the hands become white and shriveled. Contraction of the vessels is, therefore, the secondary and more permanent action of heat; the object to be attained in using a vaginal douche for therapeutic purposes is this secondary contraction.

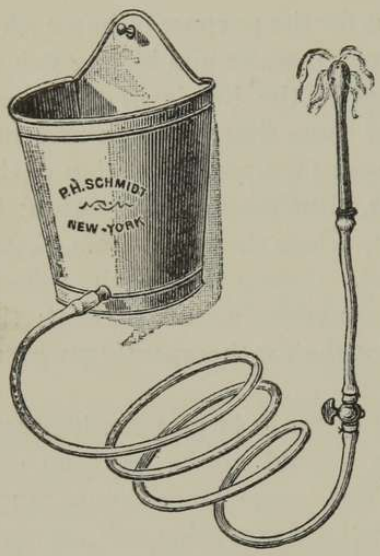
This can only be accomplished by using water in large quantities and at the proper temperature. The quantity should not be less than one gallon, preferably two and often three.* The temperature should range from 95° to 120° F., depending upon the local condition and the susceptibility of the patient.

Indications.—The douche, as a therapeutic agent, is indicated in almost all conditions where pathological congestion is present. Thus, in the various catarrhal and inflammatory affections of the uterus and endometrium, in pelvic cellulitis and peritonitis, and in vaginitis, its use is invaluable. For cleansing purposes it is indicated whenever there is an offensive discharge from the vagina, and after menstruation. Large quantities of hot water thrown into the vagina immediately preceding an operation upon the uterus or vagina is an exceedingly valuable hemostatic, and in plastic operations will prevent the loss of much blood.

Method.—When vaginal injections are given for therapeutic purposes it is best to have such apparatus as will put the patient to the least possible inconvenience. The most conscientious are too apt to neglect any method of treatment which becomes irksome. I therefore prefer some method of conducting the fluid into the vagina which requires no physical effort. This can be done either with a siphon syringe, or, better still, with a vaginal irrigator (Fig. 68). I have my dealer keep constantly on hand a supply of those irrigators holding two gallons. They can be made cheaply at any tin-shop. The rubber tub-

*Unless the patient has impressed upon her the necessity of using a *large quantity* of water she will not use it. The usual douche, a quart of water, is almost worse than useless for therapeutic purposes.

FIG. 68.



VAGINAL IRRIGATOR.

ing should be at least six feet long, and should possess a clip or cock by which the stream can be controlled. The nozzle should be of hard rubber and perforated *at the sides only*. If there is an opening at the center of the tip there is great danger of water passing into the uterine cavity. If made of metal it becomes heated by long contact with the hot water. Emmet maintains that an interrupted current, such as is derived from any of the bulb syringes, is more effective. If so, its advantage is more than offset by the exertion necessary to force a large amount of water into the vagina.

In taking the douche the patient should lie upon her back with the hips somewhat elevated. The advantages of this position are: the outlet of the vagina is higher than its vault, so that the canal is completely distended by the fluid; the hips are higher than the trunk proper, so that gravitation aids in relieving venous congestion. It becomes necessary in this position to make some provision by which the fluid can be taken care of after it passes from the vagina. If economy is an object, this can be accomplished by placing the patient across the bed, her hips projecting well over the side and her feet resting upon two chairs. By placing a rubber sheet under her and properly shaping it, the water is conducted to a receptacle on the floor. A regular douche pan is, however, always to be preferred when obtainable.

Beginning with a temperature of 95° F., it can be gradually increased by adding hot water until the maximum, 120° F., is reached. It should not be used hotter than this, and when the treatment is first begun it is well to advise the patient not to exceed 110° F., for the first few treatments, because occasionally the douches cause some sickness when too hot. The nozzle should be inserted well into the posterior fornix, behind the cervix. Unless this precaution is taken there is danger, if the os is patulous, of passing it into the cervical canal. The irrigator should be suspended at least three feet higher than the body in order to insure the necessary force.

The size of the douche and the frequency of its repetition must

necessarily depend upon circumstances. As a general rule, when used for therapeutic purposes, twice a day, the last given just before retiring, is not too often, and two gallons of water each time not too much. For hemostatic purposes three and even four gallons should be used. After a douche of this kind the mucous membrane exposed to the water will be found almost white and bleed but little when cut. For disinfecting purposes a much smaller quantity of water is required—enough, however, to cleanse the parts of all fetor.

I do not advocate the vaginal douche, in the treatment of the diseases enumerated, as a cure-all. It is to be looked upon only as an adjuvant, though a most important one. I often prescribe it in the leucorrhea of virgins and young girls when an examination is not imperative, and frequently this is all that is necessary in the way of local measures. But to prove effective the patient must be impressed with the importance of observing the proper quantity and temperature of the water, the proper position, and, above all, of persevering for weeks or months.

The thermic qualities of a vaginal douche are undoubtedly the most important from a therapeutic standpoint. Much good may be accomplished by adding to the water some medicament,—hydrastis, calendula, eucalyptus, etc.,—depending upon the indications which present. When special indications for any particular remedy exist it is my custom, especially if no other form of local treatment is being pursued, to add a tablespoonful of the agent selected to the last pint of water used, instructing the patient to lie upon her back for fifteen or twenty minutes that the remedy may remain in contact with the diseased parts for that length of time. Antiseptic and disinfecting injections are composed of: Carbolic acid, 1–200; bichloride of mercury, 1–4000; permanganate of potash, 1–100; bicarbonate of soda, 1–20; and salicylic acid, 1–1000.

Counter Indications.—Nothing more than a cleansing douche should be given during pregnancy, for obvious reasons. However, the mortal fear which some women have of throwing even a small quantity of water into the vagina while pregnant is absurd. Of course, if there is a predisposition to abortion the pregnant women cannot be too cautious, but, in the vast majority of instances, nothing but good results will follow the occasional use of a small tepid douche. This is particularly so if there exists an irritating leucorrhea. The douche should not be used during normal menstruation. When the menstrual discharge is excessive because of actual disease it can then be administered for its hemostatic properties. This treatment is invaluable in dealing with hemorrhage the result of fibroma uteri. A cleansing

douche should, however, follow the cessation of the menstrual flow if there be any fetor. Occasionally the douche will cause more or less nausea and fainting, when it should be used cautiously and not too hot. When there is much relaxation of tissue, in chronic catarrhal conditions, I do not think that the hot douche should be used too persistently. The tonic effects of tepid or cold water, in these cases, is often beneficial.

LOCAL APPLICATIONS.

There is nothing which more confuses the average student than the question of local applications in the treatment of gynecological diseases. This is owing to the fact that, even in the homeopathic school, each author and teacher has his favorite local remedy or remedies, and, unfortunately, empiricism is yet rife in the use of most of them. As a rule, the physician will accomplish more by learning how to use intelligently a few well-selected applications, and confining himself to them, than by attempting in an aimless fashion to run the whole scale. In ordinary routine work I rarely have occasion to go outside of the following list:—

Glycerin;
Boro-glycerid;
Iodin (compound tincture);
Hydrastis;
Calendula;
Carbolic acid.

I think that I have learned how to use these agents. Their special indications will be mentioned in discussing the various lesions in which they are useful, and it is only necessary in this chapter to deal in a general way with their properties and the method of their application.

Glycerin.—Glycerin, in technical parlance, is designated a *hydragogue*, because of its power to produce a free watery discharge from mucous surfaces. In hyperemia of the pelvic organs and in inflammatory conditions, whether subacute or chronic, it relieves the congestion by extracting from the blood its serum. In almost every application to the cervix and the vagina, glycerin is used either as a vehicle with which to mix a more active remedy, or for the purpose of medicating the tampon which is finally to be introduced. It is a most important auxiliary to the vaginal douche. The best method of applying it is through a speculum, with tampons of cotton-wool well saturated with it. These should be inserted daily, and the nurse should, therefore, be instructed how to introduce them. Various instruments have been devised for the purpose of enabling the patient to introduce them her-

self, but all are more or less unsatisfactory. In multiparæ it is often possible to pass a medium-sized tampon through the ostium vaginæ without the aid of any instrument.

Boro-glycerid.—This preparation is made by adding to four fluid-ounces of glycerin one ounce of powdered borax and rubbing them well together in a mortar until the borax is thoroughly dissolved. I first began to use this remedy upon the recommendation of Dr. Wylie, of New York. The borax seems to intensify the action of the glycerin in hyperplasia with much induration, or else it exerts its own action upon tissues thus affected. At any rate, it seems more efficacious than pure glycerin, where the products of inflammation are felt through the fornices and where there is hyperplasia and subinvolution, with *acrid leucorrhea and exaggerated menstrual discharge*. In aphthous ulceration of the vagina or cervix—a rare disease in adults—it is almost a specific. Boro-glycerid is also an antiseptic of no mean value.

Iodin —Churchill's tincture is the preferable preparation. It consists of seventy-five grains of iodin and ninety of iodid of potassium to the ounce of alcohol. Iodin applied to the congested cervix and vaginal mucous membrane acts upon the capillaries, causing their contraction, and upon the lymphatics, stimulating them to absorb the exudation of plastic lymph in pelvic inflammations and the hyperplastic tissue in areolar hyperplasia. Its use is, therefore, indicated in subinvolution with or without hyperplasia, in inflammatory deposits, in chronic ovaritis when the ovary is enlarged and prolapsed, in chronic corporeal endometritis, and in cervical catarrh with abrasion. It may be applied directly to the cervix, the corporeal mucosa, or the vault of the vagina. It is best applied to the cervix by means of an applicator properly wrapped in absorbent cotten. The cervix should be previouly cleared of all discharge. Any excess of iodin should be expressed by pressing the applicator against the side of the bottle. The whole vault of the vagina may be painted with the drug in the same way. Caution should, however, be exercised in the intra-uterine application of iodin. I rarely use it unless the os is patulous and drainage perfect. It should then be applied by carrying the applicator well up to the fundus, permitting it to remain for a minute or two. This enables the uterus to contract upon the cotton, bringing the medicament into contact with its entire lining membrane.

Iodin, in the cases enumerated, should be applied once or twice a week. When there is abrasion with the hyperplasia I rarely permit the drug to come in contact with the abraded surface, confining its use to the vaginal aspect of the cervix. Increased experience with the drug

leads me to believe that often the healing of abraded areas is retarded by its direct application. Instead of making direct application in the manner described, it may be diluted with glycerin (1–4) and applied upon a tampon. Indeed, if there is much hyperplasia, and rapidity of action is important, it is advisable to introduce a tampon thus saturated instead of using one dipped in pure glycerin or boro-glycerid. The tampon can be left in the vagina from twelve to twenty-four hours. As a general rule, I prefer making the direct application of the iodin, supplementing its action with the boro-glycerid tampon.

The proper application of iodin is painless. Pain may result from contact of the drug with the skin surface by awkward manipulation. This is immediately overcome by the application of glycerin. If the patient at her next visit complains of having experienced some distress, and if the tampon removed is blood-stained, it is well to lengthen the intervals between the treatments, or the iodin may be diluted by adding glycerin.

In the preparatory treatment preceding trachelorrhaphy in cases where there is much hyperplasia I rely largely upon the hot douche, the compound tincture of iodin, and the boro-glycerid tampon. Under this treatment it is surprising how quickly hyperplastic tissue will melt away. The pressure exerted by the tampon is a curative factor soon to receive attention.

Hydrastis Canadensis.—The chief indication for the local use of this drug is a *profuse, stringy leucorrhea*, with extensive glandular involvement. It is especially useful where the constitutional symptoms suggest its internal administration as well. As an intra-uterine application in chronic endometritis it is both safe and beneficial. A very serious objection to the drug as a local measure has been its staining properties. Pharmacists have now overcome this by the production of a colorless extract which formerly I thought quite as efficacious as is the original preparation, but later observation leads me to believe that it is not.

Hydrastis may be applied directly to the parts by the aid of an applicator, after which a tampon saturated in hydrastis and glycerin (1–4) should be placed against the cervix. By so doing it is longer in contact with the diseased parts—an important consideration, particularly if vaginitis complicates the endometritis, as it so frequently does.

Calendula.—Calendula is to *purulent* endometritis with erosion what hydrastis is to *glandular* involvement with a tenacious, stringy discharge. The cervix has a red, corroded, granular appearance, due to solution of continuity, which gives rise to a *purulent* leucorrhea. It is

questionable whether or not calendula exerts any power as an antiseptic.* It at least acts admirably in suppurating wounds of all kinds, and in purulent conditions is the sheet anchor of many homeopathic physicians. Southwick† says: "Following some surgical operations, after the patient has used the ordinary cleansing douche, I direct her to mix two teaspoonfuls of the tincture with half a pint of warm water, to inject it while lying on her back, and retain it from twenty minutes to half an hour. The non-alcoholic preparation is preferable."

In chronic endocervicitis Cowperthwaite‡ recommends the following: Hydrastis, one ounce; calendula, one ounce; glycerin, four ounces. Of this a tablespoonful is diluted in four ounces of water and used as an injection once or twice a day. This was also a favorite prescription of the late Dr. A. I. Sawyer. Personally, I prefer to use the remedies singly.

Carbolic Acid.—This agent is an old and well-tried disinfectant, and its use is limited to disinfecting purposes by many physicians. As such, it is used in the form of a douche, the strength varying from one to five per cent. Carbolic acid is, however, something more than a mere disinfectant. It is, in addition, antiseptic and anesthetic in its action. As an antiseptic, I not infrequently swab the cervical canal with the "impure"|| acid before begining minor operations upon the cervix or the uterus. But it is its anesthetic properties which seem to me the most valuable. When there is great hyperesthesia of the mucous membrane at the internal os—which may exist in women of all ages, but is oftener met with at or about the change of life—a thorough application of carbolic acid, even though dilatation is not practiced, will often relieve distressing nervous symptoms in a most remarkable way. An occasional application of the acid to an eroded cervix will act as a mild stimulant, supplementing the action of iodin and other remedies when they have seemingly ceased to do good. After curetting in septic endometritis, the impure acid should be applied to the entire endometrium.

In the ordinary run of cases these remedies cover nearly every indication and have the advantage of being both mild and harmless in their action. However, this chapter would be incomplete without considering those less often called for.

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*I do not believe that calendula is a germ destroyer.

† "Practical Gynecology," p. 39.

‡ "Text-book of Gynecology," p. 165.

|| Impure or commercial carbolic acid, as prepared by Dr. Squibb, is not a caustic, as is the pure.

Astringents and Styptics.

Tannin.—The one indication for tannin can be summed up in the word "relaxation." In rectocele and cystocele, with subinvolution of the vaginal walls, the application of tannin, as recommended by Mundé, is most useful. He applies it by dipping a glycerin tampon into the powdered tannin. It is styptic as well as astringent in its action, and is therefore useful in vascular conditions of the cervix and vagina.

Alum.—This is also an astringent, and is used by many specialists in preference to the tannin where there is much relaxation of the parts. I do not believe that it possesses any specific properties when used locally. Its greatest sphere of usefulness lies in its power to control hemorrhage after plastic operations which cannot be controlled by ordinary hot injections. Used as a saturated solution it is most effectual, and possesses the advantage of not forming clots, as does iron.

Iron.—When iodin, tannin, or alum fails to control hemorrhage, iron, in the form of persulphate or perchlorid, will have to be resorted to. The large clots which it forms makes it an undesirable, if not a dangerous, hemostatic to use within the uterus. Nevertheless, it is sometimes necessary to utilize its more powerful styptic properties in cases of intractable hemorrhage.

Narcotics.

Chloral Hydrate.—A solution is prepared by dissolving one drachm of chloral hydrate in one ounce of glycerin. In cancer of the cervix a tampon saturated in this and applied directly to the ulcerated surface will often afford marked relief.

Opium.—The aqueous extract may be used in carcinoma uteri. It should be applied directly to the parts by means of an applicator or upon a tampon.

Conium mac.—Conium is useful in cancer of the uterus, particularly if indicated internally, where there is much infiltration of tissue with induration. It is a favorite remedy of many homœopathic physicians for the relief of the shooting, darting pains which so frequently attend cancer in any part of the body.

Belladonna.—Belladonna exerts a specific influence in acute and subacute inflammatory lesions of the pelvic organs when the distress is aching and throbbing in character. It may be used as a cerate (one drachm to one ounce of vaseline) or in the form of the fluid extract.

Disinfectants.

Iodoform.—Iodoform is also both antiseptic and anesthetic in its action. My chief use of this valuable agent within the vagina is after plastic operations. It may be sprinkled upon a glycerin tampon thus applied; or a strip of iodoform gauze may supplant the ordinary tampon.

Iodoform must be used with care, especially with certain patients. Dr. Malcolm McLean classifies its toxic effects as follows:

"1. Cutaneous irritation: Eruptions of the skin in erythematous or eczematous form, associated with the pruritus of urticaria.

"2. Cerebral disturbances: Headache often very marked; delirium more or less active; melancholia, hallucinations; the pupils occasionally dilated, but more often contracted and motionless; the pulse decidedly accelerated, running early up to 135 or 150 per minute; quality rather small and wiry; rapid increase of temperature.

"3. Syncopal or asthenic form of poisoning: Patient overcome with dizziness, mental confusion, great lethargy; weak, rapid pulse; some paralysis of the sphincters, death coming sometimes suddenly by heart failure."

Eucalyptus Globulus.—Eucalyptus is frequently combined with hydrastis, or it may be used by diluting one drachm of the oil in one ounce of glycerin. This is applied in the ordinary way when there is an offensive discharge from the vagina from whatever cause.

Boracic Acid.—A boracic acid lotion of the strength of two drachms to the pint of water makes an excellent application in pruritus vulvæ from whatever cause. It may be applied to the cervix in the form of powder, through a powder blower, where erosions exist. This is also a convenient way of applying iodoform.

Ichthyol.—This agent has come into general use during the last three years in the treatment of various lesions, especially those of the genito-urinary tract. Jullien recommends it highly in the blennorrhagic urethritis of women and in specific inflammation of the vagina and uterus. Colosanti reports most favorable results from its use in one-half to one per cent. solutions in cystitis. In congestion of the female pelvic organs with hyperesthesia and purulent leucorrhea, which is acrid and offensive, I have found it most serviceable. I apply it by means of a tampon saturated in a ten per cent. glycerin solution.

Caustics.

I have practically discarded the use of caustics in gynecological work, and am sure that my patients are the better for it. The use of caustics

about the cervix is, I believe, wrong in principle. Terminal nerve filaments can be squeezed quite as well by the cicatrix of caustics as by the cicatrix of tears. There has been no greater curse to womankind than nitrate of silver. By its use abrasions and ulcerations of the cervix may be healed, but it is done at the sacrifice of that principle which to-day calls for the removal of all cicatrices from about the lower orifices of the body. I have more than once met with the most obstinate reflexes which followed in the train of its use. The powerful solutions recommended in virulent vaginitis are, I believe, unnecessary and may do harm. At least one case of adhesive vaginitis has come under my observation, the result of such an application. When a caustic is needed for surgical purposes the actual cautery is by all odds preferable to nitrate of silver, chloride of zinc, or the more powerful acids.

The Vaginal Tampon.

The use of the vaginal tampon as a carrier of medicinal agents has already been referred to. The material from which it is made is not altogether unimportant. There is nothing which excels the lamb's wool now on the market. It is soft, elastic, and never "balls up," as does the ordinary cotton. Unfortunately, it is rather expensive, but I am sure that when intra-vaginal pressure is an object, as it is in dealing with inflammatory exudates and hyperplasia, the extra cost is more than compensated for by the superiority of the tampon thus made. If, on the contrary, pressure is not important, the ordinary cotton or absorbent cotton may be used instead. Tow or marine lint, lamp-wicking, sterilized of course (Foster), the roller bandage, and sponges have all been used and have their advocates. Iodoform gauze in post-operative work is preferable to all other material. Except in cases of emergency I do not think that the use of sponges for tampons is justifiable.

Cotton and lamb's wool can be made into any desired shape, depending upon the use for which the tampon is intended. If its function is merely to keep a medicament in contact with the cervix, it should be soft, of disk-shape, and the string loosely tied about it. If, on the other hand, it is to support the uterus, it should be more compact and cylindrical. Cylindrical tampons can be quickly made in large numbers by spreading out a roll of sterilized lamb's wool or cotton, and again winding it tightly into rolls about one inch thick; loops of strings are placed at intervals of two inches, between which the roll is cut. This will make a number of tampons one inch thick and two inches long—a very good size for

the vaginal pouches. The string should be sufficiently strong to guard against breaking.

Indications—The vaginal tampon is used—

1. As a carrier of medicament to be applied to the cervix or vagina;
2. To control hemorrhage;
3. In uterine and ovarian displacements;
4. To retain other bodies in utero, such as stem pessaries, tents, etc.;
5. After operations.

As a Carrier of Medicaments.—The soft glycerin plug is the most serviceable tampon for this purpose. By spreading out a sufficient quantity of cotton-wool on the palm of the hand a large quantity of glycerin can be poured into it before shaping the tampon, which can be conveyed into the vagina without soiling the fingers or the clothing of the patient. Any other substance may be added to the glycerin. This is applied directly to the diseased parts. A dry roll of cotton or wool may be placed below this to keep it in position.

To Control Hemorrhage.—All clots should be first removed, and, if the exigencies of the case are not too great, the vagina thoroughly cleaned with a bichlorid solution (1:3000). If cotton is used soft cotton tampons soaked in carbolic solution (1:200) are first firmly packed with the dressing forceps into all of the fornices of the vagina. Another plug is next placed directly over the external os, after which the vagina is packed to its utmost limit. The vaginal tampon should not be used in hemorrhage from abortions after the fourth month. The cotton may be medicated with some astringent—iron, tannin, or alum —instead of soaking them in the carbolic solution.

If iodoform gauze is used, which is the preferable material when it can be had, long strips are first placed around the cervix into the fornices, after which the whole vagina is solidly packed with it. Loose gauze is finally placed over the vulva, which is held in place by a tightly fitted T bandage. If necessary, the gauze can be carried into the uterine cavity.

In Uterine or Ovarian Displacements.—There are many patients suffering from these displacements, particularly ovarian, who can tolerate no other form of support. Preparatory to the introduction of a permanent pessary the vaginal tampon is often necessary. In retroversion a cylindrical tampon is first passed into the anterior fornix, so as to push the cervix backward and the fundus forward. One or two more, depending upon the capacity of the vagina, are placed against this to retain it in position. In anteversion the same number are introduced into the posterior fornix. In both retro- and anteflexion the

supporting tampon must be placed into that fornix which is impinged upon by the fundus. In flexures the relief afforded by tampons is due more to the elevation of the entire uterus than to the straightening of its axis. In ovarian displacement a soft, medicated tampon is placed against the diseased organ.

To Retain Other Bodies in Utero.—When a stem pessary is introduced after dilatation, or when tents are introduced for the purpose of dilatation, a tampon is necessary to retain them in position. Inasmuch as both stem pessaries and tents have practically been discarded by modern specialists this use of the tampon is rarely called for.

After Operations.—In plastic operations, especially upon the cervix, a large tampon smeared with glycerin and iodoform should be placed in such a way as to relieve the sutures from tension while the patient vomits. Iodoform gauze may be used instead, and for this purpose is even preferable.

Vaginal tampons can be inserted through any form of speculum, though Sims's is by all odds the preferable instrument where hemorrhage is to be controlled. In removing the speculum the tampon, or tampons, should be held in place with the dressing forceps. If cotton or lambs-wool tampons are introduced for the purpose of controlling hemorrhage they should not be left in longer than eight or ten hours, for, no matter how carefully prepared, they soon become offensive and irritating. When resorted to for the purpose of exerting pressure or support they may be retained twenty-four or even forty-eight hours. In all instances their removal should be followed by an antiseptic douche. Iodoformized gauze may be left behind with impunity for from twenty-four to forty-eight hours.

The patient should always be instructed how to remove vaginal tampons. Traction should be made backward in the direction of the perineum instead of forward. Where more than one is introduced the patient or the nurse should be told the number; they are then removed in the order indicated by the number of knots in each of the cords. When gauze is used the ends of the strips should be secured in a string, which should be left projecting from the vagina, and which facilitates their removal.

CHAPTER XI.

ELECTRICITY IN GYNECOLOGY.

Electricity as a therapeutic agent has for many years been used more or less extensively by the vast majority of the medical profession in the treatment of general diseases. In the treatment of gynecological affections it has not been so commonly used. This is probably due to three reasons: (*a*) A general knowledge of the physics of electricity does not prevail. (*b*) It is generally believed that elaborate and costly apparatus is necessary for its successful application. (*c*) In its application to the diseases of women the absence of specific indications makes precision difficult.

While a profound knowledge of the physics of electricity is under all circumstances desirable, it must be remembered that, unlike the neurologist, the gynecologist deals with organs largely confined to the pelvis; and that instead of applying the agent for its effect upon nerves and the reaction of muscles, he applies it to overcome perverted nutrition, hyperesthesia, and local congestion. It is, then, only necessary for the gynecologist to understand the peculiar properties of the current which he may wish to use, and to know which pole of the galvanic current will produce irritation, which one absorption, sedation, anesthesia, etc.

For all ordinary gynecological work costly apparatus is a luxury, but not a necessity. One can get on very well with inexpensive batteries, and a few special electrodes. For the application of the very powerful galvanic currents (which are not so much used as formerly), a powerful battery together with a milliampèremeter, rheostat, etc., is necessary.

In undertaking toformulate specific indications in the schema appended, I have drawn largely from the writings of Grandin, Rockwell, Mundé, Massey, King, F. H. Martin, Engelmann and Apostoli. In it I have endeavored to reflect in small compass the more generally accepted rules, in order to simplify the application of electricity in the treatment of the diseases of the female pelvic organs. In those instances in which there is a conflict of opinion I have been, in large measure, governed by the weight of authority as well as by personal

experience. The reader is referred to the several excellent text-books whose authors are mentioned in the foregoing paragraph for theoretical amplification and exhaustive detail.

GALVANISM.

The *galvanic current* is generated by the decomposition of two dissimilar metals immersed in some decomposing fluid. It is continuous, chemical in its action, and starts from the affected plate toward the one least affected. The plate least affected, therefore, receives the electricity and gives it off at its external extremity, and is known as the *positive pole;* the external extremity of the plate most affected is known as the *negative pole.*

The action of these two poles is very different when applied to living tissue, and the intelligent application of galvanism requires a knowledge of this difference. The following are the essential properties of the two poles:—

The *positive pole is anesthetic, the least painful, and its tendency is to check hemorrhage and cause absorption.*

The *negative pole is irritating and caustic in its action. It is, therefore, more painful than the positive and its tendency is to produce hemorrhage and destroy.* (Grandin.)

If the destructive currents are used the difference in the cicatrices produced by the two poles is important. According to Apostoli the cicatrix formed by the positive pole is hard, retractile and dry, while that produced by the negative is soft, non-retractile and pliable.

Martin, of Chicago, sums up the polar affects of the galvanic current when applied to the interior of the uterus by means of a soft copper sound, as follows:

"*When the positive pole is used direct*—(*a*) on local nerves—sedation; (*b*) on local blood vessels—vaso-motor constriction; (*c*) result of electrolytic action—attraction of acid radicals of the disorganized tissue; (*d*) on local tissues—hardening from coagulation of albumin; (*e*) on pathogenic microbes—destruction; (*f*) on fluids in the tissues—propel toward opposite pole (cataphoric action); (*g*) effect of electrolysis on copper electrode—acids of the tissues form copper salts which are driven into the tissues by cataphoresis.

"2. *When the negative pole is used direct*—(*a*) on local nerves—irritation; (*b*) on local blood-vessels—vaso-dilatation; (*c*) result of electrolytic action—attraction of the alkaline radicals of the disorganized tissues; (*d*) on local tissues—softening and liquefaction from the effect of the alkaline; (*e*) on pathogenic microbes—destruction; (*f*) on the

fluids of the tissues—attracts them; (*g*) effect of electrolysis on copper or other metal electrodes—little or none.

"The general or systemic effect of the galvanic current apply equally to both poles: (*a*) it is a powerful promotor of general nutrition; (*b*) it is a powerful stimulant; (*c*) its inter-polar effect when powerfully concentrated is such as to promote absorption."

FARADISM.

The *faradic current*, unlike the galvanic, is interrupted and is chiefly mechanical in its effects. If it possesses any chemical action it is very slight. In gynecology it is used both to stimulate the uterus by virtue of its power to induce muscular contractions and to subdue pain by means of the secondary current.

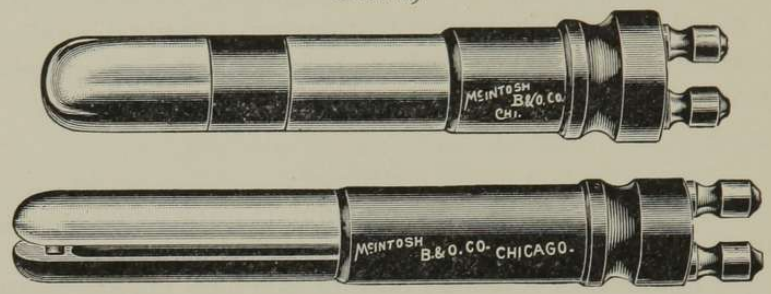
The faradic current is thus generated: An insulated conjunctive wire of a galvanic battery is coiled on itself and laid on an insulated surface. Around this is placed another coil of insulated wire in which instantaneous currents are induced by the galvanic current passing through the inner coil. From the first of these coils of insulated wire the primary current is derived; from the second, the secondary. The two together constitute the *helix*. A bundle of soft iron wire placed in the center of the helix greatly intensifies the current derived from the induction coil. "When the current of the generating cell passes through the helix the soft iron is magnetized and draws the interrupter (rheotome) in contact with it. This breaks the circuit and demagnetizes the iron. The interrupter is then returned to its former place by a spring. This step reconnects the generating cell with the helix, and again allows the iron to be magnetized. The interrupter is again drawn in contact with it. Thus the current is constantly broken and restored by a simple device known as an 'interrupter,' or 'automatic circuit-breaker. An induced current within the iron core of the helix is thus produced. This is the current which passes through the electrodes to the patient" (Ranney).

The difference in the action of the two poles is not nearly so marked as in the galvanic current, though the positive is more sedative and the negative more stimulating. The primary or inducing current is more useful in stimulating muscular contraction where sedation is not important; the secondary, or induced current, is more useful where sedation is called for.

The effects of the faradic current depend also upon the frequency of the interruptions—interruptions of high frequency acting as a sedative, whereas slow interruptions contract and relax muscular tissue. The

general or systemic effects of the interrupted current are quite as marked, if not more so, than are those produced by the continuous.

FIG. 69.

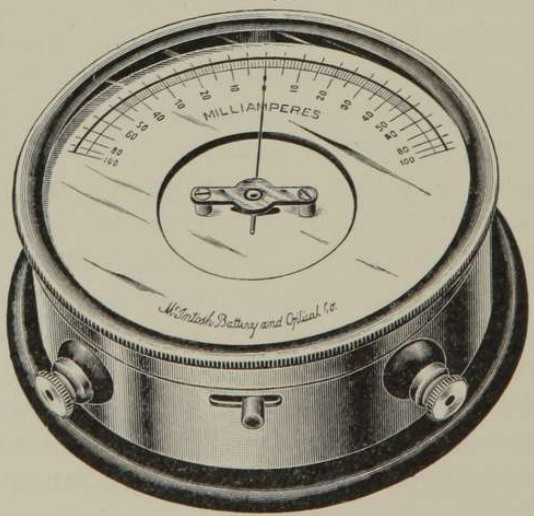


BI-POLAR VAGINAL ELECTRODE.

FIG. 70.

JEWELL GRAPHITE RHEOSTAT.

FIG. 71.



MILLIAMPÈREMETER.

THE FRANKLINIC CURRENT.

I find the franklinic current exceedingly useful in the treatment of nervous prostration with spinal irritation and hysterical pains in various parts of the body. No disturbance of the clothing is required in its application unless the wet electrodes are used. The sparks are induced

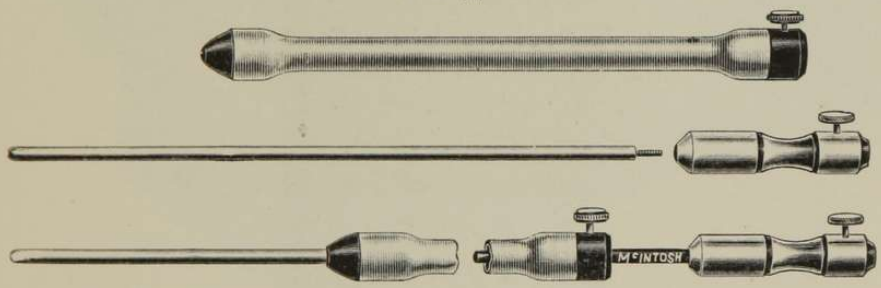
FIG. 72.

SPONGE COVERED ELECTRODE WITH LONG HANDLE.

FIG. 73.

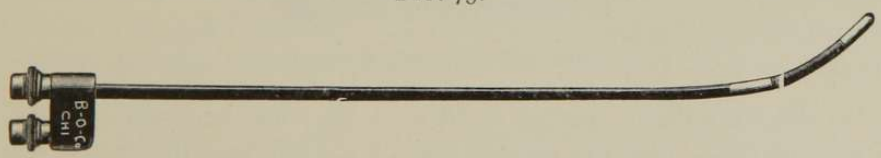
INSULATED RECTAL ELECTRODE.

FIG. 74.



MARTIN'S COPPER INTRO-UTERINE ELECTRODES.

FIG. 75.



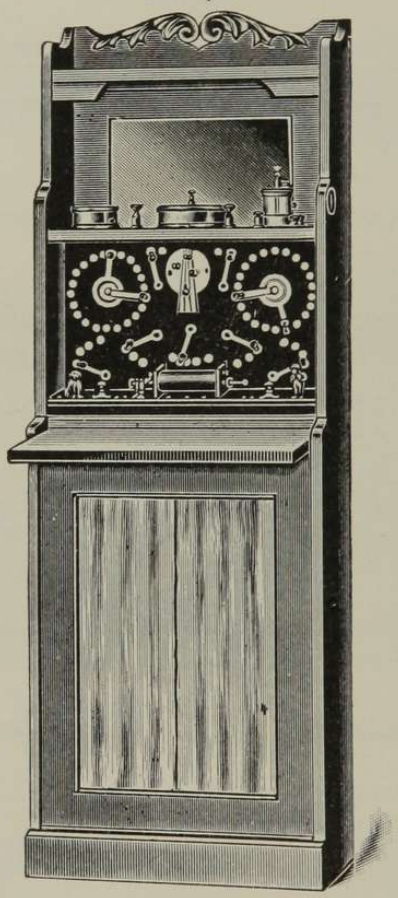
BI-POLAR INTRA-UTERINE ELECTRODE.

by a self-charging plate rotation multiplier. The voltage of each spark induced is very great, depending upon its length—according to Thompson, fifty-three thousand volts per centimeter. While the quantity of electricity conveyed by the sparks is exceedingly minute, they are capable, because of the great pressure at which they are delivered, of

powerfully stimulating the cutaneous nerve terminations. The sensation elicited where the sparks strike the skin is that of a needle-thrust. The superficial muscles are also more or less excited, especially if the wet electrodes are used.

Ranney makes the following observations on the use of the franklinic current:

FIG. 76.



THE LITTLE GEM CABINET.

"1. My experience has not confirmed the view heretofore advanced by some authors, that the *positive pole* of a static machine has a 'tonic' and the negative pole a 'depressant' action.

"I have found after repeated experimentation that either pole seems to answer equally well upon most patients. I commonly employ in my office the positive pole, however, because it happens to be the most conveniently connected with the patient.

"2. As a curative agent, *I regard static electricity as of great value.*

"While galvanism must always hold a preëminent place in electrical therapeutics, because of the chemical effects so obtained, there are certain diseased conditions in which static electricity is unquestionably superior to faradism and galvanism.

"3. It has been shown in preceding pages that the *static induced current fulfills all the known indications of faradism.*

"It has moreover two great advantages over the faradic instrument, namely, that a constant polarity is obtained and a much greater electromotive force. It is also less painful than the faradic current.

FIG. 77.

TWENTY-FOUR CELL COMBINED GALVANIC AND FARADIC BATTERY.

"4. *Static electricity possesses a decided advantage in some cases where faradization or galvanization have either given negative results or have apparently lost their remedial power after their use has been too long continued.*

"It is a common expedient with medical electricians to shift from one form of current to another from time to time whenever the progress of the case seems unsatisfactory. Under such circumstances franklinism forms another link to the chain, and greatly aids us when faradism and galvanism have both proven inefficient.

"5. I have found *heavy static sparks to surpass any other form of electrical application for the relief of contracted muscles.*

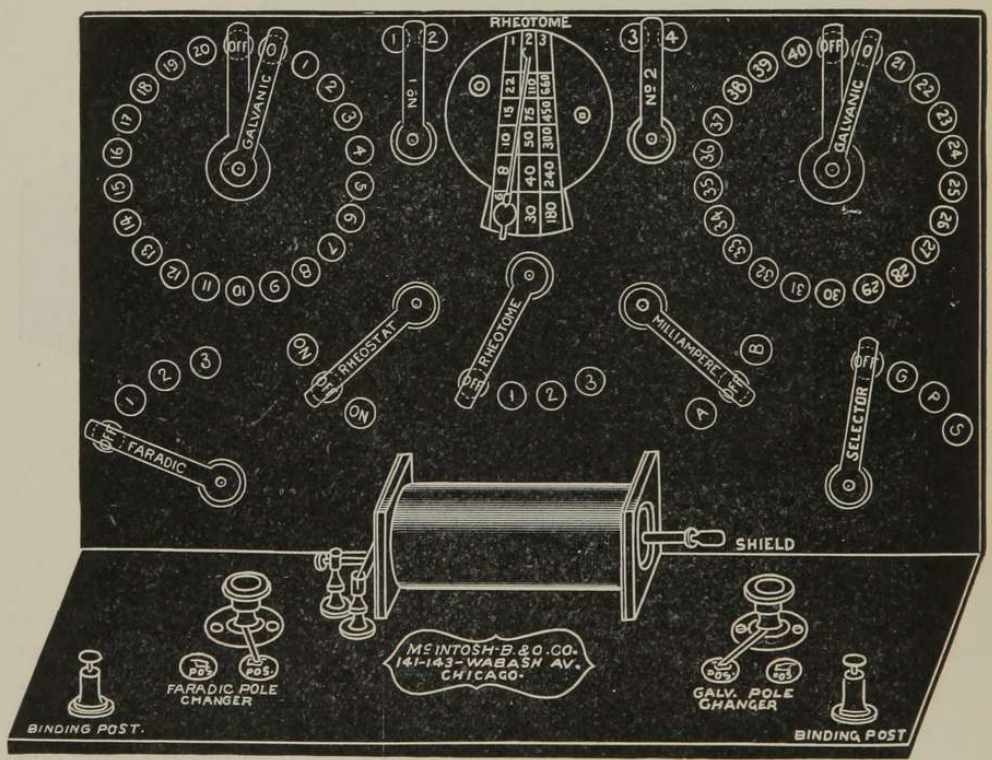
"The sparks are withdrawn from the part so affected in rapid succession for about five minutes.

"6. It is well known that *certain forms of pain often disappear at once, after static applications.*

"The most marked type of pain so relieved is the so-called '*rheumatic muscular pain*' or that observed in genuine *muscular rheumatism.* I have seen many such cases where one application of heavy sparks to the seat of pain for a few minutes has caused permanent relief. Again, *neuralgias* of a distressing kind are often dissipated after a few applications of heavy indirect static sparks for from five to ten minutes at a sitting.

"7. As a *general tonic* and also as a *stimulant to depressed nervous*

FIG. 78.



FRONT VIEW OF LITTLE GEM CABINET BATTERY PLATE.

functions 'static insulation' seems to be particularly of service.

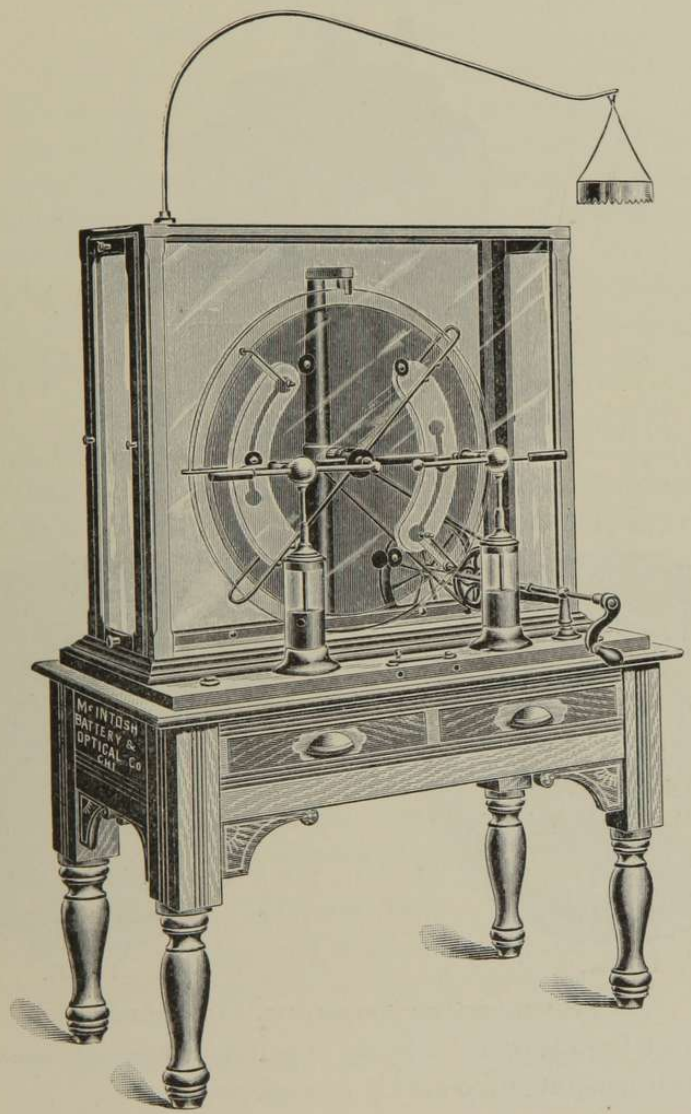
"I employ static electricity constantly by this method in *neurasthenia*, with marked benefit.

"I have observed also remarkable improvement in *disturbed visceral functions* (such, for example, as dyspepsia, habitual constipation,

diabetes, vertigo, asthma, etc.) after the use of static insulation for from ten to twenty minutes at a sitting.

"Many such cases have expressed to me the greatest delight at the beneficial effects which such an application invariably produced. For the past three years I have used my static machine almost exclusively

FIG. 79.



ATKINSON'S TÖPLER ELECTRIC MACHINE.

as a means of *improving the 'general nervous tone' of patients*, in preference to my faradic or galvanic apparatus. It is much more satis-

factory to patients because of its ease of application; and as far as I have observed, equally effective as a tonic.

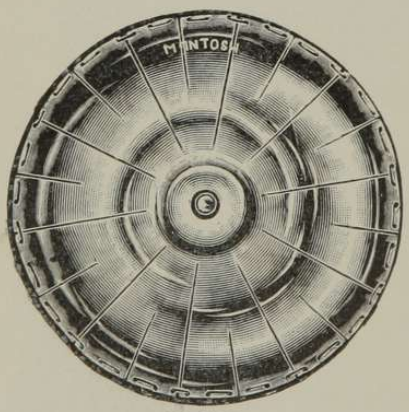
"8. I am inclined to think that those authors who have written upon static electricity as a therapeutical agent in a lukewarm spirit

THE SAMSON BATTERY.

FIG. 80.

SAMSON CELL, NO. 1.

FIG. 81.



BACK.

FACE.

SPONGIO-PILINE ABDOMINAL ELECTRODE.

have probably been supplied with an apparatus which has been ineffective because it generated too slowly or imperfectly."

APPARATUS.

In the selection of a *galvanic battery* two essentials are important: it should contain a sufficient number of elements to produce a current

strong enough for routine gynecological work; and the elements should be so constructed as to possess good working qualities.

One of the best cells is the Samson (Fig. 80). The No. 1 cell has an electromotive force of 1.44 volts and an internal resistance of 0.14 ohm.

There are many excellent batteries on the market and but few really poor ones. The chlorid of silver dry-cell galvanic batteries are rapidly gaining in favor, as there is no fluid to spill, and they require but little attention. Of the fluid batteries infinite varieties are on the market. The McIntosh and the Waite and Bartlett are old and well tried instruments. It is claimed that the high internal resistance and low electromotive force of the dry-cell makes it less desirable for gynecological work. This objection will, in time, undoubtedly be overcome.

The Kidder Tip-cup battery and the McIntosh are very popular. I have in constant use McIntosh's "Little Gem" Cabinet Battery, Waite and Bartlett's thirty-cell portable galvanic battery, and the Atkinson Four-plate Töpler static machine, and have every reason to be satisfied with all.

Galvanometer, or Milliampèremeter.

The accurate application of galvanism is not possible without some means by which the intensity of the current can be measured. It is true that the number of cells brought into the circuit is something of a guide, but inasmuch as there exists such a marked variance in the internal and external resistance, this is a rough and very inaccurate method, when a strong current is used. An instrument for this purpose is known as a *galvanometer* or *milliampèremeter*. (Fig. 71.)

A milliampère is the unit of electrical measurement, and for routine gynecological work from five to seventy-five milliampères are quite sufficient. Most milliampèremeters now made are capable of registering intensities as high as one thousand milliampères.

Rheostat.

The rheostat is an instrument devised for the purpose of modifying the intensity of the current of electricity by passing it through resistance coils or water. This is almost indispensable in treating the organs of special sense, the brain, etc., and the gynecologist will likewise find it of special utility. The water rheostat is simple and practical, and wtih it the current is regulated by the distances between the ends of the metals which are immersed in the water. The same object may be accomplished by means of a graphite current controler. (Fig. 70.)

Electrodes.

The instruments by which electrical currents are applied to the body are called electrodes. In their application to the pelvic organs special electrodes have been constructed. They are external and internal.

The ordinary *external* electrode consists of a handle to which is attached a metallic plate covered with a sponge. The sponge is, however, unsatisfactory, uncleanly, and not a good conductor. The plates of sheet-lead or block-tin are much preferable in gynecological electrotherapy, being readily adapted to the external surfaces of the body because of their pliability. They can be covered by any inexpensive material of good conducting quality (chamois, absorbent cotton, rough toweling, etc.) which can be quickly changed for each patient.

The size of the external electrode should be governed by the intensity of the current used. Manufacturers are apt, unless the size is specifically stated, to furnish those which are altogether too small. When very powerful currents are used, *i. e.*, currents of over sixty milliampères, they should be dispersed over as large an area externally as possible. To accomplish this Apostoli uses potter's clay with which to cover the abdomen, and Engelmann plates of sheet-lead of the following dimensions: 3½ x4½ inches; 4½ x 6¼ inches; 6½ x 9½ inches. Abdominal electrodes are also made of animal membrane and Spongio-piline (Fig. 81). These can be applied over the abdomen or back while the patient is in almost any posture.

The object of *internal* electrodes is to utilize the several cavities within the pelvis in order to more effectually localize the electric current. They are, therefore, made to adapt themselves to the cervix, uterus, vagina, rectum, bladder, etc. When the positive pole is used direct within the uterus and decomposition of the electrode is undesirable it should be made of platinum. Dr. F. H. Martin has devised for the purpose a very ingenious, flexible electrode.

GENERAL CONSIDERATIONS.

By the term *direct application* is meant the application of the one or the other pole directly, or as nearly so as possible, to the organ or organs diseased. This is accomplished by selecting a proper internal electrode (vaginal, uterine, urethral, rectal, etc.), the other pole being applied externally, usually over either the abdomen or the sacrum; or by the concentration of the current through the medium of a bi-polar electrode.

By the term *indirect application* is meant the application of both poles

externally, one electrode usually being placed over the abdomen and the other over the sacrum. In young unmarried women, unless the symptoms are urgent, it is advisable first to resort to this method.

The conductivity of electrodes is increased by dipping them in warm water, and the superficial revulsive effect of the galvanic current is increased by using for this purpose salt water.

The time, length, frequency, intensity and manner of the applications will necessarily vary with each case. The *séances* should last from five to thirty minutes. For routine work I rarely exceed fifty milliampères, and often use only five or ten. Due regard must be paid to the function of menstruation, and should there be any acute or subacute inflammatory symptoms, direct electrization, at least, should not be practised for the first few days preceding or following the expected period. In amenorrhea, on the contrary, the molimina should be watched for, and the applications made a week before and during their appearance.

Electricity should never be used in suspected pyosalpnix. When a mass is found in the region of either broad ligament, and the use of galvanism is followed by an aggravation of the symptoms, the evidence is pretty conclusive that pus exists. This is a diagnostic point of great value.

Some patients will tolerate much more electricity than will others. Idiosyncrasy should always be noted, and the strength and duration of the current regulated accordingly.

The Application of the Franklinic Current.

The franklinic current may be administered in various ways. The most common method is as follows: The patient is placed upon an insulated platform and is connected with the ball surmounting one of the Leyden jars by means of a conducting cord. The other pole is connected with a ball electrode having an insulated handle. After the current is created by revolving the plates, the electrode is applied through the clothing to the painful parts and up and down the spine.

In the indirect method, the second conducting cord, instead of being attached to the ball electrode, is placed on the floor near the platform, for the purpose of creating a certain degree of induction. The electrodes passing through the balls which surmount the Leyden jars are drawn beyond sparking distance. After the current is created sparks are drawn from the patient by a suitable ball or sponge electrode.

The "electric bath" or "static breeze" is administered, on the insulated stool, by using a point electrode or a static crown instead of

the roller or ball electrode. The patient is fanned by a gentle current of electrified air, which produces a delightfully cooling sensation, and which is exceedingly useful in dealing with neurasthenic cases.

The static induced current may be created by the static machine in the following way: The conducting cords are inserted in the two sockets on the front edge of the base, the free ends being attached to the metal electrodes. The switch is opened and the sliding electrodes closed. The discharge is then regulated by separating the sliding electrodes. With a separation of one-sixteenth of an inch a very smooth faradic current is obtained; a separation of one-quarter of an inch, on a large machine, will afford a current quite as powerful as the strongest nerves can endure.

Conclusions.

Let it be remembered that while electricity, in many instances, may be the chief therapeutic agent, it is rarely the only one to be used. It must be supplemented by other treatment, both constitutional and local. Again, it must be used patiently, persistently, and with discrimination. It is impossible to cure symptoms like amenorrhea and dysmenorrhea, when due to constitutional causes, by local electrization. Unless the cases are properly selected failure will be inevitable.

I purposely omit giving the technique of electro-puncture as practised by Apostoli, Keath, Engelmann and others in the treatment of hyperplasia and fibroma uteri, for the reason that I consider this treatment unsurgical and unscientific. Candor compels me to state that this somewhat dogmatic conclusion is not based upon extended personal experience, but rather upon deductions drawn from principles which seem to me clearly defined in dealing with surgical conditions, and upon observation. Patients have come to me who have been subjected to almost insufferable agony by the method of Apostoli without the least benefit, and not a few cases have come to my knowledge in which the outcome has been fatal. In the light of surgical data now at our command the results do not seem to justify the means. On the other hand, I believe that in small fibroids much good can be done by the intra-uterine application of galvanism, the active pole being selected according to individual indication. If there is menorrhagia the positive pole should be used direct; if the tendency to hemorrhage is not marked, the negative. A current of from fifty to one hundred milliampères may be thus used.

APPLICATION.

Amenorrhea.

The cases of amenorrhea in which electricity is useful must be selected with discrimination. In all instances the benefit to be derived from the use of the agent will depend upon the cause of the amenorrhea. In other words, amenorrhea must be looked upon as a symptom and not a disease, and treated accordingly. It may be either partial or absolute. When absolute the prognosis will in no small degree depend upon the presence or absence of the molimina.

Obviously it would be improper to make an effort to restore the menstrual discharge by the aid of electricity when due to the presence of diseases like tuberculosis, chlorosis, Bright's disease, or anemia. However, there yet remains a class of cases constantly presenting themselves for treatment in which menstruation is absent or scant, because of deficient development of the sexual organs, or because of suppression due to nervous shock or change of residence, in which electricity is one of the most useful therapeutic agents.

Girls who have never menstruated may have the function delayed, because of an entire absence of the uterus and ovaries. If a physical examination reveals this fact there will be but little use persevering in any kind of treatment, either local or general. On the other hand, if the development of these organs is rudimentary, and the symptoms of menstruation, except the flow, recur at regular intervals, the prospect of thus stimulating the undersized organs to perform their function is more encouraging.

There is still a further class of cases in which, according to Grandin, the application of electricity is most satisfactory. The amenorrhea in these cases is due to deficient nerve tone or force, and is typically "atonic" in character. This form of amenorrhea may be either primary or secondary, *i. e.*, occurring in girls who have never menstruated, or in women who have menstruated, but from some cause, evidently not constitutional, the flow has gradually or suddenly ceased. In both instances the normal stimulus seems to be absent, and the woman is ill because she does not menstruate. Sometimes the discharge seems to go toward the elaboration of adipose, and as a consequence she becomes corpulent concomitantly with the suppression of the menses. At any rate if a patient thus affected can be made to menstruate, or if she is menstruating but scantily the discharge can be increased, she will be made well.

The cases, then, in which electricity is most likely to prove useful may be enumerated as follows: First, where there is imperfect development of the sexual organs with molimina recurring at regular intervals. Second, where the suppression is the result of some cause which has been removed and menstruation is not restored because of the lack of what we call, for the want of a better name, sufficient "nerve tone."

Imperfect development, malnutrition, and atony are the pathological factors which are to be dealt with in the types of cases in the foregoing classification. The symptoms are variable as regards both intensity and character. In almost all instances, however, nervous depression is marked and hysterical manifestations frequently occur. Stimulation is, therefore, the object to be attained, and it is best attained by combined faradization and galvanization.

The method of application will necessarily depend upon circumstances. Rockwell emphasizes the necessity of general faradization in all cases where malnutrition is marked, and central galvanization in patients hysterically inclined, or victims of insomnia. I have derived in these cases more good from general franklinization. Undoubtedly, the general use of electricity can often be advantageously combined with the local use of the agent in any of its forms; but in the cases under consideration local mechanical effects are required rather than general, hence local faradization is oftener indicated. This theory is in perfect harmony with other forms of treatment known to be useful. The introduction of the sound, the presence of a stem pessary within the uterine cavity and the insertion of tents have long been popular methods of stimulating the uterus in a purely mechanical way, for the purpose of precipitating the menstrual flow.

There are instances, however, where the local nutrition is at fault, and something more than mere mechanical stimulation is necessary. Patients thus affected are often robust and of full habit, and the application of faradism can be advantageously combined with galvanism. Again in those instances where the uterus and its appendages are imperfectly developed, both forms of electrization are called for.

In young, unmarried girls the indirect method should be resorted to before direct application is made, though in all instances the direct method is the most useful and should be used, if necessary, before the treatment is abandoned. In the *indirect* method one pole is placed over the sacrum and the other over the lower part of the abdomen.

When *direct* application is made, one pole is applied internally either through the vagina or the uterine cavity. Suitable electrodes are used for the internal pole; the external pole is placed over the lower ad-

dominal region. Or the current may be applied by means of a bi-polar intra uterine electrode (Fig. 75).

If the faradic current is applied, it matters but little which pole is used internally. Inasmuch as the negative is slightly more irritating than the positive, the chances are that the results will be more decided if this be made the internal one. When the galvanic current is used, Rockwell, acting upon the theory that the positive exerts a more marked influence on unstriped muscular fibers, prefers it as the internal one. However, most authorities are agreed that the negative, because of its hemorrhagic tendencies, should be made the internal one, unless sedation is required. Care must be taken not to use a current strong enough to produce caustic effects when the negative pole is inserted into the uterus. One of from five to ten milliampères is strong enough to begin with. It may be gradually increased at subsequent treatments to twenty or thirty milliampères.

When the amenorrhea is absolute, the best time to make the applications is just before and during the molimina, for at this time nature is making an effort to perform a function which is held in abeyance. In no instance is entire reliance to be placed upon electricity, for other local measures, as well as constitutional ones, should be combined with its use.

Dysmenorrhea.

Dysmenorrhea, like amenorrhea, is only a symptom, and may be due to one or more of several causes. The various lesions giving rise to painful menstruation are considered under the several affections of which it is a symptom. There yet remains a type of dysmenorrhea associated with that condition of the system which is designated under the head of amenorrhea as "depressed nervous tone." There sometimes exists a condition of the uterus in which the organ, so far as can be ascertained by physical exploration, is perfectly healthy in every particular except that it is hyperesthetic. From some cause the uterus is "irritable," and as a result the patient is a victim of dysmenorrhea. Such a patient is usually of a neuralgic temperament, the symptoms of neuralgia presenting themselves upon the slightest exposure.

It is this form of the complaint in which electricity is preëminently indicated. There is an entire absence of local disease, and the one symptom to be overcome may be defined by the term "hyperesthesia." Galvanism is, therefore, the most applicable in the vast majority of cases.

The positive pole, being the sedative one, should be used internally

when the direct method is resorted to. Occasionally, and Rockwell particularly emphasizes this point, when the dysmenorrhea is associated with amenorrhea, and especially if there is a possibility of the difficulty being due to pressure by exudates upon nerve filaments, the negative pole should be the direct one.

There is yet another type of dysmenorrhea due to some form of obstruction in the treatment of which electricity is exceedingly serviceable. The obstruction may be due either to a flexion of the uterus or to stricture. When the organ is flexed a local examination will usually show it to be undersized, and as a rule the fundus is directed forward while the cervix is long and pointed, with a pinhole os. The pain is bearing down, intermittent, and the flow variable as regards quantity, although usually scant. A uterus of this kind is oftener found in girls who are overworked and poorly nourished. The indications are clearly to overcome the distortion of the uterine canal and to improve the nutrition of the organ. This is best accomplished by the faradic current applied by means of a bi-polar intra-uterine electrode. The electrode should be so introduced as to include the entire uterus in the circuit, one pole being placed in contact with the body and the other with the cervix at the point of flexure.

The secondary current is then gradually turned on and is increased in intensity until the patient complains of slight pain. It should be continued from five to ten minutes, and repeated from twice to three times a week until a cure is accomplished. Of course the faradizations are combined with suitable hygienic and internal treatment. If the amenorrhea is marked, I frequently use at the same sèance at which faradization is used negative galvanization.

Strictures of the uterine canal may be due to a number of causes—traumatism, caustics, cicatrices, trachelorrhaphy, inflammation, etc.; or they may be of congenital origin. They are most frequently located either at the internal or the external os. When the stricture is the result of deposition of cicatricial tissue, I believe that a proper surgical operation should be resorted to ; or when the external os is of the pin hole type, it should be incised or divulsed. However, many patients object to a procedure which savors of a surgical operation, and in these instances, as well as in inflammatory strictures, negative galvanization is of the greatest utility. This is accomplished by attaching an olive point, a size larger than the strictured canal, to a urethral staff. The dispersing positive electrode is placed over the lower abdomen. After the metal electrode is introduced into the canal, a ten milliampère current is turned on, which will enable the operator, by slight pressure,

to carry the bulbous tip beyond the strictured point. It is then withdrawn before the current is turned off. At the next sitting (the sittings should be repeated every second or third day) a bulb one size larger can be selected, the size being gradually increased until a cure is accomplished. A current thus localized by the bulbous points should never be used stronger than fifteen milliampères.

In virgins, the abdomino-lumbar method may be tried before the direct is resorted to. However, in no instance should the treatment be abandoned as useless until the direct method has been faithfully persevered in. The applications should be made at least twice a week during the entire inter-menstrual period, and if possible every day during the week preceding the expected flow. Let it be remembered that in any form of dysmenorrhea electricity is but an adjunct, though a very important one, to other methods of treatment.

Subinvolution.

By subinvolution is meant an abnormal condition of the uterus, the result of parturition, in which the organ is at first large, succulent, and congested, this condition passing in due time into induration and hyperplasia.

The first stage is known as acute subinvolution, and the symptoms which are to serve as guides in the application of electricity are *hypertrophy* and concomitant *hypersecretion*. The second stage is characterized by condensation of tissue with atrophy, constituting that condition ordinarily defined as *areolar hyperplasia*. The indications for the use of electricity are very different in the two stages. In the first the object to be attained is stimulation and contraction; in the second, absorption of fibrous tissue and improved nutrition. Other methods of stimulating the uterus and causing it to empty itself of blood are the hot douche, intra-uterine applications, and the glycerin tampon. Electricity cannot supplant these several methods and should be considered simply as a supplement to them. In acute subinvolution the faradic current should be used for a few moments every day or every other day, followed by the customary glycerin or boro-glycerid tampon. If the hemorrhagic tendency is marked the positive pole of a galvanic current of from thirty to fifty milliampères may be used direct. If any inflammatory symptoms exist the greatest care must be observed, particularly if applied by means of an intra-uterine electrode. By placing an intra-vaginal electrode in direct contact with the cervix with the external pole over the abdomen, the current is made to act upon both the uterus and the vagina. This is desirable, for in most instances

subinvolution of the uterus is associated with subinvolution of the vagina. In chronic subinvolution, or areolar hyperplasia, the negative pole of the galvanic current must be used direct ; or the current can be localized within the uterus by means of the bi-polar electrode.

Superinvolution and Atrophy.

These two conditions are the opposite of subinvolution, yet experience has demonstrated that in all three electricity is a valuable therapeutic agent. Rockwell observes that "a still more paradoxical feature of electricity is its power to relieve symptoms of the most variable character, and its diametrically opposite action upon normal and abnormal tissue." In proof of this he cites the fact that it relieves both hyperesthesia and anesthesia ; that in one instance it will excite torpid excretory processes and in another it will restrain this function when too active ; and that while it will surprisingly develop normal tissue it will often readily reduce morbid growths. This seemingly paradoxical action is inexplicable to one unfamiliar with the law, *similia*.

The object to be attained in superinvolution and atrophy is stimulation and improved nutrition; this is best accomplished by alternate faradization and galvanization. It must be admitted, however, that in superinvolution the results obtained by any method of treatment are not encouraging. Dr. Fordyce Barker is of the opinion that the prognosis depends upon the activity of ovulation. This is in keeping with what has alredy been said regarding the prognostic value of the molimina in amenorrhea, for the molimina are in most instances undoubtedly due to ovulation. Dr. Barker gives as further symptoms of ovulation without menstruation pain and a sense of dragging in the pelvis, nausea and vomiting, intense headache with flushing of the face and congestion of the eyes. To this list Dr. Rockwell adds intense melancholia. So long as these symptoms are present, and in the absence of more effectual methods, we are justified in persevering with electricity.

Grandin recommends the application of faradism just before and during the molimina, using utero-abdominal galvanization during the intervals. Inasmuch as amenorrhea is usually associated with an undersized uterus, the negative pole should be used direct in order to utilize its hemorrhagic effects.

Ovaralgia.

Neuralgic pains having their origin in or near the region of the ovaries, with an entire absence of appreciable lesion, constitute that

condition known as *ovaralgia*. As in all neuralgic affections, the symptoms are chimerical and changeable. Hyperesthesia and pain are the ones to be overcome, but in certain cases faradization is more useful than galvanization. Rockwell, guided by his extensive experience in the treatment of external neuralgias, deduces his indications from the effects of pressure: If pressure relieves, faradism is the preferable form; if pressure intensifies, galvanism affords more speedy relief. Engelmann, on the other hand, bases his indications upon the duration of the difficulty, using the high tension faradic current in acute, and the galvanic current in chronic cases. The applications may be made either direct or indirect.

Chronic Ovaritis

There is a variety of chronic ovaritis, characterized by congestion and enlargement of the organ without adhesions, in which electricity in the form of galvanism is the remedy *par excellence*. The congestion and irritation may result from many causes, but the most common one is sexual irregularity in some form. There is pain in one or both ovarian regions, which is worse before and during each menstrual period, and is aggravated by walking. The tendency of modern gynecology is to remove an ovary thus affected with but little ceremony. I am confident that the intelligent use of galvanism would make many such operations unnecessary.

The hyperesthesia is best overcome by using the positive pole of the galvanic current direct. A vaginal electrode placed as close to the enlarged organ as possible, with the negative pole over the tender external area, is the most satisfactory way of administering it. If the indirect method is the one employed, the positive pole should be placed over the ovary and the negative over the sacrum. I do not think that a current of greater intensity than twenty-five milliampères is ever necessary. The *séances* should be repeated at least twice or three times a week.

Chronic Pelvic Inflammation.

Under this head is included inflammation of any of the pelvic organs, but particularly the uterus and its annexa, together with their investing cellular tissue and the peritoneum. The pathology represents congestion and exudation, which, in turn, give rise to pain because of pressure, and to innumerable reflex symptoms. If such an exudation can be absorbed, and the pressure resulting therefrom re-

lieved, the patient is made well. Even by combining all of the curative measures at our command, viz., the hot douche, the medicated tampon, the indicated remedy, and electricity, we shall often fail in accomplishing this. I nevertheless contend, that unless it is clearly evident pus has formed as a sequela of the inflammation, or unless other existing symptoms make delay hazardous, it is our duty to exhaust all reasonably safe methods before opening the abdomen. In the light of present data electricity promises much, and unless electro-puncture is restored to, of which I do not approve, is perfectly free from danger.

In almost all cases of chronic pelvic inflammation there is both local and general distress, and consequently, in the application of electricity, three prominent indications are to be met, viz., sedation, absorption, and the relief of local congestion. When the local tenderness is very great, and particularly if menorrhagia is a prominent symptom, as it often is, the positive pole is the preferable one to use direct. After the local tenderness and the hemorrhage have in a measure been controlled the negative pole should be used direct, because of its destructive tendencies. Intra-uterine applications must be made with much care, and intolerance of the uterus watched for. The applications should be used from two to three times a week, the intensity of the current being governed, within certain limits, by the susceptibilities of the patient.

Uterine Displacements.

Uterine displacements are not infrequently associated with, or the result of, those pathological changes which have already been considered in this chapter. When due to any of the causes enumerated the usefulness of electricity will depend upon the curability of the subinvolution, the absorption of adhesions, or the restoration of a relaxed pelvic floor. The kind of electricity and the method of application will, in such instances, necessarily depend upon the special lesion or lesions responsible for the displacement. There yet remains a certain number of cases of ante- or retro-flexion due to deficient muscular tone in the region of the internal os, or to imperfect development. If the weak point in the uterus which is responsible for the displacement can be restored to a normal condition by the use of electricity, it is certainly more than has yet been accomplished with any other method of treatment.

It is, however, admitted by Rockwell, who is an enthusiastic advocate of the agent in this field, that the results have not equaled the promises made by Tripier and some other specialists. Its usefulness probably depends upon the hyperemia and the contraction of involuntary muscu-

lar fibers produced by the current. If this theory is correct it is desirable to localize its action as much as possible. To accomplish this the indirect pole should be placed in the rectum or in the bladder, depending upon the direction of the displacement. The other electrode is introduced into the uterus; or, better still, the current can be confined to the uterus by means of an intra-uterine bi-polar electrode. Faradization is called for in the majority of cases, but if local nutrition is much involved an occasional application of galvanism will hasten the cure.

Endometritis.

Endometritis is one of the causes of obstructive dysmenorrhea and is frequently associated with metritis and subinvolution. I have in another chapter dealt with the disease as a pathological entity, to which the reader is referred for detailed symptomatology. As a rule, corporeal endometritis is characterized by more or less pelvic distress during the inter-menstrual period, with all the symptoms of obstruction at the time of the flow The flow is usually excessive. These cases should be treated by means of an insulated copper sound of sufficient length to traverse the entire depth of the uterus, and of sufficient diameter to fill the canal. A large negative dispersing electrode is applied to the abdomen, when the current, varying in intensity from twenty-five to seventy-five milliampères, is gradually turned on through a rheostat. It should be continued from five to ten minutes and repeated every third day for at least a month. Electricity thus applied to an endometrium chronically inflamed and thickened will act curatively because of its power to control hemorrhage through cataphoresis and to dry the endometrium by attracting the acids through electrolysis. (Martin.) Besides, it has a general tonic effect upon the entire organism; it drains the uterus in a purely mechanical way; it contracts local blood vessels; and it exerts a sedative effect upon the hyperesthetic pelvic organs.

In cervical endometritis the usefulness of galvanism can hardly be over-estimated. Positive cauterization of the cervical endometrium will very often hasten the cure of cervical endometritis with glandular involvement. When the ordinary resources fail I prefer a copper electrode for its application. The applications should be made not oftener than once a week, and supplemented by the ordinary treatment for that condition.

NOSOLOGY.	PATHOLOGY.	SYMPTOMS.	INDICATIONS	TREATMENT.
AMENORRHEA.	Imperfect development and malnutrition; Atony.	Presence or absence of molimina (prognostic); Nervous depression.	Stimulation and improved nutrition.	*Faradization.*—General or local. (*Rockwell.*) *Galvanization.*—Central or local, negative pole direct. *Franklinization.*—General.
DYSMENORRHEA.	Depressed nervous tone; Flexures; Strictures.	Hyperesthesia; Neuralgia; Symptoms of obstruction.	Sedation and Stimulation.	*Sedation.*—Galvanization, with positive pole direct. *Stimulation*—Faradization, direct or indirect
SUBINVOLUTION. (ACUTE.)	Congestion.	Hypersecretion.	Stimulation and contraction.	*Stimulation.*—Direct Faradization. *Galvanization.*—Positive pole direct.
SUBINVOLUTION. (CHRONIC.)	Hyperplasia.	Deficient secretion; Hystero-neuroses.	Absorption of fibrous tissue and improved nutrition.	*Galvanization.*—Negative pole direct. If hyperesthesia, positive pole direct.
SUPERINVOLUTION.	Atrophy.	Amenorrhea.	Stimulation and improved nutrition.	Direct Faradization. *Galvanization* —Negative pole direct.
OVARALGIA.	No tissue changes.	Hyperesthesia.	Sedation.	If pressure aggravates—Galvanization. If pressure ameliorates —Farad. (*Rockwell.*)
CHRONIC OVARITIS.	Congestion and Inflammation.	Hyperesthesia.	Sedation.	*Galvanization.*—Positive pole direct. Secondary faradization.
CHRONIC PELVIC INFLAMMATION.	Pelvic congestion; Exudation.	Hyperesthesia; Pressure and reflex symptoms.	Sedation; Absorption and relief of local congestion.	*Sedation.*—Galvanization, positive pole direct *Absorption.*—Galvan., negative pole direct. Electro-puncture (*Apostoli*)
ENDOMETRITIS.	Congestion and Inflammation.	Hypersecretion and hyperesthesia.	Sedation and relief of congestion.	*Galvanization* (positive pole direct). Faradization.
UTERINE DISPLACEMENTS.	Congestion; Inflammation; Atony.	Depend upon tissue changes.	Depend upon tissue changes	*Congestion* —Galvanization and Faradization (Bi-polar electrode). *Inflammation.*—Galvan (positive pole direct) *Atony.*—Faradization (Bi-polar electrode).

CHAPTER XII.

ANTISEPSIS AND ASEPSIS IN GYNECOLOGY.

With few notable exceptions all modern surgeons and gynecologists of note acknowledge the advantages of antisepsis. Those who do not, admit at least the utility and desirability of asepsis. There are but few even among the most ardent advocates of antisepsis who would resort to antiseptics if they thought perfect asepsis were possible without the use of the germ destroying agents. There is no question that the indiscriminate use of antiseptics in the past has been attended with harm. This is especially true as regards the spray. And, too, it must be admitted that we are yet in ignorance regarding much that pertains to the field of bacteriology—a science as yet in its infancy, though wonderful strides have been made in this field during the last few years. We cannot at the present time determine with absolute certainty whether, in a given case, the existing germs are the *cause* or the *product* of morbid processes. Personally, I am a believer in the germ theory of disease. It affords to my mind the most rational explanation yet put forth of the transmission of many diseases.

In experimenting with antisepsis I have passed through three stages. When the so-called antiseptic craze first swept over the country I was fresh from college and had hardly seen a wound of any kind heal by first intention. I was delighted with the early experiments made with carbolic acid and bichlorid of mercury. Unfortunately I soon met with several cases of carbolic and mercuric poisoning, which led to my discarding for some years these agents entirely. I then studied antisepsis under some of the best-known Eastern specialists, and came to the conclusion that the accidents attending their use in my hands were largely due to faulty technique of application. During the first seven years of my service in the University of Michigan, I was compelled to do all of my hospital work in a building notoriously insanitary. As soon as I began to practice antisepsis in a fairly intelligent way my results were infinitely better; yet, in spite of the precautions taken, I had to do every now and then with suppurating wounds. Later, I studied the technique of antisepsis in many of the European hospitals.

Sir Joseph Lister's methods, as practised in King's College Hospital, disappointed me. I never have seen more untidy operating than I witnessed in the clinic of the "father of antisepsis." This surgeon washed his wounds with a small quantity of bichlorid water, which he used until it became absolutely thick with blood; yet, I was informed, his results were good. In nearly all of the London hospitals visited by me during the year of 1889, antisepsis was practised in this same haphazard manner. With the Continental surgeons, on the other hand, antisepsis had become almost a religion. As practised by such men as Leopold, of Dresden, and Martin, of Berlin, it meant a great deal more than was comprehended by me before seeing these men operate. I now endeavor to carry out their methods as nearly as possible, and am more than satisfied with the results obtained. Pus in the healing of non-septic wounds is almost unknown to me. When suppuration does occur, I can usually trace the cause to some avoidable source of infection—improperly prepared ligatures oftener than anything else.

I cannot in a practical treatise of the nature of this work discuss in detail the germ theory of disease. However, I desire briefly to consider the arguments which the opponents of antisepsis put forth. These may be stated as follows :

1. That certain prominent surgeons still ignore antisepsis *in toto* with results equal to those obtained by the most rigid disciples of antisepsis;

2. That certain dangers attend the use of chemical germicides, which more than offset any good which may come from their use; and

3. That it is possible by internal medication and hygienic treatment to so favorably impress the system as to make the multiplication of organisms within the body harmless or impossible.

"That certain prominent surgeons still ignore antisepsis *in toto* with results equal to those obtained by the most rigid disciples of antisepsis."

Lawson Tait is the one man above all others who is quoted as the chief anti-antisepsis apostle. He is referred to by big men and small who still contend that the germ-destroying agents are unnecessary. Very few of the men who so presistently quote Tait in this connection have seen him work. On the other hand, I cannot at this moment recall one surgeon of prominence in this country who has seen him operate who is not a firm believer in antisepsis. That Tait is a remarkable surgeon his worst enemies will admit; and it is his wonderful dexterity which has, in my opinion, enabled him to accomplish the results which he has accomplished in the old-time way. However, while this surgeon may be more than ordinarily successful in the saving of life, he is not an ideal surgeon. One has to go from his clinic to the clinics

of such men as Martin, of Berlin, or Leopold, of Dresden, to become a firm believer in antisepsis. The English surgeon is slovenly, his wounds are frequently infected and he uses drainage often. The Germans are clean, pus in the healing of wounds is almost unknown to them, and they rarely resort to drainage. The contrast is most striking and the conclusions inevitable. Bantock, who is also frequently quoted as opposed to antisepsis, is a thoroughly clean operator and may well be dubbed the apostle of asepsis. That Bantock's results are good no one will deny; that they might be better were he to practice antisepsis is not improbable. At any rate one is impressed with his extreme cleanliness. Now, why this extreme cleanliness? The question is certainly a pertinent one and cannot well be answered without admitting the probable correctness of the germ theory of disease. If, then, more perfect asepsis can be obtained by germ-destroying agents, and if the use of such agents is unattended by danger, is it not better to be on the safe side and use them? Tait is at least consistent and permits the germs to fight their own battle after entering the system. Bantock is clean because he desires to prevent germs and infected matter from entering the system. I believe, from personal observation and from what others have told me, that both of these gentlemen have to contend with pus much oftener than do modern antisept cians.

"That certain dangers attend the use of chemical germicides which more than offset any good which may come from their use."

I do not deny that harm has been done in the past by the so-called chemical germicides. In the early days of Listerism the stronger solutions of carbolic acid and bichloride of mercury were used, and many cases of poisoning were reported. Then, too, the chemical antiseptics were introduced into parts of the body where we would not think of introducing them at the present time. The peritoneal cavity was irrigated with the carbolic and mercuric solutions; the same solutions were applied directly to the meninges of the brain; the uterine cavity was douched with mercuric solutions as strong as one to five hundred after labor and abortion, and, when used in any of the natural or artificial cavities of the body, suitable drainage was not provided for. It was not strange, under the circumstances, that mercuric and carbolic poisonings were common. It was difficult for Lister and his early followers to comprehend, at a time when bacteriology was in its infancy, that mercuric solutions of the strength of one to five or ten thousand could possess germicidal properties.

Experience has taught us many things regarding antisepsis, and the general tendency of the present time is to keep the chemical germicides

from open wounds. All antisepticians admit that heat in some form is the best of all germ-destroying agents. Unfortunately it cannot be applied to living tissues when primary union is the object sought for, and I believe that the application of the actual cautery to pedicles highly endowed with nerve tissue, and to the lower orifices of the body, is to be deprecated. It can, however, be utilized in the sterilization of instruments, dressings, ligatures and water, so that the stronger solutions of the chemical agents can be reserved for the hands and skin surfaces, while the weaker ones only are to be used in open and extensive wounds, if used at all. In short, asepsis is to be obtained through antisepsis and antiseptic agents. These are the general principles of antisepsis as practiced by the rank and file of the practical surgeons of the day. By observing these principles no serious harm will follow in the train of the germ-destroying agents. Occasionally cases will be met with of peculiar idiosyncrasy which will manifest toxic symptoms, even though every precaution is observed. Fortunately, we are now sufficiently familiar with toxic symptoms of the germicides in general use to enable us to recognize them at their very onset and to withdraw the active agent before the system is profoundly impressed. Compared, then, with the statistics soon to be presented, the danger attending the intelligent use of antiseptics deserves little more than passing notice.

"That it is possible by internal medication and hygienic treatment to so favorably impress the system as to make the multiplication of organisms within the body harmless or impossible."

No one will, I think, dispute the advisability of getting the system into as perfect working order as possible previously to the operation. This goes without saying. Unfortunately, however, the surgeon many times has to work under the most adverse circumstances for all parties concerned—except the germs. Perfectly well people rarely submit to the surgeon's knife. The system is often surcharged with pus, or the tissues are so affected by long-continued disease that they offer but feeble resistance to the entrance and multiplication of living organisms. Undoubtedly proper hygienic and internal treatment, combined with certain sustaining and eliminative measures which are now well known, is of the greatest utility. So, too, are certain remedial agents efficacious in the treatment of scarlatina; but, because this is so, no sane physician would be so foolish as to expose his child to scarlatina if he could prevent such exposure. I do not believe that I am carrying the philosophy of analogy too far in making this comparison. I am assuming, of course, that both surgical fever and scarlatina are due to specific

germs—a theory which has more of the evidences of truth on its positive than on its negative side.

Unquestionably the diminished mortality in surgical work can be attributed in a measure to improved technique, but this can hardly be said of certain operations, notably amputations. Let the reader compare the old *régime* in amputations, with its from four to eight weeks of suppuration, with the present method of ten days' undisturbed dressings and pusless union. The technique of amputations—so far as mechanics are concerned—is practically what it was twenty years ago, and the more favorable results can only be accounted for by the application of antisepsis. Such at least seems to me the logical conclusion to which any unbiased investigator will come if he start from proper premises. It matters but little to the practical surgeon whether *the staphylococcus pyogenes aureus*, *the streptococcus pyogenes*, and other forms of bacteria, are the *cause* or the *result* of pus. Sufficient for him is the fact *that they are found with pus, and that by resorting to certain precautions implied by the term antisepsis pus and harmful micro-organisms can be excluded in the healing of wounds.*

Finally, the ultimate test of all systems and methods of cure or prophylaxis, must be the results obtained. What has been said of amputations applies with equal force to nearly all operations. Antisepsis, through which asepsis has been made possible, has wrought a revolution in surgery. It has reduced the mortality in celiotomies from seventy to less than five per cent. It has, according to the latest statistics, diminished the mortality in breast amputations from twenty to one per cent., notwithstanding the fact that the modern technique in this operation is infinitely more complicated and destructive than it was in the older operation. It has begot a degree of confidence on the part of the surgeon which has led him to explore, and with comparative impunity, almost every organ and part of the body, the brain not excepted; such explorations having resulted in numberless operations and cures, which a few years ago were not dreamed of even by the most sanguine. It has robbed the lying-in room of much of its former terror, and it has reduced the death-rate from so-called puerperal fever in certain lying-in hospitals from forty to one-half of one per cent.

The foregoing data can be verified by any one caring to take the time to investigate the subject. The evidence going to prove the value of antisepsis would seem to be overwhelmingly convincing to even a casual investigator. However, the fact cannot be ignored that a very large per cent. of the general practitioners of the country are sceptical regarding the claims set forth. This scepticism is based on

personal experience. Many of these gentlemen follow, after a fashion, the rules of antisepticians, but they have to contend with suppuration nearly, if not quite, as often as before the age of antisepsis Their failure can be accounted for in two ways:

1. As general practitioners, they are constantly coming in contact with contagious, infectious and septic diseases, which make perfect disinfection of the clothing and body exceedingly difficult, and oft-times impossible.

2. Many of them do not fully comprehend the philosophy of antisepsis and, consequently, carry out its principles but imperfectly.

1. Very few general practitioners, especially in rural regions, can get on without doing more or less surgery, and it is right that they should do it. However, for the reason given, I contend that capital operations, other than acute cases, and especially those involving the peritoneal cavity, should be assigned to the exclusive specialist. Medicine is now too comprehensive a science to be covered by any one man. Indeed, it requires more than the ordinary mind to keep apace with the literature of any one of its several departments. The general practice of medicine constitutes in itself one of the most important of the specialties, and affords innumerable instances for the intelligent application of the principles of antisepsis. Much which has been accomplished in the field of preventive medicine has been done through the means of antiseptics, and the physician who to-day ignores antisepsis and antiseptic agents in the treatment of disease, either medical or surgical, is in my opinion depriving his patient of one of the most valuable of modern discoveries.

2. The successful antiseptician must constantly bear in mind that, like a machine, antisepsis is no stronger than its weakest part. In a given operation, the operator may rigidly carry out all antiseptic details with one single exception, which exception may contaminate his wound and spoil the operation. It requires an endless amount of work to apply successfully the principles of antisepsis. No one can master these principles without a working knowledge of bacteriology. He must know, first of all, the relative power of the several germ-destroying agents and their effect when applied to living tissues. He must know the probable sources of wound infection, and he must know how best to make the field of the wound aseptic previously to the operation and how best to keep it free from harmful organisms during the operation and during the healing process.

The application of antisepsis in the practice of gynecology will be dealt with under the following heads:—

1. The agents employed.
2. The operator and assistants.
3. The patient.
4. The operating room.
5. The operation.
   (*a*) The preparation and care of instruments;
   (*b*) The preparation and care of ligatures, sponges and drainage tubes;
   (*c*) The use of the irrigator;
   (*d*) The dressings employed.
6. The after-treatment.

1. **The Agents Employed.**—For making antiseptic solutions I use almost exclusively corrosive sublimate and carbolic acid.* These can always be obtained, are inexpensive, and, above all, are probably the most trustworthy agents which have been extensively used up to the present time. Creolin and beta-naphthol are highly recommended by some operators. Permanganate of potash and oxalic acid are also used quite extensively for the purpose of disinfecting the hands. Boric acid, salicylic acid and chloral are of but limited value. Within the last few months formalin has become very popular as a general antiseptic. It is claimed for it that it is a much more effectual germicide than is the bichlorid of mercury, without any of the irritating and poisonous properties of the latter agent. Besides being a germicide, it is a powerful disinfectant and deodorizer. It is especially useful for the disinfection of dwellings and clothing. My experience with this agent up to the present time has been limited. On the whole it is better for the sur-

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* *1:20 Carbolic solution.*

℞. Acid carbolic, ... f℥vi¼
Aq. destillat. . . . . q. s. ad. Oi—M.

1:1000 Bichlorid Solution.

℞. Hydrarg. chlor. corros.,
Sodii chlor., ... āā ℈i
Aq. destillat. . . . . q. s. ad. f℥i—M.
Sig.: f℥i to Oi = 1 to 1000.

Saturated Solution of Boric Acid.

℞. Acid boric, ... ℥iv
Aq. destillat. . . . . Oi—M.

1:1000 Permanganate of Potash Solution.

℞. Potassii permanganat, ... ℈i
Aq. destillat. . . . . f℥i—M.
Sig.: f℥i to Oi = 1 to 1000.

Normal Salt Solution.

℞. Sodii chlor., ... ℥iss
Aq. destillat. . . . . f℥33½—M.

geon to adhere to those agents which he knows to be efficacious, and which he has learned to use intelligently.

Only the weakest possible solutions known to possess germicidal properties should be used in open wounds, and under no circumstances should the stronger solutions of mercury or carbolic acid be left in natural or artificial cavities of the body. Halstead, of Johns Hopkins Hospital, has made a series of experiments which show that a solution of bichlorid of mercury as weak as 1:10000 will cause a superficial line of tissue necrosis, which furnishes a soil for the pus-producing micro-organisms. For this reason many surgeons prefer the normal salt solution (ʒiss of sodium chlorid in 33½ ounces of sterile water), or sterile water alone, for irrigating open wounds, reserving the mercury for the skin surfaces.

If carbolic solutions are made of cold water, an equal amount of glycerin or alcohol should be added. Carbolic acid is soluble in warm water up to the strength of five per cent.

The sleeves should be rolled above the elbows and the nails scrupulously cleaned. The hands and forearms are next scrubbed for ten minutes in water as hot as can be borne, with green soap and a sterilized brush. After removing the excess of soap they are washed for two minutes in a warm saturated solution of permanganate of potassium. Next they are thoroughly bleached in a warm saturated solution of oxalic acid. They are then rinsed in a saturated solution of bicarbonate of soda, and finally immersed for two minutes in a 1:500 bichlorid solution. (Hunter Robb.)

This method of sterilizing the hands when used often causes them to become rough and tender. The permanganate also stains the nails so that they are not readily bleached by the oxalic acid. Latterly I have washed the hands, after completing the operation, in pure peroxid of hydrogen, which not only bleaches the hands and nails perfectly but leaves the skin soft and smooth.

2. **The Operator and Assistants.**—As already observed, neither the operator nor his assistants, especially if doing abdominal surgery, should come in contact with contagious or infectious diseases of any kind; nor should they come from the dead room to the operating amphitheatre. Frequent washing of the entire body, including the head and beard, should be practised. In the event of contact with any of the contagious or infectious diseases, corrosive sublimate (1:2000) or formalin should be used to cleanse the person. The clothing should be absolutely free from infection of any kind, and, during the operation, protected with a sterilized operating gown and apron extending from the

FIG. 82.

OPERATING GOWN.

neck to the feet. (Fig. 82.) In celiotomies the hair should be covered with a sterilized gauze cap. (Fig. 83.)

FIG. 83.

3. **The Patient.**—The necessary preparation of the patient will depend somewhat upon the nature of the operation. For the ordinary operations upon and through the genital tract the patient should take a bath the night preceding, or the morning of the operation. The bowels should be emptied by a soap and water enema not later than two hours before the anesthetic is given; if the enema is administered later than this water is retained and will be expelled during the operation.

In surgical work within or about the rectum it is a good plan to follow the enema with a saturated solution of boric acid. The patient should have the vagina washed with a large hot bichlorid douche the night before the operation and the vagina packed with iodoform gauze. The external genitalia and mons veneris should be thoroughly scrubbed with green soap and a 1:1000 bichlorid solution, shaved, and a 1:1000 bichlorid compress left over them.

After the patient is anesthetized the mons veneris and external genitalia are again washed with soap and water, shaved, and finally douched with a 1:1000 bichlorid solution. Next the vagina, by the aid of the fingers, is thoroughly washed with the same solution. When the cervix is exposed any existing discharge should be carefully sponged away.

In abdominal cases the bowels should be emptied the day before the operation with a cathartic, and the morning of the operation with an enema. The skin should be gotten in good shape by means of a daily bath two or three days prior to the operation. For at least thirty-six hours previous to the operation the diet should be entirely liquid. She should be encouraged to drink freely of hot water for several days preceding the operation. The hot water flushes the kidneys and overcomes in large measure the extreme thirst attending celiotomies. (W. H. Humiston). Nothing should be taken into the stomach later than six hours prior to the operation. The abdomen, pubes and genitalia are scrubbed on the night preceding the operation with green soap and water, then with equal parts of alcohol and ether, and finally with a 1:1000 bichlorid solution. A compress wrung from a 1:1000 bichlorid solution is applied to the lower abdominal and genital regions for at least twelve hours previously to the operation. The vagina is prepared with the same care as in operations confined to this canal. After the last douche it is packed with iodoformized gauze, which is to be left in until the patient is anesthetized. The pubes should be shaved on the day preceding the operation.

When everything is in readiness to operate, the compress and tampon are removed, the field of operation again washed with soap and water, then with a 1:1000 bichlorid solution and finally with a normal salt solution. Especial care is to be observed in cleaning the umbilicus, in order to dislodge all hidden accumulations. Next, sterilize towels are wetted in sterile water and placed in such a way as to cover the entire surface of the abdomen (except the immediate site of the incision), the genital region, and the upper thighs; or the field of the operation may be protected by means of a perforated gauze apron.

All instruments, ligatures, etc., are thus prevented from coming in contact with any portion of the integument.

4. **The Operating Room.**—In the construction of hospitals the operating room should be as far removed as it can be from the general wards, or from other possible sources of infection. It should be so constructed as to be easily cleaned, and there should be no unnecessary angles or woodwork upon which dust or germs can lodge. The furniture should be scanty and exclusively of metal or glass. A sky-light, especially in abdominal work, is most desirable. Antiseptics of variable strength, and sterilized water, should be conveniently at hand. (Fig. 84.)

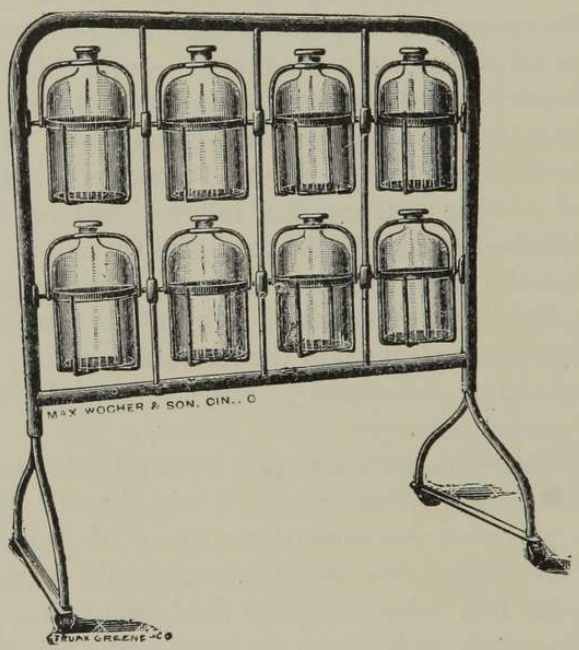
In operative work outside of the hospital all mattings, curtains, tapestry, and unnecessary furniture should be removed. A room should be selected possessing a good light—preferably with a southern exposure. Inquiry should be made as to whether the room has been recently occupied by contagious or infectious cases. If an abdominal section is to be made old paper should be removed, the walls washed with a 50:1000 carbolic solution, and followed by formalin disinfection. This is accomplished by closing the room tightly and by placing several pastilles of formalin in the tube of a lamp especially constructed for the purpose. The lamp is permitted to burn out and in one or more hours the room may be cleansed of the formalin vapor by a short airing. The room ought to be gotten ready at least forty-eight hours before the operation.

The Operation —Various methods having for their object the *disinfection of instruments* are in vogue. I rely almost entirely upon boiling in a one per cent. solution of carbonate of soda. Experiments have shown that instruments are made perfectly sterile by boiling in this solution for five minutes. The soda keeps them from rusting. During the operation they are to be kept immersed in sterile water. The antiseptic agents, unless indeed formalin proves an exception, are so injurious to all metal instruments that I have discarded them for this purpose. Instruments of the simplest construction, which can be taken apart and thoroughly cleaned, should be purchased. The handles should be of metal so that the boiling will not damage them. After an operation all instruments are scrupulously cleaned, boiled in the soda solution and dried. This method possesses all the elements of simplicity and can be applied under all circumstances. All towels and dressings used about the operation should be thoroughly sterilized by being subjected either to dry heat or boiling.

The ordinary dressings consist of bandages, absorbent gauzes and absorbent cotton. These should be subjected to a temperature of 212°

F. for three quarters of an hour in an Arnold's sterilizer. They should be thoroughly dried before being applied to the wound. Bacteriological research has abundantly proved that moisture is essentia for the growth of micro-organisms and the object of the gauze and cotton is to keep the wound dry through absorption and evaporation. Wounds outside of the peritoneal and cranial cavities should be constantly irrigated or sponged during the operation with a 1:5000 bichlorid solution, or the normal salt solution. The wound should be dressed with iodoform, iodoform and bichlorid gauze, and sterile cotton,

FIG. 84.



BOTTLE STAND FOR HOLDING ANTISEPTICS.

which are to be kept *in situ* by means of straps, collodion, or a sterile bandage.

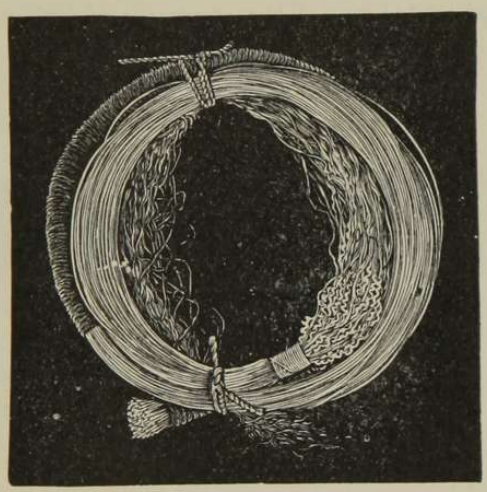
The *ligatures* most generally used are silk, silkworm gut, silver wire and catgut. The flat plaited silk is preferable to the twisted. It comes in six sizes and should be boiled for an hour in a 50:1000 carbolic solution, or steamed for one hour on three successive days in an Arnold's sterilizer. When steam sterilization is used the silk should be placed in strong glass tubes plugged with cotton previously sterilized. I believe it safe to boil the silk with the instruments previously to each operation. Silkworm gut may be prepared and kept in the same way.

It comes in rolls, each roll containing one hundred strands. (Fig. 85.) The strands should be cut and placed in test tubes for sterilization.

I am using catgut or sheepgut (nearly all so-called catgut is sheepgut) more and more in plastic work as time goes on. If properly prepared and perfectly aseptic, it is one of the best ligatures, possessing the great advantage of being absorbed. It is the one suture, therefore, which can be buried in the tissues. Catgut is, however, a most treacherous material and, until quite recently, the various methods of sterilization have proved unsatisfactory. Kelly's modification of Krönig's method is said to make the gut perfectly sterile without injuring its texture. It is as follows:

1. Cut the catgut into desired lengths, and roll twelve strands into a

FIG. 85.



SILK WORM GUT.

figure eight, formed so that it may be slipped into a large test-tube.

2. Bring the catgut gradually up to a temperature of 80° C., and hold at that point for an hour.

3. Place the catgut in cumol, which must not be above a temperature of 100° C., raise it to 135° C., and hold it at that point for an hour.

4. Pour off the cumol, and either allow the heat of the sand-bath to dry the catgut, or transfer it to a hot-air oven, at a temperature of a 100° C., for two hours.

5. Transfer the rings with sterile forceps to test tubes previously sterilized as in the laboratory.

Messrs. Johnson and Johnson have prepared for me a "*ten-day*" chromicized catgut, which is most satisfactory, and which I am using

in all my plastic work. This has been placed upon the market under my name. I found the ordinary chromicized gut too non-absorbable.

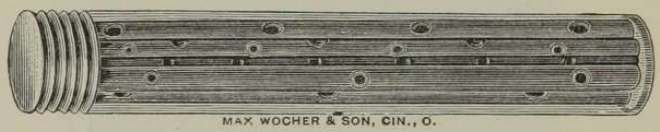
Formalin is already being utilized for the sterilization of catgut.

The only preparation required in using silver wire is heat sterilization.

Gauze or cotton sponges have largely supplanted sea sponges because they are readily sterilized by heat. Sea sponges, however, because of their greater absorbing power, are to be preferred in abdominal work. They are prepared as follows:—

The sponges are frequently washed in water for the purpose of removing all sand and dirt. This requires several days. They are next soaked for three or four minutes in a saturated solution of permanganate of potash. The permanganate is then washed out by repeated squeezings in fresh water. Next they are placed in a solution of sodium hyposulphite, of the strength of half a pound of the salt to a gallon of sterile water, to which an ounce of oxalic acid has been added, and then emersed for ten hours in a 1:500 bichlorid solution.

FIG. 86.



PREPARED RUBBER TUBING.

From this solution they are washed in warm sterilized water and then in a five per cent. carbolic solution and dried. They should be kept in a perfectly tight glass jar until used, when they are to be again washed in a 1:500 bichlorid solution and then in sterile water.

I prefer to purchase inexpensive sponges and use them but once. It is entirely possible, however, unless they have come in contact with septic matter, to clean them after being used so as to make them again perfectly aseptic. They should be first washed in plain water, so as to remove as much of the blood and filth as possible. They are next placed in the soda solution, which will dissolve the blood and fibrin. This should be changed several times, and the sponges should be repeatedly washed and squeezed in it. Finally, they are cleansed in pure water, "dipped in carbolic solution, squeezed and dried, and kept in a dry place till further use." After septic operations, it is best to destroy them.

In abdominal work large flat gauze sponges have largely supplanted the more expensive flat sea sponges. These may be made of various

sizes by folding two or more thicknesses of gauze together and trimming the edges so that no shreds will be left behind in the abdominal cavity. I prefer to have them from six to eight inches in width and from twelve to eighteen inches in length. In this form the ends can be left projecting from the abdominal wound, thus diminishing the chance of leaving any of them behind. It is well to have in readiness in celiotomies several gauze sponges ten by twelve inches in size for the purpose of protecting the intestines should they protrude from the abdomen.

Very convenient sponges can be made by rapping absorbent cotton in squares of gauze and tying the ends of the gauze so as to form a ball. These may be made of any size. However, for ordinary surgical work pledgets of gauze will answer every purpose. All gauze sponges should be sterilized with the dressings.

Rubber drainage tubes (Fig. 86) are not often required in gynecological surgery. Soft, pliable rubber tubing, of black material and of proper size, should be selected. This can be thoroughly sterilized by boiling for five minutes in a one per cent. soda solution. It is then cut into suitable lengths, which are placed in a wide-mouthed bottle or glass tube and immersed in a five per cent. carbolic solution. The solution should be renewed from time to time. Rubber drains can be sterilized in the same way.

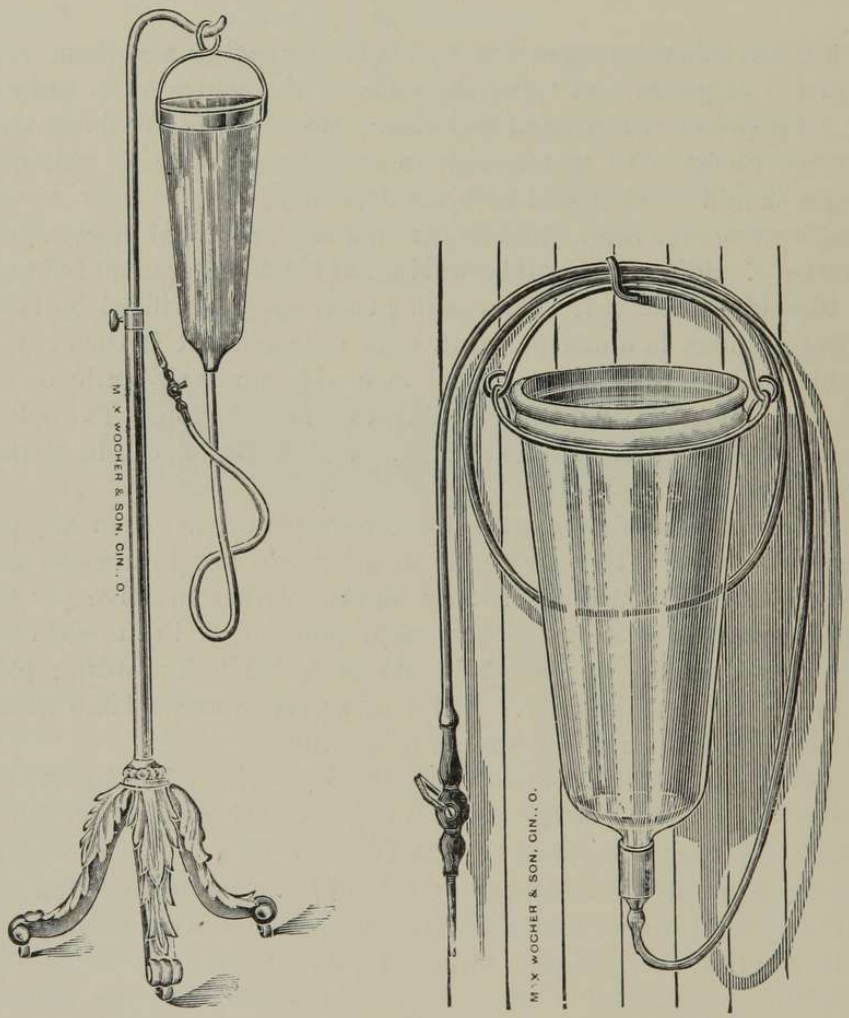
For abdominal drainage, glass tubes are used oftener than any other form of drainage. The antiseptic solutions do not injure the glass, and they can be boiled for twenty minutes either in a five per cent. carbolic solution or a 1:1000 sublimate solution; or in the soda solution. They should be rinsed in sterile water before being placed within the peritoneal cavity. Strips of gauze or sterile lamp wicking may be carried down to the bottom of the tube.

Another form of intra-abdominal drainage which has become very popular during the last five years is the so-called *tamponnement* of the peritoneum, first suggested by Mikulicz. The object of tamponment is, primarily, to isolate the portion of the peritoneum tamponed from the rest of the peritoneal cavity, and, secondarily, to afford drainage by capillary attraction. Mikulicz first places at the bottom of the cavity to be tamponed a purse of iodoform gauze, to the middle of which is attached an antiseptic silk ligature (Fig. 88). Strips of gauze are now packed into this purse in such a way as to produce sufficient pressure to control oozing. The superior ends project from the neck of the purse at the lower extremity of the abdominal wound. I have often used gauze packing within the abdominal cavity without the precaution

of first introducing the purse. It is, however, more difficult and painful to remove one continuous long strip than several shorter ones.

The tampon may be left within the peritoneal cavity for from one to five days. In one case I found it necessary to use nearly four yards of gauze (one yard wide) in order to prevent immediate death from hemorrhage. It was partly removed on the third day, but it was not all

FIG. 87.



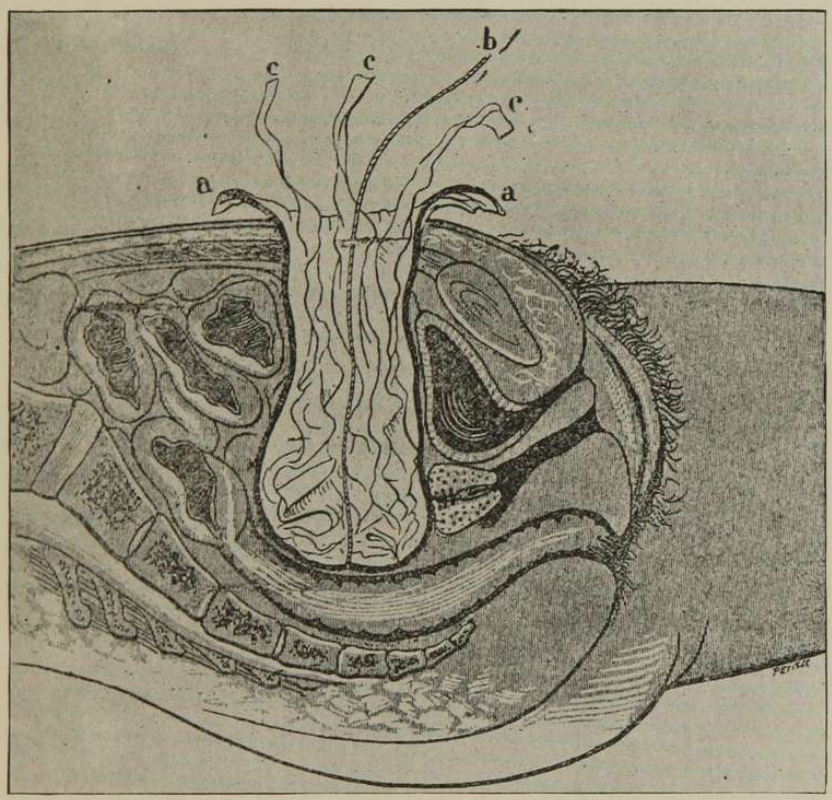
GLASS IRRIGATORS.

withdrawn until the end of the seventh, and was then perfectly sweet. In controlling hemorrhage from large oozing surfaces, which cannot be controlled in any other way, I know of nothing more satisfactory in abdominal surgery than gauze packing. If deemed best a glass drain

may be introduced into the center of the tamponnement, though by placing a pad of gauze over the ends projecting from the abdominal cavity capillary drainage is usually sufficient.

In all operations upon the cervix, vagina, perineum, bladder, or rectum, and in vaginal hysterectomy, the *irrigator* (Fig. 87) is invaluable. Irrigation can be practiced either in the lithotomy or Sims' posture.

FIG. 88.



TAMPONMENT OF THE PERITONEUM. (*Pozzi.*)

a, *a*. Purse of iodoform gauze; *b*. Silk thread; *c*, *c*. Strips of gauze.

With the patient upon her side it is exceedingly difficult, in using irrigation, to keep from wetting her. Nearly all American operators now utilize the lithotomy posture in all operations within the vagina, except those for vesico-vaginal fistula. By using Frisch's modification of Simon's specula the irrigating tube can be attached to the upper blade, at the tip of which is an opening through which the water can pass. The size of the stream is controlled by a stop-cock near the attachment of the tube; or an assistant can use the ordinary irrigator,

Fig. 89.

the size of the stream being controlled by a properly constructed hard rubber nozzle. Care must be taken not to permit the nozzle to come in contact with any unsterilized surfaces. The irrigator and tubing can be sterilized by boiling in the soda solution.

Either the bichlorid (1:5000), or the normal salt solution, may be used for irrigation. In cervical and vaginal work I prefer the mercury, especially where the animal suture is left behind. In large open wounds, such as are created by breast amputations, it is safer to use the salt solution. The solution should be kept at about 110° F.

The parts are kept constantly bathed in one of these fluids, thus preventing wound infection during the operation, and making sponging unnecessary. In using the buried catgut suture within the vagina irrigation should be constant.

Gynecological dressings, outside of abdominal work, are of the simplest character. After plastic operations in and about the vagina and perineum it is my practice to sponge the parts dry and sprinkle iodoform over them. Many operators prefer a powder composed of iodoform one part and boric acid seven parts. Strips of iodoform gauze are then packed into the vagina and about the cervix for the purpose of sustaining the parts should the patient vomit. This is removed in from twenty-four to forty-eight hours. Over the vulva is placed an antiseptic pad.

When the wound is closed by the buried catgut suture, it is recommended by Marcy, of Boston, that it be hermetically sealed with iodoform collodion.

In laparotomy, after the abdomen is closed by whatever method adopted, the wound is washed with a normal salt solution, dried, sprinkled with iodoform, or the iodoform and boric acid powder. This should be applied by means of a suitable box (Fig. 89), when the wound is covered with iodoform or sublimate gauze, over which are placed several layers of sterilized absorbent cotton. The dressings are held in place by a sterilized binder. Should a drainage tube be introduced its mouth is protected by iodoform gauze surrounded by a sterilized rubber dam.

Where no drainage is used the wound may be hermetically sealed in the following way: Powdered iodoform is first sprinkled over the wound. A layer of cut gauze is then placed over the wound,

which is covered by a double layer of iodoform or sterilized gauze large enough to extend two or three inches in every direction beyond the line of incision. This is sealed by pouring over the edge of the gauze enough bichlorid or iodoform celloidin,* to cause it to adhere firmly to the skin. Over this is placed a layer of sterilized cotton which is held in place with a many-tailed binder.

6. **The After Treatment.**—For much pertaining to the after treatment the surgeon will have to rely upon the nurse and general attendants. Consequently, unless he can impress upon them the importance of antisepsis and asepsis, all of his precautions will have been in vain. I know of nothing more exasperating than a slovenly nurse, one who is not sufficiently intelligent, or, if she is, will not follow the surgeon's directions. In operating outside of the hospital it is, therefore, wise to have printed instructions with which the nurse can jog her memory after the surgeon's departure.

In all plastic operations I permit the patient to urinate spontaneously if she can do so. After urination the nurse is instructed to use a small 1:5000 cleansing douche of bichlorid. I have every reason to feel satisfied with this treatment, for failure in primary union is almost unknown to me.† If the patient cannot urinate naturally the catheter is used, care being observed to keep the finger over the mouth of the instrument while it is being withdrawn, so that not even a few drops of urine will come in contact with the wound. When the catheter is used no injections are necessary unless there is a contaminating discharge from the upper genital tract. It is hardly necessary to add that, when the douche is resorted to, each patient should have a separate nozzle, and this should always be sterilized after it is used.

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*℞. Bichlorid celloidin (1 : 16000);
Squibb's ether,
Absolute alcohol, ... āā ℥vjss.;
Of a solution made of 15 grains of bichlorid crystals dissolved in 10 drachms of absolute alcohol, ... 16 minims.

Mix and add of Anthony's "snowy cotton" enough to give the solution the consistence of syrup.

Iodoformized celloidin.

℞. Absolute alcohol, ... ℥viss.;
Iodoform powder, ... ℥xijss.;
Mix and add ether, ... ℥vjss.

Mix and add a sufficient quantity of "snowy cotton" to give the solution the consistence of syrup. (Robb.)

† I will not even except lacerations of the perineum closed immediately after labor.

Antiseptic precautions cannot be too rigorously carried out in the use of the catheter. I have discarded absolutely the old silver female catheter, and very rarely use the rubber instrument. In their stead I use Kustner's glass catheters. They are inexpensive, sufficiently strong to insure against breakage, and can be boiled and cleaned repeatedly. The soft rubber instrument cannot be used with safety more than six or eight times, and *cannot be kept aseptic.* The nurse is instructed to boil the glass instrument each time after its withdrawal, in the soda solution. It is then kept in a 5 per cent. carbolized solution until again required, when it is rinsed in sterile water and smeared with sterile vaseline before being introduced. Unless care is observed septic matter may be transmitted through the vaseline. Always before its introduction the vestibule should be washed with an antiseptic fluid of some kind. Before observing these somewhat extreme measures urethral and vesical irritation, and even inflammation, were of frequent occurrence in my practice. Now I rarely if ever have to contend with any trouble of the kind.

In laparotomy, where the drainage tube is left behind, the syringe for drawing off the fluid should be constantly immersed in a 50:1000 carbolic solution. The gauze over the mouth of the tube should be frequently changed and care observed not to leave the opening unprotected any longer than is absolutely necessary. Of course previously to each dressing the hands of the attendant should be sterilized.

A Few Points to be Observed in Surgical Technique.—I have endeavored to show in the discussion of asepsis and antisepsis that the chief aim of the surgeon should be directed towards excluding microorganism from wounds, and from leaving substances behind which favor their development. Germs more easily invade tissues whose power of resistance has been diminished by rough handling—hence the importance of clean incisions and careful sponging. Wounds should be, when possible, nicely coaptated so that no blood or serum can accumulate in intervening spaces. When dead spaces are necessarily left behind suitable drainage, either capillary or tubular, should be provided for. If the oozing is but slight, a few strands of catgut, tied together, is all that is required. A strip of iodoform gauze, twisted, makes an excellent drain. In larger oozing surfaces some form of tubular drain is usually called for, at least during the first twenty-four hours. All bleeding points should be secured in properly prepared catgut ligatures. While I do not believe that *thoroughness* should be sacrificed for *time*, yet the operator should be as expeditious as possible. It must be borne in mind that only a *relative* degree of asepsis is accomplished

by the extreme methods which have been recommended. It is utterly impossible under the present antiseptic régime to exclude all germs. Those which abound in the operating room will find their way into the wound, in larger or smaller numbers, in spite of every precaution; and certain organisms (*staphylococcus epidermis albus*) are always to be found on the skin surfaces in spite of any method of disinfection known at the present time. The operator should aim to leave his wound as free from contamination as possible, and should therefore be as dexterous as is consistent with good work. As a rule, too, shock is greatly lessened by rapidity of operating, which leaves the system in much better shape to resist the invasion and multiplication of germs. By observing the antiseptic technique which has been given, existing germs are, as a rule, made harmless and union by first intention will follow.

Antisepsis in Ordinary Gynecological Examinations.

In ordinary gynecological examinations the danger of possible infection should always be borne in mind. There is no question that the various specific diseases are frequently conveyed through unclean instruments. When the uterine cavity is explored, precaution is especially necessary. The hands should always be thoroughly cleaned in a carbolic and glycerine solution before and after each examination. The bichlorid solution for constant washing of the hands is too irritating. The examining instruments—specula, probes, tenacula, etc.—ought to be frequently boiled in the soda solution and kept bright by the use of sapolio. They are to be kept immersed in a carbolic solution during the examination. Each time after using they should be washed in boiling water and again immersed in the carbolic solution. I use the carbolic solution here because it is impracticable to boil the instruments after each examination. It will, of course, tarnish them somewhat, but the cost of replating is slight, and a physician has no right to subject his patient to the slightest danger of infection. The old-fashioned bi- and tri-valve specula are harbingers of filth and germs. It was this fact which led me to devise the instrument shown in Fig. 32. The blades can be quickly separated and the joints gotten at with perfect ease. Plain sterilized vaseline should be used for the finger and for lubricating the specula. The vaseline should be removed from the bottle by means of a spatula, so that that which is left behind will not be contaminated.

It is wise to dip the uterine sound and probe into impure carbolic acid before they are inserted. If recently used in a suspected case of

gonorrheal endometritis, a still safer procedure is to heat them over a spirit lamp.

In the application of *electricity* through the genital tract, the same care as regards cleanliness must be observed. When the intra-uterine electrode is used, it should be introduced through a speculum, so that the vagina and cervix can be first washed with an antiseptic solution. The electrodes insulated with either hard or soft rubber cannot be sterilized by heat, so that unusual precaution is necessary in washing them. In cleaning the spiral intra-uterine platinum electrode of Martin, a good brush is necessary in order to dislodge the secretions which find their way between the wires of the spiral.

CHAPTER XIII.

THE HYSTERO-NEUROSES: HYSTERIA.

DEFINITION.

The term hystero-neuroses, in its restricted sense, implies the uterine origin of symptoms manifesting themselves in organs remote from the uterus, without structural change in such organs, being the direct result of reflex nervous influence starting from the uterus. By common usage reflex symptoms of ovarian origin are also defined as hystero-neuroses, although the term oöphoro-neuroses would more correctly indicate their origin.

If it be true that disorders of the rectum, or of any of the pelvic viscera, produce reflex symptoms—and there is abundance of clinical evidence to show that they do—it is obvious that the foregoing definition is too restricted. The word "hysteria" was used by the early writers to define the multitudinous phenomena now classified under that name, because of the erroneous idea that the womb (ὑστέρα) moved about to various parts of the body and so caused the local symptoms (Gowers).* The adjective "hystero" is derived from the same Greek word, and likewise erroneously suggests the uterine origin of a class of symptoms to which the term *pelvic neuroses* would be more literally correct, and infinitely more scientific. While, therefore, it is the mission of the gynecologist to treat any lesion found within the female pelvis, it seems wiser to adhere to the name (hystero-neuroses) which usage has made popular.

The term *hysteria* should be restricted to the general neuroses characterized particularly by psychical as well as secretory, vaso-motor and reflex derangements. It is probable that hysteria belongs among the cerebro-spinal affections. It is by no means limited to the female sex, although it is much more commonly met with in women than in men.

* "Plato says that the uterus, being an animal desirous of generation, if unfruitful for a long time becomes indignant, and wandering all over the body stops the passages of the spirits and the respiration, occasioning thus the most extreme anxiety and all sorts of diseases."—*Jenks.*

Therefore, according to the definitions given, hysteria does not necessarily have its origin in disordered function of the pelvic organs, while the hystero-neuroses always have. Inasmuch as the pathology of both affections is too occult and subtle to be perfectly understood in the present state of neurological science; and inasmuch as hysteria, as it manifests itself in women, is usually associated with utero-ovarian disease, a clinical distinction is often impossible, and, indeed, unnecessary. It is only important to remember that in hysteria there may be actual disease of the nerve centers, while in the hystero-neuroses no such disease is present. In both, however, the nervous centers are unduly impressionable, and I therefore deem it wise to study the two conditions under the same clinical head. By so doing I shall at least avoid uncertain and profitless discussion. Neurasthenia or nervous prostration is likewise frequently associated with the hystero-neuroses.

GENERAL CONSIDERATIONS.

The so-called neuroses are but beginning to receive the attention which, from their importance, they deserve, although great strides have been made in this department of medicine during the last five years. Those of the genital system constitute but a single group of that varied conglomeration of symptoms which may have their origin in any organ of the body. Flint has called attention to the cardiac neuroses, and to Dr. Pratt we owe much for his work in the rectal reflexes. The nasal and bronchial neuroses, as well as the ocular, are now receiving due attention. It is well known that, under favorable conditions, the slightest derangement or modification of function in a sensitive organ, so slight as to attract no attention to that organ, may, to use the simile of a well-known writer, cause distant organs to respond most violently—as the alarm-gong responds to the tap of a distant button.

The sympathy existing between the stomach and the brain is well known, and the one will quickly respond to any disturbance of the other. It may be impossible to overcome reflex asthma and so-called hay fever without directing attention to the hypertrophied posterior nares or the nasal mucous membrane. We are told by the oculist that certain obscure nervous symptoms—and even epilepsy—may be due to errors of refraction. All gynecologists know that an anal fissure will cause not only exquisite pain at the seat of the lesion, but may disturb the whole vaso-motor system, giving rise to the most irregular distribution of blood in various parts of the body. I myself have seen an obstinate reflex paraplegia disappear only after curing a urethral

fissure. I cite these well-known clinical facts simply to show that the genital sphere is only one of many capable of impressing the organism most profoundly in a reflex way, and the absolute necessity of studying the organism as a whole in looking for reflex causes.

Neurologists and gynecologists, unfortunately, do not agree as to the importance of the hystero-neuroses I am confident, however, that the former are often in error in ignoring pelvic symptoms as causative factors Careful observation will, I believe, demonstrate to the neurologist as well as to the general practitioner, that uterine disease frequently exists, even though the ordinary symptoms of such disease are wanting.

The profession is indebted to Dr. George J. Engelmann, of St. Louis, more than to any other man, for the development of the department of medicine under consideration. Jolly, Mayer, Fordyce Barker, Tilt, Hodge, Hilton, Emmet and Skeene blazed the way for Dr. Engelmann, but it remained for the last-named author to formulate the work of his predecessors into a system. Of the more recent writers the names of Weir Mitchell, Baird, McGillicuddy and More-Madden are to be mentioned. Dr. Skeene, in his latest work, "Medical Gynecology," has dealt with the hystero-neuroses under different names and various lesions in a most able and scholarly manner. In the homeopathic school, while no writer has produced extended dissertations on the hystero-neuroses as such, much of value has been added to the general literature of the subject by Ludlam, Conrad Wesselhœft, Arndt, Pratt, H. E. Beebe and others.

Forms of Hystero-Neuroses.

For convenience of study, the hystero-neuroses may be classified as—

1. *Physiological*, giving rise to reflex symptoms owing to increased functional activity, as during menstruation, pregnancy, and during puberty and the menopause.
2. *Pathological*, giving rise to reflex symptoms having their origin in some pathological change of the female sexual system. (Engelmann.)

This classification is not strictly correct. The term "physiological" neurosis is paradoxical, for, if a function is perfectly physiological, there should be no disturbance suggesting such a term. The fact remains, nevertheless, that there are few women who do not suffer some inconvenience during the several crises characterized by physiological congestion, and the classification at least facilitates understanding.

The Physiological Hystero-Neuroses.

(*a*) **The Hystero-Neuroses of Puberty.**—The function of menstruation in most instances gives rise to more or less distress, and to a feeling of uneasiness within the pelvis, which is still without the domain of actual or *discoverable* disease. This is especially so before the function is regularly established. In a girl whose nervous centers are unduly impressionable, reflex disturbances are common. Headache, nausea and vomiting, local spasms, neuralgia, choreic manifestations, and actual hysteria, are not infrequent symptoms.

(*b*) **The Hystero-Neuroses of Menstruation.**—The nervous symptoms of menstruation often persist during the entire menstrual life. The congestion causes an increased nervous excitability, and the neurosis, which may have subsided during the intermenstrual period, recurs. Here again it is probable that a pathological condition so insignificant as to cause no trouble wihtout the super-added menstrual congestion is, in at least the majority of instances, responsible for the neurosis occurring at this time. Menstrual neuroses are not limited to the actual period of the flow, often occurring some days before the sanguineous discharge takes place, and persisting for several days after it ceases.

(*c*) **The Climacteric Hystero-Neuroses.**—The neuroses occurring at this period are, in nearly every case, traceable to pathological lesions. And yet symptoms often occur during the change of life, as during puberty, which are without the domain of actual disease. There are few women who complete this period without suffering more or less from flushes, nervous irritability, faintness, headache, etc

(*d*) **The Hystero-Neuroses of Pregnancy.**—The uterus and all of the pelvic organs during the pregnant state are characterized by increased functional activity. Neuroses are frequently excited by these physiological changes, and often do not cease until the uterine cavity is evacuated and the congestion terminated. The stomach is usually the first organ involved in a reflex way, as a result of conception, and so common a symptom of pregnancy is nausea and vomiting that it constitutes one of its classical signs. The head, the eyes, the salivary glands, the thyroid, the bowels—indeed every part, and every function of the body, may be disturbed as a result of conception.

Let it be remembered that the existense of physiological neuroses is in perfect harmony with the theory already set forth,* to the effect that either *hyperemia* or *hyperesthesia* of the pelvic organs is essential for the

* *v.* Chapter VIII.

production of reflex symptoms having their origin within the pelvis. With the data now in our possession, we are justified in drawing a line between physiological congestion and hyperemia and pathological. Physiological congestion may affect the female organism either almost imperceptibly or very profoundly, depending upon the impressionability of the nervous system; the same is true of pathological congestion and lesion. It is probable that the degree of local hyperesthesia is likewise governed by the state of the nervous system. This explanation is in perfect accord with clinical evidence, and will account for the contradictory theories held by different men, equally eminent, regarding the importance of local lesions as symptom-producing factors. The gynecologist knows very well that the most serious or fatal local lesion may run its course without exciting any reflex symptoms, whereas in another patient, differently constituted, the slightest local rent may make her life miserable. Types of temperament are equally distinguishable during childhood The eruption of the teeth will occur in one child without the slightest disturbance, while in another this physiological process will precipitate the most violent convulsions; or, preputial smegma will cause no nervous irritation whatever in one instance, while in another its presence may cause convulsions, and even arrest of development.

Diagnosis.

The most weighty diagnostic evidence in determining the existence of a neurosis is the absence of structural changes in the organ or part involved. Unfortunately, even learned and experienced diagnosticians cannot, for instance, always differentiate between vaso-motor disturbance and slight inflammation, or between a reflex epilepsy and one due to organic disease of the nerve-centers. Engelmann has so admirably summarized the essential diagnostic points that I quote from him nearly verbatim:—*

1. *A neurosis is probable, and may be suspected—*

(*a*) By the existence of violent symptoms without corresponding pathological changes or febrile reaction.

(*b*) By the existence of lesions, uterine or ovarian.

(*c*) By the failure of proper remedies to afford relief.

(*d*) By the aggravation of symptoms in the affected organ corresponding to exacerbation of uterine diseases.

2. *A neurosis is proved—*

(*a*) If symptoms are not aggravated by causes which are known to aggravate existing pathological changes in the organ affected. Thus,

* American System of Gynecology, Vol. II, p. 77.

the use of indigestible food will not aggravate a gastric neurosis, whilst the most violent symptoms may appear in response to a diet which would seem indicated in actual stomach disease.

(*b*) If the symptoms are aggravated by causes which give rise to exacerbation of existing uterine disease.

(*c*) Improvement of symptoms upon treatment of uterine or ovarian disease regardless of any interference with the organ in which the neurosis appears.

(*d*) By a cessation of symptoms upon improvement or cure of uterine or ovarian disease.

It is necessary to eliminate from the category of neuroses those manifestations of pain due to pressure. Pelvic tumors, inflammatory exudates, or a pregnant uterus may cause most persistent and agonizing pain in the lower extremities by impinging upon the nerves within the pelvis. Disordered defecation and micturition may likewise result from an increased pressure exerted by the uterus during menstruation. These are not reflex symptoms and should not, therefore, be confounded with the neuroses.

Prognosis.

In considering the prospect of recovery from the hystero-neuroses and hysteria it is necessary to study the duration of the symptoms, the nature of the lesion to which they are due, and the previous neurotic history. The severity of the symptoms is not a safe criterion upon which to base a prognosis. The slight psychical disturbances which are permanent and persistent in character are of much more serious import than violent and transitory symptoms. It must not be forgotten, however, that ineffaceable traces of psychical weakness are apt to follow in the train of even slight and temporary attacks of insanity.

With the exception of the neuroses of the eye, nearly if not all of the reflex symptoms originating within the pelvis disappear upon removing the cause of such symptoms. Functional changes of that organ may be, and, unfortunately, are frequently perpetuated if the local disease persist for any length of time. So, too, if other organs of the body suffer in a reflex way for years, there is liable to be a certain trace of weakness left behind after the more distressing symptoms have vanished.

With the foregoing exceptions the prognosis of the hystero-neuroses is good. But the persistency of the symptoms after the cause is removed is most variable, and the practitioner should be cautious not to promise immediate relief in all instances. I have many times seen a

most distressing headache relieved almost instantly by correcting a displaced uterus, or by a simple application to an abraded cervix. I have seen a reflex asthma, which had followed almost every defecation for years, disappear upon removing a prolapsed ovary. I have on many occasions witnessed the disappearance of various types of psychoses, and of pain in various organs and parts of the body soon after the removal of cicatricial tissue from, and the closure of, cervical rents. I have frequently seen cold hands and cold feet become warm almost immediately after divulsing the rectum. Immediate results of this kind will not infrequently follow operations and local treatment, but oftener the improvement is gradual and slow. This is especially true when physical debility has been induced by depraved nutrition incident to reflex disturbance; for then re-invigoration depends upon the proper performance of the digestive function. So, too, time is required if there is anemia due to excessive uterine hemorrhage, for which the ovaries are removed or a cervical rent is closed; or if there is a badly subinvoluted uterus requiring months after operation before it returns to its normal size. Indeed, it is not uncommon for the patient to feel worse for two or three months after a serious operation, and her symptoms do not begin to disappear until the system fully reacts from the shock of the operation.

As soon as the marked irritation of the ganglia implicated begins to disappear improvement sets in, and often of the most decided character. What the patient describes as "nervous tension" vanishes; her expression changes from that of dejection to one of hopefulness; the dark rings surrounding the eyes disappear, as does the sallowness of the skin. She no longer suffers from distress in the affected organ or organs, and her nutrition improves simultaneously with the improvement of digestion and assimilation. It must not be forgotten, however, that when psychical symptoms predominate there is always more or less danger of relapse This is especially true if the patient is subjected to ill-directed sympathy bestowed by over-zealous friends. From this it may be necessary to protect her by an entire change of environment.

CHAPTER XIV.

THE HYSTERO-NEUROSES: HYSTERIA
(Continued.)

SYMPTOMATOLOGY.

A convenient classification of the hystero-neuroses is the following:—

1. *Disorders of Sensibility.*
   - (*a*) Hyperesthesia;
   - (*b*) Anesthesia.
2. *Alterations of Motility.*
   - (*a*) Clonic and tonic spasms;
   - (*b*) Paralyses.
3. *Circulatory Disturbances.*
   - (*a*) Central or cardiac;
   - (*b*) Peripheral or vascular.
4. *Anomalies of secretion and excretion.*
5. *Disorders of respiration.*
6. *Disorders of the gastro-intestinal canal.*
7. *Disorders of the skin.* (*Dermatoses.*)
8. *Glandular disturbances.*
9. *Disturbances of the nervous system.*
   - (*a*) General;
   - (*b*) Psychical.

Disorders of Sensibility.

(*a*) **Hyperesthesia.**—Hyperesthesia may be either general or local, but it is rarely if ever absent in some form. There is apt to be an exaggerated sensible irritability, so that sensory stimuli increase various kinds of pleasure and aversion; or, if the hyperesthesia be greatly exaggerated, stimulation of the senses may produce pain instead of pleasure.

Increased sensible irritability is often perverted, so that stimuli which would excite in the well actual disgust become a source of pleasure to the hystero-neurotic; or the highest degree of discomfort may be produced by agencies which, in the well, give rise to pleasure.

There may also be what Jolly terms a *psychieal hyperesthesia*, characterized by "exaggerated sensations of desires and repugnance."

The senses of *sight* and *hearing* are often extremely hyperesthetic. When the eye is involved patients cannot tolerate a bright light, and in the worst cases they are compelled to confine themselves to a darkened room. There may be subjective phenomena of flashes, sparks, or phantasms, but these symptoms are oftener associated with hysteria or ecstasy due to other causes than utero-ovarian disease. Nevertheless, hyperesthesia is probably present whenever hallucinations of vision occur.

Idiosyncrasies of the visual organs are sometimes met with. Certain objects will excite in susceptible persons peculiar symptoms. Prochaska cites the case of a woman who fainted on seeing a beet-root. It is said of Robert Boyle that he could not endure the sight of a spider. Scaliger was similarly affected by a water-cress; Wellington, Napoleon, and Henry III., of France, could not bear the sight of cats. (Gould.)

Excitation of the *sense of hearing* gives rise to greater acuteness of this faculty, so that in the worst cases slight noises are not only distressing but painful. Ringing, blowing, roaring, etc., frequently occur as subjective phenomena. From a patient whose greatest distress was a tinnitus aurium, for which she had been examined by my colleague, Prof. D. A. MacLachlan, who found no local ear disease, I removed an incredible amount of cicatricial tissue from the cervix, which entirely relieved the tinnitus. Hallucinations of hearing are rarer than visionary hallucinations, and when present suggest the possibility of permanent mental aberration.

Zimmerman tells of a girl who was thrown into convulsions by the rustling of oiled silk. Music affects certain people peculiarly. La Mothe Le Vayer, although a clap of thunder excited pleasurable sensations, could not endure the sound of musical instruments. Tissot mentions a case in which music caused epileptic convulsions (Gould); and Boyle a woman who fainted at the sound of a bell. I now have under observation a highly neurotic girl of ten who is seized with a hystero-epileptic convulsion, preceded by marked sexual excitement, immediately upon hearing the piano.

Perverted *smell and taste* occur with especial frequency. Odors which ordinarily are pleasant become repugnant and the most delicious flavors may excite nothing but disgust. On the other hand, unpleasant and disagreeable substances which are repellent to the healthy may be sought for. Cravings for chalk, dust, coal, and like materials are not uncommon. The acuteness of smell is sometimes remarkable.

One patient of mine could detect the odor of musk contained in a medium trituration and carried within a pocket case immediately upon my entering her chamber. A case is recorded by Amann of a woman who could distinguish persons by smell. Schneider records the case of a woman who fainted on smelling the odor of orange flowers. A case is mentioned by Dejean of a man who could not tolerate the atmosphere of cherries. Apparently authentic instances are recorded where the odor of the walnut tree, bread and butter, meats, cheese, citron, vinegar, etc., caused the most distressing symptoms in individuals of peculiar idiosyncrasy.

The *sense of touch* is rarely exaggerated, though it may be. The refinement of touch varies greatly in different people who are in every way healthy. The "muscle reader" possesses such refinement to an extreme degree. If this same exalted sensibility implicates any of the sensory regions, cutaneous hyperesthesia of that region is the result. It may be limited to a small portion of the body or it may be general.

The hyperesthesia often involves the deeper structures, implicating *muscles*, *fasciæ*, and *joints*. Actual disease is so closely simulated as to make it oftentimes exceedingly difficult to determine the spurious from the genuine. The so-called *hysterical joint* is not uncommon, and frequently has its origin within the pelvis. Mitchell, Brodie, Pajet, and Hilton have placed on record many such cases. If there has been real injury to the joint, with hysterical phenomena either preceding or following such injury, the problem is often exasperatingly perplexing. With the purely hysterical joint there is pain without heat or swelling; again, *forcible apposition causes much less pain than superficial pressure*, and electrical reaction remains normal. The knee joint is the one most often affected, and next to this the hip and wrist. The smaller articulations are rarely involved.

Hyperesthesia of the scalp is usually associated with an intense headache. A reflex headache is a common symptom of utero-ovarian disease. It is aggravated by emotional disturbance, and is particularly liable to recur at each menstrual period. The pain is oftener located in the vertex or occiput, but not infrequently it partakes of the character of neuralgia, implicating the occipital, and different branches of the fifth nerve; or there may be hemicrania, or *clavus hystericus*. Following these attacks of headache hyperesthesia of the scalp, or of the underlying muscles, is often marked.

The genito-urinary system frequently becomes hyperesthetic. The *external genitals*, the *bladder and urethra*, are oftener sensitive because of actual disease; they may, however, become exquisitely so without

any demonstrable cause. That condition known as *hysteralgia* is likewise a purely functional disorder without any textural change in the uterus to account for the pain.

Coccygodynia with hyperesthesia is sometimes purely reflex, but usually it is the result of structural disease in or about the bone.

Pain and hyperesthesia of the back may result from over-sensitiveness of the vertebral periosteum, from increased muscular sensibility; or it may be entirely superficial. The most frequent seat of superficial pain along the back is between the scapulæ, but it often makes its appearance alternately along different portions of the spinal column; or it may be present simultaneously at different and widely separated points. Frequently the area supplied by the intercostal nerves passing from the vertebral column at the sensitive point is painful, giving rise to so-called *intercostal neuralgia.*

When hyperesthesia affects the region of the vertebral column in this way it is known as *spinal irritation.* There is no doubt that it exists as one of the forms of the hystero-neuroses and, if so, will disappear on curing the pelvic lesion. The exact pathological condition of the structures involved is yet an unsettled point. Valleix * considers the condition one of the manifestations of hysteria. Inman † ascribes the pain excited by pressure over the spinous processes to an involvement of the muscular attachments. Erichsen,‡ Hammond,§ and Gowers || believe that the pain radiating from the spine, when structural lesions are absent, is due to anemia of the posterior columns of the cord. The explanation last given is probably the correct one, as it is in harmony with the fact that spinal irritation oftener occurs in anemic subjects.

It is very important to differentiate between *simple spinal irritation* and *chronic myelitis*, *meningitis* and *congestion.*

In *myelitis* there is often anesthesia instead of hyperesthesia; the muscular contractions are frequent and painful, and there is a sensation as if a tight cord were tied around the body at the upper limit of the paralysis. (Hammond.) The bladder and rectum are frequently implicated, and paralysis with atrophy is sooner or later developed. When paralysis results from spinal irritation, which is seldom the case, it is rarely complete, and there is never atrophy of the muscles involved.

* "Traité des neuralgies, ou affections douloureuses des nerfs," p. 345.

† "On Myalgia: its Nature, Causes and Treatment," p. 225.

‡ "On Concussion of the Spine, etc.," p. 188 *et seq.*

§ "Diseases of the Nervous System," 1886, p. 399 *et seq.*

|| "Diseases of the Nervous System," 1888.

Myelitis, unless arrested, steadily progresses toward a worse condition, which is not the case with spinal irritation.

In *spinal meningitis* there is persistent pain in the cord, and the spinal tenderness is not increased by pressure. Painful spasms of the muscles of the back is a constant symptom.

In *congestion of the cord* there is no spinal tenderness, and all of the symptoms are aggravated by the recumbent posture, because in this posture the blood gravitates toward the spinal centers.

Pain over a circumscribed area of *the extremities* may resemble very closely a periostitis.

Illustrative Cases.

CASE I.—*Neurosis of the Anterior Tibial Region Simulating Periostitis Cured by Emmet's Operation.*—Mrs. T. L., æt. 28, presented herself at the surgical clinic of Professsor H. L. Obetz during the fall of 1887. Her chief distress, and the only symptom of which she complained, was a circumscribed tenderness over the anterior tibial region of the left side. It dated from the birth of her first and only child two years previously. The pain was constant and persistent, worse during menstruation and after getting warm in bed. It was unaffected by the weather. She had been subjected to local blistering and constitutional treatment without avail. There was nothing of the "hysterical" about her temperament, being exceedingly phlegmatic and with no trace of psychical disturbance. There were no evidences of *heat or swelling*, and the case was referred to me for local examination. I found a badly lacerated cervix and perineum, which were repaired in the usual way. In two weeks after the operation the pain in the limb had entirely disappeared, and remained absent until eighteen months subsequently, when she gave birth to a second child. It then returned, and an examination revealed a recurrence of the laceration. Up to the present time she has not submitted to a second operation, and the pain persists.

CASE II.—*Hysterical Joint of Three Years' Duration, Simulating Morbus Coxarius, Cured by Directing the Treatmemt to the Pelvis.*—Miss E., a bright, intelligent girl, æt. 19, consulted me during the spring of 1890 for what had been diagnosed as hip-disease. Three years previously she fell down stairs while at school, striking upon the buttocks, soon after which she was taken with a severe pain in the occipital region, which compelled her to leave school. In a short time the left hip began to pain her, when she took to her bed and never walked up to the time of consulting me, except for a short period while wearing a brace. She had consulted various physicians of various schools, had

submitted to all kinds of treatment, in and out of sanitariums, without avail. She was brought to me in an invalid's chair. The first point that impressed me was that the girl did not look ill. I learned that she commenced to menstruate at thirteen, puberty precipitating an attack of chorea. The flow never became regular, and was always scanty and very painful. A yellowish leucorrhea had persisted since her injury. The hip-joint was excessively tender upon pressure, but there was no local increase of temperature, no evidences of fever or suppuration, and forcible apposition, by striking the heel, was not very painful. More or less spastic contraction of the flexor muscles of the affected side existed, which gave to the limb an appearance of shortening, which was very deceptive. The mother informed me that hysterical symptoms were common. Irritability of the bladder, with alternate diarrhea and constipation, frequently occurred. On examination I found the left ovary very tender, with more or less inflammation of the whole genital tract. The local examination increased the pain in the hip most decidedly, and caused much nervous agitation. I did not, therefore, deem it wise to recommend local treatment other than the hot douche with calendula, which was faithfully carried out. I put around the ankle of the affected leg three pounds of bar-lead, prescribed a pair of crutches, and insisted upon her walking. The lead was used to overcome the spastic contraction, as well as for its moral effect. I did not deem the joint lesion of such a character as to need extension. Ignatia was the only remedy given internally. I heard nothing more from the case until after my return from a six months' absence abroad. She then wrote: "I wore the weight until my left limb was nearly as long as my right, and can now walk perfectly well with the aid of a cane, though it hurts me some. I have taken no medicine except the prescription you gave, and have not deemed it necessary, because of the great improvement."

This patient quite recovered her health and remained well for five years, when she was taken with a severe attack of pelvic inflammation, or at least what her physician diagnosed as such, and died. A post-mortem was not permitted.

Case III.—*Distressing Hyperesthesia of Sight and Hearing.*—Mrs. —, æt. 47, a widow for twenty years. She is a devoted church woman and for many years was a leader in all charitable work done in the community in which she resided. Through friends she was urged to consult me, and I think that the call to the neighboring town in which she lived was countermanded at least four or five times before she finally mustered up sufficient courage and strength to see me. Upon

reaching her bed-side I found my patient in a room made dark by closed blinds, over which were hung heavy blankets to shut out every ray of light. The mirror was turned toward the wall for fear a ray of light might strike it and flash throughout the darkened room. Nor did the patient rest under these extreme precautions, for the eyes were protected with two pairs of colored glasses with side attachments. Hyperesthesia of the sense of hearing was equally marked, and noise was excluded from the room by double doors whose keyholes were stuffed with cotton. She also had her ears filled with cotton, over which she wore ear-mufflers. She was emaciated to an extreme degree, and had been reduced to her miserable condition by a series of events which so frequently precede profound neurasthenia. Here husband was killed during the war and she was left childless. Twelve months previously to taking to her bed she nursed her mother through a long and fatal illness. This greatly prostrated her, yet she kept up until a favorite brother-in-law was thrown from a carriage and killed. This was the last straw, and the shock compelled her to take her bed. In due time loss of appetite with irritability of the stomach developed, which of course led to marked depravity of nutrition. With the anemia came the hyperesthesia of the special senses, spinal irritation, headache, hysterical manifestations, etc. There was no serious pelvic lesion, although she had been much treated for an alleged uterine displacement with congestion. Unfortunately, she was encouraged instead of discouraged in her invalidism and she soon became a nosomaniac of the worst type.

With great difficulty the patient was moved on a couch to a private hospital and placed under the Weir Mitchell treatment. I ignored the pelvic trouble entirely. It is unnecessary to give in detail the progress of the case from day to day after this treatment was inaugurated. Suffice is to say that the improvement was of the most marked character, and in six weeks from the time she entered the hospital she walked to her carriage with her eyes and ears unprotected. She soon resumed her church and charitable work, in which she again finds much enjoyment.

(*b*) **Anesthesia.**—Anesthesia may temporarily impair any or all of the senses. The sense of touch is, however, oftenest affected. Henrot, Szokalsky, and Gendrin affirm that general or partial loss of sensibility follows every hysterical attack. So good an authority as Jolly, however, considers this statement too sweeping. Alternate surfaces of the body are frequenty affected, and hyperesthesia may supplant the anesthesia of the part first attacked.

All sensations are sometimes absent, but usually that of pain alone is

abolished, while those of heat and pressure remain normal. The entire surface of the body is rarely implicated. Hemianesthesia occurs oftener on the left side (Charcot). The most frequent seat, when circumscribed, is the dorsal surface of the hands and feet and the regions of the outer ankles. Cases of self mutilation occur in women while in an *anagelsic state*. Many interesting and almost incredible instances of such mutilation have been recorded by Cullingworth,* Channing,† Andrews,‡ Jolly,§ and others.|| Narath has recently placed on record two cases of what he terms hysterical gangrene. In the first case the girl ran a needle into her arm, which could not be found on exploration. The wound was not sutured and the patient irritated it through the dressings in every conceivable way, until an extensive slough was produced. In the second case a woman excited all sorts of skin eruptions, and even gangrene, with caustic alkali.

Loss of sensibility of *the muscles, bones and joints* may be associated with the cutaneous anesthesia. Muscular contraction is only temporarily impaired, if at all; in some instances there may be difficulty in executing passive movements of the limbs with the eyes closed (the Lasegue symptom complex).

Anesthesia of *the mucous membranes* is a frequent symptom in the hysterical. It may or may not be associated with the loss of cutaneous sensibility of the neighboring parts. The mucous membranes of the respiratory, genito-urinary, and alimentary tracts are the ones most frequently affected, and, as a result, there is diminution or loss of reflex excitability of the parts involved. When the rectum and bladder are the organs implicated the presence of feces or urine fails to create a desire for evacuation, and the distention often becomes very great without exciting pain. Scanzoni, in four of his patients, found complete anesthesia of the vaginal mucous membrane with an absence of all sexual desire.

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* *Op. cit.*, p. 855.

† *American Journal of Insanity*, January, 1878

‡ *Journal of Mental Science*, July, 1875.

§ Ziemssen, Vol. xv, p. 507.

|| In one of Dr. Channing's cases the following is a list of articles which were removed from the patient's arm and saved: "Ninety-four pieces of glass, thirty-four splinters, two tacks, four shoe nails, one pin and one needle. Several pieces of glass and the pins and needles first removed were, unfortunately, mislaid and lost. Including these the whole number of objects removed amounted to one hundred and fifty. * * * The longest splinter was nearly six inches long." Dr. Channing thinks that she experienced acute erotic pleasure from the probings to which she was subjected.

Deafness and visual disturbances likewise result from anesthesia, occurring particularly in conjunction with the hemianesthesia, and are therefore usually unilateral (Charcot). The visual disturbances not infrequently terminate in amblyopia and amaurosis. An ophthalmic examination rarely discloses any textural change of the eye.

Alterations of Motility.

(*a*) **Clonic and Tonic Spasms** —In dealing with the various forms of clonic and tonic spasms the same difficulty may present itself in distinguishing those that are reflex from those depending upon direct motor excitation that often exists in distinguishing a reflex pain from pain due to actual disease. It is often necessary to remove possible causes within the pelvis before an accurate diagnosis can be made.

Clonic or tonic spasms of hysterical origin may implicate any muscle or muscles of the body. When the pharynx is involved, it gives rise to that peculiar sensation known as *globus hystericus* (Hammond). Other writers attribute the peculiar sensation so often felt in the throat to a reversed peristalsis of the esophagus (Jolly). Eulenberg considers it a sensory and not a motor phenomenon. It is certain that the esophagus is frequently the seat of hysterical spasm which, under certain circumstances, continues long enough to simulate organic stricture. A similar spasm not infrequently implicates the stomach, intestines, and bladder.

A tonic spasm of the limbs causes contractions, a symptom, which, especially when accompanied with paralysis, suggests very forcibly the possibility of organic lesion. These contractions may last for an indefinite length of time. Charcot cites a case of eighteen years' standing. The patient was first seized with an hysterical paroxysm which was followed by paraplegia and contraction. Hammond says he has frequently seen such contractions last for several months.

Weir Mitchell, alluding to hysterical contracture, gives the following two forms:—

"1. This concerns single parts and limited groups of muscles, and may last for years without organic change in muscles, joints or interstitial tissues. In this form sudden cessation of contracture is possible.

"2. A form which attacks in succession one limb after another until nearly all voluntary muscles, including those of the trunk, may be affected."

(*b*) **Paralyses.**—So-called hysterical paralysis is not uncommon. It is either restricted to individual muscles, or occurs, as it oftener does, in the form of hemiplegia. *Hysterical aphonia*, coming and going sud-

denly, is due to paralysis of one or more of the laryngeal muscles. However, aphonia due to reflex causes, may and often does persist until the cause is removed. Reflex paraplegia may be partial or complete. If the lower extremities are involved, and the paralysis is incomplete, the patient has a peculiar gait, unlike that of any organic disease of the cord. By the aid of crutches or articles of furniture within her reach she drags her limbs along. As in all hysterical affections, her ability to walk is very variable, depending much on external circumstances, as well as the state of her own mind.

CASE IV.—*Reflex Paraplegia, Due to Anteversion and Urethral Fissure.*—Mrs. W., æt. 33, Muskegon, Michigan, presented herself at my clinic October 7, 1886, with symptoms of locomotor ataxia. Married for twelve years. Never pregnant. Illness dates back for six years. First noticed inability to mount staircase owing to weakness and tremor of limbs. Could not walk unless looking at feet, and could not stand with eyes closed. There was a burning pain over the sacrum. Urination painful and frequent, the bladder being emptied many times during the twenty-four hours. The urine was perfectly normal. Feet and hands cold. The uterus was anteverted, and the urethroscope showed a fissure at the neck of the bladder. The dysuria was entirely overcome by forcible dilatation of the urethra, after which an anteversion pessary was fitted, argentum nit., 6x, given internally, and the faradic current applied once per day. She returned home December 3d much improved, though not well. I have not been able to hear from her since. I should have added that electricity had been faithfully used before coming to me. The rôle played by the argentum nitricum should not be underestimated, for the indications were clear cut, and it covered the case beautifully.

CIRCULATORY DISTURBANCES.

General Considerations.—In another place* I have endeavored to show the important and intimate connection existing between the generative organs and vaso-motor system of nerves. Inasmuch as the vaso-motor system presides over the circulation, it is certainly not remarkable that the circulatory equilibrium should be disturbed by utero-ovarian disease. Dilatation and contraction of the vessels and capillaries result in response to a peripheral stimulus, so that no system is more quickly implicated as a result of reflex impressions than the circulatory. The cold pallor of contracted, and the hot flush of dilated,

* Chapter VIII.

capillaries are symptoms frequently witnessed when the utero-ovarian functions are disturbed, as during the change of life. Such disturbances may be either (*a*) central or cardiac; or (*b*) peripheral or vascular.

(*a*) **Central or Cardiac.**—In the August, 1886, number of the *American Journal of Obstetrics* will be found a most excellent article by H. J. Bolt, M. D., entitled "Cardiac Neuroses in Connection with Ovarian and Uterine Diseases." Doctor Bolt states in this article that cardiac neuroses are present in eight per cent. of all cases of uterine disease, and classifies them as follows:—

1. Palpitation;
2. A disturbance of the rhythm (irregularity);
3. A distinct suspension of a distinct beat (intermittence);
4. Angina pectoris.

Palpitation of the Heart is a common symptom resulting from pelvic lesions, and, frequently, the only one of which the patient complains; at least it so absorbs her attention and excites her apprehension as to make her oblivious to all other inconveniences. It is always made worse by nervous excitement, as the heart's action in no small degree is governed by the emotions and the state of the mind. Pain frequently accompanies the palpitation, sometimes extending to the left shoulder and down the left arm. It may be sufficiently severe to amount to an *angina pectoris*.

The palpitation is generally paroxysmal in character, though it may be continuous. It often occurs immediately upon lying down at night, preventing the patient from getting to sleep; or it is worse during digestion. The *sensation* of palpitation is frequently much greater than it really is, so that the patient complains of the violence of the heart's action when indeed it is normal, or but little disturbed. This can be accounted for only by the increased sensitiveness of the heart and the surrounding structures, thus making the patient painfully conscious of the ordinary movements of the organ (Byford).

Intermittency and irregularity of the heart's action, though not a frequent neurosis, does sometimes result from a "modification of the rhythmic discharge in the cardiac ganglia" (Bolt). It stands to reason that a reflex palpitation existing for an indefinite length of time is capable of producing an organic lesion of the heart, which would thus no longer be a pure neurosis. I believe, however, that disturbance of rhythm is often, and that intermittency is occasionally, the result of uterine disease.

Loomis* affirms that *angina pectoris* is always the result of organic heart disease. Fothergill, Peabody, and Fluck,† on the other hand, maintain that angina pectoris without organic disease is a possibility. Admitting that, in at least the larger number of instances, the symptom is the result of an evident organic lesion, the fact remains that in a limited number of cases of suspected organic disease, with severe anginal symptoms, an autopsy reveals no demonstrable disease.

In discussing the co-existence of hysteria with cardiac affections Giraudeau‡ affirms that the two conditions are oftener met with in men than in women, especially if there exist mitral stenosis, either alone or combined with insufficiency. Giraudeau emphasizes the importance of differentiating these lesions from hysterical dyspnea, hysterical precordial pains and hysterical apoplexy.

(*b*) **Peripheral or Vascular.**—The phenomena referable to reflex disturbance of the peripheral circulatory system result from the irregularity of distribution of the blood. Flushes of heat, undue redness of the face, cold hands and feet, a sensation of heat located on the top of the head, or in the occipital region, or extending into the spine, burning in the sacrum and loins, etc., are symptoms due to vaso-motor disturbance. If the vaso-motor paralysis is limited small blotches of erythema, perhaps not larger than a fifty cent piece, may appear upon any portion of the body—the back, chest, face or limbs. Ecchymoses smaller than the erythematous spots are occasionally seen. These symptoms occur not infrequently in conjunction with morbid perspirations (Tilt).

The symptoms enumerated occur more frequently during the menopause than at any other time, and cannot always be justly relegated to the category of hystero-neuroses. They are undoubtedly many times due to increased intra-arterial pressure, the result of the cessation of menstruation. In proof of this the same symptoms sometimes follow oöphorectomy in young and middle-aged women. An hyperesthesia of the mucous membrane in the region of the internal os is, however, usually present when these symptoms persist, and they will often vanish as by magic after dilatation and curetting. Lesions of the rectum may likewise perpetuate vascular disturbances. The several forms of *vicarious hemorrhages* are dealt with in another chapter.

* "Practical Medicine," p. 504.

† "Pepper's System of Medicine," Vol. III, p. 750.

‡ Le Semaine Medical, June, 1895.

Illustrative Cases.

CASE V.—*Cardiac Neurosis resulting in Organic Disease associated with and probably caused by laceration of the cervix. Greatly relieved by Trachelorraphy.*—Mrs. W. was brought up to my clinic on November 30th, 1886, by her physician, Dr. Wheelock, of Bancro't, Michigan. She was 51 years of age, possessed a good family history except that one sister suffered from periodical attacks of insanity. Has had four children. She did not get up well from the birth of her last child, soon after which she began to have severe attacks of palpitation, which were always worse during menstruation. An examination of the heart revealed undoubted dilatation and great irregularity. The uterus was prolapsed, enormously swollen and congested, the lips everted and so greatly hypertrophied as to almost present externally. The hypertrophy was so great as to make partial amputation necessary. Much cicatricial tissue was removed. The patient nearly died during the operation from the effects of ether; however, she made a splendid recovery, and for two years her health was infinitely better. The heart symptoms improved simultaneously with the local improvement, but because of the organic changes never entirely disappeared. She died two years subsequent to the operation, after undue exertion, from heart failure.

CASE VI.—*Cardiac Neurosis simulating Exophthalmic Goitre caused by retroversion and endometritis.*—L. M., æt. 40, unmarried. Had for years suffered from local pelvic distress, leucorrhea, bearing-down pain, backache, occipital headache, etc. She came to me during the month of April, 1886, because of a severe palpitation of the heart which had persisted for six months or longer. The pulse ranged from 120–160 beats per minute. The eyes were very prominent, one being more so than the other. There was suspicious enlargement of the thyroid. An examination revealed a retroversion with more or less chronic endometritis, both cervical and corporeal. I reposited the uterus, fitted a Hodge pessary and cured, by appropriate treatment, the inflammatory condition. Gelsemium, cimicifuga and kali carbonicum were given internally. In six months' time the heart's action became perfectly normal and the thyroid returned to its natural size. The eye symptoms still persist in spite of the best directed efforts of some of the most prominent oculists in America.

CASE VII.—*Cardiac Pains simulating Angina Pectoris due to pelvic lesions.*—Mrs. M., æt. 29. Married eleven years; never pregnant; menstruation began at 12 years. The present trouble dates from the

time of matrimony. Was said to have inflammation of the womb four years ago. Complains principally of pain in the heart, which is described as paroxysms of "piercing and sticking," and in the intervals as a dull continuous pain, which traverses down the left arm. Two tender points are present on pressure over the precordia. Dysmenorrhea and other symptoms are present which point to uterine trouble.

Diagnosis.—Retroversion of the portio vaginalis, with the body of uterus pushed slightly to the left. An old exudation is felt on the right side. Chronic endometritis. Patient cured on directing treatment to pelvis.—*Dr. H. J. Bolt, in the American Journal of Obstetrics.*

CASE VIII.—*Circumscribed Erythema of the Lower Limbs in a young hysterical girl of 18. Retroversion. Cured.*—The patient, of German parentage and not particularly intelligent, was, I am convinced, an onanist. The most striking symptom was the appearance, about four days previous to each menstruation, of two erythematous patches on the anterior thigh of each side, midway between the knee and body. These patches were perfectly symmetrical and about the size of a silver dollar. The patient was entirely cured by correcting the uterine displacement.

CASE IX.—*Menorrhagia with marked Vaso-motor Disturbances cured by dilating the cervix and curetting.*—Mrs. A., æt. 51. Married. Profuse menorrhagia, recurring about every six weeks. During the intervals vaso-motor disturbances of all kinds—cold hands and feet, flushes of heat, alternate redness and paleness of the face, oppression of breathing, etc. The uterus was greatly subinvoluted and the mucous membrane at the internal os most exquisitely sensitive. Entirely cured of all hemorrhage and nervous symptoms by forcible dilatation, curetting, and the application of iodine. Lachesis had modified the nervous phenomena previously to the operation, but only gave temporary relief.

CASE X.—*Vaso-Motor Paralysis of the Vessels of the Abdominal Cavity.*—"Some twenty years ago I attended a young married woman whose life was embittered by losses of property and by ill treatment of her husband, who finally deserted her. For a long time she exhibited, at times, hysteric disorders in the form of spasms, rigors, hemipalsies, and at last, for a month or two, moderate maniacal excitement. With favoring circumstances she at last got well, and, removing to the West, was lost sight of until about ten years ago, when I was called to see her at a hotel in Philadelphia. At this time my patient was 35 years old, was irregular as to her monthly flow, and had, as I found, a womb tilted forward but not diseased, and no ovarian tenderness, or, at least, no tenderness of belly, which was not the same everywhere. She was

rather pale and very thin, and had a relaxed and pendent abdomen marked by the scars of four pregnancies. I could find no disease of heart, lungs, or kidney. She gave me this brief history: After some years of ease and comfort she had been led to risk her property in a wild speculation, which ruined her, and now she was keeping a boarding-house in New York and was doing well, or likely to do well, except for the strange malady for which she came to consult me. After her new misfortunes she had some hysterical troubles, but these ceased to annoy her, and she began to observe that at about the time of the menstrual flow and afterward at any time she was liable to have an enlargement of the belly which did not seem to her to be due to wind, as with that form of swelling her previous experience had made her but too fully acquainted. The trouble became by degrees worse, and at last was so extreme as to cause certain unpleasant feelings and to subject her to suspicions of being pregnant. The swelling was certainly caused at times by emotion It began at any time—rarely at night.

"Within a few hours the belly, in place of being flaccid and pendent, was swollen enormously. She looked, in fact, as a woman—thin as she was—would have looked at the eighth month of pregnancy. Other attacks were less severe, but always they lasted for some hours before she could stand up, and it was usually a week before she was well. When I saw her an attack was at its worst. The woman's pulse was about 165, and was a mere thread—at times imperceptible. Her face and limbs were white and cold. The abdomen was tense and red, and could be felt to throb distinctly, while all over it the vessels, veins, and arteries were visibly enlarged. On listening over the belly I could hear a humming noise, a slight thrill. The chest itself was not quite so pale as the neck or face, but the breathing was difficult and rapid. It was clear that owing to the palsy of all the abdominal vessels all the available blood of the body of a too bloodless woman was for a time in this cavity and its walls. If while in this state she sat up she instantly fainted, and it was difficult even to lift her head because of the symptoms thus caused. She herself complained of the tension of the belly, and of the distressing pulsations within it. The day after the abdomen was certainly a third less, and it was then seen by Dr. Keating, who, like myself, could give no other explanation of the condition seen than the one I have just mentioned. After a week the belly became nearly as flat as usual, and I then ceased to see my patient. I learned from her some years later that by slow degrees she had become well of this singular malady" (Weir Mitchell).

Anomalies of Secretion and Excretion.

Urine.—The secretion of a large quantity of limpid and almost odorless urine frequently results from nervous excitement. The physical character depends upon the excess of water and the deficiency of salts. Again, in uterine patients, the salts may be increased in quantity and the water diminished. When the urine is decidedly morbid in its composition, however, it is usually secondary to gastric and hepatic derangements. Abnormality of the urine, especially if it be excessively acid or alkaline, frequently excites painful micturition. It may be greatly diminished or almost absent instead of increased in quantity.

Soques,* in a case of hysterical polyuria, where the total quantity of urine amounted to twenty litres in twenty-four hours, diminished the amount by hypnosis and suggestion, after thirteen sittings, to four litres. The stigmatta of hysteria were present and there was no history of traumatism.

Salivation.—Both *salivation and abnormal dryness of the mouth* have been observed in hysterical and uterine patients. Dr. H. W. Longyear, of Detroit, has reported a case of "persistent salivation, apparently due to laceration of the cervix uteri."† The profuse flow of saliva, which had persisted for more than a year, was only cured by closing a rent in the cervix. Dr. Babcock, of Jamestown, N. Y., consulted me in regard to a similar case.‡ After an hysterical paroxysm, the salivation may be apparent only, the saliva escaping from the mouth because, owing to spasm or paralysis of the pharynx, it cannot be swallowed (Valentiner). Salivation is frequently associated with pregnancy, and may be the first warning which the patient has of her condition.

Abnormal and anomalous secretions may proceed from the uterus, the vagina, the breasts, the liver, the stomach, and the bowels. As a result of utero-ovarian disease a *vicarious* leucorrhea is not uncommon and is dealt with in the succeeding chapter. Those arising from the other organs will in due time be considered *seriatim*.

Disorders of Respiration.

The painful spasm in the region of the throat has already been re-

* Archives de Neurologie, December, 1894.

† *American Journal of Obstetrics*, January, 1883.

‡ I once operated upon a woman, aged forty-two, for laceration of the cervix and complete laceration of the perineum, who had for two years been greatly annoyed by a profuse salivation. The operation completely cured the salivation.

ferred to under the designation of *globus hystericus*. This feeling of constriction often gives rise to obstructed respiration, inducing a fear of fatal suffocation. One of my patients who has laceration of the cervix complains each month immediately after menstruation ceases of a sensation extending from the pharynx to the stomach, as though hot water were running down the larynx and into the bronchi. For some years previously to experiencing this symptom, she complained of a feeling in the abdomen as though something were alive. Again there may be a sensation as if smoke or dust were being inhaled. Engelmann cites many interesting reflexes of the respiratory organs resulting from pelvic lesions—pharyngitis, tonsillitis, bronchitis, asthma, etc. Byford says he has seen "imperfect respiration or partial inflation of one lung, or parts of the lungs" in the hystero-neurotic. When this condition is associated with a cough, which in some women is exceedingly persistent, it gives rise to much concern. A reflex asthma is sometimes most distressing and obstinate, and does not always disappear after the local cause is removed.

Illustrative Cases.

CASE XI.—*Hysterical Cough, with Anteflexion and Dysmenorrhea.*—Patient, æt. 18, German. Hysterical paroxysms have been frequent. At each menstrual period she suffered from a persistent dry, hacking cough, which was kept up while awake during the entire menstrual period. I deemed a local examination advisable, but upon attempting one the cough was greatly aggravated. However, I succeeded in diagnosing an anteflexion. Because of the nervous and erotic symptoms excited by the examination I did not deem it wise to resort to local treatment. The cough continued to recur for twelve months, when it gradually disappeared.

CASE XII.—*Reflex Asthma Temporarily Cured by the Removal of the Appendages of One Side. Recurrence and the Removal of the Appendages of the Other Side. Recurrence of Asthmatic Attacks after a Respite of Three Months.*—Miss C., æt. 40, Owasso, Michigan. I was requested to see this patient by her physician, Doctor B. F. Knapp, while making a professional visit to Owasso for another purpose. The patient had been in poor health for three years, suffering from an ovarian displacement, and as all efforts at reposition were without avail she presented herself at the University Clinic on October 19, 1887. Three years previously to this date, while picking peaches, she felt something "give way" in the region of the pelvis, causing some pain, which was relieved by steady pressure over the pubes; following this accident she

suffered after each stool the most excruciating pain, which was bearing down in character and frequently excited nausea. This pain lasted for an hour or longer, extending into the spine, and, owing to its severity, defecation was delayed until constipation had become chronic, cathartics and enemata being always necessary to move the bowels. Dysmenorrhea was a prominent symptom, the pain preceding the menstrual flow for two or three days. A reflex asthma during the period was a frequent complication, during which the respiration was greatly embarrassed, the skin bathed with cold, clammy perspiration, the pulse weak and thread-like, and the features drawn and contracted. A digital examination revealed a tumor in the posterior cul-de-sac, which counter-tests proved to be the left ovary. The bimanual showed the right ovary to be in its normal position and seemingly healthy. The prolapsed ovary, however, was enlarged to twice or three times its normal size, and was exquisitely tender. All efforts made to return the displaced organ to its normal position were futile. The patient was ordered a hot vaginal douche twice a day, with a tampon made from flaxseed tied in a small muslin bag, dipped in hot water, and gently placed into the posterior vaginal fornix. Nux vomica 3x was prescribed four times a day.

November 3, 1887. Being satisfied that nothing short of a radical operation would afford permanent relief, I removed the offending organ through the abdomen. The ovary was adhered to the floor of the posterior cul-de-sac, though the adhesions were separated with little difficulty. The abdominal walls were unusually thick, and some difficulty was experienced in withdrawing the ovary far enough to include both the ovary and the tube in a Staffordshire knot The right ovary and tube seemed perfectly normal, and were, very unwisely, left behind. The abdominal wound was closed in the ordinary way, and the patient placed in bed. Briefly, her history from the above date to January 11th was as follows: Convalescence progressed favorably for two weeks, the temperature not exceeding 100° F. and this elevation could be accounted for by more or less irritation of the abdominal wound. The patient for a time even felt much relieved. At her next menstrual period, however, she suffered an unusual degree of pain, the temperature reaching 102° F. All of the old symptoms of strangury and pain after defecation returned with increased severity. The asthmatic attacks recurred very much oftener than ever before, and prostration was correspondingly great. A vaginal examination revealed the right ovary in the same locality formerly occupied by the left. It, too, was enlarged and tender. In short, the intra-peritoneal irritation incident to the removal of the left ovary had set up an inflammation of the appendage left be-

hind, resulting in its prolapse and adhesion. She very gladly submitted to the second operation, which was done on January 11th, just two months and nine days after the first. An incision was made a little to the right of the old cicatrix, the ovary separated from the floor of the cul-de-sac, tied as in the former case, and removed with the tube. The first ovary had undergone cystic degeneration, and the tube was distended with water; the ovary last removed presented all of the evidences of subacute inflammation, a small circumscribed abscess containing perhaps a teaspoonful of pus occupying a portion of its stroma. Convalescence was almost, if not quite, uninterrupted after the second operation. The bowels were moved on the third day with little or no pain, and soon became perfectly regular. Under the date of March the 1st, 1888, she wrote: "I am feeling better than I have for years. My bowels are perfectly regular, and I have no more of those nervous spells. I enjoy visiting with my friends very much, and cannot thank you sufficiently for what you have done for me."*

CASE XIII.—*Reflex Asthma of Eighteen Years Standing. Cured by Removing Prolapsed Tissue from the Urethra.*—Mrs. S., æt. 47, sent to me by Dr. S. L. Porter, of Vernon, Mich. Married for 26 years, and has given birth to three children, the eldest being 25 and the youngest ten years of age. Her present trouble dates from the birth of her second child, 18 years ago Dysuria has persisted ever since. The patient was haggard and emaciated from her extreme suffering. A severe asthma, recurring at variable intervals, persisted during the entire 18 years. Upon local examination I found an exquisitely sensitive and tender tumor as large as a pullet's egg, completely surrounding the external meatus of the urethra. This was ligated and removed. I never witnessed more rapid and greater improvement than ensued. She began to gain at once, and she never suffered from an asthmatic attack after the operation. She gained in flesh 25 pounds in three months. I heard from her in December of 1890, five years after the operation, at which time there had been no recurrence of the old symptoms.

CASE XIV.—*Reflex Aphonia Resulting from Pelvic Inflammation with Involvement of the Appendages. Cured by Salpingo-oöphorectomy.*

* In a letter dated December 31, 1890, the patient reports herself as bad as ever, so far as the asthmatic attacks are concerned. If the asthma was a genital reflex, its persistence can be explained only upon the theory that the nerve terminals are still involved in the cicatrix. I record the case under this head to show how extremely difficult it is to determine the reflex origin of any symptom without first removing the local lesion.

—Patient sent to me by Dr. W. H. Frost, of Tecumseh, Mich.; æt. 42; unmarried. She came to my clinic February 18, 1888. She was bed-ridden, could not stand on her feet, and had had absolute aphonia for 12 years, dating from an attack of typhoid fever, with probable pelvic complication. At any rate, her pelvis was a mass of inflammatory exudates; there was menorrhagia, which added each month to the anemia, already profound. Menstruation was very painful. Salpingo-oöphorectomy was performed and recovery from the operation progressed without any untoward symptoms. The patient surprised us all by talking on the day following the operation. Her general health began to improve, she got on her feet, and in six weeks returned home nearly well. This favorable condition continued for six months, when, owing to imprudence because of her favorable progress, she was taken with peritonitis and died. Her imprudence consisted in walking several miles during inclement weather to a family reunion.

CHAPTER XV.

THE HYSTERO-NEUROSES: HYSTERIA.

(Concluded.)

Disorders of the Gastro-intestinal Canal.

Gastric Neuroses.—The vagus is a bridge which unites the central portions of both nervous systems (Tilt). It is not well isolated and resembles both. By anastomosing with the sympathetic it helps to form the celiac plexus, so that when it becomes deranged the epigastric ganglia sympathize. As a result the viscera, through their ganglia react upon the brain, causing paralysis of the epigastric centers. In this way the appetite becomes perverted, and often there is in the gastric region a feeling of sinking and faintness; or there may be gaseous distention of the stomach with belching, nausea and vomiting. Indeed, indigestion and symptoms of gastritis frequently result from either morbid or physiological changes in the reproductive organs. The nausea and vomiting of pregnancy occur in response to a physiological change in these organs—or rather they often present themselves when local morbid conditions are not demonstrable. In due time the nutrition becomes seriously affected because of the indigestion.

So-called *hysterical vomiting* may be a most distressing and persistent symptom. At times it is apparently due to an increase of the gastric secretion, as fasting patients will eject enormous quantities of fluid. Again it may be a vicarious act on the part of the stomach, as both Charcot and Fernet have found urea in the vomited matter.

A gastric neurosis is differentiated from organic disease of the stomach by observing the following points:—

1. The symptoms subside upon curing the local lesion.

2. Articles of diet which would aggravate organic lesions are frequently the only ones retained in a neurosis.

3. Exacerbation of the gastric symptoms occurs simultaneously with an exacerbation of the pelvic symptoms.

4. Entire absence of the evidences of organic diseases.

Illustrative Cases.

CASE XV.—*Reflex Nausea and Indigestion Caused by an Enlarged and Prolapsed Ovary with Retro-displacement of Uterus. Cured by Salpingo-Oöphorectomy and Ventro-fixation.*—Mrs., æt. 32, referred to me by Dr. C. H. Slosson, of Youngstown, Ohio. Had been an invalid for two years, with constant nausea and indigestion, though she did not complain of pelvic distress Cervix was lacerated, uterus subinvoluted and the pelvic floor relaxed. An exquisitely sensitive mass was found in the posterior cul-de-sac, which proved to be a cystically enlarged ovary. I opened the abdomen on February 27, 1896. The right ovary, which was prolapsed, was three times its normal size. The left ovary was suspiciously diseased, so both appendages were sacrificed and the uterus fixed in front with catgut. Patient had a large bronchocele and was very anemic and emaciated. Convalescence was interrupted by an acute attack of gastritis caused by indiscretion in eating; but she left the hospital in five weeks, and soon gained in every way. The stomach trouble disappeared and the bronchocele has diminished somewhat in size. She has gained at least fifteen pounds in flesh. She is to return in the near future to have the cervix and pelvic floor repaired.

CASE XVI.—*Reflex Vomiting and Indigestion. Cured by Removing Uterus and Appendages.*—Patient æt. 46, referred to me by Professor H. H. Baxter. Four children, the youngest being 16. For years has had more or less pain in the pelvic region, with nausea and vomiting. Profuse attacks of hemorrhage from time to time, so that she was anemic and very much emaciated. An offensive leucorrhea during the intervals between the hemorrhages. Upon examination the uterus was found retroverted, greatly enlarged, exquisitely tender, and firmly attached to the rectum. For six months before I saw her she had been compelled to subsist almost entirely on liquid food because of the condition of the stomach. In March of this year she was brought to the Huron Street Hospital, and I removed the uterus and appendages through the vagina. The right tube was distended with pus, and the right ovary was bound down between the fundus and the rectum. The fundus was separated from the rectum with some difficulty, but finally both appendages were removed with the organ. The wound was closed in the usual way and the patient placed in bed. Notwithstanding her extremely prostrated condition the shock was practically nil, and convalescence was uninterrupted. She returned to her home three weeks from the day of the operation, and on my first visit to her I found her eating with relish fried oysters, cottage cheese, fried potatoes,

pickles, and coffee. The stomach trouble was purely reflex and had almost entirely disappeared.

Intestinal Neuroses.—The intestinal secretions may be deficient or excessive in uterine disease, giving rise either to *constipation* or *diarrhea*. The constipation is sometimes exceedingly obstinate, there being no tendency for the bowels to move without artificial aid. The diarrhea and constipation frequently alternate. When due to deficient secretion, the stools are dry and hard; when due to deficient peristaltic action, they are perfectly normal as regards consistence, color, etc.

Both *hyperesthesia* and *anesthesia* frequently implicate the mucous membrane of the gastro-intestinal canal. With the first, everything that comes in contact with the mucous membrane excites contraction and induces pain. Food may be ejected before passing into the intestine; if it is not, its presence in the intestine excites exaggerated peristalsis, and the food is hurried on through the canal before it is digested. Frequent evacuations of the bowels are thus induced. Should the hypersensitiveness be limited to the rectum, great distress is caused by the presence of the slightest amount of fecal matter. In a chapter entitled "The Rectum and Defecation in Hysteria,"* Weir Mitchell records a case so bad that the patient was compelled to wear a napkin over the anus, notwithstanding that the stools were normal in consistence.

In *anesthesia* there is deficient instead of exaggerated peristalsis. It may amount to almost a paralysis of the intestinal canal, although the anesthesia is usually limited to the lower intestine. Enormous accumulations of perfectly-formed fecal matter may lodge in the whole lower half of the descending colon, or merely in the sigmoid flexure. So obstinate is the retention that a stricture is sometimes suspected.

Diarrhea, with profuse, watery and exhausting discharges, occasionally accompanies uterine disease. The kind of ingesta seems to have but little influence upon the discharge, and an attack is particularly liable to occur during menstruation.

Gaseous distention of the intestines is likewise a frequent symptom of uterine disease. It is often tumultuous, and the distention may be so great as to give rise to symptoms of pregnancy. During the hysterical paroxysm it not infrequently becomes a prominent and most distressing feature of the attack.

Byford calls attention to the expulsion of *muco-fibrinous casts* from the intestinal canal as a result of uterine disease—a symptom which I have

* "Nervous Diseases," p. 252.

observed in a number of cases. It is a sort of membranous enteritis, and the quantity of casts discharged at one time may be very great. They consist either of shreds of mucous membrane or complete casts of the intestinal tube I am not aware that any other author mentions these casts in connection with uterine disease. The cases observed by me recovered fully after the pelvic trouble disappeared.

The gastro-intestinal reflexes are likewise frequently excited by rectal lesions. The gynecologist who ignores this fact will often fail ignominiously in his attempts to relieve his patients.

Illustrative Cases.

CASE XVII.—*Acute Vomiting for Two Years, due to Anteflexion of the Uterus.*—Patient æt. 25. Had suffered during the entire two years from almost incessant vomiting and occasional hematemesis. The uterus was found soft and anteflexed (with posterior rotation). Suitable treatment in a short time completely removed the vomiting.—*Hewitt.*

CASE XVIII.—*Membranous Enteritis during Climaxis.*—Patient æt. 48; married; has had four children. Was bed-ridden for two years with general nervous prostration. I was called to see this patient after she had been in bed for nearly a year. Menstruation had ceased, but the psychoses were very prominent and insanity was greatly feared. For nearly ten months after I saw her she passed enormous quantities of membranous masses, which were sometimes discharged in the form of a ball resembling parasites. There was chronic metritis. After the symptoms incident to the menopause disappeared she made a complete recovery.

CASE XIX.—*Reflex Intestinal Neurosis.*—"Miss H., æt. 15, under treatment for vesical weakness, is suffering from nervous prostration. . . . The patient had been affected with habitual constipation, which yielded but slowly to treatment. For a few days before the appearance of the first flow, I believed that a natural action of the bowels had been accomplished and a healthy tone restored; the constipation seemed overcome. After the cessation of the flow the previously existing conditions were reëstablished. With the advent of the second menstrual period the patient was seized with a diarrnea, uncontrollable at times, so that I found her in tears from mortification at her distressing state. One passage followed another. This annoying reflex persisted the two days previous to the flow, yielding to constipation during its continuance, and returning again for 36 hours after cessation of the menses. The third period was accompanied by the same symptoms, together with numerous other reflexes."—*Engelmann.*

Disorders of the Skin (*Dermatoses*).

In studying nervous lesions and nervous phenomena it is particularly difficult to distinguish between coincidences and actual effects. This is especially true in dealing with the so-called *dermatoses*. Some of the tests applied to other forms of hystero-neuroses must be applied with a certain degree of reservation in skin diseases. It has been shown that nearly if not quite all of the hystero-neuroses are aggravated by menstruation, and the dermatoses form no exception to this rule; but most skin diseases, of whatever origin, are made worse by any cause which intensifies the hyperemia of the skin, and menstruation will do this. It is, therefore, no sign of its uterine origin that a skin affection is made worse by menstruation. However, testimony is not wanting which conclusively proves that the utero-ovarian function exerts no small influence upon the skin, both for good and for evil. The acne of puberty and the pigmentation of pregnancy are recognized by all as dependent upon physiological changes within the pelvis. The symmetry of these changes points unmistakably to their nervous origin. Thus Godson cites a case, which is quoted by Engelmann, of a girl sent to St. Bartholomew's Hospital for chorea in her seventh month of pregnancy; the areolæ of both breasts were perfectly formed, except about one-third of their circumference, which was perfectly free from discoloration. The area was sharply limited and almost exactly symmetrical on the two sides. Barnes, in commenting upon this case, remarks that it is inconceivable how any difference in the quality of the blood going to the parts could exist. Engelmann observes that it is upon the larger surfaces of the body where the most peculiar and symmetrical configurations are traced, precisely the same on both sides, but that they often escape observation because concealed by the clothing or bedding. While, then, it is true that pigmentation and other forms of skin disease may often depend upon changes within the circulatory system, there is indisputable evidence proving the utero-ovarian origin of many cases which have been cured only by directing the treatment to the local cause.

Space will permit me to do nothing more than enumerate some of the varieties of dermatoses of pelvic origin, giving, by way of illustration, three clinical cases. Erythema, acne, pigmentation, pustules, sallowness, flushes, seborrhea, etc., are common affections, made worse by conditions which exacerbate the local mischief, and disappearing only after the local disease is cured. Behrend, Wagner, and Steller report cases of herpes, ecchymoses, hemorrhagic nodules, etc., of uterine origin.

Engelmann devotes considerable space to recording in detail histories of melasma, acne rosacea, and erysipelas of pelvic origin. Indeed, almost any of the dermatoid diseases, according to these writers, may have their origin in the reproductive organs.

The genito-reflex neuroses of the skin, unlike all others, represent actual and not phantom disease. Nevertheless they differ from actual disease produced by other causes inasmuch as they fail to yield either to general or direct medication.

The fact that actual skin lesions are produced in a reflex way can only be explained by the knowledge that through the vaso-motor nerves the circulatory and glandular systems are both involved. The skin "is the safety-valve of the system," and the acne of puberty; the seborrhea of menstrual irregularity, the flushes and sweats of the menopause, are often but external manifestations of a disturbed equilibrium, acting through the sympathetic system.

Illustrative Cases.

CASE XX.—*Eczema of the Face, of Five Years Standing. Cured by Operating upon the Perineum and Cervix.*—Madam —, æt. 35. Married and the mother of five children. Patient came to me with a most obstinate eczema squamosum, dating from the birth of her last child, four years previously to consulting me. This remained invulnerable to both general treatment and local applications. I found upon making a pelvic examination a cervical laceration with much relaxation of the pelvic floor. Other reflex symptoms were present, including a most persistent occipital headache. Swooning and faintness just before the menstrual onset commonly occurred and the patient's friends greatly feared serious heart trouble. I removed from the cervix a large amount of cicatricial tissue, invading the broad ligaments on either side. The pelvic relaxation was overcome by Emmet's perineal operation. For three months the patient did not improve, but from that time on she rapidly gained in every way, and one year from the date of the operation was in perfect health.

CASE XXI.—*Acne Pustule on the Side of the Nose, Recurring with each Menstrual Period. Anteflexion, Endometritis, and Perimetritis.*—"Miss C——, from Texas, 26 years of age, long afflicted with vesical pains, the result of pressure of an anteflexed uterus; menstrual suffering and great nervous depression; was much annoyed by an acne pustule which appeared for three successive menstrual periods upon one and the same place, on the right side of the nose, but ceased to come,

with decided improvement in both the position of the uterus and the catarrhal inflammation."—*Engelmann.*

CASE XXII.—Patient æt. 40, one child. Has been a confirmed invalid for years, during which time the face has been covered with pustules. I performed hysterectomy in the fall of 1895 for adhesions and pyosalpinx, since which time the face is perfectly smooth.

GLANDULAR DISTURBANCES.

Under the head of "Anomalies of Secretion," profuse salivation and urination have been referred to as symptoms indicating reflex disturbance of the parotid glands and of the kidneys. As further evidence of the sympathy existing between the reproductive organs and the salivary glands, it is only necessary to refer to the frequency of the metastasis of mumps to the generative organs of both sexes. In the male it is the testes which become involved secondarily; in the female the ovaries, the mammary bodies and the uterus. Again parotid buboes are not unknown after ovariotomy, when no evidences of sepsis exist (Schroeder); and Goodell reports a case of swelling of the parotid gland coming on two weeks after a trachelorrhaphy and persisting for nearly two years. Cases of diminution of the salivary secretion of undoubted uterine origin have been recorded by both Engelmann and Goodell, so that, to use the words of the latter, there undoubtedly exists "a kinship of sympathy between the parotid glands and the adult sexual apparatus."

The Liver.—Unfortunately we are not in possession of the same reliable data proving a direct sympathetic relationship between the liver and the pelvic organs as between the salivary glands and those organs. In proof of the fact that central lesions may exert an influence upon the liver, it is only necessary to quote the old experiments of Claude Bernard, in pricking the floor of the fourth ventricle, whereby sugar was produced in the liver; or to refer to the frequent attacks of icterus caused by fright, grief, anger, etc. The exact cause of the glycosuria of pregnancy is as yet unknown, but the fact that it disappears entirely as time advances argues against organic lesion of the nerve structures. It is not unreasonable to believe that uterine stimulation, either through the medulla oblongata or by direct ganglionic connection, may act upon the liver in such a way as to interfere with its glycogenic function. Be this as it may, every physician of experience has observed many cases of hepatic disturbance associated with uterine disease which disappeared only upon curing the latter. Possibly this may be due to the fact that the treatment adopted, both general and local, improves the quality of the blood passing through the liver. Reasoning from analogy, how-

ever, it seems unwise to ignore pelvic reflexes in dealing with hepatic diseases.

CASE XXIII.—*Hystero-neurosis of the Liver, Simulating "Gall Stones," Cured by Directing Attention to the Pelvis.*—Mrs. L——, æt. 43. Married and the mother of five children. She is a large, fleshy woman with none of the neurotic element in her make-up. For six consecutive menstrual periods she suffered from all of the symptoms of biliary colic. She would be taken suddenly with the most excruciating pain in the region of the liver, with local tenderness. Nausea and vomiting frequently supervened. These pains would last until the flow became somewhat profuse and then gradually disappear—not infrequently lasting for twenty-four hours. The dysmenorrhea was not marked, nor were there any symptoms pointing to pelvic mischief, except a slight leucorrhea. However, after hunting in vain for gall stones in the feces, I decided, much to the patient's disgust, to look to the pelvis. A retrodisplacement was found and corrected, and in the course of two months she became pregnant. There has been no return of the trouble for six years.

Thyroid Gland. — The Romans recognized enlargement of the thyroid as a sign of pregnancy. Even in our day, says Goodell, horse breeders measure the necks of their mares before and after they have been covered, to determine whether or not they have conceived. As a sign of pregnancy the presence or absence of swelling of the thyroid is no longer considered reliable, but as a matter of history, it shows that the ancients long ago recognized genital reflexes. I have two patients who are first apprised of conception by a swelling of the thyroid. The frequency of goitre at or about the time of puberty—often disappearing spontaneously after menstruation is fully established—points very significantly to the probable influence exerted by the generative organs upon this gland. At any rate, in dealing with goitre in girls and women, it is wise to bear in mind the evidence in our possession.

Mammary Glands.—The mammary bodies are often highly excited by uterine disease. This is not strange when we consider the connection existing between them and the sexual organs. Indeed, they constitute a part of the reproductive system, partaking of the same physiological changes incident to puberty, pregnancy, and the menopause; therefore, pathological changes within the pelvis very naturally react upon them. The most common sympathetic condition is congestion, whereby the mammæ increase in size and become hot and painful. Sometimes these symptoms are purely subjective, an examination revealing no perceptible alteration in the glands. Actual inflammation,

even extending to the axillary glands, may supervene, and I believe that neoplasms occasionally arise from such irritation.

As a rule, both breasts are implicated when the enlargement is of reflex origin, whereas in malignant growths the disease is oftener limited to one side. However, one breast alone may be implicated. Under the name of "hysterical breast," Gillis de la Tourette* describes what he deems an important manifestation of hysteria, inasmuch as it gives rise to much confusion and unnecessary mutilation. It consists of hyperesthesia of the breast, with temporary enlargement, which is always aggravated by menstruation. One or two tumors of variable size may be detected in the substance of the organ on palpation. The hyperesthesia is cutaneous and the tumors are not painful.

Disorders of the Nervous System.

Under different heads many of the hystero-neuroses giving rise to pain and paralyses have already been considered. There yet remains to be enumerated a class of mental symptoms arising from disorder or disease of the uterus and its annexa which are known as *hystero-psychoses;* and a class of nervous affections characterized by paroxysms and loss of consciousness—hystero- and true epilepsy, and hysteria.

The milder forms of *hystero-psychoses* manifest themselves in a slight melancholia with insomnia, loss of memory, fretfulness and an indescribable dread of some unforeseen calamity. In the severer types the melancholia is much more profound, and even mania may develop. Moral perversions are likewise often met with, due to disturbance within the pelvis. It is high time that alienists give to this subject the attention which its importance justifies.

I believe that *nymphomania* should be classed under the hystero-neuroses. At least I have found that an exaggerated sexual appetite in women is often associated with some form of utero-ovarian disease, although I recognize that perverted sexual desire is often associated with hallucinatory insanity, mania, etc. Kraff–Ebing† affirms that nymphomania is frequently observed at the climacteric and may occur in senility. Onanism is not an uncommon symptom in the hysterical and neurasthenic, and often there is a psychical hyperesthesia which is responsible for the sexual turgescence. When the imagination constantly dwells upon sexual imagery the genitals are kept in a chronic state of turgor. In due time an abnormal con-

**Journal de Medecine*, Paris, August, 1895.

† Phychopathia Sexualis, 1893. p. 375.

sciousness is induced, which may develop into hallucinations and delusions. Finally, a point is reached when the patient can no longer control her desires and she becomes a dangerous woman. I have never yet examined a nymphomaniac free from local disease, and, as a rule, the history shows that the nymphomania is secondary to the local mischief. Onanism, on the other hand, is a frequent cause of the local disease and may be of psychical origin, so that the most indifferent ideas excite sensual association. Onanism often begins in early childhood, a fact too often ignored, and may be accomplished in many different ways. I herewith append two letters which are interesting from a psychological standpoint, as they show some of the multitudinous phenomena of hysteria, as well as some of the methods of committing onanism. The first is from a girl of 22, and I have every reason to think that she is honest in her confession. She is, however, thoroughly hysterical, and is essentially a "couch loving" invalid, though a very beautiful and intelligent one. The second is from a woman of 35 who, I am convinced, is a confirmed onanist. I publish these letters *verbatim et literatim*, except to destroy in each instance the identity of the writer, for the purpose of emphasizing the importance of carefully watching the habits of young girls.

SEPT. 26, 1890.

"*Dear Doctor:*—If you remember, I visited your clinic at the University in June, 1889. I have been wanting to write you for medical advice, but learned you were abroad I still suffer constantly with my head and locally, and as to my nervous system it is completely wrecked.

"My head is so full of pain and so tired it seems impossible to think, and sometimes it seems as though I would lose my reason. Of course anything that worries me causes much extra suffering of body and mind. Of late I have been unusually worried, and felt perhaps you would help me. I feel it is asking a great deal of you as I am a stranger, and your life too busy to attend to anything outside of your practice. Then, too, it is a matter too delicate for me to broach, but I feel I must as my reputation is at stake. I explained to you fully my condition, the cause, etc., but for fear you may have forgotten I will briefly outline my history again. The day I went to Ann Arbor my mother told me there was something about me she ought to have told me before, but she had not *fully* realized it was the cause of my suffering until the past year. She said before I was born she was sick and nervous and easily irritated. A little kitten playing on the floor annoyed her, and when it jumped on the bed she requested my father

to make it go down. At that he knocked it from the bed and it fell to the floor, as mamma supposed, dead.

"It was a great pet of her's and she felt very bad, but it soon revived, laid on its left side and began to kick the right leg. It kept this up for some time. Mamma says that when I was a little thing only a few months old I would do the same way, and when she would notice it she always thought of the kitten; but supposed as I grew older I would stop it. I remember my auntie would tease me about kicking my limb, and I would always cry when mamma asked me why I did so and I would tell her I could not help it. As I grew older I was left alone a great deal, and mamma says she thought I did not do so any more, but it only increased with years. My health became very poor when I was ten years old (two years prior to my menstrual period). After that I was worse. One day in reading a medical book, when I was about fourteen years old, I saw something in regard to 'self abuse.' It was the first I had ever known of such a thing, and my soul was horrified when I read and saw that what I had done had had the same effect in *some* ways, though I had never done a thing except to jerk my limb, which was as natural as to breathe. I said nothing, but just prayed God to forgive me if I had done anything wrong. Some way I could not believe that *awful* thing of myself; at any rate I stopped it entirely in a few months, and have never been troubled much since, only once in a few months perhaps, and now never jerk my limb any more. The winter before you saw me I spent at the ——— Sanitarium under the care of Dr. ———. After he made an examination of my case, he told me I had practiced self-abuse. *I felt terribly*, and told him just how I had been. He said I ought to have no gentlemen friends, etc. I told him I never had any different feelings toward my gentlemen friends than my girl friends. He did not believe me, and as I had never talked with any one on this subject before I could not be plain with him; and if I had only known what mamma afterward told me it might have made a difference.

"Before I left the office I begged Dr. ——— not to tell *anyone*. I thought *I* would much rather tell my mother when I came home, as it would make her feel so bad coming from any one else.

"The doctor promised me he would never speak of it. While at the sanitarium I was under the charge of the Rev. Mr. ———, whose family were dear friends and had always held me up as a sort of a model to their children. But Dr. ——— did tell Rev. Mr. ———, who is a stern man, and he informed my mother. The Rev. gentleman took me in hand as if I were a low creature not fit to be associated

with. He talked very plain to me, and told me he should forbid my friends from the city calling on me, also his sons. He did so, and not only that, but told them *why! It almost crushed me at the time*, and when mamma told Rev. Mr. ——— it was a birthmark he would not listen to it, but said she was only trying to shield me I have tried not to think about it, and was real brave, until lately Rev. Mr. ———'s son came to ——— and told a gentleman of whom I have the highest estimation and who is very dear to me. When I first found it out I was almost crazed, but upon deliberation I feel that it will be more sensible to try and straighten out this tangle by going to Dr. ——— and Rev. Mr. ——— and explain to them and ask them to make it right. Also to ask Rev. Mr. ——— to tell his son I am wronged, and to forbid him telling such a wicked thing at my home. Consequently my mother is going to Dr. ——— next week, and what I ask of you is to make a statement of my case, making it plain that I am innocent, that it is from a birthmark, and not from willful self-abuse. Believe me, Dr. Wood, *I am innocent*, and if you, as a prominent physician, will make such a statement, my mother will take it to Dr. ——— and he will not be so apt to tell her she is only trying to shield me. Then Dr. ——— can make it right with the others, for I feel it will kill me if such a story should continue to be circulated. This may seem foolish to you. You may think me insane, but I am not. If I were of a low groveling nature, impure in heart and life, it would not seem so awful to me. Or had I done the thing that has been said I would feel I was only reaping as I had sown. Pardon me for taking your valuable time and for my seeming intrusion, and believe me, if you will do as I ask you, or help me out in some way, it will be a kindness I'll never forget."

"*Dear Doctor:*—I have a confession to make to you which I never could make to a doctor at home. When about twelve years old, in play, I was swinging between two chairs, by putting a hand on the back of each chair and raising myself up so that my feet would clear the floor. The strain of raising my weight from the floor brought on a pleasant sensation, and after that I did it wholly for that purpose. Any time that I would step up to a dresser, or table, or foot of the bedstead, I would practise it. All I had to do was to clear my feet from the floor and strain a little, and I could bring on a passionate feeling at once.

"The habit grew upon me, until I think I must have practised it a dozen times a day, perhaps get up once or twice after I had retired for the night for the purpose of producing the pleasurable sensation. I

would dream at night when lying on my back, and it would bring on the same feelings. It did not appear to affect my health until I was about eighteen years of age. Then I had falling of the womb and have always had weakness since, and have never been able to get the enjoyment out of married life that I expected. I could get more pleasure out of my old practice, but am quite sure it has affected my health very badly. I have not practiced it when awake in two years, but quite often now will dream and bring it on and always wake up weak and exhausted. Both my abdomen and back are very weak. I hope this will assist you in helping my trouble. I have dreaded so much to tell you."

Illustrative Cases.

CASE XXIV.—*Nymphomania and Insanity Cured by Salpingo-oöphorectomy.*—Miss. S., æt. 28, patient of Prof. Eliza J. Merrick. She was brought to the Huron Street Hospital on December 28, 1895, suffering from mania of a religious type. The nymphomaniacal symptoms were prominent. An examination under ether revealed enlargement and adhesions of the appendages of both sides and adhesions of the clitoris. Both appendages were removed and the clitoris freed. On the fourth day following the operation she became violent, got out of of bed and had to be placed in a straight jacket. She remained in this state for a week, and then gradually improved until at the present time (June, 1897,) she seems perfectly well and has gained twenty pounds. The nymphomania has entirely subsided.

CASE XXV.—*Profound Melancholia with Pyosalpinx and Universal Adhesions, Cured by Salpingo-oöphorectomy.*—Mrs. ——, æt. 28. Married; one child, born seven years ago, since which time she has been sterile. Referred to me by Prof. W. A. Tims. History of pelvic inflammation twelve months after birth of first and only child. Husband admits having had gonorrhea before marriage. She came to me in October of 1894, at which time I found a mass in the left side of the pelvis that, from the history, I took to be a pus tube and advised celiotomy. This the patient declined to have done and went her way. Six months later, after riding her wheel, she suffered from a second attack of pelvic inflammation, which came very near proving fatal. In February of 1896 she again consulted me and was willing to abide by my decision. At this time the uterus was firmly fixed and the general tenderness marked. She suffered much from dypareunia, had lost her sexual appetite and was profoundly melancholic. An intense occipital headache was a prominent symptom. I opened the abdomen a week

later and dug the appendages from inflammatory exudates. The left tube contained an ounce of pus. Drainage. Convalesence uninterrupted and the patient is now perfectly well in every way. Her sexual appetite is fully restored. She menstruated four or five times after the operation.

CASE XXVI.—*Insanity with Intractable Onanism following Pelvic Inflammation.*—Miss ——, æt. 18, referred to my clinic in the Cleveland Medical College on December 13, 1896, for a local examination by Prof. C. C. True. The following history was obtained from her mother: Four years ago she had an attack of "peritonitis" which kept her in bed for three months. Up to this time she was ordinarily bright and showed no signs of mental trouble. During her illness she began to act strange and soon became thoroughly insane, though at no time violent. Her mother was not aware of the onanism.

An examination under ether revealed hypertrophy of the clitoris and marked irritation of the nymphæ. I made the bimanual with reasonable care, and found an indefinite mass in the left side, which collapsed under the fingers. Fearing that it contained pus I removed her to the hospital and opened the abdomen at once. The ruptured cyst proved to be a hematosalpinx. The left ovary, however, was a mere shell, the size of a small orange and filled with pus. The right appendages were bound down by adhesion and were removed. The patient left the hospital at the end of the third week. She tore her dressings off several times and persisted in her onanism in spite of everything the attendants could do to prevent it. At this writing (five weeks from the time of the operation) her mental condition remains unimproved, though, of course, the case is too recent to expect improvement. Indeed I fear that there is more or less cerebral degeneration and hardly expect her to recover mentally. I report the case in this connection because of the apparent connection between the attack of inflammation and the insanity. The operation was fully justified by the physical condition, and she certainly stands a better chance to recover than before it was performed. She should be placed in an asylum, which her parents, who are ignorant, refuse to do. I mistrust that the girl was outraged before her attack of inflammation, but am not sure. I think that the case, according to the definition given, is a typical hystero-psychosis.

CASE XXVII.—*Profound Melancholia resulting from Gonorrheal Salpingits; Operation; Recovery.*—Patient æt. 36, referred to me by Dr. Butler, of Cleveland. Married ten years ago, and had miscarriage at four months, which was followed by a severe attack of pelvic inflammation and blood poisoning. Husband admits having had both gonorrhea

and syphilis before marriage. Had been in ill-health ever since this attack. Much pelvic pain; membranous dysmenorrhea. Examination revealed mass on left side, with very great tenderness of all of the pelvic organs.

Laparotomy on Aug. 13, 1895. Large tubo-ovarian cyst on left side which ruptured during removal. Right ovary and tube imbedded in inflammatory exudates. Operation difficult, but the pelvis was thoroughly cleared. Much oozing; glass drain, which was removed at the end of twenty-four hours.

There was no interruption in convalescence. Patient is now relieved of her pelvic soreness, and while she was profoundly depressed (melancholic) before the operation, she is now bright and cheerful.

Dyspareunia previously to the operation. The sexual functions are now perfectly normal.

CASE XXVIII.—*Vaginal Hysterectomy for an Enlarged, Lacerated and Subinvoluted Uterus, which was Retroflexed and Adherent; Profound Suicidal Melancholia; Complete Recovery.*—Patient æt. 45, referred to me by Prof. C. C. True, Cleveland. Patient has suffered much pelvic pain for years; menorrhagia; suicidal melancholia pronounced. Uterus lacerated and subinvoluted, retroflexed, adherent, and the right ovary bound down under fundus.

Vaginal hysterectomy on July 9, 1895. Appendages of both sides removed. The patient convalesced uninterruptedly, and her mental condition began to improve almost as soon as the operation was over. At this writing, March, 1897, she has gained twenty pounds in flesh, and is perfectly happy and cheerful. There is no longer the slightest trace of her old mental difficulty.

Epilepsy as a Hystero-Neurosis.—The most important distinction to be made between a true central lesion and a ganglionic reflex is the unfavorable prognosis of the one and the favorable prognosis of the other. An accurate diagnosis is, unfortunately, often impossible before an operation or before treatment has been resorted to. It is owing to this fact that we are unable to select reflex epilepsies with unerring certainty. We are led to suspect the utero-ovarian origin of epilepsy if it recurs at each menstrual period and if we discover actual disease of these organs, but we cannot be positive until the offending organ is removed or restored to a normal condition. Even then that which, for want of a better explanation, we designate as "habit" may have so impressed itself upon the nervous centers as to continue operative after the primary lesion is overcome; or, the irritation of a nerve fiber may

continue even after the diseased organ has been removed. In this there is nothing remarkable, since similar phenomena constantly occur under other circumstances. Thus, menstruation will sometimes persist in a vicarious form long after the entire uterus and its appendages have been removed; an epilepsy undoubtedly due to a depression of the skull will not always cease after the condition of depression has been remedied; and an imaginary pain will recur in a foot after the limb has been amputated for years. The first two illustrations are examples of "habit;" the last, an example of the continuance of irritation by the compression of terminal nerve fibers at the point of amputation. And so, it is reasonable to believe, an epilepsy primarily due to utero-ovarian lesion may be perpetuated, even though the orignal lesion be cured, or the offending organ removed.

I am fully aware that removal of the appendages for true epilepsy is looked upon with much distrust, and, in the light of the data at our command, justly so. I am confident, however, that the rapid strides of gynecology will soon define the types of epilepsy wherein the operation will prove useful. When actual disease of the appendages is demonstrable there is even now a pretty general consensus of opinion that an operation is indicated, especially if the menstrual exacerbations are marked. Unfortunately it is often impossible to demonstrate actual disease within the ovary without the aid of the microscope. The pathological findings in epilepsy have been most variable Different investigators working along this line have come to as many different conclusions. One has declared that in epilepsy the weight of the brain is increased (Echeverria); another that its weight is diminished (Meynert); and still another that there exists an unequal proportion of the two hemispheres. Again, dilatation of the vessels of the superior portion of cord; aneurism and atheroma of the blood-vessels; sclerosis of the cornu-Ammonis; anemia of the brain; an increased quantity of the cerebro-spinal fluid; tumors and thickening of the meninges of the brain; great redness and vascular tension in the fourth ventricle (Schroeder van der Kolk); alteration of the pineal gland; abnormal thickness and abnormal thinness of the cranial bones; and fatty degeneration of some portion of the medulla oblongata, are some of the many changes found *post-mortem* in epileptics. Indeed, the changes recorded by pathologists are so various that it is utterly impossible to construct an explanation of the paroxysms upon a pathological basis.

There yet remains a by no means insignificant number of cases in which neither the foregoing nor any other lesion, discoverable even by the closest scrutiny, exist. In all nervous affections characterized by

paroxysms, attacks or fits of any kind, the essential feature is, according to Brown-Sequard, a morbid increase of the reflex excitability, the symptomatic manifestations depending upon "what nerve cells are altered in their vital properties." It has been pretty conclusively proved that there is no constant *seat of epilepsy;* and it is not unreasonable to believe that irritation in any peripheral part of the nervous system may so irritate the cells at the base of the brain, or the upper part of the cord, or both, that in time their nutrition will become so altered as to create a morbid excitability. This is about the extent of our actual knowledge of epilepsy. The changes in these cells are more dynamical than physical, and the most powerful microscope has not yet revealed the difference between those which are perfectly normal and those which possess great morbid reflex power. (Brown-Sequard.)

Both clinical observation and experimental research tend to show that these cells are located chiefly in the base of the brain; and the fact that the early manifestations of an attack of epilepsy may be in very different parts of the body proves that their location must be variable. If this observation suggests anything it suggests the possibility of the most diverse forms of peripheral irritation exciting epilepsy. This theory is in perfect harmony with clinical observation. Literature contains innumerable instances of epilepsies caused by injuries to nerves and organs distant from the brain.* I submit that in the light of the array of clinical evidence now in our possession we are justified in believing that irritation having its origin in the uterus or the ovaries may, under certain circumstances, excite epilepsy; and if we can detect such irritation and remove it, we may cure the disease, providing irreparable damage has not been done to the nerve centers. It is in support of this proposition that I record the following cases of my own:

Illustrative Cases.

CASE XXIX.—*Epilepsy Mitior (petit mal) Cured by Operating upon the Cervix and Perineum.* Mrs. C., æt. 26. Patient of Dr. E. F. Chase, of Dexter, Michigan. Married, and at the time of consulting me was the mother of two children. For nearly 18 months before coming to me she suffered from frequent attacks of *petit mal,* always worse during the menstrual week. While engaged in conversa-

* *v. Medical Record,* July 21, 1890, for a case of reflex epilepsy cured by the removal of a shoe-button from the left cavity of the nose; and New Orleans *Medical and Surgical Journal,* October, 1889, for a case of *petit mal,* with concomitant asthma, in which all symptoms were relieved by curing septal and turbinal hypertrophies, seated far back.

tion she would suddenly pause in the most unaccountable manner in the middle of a sentence, the expression becoming perfectly blank; in a few seconds she would again resume conversation, being conscious, however, that there had been a break in the continuity of thought. Automatic action was also interrupted, and if walking she would stop during the unconscious interval. She suffered much from a dull, heavy, occipital headache with depression and great irritability. Her memory was more or less impaired. Family history good. There was menorrhagia with dysmenorrhea and leucorrhea.

Upon making a local examination I found a stellate cervical laceration, with subinvolution and much tenderness. The perineum was torn down to the sphincter muscle and the vaginal walls were likewise subinvoluted. I repaired the cervix and perineum in the usual manner, after which the attacks of *petit mal* became less frequent. Six months after the operation she reported herself a "new woman." Six years after there had been no recurrence of the symptoms, notwithstanding the fact that since the operation she has given birth to a third child.

CASE XXX.—*Epilepsy of Six Years Standing Greatly Relieved by Removal of the Appendages.*—Miss J. D., æt. 23, Harrisville, Pa. Mother died of phthisis three years ago, at the age of fifty. Father living, æt. 75. When nine years of age she sustained a fall, striking on her left side, since which time there has been great sensitiveness in the left ovarian region Menstruation became regular at 13, and although unusually nervous, nothing like an epileptic paroxysm made its appearance until she was 17 years of age. These attacks gradually increased in frequency, so that during the three years preceding the operation she had on an average two or three every night.

October 23, 1887, through the instrumentality of Dr. M. B. Snyder, she came to my clinic for relief. At this time her general health was fairly good; she slept and ate well, and the digestive and urinary functions were normal. If it had not been for the nervous paroxysms and the pain in the left side she would have considered herself quite well. The attacks, usually nocturnal, were preceded by an ovarian aura. There was a feeling as if the left ovary were grasped and squeezed. This peculiar sensation extended up the left side of the body into the head, when she was compelled to sit down and lost entire control of herself so far as voluntary motions were concerned, but never became unconscious. If the attacks were unusually severe there was pain in the vertex; they were somewhat more frequent just before and during menstruation. The tongue had never been bitten, nor was there any history of an epileptic cry. The patient brought

with her a bottle of bromid, and was profoundly under its influence; while modifying the severity of the attacks the drug had no perceptible effect upon their frequency. The memory, much to the patient's horror, was becoming seriously involved, and the besotted condition of the face, together with a peculiar, anxious look, indicated conclusively the natural tendency of the disease. A local examination showed both ovaries to be enlarged, and exceedingly sensitive. Pressure upon the left ovarian region would precipitate a convulsive attack, during which the limbs would become straightened and rigid, the hands clenched, the teeth set, and the eyes rolled back. The face would become more or less congested, but there was no frothing at the mouth. The attack would not last over thirty seconds. Unfortunately no opportunity presented itself to resort to pressure in an attack not thus induced.

The case seemed one eminently appropriate for operative interference. The trouble dated from an injury, and there could be no doubt that an ovarian lesion, and a serious one, existed. It is true, the paroxysms were not particularly aggravated during the menstrual period; yet a test, to my mind far more conclusive in demonstrating the connection existing between the ovarian lesion and the paroxysms, was present, namely, the ease with which one could be induced by ovarian pressure. The patient was for a month placed under the indicated remedy and proper local treatment, including galvanization, but only grew worse. She was very impatient to have an operation performed, having come several hundred miles for that purpose. With more indefinite local lesions I should have declined to operate without further efforts with constitutional and local measures. Under the circumstances, however, I performed double salpingo-oöphorectomy on November 21st, 1887, in the usual manner. Both ovaries were about three times their normal size, and both full of distended follicles, the result of cystic degeneration. Hydrosalpinx was likewise present on both sides. Why, with the right ovary and tube implicated in the pathological changes quite as much as the left, the pain should be entirely confined to the left side, is a problem for our neuro-pathologists to solve. It is hardly explicable upon an anatomical basis. A change for the better seemed to come over the patient almost as soon as she regained consciousness. No paroxysms took place until the third day after the operation; none again for a week, after which they recurred at lengthened intervals until December 29th, when she left the hospital, the longest interval being fourteen days

Improvement, in every respect, was of the most decided character. The day before starting upon her long journey home, and unknown

to the hospital attachés, she went out upon a prolonged shopping expedition and became very weary. That night she had a paroxysm, and upon her return home had two or three in frequent succession. Through a mutual acquaintance I learn that the attacks now rarely recur, are almost imperceptible when they do recur, and that she is supporting herself by hard work.

CASE XXXI.—*Epilepsy of Fourteen Years Duration Greatly Relieved by Removal of Appendages.*—I shall record this case in the language of my former assistant, Dr. V. D. Garwood, whose patient she was: "The patient, Miss R., æt. 45, is a woman of unusual intelligence; born of German parents. She lived in a quiet borough, of pronounced religious influence, inheriting, especially from her father, who ranked high as a scientist and musician, a sensitive, nervous system, and was pressed by him to the furthest limit in her education; on the other hand she was brought up in the Medean and Persian routine of German housewifery. When dysmenorrhea appeared it was regarded as too trivial for treatment, until epilepsy developed.

"As a child she was healthy until eleven, when she had scarlet fever, and for years after was subject to enuresis. Pleurisy followed some time after scarlet fever. At seventeen, eczema upon the hands appeared, lasting about a year, which was cured by outward application.

"Between 18 and 20 years of age she suffered frequently from asthma, which appeared every July. While engaged in teaching, a year or two later, a violent attack of acute pain and cramps in the stomach occurred, followed by a jaundiced condition. This attack was supposed by the physicians in attendance to be due to a round, perforating ulcer of the stomach.

"From that time until 29 years of age she seemed to be in fair health, with the exception of dysmenorrhea, to which no attention was paid. The first spasm—a very slight one—occurred in August, 1875. These continued during the fall, and were accompanied by an unpleasant noise in the head. She did not fall or lose consciousness; the slightest sound was increased to an unendurable noise in her head. Her attendants approached her on tip-toe to give her a drink or to fan her. Toward Christmas of that year the unconscious attacks began at night, with the *petit mal* during the day.

"At this stage of her trouble the most eminent physicians of Philadelphia were consulted—Drs. Weir Mitchell, Goodell, and others. After some time the mania epileptica developed; this, however, after the discontinuance of the bromides. In April, 1885, she had an attack of acute

rheumatism, in which hyperpyrexia was marked. After this there was complete exemption for six months from the nervous attacks, but overwork and intense strain upon the emotions brought them on again with renewed violence.

"She came under my care in August, 1888. For the preceding year one week of each month—her menstrual week—had been a perfect blank to her, owing to the frequency of the paroxysms. She had often bitten her tongue and had injured herself severely by falling. Observing that the periodicity of the attacks was that of the catamenia, I consulted Dr. James C. Wood, who, in May, 1889, performed double salpingo-oöphorectomy. From that time until August there were no spasms. In October there was a severe outbreak, but since that time until January, 1891, only slight attacks every two months, with excellent health in the intervals. She has returned to society and to her literary work. Her memory is being rapidly restored, and she enjoys life as never before since her illness." *

In this case I found great tenderness of the ovaries, but no perceptible enlargement. After removal they were examined by Prof. Heneage Gibbes, the pathologist of the University, who reported hyaline degeneration. Certainly if such a thing as a "menstrual epilepsy" exists, this was a case, and under the circumstances I had no hesitancy in removing the appendages. She came to me after passing through the hands of some of the ablest physicians of both schools, and I knew that all ordinary resources had been exhausted.

CASE XXXII.—*Menstrual Epilepsy of Twenty-four Years Duration Cured by Dilating the Cervix and Rectum.*—Patient æt. 39, unmarried, referred to me by Prof. D. A. McLachlan, of the University of Michigan. She is of a neurotic family, and had chorea in early childhood. Began to menstruate at fourteen, at which time she had a typical epileptic paroxysm. At the succeeding period she had two spasms, and had from one to three a month for the following twenty-four years. She suffered from obstructive dysmenorrhea from the very first. Upon consulting me in November of 1891, she was exceedingly nervous and hysterical. The skin was dry, the appetite poor, and the bowels constipated. There was marked vaso-motor disturbance as shown by the congestive headaches, the abnormal perspirations and the cold hands and feet. She rarely had the epileptic seizures during the inter-menstrual period; once in a while, however, such an attack would come on,

* This patient's improved condition remained permanent for two years, when she had a paroxysm in an out-house and died from strangulation.

so that she had to withdraw from society and did not dare to leave her home without an attendant. During the attack the face was suffused. She frothed at the mouth and frequently bit her tongue. On November 23, 1891, I thoroughly divulsed both the cervix and the rectum under an anesthetic, and packed the uterus with gauze. There were no clitoridal adhesions and no evidences of onanism, though at times sexual irritation was troublesome. As a result of the operation, the constipation was overcome, the equilibrium of the circulation restored and the dysmenorrhea almost entirely relieved. She had an epileptic paroxysm four days after the divulsion, and a second one in two weeks. For the succeeding two years, instead of from two to four paroxysms a month they occurred but three or four times a year. It has now been two years since the last paroxysm, and I think that I am justified in reporting this case as a complete cure. I had the patient constantly under observation for the first two years, and from time to time gave her local treatment for an old cervical endometritis, which, I should have added, was present before the divulsion. The epileptic aura began in the left hand with a feeling of numbness. For this and for her general neurasthenic condition I applied once or twice a week sparks from a static machine along the spine and down the arm, giving her at the same sitting a static bath. The internal remedies used were cimicifuga and ignatia.

CASE XXXIII.—*Menstrual Epilepsy of Eighteen Years Duration; Divulsion Without Relief; Salpingo-oöphorectomy with Cessation of Paroxysms for Twelve Months.*—Patient æt. 38, unmarried, brought to me by Dr. Helen M. Smith, of Delaware, O., in January of 1895. This patient had had typical epileptic attacks immediately preceding the onset of the flow for eighteen years. The bowels were constipated, the hands and feet cold and the skin dry and harsh. Many times the bowels would not move for ten or twelve days in spite of every effort to make them. The rectum contained several papillæ, and the sphincter ani was exceedingly irritable. The clitoris was adherent and there was abnormal sexual desire. An examination under ether revealed decided enlargement of the right ovary. Nothing abnormal could be detected on the left side. The patient's mother objected to a radical operation. I therefore dilated the cervix, curetted and packed the uterus, relieved the clitoris, dilated the rectum and sigmoid and removed several rectal papillæ. This work greatly relieved the general condition, but did not interrupt the frequency of the paroxysms. It entirely overcame the constipation. She returned to me in November of 1895, when I made a double salpingo-oöphorectomy. The right ovary was the size of a

hen's egg and was a mere shell, containing serum. The left was of normal size but cirrhotic. The paroxysms recurred at monthly intervals for three succeeding months (she did not menstruate after the operation), but there has been no return of them since (twelve months). This case is still too recent to place on record as a "cure," which I do not do. The improvement is, however, striking, and the outcome is promising. She is now supporting herself by doing the duties of governess, and is happier and better than she has been for years.

The extent of the disease is hardly a reliable criterion on which to base the necessity of operative interference in epilepsy, for we know that a slight amount of disease will in one woman produce serious reflex symptoms, whereas, in another, most extensive lesions will produce no disturbance whatever. It is necessary, therefore, under all circumstances in dealing with neuroses, to recognize *types* of constitution as well as the character of the local lesion. Indeed, in descending the pathological scale, a point may be reached where, instead of actual disease, there is simply functional disturbance which must be recognized as a causative factor. I believe, however, that we are rarely justified in removing the appendages unless there is pretty conclusive evidence of local disease. If such evidence be forthcoming; if the fits are intimately associated with the menstrual function; if the aura starts from the ovarian region; if there are no evidences of serious disease of the nerve-centers; if the health and mind are failing and the patient is rapidly approaching a state of chronic invalidism or insanity; and, above all, if all ordinary measures have been exhausted and internal medication faithfully tried, I believe that the gynecologist is justified in resorting to any reasonable measure promising some hope of relief.

The Hysterical Paroxysm.

A dissertation devoted to the *hystero-neuroses* and *hysteria* would be incomplete without a brief description of the hysterical paroxysm. However, were all of its manifold variations included in this description another chapter would be necessary. I shall therefore refer to the most salient features only.

An aura starting from the affected ovary frequently precedes the attack. In the milder forms there is accelerated, irregular, and often interrupted respiration. Spasms of the extremities, rhythmical in character, accompany the perverted respiration. In a few minutes the attack ceases, but others may follow in rapid succession. Consciousness is rarely lost, though in the more severe forms the loss of consciousness may be profound. Distortion and fixation of the trunk and extremities

are caused by the tetanic convulsions. The respiration becomes slow and stertorous, and there may be frothing at the mouth. The bowels are frequently greatly distended with gas. These symptoms, together with the alternate tonic and clonic character of the convulsions, have given rise to the term *hystero-epilepsy*. Before and after the attacks there is often hemianesthesia and hyperesthesia.

Relaxation succeeds tetanic muscular contraction, and this is followed in due time by exaggerated muscular phenomena. Emotional symptoms soon supervene. Anger, resentment, joy, grief, and apprehension are alternately depicted on the countenance. Lacivious manifestations are not infrequent. There may be hallucinations, during which the patient sees all sorts of disagreeable objects and things. Then comes contrition, and after it, recovery.

Treatment of the Hystero-Neuroses and Hysteria.

Certain general principles of treatment will suggest themselves to the reader. While it is usually wise in dealing with ordinary lesions to remove the *cause* at once when it is possible so to do, certain exceptions to this rule may have to be made in dealing with the hystero-neuroses. At least it is not always wise to direct the treatment to the pelvic organs until after certain systemic conditions are partially or entirely overcome and the patient has, in a measure at least, gained control of her emotional faculties. This is especially true if malnutrition is marked and if the sexual faculties are perverted. However, the treatment must be governed by the circumstances attending each case. Thus the general depravity of nutrition may be so great, and the pelvic lesion so slight, as to make it necessary to give the patient new blood and new tissue by proper feeding, medication and rest before an attempt is made to correct the local mischief. In the worst cases the rest treatment (Chapter IX.) is of the greatest utility. In another class of patients it may be necessary to overcome the local lesion at once, whatever that may be. I have endeavored, by the several illustrative cases introduced, to emphasize this point. Uterine deviations and ovarian displacements should be corrected, if possible, by postural or by non-operative measures. If this is not possible operative procedures, either conservative or destructive, may be adopted. Cervical rents and injuries to the pelvic floor may have to be repaired. In short, all lesions of the lower orifices of the body, and of the pelvis, should be corrected if possible, after which the indicated remedy and a properly selected diet will accomplish their purpose. Striking instances of the wisdom of this course are shown in cases

(XV. and XVI.). On the other hand, local treatments continued from day to day may do harm instead of good, especially if there be errotic tendencies. Usually, however, when pelvic congestion exists the hot douche, medicated, will do good.

In dealing with *nymphomania* the ovaries and uterus should not be unceremoniously sacrificed. I do not believe that we are justified in removing the appendages unless there exist sufficient disease to justify the operation, even though nymphomania were absent. The removal of the appendages does not as a rule destroy the sexual appetite, though removing abnormal ovaries may modify it. Adhesions of the clitoris and irritable nymphæ should, in these cases, always receive attention.

The physician should obtain absolute control of his patient, to accomplish which she may have to be removed from home surroundings and placed under the care of an intelligent nurse. Under all circumstances the habits of life should be looked into. In young girls the system of education may be at fault. Emotional literature should be proscribed. In married women sexual irregularities should be corrected, and, in the milder cases, sedentary habits overcome. Cycling in moderation is often beneficial, as are other forms of physical culture, when intelligently followed. In short, the patient should be improved physically, morally and intellectually and taught to master her emotions instead of permitting them to master her.

In nearly all instances electricity in some form will be found serviceable. When the nervous symptoms predominate general franklinization and central galvanization will often accomplish much good. In hyperesthesia of sight and hearing the static breeze is of benefit. Hyperesthesia of the joints and of the mucous membranes is often relieved by positive galvanization. In clonic and tonic spasms of the muscles and joints both galvanization and faradization should be tried. Hysterical aphonia can often be cured by one or more of the forms of electricity. In both hyperesthesia and anesthesia of the mucous membranes of the urethra and lower bowel divulsion under anesthesia is to be tried as a final resort. In spinal irritation a mild galvanic current (five to ten milliampéres) should be passed through the spine from one to three times a week, with the positive pole over the sensitive areas; this, in many instances, can be advantageously followed by the direct application of sparks from a faradic machine. Massage, even though the full rest treatment is not adopted, is a form of exercise exceedingly beneficial in nearly all instances. Finally, the indicated remedy should be carefully selected and not too often changed. Those given in the section devoted to "nervous prostration" are the ones oftener indicated.

Treatment of the Hysterical Paroxysm.—The physician must assume absolute control of the room and its inmates. Sympathizing and excited friends should be excluded. Slight hysterical seizures of an emotional character can often be controlled by the indicated remedy, or by inhalations of ammonia, or of nitrite of amyl. When the paroxysm is fully developed more radical measures are necessary. Most authorities recommend douching the head and face with cold water. This is a successful method of treatment, but a difficult one to apply without wetting the clothing. A few teaspoonfuls of water poured into the mouth or nostrils will often accomplish the same purpose, and should be first tried. It acts by stimulating the respiratory centers. Dr. Hare recommends closing the nostrils and mouth for fifteen or twenty seconds with a towel. Chloroform or ether inhalation is very effective, and one of the best methods of controlling an attack. Ice-water injected into the rectum may be tried. Cruveilhier and Ashwell recommend that cold water be injected into the stomach. Cutaneous faradization has been found useful. It is accomplished by placing the two electrodes anywhere from the neck to the hand, or on the two hands. Finally, Gowers * uses, when all other measures have failed, a hypodermic injection of a twelfth or sixteenth of a grain of apomorphia with invariable success. As soon as nausea is excited the paroxysm ceases, and the patient regains consciousness immediately upon vomiting, which occurs in six or eight minutes after the injection.

Pressure over the region of the ovaries, according to the method of Charcot, is a simple, harmless, and often a most effectual procedure. It is accomplished by placing the patient in a horizontal position on the floor or mattress and pressing the closed hand or fist into one or both iliac fossæ. Much force is at first necessary to overcome the contraction of the abdominal muscles. If successful, the patient soon makes numerous and noisy attempts to swallow, when consciousness returns. The phenomena of the seizure disappear in from two to four minutes.

Therapeutics of Hysteria.

Moschus.—Constriction of the chest, frequent swooning, great anguish with fear of death; HYSTERIA SIMULATING TETANIC SPASMS; globus hystericus; great desire for beer or brandy.

Chamomilla. — Irritable, peevish, impatient; great tendency to quarrel, to speak in an obstreperous manner; moaning and wailing during sleep.

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* "Diseases of the Nervous System," p. 1329.

Hyoscyamus.—Jerking and twitching in the spasms; convulsions resemble epilepsy; much silly laughter and foolish action; she is disposed to uncover herself and go naked.

Caulophyllum.—HYSTERICAL CONVULSIONS DURING DYSMENORRHEA; hysteria in anemic and greatly debilitated patients; spasmodic, intermittent pains in the bladder, stomach, groins, chest and limbs.

Platina.—Self-exaltation and contempt for others; a strange titillating sensation extending from the genital organs up into the abdomen; spasms, with wild shrieks; horrifying thoughts; menses in excess, dark and thick.

Nux moschata.—Frequent and sudden change of mental symptoms; excessive tendency to laughter; enormous distention of abdomen after meals; EXCESSIVE DRYNESS OF MOUTH AFTER SLEEPING.

Lachesis.—Sensation as if a lump were rising in the throat; CANNOT BEAR THE LEAST PRESSURE EXTERNALLY ON ANY PART OF THE BODY; AGGRAVATION AFTER SLEEPING.

Consult: — ANACARDIUM, AURUM, asafetida, GELSEMIUM, cactus grand., lilium tigr., stramonium, ZINCUM, tarantula, valeriana.

CHAPTER XVI.

MENSTRUATION AND ITS DISORDERS.

PHYSIOLOGY OF MENSTRUATION: AMENORRHEA.

General Considerations.—The anomalies of menstruation cannot be intelligently studied without a familiarity with its physiology. As to the *cause* of menstruation there is much that is yet uncertain. The *phenomena* belonging to the function are, however, well known; and, from a practical standpoint, it is these which most concern the physician.

Definition.—Menstruation may be defined as a periodical discharge of blood from the uterine cavity, recurring at regular intervals between puberty and the menopause, except when physiologically interrupted by pregnancy and lactation. Puberty begins in this climate at the average age of thirteen, and climacteric changes are usually inaugurated at about forty-four. The age of puberty is influenced by climate, habits, idiosyncrasies and disease; it occurs earlier in warm than in cold climates, and in large cities than in rural regions.* It is delayed in certain families until the age of sixteen, seventeen or even twenty years, without any perceptible ill-effect; and it is frequently delayed for an indefinite time by some constitutional bias, notably tuberculosis.

The *symptoms of approaching puberty* are very characteristic The habits of girlhood are discarded for those of retiring womanhood, the figure develops, and the breasts enlarge; coincident with these changes, hair appears upon the mons veneris.

The symptoms of perfectly normal menstruation are objective rather than subjective. Nevertheless, there are few girls or women who do not suffer just before the advent of the flow from a feeling of uneasiness or weight in the pelvic organs, and frequently there is an unpleasant sense of fulness in the breasts. These symptoms are particularly

* Lutaud (*Bulletins et mémoirs de la Société obstétricale et gynécologique, Paris, December*, 1890,) reports the case of a girl who began to menstruate at seven years and two months. The patient was well formed and healthy. Dr. D. S. Peeples (*New York Medical Journal*, May 30, 1895,) reports a case of premature menstruation in a child five days old. Another case is recorded by Dr. C. E. Cathetings, of Woodville, Miss. (*New Orleans Medical and Surgical Journal*, May, 1895,), of a child one month old, which menstruated regularly for six months.

marked at the first menstrual period, and are often accompanied with decided nervous phenomena. Occasionally the first knowledge of the approaching period is the presence of the flow.

A *normal period* continues from two to eight days, and the quantity of blood lost varies from two to nine ounces (three to twelve napkins). Either extreme may be perfectly normal, depending upon the temperament and habits of the menstruating woman. The average duration is about four days, and the average quantity of blood lost, five ounces. During the *invasion* the discharge is pale; during its *persistence* it becomes darker, is non-coagulable, and consists of red and white blood corpuscles, granular corpuscles, and mucous globules commingled with epithelium from the uterine, cervical, and vaginal cavities; during its *decline* it again becomes pale. Unless the flow is excessive there is no clotting, for the vaginal secretion preserves its fluidity.

Theories.—The *ovarian theory* of menstruation, advanced and advocated by Costé, Gendren, Bischoff, Negrier, and Pflüger, has long been, and still remains, the classical one. According to this theory, ovulation and ovarian irritation are responsible for menstruation. When oöphorectomy became a common operation, it was observed that menstruation sometimes persisted even after the ovaries were removed; and that the function was more surely, although not invariably, abrogated if the Fallopian tubes were removed with them. Lawson Tait, who was the first to observe this fact, promulgated the so-called *Fallopian theory* of menstruation. He maintains that the function of menstruation is not ruled by the ovaries, and presents the following reasons why he believes that the starting point is the Fallopian tubes:—

(1) Pain when the tubes are occluded; (2) the first appearance of menstrual fluid in the tubes; (3) the continuance of menstruation after the removal of the ovaries; (4) the arrest of menstruation after the removal of the tubes.

Tait * believes that we should not speak of menstruation as occurring but once a month and adopts the classification of Walter Heape, who divides the menstrual cycle into four distinct periods, as follows:—

A.—Period of rest.

Stage I—The resting stage.

B.—Period of growth.

Stage II—The growth of the stroma.

Stage III—The increase of vessels.

C.—Period of degeneration.

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* Provincial Medical Journal, January 1, 1895.

PLATE VII.

Fig. 1.

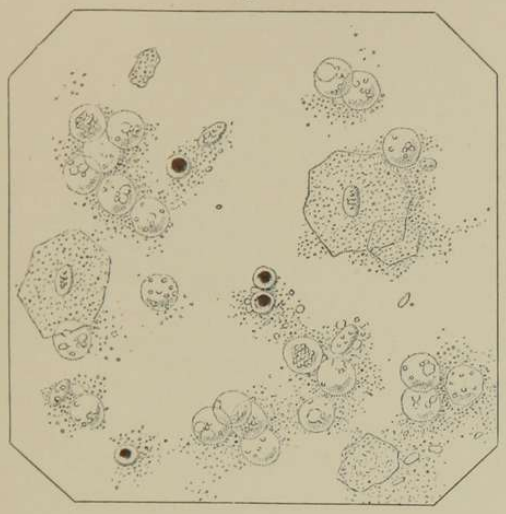

Fig. 2.

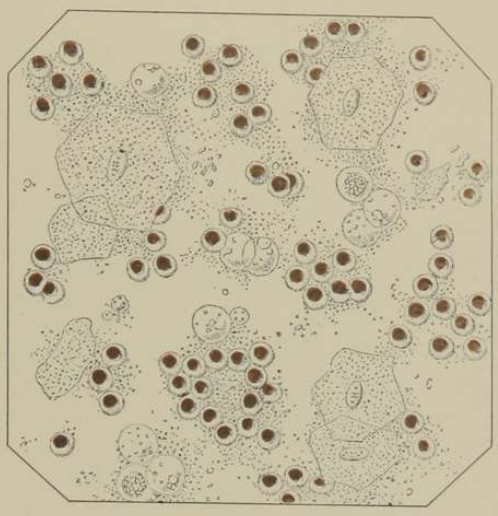

Fig. 3.

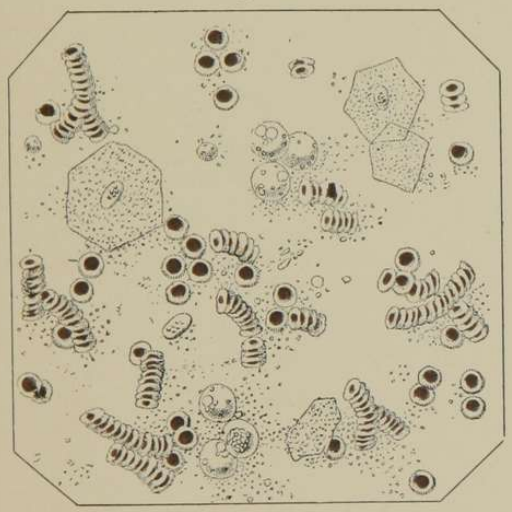

Fig. 4.

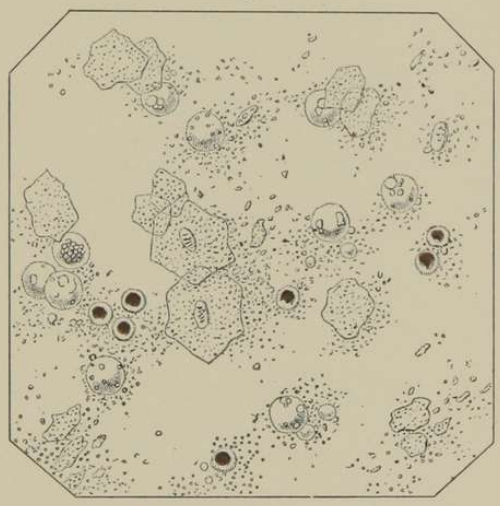

Fig. 5

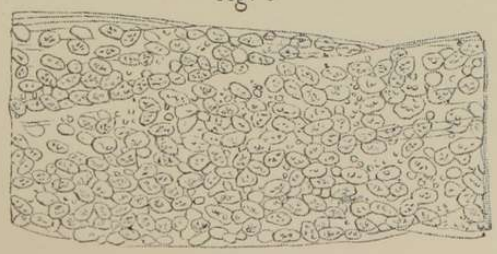

Fig. 6.

Fig. 7.

Microscopic view of menstrual fluid at different periods of menstruation (Figs. 1, 2, 3, 4). Fragments of endometrium cast off ten days after menstruation (Figs. 5, 6, 7). (*Pouchet.*)

Stage IV—The breaking down of vessels.

Stage V—The formation of lacunæ.

Stage VI—The rupture of lacunæ.

Stage VII—The formation of a menstrual clot.

D.—Period of recuperation.

Stage VIII—The recuperation stage.

As counter evidence to the Fallopian theory and in support of the ovarian, the following observations are presented:—*

(1) When the ovaries are congenitally absent menstruation is also wanting; (2) when the ovaries are removed early in life the same result is apparent; (3) when the ovaries are removed after puberty menstruation generally ceases; (4) all the secondary sexual characters of the female are dominated by the ovary, and menstruation is one of these.

The arguments set forth to substantiate these two theories of menstruation—the *Fallopian* and the *ovarian*—are based upon certain phenomena which are by no means invariable. It may be said that, while menstruation does sometimes persist after the removal of the ovaries without the tubes, this is only exceptionally the case; and it cannot be maintained that the function always ceases after the ovaries and tubes are both removed, for a number of authentic cases are now on record in which both appendages have been removed without accomplishing this end. That the first appearance of the menstrual blood in the human female is always in the tubes is hardly susceptible of proof.

On the other hand, it must be admitted that menstruation occurs at a period of life when ovulation is most active; but that there is a causal relation existing between the menstrual flow and the escape of the ovule, while probable, has not yet been conclusively proved.

A still more modern theory is that of Campbell.† Campbell believes that the menstrual rhythm is initiated by a nervous rhythm dependent upon nervous structures. "Just as there is a rhythmically pulsating respiratory and cardiac center, so there is a rhythmically pulsating sexual center which furnishes fibers both to the ovaries and to the uterus, those of the latter passing, for the most part, along the Fallopian tubes, but some few to the uterus directly."

Byron Robinson‡ also believes that all evidence favors the theory that ovulation and menstruation are independent, in proof of which he cites the fact that menstruation occurs in women whose ovaries are so

* London Lancet, December, 1888.

† Annual of Universal Medical Science, 1890.

‡ Am. Gynecological and Obstetrical Journal, Aug., 1895.

diseased as to make them incapable of ovulating; and that ovulation occurs before birth in women and other animals.

Campbell further believes that ovulation is an essential, though not an indispensable, factor of the menstrual rhythm. This hypothesis will at least explain the following facts as set forth:—

(1) The periodic flow sometimes continues after the removal of the ovaries; (2) the function is generally abrogated by the removal of the tubes; (3) occasionally it continues after both the ovaries and tubes have been removed, just as a reflex epilepsy sometimes continues after the source of irritation has been removed.*

Dr. Arthur W. Johnstone affirms "that the functions of the ovary and the uterus are separate and distinct, and that the endometrium is the real organ of menstruation."

Johnstone has described a "menstruation nerve," located in the pelvic splanchnics, which he believes to be the governor of menstruation. This trunk enters the uterine cornu beneath the Fallopian tube, starting down in the base of the broad ligament.

In discussing the probability of a menstruation center Skeene (*Medical Gynecology*, p. 36, 1895) remarks: "While the existence and position of this center are not to-day as certainly known as those of the vaso-motor and respiratory centers, nevertheless impartial experimentation upon animals and careful dissections upon the human cadaver leave little doubt. And, too, in this lumbar enlargement of the spinal cord are micturition, defecation, erection, ejaculation, and parturition centers. Why not a menstruation center?"

Christopher Martin (*British Gynecological Journal*, Nov., 1893) presents practically the arguments adduced by Skeene.

Johnstone looks upon the uterus as a hollow lymphatic gland without a lymph stream, and that menstruation is a necessity in erect animals because there are not sufficient lymphatics to carry off the lymph corpuscles.

Neither is there a general concensus of opinion regarding the *source* of the hemorrhage, and the changes which the endometrium undergoes.

J. Bland Sutton† has made a series of observations in the quadrumana, and has also examined the uteri of some young women who died during menstruation. From these observations Sutton is led to believe that the disintegration of the mucous membrane is limited to the superficial

* Robinson believes that menstruation is inaugurated by tubal motion due to ganglia situated in the uterine walls and along the tubes, which are intimately connected with the ovaries.—*New York Medical Journal*, January, 1891.

† Brit. Gynec. Journal, 1886.

and glandular epithelium, and that the mucous membrane of the Fallopian tubes remains unaltered.

Dr. Johnstone's investigations go to prove that the loss of substance in the menstruating uterus is limited to the epithelial lining of the mucous membrane.

Kundrat and Engelmann also believe that only the superficial layers of mucous membrane are removed.

In marked contrast to the foregoing views are those of Dr. John Williams, of London, who maintains that "uterine contraction drives the blood from the muscular walls into the mucous membrane; the vessels of this membrane, having undergone fatty degeneration, give way, and extravasation of blood results. This extravasation takes place always near the surface, for in that situation the degenerative changes have most advanced. The rush of blood into the vessels of the mucous membrane expels the contents of the glands, together with the greater part of their lining epithelium . . . . . When hemorrhage has taken place into the membrane it undergoes a rapid disintegration and becomes *entirely removed.*" Williams believes that a new mucous membrane is formed from the muscular walls of the organ. In the light of present data, this is hardly probable.

Leopold denies the existence of fatty degeneration, and believes that the bleeding is due to the peculiar arrangement of the blood-vessels in the endometrium. There exists, according to this author, a disproportion between the arterioles that supply the capillaries of the uterus, and the veins that receive the blood—the arterioles being relatively larger; as a result a sudden afflux of blood to the uterus is not carried off by the veins and the capillaries rupture. In the process of disintegration only the superficial layer of the mucous membrane is removed.

Moricke, basing his observations upon curettings from living menstruating women, asserts that "during menstruation the mucous membrane disappears neither partially nor fully."

It will be seen by the foregoing that much pertaining to the physiology of menstruation is as yet unsettled. I have deemed it best to present in condensed form the more prominent theories I shall not venture an opinion of my own, further than to add that Campbell's theory as regards the *cause* of the periodical flow of blood termed menstruation, and Leopold's theory as regards the *changes* which the uterine mucous membrane undergoes, as the result of this flow, seem to me the most reasonable.

Amenorrhea.

The term *amenorrhea* signifies an absence or stoppage of the menstrual discharge, due to causes other than physiological. It may be primary (*emansio-mensium*) or secondary (*suppressio-mensium*). In both of these forms there is non-secretion. *Retention of the flow* is also classified under the head of amenorrhea, though the causes responsible for the absence of the discharge are radically different from those giving rise to the primary and secondary forms. Amenorrhea is physiological during pregnancy and lactation.

Primary Amenorrhea. (*Emansio-mensium.*)—In the *primary* form of amenorrhea menstruation has never occurred and puberty, for some reason, is delayed. The *causes* for such delay are variable and must be carefully sought for. Probably some form of constitutional bias—anemia, tuberculosis, scrofulosis, or rickets—is oftener responsible for it than anything else. Such being the case the patient's vitality is conserved by the amenorrhea. Again the menstrual function may be held in abeyance by misdirected mental effort and insufficient exercise. Congenital defects involving the uterus, ovaries, Fallopian tubes, or, indeed, any of the sexual organs, are not infrequently responsible for the non-appearance of the menses.

The *symptoms* of primary amenorrhea are those of delayed puberty. The changes incident to normal puberty are wanting; the breasts do not enlarge, the figure remains undeveloped, and no hair appears upon the mons veneris. *Molimina* may or may not be present; if present many of the symptoms of menstruation occur, minus the flow; if absent, and the cause is due to one of the enumerated constitutional disorders, the symptoms of the latter will stand out prominently. Let it be remembered that in these instances the amenorrhea is the *effect* and not the *cause* of the constitutional malady.

The delay of the function not infrequently gives rise to *nervous phenomena*, especially when there is an effort on the part of the system, as indicated by the molimina, to establish it. Hysteria often occurs, and the nervous perturbation may result in chorea. Neuralgia is not an uncommon symptom, especially if anemia or chlorosis is marked.

The *diagnosis* of primary amenorrhea is not difficult. It ought not to be mistaken for physiological amenorrhea due to *pregnancy*, and yet such mistakes have been made. In primary amenorrhea the evidences of delayed puberty—the diminished size of the uterus, the undeveloped mammæ and figure—and the absence of abdominal tumor, all argue against pregnancy. It must not be forgotten that conception is possi-

ble before menstruation; from a practical as well as a medico-legal standpoint this fact is important.

Secondary Amenorrhea.—(*Suppressio-mensium*).—In *secondary amenorrhea* the menstrual function has, for a longer or shorter period, existed, but owing to some cause or causes it has become suppressed. In acute diseases—phthisis, anemia, and chlorosis—the suppression is not undesirable, for by means of it the patient's strength is conserved. Indeed, menstruation should not occur with an anemia at all marked; if it does, and the flow is profuse, the physician is justified in suspecting that the depravity of the blood is secondary to the menstrual excess. In such cases an effort should be made to induce amenorrhea, either partial or complete, by directing attention to the endometrium, for, in many instances, the latter will be found abnormal. Wylie observes that if amenorrhea occurs during the period of development of the sexual organs the growth of the latter is often permanently affected by it. The inflammatory diseases of the pelvis may likewise produce amenorrhea by leaving in their train lesions of the ovaries and tubes; oftener, however, such lesions result in menorrhagia.

There are certain women, healthy in all other respects, who suffer from suppression upon the least irregularity. Change of climate or altitude, a sea voyage, or the slightest exposure, is quite sufficient to induce amenorrhea. Usually it is only temporary, and in due time the menstrual equilibrium is restored; occasionally the system becomes so profoundly impressed by the suppression that the amenorrhea remains permanently. Those who have to deal with immigrants coming to this country state that amenorrhea frequently results from the sea voyage and climatic changes combined.

The *symptoms* of secondary amenorrhea depend in no small degree upon the suddenness of the suppression. In acute suppression there is marked disturbance of the nervous and vascular systems, manifesting itself in increased arterial tension, palpitation of the heart, headache, neuralgic pains in various parts of the body, and, not infrequently, hysteria. The local distress is sometimes very great, the pain being sharp and darting, or cramp-like. Occasionally the vascular excitement is preceded by a chill, and the congestion induced may pass into serious inflammation.

When amenorrhea is developed gradually, the symptoms are less violent, though often of most serious import. Prostration, lassitude, indigestion, constipation, and cardiac oppression, one or all, make their appearance in due time. The symptoms of the disease which is responsible for the non-performance of the function—anemia, phthisis, etc.—

force themselves upon the attention of the physician. Under all circumstances pectoral symptoms occurring in connection with amenorrhea demand serious consideration.

Diagnosis.—This form of amenorrhea is easily mistaken for *pregnancy*. The subjective symptoms are much the same in both instances; nausea, vomiting, morning sickness, mammary pains, etc., may result either from pathological or physiological suppression. During early pregnancy the increased size of the uterus is so slight as to make even the most deft diagnostician uncertain regarding its contents. If the patient is untruthful, and denies the possibility of pregnancy, *time* is the only absolute test. After the third month the diagnosis can usually be made with a fair degree of certainty.

Retention of the Flow.—Amenorrhea due to retention is the result of some interference with the exit of the menstrual discharge after it has been secreted. The cause of obstruction may be congenital or acquired. An imperforate hymen is the most frequent congenital cause, though the menses are sometimes retained because of atresia of the vagina higher up. Usually, however, when the vagina is congenitally absent the menstrual function is held in abeyance.

The *acquired* causes oftener result from child-bearing, the sequelæ of inflammation and sloughing. Operations upon the cervix may also result in atresia. Tumors, polypi, flexures and coagula may give rise to temporary retention.

Symptoms.—Retention of the menses may and usually does give rise to much suffering. Attacks of pain recur at regular intervals, with all the usual symptoms of menstruation, except the flow. The pain is of a bearing-down character, coming and going at variable intervals, and reaching its climax after some hours duration. It then gradually subsides and finally disappears to recur again at the next period. There is often marked general disturbance during the paroxysm of suffering which manifests itself in headache, increased arterial tension, nausea and vomiting, pain in the back and limbs and nervous phenomena of various kinds. Hysterical convulsions are not infrequent, and even epilepsy may develop. In due time the uterus becomes distended with the products of menstruation, giving rise to a tumor in the hypogastric region.

Diagnosis.—The regular recurrence of molimina corresponding to the menstrual cycle, and the gradual formation of a tumor in the uterine region, together with the absence of the menstrual discharge externally, will lead the physician to suspect the nature of the case. The reflex symptoms of pregnancy may be present, but a local ex-

amination will reveal the cause of the difficulty. Such an examination may necessitate exploration through both the rectum and bladder in order to determine the presence or absence of the uterus and annexa.

The *prognosis* of amenorrhea depends entirely upon its cause. Of the various constitutional ailments giving rise to it *anemia* is the most amenable to treatment. If the result of acute disease the system usually rights itself in due time. *Tuberculosis* is, of course, always of serious import.

Of the anatomical causes *imperforate hymen* is the most easily dealt with. Congenital absence of the uterus or ovaries makes a cure impossible; if due to deficient development only, the prognosis will depend upon the presence or absence of molimina. When atresia of the vagina is responsible for the retention it is possible, by surgical measures, to liberate the pent-up discharge and to restore the canal to its normal condition; when it is congenitally absent, however, an attempt to form a vagina may results in failure.

The Treatment of Amenorrhea.

Let it be remembered that amenorrhea is in many instances but an expression of some systemic trouble toward which the treatment should be directed. Anemia, chlorosis, nervous prostration, tuberculosis, etc., are the real diseases of which the amenorrhea may be but a symptom. The general and special measures appropriate for these several diseases should be brought into requisition. Under all circumstances fresh air, sunlight, exercise, and good food are of the greatest utility. In short, the several measures suggested in the chapter devoted to the General Treatment of Gynecological Diseases should be applied.

In *acute suppression* an effort should be made to restore the discharge, if this can be accomplished by measures which are not injurious. Of first importance in accomplishing this end is the indicated remedy. A hot foot or sitz bath is a most useful adjuvant, as is also the hot douche. The latter is particularly indicated if the evidences of local congestion are at all marked. Failing with these several measures, after a few hours' trial, it is not best to attempt longer to restore the flow by the use of hot water. The indicated remedy should, however, be continued until the system is put right. The use of so-called emmenagogues is, under all circumstances, to be discouraged.

When amenorrhea or scanty menstruation is due to imperfect development of the sexual organs an effort should be made to promote their development. This can be done in various ways, but undoubtedly the most useful of all agents known at the present time for accomplishing

this end is *electricity*. The time and technique of application are given in detail in the chapter devoted to that subject. Patience and persistence are required in using electricity for this purpose, but so long as nature continues to assert herself by exciting molimina, there is hope of bringing on the flow. The introduction of the uterine sound and the use of the galvanic stem pessary also stimulate the uterus in a mechanical way. There can be no objection to the careful use of the sound, but the intra-uterine stem is an instrument always to be resorted to with the utmost caution.

Therapeutics.

Calcaria carb.—LEUCOPHLEGMASIA, with malnutrition and disturbance of digestion; face pale and bloated, with blue rings around the eyes; oppression of the chest tending to tuberculosis; COLD HANDS AND COLD FEET; amenorrhea with anasarca from working in water.

Ferrum.—ANEMIA; great nervousness and debility, with FIERY REDNESS OF THE FACE ON THE LEAST EXCITEMENT; palpitation of the heart; paleness of the mucous membranes; diarrhea, with undigested food; want of breath when moving or ascending; pressure in the stomach and head.

Arsenicum.—White, waxy paleness of the face, and GREAT DEBILITY; corrosive leucorrhea; frequent paroxysms of fainting; painful lienteria, followed by much prostration.

Pulsatilla.—Especially useful at the age of puberty; suppression from getting the feet wet; menstrual suppression complicated with ophthalmia; hemicrania, with stitching pain in face and teeth; painful lumps in the breast, extending to the arms. (Guernsey.)

"When in girls of mild disposition puberty is unduly delayed, or the menstrual function is defectively or irregularly performed; when they grow pale and languid, and complain of headache, chilliness, and lassitude, pulsatilla (with or without ferrum) is a most excellent remedy.—*Hughes.**

Kali carb.—SWELLING OF THE EYELIDS; disposition to phlebitis; stiffness and pain in the small of the back; aggravation of all symptoms at two or three o'clock in the morning.

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* PULSATILLA—LILIUM TIGRINUM. A Comparison.—*Lilium*, like *Pulsatilla* causes scanty menses, but the former has irritable mood, wants to die, and yet knows not why; solicitude about health; absence of feeling in the head with amenorrhea; longs for meat; diarrhea hurries her out of bed in the morning. *Pulsatilla* has gentle, tearful mood; wants to die, but fears it; solicitude about health and salvation; mania with amenorrhea; averse to meat; diarrhea after midnight. Remission, in *lilium*, *forenoon;* in *pulsatilla*, *midnight until noon* (except diarrhea).—*American Journal of Homeopathic Materia Medica.*

Kali mur.—Menstruation too late or suppressed; fibrinous, white, stringy leucorrhea; constipation with sluggishness of liver; tongue coated white; rheumatic pains with swelling of the parts.

Kali phos.— Menstruation too late in pale, irritable, lachrymose females.

Graphites.—After pulsatilla; occasional show of menses, which are very pale and very scanty, with abdominal pains and pain in the limbs (Guernsey).

Sepia.—Yellow or greenish leucorrhea accompanied by much itching of genital organs; amenorrhea at age of puberty or later; PAINFUL SENSATION OF EMPTINESS AT PIT OF STOMACH; brown spots on chest and yellow saddle across bridge of nose.

Aconite.—Amenorrhea from taking cold or getting feet wet, with congestion of the head and chest; suppression from fright or vexation. Particularly useful in acute suppression in young girls of sanguine temperament, and who lead a sedentary life.

Belladonna.—ACUTE SUPPRESSION WITH GREAT CONGESTION OF THE FACE AND EYES AND THROBBING OF THE CAROTIDS; intolerance of light or noise; bearing-down pains as if the contents of the abdomen would issue through the vulva.

Secale corn.—There is a continual, long lasting, forcing pain in the uterus at the menstrual nisus; leucorrhea brownish and offensive, resulting from weakness and venous congestion.

Sabadilla.—Menses are suppressed immediately on their appearance, appearing again sooner or later, to be again suppressed.

Apis mel.—Amenorrhea with bloated, waxy face; ovarian irritation with stinging pains; cardiac distress.

Gelsemium.—Amenorrhea with a dull, heavy headache; vertigo, with disturbed vision; darting, twitching, neuralgic pains in the face.

Sulphur.—Great congestion of the pelvic organs and of the head; coldness of the feet, or BURNING OF THE SOLES OF THE FEET at night in bed; FLUSHES OF HEAT; hemorrhoids; chronic inflammation of the eyelids and a general eruptive tendency.

Platina.—PAINFUL SENSITIVENESS and continual pressure in region of mons veneris and genital organs; frequent sensation as if the menses would appear; amenorrhea with induration of the uterus and co-existing ovarian irritation.

Aurum.—Amenorrhea with prolapsus uteri and MELANCHOLIA; thick, white leucorrhea, with burning and smarting of the vulva.

Opium.—Amenorrhea from fright; IRRESISTIBLE DROWSINESS; great heaviness of the head with fainting on rising.

Dulcamara.—Menses suppressed by cold; mammary glands engorged and hard; rash before menses.

Consult:—**Causticum, mag. carb., cimicifuga,** borax, mercurius, nux vom., xanthoxylum,* and zincum.

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* *Xanthoxylum in Amenorrhea.*—A servant girl, during her catamenial period, scrubbed the floor in naked feet. The flow ceased at once and there was no return. At the end of six months she became emaciated, coughed terribly, with dirty, gray expectoration, pale face, night sweats, etc. Thought she had consumption and gave up work. *Xanthoxylum* brought on the menses in four days and she recovered rapidly. It is now five months since, and she has menstruated regularly, and has so far recovered her health that she has resumed her labor again.—Dr. J. C. Williams, *U. S. Med. and Surg. Journal*, October, 1871.

CHAPTER XVII.

MENSTRUATION AND ITS DISORDERS.
(Continued.)

UTERINE HEMORRHAGE.

General Considerations.—Hemorrhage from the uterus must be looked upon as different from hemorrhage proceeding from any other organ of the body, for the uterus is normally subjected to the greatest variations of vascularity. Again, it is necessary, in order to determine whether or not the menstrual discharge is excessive in a given case, to consider the age and idiosyncrasy of the patient, as well as the effect which the discharge has upon the system. One woman can, with impunity, lose an amount of blood which would be ruinous to another.

Hemorrhage from the genital canal does not always proceed from the uterus. It may have its origin in some lesion of the vagina or the urethra, or indeed, a supposed uterine hemorrhage may come from the rectum. Women are sometimes careless observers, and this fact should be borne in mind.

The term *menorrhagia* indicates the menstrual origin of the hemorrhage and signifies excessive menstruation; the term *metrorrhagia* signifies that the hemorrhage either occurs during, or is prolonged into, the inter-menstrual period. This division is convenient and in harmony with clinical observation. For the purposes of study, however, it is more practicable to deal with uterine hemorrhage *per se*, whether occurring at the menstrual or the inter-menstrual period.

The various *causes* giving rise to abnormal hemorrhage from the uterus may be classified as follows:—

1. *Constitutional*, ... {
   (*a*) Hemorrhagic diathesis;
   (*b*) Purpura;
   (*c*) Tuberculosis;
   (*d*) Bright's disease,
   (*e*) Syphilis.

2. *General*, ... {
   (*a*) Lactation;
   (*b*) Pelvic congestion due to disorders of the heart, liver, lungs, and stomach; sedentary habits; sexual excesses; and ovarian disturbances.
   (*c*) Malaria;
   (*d*) Lead poisoning;
   (*e*) Pyrexial disorders.

3. *Nervous*, ... {
   (*a*) Centric;
   (*b*) Reflex.

4. *Malignant lesions*, . . . {
   (*a*) Carcinoma;
   (*b*) Sarcoma.

5. *Non-malignant lesions*, . {
   (*a*) Fibroma and polypi;
   (*b*) Inflammatory;
   (*c*) Subinvolution.

6. *Accidental*, ... {
   (*a*) Chronic uterine inversion;
   (*b*) Hematocele;
   (*c*) Uterine displacements.

7. *Pregnancy*, ... {
   (*a*) Abortion;
   (*b*) Placenta previa.

8. *Climacteric.*

Constitutional Causes.—The various *constitutional diseases* predispose to hemorrhage by inducing blood changes. In the so-called *hemorrhagic diathesis*, *purpura*, *tuberculosis*, *Bright's disease* and *syphilis* such changes have taken place, and the blood readily passes through the lining membrane of the womb. Long continued hemorrhage, the result of some local disease, will in due time so defibrinate the blood as to predispose to hemorrhage from various channels of the body.

In dealing with the *hemorrhagic diathesis* it is not always possible to detect the constitutional bias. The victims of this diathesis are known as "bleeders," and every surgeon of experience has learned to dread them. In all other respects the patient will seem to be perfectly well, but the slightest cut or injury will bleed unduly. It is not surprising that the menstrual discharge in these patients should be great enough to demand attention.

Tuberculosis gives rise to amenorrhea oftener than to menorrhagia. Nevertheless, tubercular patients do sometimes flow excessively; and the disease may be precipitated by an exaggerated menstrual discharge which in time reduces the vitality of the patient to such an extent as to make her an easy prey to phthisis. In those cases of menorrhagia in which there is a predisposition to tuberculosis it should be the aim of the physician to conserve the patient's strength in every possible way.

In *Bright's disease* the concomitant symptoms—albuminuria, anasarca, edema, etc.—will lead the examiner to look to the kidneys for the cause of the mischief. I have more than once met with uterine hemorrhage due to *syphilis*, which yielded only upon adopting an anti-syphilitic régime.

General Causes.—Of the *general* causes, *excessive lactation*, *malaria*, *lead poisoning*, and *the pyrexial disorders*, all induce hemorrhage by their degenerating influence upon the blood. Menstruating women ought not to nurse their children, for there are few constitutions strong enough to permit of the double drain. This is especially true when there is a predisposition to some of the foregoing diathetic troubles. Lactation may also excite hemorrhage through reflex irritation.

Malaria undoubtedly predisposes to pelvic congestion, and it may be impossible to control a uterine hemorrhage while the patient remains in a malarious climate. It has been frequently observed by English physicians that women who have lived for any length of time in India are usually victims of menorrhagia. Undoubtedly the tropical temperature, as well as the malaria, is a potent factor in these cases.

The influence exerted by *lead poisoning* upon the uterus, and its tendency to produce uterine hemorrhage, has not received the attention from therapeutists commensurate with the importance of the subject. I was first impressed with the homeopathicity of *plumbum* in menorrhagia by the experience of one of the provers of the drug—a most intelligent lady practitioner—whose menorrhagia dated from a proving made ten years previously. Later clinical experience has confirmed this homeopathicity in a number of instances. Benson Baker of England (*Obstetrical Transactions*, Vol. 1), and Paul of France, have both called attention to this subject.*

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* " . . . . If parents who suffer from lead poisoning have children, we may naturally expect that in their early years they will suffer from certain diseases analogous to, or participating in, the general cachexia of lead poisoning; and if they did it would not be unreasonable to consider these children as suffering from hereditary lead poisoning. . . . . From M. Paul's paper it appears that lead poisoning amongst women, and even amongst men, causes the death of the fetus in utero. He says: 'The first time my attention was drawn to the subject was in the month of February, 1859, when a woman that worked at cleaning printers' type applied at the Hospital Necker, suffering from menorrhagia. Coupled with this menorrhagia she had also the symptoms of chronic lead poisoning. I learned from her that previous to her present employment, she had been delivered of three healthy children at full term, still alive; but that since her employment as a type polisher she had suffered much from ill health. Three months after taking to this employment she became tainted with lead poisoning, and suffered from printers'

Pelvic congestion due to the several conditions enumerated is a prominent factor in causing and keeping up uterine hemorrhage. If these causes continue active, the best directed treatment will fail in its object. *Luxurious and sedentary habits* are pernicious under any circumstances, but particularly so when there is a tendency to flow excessively. *Sexual excesses* are equally harmful, and it is sometimes exceedingly difficult to learn that such excesses are practised. One of the most obstinate cases of menorrhagia with which I have had to deal occurred in a girl of twenty, who was a confirmed onanist. Many married women are the victims of sexual excess or sexual *irregularities*, and a temporary marital separation may be necessary before a cure can be accomplished. If such excesses are associated with the other enumerated causes, especially ovarian irritation, the case is indeed complicated, and for its management no little tact and skill will be required.

Nervous Causes.—That *nervous influences* may affect the uterus and its functions for good or for evil has already been shown. They may either emanate from the nerve centers, or exert their influence in a reflex way. *Undue emotional excitement* is the most frequent *centric* cause, and occurs oftener in nervously prostrated patients who are subject to hysterical manifestations. Uterine hemorrhage occasionally follows intercourse for the first time, because of fear or emotional excitement. Spinal lesions—functional exhaustion, irritation, etc.—may likewise transmit an unnatural stimulus to the uterus.

Some of the *reflex* causes have already been referred to, notably, ovarian and mammary irritation. Vesical and rectal irritation, especially if tenesmus is marked, may act in the same way. Congestion of the rectum and congestion of the uterus are not infrequently associated; the latter resulting in menorrhagia and the former in hemorrhoids. The effect of impressions conveyed through any of the reflex channels probably would not be sufficient to excite uterine hemorrhage were the uterus perfectly normal; however, with the organ already the seat of disease which has increased its vascularity, hemorrhage is easily excited and maintained by irritation remote from the pelvis.

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colic. Four years later she had a second attack of colic and suffered intense pain; shortly after she became pregnant and was delivered of a dead child Three years elapsed and she had a miscarriage at the fifth month of her pregnancy. Besides these two cases of pregnancy she had become eight other times pregnant, and each time, after a short suppression of the menses, and a delay of two or three months, she miscarried, characterized by an abundant menorrhagia, and accompanied with colicky pains at the time.' . . . . M. Paul goes so far as to assert that if the father be tainted, the offspring may be affected in utero, even though the mother has nothing to do with lead."—*Baker.*

Malignant Lesions.—Under this head I have enumerated *carcinoma* and *sarcoma*. In the later stages there is but little difficulty in diagnosing their presence, but at the time of their onset there may be the greatest difficulty in so doing. It is important to remember that hemorrhage is by no means an early symptom in all cases of malignancy, nor, indeed, in the majority. According to the statistics of Dr. West it is the first symptom only in about 44 per cent. of uterine cancers. When an early symptom it is the result of congestion of the endometrium; later on it is due to ulceration, which, by invading the vascular structures, gives rise to a profuse and occasionally fatal hemorrhage. The amount of blood lost depends in no small measure upon the location of the disease; it is much more profuse when the fundus is involved, and may or may not be accompanied with pain.

When an unnatural loss of blood is the only symptom of malignancy which presents itself the uncertainties are very great, and the microscope may be the only means of making a positive diagnosis. If the hemorrhage occurs at or near the so-called cancerous age, *i. e.*, from forty to fifty, and if it recurs during the intermenstrual period as well, the possibilities of cancer are very great, and a careful investigation should be made. In the later stages there usually exists with the hemorrhage an offensive leucorrhea, which, together with the cachexia, makes the presence of malignancy almost certain.

In a series of one hundred and eighty-three cases of post-climacteric hemorrhage, in which the menopause had occurred at least one year previously, J. Neumann (*Monatschrift für Geburstshülfe und Gynaekologie*, 1895,) found the following lesions:—

Carcinoma of cervix, 100;
Prolapse of vagina or uterus, 24;
Carcinoma of uterine body, 18;
Mucous polypus of uterus, 8;
Senile changes in genitals, 5;
Myoma uteri, 4; Ovarian cyst, 4;
Doubtful conditions, 20.

The symptoms of *sarcoma* do not differ materially from those of true carcinoma, except that in its formative period there is often a free, "rice-watery" discharge, containing grayish-white shreds, which does not become offensive until after necrosis of tissue sets in. Other than this there is little in the subjective history which will enable the examiner to differentiate these two forms of malignant disease. When cancer takes on the form of *cauliflower excrescence* the hemorrhage may

be induced by sexual congress, walking, coughing, straining at stool, etc.

Non-malignant Lesions.—Hemorrhage resulting from the several varieties of *fibroid tumors* varies greatly—the amount depending in large measure upon the nature of the growth. It is much more profuse in submucous growths than in interstitial or sub-peritoneal. The hemorrhage does not come from the tumor itself, but from the congested and hypertrophied mucous membrane covering it. The unnatural flow is at first purely menorrhagic, the discharge increasing from month to month until finally it becomes almost persistent, and at times dangerously profuse. As the tumor increases in size pressure symptoms develop, and the patient usually detects its presence before consulting her physician.

The amount of hemorrhage produced by the various types of *polypi* is by no means governed by the size of these growths. Sometimes a very small polypus will excite a most alarming and even fatal hemorrhage, while the presence of very large ones may give rise to no inconvenience until after being forced into the vagina. Mucous tumors are very much more liable to excite hemorrhage than are fibrous, and, when small, they are often detected with difficulty. One not larger than a hazelnut may remain concealed within the uterine cavity until the cervix is forcibly dilated. The hemorrhage proceeds in mucous polypi from the surface of the tumor as well as from the endometrium.

Menorrhagia or metrorrhagia is a most common symptom in *endometritis* and *subinvolution*. Congestion and congestive hypertrophy cause an increase in the vascularity of the endometrium and, not infrequently, it undergoes fungoid degeneration. These fungosities play an important part in the etiology of menorrhagia, and when the flow is at all intractable they should be looked for. Subinvolution is a frequent sequel of cervical lacerations.

Inflammatory deposits within the pelvis, with or without the presence of pus, are often responsible for menorrhagia of a most obstinate type which cannot be reached by the ordinary remedies. Uterine congestion and endometritis are usually secondary to pelvic inflammation. Involvement of the tubes and ovaries is a most prolific cause of menorrhagia.

Accidental.—*Uterine inversion* is an accident which ought, under all circumstances, to be recognized at the time of its occurrence. Strangely enough, it sometimes remains undetected until persistent hemorrhage leads to an exploration. In menorrhagia due to this cause the hemorrhage usually dates from delivery, is severe at first but gradually

becomes less; it recurs at intervals corresponding to the menstrual cycle; it is attended by a profuse and almost constant leucorrhea; and there will be found on local examination a tumor which remains within the vagina, or presents externally. There may be much difficulty in differentiating an inverted fundus from a protruding polypus. (*v.* p. 117.)

It is hardly proper to designate a *hematocele* as one of the causes of uterine hemorrhage. Indeed, the cause of both the hematocele and the excessive hemorrhage is usually one and the same—a ruptured extra-uterine pregnancy cyst, some form of general systemic depravity, or some abnormality of the uterus, peritoneum, ovaries or tubes. In connection with the subject of menorrhagia and metrorrhagia it is, however, important to remember that a pelvic hematocele, either intra- or extra-peritoneal, may be accompanied by an exaggerated flow of blood externally. The constitutional symptoms resulting from the hematocele are those of shock and collapse and will be indicated by the countenance, pulse, respiration, etc.

The ordinary forms of *uterine displacement* give rise to menorrhagia by inducing congestion of the uterus and its appendages. Hewett particularly emphasizes the importance of flexions as causative factors; and while he may exaggerate their importance the fact remains that in many instances menorrhagia cannot be cured until an existing displacement is put right.

Pregnancy.—In uterine hemorrhage proceeding from an *abortion* the history of previous suppression will usually suggest the cause, though it must be remembered that menstrual suppression does not always follow upon conception. The hemorrhage accompanying abortion comes on gradually and the pains recur at regular intervals; they are accompanied with shivering and, frequently, nausea and vomiting; the flow of blood usually ceases upon the expulsion of the ovum, and, if the uterus has been thoroughly emptied, does not recur. If, on the contrary, any of the membranes are left behind, the flow will continue until the curette has been applied. The retained products of conception may be carried for an indefinite length of time before the real cause of the unnatural discharge is discovered. This is oftener the case in early miscarriages, the existence of pregnancy not being suspected.

When *placenta previa* is responsible for the hemorrhage, the circumstances are less confusing, for the placental separation rarely takes place until the later stages of pregnancy, when the patient knows that she is pregnant. A digital examination will reveal the unnatural implantation of the placenta. In *accidental hemorrhage*, *i. e.*, hemorrhage

resulting from the separation of a normally located placenta, a vaginal examination will at least show that the placenta is not attached to the cervix.

Climacteric.—Women who have been in the habit of menstruating profusely, and especially if full-blooded, frequently lose more blood as the change of life approaches. The age of the patient, together with her family history, will serve as a guide in determining whether or not the increased loss is the result of climacteric changes. I question, however, the entity of a *physiological* climacteric hemorrhage, if such an expression is permissible. The prevailing idea that hemorrhages at this age are natural has resulted in much harm.

Conclusions.—For guiding aphorisms in dealing with uterine hemorrhage the reader is referred to page 83. The practice of relying absolutely upon the subjective symptoms and the indicated remedy, when the loss of blood is at all persistent, is not only reprehensible but should be actionable as well. I fully appreciate the value of internal medication in dealing with menorrhagia and metrorrhagia, but, in at least a goodly proportion of cases, something more is demanded. A careful examination, both local and general, must be instituted, the *cause* sought for, and, if possible, removed. The physician should bear in mind that he is dealing with *a symptom of something wrong elsewhere*, and not a pathological entity. If the hemorrhage is an expression of malignancy the lesion may advance beyond the operative stage before it is discovered; if, on the other hand, it be due to causes other than malignancy the prolonged drain upon the system may result in anemia, general anasarca, hysteria, neurasthenia, depraved nutrition with profound emaciation, and death.

The *prognosis* of uterine hemorrhage will depend entirely upon its cause. In dealing with anemia associated with menorrhagia it must not be forgotten that, unlike amenorrhea, uterine hemorrhage is more often the cause than the result of the blood depravity. When the causes are purely local, gynecological surgery has reached a degree of perfection which makes it possible to accomplish a cure, except in advanced malignancy, in nearly every instance.

Treatment.

The treatment of uterine hemorrhage may be conveniently studied under the following heads: (*a*) General; (*b*) Conduct of patient during period; (*c*) Treatment of local causes; (*d*) Immediate control of hemorrhage; and (*e*) Therapeutics.

The *general* treatment should include the various measures recom-

mended for amenorrhea. A prescribed diet is often of the greatest utility: if the patient is plethoric and of sedentary habits it should be restricted; if, on the other hand, her nutrition is below par it should be generous. Out-door exercise is to be recommended in all instances where counter indications do not prevail; if the hemorrhage is brought on by it, and particularly if prostration is a marked symptom, all forms of exercise may have to be proscribed. Fresh air and sunlight are, however, curative agents that can in most instances be utilized, even though the patient cannot go out-doors. All clothing should be suspended from the shoulders so as to avoid constricting the waist and crowding the abdominal organs into the pelvis. Constipation is an important factor in keeping up pelvic congestion, and should be corrected; inactivity of the liver likewise obstructs the pelvic circulation, hence measures tending to overcome hepatic sluggishness are to be instituted. If one or more of the several constitutional causes exist, the treatment most appropriate for such causes must be adopted. If the patient resides in a malarious region a change of climate may be necessary before a cure can be accomplished. In short, whatever be the *cause* of the unnatural discharge, our treatment must be directed toward it.

During the period, and for a day or two previously to its onset, the patient should exercise as little as possible. The recumbent posture, and, if the hemorrhage is alarming, the recumbent posture with the foot of the bed elevated, should be maintained.

Of first importance for the *immediate control of the hemorrhage* is heat. The *hot douche*, ranging in temperature from 110° to 120° F., is a therapeutic resource in uterine hemorrhage whose value cannot be overestimated. When used for its immediate effect, however, its thermic properties are indispensable. This implies a temperature of not less than 110°, and the maximum 120° F. is still more useful. The proper method of administering the douche is described in another place. (Chapter X.)

The primary action of *cold* is to contract blood-vessels—hence its usefulness in controlling hemorrhage. Unfortunately, its secondary action is that of dilatation, so that in most instances heat is by far the better agent. Another advantage which heat possesses over cold as a hemostatic is that it does not shock the system as does the latter. Nevertheless, cold will sometimes succeed in promoting uterine contraction when heat fails, and is, therefore, to be held in reserve. Indeed, the alternate use of heat and cold will sometimes cause the uterus to contract when either agent used alone is ineffectual. It may be applied in

the form of a vaginal douche, or by the aid of an ice-bag within the vagina or over the pubes; or by cloths wrung from cold water and applied to the lower abdomen. An ice-bag placed over the lower spine is sometimes most effectual. When the evidences of shock and collapse are at all prominent cold must be used with the utmost caution; if these symptoms obtain, and the hot douche has failed to control the hemorrhage, other measures about to be described are preferable.

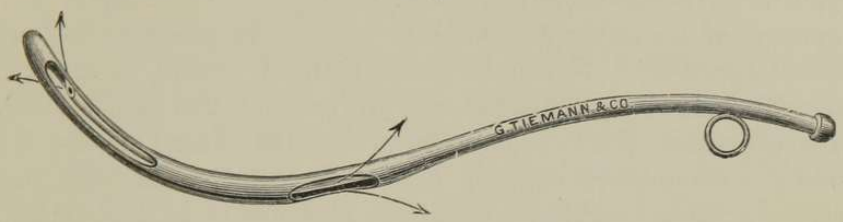
Failing to control the loss of blood by the use of heat and cold the *tampon* is indicated in all forms of uterine hemorrhage, except post-partum hemorrhage after the fourth month. In *placenta previa* and *accidental hemorrhage* it is indicated provided the uterus has not expelled the fetus. The hemorrhage may occur at any time during utero-gestation; after the fourth month, however, if the fetus has been expelled, the uterus will hold sufficient blood to make the use of the tampon dangerous. Iodoform gauze, because of its antiseptic and deodorizing properties, is the most satisfactory tampon material. If necessary it may be carried into the uterine cavity. In cases of emergency any material—roller-bandage, silk handkerchief, tarred jute, etc.—may be used, provided it is *clean*. Tamponnement of the vagina, to prove effectual in controlling hemorrhage, must be thoroughly done, so that there can be no leakage about or through the tampons. One or two strips of gauze, loosely placed against the cervix, are not only absolutely useless, but do more harm than good, for their presence tends to excite hemorrhage. The tampons should not be retained longer than twenty-four or thirty-six hours when used for this purpose, and their introduction should be preceded by an antiseptic douche. The *cervical plug*—tents or the Barnes bag—is hardly to be commended except in placenta previa or when dilatation of the cervical canal is imperative. There is a tendency to abandon the use of tents for dilating purposes, because of the danger of sepsis attending their use. If dilatation is indicated the rapid method under ether is the preferable one.

Astringents are rarely necessary to supplement the action of the tampon. Occasionally, however, passive hemorrhage will continue from the uterine cavity in spite of the foregoing methods. The blood-vessels and capillaries may remain unaffected notwithstanding the application of heat and cold, and the uterus may not respond to ordinary stimuli; in rare instances of this kind astringents are useful. They must be applied directly to the bleeding surface. Alum, tannin, hamamelis and iron are those most frequently used. *Alum*, in the form of a saturated solution, may be cautiously injected into the uterine cavity providing the os is patulous. Any intra-uterine injection must be administered

with the utmost care; no force should be used in its introduction and unless the cervical canal is sufficiently open a reflux catheter is necessary. In short, provision should always be made for the ready exit of the fluid when thrown into the uterine cavity. The fluid used should always be warm.

If the hemorrhage proceeds from the cervix or vagina the alum solution can be advantageously used as a vaginal douche. It is an excellent agent in controlling hemorrhage after cervical and plastic operations

FIG. 91.



BOZEMAN'S REFLUX UTERINE CATHETER.

within the vagina, for it does not form coagula to interfere with union as do iron and other more powerful astringents.

Hamamelis (1:20) may be used instead of the alum, and in the same manner, if the hemorrhage is of a decidedly venous character, or the remedy is called for because of constitutional symptoms.

Tannin and *iron*, to prove useful, must be concentrated, and are best applied directly to the endometrium by means of an applicator. Tannin is highly recommended by many authors, but I believe that its action is more uncertain than that of iron, and in all instances where the former is useful the latter will prove more so. The patient should be placed in the Sims posture, the cervix fixed, the coagula washed away with a bichlorid solution (1:5000) and the chlorid of iron, diluted with twice its bulk of water, applied over the entire endometrium. This heroic method should never be resorted to except when all ordinary measures have failed, for coagula left within the uterine cavity are always dangerous. Its use is only justified when the patient's life is threatened by an otherwise uncontrollable hemorrhage; we then use it to avoid a great and pressing danger by running the chance of a lesser one.

Treatment of Local Causes.—The treatment of the several local causes, both malignant and non-malignant, is given in detail in other chapters. A few general considerations only are necessary at this time. Fibroid tumors may, and frequently do, necessitate operative interference; uterine displacements are to be corrected by appropriate

measures; endometritis and subinvolution should be attacked by proper local and internal treatment—the local measures comprehending the intelligent use of the curette and the reparation of cervical lacerations; electricity in some form is often of the greatest utility; and, finally, the products of abortion, if they exist, should be sought for and removed. In dealing with these various conditions the *curette* is so frequently called for as to warrant a careful description of the technique of its application.

The Application of the Curette.—The use of this instrument for diagnostic purposes has already been referred to (*v.* Chapter V). In its application for either diagnostic or curative purposes certain precautions are necessary: It should never be used, except in septic cases, if acute inflammation, either of the uterus or of the tissues about the uterus, is present; it is to be resorted to with the utmost caution if long-standing inflammatory deposits within the pelvis exist; last, but not least, the greatest cleanliness should be observed in its application.

FIG. 92.

EMMET'S CURETTE FORCEPS.

The patient, anesthetized, is placed in the lithotomy posture and the cervix exposed by means of retractors or specula, through which the vagina and cervix are thoroughly cleansed with a 1:1000 bichlorid solution. After fixing the cervix with a tenaculum or volsella, the mucus is carefully wiped from the cervical canal with antiseptic cotton held in dressing forceps. The cervix is then divulsed by means of the dilators shown in Fig. 50, or by graduated sounds, as the operator may elect. Simon's sharp spoon curette is then applied in such a way as to reach all parts of the uterine cavity, thus removing fungoid masses, or the products of conception, which can be saved for microscopic examination. An especial effort should be made to reach the cornua uteri, for it is in these localities that the products of inflammation are more frequently found. In two uteri removed per vaginam, I have found small polypoidal masses imbedded deep into the tissues of one horn. For a long time I used only Thomas's dull wire curette, looking upon the sharper

instrument as both dangerous and unnecessary. This prejudice was inherited from Emmet, who has gone so far as to condemn *in toto* the use of the curette, substituting for it his curette forceps (Fig. 92), whose cutting edge enables the operator to remove the fungoid masses by separating and approximating its blades. However, by observing the counter-indications cited, together with the strictest antiseptic precautions, I am convinced, both from personal experience and the experience of men who have resorted to it many hundreds of times, that the use of the sharp instrument is attended with no more danger than the use of the dull, and is infinitely more effectual.

After the curetting the débris and blood should be removed by packing the uterus with a strip of iodoform gauze, or with sterilized lamp wicking (Foster). If there is subinvolution, compound tincture of iodin (Churchill's) should be applied to the entire endometrium by means of a cotton swab held in dressing forceps. Following this application, the uterus is again packed with strips of gauze, the ends of which are secured in a sterilized ligature, which is left projecting from the vagina. The vagina is next packed with gauze strips, which are likewise secured in a ligature. By observing these precautions there is no danger of the nurse leaving any of the packing behind. The patient is placed in bed, where she should remain for four or five days; if there is much pain the hot douche and the indicated remedy are to be resorted to. The packing should be removed in from twenty-four to forty-eight hours, depending upon the tendency to bleed; should there be a rise of temperature it should be removed at once. The object of the gauze within the uterus is to promote uterine contraction in a mechanical way and to afford uterine drainage, thus curing the endometritis.

In general terms, then, the curette is indicated in uterine hemorrhage after less radical measures have been exhausted, when any of the primary pathological lesions enumerated have given rise to secondary endometritis and uterine fungosities. Fibroid tumors, polypi, subinvolution, uterine displacements, chronic pelvic congestion,—any or all of these lesions frequently result in changes in the endometrium necessitating its use. In malignant lesions also it may be advantageously used as a preparatory measure previously to total extirpation, or as a purely palliative one in incurable carcinoma.

Therapeutics.

China.—HEMORRHAGE FROM ATONY OF THE UTERUS; especially useful in those who have lost much blood, with ringing in the ears, faintness, coldness, loss of sight, etc.; menses too early, profuse and CONTAIN BLACK CLOTS; great distention of the abdomen. "Cases of

malarial origin, when the symptoms show a marked periodicity, and also for women suffering from sexual excesses."—*Southwick.*

Ipecacuanha.—NAUSEA AND VOMITING; discharge of bright red blood occurs with a gush at every effort to vomit; heat about the head and debility; GASPING FOR BREATH; menses too early and profuse. "If the hemorrhage is very severe and it seems desirable to stop it at once, I give ipecacuanha, unless some other remedy is characteristically indicated."—*Winterburn.*

Belladonna.—THE FLOW IS BRIGHT RED AND IMPARTS A SENSE OF HEAT; bearing down, as if the organs would protrude from the vulva; *congestion of the head with throbbing of the carotids.*

Calcaria carb.—Menses too frequent, too profuse, and last too long; profuse menstruation during lactation; LEUCOPHLEGMATIC CONSTITUTION.*

Hamamelis.—PASSIVE HEMORRHAGE WITH ANEMIA; ABSENCE OF UTERINE pains with a discharge of dark-colored blood; hemorrhagic diathesis with varicoses; ovarian irritation and inflammation; leucorrhea with great tenderness.

Sabina.—Menses too profuse, too early, partly fluid, partly clotted, and offensive; *pains from sacrum to pubes;* metrorrhagia increased by least motion, but especially worse from walking.

Platina.—Metrorrhagia with dark, thick blood; pain in the small of the back, which extends into both groins; EXCESSIVE SENSITIVENESS of the genital organs; great sexual excitement in pregnant females; sensitiveness of the ovaries, with burning pain; menses accompanied by spasm or by painful bearing down in uterine region.

Crocus sat.—Menorrhagia of dark, stringy blood; *sensation as if something alive were rolling or turning about in the abdomen;* metrorrhagia after abortion worse from the slightest motion; subinvolution.

Nitric acid.—Menses too early and too profuse, with urine emitting an intolerably strong smell; the blood is very dark colored and thick.—*Guernsey.*

Trillium.—Active uterine hemorrhage of dark, thick and clotted blood, especially during the menopause; hemorrhagic diathesis; pain in hips, short breath, palpitation, restlessness in legs.†

Secale cornutum.—Passive hemorrhage with very fetid blood in FEEBLE, CACHECTIC PERSONS, particularly when the weakness was not

* "When the menses are too frequent and profuse, and especially if the patient is of a strumous habit, with a tendency to pectoral disorder, *Calcarea carb.* is, *par excellence*, the appropriate remedy."—*Ludlam.*

† "One of the best remedies I know of in ordinary profuse menstrual flow, coming frequently and yet without any decided constitutional character by which to

caused by previous loss of blood (Jahr); frequent labor-like pains with chronic metritis.

Erigeron.—A profuse flow of bright red blood, aggravated by the least motion; pallor and weakness in consequence of the discharge.

Ferrum met.—Menorrhagia in weakly persons with a fiery red face; tenesmus of the bladder and diurnal enuresis; sharp pains in abdomen, bearing down in uterus, painfulness of the vagina.

Ferrum phos.—Blood bright red, with excessive congestion of the entire body. "This remedy must be taken as a preventive before the periods, if these symptoms are recurrent."—*Schüssler.*

Kali mur.—Menstruation excessive, the blood being dark, clotted, or tough; black like tar.

Plumbum.—Menorrhagia with sensation of a string pulling from abdomen to back; climacteric period; dark clots alternating with fluid blood or bloody serum; Bright's disease; constipation, with feces composed of hard balls.

Consult:—Agaricus, arnica, bovista, cactus grand., **cantharis, collinsonia**, lachesis, phosphoric acid, **pulsatilla**, sepia, sulphur, cannabis Ind., hydrastis, and lilium tig.

Illustrative Cases.

CASE I.—*Hydrastis Canadensis in Uterine Hemorrhage.*—S. S., 51 years of age, married, has four children, consulted me on April 15th, 1887, for "bleeding from the womb, which has continued off and on since Christmas, 1886." Has always been regular every month, the flow being profuse and lasting generally a week. Until Christmas, 1886, had never suffered from metrorrhagia. On examination a hard, irregular fibroid tumor was found occupying the anterior and left lateral wall of the uterus. The sound passed for a distance of 3½ inches into the uterine cavity. The new growth rose one inch above the fundus uteri on the left side. The patient was ordered Pot. Brom. gr. x, and Ext. Ergot, Liq. *m* xxx, in a mixture three times a day. On April 29th, a fortnight after her first visit, the "hemorrhage was still excessive." On May 20th, as the flooding still continued, a mixture of Pot. Brom. gr. x. and tinct. Hydrastis *m* xx was ordered, with the result that the hemorrhage ceased.—*Henry T. Rutherford, B. A., M. B. The British Gynecological Journal.* Volume iv.

CASE II.—*Cannabis Indica in Menorrhagia.*—Mrs. B., æt. 34,

judge the case, is *Trillium pendulum*, especially if the flow exhausts the patient very much. I have never given it in any potency except the sixth. That has been sufficient in all my cases."—*Farrington.*

mother of three children, youngest five years old, has not been pregnant since this child was born. Has for the last three or four years been troubled with profuse and frequently recurring menstruation.

Present condition: Some eighteen days since her menses made their appearance, since which time they have been very profuse and painful, the discharge being dark but without clots. Is very anemic, suffers great mental agitation, anxiety, irritability, nervousness, loss of sleep (not having been able to sleep for two nights), pale face, cold hands and feet, violent uterine colic, so severe as to induce cramps in the extremities. For this condition she has had such remedies as arsenicum, china, cyclamen, etc., and is apparently getting worse. As a dernier resort I prescribed Cannabis Indica 1st dec. dil. gtt. x in a tumbler half full of water, a teaspoonful to be given every hour.

On my next visit I learned that after taking the third dose she became calmer, her pains grew less and she fell into a gentle slumber. On waking the nervousness was gone, the violent colic much better and all of her symptoms very greatly modified. I continued the remedy at long intervals for three days, when she expressed herself as being perfectly well. She has menstruated at regular periods three times since, and each time with less difficulty until the last time, which she says lasted only four days and was quite natural for the first time in three years. She has in the meantime taken no other medicine than Cannabis Indica.—*Richardson.*

Case III.—Mrs. H., æt. 30, has been confined to her bed for six days with a violent menorrhagia, accompanied with a terrible uterine colic of a spasmodic nature, the pains returning like labor pains; she has also great nervous agitation accompanied with sleeplessness. The Cannabis Indica was given in three-drop doses of the 1st dec. dilution every half hour; in a few hours she was very greatly relieved, and by a continuance of the medicine she was in two days discharged cured.

I have given it in several other cases in which I neglected to note the details, the results being of such a nature as to prove it to be of great utility in those prostrating cases of menorrhagia in which mental agitation and violent uterine colic seem to be the predominating symptoms; in such cases I can at least advise the profession to give it a trial.—*Richardson.*

The Curette in Uterine Hemorrhage.

Case I.—Mrs. ——, æt. 38, married and the mother of three children. This patient is exceedingly delicate and does not weigh more than ninety pounds. Has always menstruated profusely, but since the

birth of her last child, now eight years old, the quantity of blood lost grew more and more excessive until she became almost exsanguinated; the mucous membranes being blanched, the skin pale, and the anemic murmur quite distinct. What little strength she could gain during the intermenstrual period was entirely lost at the next appearance of the flow. Cannabis Indica, together with the hot douche, controlled the hemorrhage in a measure, but the relief was not lasting, the patient growing steadily worse.

On July 21, 1891, ether was administered and the sharp curette applied. Large quantities of fungoid debris were removed, which so much resembled that of diffuse sarcoma as to make me exceedingly anxious until the microscope revealed its true nature. The compound tincture of iodin was next applied to the entire endometrium, and a supporting tampon placed against the cervix, the tampon being removed as soon as the vomiting ceased. The patient was kept in bed for two weeks and an antiseptic douche used twice daily. The first period was characterized by no perceptible diminution in the discharge, nor was the improvement marked in the two following periods. However, the loss of blood gradually diminished, so that in six months after the curetting, instead of flowing excessively, the menses were scant. She rapidly gained in strength and is now quite well.

Case II.—M., æt. 48, and unmarried. An interstitial fibroid large enough to fill the lower pelvis was the cause of a uterine hemorrhage which at first was menorrhagic in character but soon became metrorrhagic; the flow, although worse at certain times of the month, became almost continuous. I dilated the cervix under ether and applied the sharp curette in the usual manner. The hemorrhage began to diminish at once and did not become again excessive until one year from the time of the first curetting. The operation was then repeated with equally good results. The patient is still under observation.

These two cases show the usefulness of the curette when indicated, and it is unnecessary to multiply them. I have used the instrument many times and have rarely been disappointed in the results obtained. Even where malignancy is suspected, and the chief object of applying the curette is to obtain tissue for the microscope, it is my practice to apply it most thoroughly, because the progress of diffuse sarcoma and carcinoma is often stayed by such a procedure. When the operation precedes trachelorrhaphy it in most instances enhances the favorable results of the latter operation, particularly if the lacerated cervix is accompanied with subinvolution and menorrhagia.

CHAPTER XVIII.

MENSTRUATION AND ITS DISORDERS (Continued).

DYSMENORRHEA.

FORM.	ETIOLOGY.	SYMPTOMS.	DIAGNOSIS.	PROGNOSIS.
Neuralgic.	Gout and rheumatism; chlorosis; malaria; anemia; sexual irregularities.	Variable; pain sharp and fixed or reflex; time of pain variable — before, during or after the flow; aggravated by cold drinks or exposure.	Pains not expulsive; flow uninterrupted; absence of clots and physical causes.	Depends upon cause and habits of patient; usually favorable.
Ovarian.	Anything that will congest or inflame the ovaries.	Pain for some days before flow or during intermenstrual period. *Character.*—Dull and aching, or sharp and stinging, frequently extending down thigh; pain in the breast.	Pain precedes flow; enlargement, tenderness, and frequently displacement of one or both ovaries.	Must be guarded.
Congestive and inflammatory.	Congestion or inflammation of any of the pelvic viscera; undue exposure; mental shock; displacements; tumors.	Sudden attack of pain during menstruation with suppression; constitutional disturbances; vesical and rectal tenesmus.	Suddenness of onset; suppression with constitutional disturbances; evidences of local disease.	Depends upon cause; usually favorable.
Obstructive.	Cervical stenosis and spasm; flexions; polypi; tumors; vaginal occlusions.	Menstrual symptoms minus the flow; or intermittent spasmodic pain relieved by a gush of blood.	Expulsive pains followed by free discharge of blood and clots with relief; flow intermittent; presence of obstruction.	Usually favorable.
Membranous.	Various theories; usually associated with endometritis.	Pain and flow simultaneous; labor-like pains ceasing upon the expulsion of clots or membranes; purulent leucorrhea.	Periodical discharge of membrane. *From abortion.*—History and repetition. *From blood casts and casts from the vagina.*—Microscopical examination.	Must be guarded.

General Considerations.—The term *dysmenorrhea* is purely a relative one and is used to designate *painful menstruation*, whether due to

functional or to organic disease of the female generative system. Like amenorrhea and menorrhagia, it is a symptom of various disorders; and the division into forms only serves to indicate, in a general way, some of the affections with which painful menstruation is associated. The forms usually given are: 1, Neuralgic; 2, ovarian; 3, congestive or inflammatory; 4, obstructive; and 5, membranous.

This division also serves to explain the great difference of opinion which exists among various authors regarding the *cause of the pain* in dysmenorrhea. Thus some writers, notably Wylie and Goodell, affirm that in all instances the pain is due to retention of the menstrual fluid, with consequent distention of the uterus. Emmet believes that anemia, inducing a tendency to neuralgia, is the most prolific cause of dysmenorrhea; according to this writer, dysmenorrhea is oftener due to constitutional than to local affections. Other writers attribute the pain in nearly all instances to inflammation and disease of the uterine appendages. The probable truth is that no single explanation will apply to any two cases of dysmenorrhea; and that the several causes suggested by the older classification of Simpson and Thomas, which I have adopted, are more clearly in harmony with clinical facts than is a pathology based upon a single theory.

Gardner (*Atlanta Medical and Surgical Journal*, Dec., 1895,) found the following lesions in 112 cases of dysmenorrhea:

Endometritis, 23; Retroversions, 14;
Pyosalpinx, 17; Anteflexions, 14;
Lacerations of cervix and endometritis, 10;
Cervical stenosis, 8; Constipation, 7;
Retroflexions, 4; Enlarged ovaries, 4;
Fibroids, 2; Prolapsed ovaries, 2;
Lacerated cervix, 1; Membranous dysmenorrhea, 1;
Nothing found, 5.

Forty per cent. of this number were sterile.

One or more of the causes enumerated might exist for an indefinite length of time without giving rise to dysmenorrhea, were it not that certain local changes induced by them render the nerves supplying the uterus, the ovaries, or the surrounding structures morbidly sensitive. If the uterus or its annexa become hyperesthetic, a degree of distention which would give rise to no suffering in a perfectly normal organ may excite the most excruciating pain in one thus affected; or the ordinary congestion of menstruation may be sufficient to cause pain when local inflammation has already induced this morbid state of the terminal nerves; or anemia, chlorosis, rheumatism, malaria, etc., may give rise

to local distress, because the expression of pain incident to these various diathetic troubles oftener occurs in parts of the body already weakened by local changes.

The clinician will rarely meet with any one form of dysmenorrhea uncomplicated, though the clinical manifestations of one form frequently stand out with sufficient prominence to overshadow all others. Usually two or more varieties blend with one another so intimately as to make differentiation impossible. Nevertheless, for the convenience of study, the classification is useful.

Neuralgic Dysmenorrhea.—The *etiology* of this form of painful menstruation can be summed up in the term "neuralgic diathesis;" a term which means so much and yet so little. Were a definition of it required, based upon accurate pathological deductions, it would not be forthcoming. Nevertheless there sometimes exists, particularly in women, a peculiar state of the system which renders the victim liable to sudden attacks of pain in various organs of the body. Frequently there is a rheumatic or gouty basis to the difficulty; or the general health may have become depreciated by anemia, chlorosis or malaria. The victims of neuralgic dysmenorrhea are oftener found among that class of women who lead a sedentary and luxurious life, and, not infrequently, sexual irregularities complicate matters. Painful menstruation is not the only expression of the peculiar constitutional bias; gastralgia, cardialgia, migraine, and other neuralgic manifestations are liable to occur from time to time, particularly if the patient has been subjected to excesses or undue exposure of any kind.

The *symptoms* are as changeable as are the symptoms of neuralgia generally. It is this peculiarity, however, which enables the practitioner to detect the nature of the case in hand. The pain may be sharp and fixed in some portion of the pelvis, or it may be shifting and reflected to any part of the body. Dr. Thomas records two cases, in one of which, during each period, the patient suffered intensely from pain limited to the outer side of the little finger; the second experienced for several days before the flow a violent pain at the root of the nose.

The occurrence of the pain relative to the flow is variable; it may set in before, during or after the flow. It is often precipitated by the slightest indiscretion, so that the patient cannot indulge in a cold drink or an ice without suffering the penalty. It will often vanish as suddenly as it appears and the victim will quickly pass from a state of acute suffering to one of comparative comfort.

The *diagnosis* of this form of dysmenorrhea is to be made by exclusion. The pains are non-expulsive, there is an absence of clots in the

discharge, and a local examination will fail to reveal the causes which give rise to the other forms about to be considered. These facts, together with the diathetic history, will afford sufficient data upon which to base a diagnosis.

The *prognosis* will depend upon the possibility of correcting the constitutional trouble responsible for the mischief. With the coöperation of the patient a cure can in most instances be accomplished.

Ovarian Dysmenorrhea.—Many authorities deny *in toto* that ovarian lesions ever give rise to painful menstruation. Indeed it is even contended by some that menstruation, instead of aggravating existing ovarian lesions, relieves them by relieving pelvic congestion—a statement in proof of which there exists certain clinical evidence. Nevertheless this does not prove that ovarian irritation and inflammation may not play an important part in the causation of dysmenorrhea; for, unless we maintain that the ovaries play no part in menstruation (a theory, as we have seen, which is hardly susceptible of proof), it is but reasonable to presume that there may be transmitted to the uterus a morbid as well as a normal ovarian stimulus. Ovarian pain may be relieved by menstruation, because of the depleting effect incident to the mere loss of blood; but before such relief comes, an increase of suffering is caused by the dehiscence of a Graafian follicle in an ovary the seat of pathological changes.

The *etiology* is that of ovarian irritation and inflammation. Anything that will congest or inflame these organs may be the indirect cause of ovarian dysmenorrhea. Cauterization of the cervix, a practice which, fortunately, has justly fallen into disrepute, is especially emphasized by many writers as a causative factor. Sexual excesses or irregularities are likewise prolific causes. Frequently ovarian displacement, with or without uterine, is associated with the dysmenorrheal trouble.

Symptoms.—The pain of ovarian dysmenorrhea occurs and persists for some days preceding the onset of the flow, and is usually limited to one or both ovarian regions, oftener the left. Not infrequently it extends down the corresponding thigh, and reflex pain in the mammary region is often induced. In character the local pain is dull and aching or stinging and burning. Dr. Priestly long ago called attention to what is termed an "intermediate pain," occurring on a given day during each intermenstrual period. Whether or not this pain is due to intermenstrual ovulation without menstruation cannot be determined. The fact remains that in a certain number of cases of ovarian dysmenorrhea this pain will recur almost to a certainty on a given day. In one of my cases it occurred on the fourteenth day after menstruation;

in another on the twelfth—in each instance persisting for several days.

Ovarian dysmenorrhea is to be *differentiated* from the other forms: by the onset of the peculiar pain some days before the appearance of the flow; by the tenderness and, frequently, displacement of one or both ovaries; by the uninterrupted flow; and by the absence of serious constitutional disturbance.

The *prognosis* must, under all circumstances, be guarded. So long as menstruation continues the ovaries are subjected to a periodical congestion which makes it exceedingly difficult to cure an existing irritation or inflammation. The nearest approach to "physiological rest" which can be given them is pregnancy and lactation. Unfortunately, ovarian dysmenorrhea occurs quite as often in the unmarried as in the married; and when it does present itself in the married the victims are frequently sterile. Nevertheless the prognosis, under treatment which brings to the patient a class of remedies not utilized by the older school, is by no means as sinister as the writers of that school lead us to believe. If irreparable damage has been done to the appendages oöphorectomy remains as a last resource.

Congestive and Inflammatory Dysmenorrhea.—This form of painful menstruation is accompanied with, and characterized by, the symptoms of congestion and inflammation. It is indeed a symptom of most of the inflammatory diseases of the pelvis, and it is brought on by the same causes which give rise to congestion or inflammation of any of the pelvic viscera. On the other hand, it may mark the beginning of inflammation. Undue exposure to wet and cold during menstruation is one of the most frequent exciting causes.

The *symptoms* depend largely upon the degree of constitutional disturbance excited by the local changes. When occurring as a primary condition there is usually a sudden attack of pain during menstruation, with a partial or complete cessation of the flow. If the congestion stops short of inflammation, the constitutional disturbance will be limited to a slightly increased intra-arterial pressure, with headache and nervous phenomena; if, on the contrary, actual inflammation already exists, or if the congestion incident to the menstrual suppression leads to actual inflammation, the local suffering is that of pelvic peritonitis. The pulse and temperature are increased, and there may be marked delirium. Occasionally vesical and rectal tenesmus become distressing.

The distinguishing features of this form of dysmenorrhea are: 1, the sudden onset of pain with more or less complete suppression of the flow; 2, the constitutional impression, which is sometimes profound;

and 3, the evidences of local tenderness or lesions obtained by physical exploration.

Prognosis.—The prognosis will necessarily depend upon the cause or causes giving rise to dysmenorrhea. If the local changes are limited to simple hyperemia, the equilibrium is easily restored by proper treatment and the succeeding menstrual period is not characterized by marked suffering. However, if the products of inflammation are left behind, or if the dysmenorrhea is due to preëxisting cellulitis or peritonitis, the prospects of relief will depend upon the curability of the pelvic lesion.

Obstructive Dysmenorrhea.—The *causes* giving rise to obstructive dysmenorrhea are stenoses of the cervical canal, spasm of the circular muscular fibers in the region of the internal os, flexions, polypi and tumors, and vaginal occlusions. Cervical stenosis may be congenital or acquired. If congenital the condition is usually associated with an undersized uterus and the menses are scant; if acquired it is often the result of powerful applications to the cervix, or it may follow in the train of amputations and trachelorrhaphies. There can be no doubt that spasm of the circular fibers of the cervix is sometimes sufficiently great to cause partial or complete occlusion, giving rise to what has been defined by some writers as "spasmodic dysmenorrhea." At any rate, a certain number of dysmenorrheal cases are met with presenting all of the phenomena of obstruction, so far as subjective symptoms are concerned, in which the cervical canal upon physical exploration seems perfectly patulous. Patients thus affected are usually of the *neurotic type*, and their suffering is best relieved by remedies having a special affinity for the nervous system.

Flexions are probably more often the cause of obstruction than anything else. For obvious reasons simple version is not so liable to impinge upon the canal, yet it is entirely possible for a retroversion to so crowd the external os against the anterior vaginal wall as to interfere with the exit of menstrual discharge. Polypi and tumors produce obstruction in a purely mechanical way. Dr. Thomas especially emphasizes the fact that a small polypus, by dropping against the internal os, thus acting as a ball-valve, may cause marked obstruction which is difficult to detect because a probe readily pushes it aside in penetrating the uterine cavity. The most frequent cause of vaginal occlusion is an imperforate hymen. However, sloughing of the vagina as a sequel of childbirth may result either in complete or partial obliteration of the canal; in complete obliteration the menses are, of course, retained.

It is worthy of note that certain eminent specialists deny the exist-

ence of this form of dysmenorrhea. I heard the late Mathews Duncan, in a lecture delivered at St. Bartholomew's Hospital, London, affirm that so long as the menstrual blood can escape from the uterine canal, no matter how small the opening may be through which it makes its egress, no pain will be caused by the obstruction. In proof of this affirmation he cited the fact that many women possessing a cervical canal not large enough to admit the finest probe menstruate without the least pain; that women with a "pin-hole os" will sometimes bleed to death; and, finally, that in many of the cases of so-called obstructive dysmenorrhea it is perfectly possible to penetrate the uterus with a large-sized probe during the intermenstrual period. In our own country Dr. Emmet and others hold nearly, if not identically, the same views.*

Undoubtedly, in a certain number of cases, the foregoing statements are in harmony with clinical facts; nevertheless, in the vast majority of dysmenorrheas presenting the symptoms of obstruction, the evidences of such obstruction are to be obtained upon physical exploration; besides the symptoms entirely vanish after thorough dilatation. Moreover, an obstruction may exist during menstruation and entirely disappear after the flow ceases; or the obstruction may be of the nature of a polypus which would admit of the ready passage of a sound and which could be detected only by exploring the uterine cavity with the finger. The fact that the spasmodic pains which characterize obstructive dysmenorrhea are followed by a discharge of clots from the uterine cavity, proves conclusively that the blood has been retained long enough for coagula to form, which would be impossible did not some obstruction exist.

Symptoms.—The symptoms are those following upon distention of any of the hollow viscera. The uterine cavity, after reaching a certain degree of distention, is excited to contraction, and the efforts made to expel its contents result in pain. A gush of clotted blood terminates the suffering, which does not recur until the organ is again distended. The degree of suffering will depend largely upon the persistence of the obstruction, and when it is exceedingly difficult to overcome, the spasmodic pains may continue for some hours before the flow makes its appearance.

Diagnosis.—The intermittent character of the pains, coming and going at regular intervals, temporarily relieved by a free discharge of

* For an extended dissertation on this subject see "Transactions of the American Gynecological Society," Vol. VIII, p. 101.

blood which often contains clots, is pathognomonic of obstructive dysmenorrhea. Exploration per vaginam and with the sound will usually locate the seat of the obstruction. The exceptions to this rule already noted should, however, be borne in mind. The spasmodic constriction of the circular muscular fibers may have entirely disappeared before an examination is made, and, indeed, the spasm may not recur at each succeeding menstrual period. A test, to my mind far more conclusive in determining the part played by the spasm, is the effect of gradual dilatation, which is discussed under the head of treatment.

The *prognosis* is usually favorable, perhaps more so than in any of the other forms of dysmenorrhea. It is, of course, modified by the existing complications, the most serious of which is inflammation of the uterus and its surrounding structures. As long as the ovaries are uninvolved, however, and as long as the condition of the patient does not forbid surgical interference, obstructive dysmenorrhea is probably the most amenable to treatment of all forms.

Membranous Dysmenorrhea. — *Pathology.*—This form of dysmenorrhea is unlike any of the foregoing in that organized material is expelled from the uterus at each menstrual period. This material consists of the menstrual decidua, which is thrown off in sections or *en masse*, when the triangular sac represents a cast of the uterine cavity. There is such a conflict of opinion regarding the *nature* and *cause* of this peculiar process as to make it unprofitable at this time to discuss the various theories at length. Instead I shall quote the conclusions of Dr. John Williams, contained in a paper presented to the "London Obstetrical Society" at a recent meeting. These conclusions are valuable, both for the reason that Dr. Williams has drawn his deductions from a series of cases which were for many years under his observation, and because he has made a special study of the changes in the endometrium during menstruation. They are as follows*:—

1. The dysmenorrheal membrane is not the product of conception, but the decidua ordinarily shed as *débris* with every menstrual epoch.

2. It is expelled as a whole or in masses, in consequence of the presence of an excess of fibrous tissue in the wall of the uterus; this excess is due to imperfect evolution at puberty, imperfect involution after parturition or abortion, or is the product of acute inflammation.

3. The membrane is neither the result of an ovarian congestion, nor of an hypertrophy of the ordinary decidua.

4. The chronic inflammation present is usually the result of the

* Edis, "The Diseases of Women," p. 483.

monthly expulsion of the decidua from the uterus, and plays an accidental part only in its production; the inflammation may, however, be independent of the expulsion of the membrane, but it has no causal relation to the formation of the latter.

5. Sterility is not necessarily associated with the affection, but is the result of the condition induced by the expulsion of the membrane from the uterus—inflammation of the uterus and ovaries.

6. The membrane may be expelled without pain.

7. Inflammation of the uterus greatly aggravates the suffering caused by the passage of the membrane along the cervical canal.

8. Great relief may be obtained by curing the inflammation of the cervix; though the membrane continues to be expelled every month.

9. In order to effect a cure, the structure of the body of the uterus must be changed.

Symptoms.—These resemble the symptoms of early abortion. The pains are labor-like, bearing down, coming and going with more or less regularity, increasing in intensity until, finally, the expulsion of a large clot, whose nucleus is a piece of membrane, or the expulsion of the whole lining of the uterine body, affords relief. The pain and flow occur simultaneously, and the flow is usually excessive. The expulsive efforts are sometimes so violent as to cause the most intense suffering, and even delirium and convulsions.

Patients who have long suffered from this form of dysmenorrhea are not entirely free from distress during the intermenstrual period. Purulent leucorrhea, because of the existing endometritis, is often a persistent symptom. Frequently, too, the victims complain of a general weariness, with more or less constant pain in the abdomen and back, which often extends to the iliac fossæ and down the inner side of the thighs. They look forward to the approaching period with much dread, and the periodical recurrence of menstruation, together with the excessive drain resulting from the menorrhagia and leucorrhea, sooner or later induces a state of chronic invalidism.

It is necessary to *differentiate* membranous dysmenorrhea from: 1, early abortions; 2, casts from the vagina; 3, casts from the bladder and pelvis of the kidney; and, 4, blood polypi (*v.* p. 80).

The *prognosis*, as to cure, is decidedly unfavorable and must always be cautiously given. Many remedies and expedients of reputed merit have been brought forward, but in due time have fallen into disrepute. A very large per cent. of those suffering from the complaint are, unfortunately, sterile, and even if conception occurs abortion is liable to follow. If the views of Dr. Williams are correct, the changes resulting

from utero-gestation would undoubtedly be beneficial. Much relief can, however, be afforded by treatment directed toward the existing inflammatory complications, and, indeed, many absolute cures have been reported. These have been accomplished, not by any routine method of treatment, but by almost as many methods as there are cases recorded. A survey of the literature of the subject forces upon one the conclusion that membranous dysmenorrhea, like most other symptoms, requires a careful study of each individual case. At least a larger ratio of cures are to be found in the literature of the homeopathic than in that of the older school of medicine, and these have been obtained by combining with the local treatment the administration of the indicated remedy. Nevertheless, the number of absolute cures is discouragingly small and shows the necessity of guarding the prognosis even under the most favorable circumstances.

I quote the following from the "American Text-book of Gynecology" (1894, p. 122,) to show the futility of seeking help from the therapeutic armamentarium of the older school:—

"Internal treatment for its cure is well-nigh abandoned. A few years ago large doses of iodid of potassium were used; this is now abandoned. All varieties of constitutional treatment have been tried and abandoned. The consensus of opinion is now centered chiefly upon the treatment by dilatation and curettement, in conjunction with the application of chlorid of zinc or carbolic acid, for the purpose of destroying the portion of membrane left behind by the curette."

The Treatment of Dysmenorrhea.

General.—This will depend, to a certain extent, upon the form of dysmenorrhea which obtains. In the *neuralgic*, for instance, constitutional measures must be adopted tending to overcome the causes which have induced the neuralgic habit. Thus anemia, chlorosis, rheumatism, malaria, etc., when present, should receive attention. Out-door exercise, a liberal diet, sea bathing, or, if this cannot be practised, a daily sponge bath, are adjuvants of the greatest value in the treatment of the neuralgic diathesis. Flannel should always be worn next to the body, for most neuralgic subjects are exceedingly sensitive to cold.

Electricity is of the greatest value in the treatment of this and of nearly all forms of dysmenorrhea. (Chapter XI.) It must, however, be intelligently applied and the cases selected with the same discriminating care observed in the selection of the homeopathic remedy. It is not a "cure-all," nor should it be so considered. Since using electricity I have discarded entirely the galvanic stem pessary. The remedies more

often useful when neuralgic symptoms predominate are: Gelsemium, ignatia, chamomilla, magnesium phos., coffea, and cimicifuga.

The suggestion made by Dr. R. Ludlam, that the remedies be administered in warm water, is a wise one, for it is surprising how susceptible these patients are to cold or cold drinks. *Heat* in the form of hot applications, hot sitz baths, or the hot douche, is, in any variety of dysmenorrhea, most useful during the paroxysm of pain, especially if the flow is suppressed or scant.

In *ovarian* dysmenorrhea the causes tending to keep up the ovarian irritation should, if possible, be removed. A careful inquiry into the sexual habits of the patient will often reveal most pernicious practices which, so long as persisted in, make it impossible to accomplish a cure. Oftentimes a temporary marital separation is necessary. Galvanism, with the positive pole direct, will, I believe, do more for simple ovarian irritation than any other agent. The more prominent remedies possessing a special affinity for the ovaries are: Belladonna, apis, lilium tigrinum, cocculus, and pulsatilla.

The *congestive* and *inflammatory* forms of dysmenorrhea require measures similar to those useful in pelvic cellulitis and peritonitis. An effort should be made to restore the discharge when it has been suppressed, and actual inflammation should be aborted if possible. The hot douche is probably the most useful agent to accomplish this end, supplemented by such remedies as aconite, belladonna, veratrum viride, pulsatilla, gelsemium, and ferrum phos.

While the general measures which have been suggested for the relief of pain will be found useful during a paroxysm of *obstructive* dysmenorrhea, the radical treatment is very different. The obstruction requires for its removal mechanical and surgical interference. Those of the vagina are to be dealt with according to the principles laid down in the chapter devoted to vaginal occlusions. Cervical obstructions due to flexions and other forms of uterine displacement, require measures for the correction of the displacement, and much relief may be obtained by a properly adjusted pessary, or by the use of electricity. I have cured many cases by means of electricity. If the flexion is marked, however, and especially if it is congenital, divulsion is usually necessary before a cure is effected. I have now resorted to the operation so often and am so well satisfied with the results obtained that I deem it best to give at some length my method of procedure. In a given case of dysmenorrhea presenting the symptoms of obstruction it is as follows:—

If the patient comes to me soon after a menstrual period I make an

examination and determine, if possible, the seat of the obstruction. In the great majority of cases it will be found at or near the internal os, at which point the mucous membrane is often exceedingly sensitive. If there is congestion or inflammation of the cervix and uterus, and there usually is, the hot douche once or twice a day is advised, and at least twice a week I place against the cervix and into the fornices of the vagina tampons of boroglycerid or pure glycerin, medicated as may seem best. These are removed at the end of twenty-four hours and are followed by the douche. Some three or four days preceding the approaching period, having reduced the congestion by this preparatory treatment, I cautiously introduce several sizes of the graduated dilators. This is repeated at least twice before the onset of the period in order to ascertain the effect of dilatation. If the effect is good, menstruation will be less painful and, if the obstruction is the result of spasm, permanent relief may be obtained by repeated introductions of the graduated sounds during the succeeding intermenstrual period. Permanent results are, however, the exception to the rule, and the utility of gradual dilatation is restricted largely to determining the probable effect of the more radical operation. It can be done in the office and should not cause more than passing pain.

If the patient reports her dysmenorrhea for one or more periods relieved by this procedure, and if in due time there is a return of the old suffering, divulsion is indicated. This must be done at her home or in the hospital and every precaution taken to guard against sepsis and inflammation. The bowels should be previously emptied by an enema, and an antiseptic douche administered shortly before getting on the table. An anesthetic is always necessary. The patient is placed in the lithotomy posture and the vagina again washed with a 1: 1000 bichlorid solution. The cervix is then exposed by means of suitable retractors and fixed with a volsella, when the sound is introduced to ascertain the direction of the canal. The steel dilator represented in Fig. 50 is next passed into the uterine cavity and the blades *gradually* expanded. I emphasize the word "gradually" because, if an effort be made to divulse with too great haste, there is danger of unduly lacerating the tissues. At least five minutes should be devoted to the operation and the canal dilated to the extent of half, three-fourths, or an inch, depending upon the size of the uterus and the resistance of the tissues. Undersized uteri, with congenital anteflexion, will not bear the same amount of dilatation without injury as will fully developed organs. The amount of force required in different cases will likewise vary greatly, and judgment must be used in applying it. Usually, however,

it is considerable—all that can be exerted by one hand. If the tissues are felt to tear it should be lessened. The object is to stretch the tissues to the extent indicated without serious laceration.

FIG. 93.

CLEVELAND'S GLASS CERVICAL PLUG.

If menorrhagia complicates the dysmenorrhea after dilatation I apply the sharp curette to the entire endometrium, remove the debris with a strip of gauze, and apply the compound tincture of iodin to the entire endometrium. If the hyperesthesia at the internal os is marked, impure carbolic acid, because of its anesthetic properties, is substituted for the iodin. The uterus is next tamponned with gauze, especial care being observed to pack the canal at the internal os solidly with it. Finally, the vagina is packed with gauze, powdered iodoform sprinkled over the external parts, and the dressings, held in place with a T bandage, applied. The packing is left behind for forty-eight hours unless the temperature rises, when it should be removed at once.

The after-treatment is very simple and consists of a small antiseptic douche after each urination, and rest in bed for ten days. Before the packing is removed the catheter should be used. If the patient complains of pain over the lower abdomen an ice bag is applied.

I have abandoned entirely the cutting operation as being not only unnecessary, but much less effectual than is divulsion without it. I have also abandoned the use of the cervical plugs (Fig. 93), as I have had some trouble following their introduction and believe that the results following gauze packing are more satisfactory.

In those cases complicated with rectal trouble—constipation, hemorrhoids, etc.—it is my invariable practice to stretch the rectal sphincter and to remove any morbid condition that may exist in the rectum. Indeed, if the patient complains of vaso-motor disturbances, as indicated by cold hands and cold feet, or if she has been unusually nervous, I thoroughly divulse the sphincter ani, even though she has suffered no local distress in the rectum. I cheerfully acknowledge my indebtedness to the teachings of Dr. E. H. Pratt for this practice, and I am thoroughly convinced that the good to be derived from divulsion of the cervix is greatly enhanced by directing attention to the rectal sphincter as well.

This treatment is advised with the full consciousness that it is not in accord with the teachings of many specialists, particularly of the homeopathic school. Ten years ago I was likewise very much prejudiced against divulsion, and advised against it in my classes. It seemed to me then, as it does to many now, a most dangerous and unnecessary procedure—a conviction which was intensified by two cases of cellulitis occurring in my practice, the result of the operation. I found, however, that the average patient suffering from obstructive dysmenorrhea, particularly if the dysmenorrhea was associated with the nervous phenomena already described, remained permanently on my hands, the most that I could accomplish with the ordinary methods being temporary relief. I then selected my cases with greater care, resorted to proper preparatory treatment, and *observed the strictest antiseptic precautions*, since which time I have not had one unfortunate result and have hardly failed to relieve permanently a single case operated upon. As regards sterility, I have not cured as large a per cent. of my cases as is reported by Goodell, yet the results have been encouraging. In properly selected cases the transformation brought about is simply marvelous, especially if the rectal sphincter is treated as well. The menstrual function becomes painless, and the patient is raised from a state of chronic invalidism to one of comparative robustness.

For the pain incident to *membranous* dysmenorrhea the same general measures adopted for the several other forms are useful. Dilatation followed by curetting is often exceedingly beneficial, and while it does not put a stop to the membranous formation, it will make the expulsion of the membrane much less painful. Dilatation also promotes uterine drainage and facilitates intra-uterine medication. Whether or not it exerts an influence upon the nutrition of the uterus through its action upon the sympathetic system is a point worthy of consideration. It is not unreasonable to presume that it does.

The local applications under which cures have been effected are those of an alterative character. Carbolic acid, iodin, chromic acid, iodoform, persulphate of iron, chlorid of zinc, etc., have been most frequently used. The remedies administered in the successful cases recorded in homeopathic literature are: Borax, rhus tox., calcaria, mercurius, bromin, millefolium, and guiacum.

Therapeutics.

Gelsemium.—Difficult menstruation; the periods are preceded by sick headache and vomiting; congestion of the head, with a dark suffused appearance of the face; passage of *large quantities of limpid, clear*

urine, which relieves the headache; uterus is markedly congested and feels as if squeezed by a band; sharp labor-like pains in the uterus, extending to the hips and back and even down the thighs.

Cimicifuga.—SEVERE PAIN IN THE BACK, DOWN THE THIGHS and through the hips, with heavy pressing down; rheumatic diathesis; tenderness of the uterus; great despondency; occipital headache; between the menses debility, nervous erethism and neuralgic pains; insomnia; INFRA-MAMMARY PAINS.

Pulsatilla.—Neuralgic dysmenorrhea; the menses are delayed, difficult and scanty; menses suppressed or flow intermittent, with throbbing headache; pain in the uterus; dysuria; ophthalmia; gastric disturbance with vomiting; morning nausea with bad taste in mouth; worse in warm room; mild, yielding, tearful disposition.*

Belladonna.—Congestive and neuralgic type; PAINS COME AND GO IN QUICK SUCCESSION; *violent bearing down, as if everything would issue from the vulva;* violent throbbing headache, better from external pressure.

Caulophyllum.—Painful contractions, congestion and irritability of the uterus; sympathetic cramps in the bladder and rectum; spasmodic intermittent pains in the stomach, groins, and even in the chest; rheumatism of the small joints.

Magnesium phos.—Menstrual colic; spasmodic pain in the uterus; inability to pass water, from spasmodic contraction; crampy pain in stomach or bowels, with a feeling as if tightly grasped by a band.

Calcaria carb.—Suppressed menses after working in water, with a tendency to cerebral congestion; SCROFULOUS DIATHESIS; *coldness of the feet,* and very easily affected by the cold air.

Apis mellifica.—Ovarian dysmenorrhea; STINGING PAIN IN THE OVARIES; urine is scant and high colored; violent, labor-like, bearing-down pains, followed by a discharge of scanty, dark, bloody mucus.

Borax.—Menses too early, too profuse, and attended with colic and nausea; leucorrhea like the white of eggs; sensation as if warm water were flowing over the parts; membranous dysmenorrhea.

Platina.—PAINFUL SENSITIVENESS AND CONTINUAL PRESSURE IN THE REGION OF THE MONS VENERIS AND GENITAL ORGANS; menses too early, too profuse, but of short duration, preceded by spasm with

* "*Pulsatilla* is at times to be used for menstrual colic, particularly when the menses are dark in color and are delayed. The flow is usually fitful. The patient is apt to be chilly; and the more severe are the pains the more chilly does she become."—*Farrington.*

bearing down, and during the flow pinching in abdomen, with excruciating pains in uterus; melancholia.

Secale cor.—Menstrual discharge of thin and black or brown fluid, which is exceedingly offensive; tearing and cutting uterine colic, with violent uterine spasms.

Cocculus.—Cramp-like pains deep in the bowels, instead of menses, with pressure in chest; vicarious leucorrhea; scanty discharge of black blood.

Coffea.—Continuous pinching pain in the iliac region; coldness and stiffness of the body; neuralgic dysmenorrhea.

Colocynth.—Dysmenorrhea relieved by drawing the lower limbs up to the abdomen.

Cantharis.—Violent pinching pains in the ovarian region; menses too early, too profuse; blood black and scanty; violent itching in the vagina with dysuria; dryness and feeling of constriction in throat.

Ignatia.—Cramp-like pains in the uterus with lancinations, worse from touching the parts; a feeling of confusion in the head, with inability to closely apply the mind; despondency, depression, sadness; CONVULSIONS, FREQUENTLY TETANIC; feeling of constriction in the throat, like *globus hystericus*.

Helonias.—Loss of sexual desire and power, with or without sterility; profound melancholia, with marked debility; pain in the back, through to the uterus; menorrhagia.

Lilium tig.—Burning, sticking, grasping pain in the ovaries, especially the left; pains extending across hypogastrium, to groin, down the leg; bearing down in uterine region; neuralgia of the ovaries, attended by cutting pains in mammæ.

Sepia.—Most useful as an intercurrent remedy; BEARING DOWN SENSATION, WITH A FEELING THAT THE LIMBS MUST BE CROSSED SO AS TO PREVENT PROTRUSION OF THE PARTS; excoriating leucorrhea; "moth spots" on various parts of the body; painful sensation of emptiness in stomach and abdomen.

Bryonia.—Stitching pain in the ovaries on deep inspiration; menses too early, too profuse, or suppressed, with vicarious bleeding from the nose.

Bromin.—Violent contractive spasms before or during menses, leaving the abdomen sore; menses too early, too profuse; bright red blood with the expulsion of membranous shreds.

Mercurius.—Deep sore pain in the pelvis with dragging in the loins; smarting, corroding, purulent leucorrhea, always worse at night.

Nux vomica.—Contractive uterine spasms; colic with discharge of

coagula; bearing down toward the sacrum; *ineffectual urging to stool;* DYSMENORRHEA COMPLICATED WITH FLATULENT COLIC AND GASTRIC DISTURBANCE.

Viburnum opulus.—Spasmodic and membranous dysmenorrhea; excruciating colicky pains through uterus and lower part of abdomen, coming on suddenly just before the menstrual flow, lasting sometimes ten or twelve hours.

Consult:—**Ustilago** (membranous dysmenorrhea), sanguinaria, ferrum phos., hyoscyamus, lachesis, rhus tox., zincum, cuprum met., aconite, collinsonia, glonoin, graphites, xanthoxylum, and millefolium.

Illustrative Cases.

CASE I.—*Borax in Membranous Dysmenorrhea.*—In a case of membranous dysmenorrhea of some months' duration Dr. A. P. Throop relates the following: As suggested by Prof. Ludlam, of Chicago, I prescribed borax 1x three times a day, till the next period.

The next period occurred the 25th of October. Dysmenorrhea much less, no cast; only shreds, less in size than for months, and the general condition better.

The last prescription of borax was given November 21st. In January, 1872, I called at the patient's home, being desirous of knowing the sequel of the case, and ascertained that there had been no more dysmenorrhea, as the period had not again appeared, and the patient was pregnant. As pregnancy and membranous desquamation from the inner walls of the uterus are not compatible, the membranous dysmenorrhea is supposed to be cured.

On the seventh of August, 1875, she gave birth to a fine, healthy female child, and there have been no symptoms since of any uterine trouble.—*N. Y. Homeo. Med. Society Transactions.*

CASE II.—*Platina in Dysmenorrhea.*—October 23, 1888, I was called to see Mrs. A., æt. 35, nervo-sanguine temperament, and the mother of two children. I found her suffering from dysmenorrhea. She informed me that she had been subject to this trouble ever since puberty; had been under the treatment of four different physicians without benefit, and had grown steadily worse since the birth of her children. Menstruation was regular and normal in quantity and quality, but accompanied with severe spasmodic pains extending from the uterus to the groins and upper part of the thighs. She was extremely nervous, and one foot was in constant motion, beating the bed clothes with the rhythmical regularity of machinery. While telling her

symptoms she suddenly became rigid and unconscious; the jaws were firmly locked, the forearms flexed upon the arms, the legs extended, and the whole body bent slightly backward. After a few moments she regained consciousness and the regular motion of the foot again commenced and continued until interrupted by another tonic spasm.

Her husband stated that during every menstrual period she had from four to ten of these attacks, varying in duration from five minutes to half an hour. Cimicifuga 3x was given, but failed to relieve.

One week later, a thorough examination was made, but nothing abnormal could be detected except an undue sensitiveness of the internal os during the passing of the sound.

Failing to find any mechanical cause, and being firmly convinced that the trouble was mainly hysterical, I now gave Ignatia 30x. The result was another failure, a discouraged patient, and a determination to stop prescribing on pathological theories and to treat the cases according to symptomatic indications.

After a long search, "tetanic spasms with trismus during the menses" was found under *Platina*. Was called again at the termination of the first day of the next menstrual period, and gave *Platina* 30x in water every two hours. The spasms ceased at once and have never since recurred. In other respects, the improvement was more gradual; but after taking the remedy during the menses for the next four months, the flow became comparatively painless and the patient was discharged. As nearly two years have now elapsed without a return of the old symptoms, the cure may be considered permanent.—*Dr. W. T. Laird, N. A. Jour. of Homeopathy*, May, 1891.

CASE III.—*Viburnum opulus in Dysmenorrhea.*—In my treatment of *spasmodic dysmenorrhea*, for which variety this remedy is specifically indicated, when the pain sets in, I give *Viburnum op.* every hour, or every fifteen minutes if the pains are severe. * * So confident have I been in its almost marvelous powers that I have taken the pains to look up some old cases that I dismissed years ago as incurable, in order to test this new remedy on them.

In every instance so far it has cured these old obstinate cases. Its sphere of action seems to cover nearly the same ground as galvanism. In the last number of the *N. A. Jour. of Homeo.* Dr. Neftel has a valuable paper illustrating the curative power of galvanism. He gives many illustrative cases, and, singularly enough, they all resemble the cases I have cured with *Viburnum.* I use the 1st dec. dil.—*E. M. Hale, M. D., American Observer*, 1874.

CASE IV.—*Viburnum opulus in Dysmenorrhea.*—Two years ago

my attention was called to the use of *Viburnum opulus* as a remedy for dysmenorrhea, or menstrual colic. Having a patient who was suffering from this difficulty, I procured the remedy for the purpose of a trial. Her symptoms were: An excruciating, colicky pain through the womb and lower part of the abdomen, coming on quite suddenly just preceding the menstrual flow. * * I had failed to do her much good, though caulophyllum had relieved her sometimes. I gave her *Viburnum* 1st decimal dilution, three-drop doses, to be repeated in half an hour if not relieved. The first dose relieved her, and she took but two. During the interval of the next period I directed her to take one drop once a day, and if the pain returned at the succeeding period, to take three drops and repeat as before. Suffice it to say, she had but a slight return of the colic, and now reports herself as cured.—*Geo. B. Palmer, M. D., American Observer*, 1877.

CASE V.—*Cocculus in Dysmenorrhea.*—I have found this drug useful in cases of *regular*, *irregular*, and *suppressed* menstruation, the flow in most cases being very profuse, accompanied with severe uterine colic, with bearing down in pelvic region and intense lumbo-sacral pains. * * In every case where I have found it useful in dysmenorrhea the patient has had a thick, yellow leucorrhea, and in most cases granular degeneration of the cervix. * * Where uterine disease existed, dyspepsia, characterized by *nausea* and *flatulence*, was, with few exceptions, more or less pronounced during the intermenstrual period.—*Emma Scott Wright, M. D., Transactions of the Homeo. Med. Society of the State of New York*, 1878.

CASE VI.—*Xanthoxylum in Membranous Dysmenorrhea.*—Mrs. ——, aged twenty-five years, tall, slender, of light complexion, somewhat stooping, emaciated, anemic; has the appearance of a consumptive. Used to be a rugged, hearty girl; has been married three years; has suffered intensely with dysmenorrhea and has never been pregnant. Menstruation was so painful that she was obliged to remain in bed for several days, from which she would get up so utterly prostrated that she could not rally before her next period came on. Menstruation was normal as to time; the pains were contractive, with great bearing down; the flow was slight; the intensity of her suffering caused her to keep her limbs in constant motion, drawing them up and down in bed, in spite of urgent advice to the contrary. Cocculus and, later, belladonna gave considerable relief. Examination of the napkins used confirmed my diagnosis, viz: membranous dysmenorrhea. *Xanthoxylum* 2d dec. trituration, three doses each day, acted so favorably that her next period was remarkably free from pain; she was dis-

charged in about three months, looking hearty and well. In the course of a year she gave birth to a healthy child, and has been quite free from disease during a period of, now, five years.—*Dr. I. N. Eldridge, Medical Counselor*, Vol. x.

CASE VII. — *Membranous Dysmenorrhea. Milfoil Internally and Iodized Phenol Topically.*—Mrs. H., the mother of two children; six years after the last confinement she came to me to be treated for sterility. I learned that about a year ago she observed that the pain during menstruation became very severe; each period more severe than the former. The pains were forcing labor-like, in the back and down the thighs; the blood was dark and clotted, and on the last day (usually the sixth) a membranous mass would be expelled, when the pain would cease. An examination of these membranes showed them to be such as are described as pseudo-membranous. The treatment was commenced one week before the menstrual period. It consisted in applying to the endometrium, by means of a probe wrapped with absorbent cotton, a mixture of tinct. ioidn, 1 part; 50 per cent. carbolic acid, 1 part. Internally I ordered *Inf. Milfoil*, prepared by infusing ʒij of the dried herb in one pint of hot water, ℥j to be taken three times a day. I only made one application topically. She returned to her home in Iowa.

One week after her menses ceased she wrote to me that she *had no pain during the menses, the blood was normal in appearance and no membrane was expelled.* I requested her to report after the next period, if it was *not* normal. Two months have now elapsed (two menstrual periods) and I have not heard from her. She is probably cured.—*E. M. Hale, M. D., Homeo. Jour. of Obstetrics*, 1886.

CASE VIII.— *Guiacum in Chronic Ovaritis with Dysmenorrhea.*—Miss D., aged 30; nervo-sanguine temperament. She has always been irregular, and when menstruation takes place the pains are agonizing. Frequently she subsides into an unconscious state after the pains lessen, unless stimulants of various kinds are used. There is an irritable bladder. Both ovaries are sensitive on pressure; the left one is constantly painful, and is perceptibly enlarged. Gave a suppository of *Guiac.* morning and evening. Relief was experienced in five days and 36 suppositories gave permanent relief.—*M. O. Terry, M. D.*

CASE IX.—*Dysmenorrhea and Spinal Irritation for years. Subacute Ovaritis of two years' duration cured in 18 days with Guiacum.*—Miss H., aged 24; nervo-bilious temperament. She has constant pain between the shoulders; fullness in the head, accompanied frequently with pain; suffers from stomach derangement and dysmenor-

rhea The first five of the dorsal vertebræ, the coccyx, and two inches above it, are sensitive on pressure. There is a dull, aching pain in the left ovary, which has continued over two years.

I will not give the names of the "indicated" remedies which were tried and found wanting in her case.

The pains across the shoulders, fullness in the head, and nausea, disappeared after a few applications of Paquelin's thermo-cautery had been made to the sensitive vertebræ.

Other remedies having failed in the ovarian pain, *Guiac.* suppositories, 36 in number, given as in the other cases, entirely eradicated it.—*M. O. Terry, M. D., New York Transactions*, 1883.

Cases Showing the Beneficial Effects of Divulsion in Dysmenorrhea.

Case I.—M., æt. 26, very tall but well proportioned. Upon presenting herself to me she gave the following history: Began to menstruate at 13, and became regular at 15; more or less dysmenorrhea from the first, and the amount of blood lost has always been excessive. Says that she does not remember when she did not have cold hands and feet. However, she got on very well until entering college, when the hard mental work, together with the exposure and "stair-climbing" incident to her college course, completely prostrated her. The symptoms of obstructive dysmenorrhea kept her in bed during the entire sick week; she became greatly depressed and melancholic—so much so that her room-mate feared suicide; subject to frequent attacks of palpitation with syncope; the bowels remained obstinately constipated in spite of the best directed general and therapeutic measures, and the digestion became bad. The amount of blood lost was excessive and the resulting anemia was marked. On July 15, the cervix and rectum were divulsed in the manner heretofore noted, the uterus curetted and the patient left in care of Dr. Luten, of Grand Rapids. She remained in bed for ten days, when the plug was removed and she was permitted to get up. Notwithstanding the fact that she began the arduous duties of a teacher four weeks later, the improvement was of the most marked character. Six months from the time of the operation she walked into my office looking the picture of health. To use her own words, she said: "I have never before known what it was to to be *luxuriously* well." Menstruation from the very first period following the operation was painless and the first premonition of its oncoming was the appearance of the flow. The nervousness and mental depression have entirely vanished, the hands and feet have become

warm, the digestion is markedly improved and the bowels are perfectly regular.

CASE II.—M., æt. 21, referred to me by Prof. D. A. McLachlan, because of some obscure eye trouble which failed to yield to measures directed to the eye, and which, from the symptoms complained of, led him to believe that pelvic complications were responsible for much of the difficulty. This patient, so far as physical development is concerned, is an ideal specimen of womanhood, and yet three days of each month were characterized by intense dysmenorrheal pains with all the phenomena of obstruction. Obstinate constipation was the only disturbance of the gastro-intestinal canal, and there were no prominent nervous symptoms. Menstruation was scant rather than excessive. The uterus was anteflexed, and the external os of the "pin-hole" type; at first it was with much difficulty that a fine probe could be made to insinuate itself through the internal opening, though there was not the usual sensitiveness at this point, a fact which explains the absence of many of the nervous symptoms described in the preceding case.

In spite of my best directed treatment I could do nothing more than palliate the dysmenorrheal symptoms. Gelsemium did much good during the attack, and the graduated sounds introduced just before the advent of the flow would cause the succeeding period to be much less painful; but the improvement, notwithstanding a three months' course of local and general treatment, was only temporary, and after an interval of two months the dysmenorrhea became quite as bad as before the treatment. Accordingly on December 23, 1890, I divulsed, under ether, both the cervix and the rectum, operating upon the latter because of the constipation. The patient menstruated at the succeeding period with absolutely no pain, and up to the present time (July, 1893,) remains almost entirely free from suffering during the menstrual week. Her constipation, while not absolutely cured, is infinitely better, and with the least care in diet gives her no trouble. The eye symptoms are likewise much benefited though not entirely relieved. I have in another place (Chapter XIII) remarked upon the obstinacy of the ocular neuroses; when due to pelvic lesions they are usually the last to disappear when such lesions have been cured, and, indeed, often will not yield to any treatment.

CHAPTER XIX.

THE MENOPAUSE.

Definition.—This term is applied to that time of life when the function of menstruation is permanently suspended. It is known, also, as the change of life, the critical time, the turn of life, and the climacteric period. The age at which the menopause occurs is most variable. Cases are on record in which menstruation was permanently suspended at thirty-two, and Dr. T. A. Emmet has reported a case in which the function recurred regularly although the woman was seventy-two years old. These ages are the extremes, the climacteric changes being inaugurated in the larger number of cases at about forty-five. Such extremes may be due either to idiosyncrasy, to rapid child-bearing, or to some constitutional disease. Thus, there are certain families in which the climacteric period occurs early, or, it may be, late in life. Rapid child-bearing has a tendency, by depressing the system, to hasten the change; and constitutional diseases may either precipitate or prolong the menopause, as they may precipitate or delay puberty.

There is a popular error, which is by no means limited to the laity, that it is necessary for a woman to undergo a certain amount of suffering while passing through this period. Much harm has resulted from this erroneous impression. A woman, perfectly healthy in all respects, should not suffer inconvenience; nevertheless, there are very few instances where the change of life is passed through without more or less discomfort. If, however, the function of menstruation has been perfectly normal, if there exist no local or constitutional disease—in short, if a woman is perfectly healthy—the climacteric change should come to her as a pleasant advent rather than one of suffering.

The doctrine of necessary suffering at this time, and especially the doctrine that it is perfectly natural for excessive menstruation and metrorrhagia to take place, has more than once led to the neglect of various affections which are responsible for the delayed menopause. Thus, cancer, fibroid tumors, fungoid degeneration of the endometrium, and polypi are permitted to progress indefinitely, the woman continuing to flow long after ovulation has ceased. Usually, when menstruation

is prolonged after the age of fifty, it is because of local disease, and a thorough examination should be instituted.

Anatomical Changes.—The vascularity of all the pelvic organs is diminished. The ovaries become smaller and in time are converted into contracted masses of fibrous and cellular tissue; the Graafian follicles shrivel and contract. Like changes take place in the Fallopian tubes, the uterus and the vagina. The mucous membrane of the uterus loses its corpuscular elements and becomes thin. Occasionally the external or internal os, or both, close. The vaginal fornices are frequently obliterated (senile vaginitis). The breasts may atrophy; or they may become larger from deposition of fat. The Fallopian tubes atrophy and often become impervious. Indeed, all of the sexual organs undergo senile atrophy and are reduced to a rudimentary state. These anatomical changes are quite the opposite of those which characterize puberty.

This rearrangement may take place suddenly or gradually, requiring much more time in some women than in others. During its progress the line of demarcation between the physiological and pathological may be very hard to define.

Symptoms.—As already stated, no distressing symptoms should attend the menopause if the patient is in a perfectly healthy condition; but, as there are few women absolutely free from distress during the menstrual period, though this function should be perfectly painless, so there are few women absolutely free from discomfort while the system is undergoing climacteric changes. The degree of suffering will, however, depend, in no small measure, upon the temperament of the patient—a nervous woman suffering infinitely more than one of phlegmatic temperament. The general distress is usually more marked when the menopause suddenly occurs, or when it is precipitated by oöphorectomy.

The character of the symptoms will also depend upon the habit of the patient. If she be plethoric, for instance, the phenomena will be those attending plethora—congestion of various parts of the body, headache, palpitation, hemorrhages, etc.; if chlorotic or anemic, she will suffer from the symptoms incident to the depravity of nutrition.

Headaches are of frequent occurrence and may be either congestive or anemic in character. The disturbance of the vaso-motor system gives rise to flushings and an irregular distribution of blood to various parts of the body. Alternate coldness and heat of the hands and feet are likewise common. There may be either irritability or torpor and sluggishness of the gastro-intestinal canal. If irritability, there

is often nausea, vomiting, and diarrhea, the result of a hyperesthetic condition of the mucous membrane. One of the worst cases of irritable rectum which I have ever met occurred during the climacteric period If there be sensory paralysis of the mucous membrane, the most obstinate constipation may ensue. Flatulence is likewise a frequent result of the gastro-intestinal disturbance. So great is the accumulation of gas at times that pregnancy is suspected. Indeed, all of the subjective symptoms of pregnancy may be so faithfully imitated as to make the diagnosis extremely uncertain.

The processes of elimination are more active in every way. The skin eliminates more readily, and morbid perspirations often occur. All of the salts of the urine, especially the urea, are in excess. The quantity of carbonic acid eliminated is also increased. Very often, too, the secretions of all of the mucous membranes, particularly those of the genital tract, are exaggerated. Occasionally vicarious leucorrhea will continue, becoming increased at regular intervals, for a long time after the last appearance of the flow. Let it not be forgotten, however, that a leucorrhea more or less persistent is usually the result of local disease, and when it does not abate in due time an examination should not be too long delayed. The first symptom of carcinoma may be a leucorrheal discharge, and since the patient is passing through the so-called cancerous age, any suspicious symptoms should be carefully investigated.

The nervous symptoms not infrequently predominate, though the patient may not suffer from an excessive loss of blood. Indeed, they often persist after menstruation has ceased entirely, and when the local evidences of disease, so far as tissue changes are concerned, are wanting. Dr. Wylie has called attention to the fact that there often exists, in these seemingly obscure cases, a hyperesthetic spot at the internal os, or at some portion of the fundal mucous membrane. I have frequently demonstrated the presence of this hyperesthetic spot, not only in women passing through the change of life, but in young girls victims of dysmenorrhea. A sound passed into the uterine cavity will give rise to the most exquisite pain when it comes in contact with it; and I have had patients nearly jump from the examining table when the tender point was touched. The cause of the hyperesthesia is uncertain; though it is probable, as suggested by Wylie, that it is the result of previous inflammation. The fact that this localized hyperesthesia is productive of innumerable reflex symptoms is clearly proved by the effects of treatment; when the diseased area is destroyed, the symptoms will frequently vanish as if by magic.

The changes attending the menopause are indeed critical in character, and the patient's future health will depend, in no small degree, upon the care which she receives while passing through this period. Many existing diseases will entirely disappear. This is especially true of the various chronic inflammatory affections. Indeed, metritis may be incurable so long as menstruation recurs at each month to excite congestion. The various inflammatory affections of the ovaries are likewise often incurable while the function of ovulation continues; and of course the different forms of menstrual irregularities disappear with the cessation of ovulation. Fibroid tumors usually stop growing after the change of life, and often undergo a more or less decided atrophy.

On the other hand, certain other diseases are either aggravated or precipitated by the climacteric changes. As already intimated, the several forms of cancer make their appearance at this time oftener than at any other. Nervous affections of various kinds frequently date from this period. Hysteria, epilepsy, paralyses, apoplexy, and especially insanity, are often fanned into existence by the conditions attending the change of life. Skin affections are particularly liable to be brought to the surface at this period, and a careful inquiry into the clinical history will frequently reveal the fact that the patient suffered from the same affection during girlhood.*

In conclusion, then, a woman should pass through the menopause, if perfectly well, without serious inconvenience. When the system is greatly perturbed, it means that something is wrong. The disturbing cause may or may not require for its removal local measures. The inconvenience may be so slight as hardly to overstep the boundary of the

*J. Newmann found (*Monatsschrift für Geburtchülfe und Gynaekologie*, December, 1895,) the following diseases immediately before the end of menstrual life in a series of 500 cases :—

	No.	*Av. age.*
Carcinoma Cervicis Uteri,	100	45.5
Displacements and inflammation of Uterus,	75	46.5
Myoma Uteri,	70	48.0
Climacteric Anomalies,	55	47.0
Prolapse of Uterus or Vagina,	55	47.0
Endometritis,	20	46.5
Carcinoma Corporis Uteri,	11	41.3
Ovarian Cyst,	10	46.5
Pregnancy,	8	45.5
Various other affections of the Genitals,	61	48.5
Doubtful conditions,	35	47.0
Totals,	500	46.5

normal, and no attention other than perhaps a little general advice need be given the case. On the other hand, if the patient suffers unduly, there is no period of her life during which she more needs judicious care and treatment.

Treatment.—There are certain general hygienic principles which are applicable in all cases. The frequent use of the sponge bath will keep the skin active and promote elimination. At least twice a week the patient should take a hot bath, remaining in the water for from ten to twenty minutes. After either the sponge or tub bath, the skin should be well rubbed with a Turkish towel.

The amount of physical exercise to be prescribed in a given case must depend upon circumstances. Plethoric patients are nearly always benefited by outdoor exercise, short of fatigue—weariness or exhaustion is always injurious. Where there is marked debility, walking, or, indeed, any form of exercise, may be impossible. The muscular system should, however, receive attention, and if the patient finds it difficult to walk, massage may be advantageously substituted.

Late hours, especially in nervous cases, should be avoided. Insomnia is often a prominent symptom and every precaution should be taken to promote sleep. Plenty of fresh air is the best natural soporific and the sleeping apartments should, therefore, be well ventilated. Excitement during the evening is most injurious. Many times a warm bath or a hot vaginal douche immediately before retiring will afford a good night's sleep. Tilt maintains that thin, nervous women cannot sleep too much. He recommends, when insomnia is very troublesome, that the patient eat immediately before retiring, or have at her bedside some light broth or bouillon to take during the night.

Sexual hygiene is likewise of much importance. Intercourse should take place only at long intervals. When there is an increase in the sexual appetite it means, as a rule, that there is some local disease which requires attention. Tilt emphasizes the fact that women passing through the climacteric period should not marry. He cites several cases coming under his personal observation where the most disastrous consequences followed immediately upon marriage.

Much tact is often required in the management of the mental and moral symptoms. There is, many times, a marked perversion in the moral sensibilities. Women previously cheerful and contented become irritable, taciturn and unreasonable. It may be necessary to remove a woman thus affected from home surroundings. A change of scenery, association, and climate is often most beneficial.

As regards local treatment, any of the various lesions which have been

enumerated should, if present, be removed. The treatment of the hyperesthetic spot, when it exists, consists of the application of a ten per cent. solution of cocaine directly to the parts, followed by the introduction of a hard steel dilator and a moderate degree of divulsion. Pure carbolic acid is then applied to the endometrium, after which a boro-glycerid tampon is introduced into the vagina. It is surprising how quickly this treatment will relieve many of the reflex nervous symptoms. If hemorrhage is a prominent symptom the uterine cavity should be carefully explored, and, if necessary, the curette applied. Finally, lesions of the rectum should always be looked for. It is my practice to divulse the rectum with the cervix when the nervous symptoms are prominent.

I know of no class of symptoms which will respond more quickly to the properly selected remedy than will the various disturbances and phenomena incident to the menopause. It is to me most surprising that the specialists of the older school have never learned to use intelligently, at least some of the remedies which the homeopathic school find so useful in relieving the innumerable phenomena characterizing this period. Ringer, Bartholow and others have hinted at the utility of many of them in the condition under consideration, but the specialists have largely ignored the suggestions of these writers. They confess their inability to relieve the flushes, the headaches, the local congestions, etc., without placing the patient under the action of remedies, the continuous use of which they themselves admit to be pernicious. At the same time I desire to insist upon the necessity of looking for local causes when the internal remedy fails to relieve the symptoms for which it is prescribed. If selected with care the remedy will do all that it is possible for internal medication to accomplish, and when it fails in its object it is usually because of the existence of some local or mechanical cause which requires for its eradication local or mechanical measures.

Therapeutics.

Sanguinaria.—There is much irritability and anger; *headache begins in the occiput, extends upward and settles over the right eye;* distention of the veins of the face with excessive redness, or *circumscribed redness of one or both cheeks;* FLUSHINGS, lassitude, torpor and languor; not disposed to move or make any mental exertion; symptoms all aggravated during damp weather.

Lachesis.—Chills at night and flushes of heat during the day; *patient feels much depressed in early morning;* MUCH HEAT AT THE

VERTEX; globus hystericus with *great sensitiveness of the larynx;* SYMPTOMS WORSE AFTER SLEEP.

Sulphur.—Flushes of heat followed by cold spells; *cold feet;* bleeding hemorrhoids; constitutional bias prominent.

Pulsatilla.—Tearful temperament; shooting neuralgic pains in various parts of the body; milky, thick leucorrhea with swollen vulva; pressure in pit of stomach after every meal, with vomiting of food; *all symptoms relieved in open air.*

Jaborandi.—MORBID PERSPIRATIONS; MARKED SALIVATION; suffusion of the face and the entire body; nausea and vomiting.

"The face becomes red, the temporal arteries throb more strongly; then there is a peculiar feeling of heat in the mouth and on the face, and the flow of saliva begins. In a little while the forehead becomes moist and the face more red; then beads of perspiration appear on the forehead, cheeks and temples."—*Enc. of Drug Pathy.*

Jaborandi is a remedy which, I feel confident, is not as often used in morbid perspiration as it should be. I rarely use it lower than the 6th decimal dilution.

Sepia.—ALL GONE, SINKING SENSATION AT PIT OF STOMACH; moth-colored spots on the skin, especially on forehead and over bridge of nose; *unnatural perspiration, particularly in axillæ;* anemia from profuse menstruation; leucorrhea yellowish or greenish and causing much itching; hysterical twitchings and spasms.

Amyl nitrite.—This remedy is, I believe, one of the most useful of all remedies in the flushes of heat so often present during the menopause. They are attended by throbbing and a sensation of intense fullness in the head; there is often a choking, restricted feeling about the throat which lachesis fails to relieve; much throbbing in the ears.

Glonoin.—Congestion about the head with much FULLNESS AND THROBBING; flushes of heat with vertigo; alternate redness and paleness of face; symptoms all aggravated in a warm room and ameliorated by walking in the cold air; frequent attacks of fainting.

Ignatia.—Desire to be alone; changeable disposition, though sadness predominates; clavus hystericus; throbbing pain in the occiput.

Consult:—Aconite, **caulophyllum**, cimicifuga, **belladonna**, **gelsemium**, argentum nit., and coffea.

Illustrative Cases.

CASE I.—*Reflex Nervous Symptoms Cured by Divulsion and the Application of Carbolic Acid.*—In the spring of 1880, a rather thin, wiry woman was sent to me by Dr. Greenough, of this city. She said

that she had dysmenorrhea when young, but had not had any special uterine disease that she was aware of; that she had married when 30, and about five years later her menstruation had ceased, and had not shown itself, except two or three times when she had a scanty flow, for the past two years, and that during this time she had had hot flashes and all kinds of nervous symptoms, had taken all kinds of remedies, but that she was growing thin, sleepless, etc., and that Dr. G. advised her to have a local examination. I found the vagina and uterine appendages normal, so far as I could discover; the uterus was a little below the normal size, but not as small as is usual two years after the menopause. It was anteflexed and in about the normal position. In and near the os the mucous membrane had a peculiar coppery or yellowish-stained appearance, which I had now and then seen about the cervix uteri of women past the menopause. In passing a sound I found the os internum contracted, and as the sound passed into the cavity of the fundus it gave exquisite pain, and reminded me so forcibly of the condition of the uterus so very common in young women suffering from dysmenorrhea due to imperfect development that I made up my mind to give it the same treatment that I was then using for the relief of dysmenorrhea. I gave the usual preparatory treatment, and dilated the cervix with a steel dilator, and applied, by means of an applicator and cervical protector, pure carbolic acid to the endometrium. I warned her, as I do in cases of dysmenorrhea, that the first dilatation might be quite painful and increase her nervousness for a day or so, but that the second would not be so painful, and the third still less so, and that if this treatment helped her I could probably cure her. The dilatations were made about a week apart. The result was magical; her nervous system quieted down, she could sleep, eat well, and she steadily improved in general health. Twice within six months she had a slight return of the reflex symptoms, and the dilatations and applications were repeated with equally good results. In a year's time she had gained 26 pounds in weight, and claimed to be perfectly well. Since then I have treated a large number of cases suffering from reflex nervousness at and soon after the menopause, by dilatation and applications, and with most excellent success. In two or three of these cases the nervousness was extreme, and the patients had been through all kinds of treatment in the way of medication, water cures, and even "rest cures," without permanent relief; yet they were cured in a very short time by dilatation and intra-uterine applications.—*Wylie.*

CASE II.—*Dipsomania.*—Like B. de Boismont, I have several times seen temperate women have a craving for spirits only at the menstrual epochs, the craving subsiding with the flow; and the same desire has

been noticed in pregnant and puerperal women. Esquirol and H. Royer-Collard have met with women in good circumstances, who all through life had been temperate, but who at the change were suddenly seized with an irresistible desire for brandy, which again became disagreeable to them when the critical period was passed. This impulse is akin to the well-known longings of pregnancy, and those who yield to it know that they are doing wrong, struggle against it, but are sometimes overcome. It is easy to understand how such impulses should be rife at all the periods when the ganglionic nervous system is in a state of perturbation, and when anomalous sensations at the epigastric region indicate morbid action in the central ganglia. It can be cured by proper treatment.—*Tilt.*

CASE III.—*Kleptomania.*—Drs. Taylor and Marc have known patients who, previous to puberty or to disordered menstruation, were conscientious respecters of rights of property, but who, though in affluence, would steal, at all risks, at the critical periods of life. Dr. Marc mentions a rich lady who, during pregnancy, could not resist the temptation of stealing a chicken from a cook shop. I have already described cases of this description caused by the change of life, and I believe they are of more frequent occurrence than is supposed, although the sense of acting wrongly is still present to the mind of those who yield to this impulse.—*Tilt.*

CASE IV.—*Nervous Aphonia.*—This is a rare affection, but I have had a good opportunity for studying the case of a lady, at the change of life, who, after losing her husband, came to town and settled in Belgravia. Though she had not been hitherto subject to nervous affections, cold, over-exertion or worry would suddenly deprive her of her voice for a few days, and this sometimes occurred without apparent cause. The nervous nature of the ailment was shown by the sudden coming and leaving of the aphonia, and by the effect of change of air; for a drive in Regent's Park or to Hampstead would often restore her voice to its natural tone. On leaving town to reside in the country, she has ever since enjoyed a comparative immunity from this complaint. Sometimes a potion containing ether speedily dispelled the aphonia. In two cases I found sudorifics useful, the permanent return of the voice coinciding with a marked determination to the skin. Cerise speaks in favor of emetics for nervous aphonia, and I have witnessed their sudden good effects, but the best treatment is the direct application of electro-magnetism, either to the tongue or to the larynx, by means of Dr. Morrell Mackenzie's galvanizer. The shock makes the patient scream, the spell is broken, and she is immediately cured. —*Tilt.*

CASE V. — *The Menopause Delayed by Fungosities of the Endometrium.*—This patient was married, and the mother of five children. After the birth of her last child she suffered from uterine leucorrhea, probably caused by endometritis. She had fair health in spite of that, and menstruated regularly until she was 46 years old, and then the menstrual flow became more profuse. This continued intermittently for nearly one year, when the menses came more frequently, lasted longer, and the flow was quite profuse. Her health failed gradually; she became anemic, weak, low-spirited, and nervous. Though her flesh remained (she was rather stout), her strength was greatly reduced. Her family physician gave her the usual remedies—lead and opium, ergot, cannabis indica, and aromatic sulphuric acid—in the hope of controlling the flow, but without effect.

Finally, she consented, with some reluctance, to an examination, when a large number of polypoid growths were found in the cavity of the uterus. These were removed with the curette, and the flow stopped for six weeks; it then returned for a few days, but was not very free. There was a return of the menstrual flow in two months, very scanty, and another in three months, and that was the end of it. She was then 48 years old. After the removal of the fungous growths with the curette, her health improved under tonic treatment, and, when last seen, at 49 years of age, she was quite well.—*Skene.*

CASE VI.— *Diarrhea and Morbid Perspirations.*— Catherine M., aged fifty-three, tall, thin, and pale, menstruated very abundantly at 15 years of age; was regular from the first, and continued so for three or four days every three or four weeks, with so little suffering that "she never felt them come or go." She married at 33 miscarried three times, and bore five children, the last at 47; and menstruation, which had been irregular a year previous to conception, never returned after that event. The patient was generally relaxed during the menstrual epochs, and during her last pregnancy, and after her confinement, she frequently had three or four stools a day, without pain or loss of appetite, after which diarrhea came on every three or four weeks, with flushes and drenching perspirations. For the last twelve months she was relieved six or seven times a day, until lately, when the bowels only acted once in two days, and on this account she had suffered much from heat, flatus, nausea, oppression at the pit of the stomach, and want of appetite, although her tongue was clean and healthy. When the action of the bowels became freer, the patient got well.—*Tilt.*

CHAPTER XX.

VICARIOUS MENSTRUATION.

Definition and Synonyms.—The term vicarious menstruation is applied to the discharge of menstrual blood through some channel other than the uterus. Flamant uses to define this condition the word *xenomania*, which expresses "the idea of the menses taking a wrong course." Barnes proposes, when the menses escape from the wrong place, the term *ectopic menstruation*. Finally, Dr. Bedford-Fenwick suggests that the term *vicarious hemorrhage* more clearly defines the phenomenon than does that of vicarious menstruation, because the vicarious discharges do not possess the characteristics of true menstrual blood.

The dearth of modern literature bearing upon the subject is something surprising. Gendren, Parrot, Whitehead, and Courty, of the older authors, deal with it somewhat in detail and have recorded several cases of so-called vicarious menstruation, some of which will hardly stand the test of modern scientific investigation. More recent and reliable ones are recorded by Butler,§ Rein,§ Chapman,§ Hardon,§ Cooper,§ Barnes,* Routh,* Fenwick,* Mansell-Moullin,* Mitchell,† M. Guépin,‡ and many other writers. Some of these cases are referred to in detail at the end of this chapter.

By far the most learned and scientific dissertation yet produced in any language treating of vicarious menstruation was presented in 1886 to the *British Gynecological Society*, by Robert Barnes, M. D., F. R. C. P., and published in the Transactions of that year. The discussion that followed is equally learned, making with the essay a most valuable and elaborate contribution to the literature of the subject. I shall in this chapter simply endeavor to reflect the views of the justly celebrated essayist, giving his conclusions in full.

Barnes was prompted to collect the data therein given for the reason that Dr. Wilks, a writer equally sagacious, disputed most emphatically

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* British Gynecological Journal, Vol. II

† American Journal of Medical Sciences, Vol. XXX, p. 83.

‡ Medical Times and Gazette, 1862, p. 338.

§ "Annual of Universal Medical Sciences," 1889.

and energetically the existence of so-called vicarious menstruation. The former's arguments are so largely based upon physiological and pathological phenomena and analogies, which at times require most careful study in order to comprehend the author's meaning, as to prompt me to create from them the following schema. This will be sufficiently amplified to make it clear, and will, I think, aid the reader very materially in following the arguments set forth:—

VICARIOUS MENSTRUATION.

- I. Phenomena of normal menstruation, ...
  - (*a*) Increased nervous tension and mobility;
  - (*b*) Increased vascular tension;
  - (*c*) Increased temperature;
  - (*d*) Increased excretion of urea.
- II. Analogy between menstruation and pregnancy, ...
  - (*a*) Ovulation the beginning of both;
  - (*b*) Mucous membrane—similar changes in both;
  - (*c*) Exalted nervous tension—present in both;
  - (*d*) Casting off of useless decidua in menstruation is analogous to labor.

The object of normal menstruation is, therefore, to discharge superfluous material and energy not required for gestation.

- III. Physiological substitutes for menstruation, ...
  - (*a*) Pregnancy—hence a form of vicarious menstruation;
  - (*b*) Lactation—hence a form of vicarious menstruation;
  - (*c*) Building up of new tissue.
- IV. Pathological substitutes for menstruation, ...
  - (*a*) Vicarious diarrhea or leucorrhea;
  - (*b*) Serous effusions;
  - (*c*) Ectopic, or vicarious discharge of blood.
- V. Theories, .
  - (*a*) Plethoric—increased intra-vascular pressure.
  - (*b*) Neurotic—proofs, . . .
    - (1) Influence of the emotions upon menstruation;
    - (2 Influence of nervous system upon the circulation;
    - (3) Frequency of vicarious menstruation in neurotic subjects.
  - (*c*) Becquerel's and Scanzoni's theory,
    - Abnormal structure of the vessels and organs to which the flux is directed.

Dr. Barnes says: "We are met at the outset by this difficulty: physiologists are not agreed as to what causes or constitutes normal menstruation. This difficulty may be evaded without seriously affect-

ing the argument, by putting aside the controversy as to whether the menstrual flux is caused by the maturation of the ovules. My own observation inclines strongly to the conclusion that ovulation is the immediate cause of the flux. * * * Briefly, then, menstruation consists in the periodical discharge of blood from the uterus. This, the most conspicuous objective phenomenon, is, however, only one act in a complicated process, of which the genital system is the focus, but upon which the entire organism is at work."

The phenomena of normal menstruation are—

1. *Increased nervous tension and mobility.*—This is evidenced by "exalted psychical, emotional, and reflex action."

2. *Increased vascular tension.*—This gives rise to "turgescence of the capillary and venous systems," as is demonstrable by the sphygmograph. "The vascular tension falls quickly when the menstrual blood-flow sets in."*

3. *Increased temperature.*—Repeated observation shows that the temperature is increased before and during the menstrual flow at least .5°. The urea is also increased.

The writer next draws a most ingenious analogy between menstruation and pregnancy. He says: "Assuming that the *primum mobile* in either case resides in the ovary; the first step is ovulation, or the ripening of an ovum and the depositing of it in the uterus. But the work of preparation begins in the uterus long before the extrusion of the ovule from the ovary. In response to the development of the ovum, nerve force and blood are attracted to the uterus, the whole organ swells, becomes heavier and more sensitive, softer, from the permeation of its walls by fluid; the utricular glands of its cavity enlarge, secrete more freely; the mucous membrane swells, grows, is developed into a thick, soft, pulpy membrane, the decidua. This process is the representation—to this point—of pregnancy. It is marked by certain signs, more or less distinct, in different cases. But in all there may be observed exalted nerve-tension, expressed by greater emotional and reflex mobility, sometimes revealed in neuralgia, in vomiting, and even convulsions. There is increased central nervous irritability, and there is

* "The volume of blood is also increased. Andral and Gavarret showed that the quantity of carbonic acid exhaled by the lungs rises until the age of thirty in men, but only until puberty in women; moreover, that in women it falls off as soon as menstruation is established, to increase again after the menopause. If for any cause the menstrual flow is arrested for several months, as by pregnancy or lactation, the quantity of carbonic acid is increased, as after the menopause."—*Barnes.*

the eccentric source of irritation in the uterus. Concurrently, there is observed a marked increase of vascular tension. The pelvic vascular region especially feels the attractive force of the uterus. Then there comes a casting-off and casting-out of the useless decidua; the process is traumatic. This is the analogue of labor. The developed muscular fibers contract under the influence of the intensified diastaltic function. Hemorrhage attends. The mimic labor over, the blood-current and nerve energy are lowered, and the excess diverted from the pelvis, and for a time the ordinary equilibrium of the economy is restored. The uterus returns to its wonted state, and the breasts become quiescent. This history presents points of similitude with that of gestation at every stage."

Certainly the analogy between the two processes is traceable in detail and without any great stretch of the imagination. Ovulation has for its final object conception. If this does not take place then menstruation occurs as a *substitute* for both conception and parturition, during the last stage of which may be seen the analogue of the puerpera; the energy and material prepared for the missed pregnancy are now superfluous and are discharged.

Since, then, the object of menstruation is the discharge of "superfluous material and energy," it necessarily follows that when the function is held in abeyance by physiological causes there must be *physiological substitutes* for menstruation. The causes which physiologically suspend the function are *pregnancy* and *lactation*. During gestation the blood which would be lost in the menstrual discharge, were menstruation not interrupted by pregnancy, is used for structural purposes in the development of the fetus. *Lactation* is likewise a substitute for menstruation, for, commonly, menstruation is suspended during the usual period of lactation. A third substitute for menstruation is the *building up of new tissue*. This is why women so frequently become fleshy after the menopause. The material elaborated for menstruation is no longer needed for that purpose; nor can it be utilized for either gestation or lactation -- hence the general deposition of fat.

It must be observed, in passing, that neither pregnancy nor lactation always suspends menstruation. For some reason ovulation (I assume that ovulation is the *primum mobile* of menstruation) is not interrupted by gestation; or recurs during lactation. In this way true menstruation, *i. e.*, a periodical discharge of blood from the uterine cavity, takes place, which differs in no wise from true menstrual discharge. For the first three months of gestation this is entirely explicable, for the decidual cavity is not always perfectly closed. Of course, it is not difficult

to understand the processes of menstruation during lactation; the uterine mucosa has returned to its normal state and, if the menstrual wave is set in motion by ovulation, it is ready to undergo the changes incident to menstruation. Hemorrhage occurring at these periods, however, does not always proceed from the uterine cavity. It may come from the vagina or the cervical canal—the tendency to an overflow from some point being too strong to be restrained. Barnes records one case in which the villi of the vaginal portion was bared, tumid, and vascular, so that malignant disease was strongly suspected. The cervix returned to its normal condition after labor. I have seen a case very much like this, the patient menstruating regularly up to the time of her miscarriage at the end of the fourth month. Projecting from the posterior lip was a vascular growth as large as a hickory nut, which a microscopical examination proved to be simple hypertrophy of the mucous membrane. After the miscarriage the hypertrophied tissue entirely disappeared.

"These hemorrhages," says Barnes, "are conservative in design. * * * * They relieve systemic and local hyperemia. In this respect they resemble some cases of abortion, which may be regarded as a protest of nature against the continuance of a dangerous pregnancy; unless relief be found in this way, vital organs may be struck, and we may have fatal cerebral or lung apoplexy."

I will now allude to the evidence which justifies a belief in the existence of vicarious menstruation.

1. *Clinical observation.*—Not all of the cases recorded by Barnes and other writers will bear close investigation, but there is, I believe, sufficient reliable clinical evidence to convince any unprejudiced investigator that vicarious hemorrhages do occur.

2. *A profuse hemorrhage from distant organs frequently causes catamenial suppression.*—This shows the part played by increased vascular tension, which characterizes normal menstruation. If this tension is relieved by an escape of blood from any part of the body remote from the uterus it may suspend, temporarily, menstruation—in fact, is a substitute for menstruation.

3. *The various organs of the body are constantly assuming vicarious or supplementary functions.*—I again quote in detail from Barnes: "The skin, the kidneys, the lungs, the liver, the glandular system, intestinal and other, are constantly doing reciprocal work. That obstructed or arrested menstruation, then, should be supplemented or helped by other organs than the uterus is in strict accordance with the fundamental laws of physiology. There is a solidarity in the organism,

binding the constituent organs into unity, and making them work with one consent. Reasoning from this basis we shall be prepared to understand that menstruation is not simply a function of the uterus and ovaries, but a systemic function. * * Menstruation, or an equivalent substitute, must be performed."

We have seen that the physiological substitutes for menstruation are pregnancy, lactation, and the building up of new tissue. If the material elaborated for these several purposes is not utilized for the same; or, if it is not discharged as superfluous in the form of menstruation, we may expect a more or less successful attempt at one or more of the following *pathological substitutes:*—

1. *A vicarious diarrhea or leucorrhea.*—Both are usually very watery, the leucorrhea consisting of serum or mucus.

2. *Serous effusions.*—These occur in the substance of organs, in serous cavities, or in connective tissue. In chloro-anemic girls, anasarca, more or less general, is not of infrequent occurence.

3. *Ectopic or vicarious discharges of blood from any and every part of the body.*—The most common seat of the discharge is the nose; next in frequency come the stomach and lungs. It may, however, proceed from any part of the body, selecting by preference, as we shall see later on, some site previously weakened by disease.

Should the system not be relieved by the foregoing substitutes there may arise any of the various neuroses, as neuralgia, migraine, hysteria, epilepsy, apoplexy, etc. To classify these affections as pathological substitutes for menstruation, as does Barnes, strikes me as carrying the philosophy of analogy too far. They are rather the sequelæ of an arrested function, and hardly come within the range of either an analogue or a homologue of menstruation.

I think that the arguments produced prove pretty conclusively that menstruation, or its equivalent, must be performed, or the system will bring into action reciprocal functions. It now becomes necessary to analyze the various theories which have been put forth as explanatory of vicarious menstruation. They are the following:—

1. *The Plethoric Theory.*—This is one of the oldest, and is based upon the well-known fact that intra-arterial pressure is always increased before menstruation. It implies the necessity of relief through *some* channel—if the usual avenue is closed, vent is found at the *locus minoris resistentiæ.* Should the ordinary safety-valves fail, and the blood find no external outlet, it may escape, as we have seen, into the brain, the liver, the kidney, the spleen, or, indeed, into and from any of the internal organs.

Parrot objects to this theory upon the ground that most of the victims of vicarious hemorrhage have been chlorotic, in which affection the red blood-corpuscles are diminished—the very reverse of true plethora. In refutation of Parrot's objection, Barnes very appropriately remarks that "increased vascular turgescence and exalted vascular pressure are phenomena found with diminution of the red globules." Such a state exists in pregnancy, for instance, when the watery element of the blood is increased with correspondingly increased peripheral vascular tension.*

2. *The Neurotic Theory.*—The chief champion of this theory is Parrot, whom I have just quoted. Parrot has applied to these hemorrhages the term "neuropathic." In support of this theory it is adduced that menstruation may be suppressed by emotional causes, as anger, fright, joy, etc., the suppression being frequently followed by hematemesis; that the subjects of vicarious hemorrhage are nearly, if not quite, all victims of some nervous disorder; and, finally, that in those cases where the discharge continues after the removal of such disorder, a habit induced by the periodical repetition is sufficient to perpetuate the menstrual escape of blood. (Whitehead.)

The influence of the nervous system in the perversion of the function of menstruation cannot be questioned. I have endeavored to make this clear in the chapter devoted to the General Pathology of Gynecological Diseases. That local hyperemia and anemia may be induced by nervous influences is well known in the phenomena of blushing and the pallor of fear. The nervous system exerts a controlling force upon the circulation which, if suspended or diverted, may cause intense congestion in some part or organ of the body, with resulting hemorrhage. But, as observed by Barnes, "If we must admit the fact that the blood could not move in the vessels unless under the influence of nervous energy, we must equally admit that there would be no nervous energy were it not for the nutrient and stimulant energy of the blood." There is, therefore, a concurrent and mutual action of both the vascular and nervous system in normal menstruation, and vicarious menstruation is but a perversion of physiology. The part played by congenital weakness and abnormal structure will be considered under the caption of—

* Stevenson, of Aberdeen University (A. W Johnstone in *Am. Journal of Obstetrics*, May, 1895), has recently shown by delicate manometers that there is a definite variation from one period to the next in a woman's pelvic circulation during her menstrual life. The pressure is greatest at the commencement of the flow, least immediately on its cessation, and remains about the same height for seventeen days, when it again begins to rise.

3. *Becquerel's and Scanzoni's Theory.*—It has been observed that the seat of hemorrhage is frequently located in tissues diseased or congenitally weak. Scanzoni especially emphasizes the importance of abnormal structure of the vessels supplying the organ from which the flux proceeds. Depaul and Guéinot (quoted by Barnes) remark "that the blood-flux usually takes place in regions or tissues deprived of their natural tegument, that is, from wounds, ulcers, rupture of varicose veins, etc." This has been my observation in several cases, though there are many on record in which no such disease was present. It must not be forgotten that the diseased tissues may be the consequence rather than the cause of the ectopic discharge. If it be true that increased intra-vascular pressure plays such a prominent rôle in both normal and vicarious menstruation, it seems not illogical to presume that the escape of blood is most liable to occur at the point of least resistance. The flow generally continues to recur from the seat of election, and it may take place from several points simultaneously.

None of the several factors, then, upon which the foregoing theories —plethoric, neurotic, and local depravity of tissue—are based can be ignored in studying the etiology of vicarious menstruation. Some one element may be sufficiently conspicuous in a given case to overshadow the other two; but a more careful analysis will, in most instances at least, show a blending of two or more of them, each of which plays a more or less important rôle.

The *conclusions* given by Barnes are as follows:—

1. "That, as menstruation is a physiological necessity, so when the function cannot be performed in the ordinary way some substitute for it must be found, or mischief will ensue.

2. "Vicarious or supplementary functional action is a fundamental law in physiology. There is nothing exceptional in vicarious menstruation.

3. "Vicarious menstruation may occur under various phases.

4. "It is conservative in intent and action, lessening or averting evil."

Treatment.

The therapeutical propositions set forth by Barnes cannot be advantageously enlarged upon. They are in substance as follows:—

1. The conditions which interfere with the proper discharge of the menstrual blood should be removed.

2. Since vicarious menstruation is often associated with amenorrhea and dysmenorrhea, the cause of these two symptoms should be sought

for and removed. Mechanical obstruction in some portion of the genital tract is a frequent cause, and such obstruction should be overcome.

3. When the neurotic element predominates the nutritive functions are usually disordered. Defective hematosis is of frequent occurrence, and the functional derangement is often marked. The depravity of nutrition may either precede or follow the nervous disorder. The indications in either event are to correct the constitutional bias.

4. If the vicarious discharge proceeds from an unhealthy surface an attempt should be made to heal the morbid seat. An effort should also be made to divert or attract the menstrual nisus to the uterus, by: (*a*) derivative or revulsive bleeding; (*b*) local applications of iodin and the hot vaginal douche, electricity, etc.; and (*c*) the internal administration of such remedies as hamamelis, gossypium, digitalis, ergot, iodin, mercury, arsenic, etc.

Of the foregoing measures I would especially emphasize the importance of electricity and the internal remedy. The method of using electricity does not differ from that given in dealing with amenorrhea. Negative galvanization, in conjunction with intra-uterine faradization, will, as I know from experience, do much in the way of attracting blood to the uterus. I have, too, great faith in the utility of the homeopathic remedy in setting right the perverted function. It should, therefore, be selected with care; an effort being made to find a drug whose action is sufficiently profound to reach the constitutional derangements, even though the word "vicarious" does not appear in its recorded symptoms.

Therapeutics.

Pulsatilla.—Particularly suitable to mild, tearful, yielding dispositions; pale face; difficulty in breathing after slight emotions; *morning sickness with bad taste in the mouth;* no appetite; vicarious hemorrhages in consequence of wet feet; epistaxis or hematemesis following the suppression of menses; FEELS BETTER OUT OF DOORS.

Bryonia.—*Stitch-like pains in the lower abdomen, aggravated by the slightest motion*, with tendency of blood to head; membranous dysmenorrhea; frequent nosebleed when menses are suppressed; in women accustomed to too early and too profuse menstruation.

Ferrum.—ANEMIC WOMEN SUBJECT TO FIERY RED FLUSHING OF THE FACE; menses appear with physical languor and mental depression, unfitting her for work; hysterical symptoms after menses.

Hamamelis.—Vicarious hemorrhages from nose, mouth, stomach,

or rectum, the blood being *dark or venous in character;* VARICOSE VEINS OF LOWER EXTREMITIES.

Lachesis.—*Evidences of blood degeneration; flashes of heat,* especially at the climacteric; coldness of feet; *palpitation of heart with feeling of constriction about the heart as if tightly held in cords;* oppression of the chest with dyspnea on wakening; menses scanty but regular; desire for fresh air.

Digitalis.—Dr. W. H. Hoyt reports a case, characterized by the following symptoms, cured by digitalis: Pain in and about the chest and sometimes epistaxis before the menses, followed by choking spasmodic cough at night and expectoration of a solid bloody mass with immediate relief. This mucus was very difficult to detach and presented a rusty black, clot-like appearance. (Southwick.)

Kali carb.—Congestion of the brain and chest; hot flashes; burning pain in region of hips; intermitting pulse; STITCHES IN CHEST; heavy aching sensation in small of back during menses; menses acrid, of a bad, pungent odor and excoriating; backache and sticking pains in abdomen.

Ipecacuanha.—Menses too early and too profuse, *blood bright red;* great weakness after menses; blue rings around eyes; distress in umbilical region; CONSTANT NAUSEA AND FAINTING.

Sanguinaria.—Scanty menstrual discharge *with headache from occiput to forehead as if the head would burst;* eyes pressed out; *face red and hot.*

Sabadilla.—The menses are suppressed immediately upon their appearance, when they appear again sooner or later and are again suppressed. (Guernsey.)

Sulphur.—Menses too early, too profuse and of too short duration; during menses, headache, rush of blood to head, nosebleed; *burning in the vagina with troublesome itching of the genitals due to papillary eruption.*

Trillium.—Hemorrhage from the uterus with sensation as though the hips and back were being pulled to pieces; better from a tight bandage. (Cowperthwaite.) Hematuria; profuse nosebleed; bleeding from gums; hematemesis.

(*V.* Therapeutics of dysmenorrhea, amenorrhea and uterine hemorrhage.)

Illustrative Cases.

CASE I.—*Dropsy and Hematuria Attending Pregnancy.*—In this case pregnancy was attended by dropsy and hematuria. A young woman, four to five months pregnant for the first time, came to the

London Hospital, having had dropsy for some weeks; it was general; the labia majora were much distended. There was hydremia, and she complained of palpitation. She passed blood in the urine.—*Barnes.*

CASE II.—*Vicarious Hemorrhages from Stomach, Eyes and Nose.*—M. A., æt. 30, single. A stout, strong woman, admitted complaining of distressing soreness of the stomach and pain in the left shoulder, extending down the arm, which was rigidly flexed; the least attempt to move it caused great pain. After being ill a month she vomited a large quantity of blood. She was carried to bed fainting—vomiting of blood recurred every month. The menstrual discharge, which occurred at the same time, was regular, both as to time and quantity. She afterwards bled from the eyes and from the nose. She had copious lachrymation, and a serous discharge from the ear and profuse perspiration. Everything bespoke aggravated hysteria.—*Law.*

CASE III.—*Vicarious Hemorrhage from Strumous Scars, Eyes, Knees, Thighs, Chest, from the site of neuralgic pains and from the Stomach.*—Madame X. had strumous ulcers when seven months old, on the fingers of the right hand. These cicatrized. At six years old she was seized with convulsive attacks two or three times a month; and later a sanguinous exudation took place from the scars of the hand. One day, under the influence of violent grief, blood came with the tears. From this time on the hematidrosis broke out indifferently on the knees, thighs, chest and grooves of the lower eyelids. The menses appeared at eleven, when temporary improvement occurred, but soon disturbances returned. Then bleedings nearly always followed a moral emotion and complicated a nervous attack, with complete loss of movement and sensibility. At fifteen the nervous attacks became more violent. They disappeared during her first pregnancy, and broke out again a year later, on the occasion of metrorrhagia.

Some time after this I saw her for violent nervous attacks. Again, the menses being a few days in arrear, pains set in in the groins, thighs, breasts, head, hypochondria and epigastrium; relieved by chloroform; then three attacks of epilepsy came; then blood oozed from a patch in the scalp; next, all the neuralgic paroxysms were accompanied by blood-sweating at the seat of pain. At intervals blood escaped from the skin of the forehead; in the subpalpebral folds blood ran in drops. The appearance of the catamenia next day brought relief. I examined the exudation microscopically. It consisted of the elements of true blood. Similar attacks supervening, an arrest of menstruation recurred. Frequently she vomited blood. Relief followed the appearance of menstruation.—*Parrot, quoted by Barnes.*

CASE IV.—*Vicarious Hemorrhage from the Leg, at the site of which an ulcer formed, which bled periodically every month.*—Mrs. G., æt. 41. When about fifteen became subject to occasional sudden flushings of face, with slight confusion of ideas; healthy. She was bled for "fullness of blood." This went on for three successive springs, when menstruation came on, and continued regularly until nearly six years ago. Menses always scanty and short. The flushings disappeared after the occurrence of menstruation. Six years later, after considerable exertion in breaking sticks, which she did with her right foot, she felt a pain in the calf. The skin became inflamed, and an ulcer formed over the outer and lower aspect of the leg. This ulcer never healed. When admitted, it was about eight inches long by six inches broad; the tissues around were slightly sunken; veins not varicose. The day after admission pretty copious hemorrhage occurred from the ulcer. This continued forty-eight hours, in spite of pressure by bandage. Fearing that this bleeding might have been caused by some injury during her journey to the hospital, I inquired about it; the patient informed me that since the date of the injury six years ago she had not menstruated at all; but that every month, about the time of the expected appearance, the ulcer bled for two days, that is, for the same time that the menstrual flow lasted, before its suppression.

After the bleeding ceased the ulcer had the appearance of a calloused and rather foul ulcer.—*Buchanan.*

CASE V.—*Vicarious Leucorrhea.*—A girl, aged twenty, sought relief for chlorosis. Since fourteen she has complained of languor, pain in the back, distention and pain in the abdomen, and mucous discharges from the vagina. For six years copious leucorrhea took place every month, following upon aggravation of pain in the loins, distention of the abdomen and lassitude.—*Whitehead.*

CASE VI.—*Vicarious Hemorrhage from the Lower Lip.*—A. P., sixteen years of age, had been an inmate of the Indiana Reformatory for Women and Girls, for some months, before requiring my professional attention. On March 10, 1876, I found her in the hospital room suffering with slight hemoptysis. To my surprise, I observed both lips to be swollen, and of a purplish hue, the swelling and the dark color being much more marked in the lower than in the upper lip—indeed, this was so dark and so much enlarged, that for the moment I thought a gangrenous inflammation was impending.

Upon closer examination I found a little blood oozing from the inner surface of the lower lip.

In four days all hemorrhage had ceased, and the lips resumed their normal size and color.

The patient's history was briefly this: Born of healthy parents, but a cast-away, she had hitherto led a life most unfavorable for a healthy physical, intellectual, or moral development. She menstruated at fourteen, and the function was normal for two years, or up to the time of her admission to the Reformatory; it then ceased for six months, when it reappeared in the abnormal form I have detailed. She was delicate in form and quite anemic. Iron was prescribed. A month after my first prescribing for her, there was a return of precisely the same symptoms that I have mentioned as observed on March 10th. May and June each repeated the previous history. Soon after the third recurrence of the abnormal menstruation, she made her escape from the Institution—an unfortunate escape for her own good, and for the interests of professional study.—*Parvin.*

CASE VII.—*Amenorrhea with Vicarious Hemorrhage.*—The patient is a young mulatto woman, whiter than most white women. She was married several years ago and gave birth to one child. Always been regular in her menstrual periods until two years before coming to me. At that time another colored woman stole her husband's affections from her and followed up the theft by attempting to cut her throat. She lost a good deal of blood from the wound. Her menses coming just at this time, she said her physician gave her two kinds of bitter medicine to stop the flow, saying she had lost blood enough. The "bitter medicine" proved effectual, as she had but three catamenial periods in the two years following, at which times she suffered with severe pains in the back and pelvis. About two weeks before I saw her she felt the symptoms of the approaching menses, but instead of the usual flow she bled profusely from both nipples. The mammæ were painful and tender to touch before the hemorrhage. I found the uterus in a normal condition.

The patient complained of a throbbing in the temples at times. Also of a dull headache, made worse by stooping, and attended with constipated bowels. Belladonna and bryonia relieved her wholly of these ailments. I then prescribed cimicifuga in a low potency. There was every indication of the natural appearance of the menses at the next month, but at that time she went out in the rain and got her feet wet, and no flow appeared. I continued the cimicifuga and the following month she had a more natural and profuse flow than at any time since her troubles began.—*Dr. S. J. Millsop, The Clinique*, April 15, 1890.

CASE VIII.—*Vicarious Hemorrhage from Varicose Ulcers of the Legs.*

—Woman in bed for large varicose ulcers of both legs. Heard some bad news. Menstruation, which was going on, suddenly ceased, and ulcers began to exude blood, and continued to do so, despite compression, for three or four days. Following month ulcers, though much reduced in size, suddenly began to exude blood again, and menstruation did not appear. Ulcers healed up before next period, and patient was discharged.—*Bedford-Fenwick.*

CASE IX.—*Singular Case of Vicarious Menstruation.*—A negro woman, about thirty-five years of age, of apparently good constitution, and, with the exception about to be mentioned, of general good health.

She began menstruating at the age of fifteen, and continued regular in this respect until three years since. Eight years ago, when about twenty-seven years of age, she was attacked with a violent pain in the foot, which was succeeded by an abscess, which was lanced, but did not heal. Ulceration succeeded, which continued to move upward until the leg was involved and became the seat of its permanent location. About three years since the catamenial discharge began manifestly to decline, and so continued until it ceased altogether, when she was seized with severe shooting pains, passing from the sacro-lumbar to the uterine region, and to the ovaries. At the approach of her next menstrual period she noticed a slow oozing of blood from the ulcer on the leg (I give her own account of the matter), which continued about the usual time of that discharge and ceased. At subsequent *periods* the same discharge sometimes occurred, while at others, small sacks of blood were formed contiguous to the ulcer, which were obliged to be opened and the blood discharged before relief could be obtained.

In June last, the ulceration of the leg had become so extensive and threatening as to require, in the judgment of Dr. —— (whose patient she then was), amputation.

Since the operation, the ulcer being removed, there has been no regular monthly periodic discharge of blood, but at each monthly period, sacks, such as were above described, formed around the stump of the amputated limb, and required to be lanced for the relief of the patient. I have seen these sacks, and in fact opened them, and can entertain no doubt as to their true nature. So uniform are these singular occurrences in their periodic character, as to have induced this woman to keep a lancet for the purpose, and thus *surgically* to perform the work of menstruation. It should be observed that she continues without any vaginal discharge, and that the determination of blood to the stump of the amputated limb, and the formation of these sacks of blood, occur periodically, and observe *strictly* the menstrual periods as to the time

of their recurrence and duration.—*Dr. Doring, New York Journal of Medicine, Jan., 1856.*

The following cases passed under my own observation:—

CASE X.—*Vicarious Hemorrhage from Hemorrhoidal Tumors of the Rectum.*—Mrs. B., æt. 36. Patient came to me from the northern part of Michigan, in July, 1886, stating that her physician had made a diagnosis of "cancer of the rectum," without, however, resorting to a local examination, although she had suffered intensely for three years. She was pale and anemic, and for the last twelve months had lost enormous quantities of blood from the rectum. Menstruation had been entirely suppressed for five months, and the rectal hemorrhage, although recurring in small quantities after each stool, presented all the elements of periodicity. A series of rigid cross questions were put to the patient in order either to confirm or disprove her statement; the statement was incontrovertible. An examination revealed, not a carcinoma, but a mass of hemorrhoidal tumors which were greatly aggravated by opium, the patient taking the tincture in tablespoonful doses. On August 30th I ligated and removed the hemorrhoids. I gradually withdrew the opium, prescribed nux vomica, and the patient made a good recovery. Two weeks after the operation she menstruated in a natural way, the first time in five months. She also menstruated September 20th and October 25th, since which time I have lost sight of the case.

CASE XI.—*Vicarious Hemorrhage from a Mole on the Forehead.*—E. B., æt 20. Of Irish descent, nervous temperament, but not hysterical, and a victim of spasmodic dysmenorrhea. The patient was not under my observation long enough to permit a careful study of all the symptoms. She caught cold just as the menses were due, and, as a consequence, was suffering much more than usual from dysmenorrhea.

Upon reaching the bedside I found her bleeding quite profusely from a small mole, not larger than a millet-seed, located on the forehead. Several large handkerchiefs were completely stained with the discharge, of which there was not less than an ounce. The face was red, the headache intense, and the restlessness very great. Under the use of hot cloths externally over the abdomen, and a hot foot-bath, with aconite internally, the natural flow was established, when the vicarious discharge ceased. She gave a history of being similarly affected a year or so before, and has had a recurrence of the ectopic discharge two or three times during the last eight years.

CASE XII.—*Vicarious Epistaxis.*—O. A., æt. 13. She is large for her years, well developed, the mammæ being prominent, with quite a heavy growth of hair upon the pubes. Every four weeks, for the last

six months, she has had a profuse epistaxis. The attacks recur every twenty-eight or thirty days. Pulsatilla was prescribed, and in due time she became quite regular, when the epistaxis ceased. During the six months while suffering from the epistaxis she did not menstruate.

I have frequently met with vicarious epistaxis following oöphorectomy and hysterectomy. Kobern * says that the prognosis should be guarded when the bleeding takes place through the lungs, as not infrequently it is the beginning of acute tuberculosis.

Dr. J. L. Hancock, of Chicago, has placed on record † a case of vicarious bleeding from the breast. The woman is 31 years of age, and has a discharge from the left breast three days before each menstrual period. The discharge, which is at first whitish, becomes bloody and then yellowish. It ceases upon the advent of the flow from the uterus, but recurs at its cessation and lasts for two or three days.

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* Berliner Klinische Wochenschrift, Jan., 1895.

† Progress, May 11, 1895.

CHAPTER XXI.

STERILITY AND IMPOTENCE.

Sterility is a symptom, or, rather, the consequence, of so many different conditions and affections as to make it necessary in a chapter devoted especially to the subject to do but little more than classify the causes, and to suggest the general principles of treatment.

To make human fecundation possible, it is necessary—

1. For living spermatozoa to find their way into the female genital tract;

2. For the contact of spermatozoa or a spermatozoön in some portion of the genital tract with a healthy ovule capable of fertilization; and, finally,

3. For the occurrence of suitable changes within the uterus, that the impregnated ovule may not be prematurely expelled.

The statistics of Matthews Duncan* show that about one marriage in every ten is fruitless. The various factors responsible for this may be classified as follows:—

1. *Causes preventing insemination*—
   - Impotence of the male;
   - Impotence of the female;
   - Stenosis of the vagina or ostium vaginæ.

2. *Causes preventing or interfering with coitus*—
   - Atresia or stenosis of the vagina;
   - Imperforate hymen;
   - Malformation of the external genital organs;
   - Hypertrophy of the clitoris and labia;
   - Vaginismus;
   - Prolapse of the ovary;
   - Undue shortness of the vagina;
   - Fissures and neuromata;
   - Uterine and peri-uterine inflammation;
   - Hypertrophic elongation of the cervix;

* "Gulstonian Lectures," 1883.

Coccygodynia;
Disproportion between the size of the male and female organs.

3. *Causes preventing passage of semen from vagina into uterus—*
Inflammatory occlusion of the cervical canal;
Fibroid tumors and polypi;
Uterine displacements;
Conical shape of cervix;
Lacerations of cervix.

4. *Causes preventing passage of ovule into uterus—*
Fallopian stenosis;
Fallopian adhesions;
Absence of tubes.

5. *Causes interfering with ovulation—*
Ovaritis and the various peri-uterine inflammatory diseases;
Abnormal states of the blood interfering with the maturation of ova;
Tuberculosis;
Syphilis;
Gonorrhea.

6. *Causes interfering with gestation—*
Endometritis;
Subinvolution and areolar hyperplasia;
Tumors of the uterus;
Membranous dysmenorrhea;
Uterine hemorrhages.

7. *Causes destroying vitality of semen—*
Abnormal vaginal secretion;
Abnormal uterine secretion;
Syphilis;
Tuberculosis.

It will be seen by this long array of causes that sterility may be permanent or temporary, congenital or acquired, absolute or relative.

1. **Causes Preventing Insemination.**—The first fact to be determined when called upon to treat a case of sterility is the procreating power of the male. It is certainly most unjust to subject the wife to an examination and a long course of treatment, only to discover at the end of some weeks or months that the fault lies not with her, but with the husband.*

* De Sinety estimates that in unproductive marriages the husbands are at fault in

By the term *impotence* is meant the inability to perform the sexual act. In the male, this may be due to a number of causes, either temporary or permanent. It not infrequently results from excesses and early indiscretions, but oftener from some exhausting disease which has greatly depressed the system. Temporary impotence is not uncommon in the newly married, especially with men who are victims of the horde of unscrupulous quacks that infest the land. They have had impressed upon them the probabilities of impotence, and enter into marital relations with fear and trembling. The mind plays no insignificant part in the sexual act, and if the first attempt is not successful, as it frequently is not, an impotence more or less permanent is developed which is purely mental. Dr. Hammond† has placed on record several cases of this nature.

To all appearances the sexual act may be completed in a most natural way, yet no semen is ejected; or, the semen ejected may not contain healthy spermatozoa, hence the sterility. A. Lataud, of Paris, found in the cases of sterility passing under his observation, the absence of spermatozoa in the semen in twelve per cent. In order to determine the presence or absence of spermatozoa, an examination should be made soon after it is ejected by placing a drop of the fluid under the lens of a good microscope. The spermatozoa consist of a large number of ciliated cells held in suspension by the thick, watery portion of the semen. These cells, if normal, should be seen to move about in every direction under the field of the microscope.

Impotence in the female may be due to absence of sexual desire, to physical conditions preventing the entrance of the male organ into the vagina, or to inability to experience the sexual orgasm. Frigidity on the part of the woman may be the cause of impotence in the male. That is to say, a man may not, because of lack of proper response or encouragement, have his virile powers sufficiently stimulated to complete the act. Instances of this kind are, however, rare, though the sexual appetite is very much below the normal in many women. The causes for this have been classified by Hammond as follows:‡—

Absence, or arrest of development, of the clitoris;

Extreme smallness of the clitoris;

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fifty per cent. of all cases. Treu's (*La Semaine Médicale*, Aug., 1889) estimate is thirty-six per cent. Fuerbringer (*Deutsche Medicinische Wochenschrift*, 1888) likewise believes that barrenness is due to some defect in the virile powers of the male oftener that is supposed.

† "Sexual Impotence in the Male and Female," 1887.

‡ *Op. Cit.*, p. 278.

Original absence of sexual desire.

I think there is no question that in the majority of women the sexual orgasm is largely centered in the clitoris This is not, however, true in all cases, for in many the seat of sexual pleasure lies either in the vagina, the vulva, the uterus, or equally in all of these organs.

Some women do not seem to realize they have a clitoris. In instances of the kind proper instruction regarding the function of this organ during the sexual act will put matters right and the orgasm will be experienced. I have more than once found the clitoris, in women devoid of sexual desire, bound down by adhesions; after liberating the glans, sexual intercourse was perfectly normal.

It is easy enough to comprehend that these various anatomical defects may give rise to impotence. There yet remains a goodly number of women in whom no such defects and, indeed, no abnormal condition of any kind can be found. Sexual intercourse is not painful; the patient may possess most affectionate qualities; the act itself is not repugnant, yet she experiences not the slightest degree of pleasure, even though she makes every effort to do so. There is, in the language of Hammond, "an original absence of sexual desire." It is probable that this inherent absence is of rare occurrence. Usually there exists some reason for it—a reason which keeps a latent desire from asserting itself. Too often it is incompatibility between husband and wife. At any rate, I have known women absolutely devoid of sexual desire while living with their first husband to possess it to a marked degree after a second marriage. This incompatibility is, when it exists, always a source of unhappiness, and has not, I feel confident, because of a false modesty regarding sexual matters, received from the medical profession the attention it deserves.

The sexual appetite may be absent for some time after marriage, but gradually develops as time goes on—perhaps after the birth of one or more children. I have had related to me many instances of this kind.

While it is probable that a frigid woman is not so apt to conceive as one possessing a normal or exaggerated sexual appetite, yet many women thus affected are very prolific. Of course, if the frigidity is such as to fail to excite the virile powers of the male, then, indeed, it may absolutely prevent, indirectly, insemination. Fortunately, such instances are very rare—much more so than are instances of large families coming to women who have never experienced the sexual orgasm. Skene (*Medical Gynecology*, p. 82, 1895) says: "Strong sexual instinct is no assurance of fertility, as barren women may be possessed of it. Indeed, from the history of a great number of noted coquettes—

French chiefly, and here is a nation unsparingly, unblushingly self-scrutinizing, self-critical—I am sure the reverse is true, namely, that barrenness is oftenest associated with a strong female sexual appetence."

Is intromission necessary for fruitful insemination? I think that this question can be positively answered in the negative. The self-propelling power possessed by the spermatozoa enables them, even when deposited upon the external organs, to find their way upward through the vagina and into the uterus. Testimony bearing upon this point is sometimes necessary in cases of alleged rape.

2. **Causes Preventing or Interfering with Coitus.** — These several causes require no great amplification. Some of them interfere with or prevent coition because of mechanical obstacles interposed to the entrance of the penis into the vagina; others make sexual intercourse impossible because of the pain resulting from an attempt to perform the act (*v.* Dyspareunia).

These several pathological conditions have elsewhere received due attention.

It should not be forgotten that failure to consummate the act may be due to simple awkwardness on the part of the male, or to want of proper gentleness. The vagina is sometimes unnaturally small, or the male organ unusually large. This disparity in either event interferes with coition or makes it impossible.

3. **Causes Preventing the Passage of Semen from the Vagina into the Uterus.**—Occlusions of the cervical canal occasionally result from sloughing or from inflammation following intra-uterine applications. Chourarsky (*Annales de Gynécologie et d' Obstetrique*, Dec., 1895) examined the spermatozoa taken from the vagina and the uterus immediately after intercourse in forty-eight cases. The spermatozoa only entered the womb, and always through a mucous plug. This plug, according to Chourarsky, acts as a filter and materially affects the vitality of the spermatozoa. A local examination will be necessary in order to determine this condition. Fibroid tumors and polypi impinging upon the cervical canal act as an obstacle to the passage of the spermatozoa. Even a very small polypus may cause sterility.

Uterine displacements are likewise a frequent cause of sterility. In the case of flexures the uterine axis is so changed that the organ is bent upon itself in the form of a retort. Deformities of the cervix from any cause may prevent the entrance of the semen into the uterus. The so-called *conical cervix* may make it difficult for conception to occur. Lacerations of the cervix, notwithstanding the increased size of the cervical canal, are frequently associated with sterility. I have known

many instances where women have not conceived for years, but have become pregnant soon after the cervix was repaired. The probable reason for this is that a lacerated cervix perpetuates endometritis, the resulting discharge obstructing the cervical canal.

4. **Causes Preventing the Passage of the Ovule into the Uterus.**—The Fallopian tubes are often obstructed by preëxisting disease. Indeed, it is surprising that pelvic inflammation in its severer forms ever runs its course without permanently occluding the tubes. They are frequently involved in inflammation, but, unless bound down by adhesions, usually regain their normal function. If, however, the adhesions are extensive, or if pus forms in the tubes, it is next to impossible for the ovule to pass through them to the uterus. There is nothing in the physiology of menstruation more remarkable than the manner in which the ovule finds its way into the Fallopian tubes, even in normal conditions. It is probable, as suggested by Tait, that in the majority of instances, the ovule, instead of finding its way into the Fallopian tubes, drops into the free peritoneal cavity. If this be true, even though the tubes are normal, it is certainly much more apt to be so if there exist disease of any kind. In the vast majority of cases women with peri-uterine inflammation are sterile because of distortion and disease either of the tubes or the ovaries. In rare instances the tubes may be congenitally absent.

5. **Causes Interfering with Ovulation.**—The diseases involving the tubes frequently involve the ovaries as well. Ovulation will, however, sometimes continue in spite of most extensive disease. I have dug ovaries from inflammatory exudates containing Graäfian follicles ready to burst, or Graäfian follicles which had just ruptured. I have also removed ovaries showing evidences of recent ovulation, whose structure was almost completely degenerated. It is well known that conception may take place in women suffering from chronic inflammation of one ovary, though sterility is the usual result when both ovaries are implicated. Nevertheless, we must not too quickly sacrifice ovaries chronically inflamed. The reason why it is so difficult to cure ovarian inflammation is that perfect physiological rest, so long as the patient menstruates, is impossible. The nearest approach to it will be a cessation of ovulation, the result of pregnancy; pregnancy will occasionally occur in the most unpromising cases.

There are certain abnormal states of the blood which interfere with the maturation of the ova. Anemia, chlorosis, syphilis, tuberculosis, or any condition seriously interfering with the blood-making processes, may so depress the system as to affect the function of ovulation. Gon-

orrhea is often responsible for sterility. I have in another place (Chapter XXVI.) dwelt in detail upon this subject. The frequent involvement of the ovaries and tubes in patients suffering from gonorrhea is no longer questioned. The specific form of vaginitis is much more apt to extend to the tubes and ovaries than is the non-specific.

6. **Causes Interfering with Gestation.**—The list of causes includes those conditions which are inimical to the life of the ovule after it reaches the uterus. Indeed, many of the causes there enumerated are fatal to the life of the spermatozoa before they reach the ovule. Endometritis, because of the abnormal secretion, interferes with the growth of the ovule; so do subinvolution and areolar hyperplasia, though there is usually associated with these affections more or less endometritis. Tumors of the uterus either prevent that organ from growing, or impinge upon the intra-uterine cavity in such a way as to cause premature expulsion of the ovum. Victims of membranous dysmenorrhea are nearly always sterile. This peculiar affection makes it almost impossible for the uterine mucous membrane to undergo those changes which are necessary for the reception of the impregnated ovule. Women suffering from menorrhagia and metrorrhagia are often sterile, not so much because of the excessive discharge, as because of the lesion or lesions which are responsible for the hemorrhage.

7. **Causes Destroying the Vitality of the Semen.**—Excessive acidity of the vaginal secretion will destroy the life of spermatozoa. Cases in which this unnatural condition exists are not uncommon Sometimes the acidity is so great as to make the discharge most excoriating. It may even excite intense irritation of the male organ after intercourse. I have more than once been able to detect this unnatural condition in making a digital examination, the finger smarting when coming in contact with the discharge. Abnormal secretion of the uterus has already been referred to. It may be due to numerous causes. While usually not acid in its reaction, yet if its properties are markedly changed it will destroy the vitality of the semen.

The part played by obesity in the production of sterility deserves some attention. Philbert* has recorded five instances of sterility in women unnaturally obese, all of whom became pregnant after the reduction of flesh. It is probable, as suggested by Fournel,† that the disease of the blood corpuscles which results in obesity affects also the uterus and ovaries, thus interfering both with the function of ovulation

* *Revue Générale de Clinique et de Therapeutique*, April, 1889.
† *Gazette des Hôpitaux*, February, 1889.

and the nutrition of the uterus. Obese women usually suffer from relaxation of the muscular fibers throughout the body, and the tissues of the uterus may likewise become implicated. At any rate, when conception does occur in cases of the kind, labor is usually most tedious. Obese women are also victims of miscarriages oftener than those of normal flesh. This is due, according to Fournel, to asphyxia of the fetus because of deficient oxidation of the blood corpuscles, the resulting accumulation of carbonic acid exciting uterine contraction and thus expelling the fetus.

Duncan* states that "the average time after marriage for the birth of the first child is about one year, though not infrequently three years elapse before the birth of the first child, and we are hardly justified in assuming that permanent sterility exists until after this time." He also considers the average interval between the birth of successive children to be from eighteen to twenty months. And he affirms that the physiological number of children for each fertile woman closely approaches ten. Too much stress must not, however, be placed upon these deductions. Causes of various kinds, especially social, may and frequently do disturb these averages.

Syphilis, tuberculosis, scrofulosis, etc., of the male are not infrequently responsible for sterility. I have already referred to the necessity of examining the semen where there is a possibility of the male instead of the female being at fault.

Treatment.—Some of the causes of sterility which I have presented are remediable, though many are not. Most of the stenoses can be overcome by proper operative treatment. I have cured many of them by negative galvanization, impregnation following this treatment. The removal of imperforate hymen is neither difficult nor dangerous. The possibility of curing malformations of the external genital organs will depend entirely upon their nature. Hypertrophy of the clitoris and labia is to be reduced by the scalpel. Vaginismus—often a most obstinate condition to contend with—can usually be overcome in time by combined internal and local treatment. Nothing more fortunate can befall a patient suffering from vaginismus than pregnancy, for the affection frequently disappears after the birth of the first child. Prolapse of the ovary is also a most obstinate affection; too often the resulting distress can only be overcome by abdominal section and removal of the displaced organ, or by attaching the fundus uteri to the anterior abdominal wall. There is no way of lengthening a short vagina; it is possible, however, for

Op. cit.

conception to occur even here. The patient should be instructed to lie with her hips elevated for some time after intercourse, so that the semen may be retained. Fissures and neuromata are barriers easily overcome, though they usually require surgical interference. The prognosis in uterine and peri-uterine inflammation will depend largely upon the extent of involvement of the Fallopian tubes and ovaries. Irreparable damage may be done to both, or it may be possible to restore them to their normal condition. Hypertrophic elongation of the cervix must be reduced by the scalpel.

In occlusions of the cervical canal from whatever cause divulsion is to be practiced.* In a goodly number of cases of uterine flexures, when the patient is otherwise healthy, conception will follow this operation. In the event of fibroid tumors or polypi the prognosis will, of course, depend upon the possibility of removing these adventitious growths.

Where causes exist preventing the passage of the ovule into the uterus, the prognosis is more unfavorable. It is exceedingly difficult to overcome Fallopian stenosis when the obstruction is due to inflammatory adhesions. Even here, however, measures having for their object the absorption of adhesions and the removal of inflammatory exudates may overcome the obstruction. The pain resulting from extensive adhesions which involve the ovaries is, unfortunately, so great in most instances as to require salpingo-oöphorectomy. Absence of the tubes is by no means an easy matter to determine. Once determined, it is hardly necessary to state that further effort is useless.

In the event of serious systemic disturbance much good may be accomplished by proper hygienic, dietetic, and general treatment. It is not an uncommon thing for women whose nutrition is seriously interfered with from any cause to conceive after being restored to a state of health. As regards tuberculosis, if this is responsible for the sterility, it is indeed most fortunate that the patient is sterile. It would, in my mind, be a most cruel thing to encourage a victim of tuberculosis to bear children, or to resort to any operation which would make conception more probable.

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* Outerbridge has devised an instrument, consisting of a continuous steel wire made so as to form two blades, which he introduces into the cervix six days in advance of the menstrual flow, allowing it to remain in position for from five to eight days after the period. He reports several successful cases following the introduction of this instrument. If it is used at all, I should recommend the same precaution to be observed as in the use of the intra-uterine stem, keeping the patient in bed until after its removal.

When the blood taint is due to syphilis, anti-syphilitic treatment will sometimes make a sterile woman fruitful; or, if the husband is the infected party, the same treatment directed to him will often restore his virile powers. Here again, owing to the difficulty of completely eradicating the disease, it were better if the wife remained sterile. Sometimes a lacerated perineum will prevent the retention of semen within the vagina for a sufficient length of time to enable it to pass into the cervical canal. The indications here are clearly to restore the perineum by a proper operation.

So far as internal medication is concerned, it is useful just in proportion as it is useful in the several affections which have been considered as causative factors. As has been shown, sterility is a symptom of innumerable causes and diseases, and it seems to me the height of folly to prescribe for it as an affection *per se*. I therefore deem it unnecessary to give a list of indicated remedies.

In conclusion, I desire to take issue with certain recent writers, notably Reeves Jackson and Professor John Thorburn, in the statement that no operation should be performed solely for the purpose of overcoming sterility. These gentlemen infer that the desire for offspring on the part of husband or wife does not in itself warrant interference, or, at least, operative interference, in any way endangering the life of the patient. They maintain that, if surgical measures are necessary for the removal of causes which in themselves demand such measures, the physician is justified in operating; otherwise he is not. This would exclude from operative treatment that class of patients in whom nothing abnormal can be found by the ordinary methods of examination. Dysmenorrhea may even be absent, and yet divulsion of the uterine canal will sometimes be followed by conception. This, under proper antiseptic precautions, is but slightly dangerous. I maintain that when a woman desires to assume the responsibilities of maternity every resource which does not too greatly endanger life or shock the sensibilities should be exhausted. At this day and age there are too many women shirking this responsibility, and the future happiness of both the husband and wife may, in no small degree, depend upon the advent of a babe into the household.

The results of artificial impregnation have not been sufficiently satisfactory to warrant a description of its technique. It is to me a most revolting procedure; and it is a serious question whether or not, in the alleged successful instances where it has been practiced, impregnation was not due to dilatation incident to the introduction of the syringe into the cervical canal rather than to the transmission of semen through

the syringe. At any rate, the percentage of successes following this procedure is so low that doubt is raised as to whether, in the instances in which pregnancy has resulted, conception would not have occurred without it.

Dyspareunia.

This term, reintroduced by the older Barnes, is applied to that condition in which sexual intercourse is, in the female, attended with pain. It is a symptom of many of the affections enumerated as causes of sterility and of the various local diseases of the external and internal genital organs which are elsewhere dealt with.

Pain during sexual intercourse is not uncommon in women. When it exists to any marked degree its importance cannot be overestimated, for the consequences are sometimes most disastrous. If the attempt be persisted in, the resulting distress will undermine the patient's health and may give rise to serious mental or nervous disease; if, on the other hand, no further effort be made to consummate the act, marital infelicity may ensue. The subject is always a delicate one, and many times suffering is endured for years before the physician is consulted. I have more than once found dyspareunia at the bottom of some seemingly obscure nervous affection, the cause not being disclosed to me until after the patient had been under treatment for some time. Women of nervous organization are often completely upset by even a slight degree of pain during the sexual act. When it is at all marked, the sexual orgasm is not experienced, and, under all circumstances, ungratified sexual excitement is injurious.

When a gross lesion exists, there will be little difficulty in finding the cause of the dyspareunia. Often, however, the seat of the mischief is obscure, and to locate it requires no little tact.

The trouble may be purely mental. Too often the girl is permitted to assume marital responsibilities while perfectly ignorant of them. She is not only surprised but shocked on discovering the rôle she is to play. If the husband is likewise ignorant, or if his ideas of the sexual relations have been obtained from impure sources, the first attempts at intercourse, because of awkwardness or lack of gentleness, are exceedingly painful to the woman. Subsequent efforts are made with fear and dread, and in due time a peculiar nervous state is engendered in which even the thought of intercourse will result in spasm of the muscles of the pelvic floor. (*v.* Vaginismus). The time is fast approaching when all educated mothers will realize that their full duty will not have been

done until their grown-up daughters have received from them some knowledge bearing upon sexual hygiene and the sexual relations.

Stenosis of the vagina, imperforate hymen, the various inflammatory diseases of the vulva, vagina, and the pelvic organs, uterine and ovarian displacements—any or all of these several affections may not only give rise to pain during sexual intercourse, but may make the act impossible. Occasionally the frenum is sufficiently developed to catch the male organ, thus making intercourse painful to both parties (Hadra).

Fissures and abrasions at the vulvar outlet, so insignificant at times as to make them difficult to detect, may be responsible for the pain. These lesions often follow a successful attempt at intercourse. By exposing the parts to a good light slight rents or abrasions of the mucous membrane may be seen. If not extensive, they can ordinarily be healed by the patient living for a time *absque marito* and applying to the parts lint soaked in calendula and smeared with iodoform; or by sprinkling the diseased surface with iodoform and then painting it over with oleaginous collodion. The collodion acts as a protective and is most useful. In the case of fissure, if this treatment fails, an incision should be made through it, as in dealing with fissure of the rectum.

A prolapsed ovary is nearly always tender, and when the penis comes in contact with it the distress is usually very great. An examination, per rectum or vaginam, will determine the cause of the dyspareunia. But a prolapsed ovary may give rise to pain and spasm at the ostium vaginæ in a purely reflex way; it is important to bear this fact in mind in looking for the cause of vaginismus when no visible lesion is found to explain the hyperesthesia of the vaginal outlet.

Neuromata and carunculæ, located at the hymeneal base or the urethral orifice, are often exquisitely sensitive (*v.* Chapter XXXIII). In size they vary from a pin-head to a hazel-nut. The smaller ones may be difficult to detect. In order to cure these growths thorough eradication is necessary.

The cause is occasionally located some distance from the vagina and genital tract. Rectal lesions, fissures, hemorrhoids, etc., may give rise to dyspareunia. Coccygodynia is another cause which will remain undetermined if the examination is confined to the genital organs.

When a woman presents herself suffering from this distressing symptom, every effort should be made to determine and remove the lesion responsible for the difficulty. Intercourse should be forbidden while the patient is undergoing treatment, and it is usually wise to separate her temporarily from her husband. A little judicious advice given to the husband will often result in much good.

CHAPTER XXII.

DISEASES OF THE EXTERNAL ORGANS OF GENERATION.

General Considerations.—The importance of certain diseases affecting the external organs of generation is greater than is imagined. I refer especially to that class of affections which, though exceedingly distressing and painful, give rise to but little deformity. Of course those diseases which result in deformity, like cancer, tumors, elephantiasis, etc., compel attention. The lesser affections, on the other hand, frequently give rise to the most excruciating suffering, and because the patient cannot detect the actual evidences of disease, or perhaps because of the consciousness that an ocular inspection on the part of the physician will be necessary, she suffers indefinitely before seeking medical aid. It is impossible to exaggerate the evil consequences of a long-continued pruritus vulvæ, a frequent symptom of the various affections to be dealt with in this chapter, especially in girls or women with highly wrought nervous systems. Sexual excitement results in many instances, and onanism in the female has, I believe, its usual origin in some pathological lesion of the vulva setting up irritation and itching. Then, too, there is a peculiar tendency to chronicity with many of these diseases. In spite of the most carefully selected internal remedy and the most energetic external applications, they often run a protracted course. This obstinacy is due to the long-continued duration of the symptoms before the physician is consulted, for, owing to the reasons already given, the average woman shrinks from the necessary examination, which is infinitely more embarrassing to her than is simple digital or specular exploration.

Unless there is a marked degree of deformity, or unless the patient is able accurately to locate the diseased area, the dorsal position is necessary for a satisfactory examination. By separating the labia with the fingers of the left hand, and by the aid of good side or reflected light, the disease, whatever its nature, can usually be detected. A more careful exploration is, however, sometimes required in order to discover minutely hyperesthetic points, and for this purpose a delicate silver probe, supplemented by a good magnifying glass, should be used.

Deformities of the Vulva.

Under this head are included *hypertrophy and atrophy of the labia majora and of the nymphæ*, and *hypertrophy and atrophy of the clitoris*. Deformities resulting from *injuries to the perineum* are treated of in the chapter devoted to that subject.

Hypertrophy of the Labia Majora and of the Nymphæ may result from hyperplasia following inflammation, from masturbation, elephantiasis, or syphilis. When limited to the labia majora it may be great enough to cause them to reach the anus, hanging in folds. The increase in size is rarely so great as this, though the slighter and more moderate degrees of hypertrophy are of frequent occurrence. *Hypertrophy of the nymphæ* is oftener observed, and not infrequently they hang below the labia majora. It is more prevalent among certain races, and is described by the older authors as the "Hottentot apron," because of its supposed greater frequency in that people. There is often a lack of symmetry of the two sides. (*v.* Fig. 95.)

Winckel records two cases, in one of which the nymphæ measured 4.6 inches and in the other 3.7 inches in length.* The same author maintains that nineteen per cent. of pregnant women have one of the nymphæ more developed than the other.†

Atrophy of the Labia Majora and of the Nymphæ may be either physiological or pathological. Senile atrophy of these organs takes place after the climacteric and, as old age approaches, concomitantly with similar changes of the internal organs. Imperfect development or congenital absence may characterize the external as well as the internal organs.

According to Hyrtl the *clitoris* is physiologically larger in the tropics than in colder countries. It is probable that the same causes giving rise to hypertrophy of the labia and nymphæ will give rise, if continued, to hypertrophy of the clitoris, though Winckel maintains that it does not occur as a result of masturbation. The size of the organ varies greatly within normal limits in different subjects—from a mere tubercle in the anterior commissure to an erectile, miniature penis. The degree of hypertrophy is also very variable when it occurs. Fre-

* "Diseases of Women," p. 31.

† "Hypertrophied nymphæ may cause great inconvenience; it is, therefore, interesting to note that H. Carrard has very recently been able to show that the cause is an increase of their nerve-fibers in the form of Meissner's tactile bodies, also in the form of club-shaped terminations and peculiar tactile bodies having an aggregation of adenoid tissue."—*Winckel*.

quently the enlargement is congenital, though assuming new proportions at and following puberty. Tait has recorded a case in which the clitoris was as large as an infantile penis.* Parent-Duchatelet found in examining six thousand prostitutes, three cases of hypertrophy in which the clitoris was the size of the ordinary male organ. (Fig. 94.)

FIG 94.

HYPERTROPHY OF CLITORIS.

A lobulated tumor was formed, apparently by enlargement of the prepuce of the clitoris. (*Museum R. C. S. Photographed by the Author.*)

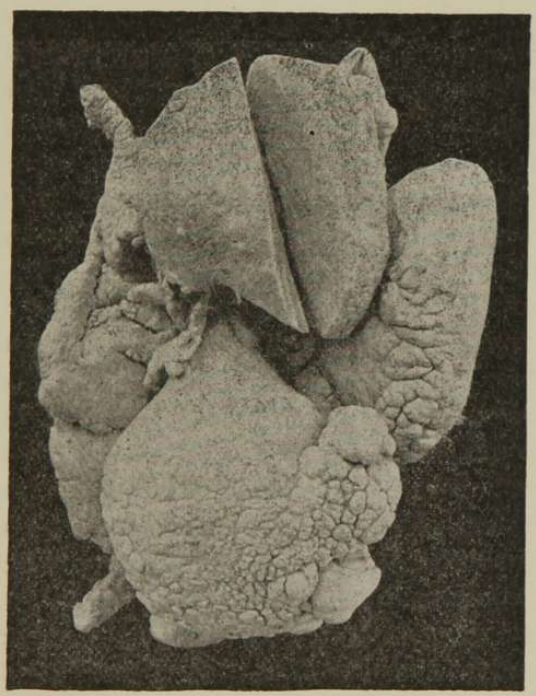
Atrophy of the Clitoris, other than senile, results oftener from adhesions of the organ than from any other cause. I am fully satisfied that this is a condition calling for the most careful attention. By referring to Fig. 1, the location of the clitoris and the manner in which the nymphæ form a prepuce will be seen. This prepuce may become adherent, attaching itself to, and binding down the entire clitoris, exactly as the foreskin in the male becomes adherent to the glans penis in phimosis. That the results are equally pernicious I am fully convinced. The peripheral nervous apparatus of the female sexual organs reaches its highest development in the clitoris, and, consequently, the sexual erethism is inaugurated, in at least the majority of instances, by normal or abnormal excitation of this region. I say in the majority of instances, because the chief center of sexual erethism occasionally resides in other portions of the genital tract—the uterus, vagina, and, probably, the ovaries. Where adhesions exist the clitoris becomes almost obliterated by the overlapping prepuce, which forms the apex of the vestibule. Sometimes the head of the glans will slightly project, and underneath the superficial adhesions a small quantity of hardened secretion is seen. This condition is in the larger per cent. of cases congenital, and when the nervous system in young girls is unnaturally perturbed, with evident irritation of the external genitalia, it is my practice to examine carefully for an adherent clitoris.

That this condition may become in later life a source either of irrita-

* "Diseases of Women and Abdominal Surgery."

tion or want of feeling, there can be no doubt. The accumulated secretions excite an itching which not infrequently ends in onanism; or in due time the unnatural condition of the parts results in permanent atrophy with diminished or entire loss of sensation, which, in many instances, makes complete sexual orgasm impossible. In either event the remote effects upon the mind, and the nervous system in general, are most pernicious. It is always well, therefore, in performing any operation upon the female genital organs, to examine the clitoris, and, if necessary, liberate the adhesions before the patient is removed from the table.

FIG. 95.



HYPERTROPHY OF EXTERNAL ORGANS OF GENERATION.

The two lateral portions are probably the labia, each of which is six inches in length and two or three inches in width. (*Museum R. C. S. Photographed by the Author.*)

The *treatment* of the various conditions resulting in deformity of the vulva is both medicinal and surgical. Palliative applications, when chafing or itching is prominent, are most soothing and useful. Frequent bathing, followed by washes of calendula, lead-water, carbolic or boracic acid solutions, will often bring to the patient temporary relief.

Any one of the several applications and remedies recommended for *pruritus vulvæ* may be used when the itching is troublesome.

Hypertrophy of the labia majora and nymphæ rarely call for surgical interference, though, if large enough to interfere with coition or locomotion, the knife may be indicated. The same statement holds good as regards hypertrophy of the clitoris. Clitoridectomy, recommended by Baker Brown in 1866, is no longer a justifiable operation for the relief simply of nymphomania or masturbation.* When the organ becomes sufficiently hypertrophied to cause serious deformity it should then be removed, for purely mechanical reasons. Experience has demonstrated that it is hardly possible to break up vicious habits by clitoridectomy, even though the most radical measures are practiced for the purpose of destroying every vestige of the organ. When the operation is done for excessive hypertrophy it is best done by the galvanocautery loop, or the Paquelin. Hemorrhage is in most instances controlled by these methods, but if the parts seem unduly vascular deep transfixion pins and the elastic ligature may be used, after which the knife instead of the cautery can be safely applied. If the cautery is not used deep sutures should be inserted and tied before the pins and ligature are removed.

The detachment of an adherent clitoris is easily accomplished, though, owing to the exquisite sensitiveness of the parts, an anesthetic is usually necessary. I have several times, in adults, done the operation after applying a 20 per cent. solution of cocaine, but even then a good deal of suffering is caused. The new local anesthetic, ethyl chlorid, is even more satisfactory than cocaine. With children a general anesthetic should always be used. With the patient in the dorsal posture, the labia are separated by an assistant or with the unengaged hand. The clitoris is then carefully dissected by the application of a blunt instrument (the point of an ordinary director), care being taken not to lacerate the organ. After it is thoroughly liberated, the parts should be washed in a weak solution of bichlorid, smeared with sterilized vaseline, and protected with iodoform gauze. Subsequent dressings twice a day should be made,

* "This is a dark page in the history of our progress, and the operation (clitoridectomy) has not yet been abandoned. A short time ago I examined a young girl whose clitoris had been partially removed, and the cicatrix afterward cauterized, because the irritation had returned. What was the result? The irritation is more severe than ever, and manifests itself even when the patient looks at naked figures in galleries, etc. West has protested against the operation for masturbation, and at this time the majority of gynecologists are firmly convinced that it is quite useless in epilepsy, hysteria, or masturbation."—*Winckel.*

the parts being separated with gauze in such a way as to prevent their readherence.

Eruptions.

The most frequent forms of eruptions occurring about the vulva are *eczema*, *lichen*, *acne*, and *furuncles*.

The pathology of **Eczema** does not differ materially from eczema attacking other parts of the body. Loss of hair, with thickening of the skin and mucous membrane, results in due time. The disease usually begins on the outer surface of the labia majora, involving sooner or later the vulvar mucous membrane and the skin of the thighs and abdomen. Pruritus is the chief symptom, and is often most distressing. The connection of eczema vulvæ with diabetes mellitus is of such frequent occurrence as to call for a careful examination of the urine, especially in elderly women, in all instances where the eruption does not yield to ordinary treatment. The irritating character of the urine is not the sole factor in exciting the eruption, for eczema in other parts of the body is a well known complication of diabetes.

The constitutional and local *treatment* of this form of eruption does not differ from that of eczema in other parts of the body. It is, of course, essentially constitutional if diabetes is at the bottom of the difficulty. Chronic eczema is always an obstinate disease, and exacerbations are of frequent occurrence. Cleanliness is a *sine quâ non*, and yet the parts must be washed with the utmost gentleness, the soap used being of the blandest kind. Medicinal applications will do but little good until the superficial crust is softened and removed. As a preparatory measure, therefore, and for the purpose of softening the tissues, a flaxseed poultice is most useful and soothing.

The number of applications recommended for eczema is legion, and I will give but few, referring the reader to special works for a more extended list. Applications of lime-water will often control the intense itching. Of the ointments the various preparations of zinc stand at the head. Thornburn* recommends the following:—

℞. Zinci oleat., ... ℥j;
Ad vaselin. alb. . . . . ℥ij.

Dilute hydrocyanic acid . . . . . (*m*v-x ad ℥j).
Chloral . . . . . (℥ss-℥j to ℥j of glycerinæ).
The glycerole of acetate of lead . . . . . (grs. x-xx to ℥j).
The unguentum acid chrysophanic . . . . . (℥ss to ℥j).

The itching may be so intense as to call for the more powerful ap-

* "A Practical Treatise on the Diseases of Women," p. 39.

plications (nitrate of silver, ʒj ad ℥j; strong carbolic acid; caustic potash, ʒss ad ℥j; or even the solid nitrate of silver). In eczema with marked nervousness the following formula will be found useful:—

℞. Ammon. sulpho-ichthyol . . . . . ʒii.
Aq. rosæ.
Glycerinæ . . . . . āā fʒss—*M.*
S.—Apply locally.

As in all forms of skin disease, the internal remedy should be selected with much care. If a cure can be accomplished without the aid of external measures, other than those used for the purpose of cleanliness, so much the better. I am compelled to confess, however, that in my own practice eczema vulvæ has given me much trouble, and in the chronic form I have been unable to dispense with outward medicaments.

Lichen is usually confined to the pubes. The papules vary greatly as regards numbers, and present characteristic thickened and slightly indurated bases. The *treatment* consists of the indicated internal remedy and the application of some powder (starch and boric acid), for the purpose of keeping the cutaneous surface perfectly dry.

Furuncles sometimes occur in troublesome succession on or about the vulva. They may possess at their onset all the characteristics of simple acne, becoming inflammatory in due time. When large enough to cause suffering they should be poulticed, and opened as soon as suppuration is evident.

Prurigo, Elephantiasis, Erythema, Syphilides, and **Erysipelas** are forms of eruptive disease attacking the vulva with greater or less frequency. Their clinical manifestations do not, however, differ essentially from those present when the several affections are located in other parts of the body.

Vulvitis.

Four types of vulvitis may attack the vulva—*simple*, *purulent*, *follicular*, and *gangrenous*.

Simple Vulvitis is the form most frequently met with, and occurs oftener in blondes than brunettes; for some reason the secretions of the former decompose more readily than the secretions of brunettes. The inflammation may result from irritating discharges, from pediculi, or from pruritus. The prominent subjective symptom is itching, and the act of scratching greatly intensifies the disease. Ocular inspection will reveal a red and more or less eroded surface, sometimes involving the anus and nates.

The *treatment* must be directed to the removal of the original causes. If due to irritating discharges from the uterus or vagina these should be looked after. A tampon saturated in a boroglycerid solution will catch the discharges and prevent their coming in contact with the inflamed surfaces; this will not only give temporary relief, but will serve as a means of diagnosis. If it is not expedient to treat the primary cause—vaginitis, cervicitis, endometritis, etc.—the parts may be protected by smearing over them carbolized vaseline or sprinkling them with fuller's earth, or boric acid and starch (ʒj–ℨj). The urine should be examined for sugar. Pediculi are to be destroyed with ungt. hydrargyri, or by a bichlorid solution (grs. iij–ℨj). The solution of bichlorid is much cleaner than the ointment and is usually efficacious. After the cause is removed the symptoms of inflammation usually subside. Applications of hydrastis or calendula may be advantageously made, supplemented, if necessary, by such internal remedies as sulphur, cantharis, graphites, and sepia.

The causes of **Purulent Vulvitis** are: gonorrhea, immoderate coitus, onanism, traumatism, and uncleanliness. Simple vulvitis may become purulent if the cause continues operative long enough. The *symptoms* are characteristic of localized inflammation attacking muco-cutaneous surfaces—slight constitutional disturbance, with first dryness and redness of the parts, which soon become bathed with a purulent discharge. The discharge frequently excites excoriation and itching. The neighboring organs are often implicated—urethritis, vaginitis and cystitis becoming complications. It is said that the urethra is oftener involved in specific vulvitis than in non-specific. However this may be, the surest way of differentiating between the two forms of inflammation is by the aid of the microscope. It is probable that specific pus is the more infectious, but urethritis in the male may follow contact with the non-specific virus. Morgenstern reports (*Medical Record*, Feb., 1895) a case of acute gonorrheal vulvitis in an infant at birth. The mother had been treated for a long time for a similar discharge. Large numbers of gonococci were found in the discharge.

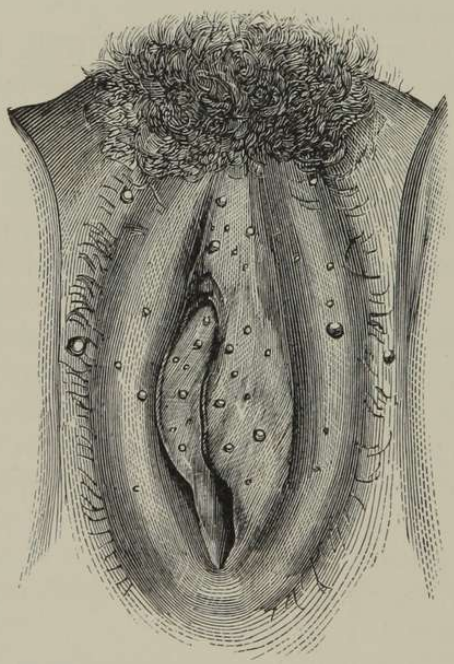
Treatment.—The recumbent posture, cleanliness, frequent ablutions and warm fomentations are all important. I know of nothing more soothing than a stream of warm water thrown against the parts by the aid of an irrigator. Calendula (1–10) is a most useful application. A dossil of lint saturated in a calendula solution should separate the opposing surfaces of the labia after the parts have been thoroughly cleaned. Other sedative lotions and applications are: Glycer. boracis ℨij, liq. morphiæ acet. ℨj, aq. rosæ ℨv (Edis); Camphor ℨss., spir. vin. rect.

q. s., bismuthi carbonat. ℥ss., pulv. amyli ℥ij (Edis); Liq. plumbi. subacet. ℥j, tinct. opii ℥j, aq. Oj. After the subsidence of the acute symptoms arsenicum and mercurius cor. are the remedies oftener indicated.

In **Follicular Vulvitis** the mucous and sebaceous glands are involved, either separately or conjointly, to such an extent as to warrant the designation given. The causes are the same as in the purulent form, except that it occurs often as a complication of early pregnancy. The subjective symptoms, too, are much the same as those of purulent vulvitis, though the pruritus is usually of greater intensity.

The *physical signs* depend upon the glands chiefly involved. If the sebaceous, the surface of the labia, extending as far as their junction anteriorly, will be studded with small rounded papillæ; if the mucous, small, red, elevated spots are seen upon the mucous membrane of the

FIG. 96.



FOLLICULAR VULVITIS. (*Thomas.*)

vulva, which are very vascular and exceedingly tender. The secretion is of an offensive odor and may be great enough to conceal the prominent follicles. (Fig. 96.)

Follicular vulvitis runs an exceedingly obstinate course, and the prognosis should be guarded. If it occurs as a complication of pregnancy it may continue throughout the entire period. Abortions have

resulted from the intensity of the pruritus. Vaginismus sometimes occurs in the non-pregnant, because of its protracted course. The virus is even more virulent than that of purulent vulvitis.

The *treatment* does not differ essentially from that given in uncomplicated purulent inflammation, except that it may have to be more energetic. When the follicles are distended with pus they should be freely opened and their bases destroyed and washed with a weak bichlorid solution. This is to be followed by a moist carbolized dressing (two per cent.) as recommended by Thomas. When the course run is more chronic the inflamed points may be treated with a nitrate of silver stick, or impure carbolic acid.

Gangrenous Vulvitis is of rare occurrence in adults, except as an epidemic affection in connection with some types of puerperal fever. It has been met with as a complication of the zymotic diseases in cachectic children. In either case it is an indication of great depreciation of the vital forces and is often fatal.

The gangrenous invasion begins as a grayish, reddish or blackish vesicle, or patch, which ends in ulceration, induration and mortification. (Velpeau.)

The *treatment* consists of general sustaining measures, and local ones calculated to destroy the diseased area. The first implies the judicious use of stimulants and the most nourishing and concentrated food; the second, the destruction of the gangrenous area by the actual cautery or nitric acid. Disinfecting poultices, both before and after the application of the cautery or caustic, are to be used. The internal remedy should be directed toward the constitutional affection.

Therapeutics of Vulvitis.

Aconite.—Vulva dry, hot and sensitive; painful urging to urinate; urine scanty and scalding hot; more or less vascular excitement with restlessness.

Belladonna.—*Sensitiveness of vulva;* burning pressure with weight and throbbing pain in the uterine region; *sensation of bearing down.*

Graphites.—Thin white leucorrhea, which is very profuse; menses too late, or scanty and painful; ITCHING OF PUDENDA BEFORE MENSTRUATION; swelling of the labia; papules on pudenda, which give rise to much itching.

Sepia.—*Soreness of labia, perineum, and between thighs, with redness;* sticking in pudenda; vulva feels enlarged; leucorrhea after micturition, with itching in vagina; discharge of blood after coition.

Cantharis.—*Swelling and irritation of vulva, with violent itching;* pruritus, with strong sexual desire; *painful urination.*

Calcaria carb.—Inflammation and redness and soreness of the vulva with purulent discharge; much discharge between the labia and thighs with biting pains; cold damp feet.

Mercurius.—Sensation of rawness; itching of the labia, worse at night; perspiration affords no relief; salivation; soreness of the gums, teeth, etc.

Thuja.—Soreness of both labia; all the itching, burning and pains are excited and aggravated either during or after a walk, or from touching the parts.

Rhus tox.—Inflammation of the external genitals, with itching, burning and great restlessness; relief from change of posture.

Consult:—**Arsenicum**, merc. cor., **sulphur**, apis, hamamelis, **hydrastis, lycopodium**, platina, **rhus tox.**, bromin and silicea.

Phlegmonous Inflammation of the Labia Majora.

The labia majora are composed largely of adipose and areolar tissue, which is liable to become inflamed. The various forms of vulvitis may involve the deeper structures and end in phlegmonous inflammation. It is oftener, however, due to direct injury.

The *symptoms* follow, as in inflammation of similar structures elsewhere, in pathological succession. There is first congestion, succeeded by hardness and tension from effusion of liquor sanguinis. The effusion may be absorbed, or suppuration may ensue. The pus is usually very offensive.

Diagnosis.—The disease commences with symptoms of heat in the affected area, followed by pruritus and exaggerated glandular secretion, which is often both offensive and irritating. Pain of a throbbing or aching character soon supervenes, which is aggravated by walking or the upright posture. Suppuration is preceded by an indistinct chill. After the tumor forms care must be taken not to confound it with pudendal hematocele, labial hernia, displaced ovary, or distention of the Bartholinian glands.

Treatment.—An effort should be made to abort suppuration at the onset by perfect rest, cold applications, and the administration of the indicated remedy (bell., hepar s., mercurius, apis). If suppuration is inevitable it should be hastened by hot applications, and as soon as pus has formed the parts should be freely incised. The peculiar character of the tissue involved usually makes surgical interference necessary, for the abscess will become very large before spontaneous discharge

occurs, and may even reach the abdominal ring through the dartoid sac.

Inflammation and Abscess of the Vulvo-Vaginal Glands.

Any of the forms of inflammation of the external genitalia already studied may extend to these glands or their ducts. *Gonorrheal Vulvitis* is, however, the most frequent cause.

The duct is usually obliterated by the inflammatory process, when the gland becomes distended. If suppuration ensues it gives rise to more or less febrile disturbance. There is a beating, throbbing pain in the parts, which become very sensitive to contact or touch of any kind. Should suppuration not ensue there is formed a painless tumor or cyst varying in size from a pigeon's to a hen's egg, which may remain dormant for an indefinite period. I have removed these sacs after they had existed for fifteen years. A non-purulent cyst is, however, liable to suppurate at any time.

The swelling is located at the posterior portion of the labium majus at its outer border, impinging upon the opposite side and partially occluding the vaginal orifice. When both sides are involved, which is the exception, the introduction of the finger into the vagina may be difficult. When suppuration follows the inflammation the pus may partly escape through the duct, the abscess refilling and discharging indefinitely.

I am not aware that any of the authorities mention that cysts of the Bartholinian glands may excite reflex phenomena. In a case coming under my observation the patient had long been a victim of severe attacks of migraine, for the relief of which she was compelled to resort to morphine and had almost contracted the opium habit. Both glands were enormously distended, and their complete removal required quite an extensive and bloody dissection. The incisions were closed by a continuous suture, except at their lower border, and the oozing was controlled by packing with iodoform gauze. It required some time for the cavities to close by granulation, but from the day of the operation to the present time (six months) there has been no return of the sick-headaches. As an isolated instance of the kind it is interesting, though final conclusions should not be drawn from a single case. We know so little of the actual *modus operandi* of reflexes that we are at least warranted in recording isolated cases when marked results follow the removal of a possible cause.

Treatment.—The same principles governing the treatment of phlegmonous inflammation apply to this condition during the period of

active inflammation. After an abscess has formed a simple incision is hardly sufficient, for measures must be taken to destroy thoroughly the secreting surface of the gland. This can be done by packing the cavity with lint soaked in the tincture of iodin, but a more radical and satisfactory method is complete dissection of the sac. In non-purulent cysts this is my invariable practice, and I have several times performed the operation by the aid of cocaine anesthesia. From five to fifteen minims of a four per cent. solution should be injected under the skin in the line of the incision, which should be parallel to the long axis of the labium. By inserting the point of the hypodermic needle midway between the two extremities of the contemplated incision it can be pushed upward and downward in the superficial areolar tissue, while the fluid is being gradually ejected in such a way as to make but one puncture necessary. After waiting five minutes, an incision is made which exposes nearly the entire length of the sac, and which makes its removal possible without rupture. More cocaine can be applied as the operation progresses if it becomes necessary. Arteries requiring it should be tied with fine catgut. The remaining cavity should be closed from the bottom by superimposed layers of catgut, the last approximating the skin. The dressings should be changed at least once a day.

In distention from closure of the duct any attempt to restore the patulousness of the latter is utterly useless, as is also any attempt to cure the cyst by simple incision. The secreting surface of the gland must be destroyed, or it will rapidly refill, and while this may be done by destructive agents applied to its interior, the complete dissection is, in my experience, a much more satisfactory and surgical-like procedure.

Therapeutics of Phlegmonous Inflammation of the Labia Majora and Abscess of the Vulvo-Vaginal Glands.

Belladonna.—Burning pressure, with *weight and throbbing pain* in the inflamed parts; *bearing-down sensation.*

Apis mel.—Deep, penetrating pain in clitoris, extending into vagina, with swelling, dryness, and hardness of labia minora, which is relieved by the application of cold water; *pain in vulva, associated with stinging, burning pain in ovarian region;* ERYSIPELATOUS INFLAMMATION, WITH MUCH EDEMA.

Hepar sulph.—Abscesses of the labia, which are very sensitive, with splinter-like pains and extremely offensive leucorrhea of carrion-like odor; useful either for preventing or promoting suppuration.

Mercurius sol.—*Leucorrhea always worse at night;* inflammation of

labia, with smarting, corroding, and itching; *vulvitis, especially of gonorrheal or syphilitic origin, with rawness and excoriation of the parts.*

Silicea.—Profuse, acrid, corrosive leucorrhea; burning in pudenda, with eruption on inner side of thigh; *pudendal abscess, which does not readily heal, with thin discharge.*

Consult:—**Sulphur,** rhus tox., **pulsatilla,** kreosotum, **lachesis, borax, iodium.**

Pudendal Hemorrhage.

Traumatic causes, such as kicks, falls, incisions, etc., may rupture both the skin and the bulb of the vestibule, thus permitting alarming and even fatal hemorrhage to take place externally. The accident is not a frequent one, and the treatment will depend upon the extent of the injury and the amount of hemorrhage. If the quantity of blood escaping is not great, cold applications, with pressure, may be all that is necessary. If this fails, astringents, such as the saturated solution of alum, powdered tannin, or the persulphate of iron, should be applied. If it is not affected by these agents, the vagina should be plugged and the parts firmly compressed by the aid of a T bandage; or the wound enlarged and the bleeding surface packed with styptic cotton. No fatal hemorrhage should occur from a wound of the kind if proper surgical measures are attainable.

Pudendal Hematocele.

By this term is meant a hematic tumor formed by the rupture of the bulb of the vestibule, with an effusion of blood into the surrounding tissues. It is met with much oftener in obstetric than in gynecological practice, yet in the non-puerperal the same causes which sometimes give rise to pudendal hemorrhage by lacerating the skin may rupture the bulb alone. The largest pudendal hematocele I have ever seen was the result of falling astride a wagon wheel, the patient being very large and fleshy.

Symptoms.—The tumor varies in size from that of a walnut to a fetal head. It is sudden in origin, though its full size may be attained gradually. When it occurs as a complication of labor it is more apt to take place during or immediately after the expulsion of the child. At first the patient complains of nothing more than a sense of discomfort, but as the tumor increases in size, pain and throbbing become prominent. Micturition may be difficult or impossible because of the pressure. Touch will reveal a tumor which, if very large, may obstruct the vaginal

orifice. In the larger effusions the parts sooner or later become deeply discolored.

The *course and termination* are variable, depending upon the size of the tumor and, in no small degree, upon the treatment resorted to. If the effusion is small, it usually becomes entirely absorbed, or may remain almost indefinitely in the tissues as an encysted mass. Suppuration is particularly liable to follow parturition, in which event there is always great danger, because of the exaggerated size of the veins and lymphatics at this time, of septic infection. Secondary hemorrhage may ensue from rupture of the sac.

In the *treatment* of pudendal hematocele an attempt should be made: (1) to limit the effusion by rest, cold applications, and the use of hamamelis, both externally and internally; (2) to promote suppuration, if inevitable, by hot fomentations, poultices, etc., and the administration of hepar sulphur internally. The abscess should be opened as soon as the evidences of pus present themselves, and the cavity washed with a 1–5000 bichlorid solution.

Occasionally a large tumor manifests no tendency either to disappear or to suppurate, and operative interference becomes imperative to relieve the patient of its presence. This consists of a longitudinal incision sufficiently long to enable the operator to turn out the clot. Hemorrhage is to be controlled by pressure, if possible; if this fails, by packing the cavity, after thoroughly washing it out with a 1–5000 bichlorid solution, with strips of gauze saturated in liq. ferri perchlor. For reasons already given, the dressings should be changed at least once every twenty-four hours in non-puerperal, and even oftener than this in puerperal cases.

Pudendal Hernia.

In order to understand how any of the abdominal viscera can find their way into the pudenda it is necessary to revert to the anatomy of these parts (Fig 3). The pudendal sacs, formed by the deep layer of superficial fascia and the outer layer of triangular ligament, receive at their neck the terminal fibers of the round ligaments of the uterus. The round ligaments are the analogues of the spermatic cord in the male and the labia majora correspond to the scrotum. Since the ligaments pass through the inguinal canals into the abdomen, it is entirely possible for a loop of intestine, a portion of the omentum, or even an ovary, to descend into the pudendal sac, thus constituting a hernia.

The *causes* are, as in the male, congenital weakness of the parts, blows, falls, violent muscular efforts, coughing, sneezing, etc.

The *symptoms* do not differ essentially from those of hernia in the male. There is greater danger, however, in women of mistaking pudendal hernia for other conditions calling for the use of the knife—hence the importance of careful exploration in all tumors about the vulva before any cutting operation is resorted to. *In all cases of obstinate vomiting in the female, with symptoms of intestinal obstruction, the pudendal, femoral, and inguinal regions should be carefully explored.*

When the contents of the sac consist of intestine, and no strangulation exists, the patient will complain of pain upon bending the body, which will direct her attention to the parts. An examination will reveal the characteristic symptoms of intestinal hernia—impulse upon coughing, resonance on percussion and absence of inflammatory signs or those of edema. As a final test taxis should be applied. If the sac contains omentum alone there is greater difficulty in making a diagnosis, especially if it is adherent. Fortunately, a mistake here would not be so serious, were a knife introduced, as in case of intestinal hernia; it is one, nevertheless, that ought not to occur. The *ovary* occasionally finds its way into the pudendal sac, either congenitally or otherwise. The tumor is very sensitive, especially at the menstrual period, and there is a peculiar sickening pain upon pressure.

The *treatment* of pudendal hernia does not differ from the treatment of scrotal hernia in the male. The hips should be elevated by having placed under them a cushion, or by raising the foot of the bed. Taxis should be exerted in an upward direction in such a way as to carry the contents toward the abdominal ring. After reduction a properly fitted truss should be worn, so that the pad will press upon the inguinal canal close to the point of exit.

If the hernia cannot be reduced by taxis, and strangulation has occurred, operative measures should be instituted at once. The technique of the operation is described in all text-books on surgery, and requires no description at this time.

Hydrocele.

Hydrocele is an exceedingly rare affection in the female. The canal of Nuck is ordinarily obliterated in the adult female, which accounts for the rarity of both hernia and hydrocele in women.

Excessive secretion of this serous membrane, which is a prolongation of the peritoneum, constitutes hydrocele. The accumulation may be either sacculated or free, depending upon the perviousness of the abdominal opening. If the latter is open the fluid can be forced into the abdominal cavity, as in hydrocele of the male.

The *symptoms* of hydrocele are sometimes very obscure, and careful differentiation is important. The *diagnosis* must be reached by exclusion. The tumor develops gradually with entire absence of pain or constitutional disturbance. Inflammatory symptoms are likewise absent, and the ordinary signs of hernia—resonance, cough impulse, etc.—are wanting. There may be translucency, but this is an exceedingly rare symptom. The cyst should be pressed down and its upper border defined, when the continuation upward will be found too small for a hernia (Lloyd G. Smith). In all cases of uncertainty a fine exploring needle may be used with comparatively little danger.

Treatment.—This is conducted upon the same principles observed in the treatment of hydrocele in the male. Simply drawing the fluid off through an aspirator may be all that is necessary. If this fails, the sac can be injected with a few drops of carbolic acid. If failure again results, the radical operation may be resorted to. This consists of exposing the cyst by a linear incision, ligation of the neck and enucleation. The wound is closed by superimposed layers of catgut. Apis should be given internally.*

Edema of the Labia Majora and Nymphæ.

This condition is always symptomatic, either of general anasarca or of pressure upon the large vessels within the pelvis, usually the result of pregnancy. The swelling pits upon pressure, is usually symmetrical, and is tense and shining. There is but little pain unless excoriation follows, and the only inconvenience results from interference with sitting or micturition.

The *treatment* must be directed to the constitutional or mechanical cause responsible for the mischief. The heart and liver should be examined, and if the edema occurs as a complication of pregnancy, the urine should be carefully analyzed. If due to simple pressure, the horizontal posture should be assumed as much as possible. Apis in-

* Lammert (*Münchener Medicinische Wochenschrift, 1891*) believes that gestation and the puerperum are the most prominent predisposing causes of hydrocele in women. The round ligaments during this time partake of the physiological hypertrophy of the uterus, and inflammatory irritation of the canal of Nuck is easily excited by trauma or otherwise. He advises that small hydroceles be left unmolested. This author believes, as does Gottschalk (*Cent. f. Gyn., 1887*), that the effusion of serum is frequently the result of irritation caused by an escape of blood into the canal through rupture of a small vessel. Gottschalk cites a case of three years' duration which was mistaken for hernia and a truss worn during the entire time. Smital (*Cent. f. Gyn., 1891*) removed six ounces of fluid from a hydrocele coming under his observation.

ternally will do much good, and is the remedy oftener indicated. Should the distention be great enough to interfere with parturition, superficial punctures with a needle or scalpel may be made for the purpose of liberating the fluid.

Neoplasms of the Vulva.

Almost any form of neoplasm may occur in this region. The most common are those resulting from venereal infection—*condylomata lata and acuminata*—yet fibromata, myxomata, lipomata, enchondromata, neuromata, lupus, and the various forms of malignant growths are occasionally met with.

The *condylomata lata* are usually found on or about the perineum, in the region of the anus or on the inside of the labia majora. They result invariably from true syphilitic infection. The *condylomata acuminata*, on the other hand, are oftener due to gonorrheal infection, or to non-specific leucorrheal discharge.

Care must be taken to differentiate phagedenic chancroids of the vulva from epithelioma. Chancroids occur at all ages, grow rapidly, cicatrize, and often implicate the lower fourth of the vagina and the cervix. While the ulcer may be single at first it rapidly becomes multiple.

The *treatment* must be governed by the cause. If due to syphilis, an anti-syphilitic régime should be observed. In simple papillomata, thuja occidentalis, externally and internally, will usually accomplish a cure without resorting to surgical measures. They are, however, effectually destroyed by clipping them off with scissors and touching their bases with strong nitric acid, or pure phenol (Raulin). When the acids are used the neighboring parts should be protected with vaseline. The thermocautery is more applicable to the treatment of tumors possessing a large pedicle.

Fibromata, *myxomata*, and *lipomata* are of rare occurrence. Polaillon reports (*Annual of the Universal Medical Sciences*, 1892) an enormous fibro-myoma, the pedicle of which was formed by the hypertrophied round ligament, which was as large as the index finger. The rarity of these several formations makes a more extended description unnecessary. Their greatest clinical importance lies in the fact that they may be confounded with some one of the several conditions causing an increase in the size of the vulva. By carefully observing their clinical history this can usually be avoided.

Cavernous Tumors of the Vulva.

Eicholz* reports a case of cavernous tumor of the vulva over four inches long and two broad which involved the entire left labium majus. Another case is reported by Allen† in a child four months old. Allen's case was cured by electrolysis. Fordyce suggests the use of the thermo-cautery for the destruction of nævi appearing in this locality.

Of the *malignant growths* epithelioma is the most common. A most interesting case of epithelioma of the external genitalia is shown in Fig. 97, which came under my observation at my clinic during the college session of 1890–91.‡ There were no signs of the disease three months previously to the patient's entering the hospital, at which time

Fig. 97.

Epithelioma of the External Genitalia. (*Wood.*)

she was being treated for hemorrhoids. Her physician was so unfortunate as to spill the fluid with which he was injecting the tumors (probably carbolic acid), and it burned her severely. The accident was followed by inflammation and ulceration, which took on a malignant type. I removed the diseased area as completely as possible with a Paquelin, and with the loss of no blood. The groin was thoroughly emptied and the parts healed kindly, but in three months' time she returned with a hopeless invasion of the disease.

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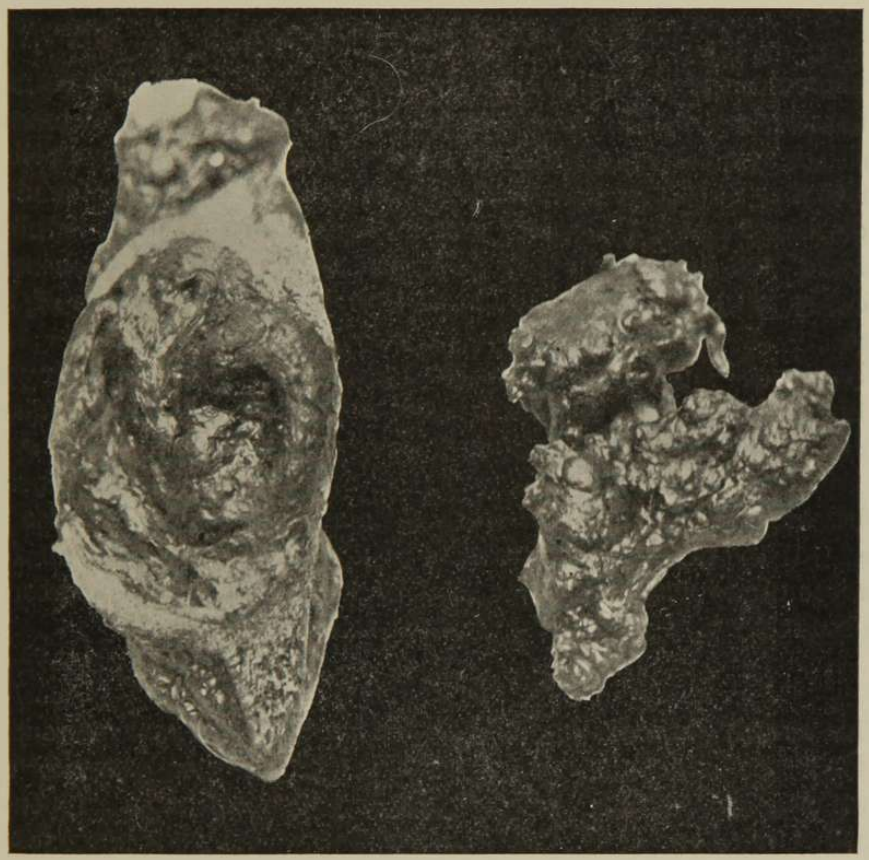
* *Der Frauenartzt*, Berlin, December, 1892.

† Journal of Cutaneous and Genito-Urinary Diseases, August, 1894.

‡ North American Journal of Homeopathy, October, 1891.

Fig. 98 shows another epithelioma of the vulva, together with the inguinal glands, which I removed from a woman of seventy-three, who weighed at least two hundred pounds. The disease returned within one year.

FIG. 98.



EPITHELIOMA OF THE EXTERNAL GENITALIA, (*Wood.*)

Dr. J. W. Taylor in the Birmingham *Medical Review*, cites a case of epithelioma of the vulva, which he thinks had its origin in an intractable chronic inflammation. I now have under observation an unmarried woman of twenty-eight, who suffered with uncontrollable pruritus for years. The irritation resulting from friction of the parts gave rise to great thickening and distortion of the labia majora, the nymphæ and the clitoris. The hypertrophy was reduced by a thorough application of the Paquelin, which gave almost complete relief for a year. At the end of that time an angry and painful ulcer appeared on the left labium, which rapidly extended. This was removed by a wide

dissection and proved to be epitheliomatous. The patient has remained well (three years) since the growth was removed. Cases are recorded by both Hirst (*Am. Journal of Obstetrics*, June, 1895,) and Ruprecht, which go to prove that epithelioma of the vulva at its beginning is not an entirely hopeless disease.

Tuberculosis of the Vulva.

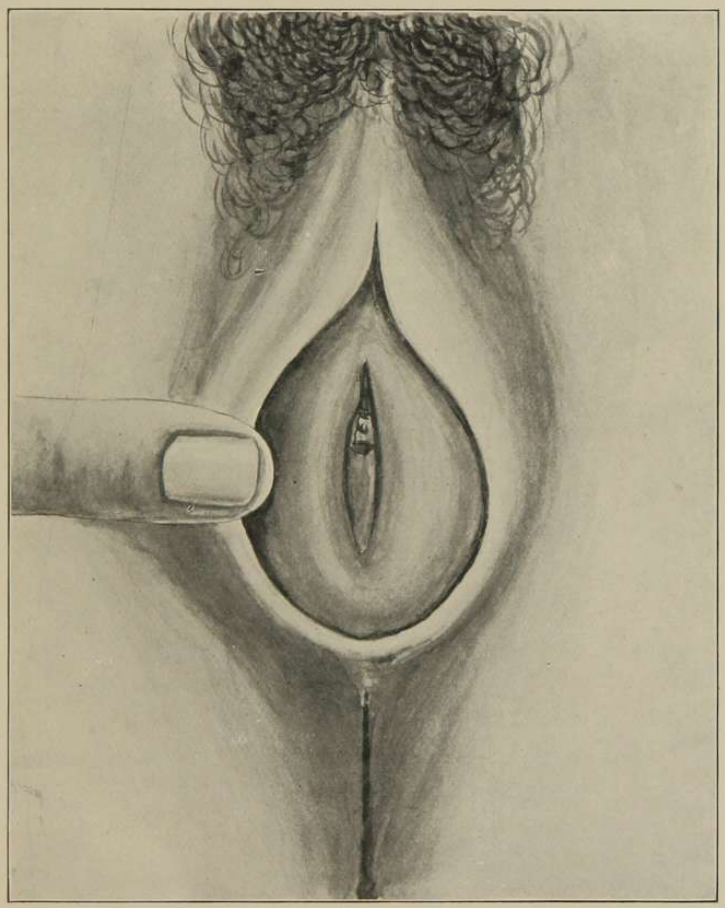
Tuberculosis of the vulva is rarely met with. When it does occur it is characterized by the formation of ulcers which have a depressed grayish-yellow bottom covered with a cheesy detritus. Opaque yellow nodules may be located around the ulcers; tubercle bacilli are found in the discharge and in the tissues forming the nodules. Rarely is tuberculosis of the vulva met with as a primary affection; it is usually secondary to tuberculosis of other parts of the genital tract or of the lungs.

Treatment.—This consists in the eradication of the disease, either with the knife or the cautery. In the latter stages, and if the tuberculosis is general, applications of iodin or iodoform may be made. The general treatment should be carefully looked after, a nutritious diet being of first importance; plenty of fresh air and sunshine should also be taken. If the patient is too weak to justify radical operative interference, the ulcers may be curetted and packed with aristol or iodoform. The internal remedy should be carefully selected.

Kraurosis Vulvæ.

This term is given to a peculiar atrophy of the mucous membrane of the inner side of the labia minora, which is more common at or after the menopause, but is occasionally met with in younger persons. Its onset is characterized by the appearance of small red spots which are exceedingly tender, tend to bleed and are either transitory or spreading. They are depressed below the level of the surrounding mucous membrane, and not infrequently they spread serpiginously, or they may disappear at one place to appear at another. As time goes on the mucous membrane contracts, which gives rise to more or less coarctation of the vestibule. This results in stenosis and dyspareunia, the contraction at times being so great that the finger cannot be introduced into the vagina. All traces of the labia minora may be destroyed, and it is this condition which led Tait to apply to the disease the term "progressive atrophy of the nymphæ." Sometimes there is a slight discharge. On inspection the mucous membrane has a dry, smooth appearance. The condition is well shown in Plate VIII.

PLATE VIII.



KRAUROSIS VULVÆ (*Reed.*)

The *etiology* is as yet uncertain. For a time it was supposed to be due to syphilis, but this theory has been disproved by Lewin and others. Olshausen believes that in a limited number of cases the atrophic

TABLE SHOWING THE DIFFERENTIAL DIAGNOSIS OF PUDENDAL ABSCESS, HEMATOCELE, HERNIA, HYDROCELE, CYSTS OF THE BARTHOLINIAN GLANDS, EDEMA OF THE LABIA MAJORA AND NYMPHÆ, AND NEOPLASMS OF THE VULVA.

NAME.	ONSET.	CAUSES.	SYMPTOMS.
Abscess.	Acute.	Inflammation, traumatism, gonorrhea, etc.	Pain, chilliness, fever, redness, swelling, etc.
Hematocele.	Sudden.	Parturition and traumatism.	Sudden appearance of tumor, at first painless; *discoloration;* resolution or secondary symptoms of suppuration.
Hernia.	Sudden or insidious.	May be congenital; lifting, straining, kicks, blows, etc.	Impulse on coughing; resonance; absence of inflammatory signs; effects of taxis; if sac contains ovary—great sensitiveness and symptoms all aggravated at menstrual period.
Hydrocele.	Gradual.	Same as hernia; effusion of blood into canal of Nuck. (*Lammert, Gottschalk.*)	Absence of signs of hernia; translucency; evacuation by exploring needle and collapse of tumor.
Cysts of the Bartholinian glands.	Gradual.	Any source of vulvar irritation.	Absence of inflammatory symptoms and signs of pus; absence of hernial signs; location of tumor (backward); exploring needle (the fluid is much more viscid than that of hydrocele).
Edema of labia majora and nymphæ.	Gradual.	*Systemic.*—Diseases of heart, liver, or kidneys. Pressure resulting from pregnancy or tumors.	*General.*—Symptoms of constitutional lesion and general anasarca; symmetry of swelling; shining surface, which pits upon pressure; *absence* of inflammation.
Neoplasms of the vulva.	Always gradual.	Often no definite cause traceable.	The only neoplasm liable to be confounded with the conditions included in this table is a small, non-malignant growth (fibroma). The diagnosis can usually be made by exclusion as well as by the physical character of the growth. It is hard, painless and unyielding. In all cases of doubt a fine aseptic exploring needle may be used with comparative impunity.

changes may be inaugurated by the extirpation of the uterine appendages.

A microscopical examination shows that the red spots are made up of dilated capillaries with thin walls and nerve fibers. The epithelium is of very irregular thickness and contains in places small rents or fissures. Sänger believes that the absence of itching may be accounted for by the rapid and serious involvement of the nerves, which become atrophied by pressure.

Treatment.—The palliative treatment consists in the application of medicaments for the relief of pain, such as phenol, a solution of neutral acetate of lead in glycerol, and the stick silver nitrate. It is said that cocaine aggravates the pain. The curative treatment is purely surgical. An ellipse of mucosa from either side of the introitus should be removed and the margins united by interrupted sutures (Reed).

The affected part may also be destroyed with the thermo- or galvanocautery.

CHAPTER XXIII.

DISEASES OF THE EXTERNAL ORGANS OF GENERATION (Concluded).

PRURITUS VULVÆ; HYPERESTHESIA OF THE VULVA.

Pruritus Vulvæ.—Itching of the vulva is a symptom, more or less prominent, of the various affections described in the preceding chapter. It rarely, if ever, occurs as an independent affection, yet its importance is such as to call for special attention.

Causes.—Sänger (*Centralbl. f. Gynäk.*, 1894), who prefers the term *vulvitis pruriginosa* to pruritus vulvæ, as better indicating the nature of the disease, classifies the causes as follows:

- I. Endogenetic Causes, ...
  - (1) *Hematogenetic.* (Icterus, chronic nephritis, diabetes mellitus, etc.)
  - (2) *Circulatory.* (Any disease or condition exciting congestion of the venæ pudendæ.)
  - (3) *Hematogenetic Skin Affection.* (Urticaria, herpes, erythema, eczema, etc.)
- II. Exogenetic Causes, . .
  - (1) Secretory and Chemic, .
    - (*a*) Hyperidrosis, seborrhea, etc.
    - (*b*) Contact with irritating urine.
    - (*c*) Contact with pathological secretions from uterus, vagina, vulva, rectum, etc.
  - (2) Parasitic, . .
    - (*a*) Animal parasites.
    - (*b*) Vegetable parasites.
  - (3) Mechanic, . Masturbation, excessive washing, scratching, etc.
  - (4) Thermal, . . Warmth of bed, etc.

To the foregoing, should be added the following predisposing causes:—

Pregnancy;
Sedentary habits;
Depreciated general health;
Neurotic diathesis.

These various causes require no extended consideration. Irritating

discharges excite pruritus oftener than does anything else. Those coming from the vagina and endometrium are the most irritating, especially when they are due to chronic inflammatory trouble. Those cases of endometritis occurring and continuing after the menopause give rise to a discharge which is especially troublesome and obstinate. It must be borne in mind that a very slight discharge may be responsible for the pruritus, and this may proceed from the urethra, Skene's glands, or even from the vulvo-vaginal glands (Mann). The scantiness of the discharge may make it exceedingly difficult to discover its true source.

Attention has already been called to the importance of diabetes as a causative factor in vulvitis. The irritating character of diabetic urine is well known; consequently in pruritus vulvæ the urine should always be examined for sugar.

Of the various forms of vulvitis the *follicular*—possibly because it occurs oftener in connection with pregnancy—is attended with the severest type of pruritus. All of the eruptive diseases give rise to more or less itching, as they do when occurring in any part of the body. The itching, as in all skin affections, is aggravated by heat and, especially, by the warmth of the bed.

The *parasites* sometimes responsible for this symptom may be of the animal (*pediculus pubis*, *acarus scabiei*, *oxyuris vermicularis*), or of the vegetable variety (*lepothrix vaginalis*, *oïdium albicans*, *gonococcus*, *smegma bacilli*, etc.). It is maintained that the former varieties, when they inhabit the intestinal canal, may act in a reflex way as well as by direct contact. The vegetable parasites are rarely met with in this locality.

Growth of short, bristly hair on the mucous face of the labia oftener results from some local disease, especially eczema, which modifies the nutrition of the parts.

Pruritus vulvæ occasionally occurs as a purely neurotic affection. That is to say, itching may be present in its most intense form without any discoverable causes or lesions. This form of pruritus oftener occurs in conjunction with pregnancy, and may extend down the thighs and over the entire surface of the abdomen. The extensive area involved cannot be due to direct inoculation through scratching, for in most instances there is an entire absence of secretion. It is essentially neurotic when manifesting itself in this form, and is much more apt to occur in women of neurotic temperament.

Pathology.—To whatever cause the pruritus may be due, there is exaggerated irritability of the nerves supplying the parts involved. This

change consists, according to Webster,* "of a slowly progressing *fibrosis* of microscopical proportions, especially of the nerve and nerve endings of the clitoris and labia minora." This writer maintains that many of the nerve-fibers are compressed or destroyed by the dense, fibrous character of these changes. In harmony with these views, he practices the thorough removal of the affected part in order to cure the disease.

Symptoms.—The intensity of the symptoms will depend upon the nature of the cause and the temperament of the patient. The itching is aggravated by exercise and especially by the warmth of the bed. In the severer forms the patient cannot refrain from scratching, which only intensifies the distress, irritating and lacerating the parts. Leucorrhea is so commonly associated with pruritus that it is many times difficult to determine whether it is the primary cause, or the result of the vulvitis excited by scratching the parts.

Treatment.—It is unnecessary to remind the reader that if any of the causes enumerated exist they must receive attention. If removable, very good; if not, measures must be taken to protect the parts from contact with them. It is often imperative, too, temporarily to palliate the existing suffering, and for this purpose some form of local application is indispensable.

The parts should be protected from irritating discharges by a medicated tampon placed in the vagina; or by applying to them some of the powders or unctuous substances recommended in the various forms of vulvitis. An effort should, of course, be made to cure the discharge by attacking the seat of the catarrh. Animal and vegetable parasites should be destroyed—the former, when occurring upon the pubes, by ungt. hydrargyri, or by a bichlorid wash (grs. iij–℥j). Ascarides must be attacked through the rectum. The vegetable parasites are best destroyed by a solution of borax (℥j–℥j). If short, bristly hairs are found upon the mucous surface of the labia these should be removed with fine pincers. The general management of cases due to depreciated general health and sedentary habits naturally suggests itself to the practitioner.

The *curative* treatment is both local and general. Local measures are absolutely imperative for the relief of the itching as well as for their curative effect. More than once patients with pruritus vulvæ have come to me from the hands of other physicians because local expedients had been denied them. It is true that in using local measures we cannot do so with any degree of precision. There are no specific indications

* Edinburgh Medical Journal, 1891.

for a given application in a given case, and in the larger proportion of instances the use of local applications is purely empirical. As a result, almost countless numbers of formulæ are given by various writers, and almost countless numbers are at times necessary before one can be found that will mitigate the terrible suffering sometimes present. When the pruritus occurs in its worst form there are few women who, if relief is not afforded, possess sufficient resolution to refrain from going from one physician to another. I therefore follow in the footsteps of my predecessors and give to the reader several formulæ to draw from. I have simply selected those which appeal to my judgment, or with which I have had personal experience. The properly selected internal remedy is all-important and should be sought for with care and discrimination.

Previously to the use of any local application the parts should be thoroughly washed with pure castile soap or juniper tar soap. The diet should be non-stimulating and the clothing not too warm. Any one of the following applications may then be made as frequently as the severity of the symptoms calls for:—

℞. Sodii boratis, ... ℥ij.
Morphiæ muriatis, ... grs. xx.
Acidi hydrocyanici, dil., ... f℥j.
Aquam rosæ, ad. . . . . f℥viij. M.
S.—Apply with soft sponge. (Goodell.)

℞. Hydrarg. bichloridi, ... gr. ii.
Tr. opii., ... f℥j.
Aquæ, ... f℥viij. M.
S.—For external use only. (Thomas and Mundé.)

℞. Acidi hydrocyan dil., ... f℥ij.
Plumbi diacetatis, ... f℈j.
Olei cacao, ... f℥ij. M.
S.—Apply after washing with cold water. (Thomas and Mundé.)

℞. Chloroformi, ... f℥j.
Olei amygdalæ expressi, ... f℥j. M.
S.—Apply to the itching parts.

℞. Acidi acetici, ... f℥j.
Glycerinæ, ... f℥iij. M.
S.—Apply locally. (Goodell.)

℞. Acid. tannici, ... ℥ij.
Extra. belladon., ... gr. x.
Butyr. cacao, ... ℥v. M.
Div. in suppositories No. xx.
S.—Insert one into the vagina night and morning. (May.)

℞. Chlorali,
Camphoræ, ... āā . . . ℥iv.
Rub these into an oil and then add
Unguenti simplicis, ... ℥j.
Pulv. acidi borici, ... ℥iv. M.
S.—Apply with a brush. (Goodell.)

℞ Morph. sulphatis, ... gr. vi.
Sodii borat., ... ℥iv.
Aq. camphoræ, ... f℥vi. M.
S.—Apply twice a day after washing parts with warm water and castile soap. (Baer.)

℞. Cocaini hydrochlor., ... gr. x.
Lanolini, ... ℥i. M.
S.—Apply a small quantity to the parts when the pain is great.

℞. Acid. carbol., ... gtt. v–x.
Adipis benzoin,
Ungt. petrol., ... āā . . . ℥i. M.
S.—Apply as an ointment.

℞. Menthol, ... gr. xv–xxx.
Lanolini, ... ℥i. M.
S.—Apply locally.

℞. Menthol, ... grs. xxiv.
Spt. vini rectif., ... f℥i. M.
S.—Use locally.

℞. Aluminii nitratis, ... gr. vj.
Aquæ destillatæ, ... f℥j. M.
S.—Apply with soft sponge. (Gill.)

℞. Potassii cyanidi, ... gr. j–iij.
Liquoris calcis, ... f℥iv.
Adipis, ... ℥iv. M.
S.—Apply locally. (Goodell.)

For vaginal injections the following are recommended by Professor Thorburn.* The figures attached to each indicate the quantity to be used per ounce:—

Acid carbolic, gr. x and upwards.
Liq. plumbi acetat., f℥ ss.
Acid boracic, ad. sat.
Acid hydrocyanici, dil., *m* x.
Sulpho-carbolate of zinc, gr. x.
Sulphurous acid, ℥ j.

* "A Practical Treatise on the Diseases of Women." London, 1885.

Dr. Skene* recommends the following:—

A powder composed of one grain of morphine to two grains of chalk, to be applied night and morning;

Equal parts of the tincture of opium, iodin, and aconite;

Iodoform in ether applied by means of an atomizer;

Carbolic acid and iodin, equal parts.

More Madden† claims to have derived marked results from a strong lotion of methylene blue.

Ludlam ‡ says: "If there is a vesicular eruption with a raw surface, or the burning in the urethra and the dysuria are very marked, water or glycerin or both may be medicated with the tincture of *cantharis* and applied to the vulva by means of compresses.

"The *urtica urens* is appropriate to the erythematous form, with a scarlet surface of the mucous membrane, and where there is complaint of burning and stinging as from nettles.

"In case of aphthous ulceration * * * common *borax* and *hydrastis* are in excellent repute as palliatives * * *."

Alexander Duke || recommends penciling the parts with menthol cones.

Von Campe § records the following case:—

"The patient, aged fifty-three, suffered for two and a half years from intense irritation of the vulva, perineum and groin. Various and numberless remedies had been tried in vain—the sensitive portion of the skin and mucous membrane having been excised. A cessation of all symptoms occurred in two days following the use of the constant current, the anode being applied to the vulva and the cathode to the various other parts affected."

I used the constant current with marked success in one case of pruritus vulvæ. The patient was of the neurotic type and the itching, of long duration, was very severe. The labia were more or less thickened as the result of scratching, and there was some uterine discharge caused by retroflexion. This entirely ceased after the organ was straightened by the Alexander operation, and I could then discover no cause to account for the irritation. In a fit of desperation, and before I had seen any recorded instance of the use of electricity for this condition, I resorted to galvanism. The dispersing negative

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* "Diseases of Women," p. 96,

† Prov. Med. Journal, 1894.

‡ *Op. cit.*.

|| Annual of the Universal Medical Sciences, 1892.

§ *Ibid.*

electrode was applied to the abdomen and the positive, by means of a metal electrode, to the parts affected. A current of five milliampères was as strong as the patient could tolerate. These applications were made every other day for two weeks, when the symptoms entirely disappeared. Four years have now elapsed and there has been no return of the disease.

In another patient the pruritus entirely disappeared while using the stronger current (50 milliampères) for the purpose of absorbing pelvic adhesions. Direct applications were made by means of an intra-vaginal electrode. There was much thickening of the nymphæ and labia, which subsided as the treatment progressed.

Where there is much distortion of the parts, the result of inflammatory infiltration, operative interference may be necessary. Sänger* advises in intractable cases partial or total excision of the vulva, and in elderly women removal of the glans clitoridis and prepuce, the wound being closed by a plastic operation if necessary. I have used with advantage, in one case, the Paquelin cautery. These radical measures should be resorted to only when the more conservative measures have been exhausted.

Therapeutics.

Sepia.—*Severe itching of the vulva with swelling and eruption of the inner labia;* painless vesicles in the outer part of the vulva; violent stitches sometimes extending as far as the umbilicus.

Graphites.—Itching and smarting of vulva; *painful soreness between the vulva and thighs, the parts being covered with pimples, vesicles and ulcers;* menses too late, too scanty, and too pale; *moist eruptions on various parts of the body.*

Rhus tox.—Eczema of the vulva with much burning and itching; relief from change of posture.

Cantharis.—Pruritus associated with frequent desire to urinate, with burning pain on passing a few drops, or complete strangury.

Mercurius.—*Greenish, offensive leucorrhea, always worse at night,* with smarting and burning after scratching; sensation of rawness; salivation, soreness of the gums, teeth, etc.

Lycopodium.—A great deal of itching of the parts after menses; much restlessness at night.

Kreosotum.—*Violent itching of the labia, also of the vagina;* external genitals are swollen and excoriated from contact with acrid discharge

* *Cent. f. Gynäk.*, No. 7, 1894.

from above; leucorrhea of a yellow color, staining linen yellow, with great weakness.

Sulphur.—Burning in the vagina; troublesome itching of the genitals with papillary eruptions about them; *flushes of heat, faint spells, etc.*

Conium.—Pruritus extending into vagina; violent itching in the vulva and vagina, especially after menses; leucorrhea with weakness and paralyzed sensation in small of back before the discharge.

Collinsonia.—Especially during pregnancy or when associated with *hemorrhoids, constipation, or other rectal troubles.*

Arsenicum.—Vesicular or dry, scaly eruptions with a gangrenous tendency; worse at night; *better from warmth and warm applications.*

Consult:—Ambra, caladium, **carbolic acid**, petroleum, nitric acid, **kali bromatum**, silicea and carbo veg.

Hyperesthesia of the Vulva.—This condition consists in an abnormal sensibility of the sensory nerves supplying some portion of the vulvar mucous membrane (Thomas). The affected area may be limited to the meatus urinarius, to one labium minus, or to the vestibule, or it may implicate the entire vulva. It possesses none of the characteristics of a true neuralgia, and seems to be due entirely to a hyperesthesia of the sensory nerves.

Frequency.—The profession is indebted to Thomas* for the first description of this disease. I have never yet seen a case, and Mundé, whose experience has certainly been exceptionally great, has never met with one. With the exception of Thomas, the authorities generally agree that the disease is not of frequent occurrence. I shall therefore, in this brief description, draw largely from the original article of Thomas.

Causes.—In many instances no cause whatever can be discovered. Occasionally it can be traced to irritable urethral caruncles and to chronic vulvitis. Hysteria and hypochondriasis act as predisposing factors, and Thomas has met with it oftener at or about the menopause.

Pathology.—The condition is characterized by a "plus state of excitability" in the sensory nerves. There is an absence of inflammation, an absence of pruritus, and a physical examination "reveals nothing except occasional spots of erythematous redness scattered here or there." The affection, in its uncomplicated form, is one of simple hyperesthesia of the diseased nerves, and is not unlike that condition of the rectum which Weir Mitchell has described under the head of "hysterical rectum."

* "Diseases of Women," p. 145, 1880.

Symptoms.—Dyspareunia is the one symptom which, in the vast majority of instances, leads the patient to seek medical advice. This is in most cases absolute, and any attempt at intercourse gives rise to the most excruciating suffering. In the worst forms, the slightest friction or even a current of air striking the parts is sufficient to excite pain. The general health is affected out of all proportion to the local manifestations, and great mental depression not infrequently occurs.

Treatment.—Judging from the experience of Thomas and others with local measures, I should be disposed, were I to meet with a case, to rely almost entirely upon symptomatic treatment. Galvanism might be of service, though I am unable to find any recorded evidence bearing upon this point. The local sedative effect of the positive pole ought to be useful. Thomas has destroyed the sensitive area with nitric acid, has dissected off all of the sensitive tissue, and yet affirms: "I have met with a number of cases of marked character, and in not one was complete relief given by treatment." He recommends: a change of air and surroundings; the use of general tonics, as arsenic, strychnine, quinine, and iron; the removal of existing local lesions—vulvitis, urethral vegetations, etc.; frequent ablutions with warm water, followed by the use of local sedatives (opium, carbolic acid, chloroform, belladonna, iodoform, cocaine), and that the patient live *absque marito.*

Sensitive spots on or about the hymen or the urethral orifice should be destroyed, and rectal lesions cared for. Skene* says that menthol and benzoinol are of marked value when the disease is associated with dryness and tenderness of the mucous membrane, especially at or about the menopause.

We do not have to contend with the same urgency of symptoms here as in pruritus vulvæ—hence temporary relief is not so important. In view of this fact, and because of the unsatisfactory results obtained by Thomas, who relies almost entirely upon local therapeutic measures, our greatest reliance should be placed upon the carefully selected remedy.

Therapeutics.

Platina.—PAINFUL SENSITIVENESS AND PRESSURE IN THE REGION OF MONS VENERIS, GENITAL ORGANS AND NYMPHÆ; tingling or titillation from genitals up into abdomen; frequent sensation as if menses would appear; menses too profuse and too short lasting; *flow dark and clotted, preceded by spasm and much bearing down;* pruritus vulvæ with

* Medical Gynecology, 1895, p. 266.

anxiety and palpitation of the heart; vulva painfully sensitive during coitus.

Belladonna.—PRESSURE DOWNWARD AS IF ALL OF THE CONTENTS OF THE ABDOMEN WOULD ISSUE FROM THE VULVA; clutching or clawing pains in the uterine region; parts sensitive; *cannot bear least jar; great heat and dryness of vagina.*

Cimicifuga.—Bruised feeling in vagina; *sensitiveness of uterus;* menorrhagia; grieved, troubled and sighing, alternating with cheerfulness; *ovarian neuralgia, especially of left ovary;* pain extends up and down left side with great tenderness.

Gelsemium.—Ovarian irritation with hyperesthesia of vulva; uterus feels as if squeezed by the hand; *menses suppressed, with passive congestion to the head.*

Ignatia.—Violent labor-like pains in uterus, followed by purulent corrosive leucorrhea; cramp-like pains in uterus, worse from touching the parts.

Consult:—Cocculus, **coffea**, **zincum**, nux vomica, thuja, magnesium phos., and **kali brom.** *V.* also *Therapeutics of Pruritus Vulvæ* and *Vulvitis.*

CHAPTER XXIV.

VAGINISMUS; COCCYGODYNIA.

Vaginismus.—The muscles of the pelvic floor, any or all of them, may contract spasmodically. The form of spasm under consideration is defined by Sims, who coined the word "vaginismus," as "an excessive hyperesthesia of the hymen and vulvar outlet, associated with such involuntary spasmodic contraction of the sphincter vaginæ muscle as to prevent coition." Catrin and Molènes applied to the same condition the term *vulvismus*.

Pathology.—The greatest difference of opinion prevails regarding the pathology of vaginismus. Tait* goes so far as to contend that the so-called sphincter vaginæ muscle (composed of the vulvi cavernosi muscles) exists only in imagination, or, if it does exist, it is made up of a few bundles of muscular fibers, and is, therefore, utterly incapable of acting as a constrictor of the vagina. He admits, however, that the symptoms referred to are common enough, but does not undertake to explain what muscles are contracted in the spasm.

The prevailing confusion is probably due to the fact that there are several classes of causes. The classification made by Mann† seems to me the best yet given. He divides the cases into three classes. In the first class the cause is to be found in some pathological lesion in or about the vulvar outlet; in the second, the seat of irritation causing the reflex spasm of the muscle is found to be in distant organs—the uterus, ovaries, or rectum; while in the third class no local lesion can be found and the cause must be sought for in the nervous system.

In the first class the anatomical changes usually observed are lesions of the hymen, erosions, fissures, redness, swollen follicles and, frequently, papillary excrescences at the navicular fossa. Sims believed that in the majority of instances the lesion is located at the base of the hymen, oftener at the margin nearest the urethral commissure. These several lesions may result in various ways. The trouble not infrequently dates from marriage, and it is probable that some partial

* "Diseases of Women and Abdominal Surgery," p. 78, 1889.

† "American System of Gynecology," vol. I, p. 511, 1887.

obstacle to intercourse on the part of the woman (small vulvar orifice or a rigid hymen) is responsible for the difficulty. Other obstacles to sexual intercourse are: an abnormally high location of the vulva, so that the penis presses the meatus against the pubes and injures it, and a disproportion between the size of the male and female organs (Schrœder). At any rate, difficult or painful cohabitation, from whatever cause, may in time induce any of the enumerated lesions, which in turn give rise to reflex spasm.

In the second class of cases the disease does not come on until after sexual intercourse has been frequently performed, and oftentimes not until after the woman has given birth to one or more children. Any lesion of the more remote organs may inaugurate the reflex spasm. Such are: diseases of the rectum (hemorrhoids, fissures, parasites, etc.); ovarian inflammation or displacement; lacerations of the cervix and inflammatory diseases of the uterus. Of these several causes I consider lesions of the rectum of first importance. There is such intimate sympathy existing between all of the pelvic organs that in an obscure disease like vaginismus the rectum should always be examined.

Finally, a different explanation must be given in the third class, where neither local nor remote evidences of disease are found to account for the difficulty. The victims of this form of vaginismus usually possess a nervous temperament, and are frequently hysterical. In one of the worst cases of this kind coming under my observation the patient was nymphomaniacal. Just why the spasm should occur under the circumstances it is hard to say. The explanation offered by Sims, and accepted by most authorities, is the following: An ineffectual or painful attempt at intercourse gives rise to nervous apprehension on the part of the woman, so that subsequent approaches of the male result in nervous excitement and an involuntary contraction of the levatores ani and constrictores cunni muscles.

I have a case at this writing under observation, the patient, a woman of thirty, having had three children. On examination the vaginal orifice is found to be so open from relaxation of the pelvic floor that the cervix can almost be seen without a speculum. Notwithstanding this relaxed condition, a violent spasm takes place on each effort at intercourse, which makes the act extremely difficult. There are no evidences of abrasion or hyperesthetic spots at or about the vaginal orifice, and I think that the cause is essentially neurotic. The vaginismus dates from marriage—nine years—though it has not been improved by childbearing.

The larger number of cases are undoubtedly due to the first class of

causes, a tender or hyperesthetic condition of the hymen being oftener responsible for the difficulty than anything else.

There is yet another form of spasm of the muscles of the female pelvic floor, which is known as *deep vaginismus* or *penis captivus*. It is due to spasm of the levatores ani muscles, which gives rise to a tetanically contracted circular band, which prevents further progress of the male organ, or encircles the corona of the penis after full introduction so that its withdrawal is painful and even impossible. Sometimes the spasm can be detected on digital examination. This is a rare form of the affection and I have never met with a case.

Symptoms.—The chief symptom is that of spasm of the muscles of the pelvic floor, excited especially by attempts at sexual intercourse. The spasm usually gives rise to pain, often very intense, and after several attempts at intercourse the approaches of the male result in such a degree of nervous apprehension as to make further effort impossible. If digital examination be attempted in the worst cases the spasm and pain are at once exhibited, and it becomes utterly impossible to insert the finger into the vagina. In several cases seen by me the vaginismus was not so decided as this, giving rise to hindrance, though not absolutely preventing sexual intercourse. The finger could be passed into the vagina, but an evident spasm was brought on by indagation. I have had patients almost throw themselves from the table immediately upon the parts being touched. Barnes has seen cases where convulsions and syncope were excited by attempted intercourse, and Thomas reports a case in which washing the genitals, or even a sudden change of position, was sufficient to bring on the spasm. On the other hand, Mann has seen instances where an examination, even with the speculum, failed to provoke a spasm, yet the introitus vaginæ tightly closed on each attempt at intercourse. In another case observed by the last named author coitus was impossible, notwithstanding the fact that the patient could herself introduce the largest-sized Sims dilator. In all of Mann's cases there was undoubtedly a nervous basis for the vaginismus.

The *prognosis* is usually favorable if proper treatment is resorted to; without treatment there is a tendency for the disease to continue indefinitely. Pregnancy and parturition do not always cure it, and the practice recommended by Sims of permitting coitus under ether narcosis is to be condemned. The purely nervous cases are the most difficult to cure.

Treatment.—There is no question in my mind regarding the efficacy of the homeopathic remedy in the treatment of this condition. It is

probable that in the majority of instances some surgical procedure will have to be resorted to before the cure is complete, but in the newly married it is my practice to try internal medication first. This is emphatically the thing to do where no local causes are discernible and when the nervous element stands out prominently. A little good advice should be administered with the remedy, for it is surprising how dense is the prevailing ignorance on the subject of marital relations. In the class of cases alluded to the wife should occupy a separate bed for at least a week or ten days, during which time frequent sitz baths are to be taken. If there is very great sensitiveness of the parts a suppository containing one grain of cocaine should be passed into the vagina night and morning; or the parts smeared with an ointment of atropine (gr. ii–ʒi). Galvanism, with the positive pole within the vagina, may be tried. It is a good plan to smear the parts with a ten per cent. cocaine ointment before intercourse is again attempted, which attempt should be made with the utmost gentleness and care. If accomplished without pain the nervous terror is largely done away with, and subsequent attempts, which should be made at long intervals, are usually successful.

Failing to relieve the disease by this method, a more radical one becomes imperative. What this shall be must depend upon circumstances. As has been seen, the most frequent lesions are found at or about the seat of the hymen or its remains (carunculæ myrtiformes). By touching the sensitive area with the finger or a fine probe the spasm and pain are at once produced. When this condition presents itself there is but one satisfactory way to proceed, and that is to remove the entire mucous membrane covering the diseased surface. This is done by bringing the patient profoundly under the influence of an anesthetic, exposing the hymeneal area with suitable retractors, and with a tenaculum and curved scissors, removing it in one continuous strip. Should there be any spurting arteries these are compressed or, if necessary, tied with fine catgut. The vagina is next thoroughly stretched with two Sims specula, or with a large bi-valve rectal speculum. After this is done the separated edges of the mucous membrane should be brought together with a continuous catgut suture and the opposing walls of the vagina kept separated with iodoform gauze. Sims devised for this purpose his well-known dilator (Fig. 99) which is to be kept in the vagina, after his cutting operation, for some days. I do not like it, for it not only gives rise to much suffering, but dams up the discharges and interferes with the healing of the wound Subsequently, after the parts are perfectly healed, these dilators may be advantageously used

by the patient herself in order to maintain a patulous condition of the canal. Pratt's rectal plugs will serve the same purpose admirably. Any other traces of disease at or about the vulva should be looked after, the urethral orifice being carefully inspected. If urethral vascular tumors exist they should be snipped off with scissors and their bases touched with the actual cautery. The rectum should next receive attention. My observation has been that, in most cases of vaginismus,

FIG. 99.

SIMS'S VAGINAL DILATOR.

there is constipation with more or less spasm of the sphincter ani muscle. It is my practice, therefore, to divulse the rectum at the same sitting, and to remove any disease of this organ that may exist.

Where no local causes are found, and the case is essentially neurotic in all its aspects, I wish to emphasize two things essential to successful treatment: First, the constitutional treatment is of the greatest importance, and should be carefully looked after in all its details; secondly, when divulsion is resorted to, let it be done in the most thorough manner. Incomplete divulsion is worse than useless, and I am confident that failures often result from an unnecessary fear of overstretching the parts. The irritable muscle must be paralyzed, to accomplish which a considerable degree of force is necessary.

In case of disease or displacement of the organs above the vagina, due attention must be paid to them. I once had to do in my clinic with a case of vaginismus which was most obstinate, though not absolute, and which was due to an exceedingly excoriating discharge from the uterus. The acridity was so great as to cause excoriation of the male member after intercourse. There was a flexion of the uterus with obstruction, which kept the secretions pent up. This case was ultimately cured by divulsing the cervix, thus establishing free drainage of the uterus.

Sims's operation for vaginismus is a much more bloody one than that given, and seems to me an unnecessary mutilation. It consists of a deep cut made with a scalpel through the vaginal tissues on either

side, terminating at the raphe of the perineum. A third incision is extended directly backward through the perineal raphe, completing the lower part of a Y. The vertical incision is about an inch deep. The parts must be kept dilated with the Sims dilator or with gauze until perfectly healed.

Therapeutics.

Belladonna.—*The spasms come on suddenly and disappear with equal suddenness;* a sense of heat and dryness is felt in the parts.

Platina.—Spasm and constriction of vagina in nervous women with *great hyperesthesia of the parts;* depression of spirits, anxiety, and palpitation of the heart; nymphomania.

Caulophyllum.—Excessively irritable vagina; intense and continued pain and spasm.

Cocculus.—Aggravated at every menstrual period; much weakness and prostration during menses.

Magnesium phos.—Vaginismus with neuralgic pains in back, which are darting, boring, and remitting in character.

Ferrum phos.—Vaginismus associated with throbbing pain and congestion of the parts; symptoms made worse by motion; dysmenorrhea, with hot, flushed face, and quick pulse.

Cimicifuga.—Intense intermitting, neuralgic-like pains, attended with cramps in lower limbs.

Berberis.—Intense pain in vagina, with burning and soreness as if excoriated.

Consult:—Causticum, conium, kreosotum, mercurius, nux vomica, and nitric acid.

Coccygodynia.—This name signifies *pain in the coccyx.* It is one of the causes, and a very frequent one, of so-called "painful sitting" (Duncan). The affection is of quite common occurrence and calls for careful consideration.

Anatomy.—The coccyx is formed by the four last rudimentary vertebræ of the spine. It juts sharply forward, forming an obtuse angle with the sacrum. The sacro-coccygeal articulations permit of a limited degree of backward movement during defecation and parturition. Through disease, or because of changes resulting from advancing years, ankylosis occasionally occurs.

The coccyx serves as a point of attachment for the sphincter ani, levatores ani, some of the fibers of the glutei, and the ischio-coccygei muscles. The greater or lesser sacro-sciatic ligaments are also attached to it (Fig. 2). These various structures are called into play during the acts of sit-

ting, standing and defecation. If the bone is diseased, or its surrounding structures hyperesthetic, these several acts reveal the condition under consideration.

Causes.—Coccygodynia occurs either as a symptomatic or an idiopathic affection. Any of the diseases of the genital organs or of the rectum may give rise to it. When symptomatic of disease of these organs all evidences of lesions of the bone itself will be wanting. The most frequent cause is traumatism—kicks, falls, horseback riding, etc.—and the injuries resulting from parturition. In a total of twenty-four cases observed by Scanzoni, nine were caused by delivery. It is more apt to occur in primiparæ somewhat advanced in years. Two cases coming under my observation were the result of falling down stairs, the buttocks striking upon the steps. While by far the larger per cent. of coccygodynias are met with in women, it is by no means confined to them, men and even small children occasionally suffering from the affection.

Pathology.—This, as suggested by the causes enumerated, is variable. In perhaps the majority of instances inflammation and necrosis are wanting. Luxation is found in a goodly number of cases, but luxation does not always give rise to pain. In examining one hundred and eighty pelves, Hyrtl found thirty-two cases of luxation and ankylosis. This is a surprisingly large per cent., and far exceeds the ratio of frequency of coccygodynia. The most distressing cases that result from luxation occur when the bone is directed backward and becomes fixed. Periostitis and necrosis of the bone sometimes develop, when the local evidences of disease can be discovered. An abscess may form as a result of the inflammation. When the condition is symptomatic of lesions of neighboring organs the pain is probably due to hyperesthesia or rheumatism of the tendons; at least, pain in this region is sometimes associated with lumbago, and is more apt to occur in the rheumatic and neuralgic diatheses.

Symptoms —Any movement causing a sudden contraction of the structures attached to the coccyx will, if the bone or its surrounding structures are diseased or hyperesthetic, give rise to acute pain. It is often most intense during the act of defecation, and care must be exercised in distinguishing it from pain due to rectal disease, or a displaced ovary. It is aggravated by walking and by sitting. Sometimes the latter act is impossible, or the patient is compelled to rest one buttock on the edge of the chair in such a way as to protect the tender bone from pressure. If there is a history of an injury, or if the symptoms

enumerated follow parturition,* coccygodynia should always be suspected. These suspicions may now be confirmed or banished by placing the patient upon her side and grasping the bone between the forefinger in the rectum or the vagina and the thumb externally. If the symptoms result from coccygodynia, movement of the bone will excite intolerable suffering. If the bone itself, or its periosteum, is involved, there is also tenderness on external pressure.

The *differential diagnosis* will have to be reached by exclusion. Existing diseases of the rectum, vulva, vagina, or uterus which might give rise to similar symptoms should be sought for. Lesions of the rectum are not infrequently confounded with coccygodynia, and, indeed, lesions of that organ often excite true coccygodynia, as has been shown. In all instances of the latter affection, whether reflex in origin or due to actual disease of the bone, the pain is excited by manipulation in the manner described.

Goodell maintains that the coccygeal joint is quite as liable to become hysterical as is the knee joint.† A differentiation here is sometimes exceedingly difficult. The hysterical affection is usually characterized by those erratic manifestations of pain which stamp the character of hysteria wherever found.

The *prognosis* necessarily depends upon the cause of the disease, though with proper treatment it is usually favorable.

Treatment.—The cause must be sought for and removed if possible. The rheumatic and neuralgic cases are best reached by internal medication. Sometimes galvanism is exceedingly useful, and I have more than once succeeded in relieving the pain by passing a twenty milliampère current through the parts. This may be done by using the negative pole either within the vagina or the rectum, and a large dispersing positive electrode over the coccyx and the lower surface of the sacrum. Galvanism will at least afford temporary relief in most instances where the bone is not actually diseased.

If the pain persists in spite of the more conservative measures, there are two operations, one or the other of which usually proves successful. The first is the subcutaneous separation of the ligaments as proposed by Simpson. A tenotomy knife is inserted under the skin at the tip of the coccyx and carried to its base. The muscular and tendinous attachments are completely severed from the bone on either side before the knife is withdrawn. If for any reason this procedure is difficult or im-

* "I have more than once heard this joint snap, during labor, with a sound so loud as to be heard some distance from the bed."—*Goodell.*

† "Lessons in Gynecology," p 96.

possible, the method of Thomas may be practiced. This author makes an incision extending the entire length of the coccyx, grasps the tip of the bone, and separates the attachments with scissors. A still more radical measure is that of Nott, and is indicated if the operations of Simpson or Thomas fail to cure the disease, or if the bone is necrosed. The coccyx is laid bare, disarticulated, and removed. This is not a difficult operation and can be done by any surgeon possessing a modicum of skill. The edges of the wound should be coaptated and a drainage-tube left in for several days Because of the close proximity to the rectum, it is best to use antiseptic injections until the discharge ceases. Total extirpation affords complete relief in almost every instance. However, it is rarely called for unless the coccyx is displaced or actually necrosed. Just at the present time it is a "fad" in certain quarters to remove the coccyx for the most indefinite lesions. I have witnessed several cases which were made immeasurably worse by the operation.

Therapeutics.

Magnesium phos.—Sudden, piercing pain in the coccyx; sudden, violent, concussive, tearing, stitching pain in the region as if the coccyx were bent backward.

Cicuta vir.—Tearing, jerking in the coccyx, especially during menses; painful feeling of stiffness in the muscles of the lower limbs; general prostration; bruised sensation throughout the body.

Lachesis —Continual pain in sacrum and coccyx; pain in small of back, as if sprained, hindering motion; agonizing pain when rising from a chair.

Belladonna.—Intense, cramp-like pain in small of back and coccyx; relieved by standing or walking slowly.

Causticum.—Dull, drawing pain in the region of coccyx; every movement of the body gives a pain in the small of the back.

Graphites.—Violent itching of the coccygeal region, the parts being moist, with scurfy eruption; dull drawing in the coccyx in the evening.

Mercurius.—Tearing pain in the coccyx; worse at night; pain in the sacrum, as if one had been lying on too hard a couch.

Kreosotum —Drawing pain along the coccyx down to the rectum and vagina, where a spasmodic contractive pain is felt.

Consult: — **Cimicifuga, ferrum phos., bryonia,** zincum, thuja, muriatic acid, rhus tox., kali carb , and ruta grav.

CHAPTER XXV.

CONGENITAL AND ACQUIRED MALFORMATIONS AND DISEASES OF THE VAGINA.

OCCLUSIONS OF THE GENITAL TRACT.

The various conditions which give rise to occlusions of the genital tract are:—

Atresia vulvæ;
Imperforate hymen;
Persistent hymen;
Congenital atresia vaginæ;
Acquired atresia vaginæ.

Symptoms of Obstruction.—Atresia vulvæ is usually discovered during infancy; the other forms of occlusion are ordinarily not detected until they interfere either with the exit of the menstrual blood or with the marital relations.

The occlusion, whatever the cause, may be either partial or absolute. When the menstrual blood is retained the subjective symptoms are the same as have been described under the head of "Retention of the Flow." The girl reaches an age when she should menstruate and undergoes all the physical changes of puberty. At certain regular intervals all of the phenomena of menstruation recur—except the flow. There is an exaggerated degree of suffering, and the pain is of a bearing-down character. Sooner or later the retained discharge gives rise to a tumor. A physical exploration is always necessary in order to determine the cause of the obstruction. The same symptoms occur when the obstruction is higher up in the uterus

Results of Menstrual Retention from Occlusions of the Genital Tract.—The higher the occlusion is located in the genital canal the greater is the danger of rupture from distention of the uterus and Fallopian tubes. If the obstruction is located at the hymen, or low down in the vagina, the distensibility of this canal will enable it to expand greatly before the uterus becomes dangerously distended. It is claimed by some prominent authorities that hematosalpinx never results

from a reflux of blood through the uterine ends of the tubes, even though the uterus is enormously distended. The Fallopian distention, it is maintained, is due to a vicarious discharge from the lining membranes of the tube, which is excited by the obstruction. However this may be, hematosalpinx is oftener found in occlusions of the cervix than in occlusions of the vagina, and tubal rupture, with resulting peritonitis, is liable to occur at any time; or if the uterus be suddenly emptied, uterine contractions are occasionally excited which may extend to the tubes and cause rupture. Again, as a consequence of the distention, wherever the tumor may be located, the uterus and Fallopian tubes are carried high up in the pelvis, and the tubes often become adhered. As a result they are dragged upon after the uterus descends, and in this way rupture may occur.

Atresia of the Vulva.

Atresia of the vulva may be either congenital or acquired. When congenital it is usually detected soon after birth by the nurse, who, in bathing the child, observes that something is wrong. It rarely involves the urethral orifice, so that urination is not interfered with. Should the agglutination seal entirely the opposing lips of the vulva, retention of the urine would, of course, result. When acquired, it is usually due to vulvitis with resulting adhesions.

The firmness of the adhesion varies greatly, though it is seldom difficult to overcome. The diagnosis is easily made by separating the labia, and the treatment is, ordinarily, most simple. If the agglutination extends high up, and has become firm, a dissection more or less extensive may be necessary. I have, however, never met with such a case, though I have repeatedly had to do with this form of atresia in babies and young children. In almost all instances adhesions of the clitoris are associated with the condition and should be overcome at the same time. Any blunt instrument or probe will serve the desired purpose. This is passed between the labia in such a way as to separate them perfectly. Care should be taken to prevent re-agglutination by keeping the raw surfaces separated for a few days with a strip of lint smeared with sterilized vaseline.

Notwithstanding the ease with which the diagnosis can be made and the obstruction overcome, I have had patients brought to me from a distance of two hundred miles because the medical attendant believed that he had to do with an extensive atresia.

Imperforate Hymen.

Anatomy.—The hymen (Fig. 1, *h*) separates the external and in-

ternal organs of generation. It is supposed to be formed by the closed lower ends of Müller's ducts. In shape it is usually crescentic; the opening may be circular, cribriform, or there may be two large openings separated by a narrow strip of membrane. It is occasionally absent, even in virgins, and in parous women the *caruncul*æ *myrtiformes* are usually the only remaining evidence of the organ.

The presence of the hymen is not absolute proof of virginity; nor does its absence prove that sexual intercourse has taken place. It is possible for sexual congress to occur without its rupture, and, as we have seen, it may be congenitally absent. Its rupture is frequently the result of other causes than sexual congress—injury, examinations, onanism, etc. From a medico-legal standpoint this fact is important, and the practitioner cannot be too cautious in presenting testimony bearing upon the question of virginity. There are many cases on record in which pregnancy occurred before the hymen was ruptured.

Symptoms.—In by far the larger proportion of cases an imperforate hymen gives rise to no trouble previous to puberty. Indeed, the patient may not seek relief until marriage, for, strangely enough, the system will occasionally adapt itself to the unnatural condition; and, after a period of suffering, more or less prolonged, a fair degree of health is enjoyed. Usually, however, the symptoms resulting from the retained menstrual discharges call for immediate relief. During the molimina there is more or less fever, nausea, vomiting, headache, etc. The pelvic pain is very great, and radiates down the thighs. The rectum and bladder are often impinged upon and their functions interfered with. As the case progresses, the complexion becomes sallow, the headache constant, and there may be manifestations of septicemia and pyemia, as indicated by chills, increased temperature, etc. Sometimes vicarious bleeding takes place from the nose, lungs, rectum, or from any part of the body.

Physical Examination.—Rarely do all of the foregoing symptoms occur in a given case, yet a persistence of any number of them, especially if they exacerbate at more or less regular intervals, calls for a physical examination. This will reveal a tumor of greater or less size, depending upon the duration of the occlusion and the capacity of the pelvis. There is a bulging of the hymen, and the finger carried into the rectum will detect the presence of a fluid tumor crowded against it. By recto-abdominal palpation, fluctuation can at times be detected. The distention is greatest immediately after the subsidence of the molimina. There is more or less resorption during the intermenstrual period, and, as has already been suggested, if menstruation ceases be-

cause of the anomalous condition, the accumulated blood may be largely resorbed. The given history, supplemented by a careful physical exploration, will usually enable the practitioner to make a correct diagnosis.

Notwithstanding the fact that the operative measures necessary to overcome the obstruction are very simple, a guarded *prognosis* should be given. All specialists are agreed to this. A large quantity of retained menstrual blood, from whatever cause, cannot be liberated with impunity. The greater the quantity and the longer it has been retained the more dangerous is its withdrawal. I have previously mentioned some of the accidents to be dreaded—reflux of blood through the Fallopian tubes into the abdomen, and rupture of the tubes. A still more serious one is that of decomposition through the admission of air.

Treatment.—Operators are not agreed as to the best method of removing the pent-up discharge when due to the cause under consideration. Emmet and a few followers advocate a large incision (after the method of Dupuytren), rapid evacuation, and subsequent douching of the cavity until the water returns clear. The larger number of operators, however, prefer the more conservative method of gradual evacuation, as first practiced by Amussat. It is claimed by the advocates of the latter method that there is much more danger of blood poisoning and rupture of the uterus and the tubes when the fluid is rapidly withdrawn. Recent statistics bearing upon the subject tend to uphold this claim. Thus Hemenway* has collected eighty-one reported cases of imperforate hymen, which were operated upon with the following result: Of the fifty-six cases rapidly evacuated the mortality was seven, or twelve and one-half per cent.; whereas of the twenty-five cases operated upon by the gradual method but one died, a mortality of but four per cent. An analysis of Emmet's cases† shows that the quantity of blood evacuated in each was not great—an average of about six ounces. This is a very different state of affairs from that represented in Fig. 100. In this representation the uterus is carried upward, its cavity and that of the vagina are very greatly distended, and their absorbing surfaces much increased. Even if sepsis could be avoided in cases of this kind by the strict observance of every precaution, the danger of laceration and rupture from the dragging upon the parts would, in rapid evacuation, be very great. Ross,‡ in order to prevent collapse in large accumulations, makes a small opening into the hymen, through which he passes the douche nozzle and

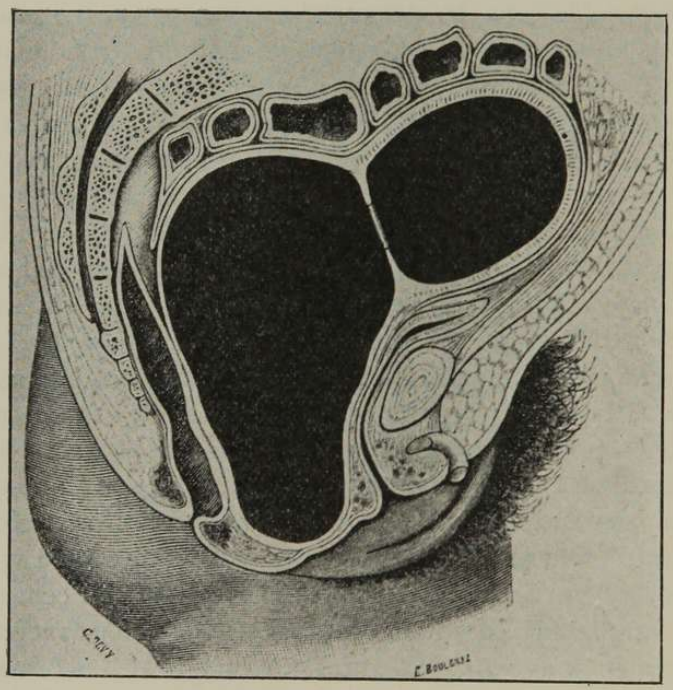
* American Journal of Obstetrics, Nov., 1891.

† "Principles and Practice of Gynecology," p. 195, 1884.

‡ Jour. of the Am. Med. Association, 1891.

washes the treacly discharge entirely away. The cavity is kept distended with fluid until it is forced out by iodoform gauze, which is carefully packed into it. The gauze, he maintains, is soft, unirritating, and antiseptic, affording both support and drainage. If rapid evacuation be practiced in the larger accumulations this procedure appeals to my judgment. At any rate, in the light of the statistics now available, and with modern antiseptic methods, it is probable that the smaller accumulation can be rapidly evacuated with but little danger. The cavity should be washed out with a sterilized salt solution, and properly

FIG. 100.



IMPERFORATE HYMEN WITH DISTENTION OF VAGINA AND UTERUS.

drained. This should be repeated often enough to prevent resorption of any of the discharge.

In the larger accumulations, on the other hand, and particularly if the Fallopian tubes are distended, gradual evacuation would seem to be the safer procedure. In it care must be taken to prevent the invasion of germs. A small quantity of fluid may be daily drawn off by means of an aspirator; or a small, elliptic incision may be made in the hymen in such a way as to prevent rapid egress of the fluid (Hewitt).

Should, however, the evidences of sepsis present themselves there is

but one course to pursue, and that is to open the hymen freely and to remove, under a bichlorid stream, as much of the débris as can be removed. If it is believed that the tubes are distended at the time of the evacuation from below, the operator should hold himself in readiness to open the abdomen, if symptoms of rupture or peritonitis supervene.

A subsequent operation is usually necessary, after any of the gradual methods, for the purpose of destroying the hymen. This may be done by entirely removing the membrane with a pair of curved scissors, and closing the wound thus made with a continuous catgut suture; or by making three or four incisions down to its base and inserting a Sims vaginal dilator, which is to be retained for several days. I much prefer the former method because it does away with all remnants of the hymen, which, if left behind, sometimes become inflamed and give rise to vaginismus.

Persistent Hymen.

In this condition there are one or more openings in the hymen which insure the egress of the menstrual blood more or less completely. The membrane is, however, unduly tough, and prevents or interferes with the intromission of the male organ.

It is usually not discovered until an attempt at coition has been made. Indeed, the first knowledge of the unnatural condition is often obtained by the accoucheur, who finds the hymen stretched over the advancing head. In these cases conception has occurred notwithstanding partial intromission, the semen having found its way through the hymeneal aperture or apertures; or the hymen, after frequent attempts at intercourse, becomes stretched and elongated to such a degree as to permit the complete insertion of the male organ. Conception may occur through a very minute opening.

If not interfered with, the membrane may be ruptured during the parturient act, but if very dense it can oppose great resistance, and there is danger of serious injury being done to the vaginal outlet.

A perfectly normal hymen may remain intact because of the inability of the male to rupture it. In time, if sexual intercourse is persisted in, the parts become tender and sore, which leads the patient to consult her medical attendant. Instances are on record in which the urethra has been greatly dilated by the introduction of the male organ, the unyielding hymen directing it into the urinary canal.

During the last year I have had to do with two interesting cases of persistent hymen. The first occurred in a maiden of thirty-five, who

came to me from China, where she had worked for a number of years as a missionary, for the purpose of undergoing a hysterectomy for fibroid. Previously to leaving China she suffered from an acute illness which necessitated the use of a catheter. Her physician then discovered the anomalous condition and supposed that the vagina was congenitally absent. An examination under ether revealed that the vagina was patulous. The only opening into the hymen was a very small one immediately below the urethral meatus, which was barely large enough to admit the tip of a sound. The patient menstruated regularly, and it was supposed that the discharge escaped through the urethra. After the hymen was removed the vagina was found unduly large and studded with granulations. It is possible that the imperfect drainage which excited the vaginitis had something to do with the formation of the fibroid. The second case occurred in a woman of thirty, who was referred to me by Dr. G. J. Jones, of Cleveland. The physical condition was almost identically the same as that just described, though the patient was a nervous wreck, having long suffered from dysmenorrhea, constipation, irregular distribution of blood, etc. She had masturbated from early girlhood, having contracted the habit because of pruritus. In both of these cases the hymen was removed according to the method given above.

The **treatment**, under whatever circumstances the anomaly is discovered, is very simple. The hymen is to be removed in the manner already described under the preceding head. Spontaneous rupture should never be permitted in parturition. It is much safer to overcome the obstacle by stellate incisions made with a pair of scissors. The raw surfaces are to be kept from reuniting by a pledget of iodoform gauze.

Congenital and Acquired Atresia Vaginæ.

Congenital atresia of the vagina presents itself under several different forms. The Müllerian ducts may have so failed in their development as to produce no trace of the canal; or they may have created the lower part of the canal, the upper being entirely closed; or there may be two cul-de-sacs, one above and the other below a central partition; or the canal may be represented simply by a fibrous cord.

Acquired atresia likewise varies greatly in form and extent. It may result from any one of a number of causes, though prolonged pressure of the fetal head is oftener responsible for it than anything else. However, any disease or accident giving rise to inflammation, ulceration, or sloughing may end either in atresia or stenosis. Such

are: vaginitis, syphilitic ulceration, or ulceration resulting from low fevers, the application of strong medicaments, and traumatism.

Symptoms.—Like imperforate hymen, atresia in itself gives rise to no inconvenience, and it is only when the disorder obstructs the menstrual discharge, or interferes with coition, that trouble is caused. When congenital, therefore, it is rarely detected until puberty, and often not until marriage. If the uterus and ovaries are developed, there will be retention of the menstrual discharge, with all of the symptoms incident to that condition. On the other hand, if the development of these organs has also been arrested, the function of menstruation is held in abeyance, and the amenorrhea is absolute. In the latter event all signs of puberty are wanting: the breasts do not develop, no hair appears upon the mons veneris, and the figure assumes few of the characteristics of womanhood.

If the atresia be acquired, and is the result of parturition, the patient, having already menstruated, will suffer from menstrual retention when ovulation is reëstablished.

Physical exploration will, in most instances, enable the examiner to determine the nature of the trouble. It is not, however, always so easy to determine the presence or absence of the uterus and ovaries. If all signs of the molimina are wanting, together with the usual changes of puberty, the physician is reasonably safe in concluding that they are either absent or arrested in their development. The examination should be conducted as follows: Place the patient upon her back and practice recto-abdominal palpation (p. 112), endeavoring to press the organs toward the finger in the rectum. Under anesthesia this is sometimes very satisfactory. Next pass a sound into the bladder, and direct its tip toward the finger in the rectum. If it come in contact with the finger, the evidence is pretty conclusive that no uterus intervenes. By carrying the point of the sound toward the lower part of the rectum the examiner can determine the thickness of the structures between the bladder and that organ. This is important in determining whether or not an operation is practicable.

Prognosis.—There are many factors to be considered in dealing with the prognosis of vaginal atresia. It may be stated in a general way that the prospects of restoring the canal to its former condition, or of making a new vagina, by surgical interference, depend upon the amount of tissue intervening between the bladder and the rectum. In the congenital cases, if there is no vestige of the canal, and if the uterus is absent, the possibilities of creating a new vagina are not encouraging. On the other hand, if the vagina is represented by a fibrinous band

leading to the uterus, or if the closure is the result of accident, without the loss of too much tissue by sloughing, the prognosis is much more favorable.

Too much, however, must not be promised. I know of nothing more trying to either the surgeon or the patient than an attempt to create a new vagina. There are few women willing to endure the long suffering incident to such a procedure. Yet, with the coöperation of the patient, it is surprising what can be done even in the worst cases. When the operation is performed chiefly for the purpose of liberating pent-up menstrual discharge it may not be wise to attempt to create a canal of normal size; if, however, there be sufficient tissue to permit of this without endangering the rectum and bladder, it should be made.

Treatment.—The question of operative interference in a given case of atresia must depend upon circumstances. The occlusion in itself, like imperforate hymen, neither endangers life nor gives rise to great inconvenience. It is only when it interferes with one or both of the functions mentioned—menstruation and coition—that we are called upon to decide as to the necessity of an operation.

There is no question as to the wisdom of operative interference if the menstrual blood is retained, and there is a fair prospect of reaching it. On the other hand, if the patient has never shown any signs of menstruation, probably because of an absence of the uterus and ovaries, the sole object of the operation is to make sexual congress possible. In the latter case the decision must rest with the patient. I question very much the right of a woman thus afflicted to assume the responsibilities of the married state if aware of her condition previously to entering upon it. Unfortunately, these patients are often ignorant of their deformity until an attempt is made to consummate the marriage, and it is their inability to consummate it that brings them to the specialist. In all instances of the kind we are justified, if it be the patient's wish, in making an attempt to create a vagina, as we are also where the atresia is acquired, providing there be a fair prospect of success.

The operation, though not complicated, nevertheless requires care, perseverance, and skill. The patient should be thoroughly anesthetized and placed in the lithotomy posture, with the hips well over the edge of the table. The anatomical relationship is ascertained as accurately as possible by keeping the index finger of the left hand in the rectum, and the sound, held by an assistant, in the bladder. A transverse incision through the skin and cellular tissue is made in front of the anus. It is always wise to work as close to the rectum as possible, because, with

the index finger in this organ to serve as a guide, there is much less danger of penetrating it than there is of penetrating the bladder.

After the skin is incised cutting instruments should be used as little as possible. It is much less dangerous to bore one's way into the tissues with the finger, aided, if necessary, by the handle of a scalpel. If space will permit, the caliber of the canal should be greater than the normal, because of the tendency of the tissues to contract during the healing process. Such a dissection as this is long and tedious, and it may be necessary to complete it, because of the exhaustion of the patient, at a subsequent operation.

The question of penetrating the uterus, if the cervix is found closed, will also depend upon the condition of the patient. If the shock is already great, because of the duration of the operation, it is best not to open the uterus until some future time.

After the canal has been made or reopened it is to be kept patulous by the Sims dilator, or by a strip of iodoform gauze packed into it. I prefer the latter method, changing the dressing for the first time at the end of forty-eight hours and, subsequently, every twenty-four hours. Later on the Sims dilator can be advantageously used. In time epithelium forms over the raw surface, and it is surprising how very like normal vaginal mucous membrane the interior of a vagina thus made becomes.

The parts must be kept patulous for months by artificial measures, and it is this procedure which greatly taxes the endurance of the patient. She should be instructed how to insert the Sims dilator, which, if too painful to be worn continuously, should be left in for an hour twice a day. Specular dilatation from time to time may be necessary.

Puncture through the rectum or above the pubes, for the purpose of reaching the retained discharge, is hardly a justifiable operation except in extreme cases. I dislike always to drain any cavity into the rectum if such a procedure can possibly be avoided. Fecal contamination is almost inevitable and the principle of drainage is wrong. Nevertheless, if the tumor bulges into the rectum, and the tissues corresponding to the vaginal tract are limited, this may be the only resource.

When it is not possible to restore or create a vagina, and the uterus and ovaries are present, oöphorectomy, or oöphorotomy and hysterectomy, may be called for.

Operation for the Creation of a New Vagina.

Case I.—Patient æt. 22, brought to me by Dr. Chamberlain, of Tiffin, Ohio. Has never menstruated, though the menstrual molimina

occur regularly every four weeks. A previous attempt had been made to create an opening, but without success. Examination under ether revealed the uterus absent, but two small bodies were felt on either side, which resembled imperfectly developed ovaries. A new vagina, five inches in depth, was made by incising the tissues laterally between the anus and the fourchette in front; then with the finger and scissors the dissection was carried upwards for a distance of five inches. This was kept open with gauze until she left the hospital, four weeks later, when a vagina four inches in depth and an inch and a half in diameter was left. Her physician was instructed to keep the new vagina open. She is to be married soon, and it is for this reason that she was anxious to have a new vagina made. She says that she is exceedingly passionate. Her breasts are well developed, and her external sexual organs are perfect. I explained to her that the operation would not relieve the periodical distress, which is probably the result of ovulation. She has promised to return later and have the ovaries removed, should this pain become more severe.

Double Vagina.

Double vagina is occasionally met with as one of the anomalies of development. In most instances it is associated with a double uterus, though not always. The septum dividing the two vaginæ may be complete or partial, and consists of a double layer of mucous membrane, separated by more or less muscular tissue. Where the septum is incomplete it may be found stretched across the upper, middle, or lower part of the vagina. Sometimes it is perforated.

The two sides of a double vagina are usually of unequal size, one being much smaller than the other. This is always the case when the double canal leads up to a one-horned uterus, the side corresponding to the absent cornu remaining rudimentary. On the other hand, when the uterus is double, both sides may be fully developed. Each half is generally guarded by a hymen.

Hunter Robb* reports an interesting case of double vagina. The smaller of the two tubes terminated in a fluid sac and was not connected with the uterus, which was normal.

Double Hymen.

This rare condition has been met with in different forms. The two hymen may be placed one immediately above the other, or the upper

* New York Medical Journal, September, 1894.

one may be high up, close to the cervix. The latter condition sometimes is very confusing, as was the following case: Mrs. ——, æt. 28, was referred to me by Prof. Walter Wesselhœft, of Boston. As a girl she was strong and vigorous, never having suffered from dysmenorrhea; after marriage, soon after which she became pregnant, there was not the slightest history of dyspareunia. Pregnancy progressed in a perfectly normal way, and at the end of gestation Dr. Wesselhœft was called upon to care for her in labor. To his surprise he found at the upper part of the vagina a septum, through which he could not pass the finger. If an opening existed, which must have been the case to have permitted of conception, it could not be detected by the examining finger. The septum was cut through and the labor terminated by forceps. The patient made a good recovery, and in due time came to Michigan to reside, when she placed herself under my care. I made an examination twelve months after delivery. The upper part of the vagina was narrowed and the septum referred to was perforated by an opening about one-quarter of an inch in diameter. The edges of it were thick and indurated and the cervix impinged upon its upper border. The cervix was badly lacerated, everted, and eroded, which condition, together with the obstacles interposed by the septum, led me to think, on making the first examination, that there was a double uterus. A second examination, however, convinced me that this was not the case. The uterine catarrh was perpetuated by the retained secretions above the septum, and the patient suffered more or less in a general way as a result of this. The preliminary treatment consisted of frequent douches and the application of the compound tincture of iodin twice a week; after these applications a strip of iodoform gauze was packed about the cervix above the septum. The gauze afforded good drainage and the improvement was rapid. My intention was to entirely remove the septum and to repair the cervix in the usual way. When I came to operate I found, to my surprise, that the septum was composed of a duplicature of the vagina, folded upon itself in such a way that the bladder and the Douglas cul-de-sac were turned into it. My first incision opened into the peritoneal cavity through the cul-de-sac, so that, after carefully closing it, I desisted from further efforts to remove the septum. I enlarged the opening by nicking it, and with much difficulty succeeded in repairing the cervix. The patient made an uneventful recovery and is now quite well.

Vaginal Cysts.

These sometimes form in the vagina and vary in size from a walnut

to an orange. They may result from the persistence of Gärtner's ducts, or from occlusion of some of the muciparous follicles. In the first instance they are found on the anterior vaginal wall at its lower part; if formed by the distention of muciparous follicles they are located in the fornices of the vagina. They contain a limpid fluid which sometimes becomes viscid. When located on the anterior vaginal wall care must be taken not to confound them with cystocele. The introduction of a catheter will enable the physician to differentiate the two conditions. The treatment is very simple: They should be cut into, evacuated, and packed with gauze previously dipped in a solution of iodin; or the cyst may be removed by careful dissection, the resulting wound being closed by superimposed layers of catgut.

Fibroid Tumors of the Vagina.

Fibro-myomatous tumors of the vagina are occasionally met with. They may be either sessile or pedunculated. When sessile they lie in the vaginal wall, as do cysts, and occasionally they are edematous and soft. It may be impossible to differentiate them from cysts except by aspiration. As time goes on they may become pedunculated, or necrosis may destroy the capsule and spontaneous extrusion from the vulva take place.

The *treatment* is purely surgical. When non-pedunculated, they should be enucleated and the capsule closed from below with superimposed layers of catgut. When pedunculated they should be cut away and the pedical either ligatured or seared with the Paquelin.

Carcinoma of the Vagina.

Primary carcinoma of the vagina is an exceedingly rare disease. It is usually secondary to cancer of the uterus, rectum, bladder, vulva or urethra. It may result from metastasis from malignant involvement of distant parts. I have during the last year met with a case of primary vaginal cancer.

Primary cancer of the vagina occurs in two forms:—

1. Papillary epithelioma; and, 2, Diffuse carcinomatous infiltration of the vaginal walls.

The *causes* are probably those which are active in the production of carcinoma of the cervix. Irritation from improperly fitted vaginal pessaries may give rise to the disease. It is rarely met with previous to the age of thirty years.

The *progress* of the disease is rapid. Ulceration is early; fistulous

communication with neighboring organs is common; and in due time all of the pelvic organs are implicated to a greater or less extent.

The chief *symptoms* are pain, hemorrhage and an offensive, ichorous discharge. Occasionally the first symptom which calls the patient's attention to the vagina is the stenosis which interferes with intercourse; or the disease may not be detected until labor sets in. In time the functions of the bladder and rectum are interfered with.

On physical examination there will be found either a cauliflower growth (papillary epithelioma), or a firm sessile tumor immovably fixed.

In diffuse carcinomatous infiltration the whole canal has a brawny sensation and its caliber is more or less obstructed and sometimes completely occluded. When ulceration is established hemorrhage is easily excited. The characteristic offensive discharge is rarely wanting in the later stages of the disease.

Papillary epithelioma can only be distinguished with certainty from benign growths by the microscope. The malignant growth is more brittle and is characterized by a greater tendency to hemorrhage. The microscope will also have to be relied upon in differentiating carcinoma from sarcoma.

Only by early and radical operative interference is there the slightest chance of eradicating the disease. Unfortunately, it will have usually progressed beyond the operative stage before it is detected. Should it be secondary to carcinoma of neighboring organs, an operation, other than palliative, will of course be useless. As in all operations for malignancy, the knife should extend well into healthy tissue, even though the rectum or parts of the bladder have to be incised. If possible the wound should be closed and an effort made to secure primary union.

When the disease has advanced beyond the curative stage the patient may be made more comfortable and life prolonged by removing as much of it as possible with the Paquelin or galvano-cautery. Any of the measures recommended for inoperable carcinoma of the uterus may be tried.

Tuberculosis of the vagina is also a rare disease, though more common than is tuberculosis of the vulva. It is usually associated with tubercular involvement of the uterus.

The nodules are oftener located on the posterior wall. In time they may undergo caseous degeneration and ulcerate. They may result in fistulæ which communicate with the rectum, bladder and urethra. Tubercle bacilli are found in the discharge.

The *treatment* does not differ from that recommended for tuberculosis

of the vulva. In operating for tuberculous fistulæ a wide area of tissue should be removed.

Hermaphrodism.*

This term is applied to that congenital condition of the sexual organs in which the ovaries and testicles exist in the same individual. True hermaphrodism is extremely rare, yet undoubted cases of it have been recorded. That of Katharine Hoffman is a well-known instance.

Both ovaries and testicles, or but one of each, may exist in the same person. This constitutes true hermaphrodism, and, as I have already said, is an extremely rare condition. *Pseudo-* or *false* hermaphrodism is, on the other hand, much more common. Here, owing to malformation, the external genitals resemble more or less closely the sexual organs of the opposite sex. Thus hypospadiasis in the male may so divide the sexual organs as to make them resemble the vulvar cleft in the female; or the clitoris in the female may be so enlarged as to resemble the penis, while the labia minora, because of their close proximity, are mistaken for the scrotum. If the individual be a male, the testicle will, in most instances, be found in the structures simulating the labia and scrotum. It must, however, be borne in mind that the testicles may not have descended; and that the ovaries may find their way into the pudendal sac. These confusing factors may make it impossible to determine the sex until the age of puberty is reached. The menstrual function will then assert itself if the patient be a female, and the breasts, the face, the form, the voice, etc., will serve as distinguishing features. Sometimes the uterus and ovaries can be palpated through the rectum. When called upon to determine the sex of an infant too much care, for obvious reasons, cannot be exercised.

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* "Hermaphroditus was fabled to be the son of *Hermes* (or Mercury) and *Aphrodite* (or Venus), and to have united both sexes in one person."—*Joseph Thomas.*

CHAPTER XXVI.

VAGINITIS.

The mucous membrane of the vagina is perhaps oftener attacked by inflammation than any other mucous membrane of the body. When thus affected it is known as *vaginitis, colpitis, blenorrhagia, or blenorrhea.* These several terms are used synonymously by different writers to indicate the various forms of inflammation attacking this organ.

Anatomy.—The peculiar structure of the vagina is one of the reasons why it is so frequently the seat of inflammation. It extends from the ostium vaginæ to the cervix uteri and consists of three coats —fibrous, muscular, and mucous. The fibrous and muscular coats are attached to the ischio-pubic rami, constituting a part of the perineal septum. The mucous membrane is lined with squamous epithelium. The posterior wall is about four inches long being twice the length of the anterior. This throws the anterior wall into transverse rugæ, which greatly increase its mucous surface and form nidi for the reception of virus (Fig. 10).

Neumann doubts the existence of true muciparous follicles in the vagina.* Von Preuschen maintains that they do exist, but that they are limited to the upper portion of the vagina. There is, however, no question regarding the existence of numerous papillæ which cover the folds or rugæ.

Varieties.—Vaginitis may be divided into six forms: 1. Simple; 2. Specific or gonorrheal; 3. Granular or papillary; 4. Emphysematous; 5. Vesicular; and 6. Senile or adhesive. So-called diphtheritic vaginitis is a condition characterized by a diphtheritic deposit upon the mucous membrane of this canal which attends some epidemics of diphtheria and puerperal fever.

Simple and Specific Vaginitis.

While these two forms of vaginitis result from entirely different causes—the specific always being due to gonorrheal infection—yet clinically it is often impossible to differentiate them. I therefore deem

* *Deutsche medicinische Wochenschrift*, 1890.

it more practicable first to study their clinical manifestations conjointly, referring in conclusion to the differential points given by various authors.

The *causes* may be enumerated as follows:—

1. Contact with specific poison;
2. Contact with various irritating and mechanical agents used for disinfecting or examining purposes;
3. Contact with discharges from the uterus or from abscesses opening into the vagina;
4. Undue exposure;
5. Excessive coitus;
6. Disordered blood states resulting from phthisis, the exanthemata, etc.;
7. Traumatism due to parturition, the use of pessaries, etc.

Simple and specific vaginitis may run either an acute or a chronic course. The simple is often met with as a secondary affection, resulting from extension of inflammation of contiguous structures, or from contact with discharges issuing from the uterus or pelvis. Undoubtedly the condition of the system has much to do with the acuity of the symptoms. A simple chronic vaginitis may have existed for an indefinite period in one otherwise perfectly well, when, if for any reason the patient's vitality is reduced to a certain point, it will assume the form of an acute inflammation upon the slightest provocation. The acute form, unless arrested by proper treatment, rapidly passes into the chronic.

Pathology.—The characteristic changes attending inflammation of any of the mucous surfaces, modified only by the anatomical structure of the parts involved, take place in vaginitis. The parts are at first dry, hot, and congested. This congestion is, in due time, relieved by an exudation, which is at first serous but, in a few days, becomes purulent. The duration of the first stage is variable—from a few hours to several days. The extent of tissue involved depends both upon the cause and the vitality of the patient. Thus the involvement is usually greater and more serious in specific than in non-specific inflammation; and the sub-mucous structures are more apt to be implicated when the affection occurs as a complication of the exanthemata, or puerperal fever. A true phlegmonous process may be inaugurated by the involvement of the deeper structures. Not infrequently the epithelium is shed in patches, leaving the underlying surfaces exposed; or occasionally the entire epithelial layer of the vagina is cast off *en masse*, owing to the intensity of the disease. Griffiths (*Brit. Med. Jour.*, June, 1894) be-

lieves that the nervous system is at fault in "membranous vaginitis." This opinion is based upon the fact that it occurs oftener in the neurotic and that there is frequently associated with the discharge of membrane a pustular rash. The inflammation may extend over the entire mucous area of the vagina, as well as that of the vulva and urethra, or be limited to the vaginal fornices.

Symptoms.—The intensity of the symptoms depends in large measure upon their acuity. The onset of an acute attack is usually characterized by a slight chill or chilliness. This is soon followed by a sensation of heat or burning in the region of the vagina or vulva, which is often very intense. There is heaviness and frequently an aching sensation in the pelvic region, which extends down the thighs or radiates upward. Sooner or later a more or less profuse discharge occurs, which is often exceedingly excoriating and gives rise to intense pruritus. Dysuria, from involvement of the urethra, is a frequent complication, and when the cause is gonorrheal infection it may be most distressing and obstinate.

The *local* symptoms become less marked as the disease assumes a chronic form, until finally they disappear entirely. The discharge may, however, continue in the form of a leucorrhea for an indefinite length of time after the local suffering ceases.

Physical exploration will reveal one or all of the changes mentioned under the head of pathology. If the examination be made during the first stage of the disease the parts will be found hot, dry, and tender. Later on they are bathed in a profuse secretion of purulent matter, which escapes upon separating the labia. By drawing the finger along the tract of the urethra pus is often forced from it.* A specular examination will usually reveal abraded patches, or, possibly, the evidences of true ulceration. Involvement of the cervix is also frequently observed. During the acute stage a specular examination, because of the pain produced, is hardly justifiable. Later on this instrument is useful in differentiating endometritis and pelvic abscess from vaginitis. Pelvic abscess opening into the vagina has more than once been mistaken for vaginitis. These cases, because of the fact that vaginitis is

* In this connection the observations of Horand are valuable (*L'Union Médical*, Aug., 1889). Of 483 women examined there was a urethral discharge in 143. Horand, while believing that it was frequently due to gonorrhea, maintains that such discharge often results from a simple folliculitis. This discharge is occasionally seen in virgins with absolutely no signs of inflammatory involvement of either the urethra or the vagina.

frequently excited by the discharge from the abscess, are often misleading.

Differentiation Between Simple and Specific Vaginitis.—This question has already been discussed in Chapter IV., to which the reader is referred. It must be admitted that few investigators are as sanguine as Aubert, whose opinion is there given, in relying upon the gonococcus of Neisser as furnishing conclusive evidence of the specific nature of vaginitis. Thus, Vibert and Bordas* affirm that gonococci are practically indistinguishable by any means yet known to us from other forms of micro-organisms, and that there is no way by which, in medico-legal cases, the two forms of inflammation can be distinguished the one from the other. Currier† believes that specific vaginitis is always caused by the gonococcus of Neisser, but admits that it is not always present in gonorrheal pus; Ollivier asserts it as his belief that in the present state of knowledge we cannot absolutely demonstrate the infectious principle of gonorrhea; and finally, Thomas and Mundé, in their latest work,‡ affirm that differentiation between the acute and subacute forms of the two affections can seldom, if ever, be made. Henry Heinman,|| on the other hand, affirms that the gonococcus of Neisser is never present in the normal urethra. It is, however, necessary, according to Heinman, to resort to the Gram stain (p. 83) in order to differentiate the diplococci found in the normal urethra. He believes that in specific vaginitis the gonococcus found is identical with that found in specific male urethritis, and that "the experiments on the human urethra confirm the belief in the specific pathogenic power of the gonococcus (Neisser)."

All of the authorities quoted are quite agreed that the cause of specific vaginitis is always a specific discharge, though nearly if not quite all admit that non-specific vaginitis occasionally gives rise to urethritis in the male. There certainly exists much confusion regarding the subject, and the medico-legal expert should give his testimony with a good deal of caution. In cases of rape, for instance, or where the chastity of a girl or a woman is at stake, the responsibility of the medical expert is very great. It is no small thing to ruin the reputation of either a man or a woman by evidence based upon a pathology as yet unsettled.

There are, however, symptoms other than those obtained by micro-

* *Le Médecine Moderne*, Paris, 1890.

† Medical News, 1889.

‡ *Op. cit.*

|| Medical Record, June, 1895.

scopical examination of the pus which will at least lead the physician to suspect the form of vaginitis met with. Of first importance is the *infectious character of the discharge.* There is no question but that specific vaginitis is infinitely more liable to excite urethritis in the male than is the simple form. In proof of this, it is only necessary to remind the reader of the frequency of vaginal catarrh in married women, and the comparatively few cases of urethritis in the male resulting from the same; whereas, a single cohabitation with a prostitute who has specific vaginitis will, in at least a goodly per cent. of cases, give rise to virulent urethritis.

The *acuity* and *intensity* of the symptoms will lead us to suspect the specific nature, though simple vaginitis not infrequently runs a course quite as acute and virulent as the specific form.

Urethral complications occur oftener, as has been shown, in the specific form of the disease. Indeed, the inflammation may, in gonorrhea, be confined almost entirely to the urethra.

Other circumstances should be noted. For instance, if the foregoing symptoms suddenly develop in a woman who has never before suffered from a vaginal discharge, we are at least warranted in suspecting gonorrhea. On the other hand, if a girl preserves all of the evidences of virginity, as shown by the hymen, etc., and if her reputation is such as to make illegitimate intercourse improbable, we ought at least to give her the benefit of the doubt, and consider the case one of simple vaginitis.

Course and Termination.—Gonorrhea was supposed to be a self-limited disease. Until 1873, in which year Noeggerath wrote a most startling paper on the subject, its remote effects in the female were considered most insignificant. In the paper referred to Noeggerath makes the following affirmation: "* * * I believe that I do not go too far when I assert that of every one hundred wives who marry husbands who have previously had gonorrhea, scarcely ten remain healthy; the rest suffer from it, or some other of the diseases which it is the task of this paper to describe. And of the ten that are spared, we can positively affirm that in some of them, through some accidental cause, the hidden mischief will sooner or later develop itself."

There can be no doubt that gonorrhea is frequently responsible for perimetric inflammation and pyosalpinx. I have many times been able to trace these lesions to this source, and while engaged in writing this chapter, I had occasion to operate for Dr. E. F. Chase, of Dexter, Mich., on a patient who presented the following history: Though married, she was but seventeen years old, and not well developed for

one of her years. Previously to marriage Dr. Chase had treated the husband for gonorrhea, and all discharge had ceased. Soon after marriage, however, the patient was taken with severe inflammatory symptoms, accompanied with agonizing pain in the pelvic region. Her symptoms grew from bad to worse, the temperature running very high and presenting all the characteristics of pyemia; the pulse became more and more rapid, and her general appearance clearly indicated a fatal termination if the progress of the disease were not arrested.

An examination under chloroform revealed the usual board-like hardness of the pelvic roof. I opened the abdomen two days after making the first examination (about six weeks from the onset of the first symptoms) and dug the distended tubes and the friable ovaries from a mass of inflammatory exudates. Many intestinal adhesions were separated, the abdomen washed with sterilized water, a drainage tube inserted, and the wound closed. The patient came near dying from shock while on the table, the operation requiring fifty minutes, but rallied, only to succumb fifteen hours later.

Cases like the above, I am sorry to say, are only too common. There was no history of traumatism or of other possible cause of the mischief. The symptoms came on insidiously and were preceded by a vaginal discharge.

Noeggerath is probably right in maintaining that gonorrhea may remain latent in both the male and female for almost an indefinite length of time. Lawson Tait, in support of the teachings of Noeggerath, contends that gonorrhea is responsible for infinitely more suffering, and is infinitely more serious in its consequences, than is syphilis. More recently, however, there is a tendency to question the sweeping assertion of Noeggerath and Tait as to the almost inevitable transmission of the disease from the male to the female. Gonorrhea in the male is, unfortunately, too common to justify it. Bantock, of London, who has certainly had extraordinary opportunities for observation, informs me that, in England at least, Noeggerath's statement does not hold good.

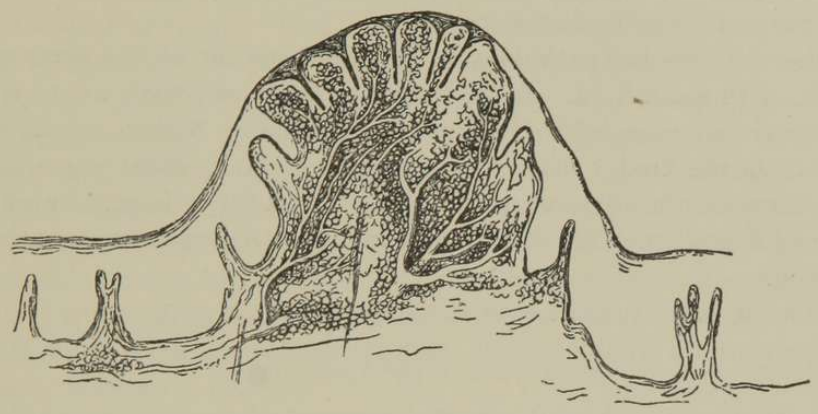
While admitting, then, that specific vaginitis frequently does give rise to serious and often fatal pelvic complications, it is possible that both forms of the inflammation may run their course without extending above the vagina.

Granular or Papillary Vaginitis.

Definition.—These terms have been applied to a form of inflammation attacking the vagina characterized by a hypertrophy of the vaginal

papillæ. It may be secondary to simple and specific vaginitis. For a long time it was supposed to be a hypertrophy of the muciparous follicles, but, if the teachings of Neumann are correct, these follicles, if they exist at all in the vagina, are very limited. The papillæ, on the other hand, are found scattered over the transverse folds in large numbers, and, in all probability, the granular appearance which characterizes the disease is due to their enlargement.

FIG. 101.



GRANULAR VAGINITIS. (*Ruge.*)

There is a certain resemblance between granular vaginitis and follicular vulvitis. Both are much oftener met with during pregnancy, and both commonly continue until utero-gestation is terminated. A follicular vulvitis frequently implicates the vagina, and, conversely, I have seen granular vaginitis ending in the former condition. The physiological congestion of pregnancy tends to produce both diseases.

It is by no means peculiar to the pregnant state, however. One of the worst cases that I ever met with occurred in a virgin twenty-six years of age. The impression obtained on digital examination was not unlike that experienced on scraping the finger over the surface of a beef's tongue.

Symptoms.—The symptoms do not differ essentially from those of the two forms of vaginitis already studied. In the cases coming under my observation the acute manifestations were not so marked, but the irritation and pruritus were infinitely greater. The enlarged papillæ can be plainly seen and felt (Fig. 101). They extend from the ostium vaginæ to the cervix, and sometimes stud the entire surface of the latter.

Emphysematous and vesicular vaginitis are varieties of the disease rarely met with. In emphysematous vaginitis gas forms in the lym-

phatics and the spaces of the connective tissue at the upper end of the vagina. It, too, is oftener met with in pregnant women.

Vesicular vaginitis is characterized by the formation of round vesicles over an inflamed area. These burst and leave behind raw surfaces of variable size whose edges are sharply defined.

Maher (*Medical Record*, March, 1894) describes a new disease of the vagina which he terms "perivaginitis simplex." Its chief characteristic is a brawny hardness of the perineal body and vaginal walls "so that the vagina forms a rigid tube, all agape, with the cervix and os uteri distinctly visible at the upper end."

Maher believes the pathology to be inflammation of the perivaginal tissues, with induration. Some ten years ago I met with a case whose symptoms corresponded to the disease described by Maher, which is the only one of the kind I have ever met with. The patient was exceedingly nervous, the parts were very tender, and for a time I feared malignant infiltration. The usual local treatment failed to impress the induration.

Senile vaginitis is dealt with in Chapter XXVII.

Treatment of Vaginitis.

The treatment of the three chief varieties of vaginitis which have been considered is so much the same as to make a separate consideration of each unnecessary. During the acute stage quiet must be observed, the patient being confined to her bed for two or three days. Aconite, belladonna, and cantharis are the remedies oftener useful in controlling the pain and the slight fever present. Frequent douching of the vagina with a hot salt solution (normal) will not only relieve the local distress incident to this stage, but will many times shorten the duration of the disease. If the itching is very intense, a saturated solution of boric acid may be substituted for the salt solution, and one of the applications recommended for pruritus vulvæ (*v.* Chapter XXIII.) may be utilized. The douches should be repeated every five or six hours. If persevered in for several days, this treatment, combined with proper rest, will accomplish a cure in many cases. As the disease becomes more chronic a 1:3000 bichlorid douche should be substituted. The injections, whatever medicament is used in the water, must be thoroughly made according to the method described in Chapter X. Later on, when the discharge assumes a purulent character, a solution of calendula and glycerin can be advantageously used after the parts have been washed with a 1:4000 bichlorid solution.

When the acute symptoms have subsided the douches need not be

administered oftener than twice a day. I then apply the nitrate of silver after the method described by Skene. The parts are exposed by the aid of a Sims speculum, douched with a 1:3000 bichlorid solution, and a one-grain solution of the silver sprayed with a good atomizer over the whole vaginal surface. The force of the atomizer causes the fluid to come in contact with the vaginal folds much more thoroughly than is possible by simple applications, and makes the stronger solutions unnecessary. This treatment is repeated once a day until the pain is relieved, after which the so-called "dry treatment" of Engelmann is to be substituted for it. This consists of various preparations of powder sprinkled upon dry tampons, which are inserted in such a way as to keep the opposing vaginal walls separated. For this purpose I prefer iodoform one part to boric acid five parts. The tampons should not be worn longer than twenty-four hours, when they are removed, the vagina washed with a douche of warm water and borax (a drachm to the quart) and new ones substituted. The treatment is persevered in until a cure is accomplished. This simple method has proved more useful in my hands than any other yet experimented with.

Skene prefers a powder composed of equal parts of prepared chalk and subnitrate of bismuth.

Granular vaginitis is the most obstinate of all forms to treat, but when it occurs as a complication of pregnancy it usually terminates with the pregnancy. Montgomery recommends the thermo-cautery for the purpose of destroying the papillæ. Unless used with the utmost caution this strikes me as a dangerous expedient.

The parts should be kept clean and the opposing vaginal walls separated by tampons of borated cotton medicated with the iodoform and boric acid powder.

In emphysematous vaginitis no treatment, other than cleanliness, is called for. In the vesicular form the cysts should be punctured and their bases touched with the compound tincture of iodin.

Levy treats vaginitis by means of electricity, the annode of a galvanic current, filled with salt water, being introduced into the vagina. He uses a current of from twenty-five to eighty milliampères twice a week.

When any of the varieties of vaginitis become chronic and there is much relaxation of tissue, applications of tannin and alum are often decidedly beneficial.

Therapeutics of Vaginitis.

Aconite.—Non-specific vaginitis resulting from cold, especially in

the beginning of the attack; painful urging to urinate; the vagina is hot, dry, and sensitive.

Belladonna.—*Shooting pains in internal organs at every step;* dryness of vagina, with burning and stinging; URGING, AS IF EVERYTHING WOULD BE FORCED FROM THE VULVA; aggravated by sitting bent and walking; ameliorated by lying down and sitting erect; *fever with marked cerebral symptoms.*

Mercurius cor.—*Inflammation of vulva;* vagina swollen, red, hot, with discharge of watery mucus, then of mucus tinged with blood; forcing downward as in labor; slight hemorrhage from vagina.

Cantharis.—*Swelling of vulva and vagina, with irritation;* burning in vagina and vulva, with a thick, white discharge; *swelling of neck of uterus, with burning in bladder;* DYSURIA; pruritus of vagina; menstruation too early, with great soreness of breasts.

Sepia.—*Soreness of labia, perineum, and between thighs, with redness;* yellow leucorrhea, ACRID BEFORE MENSES, WITH SORENESS OF PUDENDA; *purulent leucorrhea;* symptoms of pressure as if everything would protrude from the vulva, *with all-gone sensation at pit of stomach.*

Hydrastis Can.—Chronic specific vaginitis associated with ulceration of the cervix and prolapse of the uterus; *thick, tenacious leucorrhea;* vaginitis is associated with great prostration and palpitation, or with derangement of the liver, giving rise to constipation, hemorrhoids, etc.

Kreosote.—ITCHING AND SMARTING IN THE VAGINA, WORSE AT NIGHT; GENITALS SWOLLEN AND HOT; ON URINATING, SORE PAINS IN VAGINA; *voluptuous irritation deep in vagina;* white discharge from vagina preceded by pain in small of back; yellow leucorrhea staining linen, with weakness in legs; *great acridity of leucorrhea, which causes itching and biting of external genitals.*

Arsenicum.—Shooting pains from the abdomen into the vagina, with profuse yellow, corroding leucorrhea; sudden profuse discharge of dark blood from vagina; menses too early and too profuse, or pale and scanty; PROSTRATION AND EMACIATION.

Calcaria carb.—*Scrofulous diathesis;* MENSTRUATION TOO EARLY AND TOO PROFUSE; general weakness with exaggerated desires; constant aching in the vagina, profuse leucorrhea like milk; burning in labia before menstruation; discharge of bloody water from vagina in elderly women, with pain in small of back, as if menses would appear.

Helonias.—Offensive leucorrhea; very little exercise tends to produce a flow of blood; vaginitis with uterine prolapse and a sensation as though there were a heavy weight over the chest, on the sternum, or

a feeling as though the chest had been gripped in a vice (Farrington); persistent itching about the genitals, with or without the formation of blisters or sores; aphthous vaginitis and erythema of external genitals (L. L. Danforth).

Thuja.—Extreme sensitiveness of vagina; mucous leucorrhea; cauliflower excrescences, bleeding freely; condylomata which are moist, suppurating, and give rise to an exceedingly offensive discharge.

Sulphur.—Menses too late, of short duration, or suppressed; bearing down in vulva toward genitals; leucorrhea of yellow mucus, corroding and preceded by pains in abdomen; tendency to eruptions.

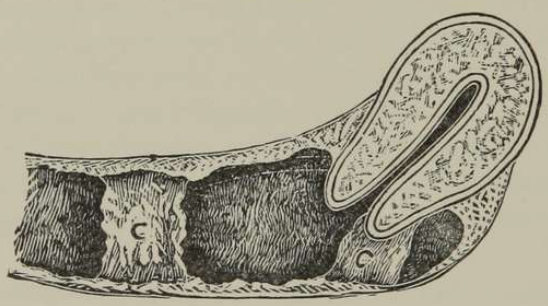
Consult:—**Rhus tox.**, conium, kali carb., croton tig., cimicifuga, *gelsemium*, and kali mur.

CHAPTER XXVII.

SENILE OR ADHESIVE VAGINITIS.

General Considerations and History.—Dr. Alfred McClintock, at the June, 1870,* meeting of the Dublin Obstetrical Society, presented a paper entitled "Senile Contraction of the Vagina," in which he describes certain pathological changes corresponding to those resulting from the type of inflammation designated by the title of this chapter.

FIG. 102.



SECTION OF VAGINA; *c*, *c*, Cicatricial Bands.† (*Wood.*)

Dr. McClintock first refers to the frequency of contractions, contortions and occlusions of the vagina resulting from cicatrices and adhesions. These sequelæ of inflammation and sloughing of the vagina are familiar to all practical gynecologists and obstetricians, as are also those minor forms of contraction resulting from projecting transverse folds, which present to the finger a sharp, crescentic edge like that shown in Fig. 102.

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* Dublin Quarterly Review, vol. L., p. 17.

† The patient from whom this illustration was taken presented herself at my clinic with complete laceration of the perineum, the rent in the recto-vaginal septum extending to the first cicatricial band. Before the laceration could be repaired I found it necessary to overcome the contractions by cutting them and dilating the vagina. My object in presenting this cut is to show, by contrast, the difference between this not unusual form of contraction and cicatrization and the rarer types seen in Figs. 103 and 105, which McClintock and two or three other writers have described under different names.

In the paper referred to, the writer next reminds the reader of the well-known fact that the upper part of the vagina is, normally, both capacious and distensible. In both married women and in virgins the finger can be passed freely into all of the fornices, between the cervix and the vaginal walls. In the peculiar form of vaginitis under consideration the conditions are quite altered. "There is," says McClintock, "a progressive diminution of the caliber of the vagina—not throughout its entire extent—but commencing at its summit and slowly advancing downward. When the contraction has reached the level of the os tincæ, the introduction of the finger into the vaginal cul-de-sac around the cervix becomes quite impossible, this part (cervix) being so closely embraced by the broad, ribbon-like structure. With the persistent increase of the constriction the os and cervix become quite encapsulated, and beyond the reach of touch or sight. The foramen through the stricture, in two of my cases, was so small as barely to admit a probe, and might very readily have been mistaken for the os uteri itself. How much lower down this process of contraction may extend I cannot at present say, the cases which have longest been under my observation being married women, and I should imagine that sexual intercourse would tend to hinder or retard the progress of the contraction downward."

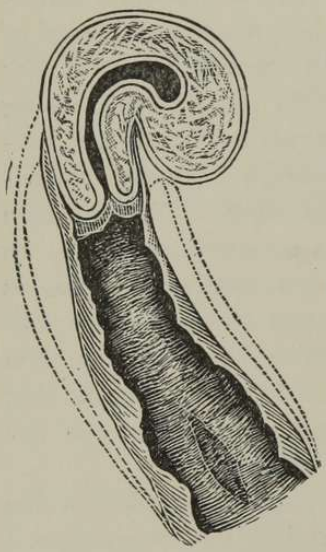
Simpson,* in a chapter devoted to "Closure and Contraction of the Vagina as a Result of Inflammation, and Independently of Pregnancy," introduces his subject by describing, first, those forms of vaginal inflammation occurring oftener in children, and which result in contraction and closure of the canal at its lowest point. This form of inflammation is also frequently met with and is easily recognized. I desire, nevertheless, to quote in detail from Simpson: † "You may meet likewise among adults with cases of a kind of adhesive or obliterative vaginitis of an analogous type. But the disease in adults differs from the disease in infants in one or two important respects. In infants the inflammatory closure is usually limited to the very orifice of the vagina, and produces complete occlusion of the canal. In adults it generally commences at the upper part of the vagina, and spreads gradually downward, and seldom causes complete closure. In infants there is commonly cohesion merely of the opposed sides of the orifice of the vagina, without any tendency to circular contraction in the caliber or circumference of the orifice. In adults, on the contrary, a state of in-

* "Diseases of Women," vol. III, p. 269.

† *Ibid.*, p. 260.

flammatory cohesion and obliteration is almost always attended with a simultaneous tendency to circumferential contraction of the canal at the site of the disease, so that when it is limited, as it often is, to the top of the vagina, the os uteri is felt drawn up, as it were, to the apex of a narrow, conical, or funnel-shaped cavity. * * * There is evidently a tendency in some rare cases to the occurrence of obliterative inflammation of the uterine canal itself; for in the instances I refer to you may open up the canal repeatedly with the uterine sound, and yet the patients will occasionally come back to you with perfect amenorrhea, and when you pass the sound along the canal you will have the sensation imparted to you of the instrument separating the adherent surfaces, just as you can feel the adhesions of the vagina separating under the pressure of the finger."

FIG. 103.



CONTRACTED VAGINA. Dotted line showing normal outline of Vagina. (*Wood.*)

McClintock's paper was published in 1870. Simpson's work was not issued until 1872, but the editor, A. R. Simpson, states, in his preface, that "the greater number of lectures contained in this volume appeared in the *Medical Times and Gazette* during the years 1859–1861." Whether or not this particular lecture was published at the time I do not know. At any rate, McClintock makes no reference to it in his paper. I have thus quoted somewhat at length from these two writers, because they are the only ones in the whole range of literature which I have traversed who give anything like a comprehensive description of the peculiar and not altogether rare condition under consideration.

Prof. A. J. C. Skene presented in 1877 a most admirable essay to the American Gynecological Society on "Cicatrices of the Cervix Uteri and Vagina."* In it the author deals especially with those forms of contraction occurring below the fornix vaginæ which result usually from parturition. Three clinical cases are recorded by Skene, one a nullipara who had during childhood what was supposed to be a "typho-malarial" fever, followed by pelvic inflammation and abscesses—a point worth noting in connection with the cases whose records I shall present. In this essay no mention is made of McClintock's and Simpson's arti-

* Transactions, vol. 1, p. 91.

cles; nor does Skene in his later work* have anything to say of "adhesive vaginitis."

Bedford,† in a series of clinical cases, describes adhesions of the upper portion of the vagina caused by the unskillful use of instruments, but an analysis of these cases shows them to be not unique in their pathology.

May,‡ evidently deriving his information from Fritsch, dismisses the whole subject in six lines.

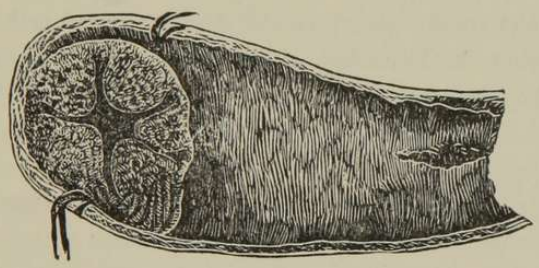
Tilt§ refers to "vaginal contraction" as a result either of traumatism or chemical irritants, but says nothing more.

Sims|| treats of certain unnatural conditions of the vaginal vault, either congenital or acquired, giving rise to sterility, but he conveys to the reader no definite idea of the peculiar vaginal deformity under consideration.

Fritsch,¶ on the other hand, evidently looks upon the lesion as a pathological entity, giving a brief but very good description of it.

Byford's** description of vaginal cicatrices is confined to those varie-

FIG. 104.



THE RIGHT AND ANTERIOR FORNICES OBLITERATED, THE LEFT FREE. (*Wood.*)

ties where there is a "frenum-like projection in the vaginal walls," such as is depicted in Figure 102.

Hart and Barbour†† say: "The cicatricial contraction of the vagina observed after the menopause is due to senile vaginitis. The epithelium

* Diseases of Women, 1889.

† Clinical Lectures on Diseases of Women and Children, pp. 347 and 379.

‡ Manual of Diseases of Women, p. 79.

§ A Handbook of Uterine Therapeutics, p. 241.

|| Clinical Notes on Uterine Surgery, p. 342.

¶ Diseases of Women, pp. 96 and 98.

** The Practice of Medicine and Surgery, Applied to the Diseases and Accidents Incident to Women, 2d Edition.

†† Practical Manual of Gynecology, p. 495.

is shed in patches, and the raw surfaces thus produced adhere together (Hildebrandt). This process is similar to that which produces occlusion of the cervical canal after the menopause."

Southwick, * in his schema of the several varieties of vaginitis, briefly refers to the senile or adhesive, asserting that "there may be no subjective symptoms whatever."

Breisky † has a very interesting chapter upon "Acquired Atresias and Stenoses," and refers to Simpson's article. He offers no observations of his own bearing upon senile vaginitis.

Cowperthwaite ‡ gives in substance the brief reference to the condition made by Hart and Barbour, quoting indirectly Hildebrandt's article.

Winckel, || under the head of "Senile Changes of the Uterus," says:— "With the approach of the menopause the uterus begins gradually to decrease in size; at the same time the fornices of the vagina become shorter and narrower and are finally obliterated. The vaginal vault becomes narrowed, thus giving the vagina a funnel shape as it approaches the cervix. * * * The lips of the external os and the mucous membrane of the internal os lie firmly together, thus preventing the free exit of the secretion, which abundantly accumulates first in the cavity of the fundus, next in the cavity of the cervix, and finally in the narrow vault of the vagina." Winckel gives several interesting illustrations taken from photographs of post-mortem specimens. These, however, do not show the characteristic vaginal changes of the affection under consideration.

The more recent works on gynecology, published since 1894, do little more than allude to the form of vaginitis under consideration. It is this paucity of literature bearing upon the subject that has led me to quote freely from the two or three writers who have given it some consideration I am confident that the condition gives rise to more post-climacteric suffering than is ordinarily supposed.

Diagnosis and Prognosis.—There may be some difficulty in differentiating the affection from malignancy. Indeed, such an error is recorded by Byford, and I have had several cases brought to me who were supposed to be the victims of cancer. The history of the case, the duration of the pelvic symptoms, and the local condition described, should be noted in forming a diagnosis. By carefully observing the peculiar funnel-shape of the vagina, the obliteration of the fornices and

* Practical Manual of Gynecology, p. 115.

† Diseases of the Vagina, p. 264.

‡ A Text-Book of Gynecology, p. 98.

|| *Die Pathologie der Weiblichen Sexual-Organe*, 1881.

the absence of involvement of the surrounding tissues, senile vaginitis should not be mistaken for malignancy. There are no features of the lesion suggesting an unfavorable prognosis so far as life is concerned; it may, nevertheless, prove a most obstinate one to treat.

Etiology and Pathology.—In 1870 McClintock wrote: "Although years have elapsed since I recognized this state of the vagina as a distinct lesion, I can give but a very imperfect account of it. I know nothing of its etiology, nor have I had an opportunity of making an anatomical examination of the parts affected, so that I am equally ignorant of its pathology."

Even in the light of our present knowledge, we can speak positively concerning neither the etiology nor the pathology. It is worthy of note, however, that in two of my own cases, which I append, and in one case recorded by Skene, serious pelvic symptoms dated from an attack of continued fever. There is abundance of corroborative testimony showing that any low fever may cause alarming vaginitis with cicatricial contractions lower down in the canal. White and Nélaton have traced such contractions to cholera; Scanzoni, Hening, and Richter to acute exanthemata; Martin, L. Mayer, and Bohm to typhus. The history of a low or continued fever of any kind should not, therefore, be lost sight of in looking for etiological factors, though a larger series of cases than has yet been recorded will be required to determine this point, and the cause will, in many instances, remain obscure. If, in the cases presented by myself, the disease was the sequel of fever, the term "senile" vaginitis is clearly a misnomer. On the other hand, it is hard to explain why, in advanced age, the vaginal fornices should take on inflammatory action when all forms of irritation are wanting. Fritsch* observes that cervical catarrh has complicated every case of *vaginitis adhesiva* seen by him. It is well known, too, that the layer of pavement epithelium becomes gradually thinner as age progresses, thus facilitating an extension of the catarrh from the cervix to the vagina.

The inflammation may be universal or circumscribed. In either event granulating surfaces form in the vaginal fornices which cause them to adhere to the cervix. In this way "the vaginal portion may partially adhere to the fornix, so that isolated cords can be felt; or totally, so that the vaginal portion cannot be felt at all." (Fritsch.) Hildebrandt observes that very similar adhesions may occasionally result from ulcerative vaginitis, and where they are firm it is probable that a more destructive process than mere abrasion has existed. Again,

* *Op. cit.*

it would hardly be possible to have the degree of contraction shown in Fig. 103 without secondary cellular infiltration (Ziegler) into the connective tissue of the mucosa, and often, also, of the sub-mucosa. The existing conditions are difficult to explain on any other hypothesis. (Fig. 105.)

FIG. 105.

SENILE OR ADHESIVE VAGINITIS. (*Ruge.*)

Treatment.—There is but little said in the limited literature concerning the management of adhesive vaginitis. The following principles of treatment should be observed:—

1. If the morbid process has given rise to no distress or inconvenience, let it alone.

2. If there is cervical occlusion with uterine tenesmus and general pelvic distress, the stenosis should be overcome.

3. Subdue the existing inflammation and promote absorption of cellular infiltration: (*a*) by the hot douche; (*b*) by the medicated cotton-wool tampon; (*c*) by galvanism, with the negative pole direct.

4. Separate adhesions with the finger, knife, or scissors, when the cicatrices interfere with the functions of the bladder or the bowels, or when *dyspareunia* becomes a prominent symptom.

5. Control reflex and constitutional symptoms with the indicated remedy.

I have no doubt that many women go for years with senile vaginitis without suffering any inconvenience. It is a great mistake, however, to act upon the assumption that because a woman has passed through "the change of life" her pelvic organs no longer require attention. The following cases I record for the purpose of showing the systemic disturbance which may arise from the disease under consideration. In married women the changes incident to it are especially liable to cause dyspareunia.

Illustrative Cases.

CASE I.—A maiden lady, 52 years of age. Never has been strong. Commenced to menstruate at 13, but was very irregular until 16, for which irregularity she frequently took "tansy tea." Until the age of 20 she had frequent attacks of epistaxis, and has occasionally bled from the nose since that time. During her girlhood hysteria was a frequent symptom, particularly before or during the menstrual period; the hysterical explosions were not infrequently followed by decided choreic manifestations, implicating the head, face, and upper extremities. Her menses were fairly regular until the age of 35, at which time she had an attack of what her physician called "typho-malarial fever." Her menses were always more or less scant, and were attended with a good deal of pain. She ceased menstruating two years ago. Her attending physician during the attack of fever was a "Thomsonian." He administered a powerful lobelia enema which excited the most aggravated retching and vomiting, the patient declaring that she vomited some of the injection. At any rate, the prostration following this heroic treatment was both profound and alarming, and she got up from a lingering illness with much pelvic distress. From that time on there has been an aching, pressing, bearing-down sensation in the pelvis, with dysuria, hemorrhoids and prolapse of the rectum. Indigestion from girlhood has troubled her much, there being times, lasting for days or weeks, when the stomach will immediately eject everything. These attacks of vomiting have recurred at variable intervals up to the present time. The food is vomited undigested soon after eating and with but little retching. There is at all times a great feeling of satiety after a few mouthfuls have been swallowed. The patient is very nervous, suffering much from occipital headache, flushes of heat, and insomnia, the latter symptom being aggravated by the menace and worry incident to the care of a large estate. Upon making a local examination I found the condition represented in Figure 103. As the finger passed into the vagina there was no perceptible induration to the touch, such as is found in constrictions following inflammation with decided cellular infiltration or sloughing (Figure 102). There was, however, a decided narrowing of the caliber of the vagina, this narrowing being much more marked at the os tincæ than below, so that the canal was funnel-shaped. The fornices of the vagina were entirely obliterated, and the cervix could not be found. Owing to the necessarily unsatisfactory bimanual I at first thought that the uterus was absent. Upon introducing a small virgin speculum (Nott's) the entire

surface of the vagina was seen to be intensely red and congested. A fair idea of the degree of contraction present at the cervix can be had when it is stated that the blades of the speculum could not be separated more than half an inch. There was a small opening corresponding to the external os, but the cervical canal proper was entirely obliterated. Subsequent treatment reduced the tenderness and inflammation so that I succeeded in opening the canal, hoping thereby to relieve the tenesmus and bearing-down sensation. The parts have, under the treatment outlined, improved greatly, and the small infantile cervix has been freed from its encapsulation. I should have added that the uterine body is unnaturally small and anteflexed.

CASE II.—Mrs. C., æt. 52, and the mother of 10 children. This patient presented herself at the clinic of Prof. D. A. McLachlan, on February 8, 1889. Her father died of phthisis, and her mother of cancer. She has three sisters and four brothers, all living. She, also, has dyspeptic trouble dating back to early childhood, for the relief of which she came to Ann Arbor. There is a history of typhoid fever in early life, though the stomach trouble existed before the onset of the fever. Her indigestion frequently gives rise to vomiting, and there is, and has been for years, a persistent acidity of the stomach with water-brash. There is much flatulence with faintness, and an all-gone sensation at the pit of the stomach. Menstruation ceased three years ago. She suffered much from dysmenorrhea, and has had for years marked pelvic distress. I was requested to make a local examination, and found what is very accurately depicted in Figure 104. The upper and right fornices were not obliterated, though not as deep as normal; the lower and left were, on the contrary, entirely effaced by the gluing together of the opposed mucous surfaces. The os tincæ was somewhat dilated, and the cervix had suffered a stellate laceration. The vagina was much narrower than normal, though not as small as in Case I. I could not get a good view of the parts with the speculum, but there was much redness and congestion. The patient returned to her home in the interior of the State, and it is not likely that another opportunity for an examination will present itself.

CASE III.—I regret that I cannot furnish full notes of this case. The patient, a woman 55 years of age, was sent to me for examination by Dr Mary E. Havens, of St. Johns, Michigan. She had given birth to a number of children, and there was much mental and nervous trouble, symptoms of insanity causing her friends much anxiety at times. She came to me with an attendant. There was a history of "inflammation of the bowels," which was probably peritonitis. There was also a bad

leucorrhea, and the patient complained much of stinging, burning pains in the region of the uterus and the ovaries. An examination revealed the vagina shaped not unlike that shown in Figure 103, with an evident bilateral laceration of the cervix. Her physician informed me, some twelve months after my examination, that the local condition had quite disappeared under treatment, and the patient had greatly improved both mentally and physically.

CHAPTER XXVIII.

ACUTE INFLAMMATORY DISEASES OF THE UTERUS, THE UTERINE APPENDAGES, AND OF THE PELVIC PERITONEUM AND CELLULAR TISSUE.

My experience as a teacher of gynecology convinces me that there is nothing more confusing to the student of medicine than an attempt to follow the ordinary text-book classifications of the various inflammatory affections of the uterus and its surrounding structures; and my experience as a practitioner of gynecology is that the time-worn classifications and divisions, while serving a very good purpose on paper, are frequently valueless at the bedside. Acute inflammation of the uterus, were it ever confined absolutely to the endometrium or the parenchyma of the organ, would require practically the same treatment in either event, and, indeed, the treatment of acute endometritis and metritis is not essentially different from that of acute cellulitis and peritonitis. There is in most instances a blending of the pathology of the various acute inflammatory affections of the pelvic organs; and, so far at least as the subjective phenomena are concerned, there is likewise a blending of the symptoms. It is this fact which is so confusing to the ordinary student. In studying in succession (and as distinct and separate lesions) acute and chronic metritis, acute and chronic endometritis (cervical and corporeal), salpingitis, ovaritis, cellulitis, and peritonitis, he becomes utterly swamped in the uncertainty of differentiation. I maintain that this method of teaching is illogical and unscientific. The teacher or author has no right to expect from the student of medicine more than can be done by himself at the bedside. I therefore deem it more practicable to classify the inflammatory affections of the uterus and peri-uterine structures according to the acuity or chronicity of the symptoms which characterize them, believing both clinical manifestations and pathological blendings justify such a classification. It is for this reason that I have grouped together the several affections embraced in this chapter.

Acute Metritis and Endometritis.

Metritis and *endometritis* are the terms used to designate respectively inflammation of the parenchyma of the uterus, and of its lining membrane or endometrium. In most of the text-books these disorders are treated of as separate and distinct, and yet, when so dealt with, a comparison of the symptoms of the two affections will show a similarity making them indistinguishable the one from the other, even on paper.

The anatomy of the uterus is peculiar, and the relationship of the mucous membrane to the underlying muscular structure differs from that of mucous membranes in general. The mucous membrane is, first of all, more dense in character, and it is not separated from the parenchyma by the layer of areolar tissue which underlies most mucous surfaces. Again, the numerous glands which go to make up the mucous membrane are imbedded more or less in the muscular layer. Acute inflammation of the endometrium will, therefore, inevitably implicate the uterus proper; and, conversely, acute metritis cannot run its course without involving the endometrium to a greater or less extent—hence the absurdity of studying the two conditions as distinct affections.

Causes.—Any of the following causes may give rise to the inflammation: Sepsis resulting from parturition or miscarriage; traumatism resulting from instrumental interference or from immoderate coitus; menstrual suppression; extension of inflammation from the vagina, especially when of gonorrheal origin; exanthemata.

Sepsis is undoubtedly the most frequent cause, and the inflammation resulting from it may be of the most virulent character. In the larger number of instances it is due to improper management, either on the part of the physician or the patient, during parturition or miscarriage. Retained membranes or clots soon become putrid and set up inflammation with absorption of septic matter; or the source of sepsis may be the débris resulting from an effort to remove fibroids. In miscarriages inflammation is often induced by getting up too soon. It will require another decade to educate the laity to the necessity of proper caution after miscarriages. The average woman imagines that early abortions require but a short period of rest, and, accordingly, she gets on her feet while the uterus is yet heavy and congested. In this state it is only a step to actual inflammation; and, if clots or membranes have been left behind, sepsis frequently supervenes.

The next most frequent cause is gonorrhea (*v.* Chapter XXVI).

Non-puerperal inflammation of the uterus, except when of specific

origin, rarely runs so intense a course as does the puerperal form of the disease. As a complication of the exanthemata it may, however, be very severe. Some women seem peculiarly prone to the difficulty, even the introduction of the uterine sound giving rise to metritis. This is probably because of pre-existing chronic inflammation; or because the instrument creates an avenue for the entrance and multiplication of germs, the diseased tissues offering but feeble resistance.

Pathology.—The essential pathological changes are: Great hyperemia of the endometrium, which becomes swollen and softened as a result of edema; infiltration of the uterine tissues with ecchymoses and, occasionally, small deposits of pus between the muscular fibers; and involvement to a greater or less extent of all of the uterine veins and lymphatics. A large accumulation of pus in the uterine wall is of exceedingly rare occurrence, though such a case is recorded by Tait.*

Symptoms.—The disorder gives rise to symptoms of varying intensity, depending largely upon the cause, and the extent of tissue involved. In non-puerperal cases, and especially in those due to an extension of the disease from the vagina, the symptoms are not usually urgent. A slight chill ushers in the attack, which is followed by a moderate increase of temperature. The patient will complain of a throbbing pain in the hypogastric region, together with more or less weight and bearing down. The bowels and bladder may become implicated, giving rise to more or less tenesmus and dysuria. On the whole, the constitutional symptoms are not severe, and the disease frequently passes into a chronic form without arousing serious apprehension on the part of either the physician or the patient.

On the other hand, when the cause is septic and the inflammation is puerperal in its origin, it is of most serious import, and, indeed, often fatal. The initiatory chill is marked and is followed by high temperature, rapid pulse, and much local tenderness. The lochia and milk become suppressed and the whole system is profoundly shocked by the septic invasion. The patient often complains of great pain in the back, which radiates to the groin and thighs. The disease frequently involves the peritoneum, when there will be much distension and tenderness with nausea and vomiting. The characteristic *peritoneal facies* presents itself, the breath is of a peculiarly sweetish and sickish odor, the prostration becomes more and more profound, and death only too often results.

Cases of gonorrheal origin may run an equally virulent course.

* "Diseases of Women and Abdominal Surgery," p. 122, 1889.

In the non-puerperal cases the discharge is first thin or viscid, but in the course of several days it becomes muco-purulent or purulent. Not infrequently it is exceedingly excoriating and, especially if there be a septic tinge, offensive.

A *physical examination* will reveal at first dryness and heat of the vagina with tenderness of the cervix. The uterus is large and heavy. If it can be gotten between the two hands this increase in size and weight is very perceptible.

Differentiation.—There is but one pathognomonic symptom of uncomplicated acute metritis and endometritis which will serve to distinguish them from pelvic cellulitis and peritonitis, namely, *swelling and tenderness of the uterus with mobility of the organ.* It is the height of nonsense to affirm, as is done by so many authors, that the constitutional symptoms of puerperal metritis are not so marked as those of pelvic cellulitis and peritonitis. I have many times observed in metritis symptoms infinitely more profound than those resulting from non-puerperal peritonitis and cellulitis, and when it is remembered that metritis is often complicated by para-and periuterine inflammation the uncertainty is increased beyond all differentiation by subjective phenomena alone. I admit that cases of metritis, cellulitis, peritonitis, etc., are occasionally met with, running a course sufficiently distinct and characteristic to enable the attendant, by the aid of both the clinical history and a *thorough physical exploration*, to determine the organ or tissues chiefly involved, and for this reason I shall soon introduce a differentiating table. Unfortunately, thorough physical exploration is the last thing to be thought of in dealing with severe pelvic inflammation of an acute character. While granting that refinement of diagnosis is something always to be desired, in the several acute affections now under consideration it is useful as a means of determining the prognosis rather than as a guide for treatment.

The **prognosis** will depend entirely upon the character and extent of the inflammation. In the milder attacks of non-puerperal metritis it is favorable, though the patient is often left with a chronic endometritis which may continue almost indefinitely. On the other hand, septic metritis and endometritis are always of serious import, and, if associated with the puerperium, frequently result fatally. The prognosis is, of course, modified by existing complications, especially involvement of the periuterine structures.

Acute Pelvic Cellulitis and Peritonitis.

Since the days of Morgagni, who first attracted attention to pelvic

peritonitis by placing on record a case in which adhesions were found, post-mortem, between the right ovary and tube and colon, and the days of Doherty and Marchal de Calvi, to whom we are indebted for the first intelligent description of pelvic cellulitis, there has existed the greatest confusion regarding these two disorders. As in acute inflammation of the uterus and its lining membrane, we have two structures which, though histologically different, are in such close contiguity as to make it impossible for the one to become involved in the inflammatory process without implicating, to a greater or less extent, the other also, and, indeed, all of the pelvic organs—hence the confusion. I grant that in studying these diseases from the standpoint of pathology we find abundance of evidence showing that acute inflammation may spend its greatest force upon either the pelvic cellular tissue or its investing serous membrane. Furthermore, I grant that, when this is the case, the clinical picture may be such as to enable us to determine which structure is chiefly involved. All this is desirable from the standpoint of pathology and diagnosis, but I contend that the two diseases are so often blended as to make this knowledge of but little value to the clinician. The fact remains that, when the clinician goes to the bedside of a woman suffering with acute inflammation of any of the pelvic organs, he is confronted with a condition which demands of him certain duties: first, he is required to determine the *cause* of the mischief and remove that cause as speedily as possible; secondly, he is to contend with the expressions of the disease to which the cause has given rise. The same cause may in one instance result in metritis, while in the next it may give rise to cellulitis, peritonitis, or involvement of all of the contents of the pelvis.

We may, then, be unable to determine the exact pathological changes that have taken place within the pelvis, but, from the standpoint of treatment—and the chief aim of the physician is to cure disease that he cannot prevent—this is not important. In making this statement I am not drawing deductions solely from my own school of medicine, for, in comparing the treatment of the several diseases under consideration given by the principal writers of the older school, it will be found that each practically observes the same principles of treatment in dealing with all forms of acute pelvic inflammation.

Modern abdominal surgery has taught us much regarding pelvic inflammation. I have more than once opened the abdomen expecting to find this or that product of inflammation, only to discover that an entirely different lesion existed. I make this confession unblushingly, for such men as Tait, Bantock, and others of equal eminence, admit

the utter impossibility of determining, in the vast majority of instances, the actual changes resulting from pelvic inflammation before the abdomen is opened.

In dealing with the sequelæ of inflammation we can conduct the examination under the most favorable circumstances. We can, if necessary, paralyze the abdominal walls with an anesthetic and bring the pelvic contents within the grasp of the hands. It is, nevertheless, a notorious fact that, notwithstanding the resources permitted by the chronicity of the condition, certainty of diagnosis is often impossible. How utterly foolish it is, then, in the acute affections, in which we have to rely for diagnosis largely upon subjective symptoms, to affirm dogmatically that this or that tissue or organ is the one chiefly involved! Confusion will inevitably result from such teaching. The student may go to the bedside with a vivid recollection of the parallel differentiating columns given to him by his professor, but he will return from it with a full consciousness that clinical phenomena blend with an obstinate disregard for prescribed rules.

I cannot better illustrate the wide difference of opinion that prevails regarding pelvic cellulitis and peritonitis than by quoting, somewhat in detail, from two of the most popular text-books on gynecology published in the English language.* Much the same diversity of opinion prevails in the French and the German literature. Lawson Tait† says:—

"In the employment of the terms 'perimetritis' and 'parametritis,' as introduced by Virchow (who knew nothing of gynecology), and advocated by Matthews Duncan (who has never had his fingers inside the pelvis from above), we have had introduced a wholesale confusion into gynecology which will take many years of industrious work to get right. The confusion has been vastly aided by Dr Emmet's teachings about 'cellulitis.' If 'parametritis' and 'pelvic cellulitis' be relegated to their proper place—and they may be taken to mean the same thing—it is one of the rare conditions we have to deal with among the special ailments of woman. * * *

"Perimetritis is a much more fatal disease than is parametritis, and occurs with greater frequency in association with two particular conditions. These are parturition, either at the full time or prematurely, and gonorrheal infection. * * *

* In the chapter devoted to "Pelvic Inflammations," in the American Text-Book of Gynecology, Baldy has adopted practically the same classification observed by me in the first edition of this work. The American Text-Book and the first edition of this work came from the press during the same month.

† "Diseases of Women and Abdominal Surgery," p. 131, 1889.

"Before the light came that was shed on these ailments by modern abdominal surgery, I believed, as others did and do still, that parametritis, or pelvic cellulitis, was a common disease; and in my writings up to 1878 it is evident I confused cases of damaged uterine appendages with 'pelvic cellulitis.' The latter disease is rare, and occurs in two forms, depending for their characters upon the situation of the disease. If it is situated on the inner half of the broad ligament it is to be recognized as a mass lying close to the uterus and in front of it, between the uterus and the bladder, and into the bladder it generally bursts. If it exists in the outer half of the broad ligament it is to be recognized as an ill-defined mass, lying at the brim of the pelvis and fading off on that ridge. In this position it bursts over the brim of the pelvis and constitutes the familiar pelvic abscess, whose sinuses go on for years. Suppurating hematoceles of the broad ligament have similar endings. Rarely does the abscess open into the rectum, because it is generally situated far above the rectum and in front of it."

I next quote from Thomas and Mundé:—*

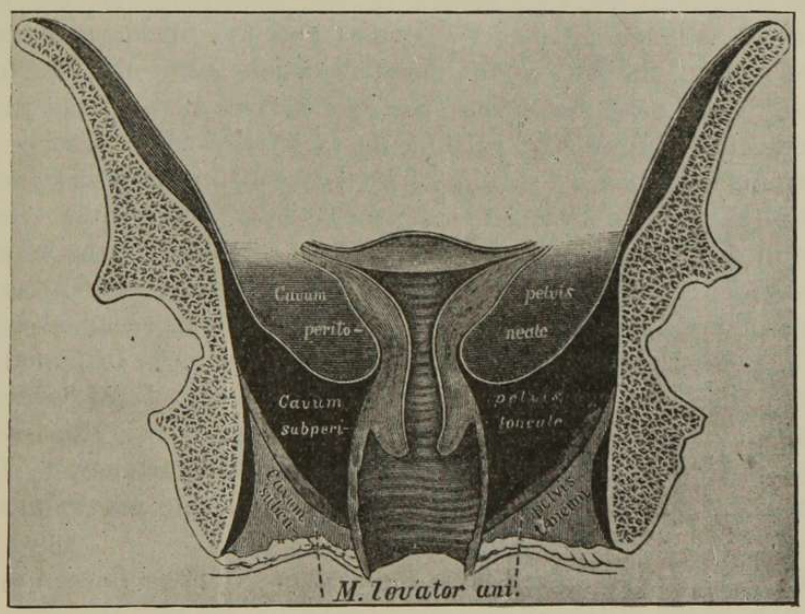
"It has become fashionable of late for many of our most enthusiastic and progressive laparotomists to deny utterly the existence of such a pathological condition as cellulitis, except in a few rare instances after parturition, and to assume that all cases of inflammatory exudations in the pelvis, with or without suppuration, are unquestionably intraperitoneal; that is to say, that *all* cases of pelvic peritonitis proceed primarily from the Fallopian tubes, and involve secondarily the ovary and the adjacent peritoneum. Pelvic abscess, as such, exist in the minds of these gentlemen only as a synonym for abscess of the Fallopian tube (pyosalpinx), ovary, or pelvic peritoneum, any one of which may, by adhesion and perforation, force its way into the pelvic cellular tissue, and thus simulate an abscess resulting from pelvic cellulitis. * * In our opinion inflammation of the pelvic cellular tissue, with its resultant consequences of dislocation of the uterus, pelvic abscess, and cicatricial induration, occurs independently by itself, as well as inflammation of the Fallopian tube, ovary, or adjacent peritoneum, with resultant purulent accumulation in these organs. * * Pelvic peritonitis and pelvic cellulitis are, in fact, independent and entirely unassociated diseases, just as pleurisy of one part of the lung may occur at the same time with an inflammation of the substance of the lung at another point."

The authors last quoted refer to the statistics of Bernuth, who has

* *Op. cit.*, p. 467.

recorded the results of "five autopsies by himself, and between twenty and thirty by others, which presented all the signs of pelvic peritonitis and none of cellulitis, although during life the symptoms and signs generally attributed to the latter disease were present." They, however, question the accuracy of a number of the cases quoted, but the doubt expressed only adds force to the argument which I am putting forth. In the first place we are presented, by so good an authority as Bernuth, with the record of a large number of autopsies in which, during life, all of the signs of pelvic cellulitis presented themselves and none of peritonitis; yet, according to Bernuth, the post-mortem revealed exactly the opposite condition in every instance, though Thomas

FIG. 106.



CROSS-SECTION OF PELVIS. (*Luschka.*)

and Mundé reject "a number of cases reported, because not sufficiently conclusive." If such uncertainty prevails in dealing with post-mortem cases, how ridiculous it is to study, in the living, pelvic peritonitis and cellulitis as entirely distinct affections.

I have been led, therefore, both by personal experience and by a careful survey of the literature, to adopt the plan of presenting conjointly to the student pelvic cellulitis (parametritis) and pelvic peritonitis (perimetritis), emphasizing this or that symptom which may

serve to indicate the tissues chiefly involved, and to treat of acute ovaritis and salpingitis as complications of general pelvic inflammation. Pelvic abscess, which may be a sequel of any form of acute inflammation, and diseases of the appendages, which, as a rule, are nothing more than complications and sequelæ of general pelvic inflammation, are discussed in separate chapters (Chapters XXXI. and XLVIII.). This is done solely because such division facilitates the study of these affections and not because they are disassociated, either etiologically, clinically or pathologically, with general pelvic inflammation.

Anatomy.—If the reader will refer to Fig. 12 he will find the peritoneum, as it is related to the pelvic organs, clearly outlined; and on page 55 will be found a description of the pelvic cellular tissue. Let the relationship of the two structures be borne in mind. The cellular tissue surrounds, in greater or less abundance, all the pelvic organs. It is found between the uterus and the bladder, the vagina and the rectum, the folds of the broad ligament, and in the iliac fossæ. It passes by continuity along the posterior surface of the psoas muscles and separates, in front, the peritoneum and transversalis fascia. It is most abundant between the folds of the broad ligaments; and least so between the peritoneum and the uterus in front and behind—its existence in these localities having been denied by some. In the language of Savage* it "fills up all that part of the pelvic cavity between the pelvic roof and the floor of the pelvis which is not occupied by the viscera, and is the sole bond of union between them." Its function is to steady the pelvic organs and to break the force of the jar which, without it, would be felt at every step. Through it the blood-vessels and lymphatics of the pelvis pass. The peritoneum is everywhere, except along the posterior surface of the psoas muscles, in intimate contact with it.

In Fig. 106 the peritoneal and subperitoneal cavities formed by this disposition of the cellular tissue and peritoneum are well shown.

Frequency and Causes.—Pelvic inflammation is of frequent occurrence, and may result from any of the following causes:—

Parturition;

Gonorrhea and extension of inflammation from the uterus;

Intrauterine and vaginal injections;

Mechanical injuries;

Operations on cervix, fundus, rectum, etc.;

Menstrual suppression;

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* "Female Pelvic Organs."

Rupture of ovarian cysts, extrauterine gestation cysts, perforation of the intestine, etc.;

Escape of blood from Fallopian tubes and ovaries;

Intraperitoneal surgical operations.

In by far the larger number of cases *parturition* is the predisposing cause. The reasons for this are obvious. Gestation has brought about a physiological hypertrophy of all of the tissues of the pelvis—the cellular tissue, peritoneum, blood-vessels, lymphatics, etc. The lymphatics are in a condition readily to absorb septic matter if avenues for the same be furnished, and the frequent lacerations incident to parturition furnish such avenues.

Primiparæ are more often the victims than women who have borne a number of children, for the reason that lacerations oftener occur in the former; and the bruising of the structures is greater. The disease has its beginning, in the larger per cent. of cases, on the left side, toward which the occiput is directed in the majority of births.

We thus see that the changes incident to child-bearing place the parturient in a state in which the reception of septic matter easily occurs and inflammation is readily excited. Improper care on the part of either the physician or the patient at this time may precipitate an attack of cellulitis or peritonitis. Uncleanliness is the curse of the lying-in room, and although modern antisepsis has done much toward diminishing the frequency of this form of "puerperal fever,"* uncleanliness is still a frequent source of infection. Indeed, all of the causes given in obstetric works, either heterogenetic or autogenetic, of the various forms of puerperal fever, may, under favorable conditions, give rise to the forms of inflammation now being discussed. Puerperal septic infection usually first attacks the uterus and then extends to the periuterine structures.

I have already, in the chapter devoted to vaginitis, dealt in detail with *gonorrhea* and its tendency to invade the pelvis. In the light of present evidence there can be no doubt that gonorrhea, starting in the vagina, frequently gives rise to disease of the tubes, and subsequently to peritonitis and cellulitis.

Intrauterine injections are so liable to result in mischief that many specialists have discarded them entirely. Unless used with the utmost care the fluid is liable to pass through the Fallopian tubes into the

* The Royal College of Physicians of England has abandoned the term "puerperal fever," and has substituted for it the terms, "puerperal cellulitis," "puerperal peritonitis," "puerperal metritis," "puerperal septicemia," "puerpera pyemia," etc.

peritoneal cavity. One of the sharpest attacks of inflammation with which I have had to deal came about in this way.

Vaginal injections immediately after coitus, for the purpose of preventing conception, are not infrequently responsible for severe and fatal cases of inflammation. Cold water at this time, and for the purpose mentioned, is especially harmful and should never be used.

Operations upon the cervix, fundus, rectum, etc., have more than once been followed by inflammation of the periuterine tissues higher up. The manner in which the broad ligaments extend down on either side of the cervix will readily explain why operations upon the latter, when not done aseptically, so often set up cellulitis in these ligaments. Even slight operations upon the rectum have resulted in fatal cellulitis.

Menstrual suppression, from undue exposure or otherwise, is an important etiological factor. It is but a step from the physiological congestion of menstruation to inflammation, hence the danger of an acute suppression.

Rupture of any pathological growth, or of the hollow viscera, into the peritoneal cavity, first gives rise to peritonitis and then to cellulitis, except in cases of Fallopian pregnancy, which primarily rupture into the folds of the corresponding broad ligament. In the latter event cellulitis is first established, though it may not be of serious import. Pelvic peritonitis is not infrequently excited by fluid which escapes from the fimbrinated extremity of the Fallopian tube. According to some authors pyosalpinx is the chief cause of pelvic inflammation. Instead of pus exciting it by escaping through the extremity of the tube, it may infect the peritoneum and the ovaries through the lymphatics.

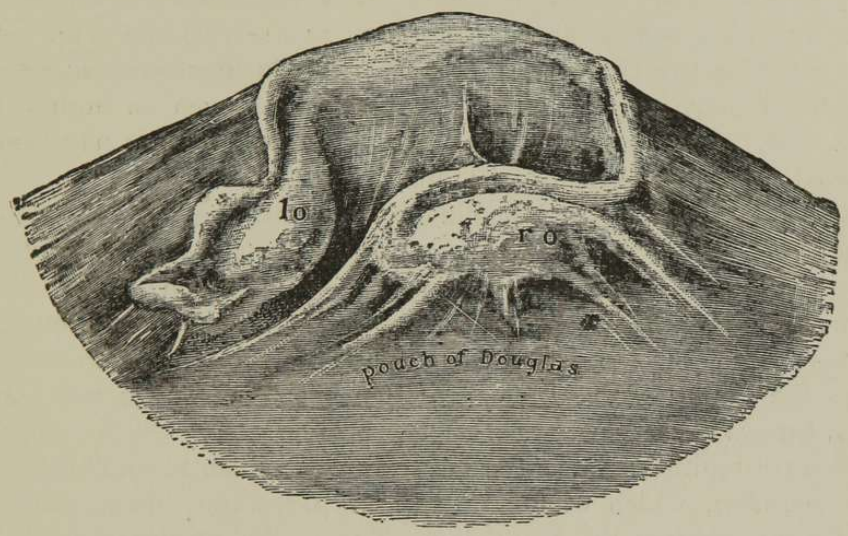
Blood may also find its way into the peritoneal cavity through the Fallopian tube, or by escaping from a ruptured Graafian follicle. The amount of irritation excited depends upon the nature and quantity of the fluid: if it is fresh and bland, the peritoneum, with its wonderful absorbing power, will take care of a large quantity of it without serious trouble; if, on the other hand, it proceeds from a contaminated uterine cavity, a very small amount may excite alarming peritonitis.

Pathology.—When the *pelvic peritoneum* is first attacked (pelvic peritonitis) the membrane becomes hyperemic, red, and dry. Sometimes the engorgement is so great as to produce a rough granular condition of the surface, with here and there a red punctate patch. This is the first stage.

In the second stage the engorgement is relieved by an exudation of lymph, plastic in character. It glues the opposing surfaces together and gives rise to firm adhesions; or the exuded lymph may be serous,

or sero-purulent, in character, gravitating into some of the pelvic pouches, usually into the Douglas cul-de-sac. In time this becomes consolidated into a firm, dense mass, matting together the pelvic organs and forming adhesions between them and the intestines. The pelvic cavity may be entirely cut off from the abdominal cavity proper by adhesions thus formed. (Plate IX, Fig. 2.) This condition is sometimes spoken of as encysted serous perimetritis.

FIG. 107.



OVARIES AND TUBES DISPLACED AND BOUND DOWN BY ADHESIONS. r. o., RIGHT OVARY; l. o., LEFT OVARY. (*Baldy.*)

These accumulations may remain indefinitely, distorting the pelvic cavities and impinging upon the various surrounding structures; or they may suppurate and burst either externally or into the rectum, vagina, or bladder. Rupture rarely takes place into the general peritoneal cavity.

Frequently the ovaries and tubes are buried in inflammatory exudates, and the fundus of the uterus, when the fingers are introduced from above, is difficult to locate. (Fig. 107.)

The foregoing are the usual changes. Certain modifications are, however, of frequent occurrence. In virulent septic cases, for instance, the fluid, instead of becoming adhesive, is flocculent and pultaceous, so that the adhesions, not being firm, readily break down. In the event of recovery, the fluid is absorbed. In all instances the areolar tissue is more or less involved.

In *pelvic cellulitis* we may also have three stages—congestion, exuda-

tion, and suppuration. Suppuration, though it occurs oftener than in pelvic peritonitis, by no means results in the majority of cases. If a digital examination be made soon after the onset of the attack, the swelling will be found soft and elastic. This intumescence is of short duration, and very soon the swelling becomes hard from pouring out of the serum. In the worst cases the tissues may slough, as occurs in anthrax or phlegmonous erysipelas.

The extent of the exudation is variable, as is shown in Figs. 1, 4, and 5, of Plate IX. It may be limited to a small tumor in one of the broad ligaments, which pushes the uterus to the opposite side; or it may dissect up the lateral attachment of the ligament, extending into the cellular tissue of the anterior abdominal wall, even as high as the diaphragm. Indeed, the cellular tissue of the entire pelvis may become involved, fixing all of the organs immovably.

If resolution ensues, the inflammatory exudates are largely absorbed, though there is left behind, in the majority of instances, a contractile fibrous deposit. This is cicatricial tissue, and, if in one of the broad ligaments, draws the uterus to the corresponding side, thus producing latero-version; or, if in the utero-sacral ligaments, the contraction draws the cervix backward and, providing the fundus is not bound down, throws the latter forward on the bladder.

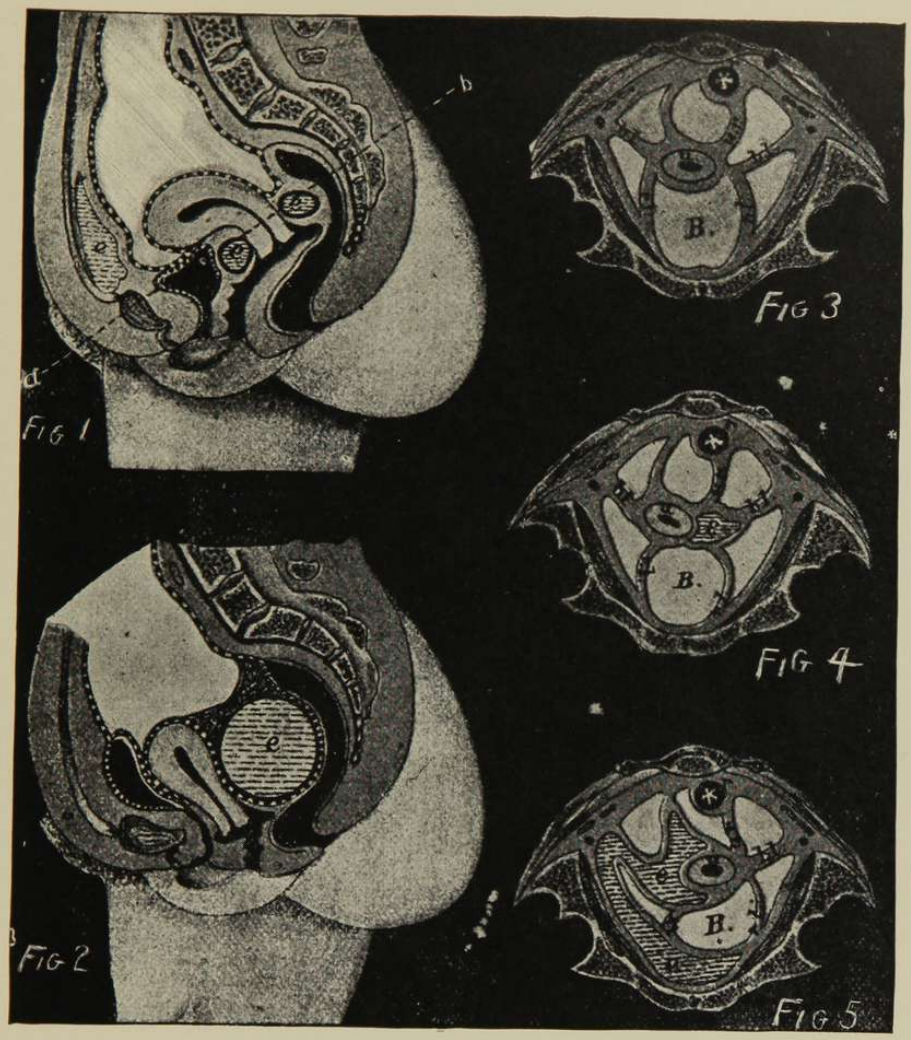
As in peritonitis, the tubes and ovaries are frequently implicated.

Suppuration, which occurs oftener in parturient cases, does not usually ensue before the tenth day. The extent of tissue destroyed varies greatly, so that the resulting abscess may be either circumscribed or large enough to fill the entire pelvis. The most frequent exit of the pus is above Poupart's ligament; next in order of frequency come the rectum, vagina, bladder, anus, and saphenous openings. As in peritonitis, rupture rarely occurs into the free peritoneal cavity.

In non-puerperal cases suppuration is the exception to the rule, and in most instances pelvic peritonitis and cellulitis run their course without the formation of pus. In puerperal inflammations, on the other hand, it is claimed that suppuration occurs in at least fifty per cent. of all cases. Again, let what has been said regarding the blending of the pathology of the two forms of inflammation be borne in mind. As I have endeavored to show, it is often impossible to determine, even after the abdomen is opened, whether we have to do with the sequelæ of peritonitis or cellulitis.

Symptoms.—Acute pelvic peritonitis and cellulitis give rise to certain symptoms sufficiently characteristic to call for careful consideration. I nevertheless warn the student that, if he rely implicitly upon

PLATE IX.



TOPOGRAPHICAL RELATIONS OF THE PELVIC PERITONEUM AND CELLULAR TISSUE, SHOWING SEATS OF EXUDATION. (*Fritsch.*)

Fig. 1. *Pelvic Cellulitis.*—Vertical section of pelvic organs, showing (*e*) exudation into the cellular tissue before and behind the uterus and into the anterior abdominal wall. *a–b* shows plane of transverse section in Figs. 3, 4, and 5.

Fig. 2. *Pelvic Peritonitis.*—Vertical section, showing (*e*) exudation in Douglas' pouch, separated from healthy peritoneal cavity by adhesions.

Fig. 3. *Transverse Section Through Normal Pelvis.*—*u*, Uterus; *r*, rectum; *b*, bladder; *u.-r*, utero-rectal ligaments; *r. l*, round ligaments; *b. l*, broad ligaments. Light spaces show sections of peritoneal pouches.

Fig. 4. *Pelvic Cellulitis.*—The same as Fig. 3, with small exudation (*e*) to left of broad ligament.

Fig. 5 *Pelvic Cellulitis* —The same with large exudation (*e*) in right broad ligament extending into the cellular tissue of the anterior abdominal wall, and distorting the pelvic peritoneal pouches.

any group of symptoms as pathognomonic of the condition, he will do so at the risk of being misled. I have more than once, in both clinical and private practice, met with cases in which the products of inflammation distorted all of the fornices of the vagina, though no history of inflammation could be elicited. And I remember seeing a patient in Leopold's clinic at Dresden whose entire pelvis was filled with an organized exudate, yet the woman, a fairly intelligent German, could not remember that she had suffered from anything more than an indefinable bearing-down sensation. Patients thus affected seek relief because of more or less local distress, when an examination will reveal, what the clinical history does not suggest, the existence of the products of inflammation.

There can be no doubt, then, that even a severe attack of pelvic peritonitis or cellulitis may run its course without giving rise to symptoms of sufficient intensity to attract attention to the pelvic organs. It may be that in many instances the patient forgets that at some previous time she suffered more or less pain and tenderness in the hypogastric region; or, possibly, the indisposition dates back to some confinement which, for reasons unsuspected at the time, kept her from convalescing as she should.

In other instances we may be able to ascertain that the patient has had an attack of so-called "inflammation of the bowels," possibly at or near the menstrual period, which was nothing more or less than some form of periuterine inflammation.

The symptoms which especially lead us to suspect acute pelvic peritonitis and cellulitis may be enumerated as follows:—

Chill;
Fever;
Pain;
Tenderness;
Vesical and rectal irritation;
Tympanites;
Peritoneal facies;
Nausea and vomiting.

The intensity of the *chill* is variable and is usually most marked when the cellular tissue is first attacked. The early symptoms of inflammation attacking structures of similar formation throughout the body are generally similar in character. Thus the characteristic chill of pneumonia is decided, while that of pleurisy is erratic and slight. In the first instance, we have in the lungs a structure not unlike the pelvic cellular tissue; while in the second, the pleura, which is a serous

membrane, corresponds to the pelvic peritoneum. Therefore when the peritoneum is the primary seat of inflammation the initiatory chill may be nothing more than a sensation of coldness, which is soon forgotten.

The *thermometric range* is quite as variable as is the chill. It may range from subnormal to 106° F., or even higher. In the worst cases of septic peritonitis it is sometimes subnormal, though as a general rule the higher the temperature the more serious is the attack. This is emphatically so if it remain persistently high, for long-continued elevation of temperature is in itself an element of danger. The temperature immediately following the chill usually ranges from 102°–104° F.; that of non-septic peritonitis is somewhat higher than non-septic cellulitis.

The *pulse* is a much more reliable indication as to the seriousness of an attack than is the temperature. The former ranges from 110–140, and may be full and compressible; or small and wiry—the characteristic peritoneal pulse. Great rapidity of the pulse is always an ominous symptom.*

The degree of *pain and tenderness* depends in large measure upon the extent of peritoneal involvement. It may amount to nothing more than a local distress or bearing-down sensation, or it may be so intense as to give rise to the most excruciating suffering. I have seen it so great as to make it almost impossible to quiet the cries of the patient even with full doses of morphia. It is usually worse when the ovaries and tubes are involved. The tenderness is often so great over the lower surface of the abdomen as to make contact of any kind intolerable. In peritonitis or bilateral cellulitis both thighs are drawn toward the abdomen, so as to relax the parts as much as possible. When the cellulitis is limited to one side the corresponding limb only is retracted.

Vesical and rectal irritation, when present, result either from direct involvement of the bladder and the rectum in the inflammatory process, from direct pressure upon them by the exudates, or from displacement caused by secondary retraction. There is no more frequent cause of dysuria than shortening of the utero-sacral ligaments by inflammation. The cervix is drawn backward and the neck of the bladder is so stretched that micturition becomes both difficult and painful.

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* This statement is not absolutely true in peritoneal surgery. In some of my cases of abdominal section, in which the convalescence was uninterrupted, the pulse ranged from 120–140, without any increase in temperature, for two or three days after the operation.

In septic cases an offensive and prostrating *diarrhea* may be a feature of the disease.

Tympanites, the so-called *peritoneal facies*, and *nausea and vomiting* can very appropriately be considered together, because all depend chiefly upon general peritoneal involvement. The distention is sometimes very great—so that coils of intestine can be seen through the tense abdominal walls. Although the expression is characteristic, it is hard to describe the facies of peritonitis. There is a peculiar anxiety depicted in the countenance, which is made more striking by dark areolæ about the eyes. So long as the disease is limited to the pelvis, nausea and vomiting are not marked symptoms, unless, indeed, an inflammatory band has obstructed the bowel, or the ovary is seriously affected. In general peritonitis, on the other hand, nausea and vomiting often become most persistent and formidable.

Physical Signs.—The extent and nature of the pelvic deformity produced can only be determined by careful physical exploration. For obvious reasons, this must be conducted with much care. Indeed, if I were satisfied that the uterus did not contain septic products, I should question the wisdom of undertaking a thorough examination in acute pelvic inflammation of any kind. The pain caused by it is usually very great and there is danger of aggravating the disease. A careful digital examination at the onset is usually harmless, however, and when the symptoms become less severe a more thorough examination may be made.

In the sub-acute forms of inflammation, as well as in those cases where the formation of pus is suspected, the conditions are very different and call for careful exploration.

In the very early stage the vagina will be found hot and dry, with marked tenderness of its vault. This is true in both cellulitis and peritonitis.

Should the *cellular tissue* be the chief seat of the disease, it is even possible to detect, at the very onset, a soft, edematous spot which indicates the point attacked. This stage is of short duration, and rarely is the examination made early enough to discover it.

After infiltration has taken place the uterus is usually found displaced and fixed. It may be directed backward, forward, laterally, or downward, depending upon the location and the extent of the effusion. To the touch the inflammatory tumor gives a hard, unyielding sensation, and if the effusion surrounds the cervix, it may impinge upon the vaginal fornices to such an extent as almost to conceal the os uteri. By conjoined manipulation and percussion the extent of the effusion

can be determined. It may dissect up the peritoneum as high as the umbilicus.

Examination *per rectum* will many times afford valuable information. The posterior surface of the uterus can be reached and the extent of the effusion in this locality determined. If the utero-sacral ligaments are involved they will be felt as a tense band on each side. Sometimes the inflammation has extended to the perirectal areolar tissue, so that the finger will detect a distinct collar surrounding this organ.

Should pus have formed, the tumor will be more or less softened and fluctuation can be detected.

The physical changes of *pelvic peritonitis* vary somewhat from those just given. The general adhesions are usually more extensive, but peritoneal inflammation does not so often give rise to the formation of a distinct tumor. During the early stage any manipulation of the uterus excites intense pain. The hypogastric tenderness is most marked. If the effusion is great it usually gravitates into the posterior cul-de-sac, becomes organized, and can there be felt as an ill-defined mass; or, especially in septic cases, it may remain fluid, being shut off from the general peritoneal cavity by adhesions from above. (Plate IX, Fig. 2, *e*.) The effusion is sometimes great enough to extend above the brim of the pelvis and even as high as the umbilicus.

The uterus is even more markedly immobile than in cellulitis. The whole pelvic roof may present a board-like hardness.

Complications.—I have already mentioned that irritation of the *bladder* and the *rectum* is a frequent symptom of pelvic peritonitis and cellulitis. Under the present head it is only necessary to allude to disturbance of these organs for the purpose of again reminding the reader that in those cases not characterized by other decided symptoms of pelvic inflammation we may find, on examination, an inflammatory exudate responsible for such disturbance. Acute *metritis* as a complicating factor has also been dealt with. The remaining conditions to be considered at this time are *acute oöphoritis and salpingitis*. In my treatment of them here I shall comprise all that I have to say concerning them as distinct acute affections.

Let it be remembered that acute exacerbations of metritis and general pelvic inflammation are often due to septic disease of the appendages, even though the pyosalpinx originally resulted from an inflammation which extended from the vagina and uterus. Gonorrheal salpingitis is a most frequent cause of pelvic peritonitis. On the other hand, metritis and general pelvic inflammation rarely if ever run their course without implicating the appendages. In perhaps the larger number of cases

this occurs without our being able to determine the fact by any special symptoms. In reality, then, acute ovaritis and salpingitis occur as an essential feature of general pelvic inflammation, rather than as a complication. We may be reasonably certain of involvement of the ovary, if pain and tenderness in the region of the affected organ are marked, particularly if the attacks of pain are attended with nausea and vomiting. It may be possible by conjoined manipulation to get the enlarged and tender organ between the examining fingers; or rectal exploration may reveal the prolapsed and adherent ovary between the uterus and the rectum. Acute inflammation of the tube is always associated with that of the ovary.

The *sequelæ* of inflammation of these organs are very variable. If the ovaries are not too seriously damaged, resolution will ensue upon the subsidence of the general inflammation, or they may remain imbedded in the inflammatory mass. Suppuration frequently occurs, calling for their removal. The chronic diseases of the appendages are considered in Chapters XLVIII. and XLIX.

Differentiation.—The various forms of acute inflammation of the pelvis are differentiated, as nearly as it is possible to do so, in the table of comparison given on page 452. The only conditions, therefore, calling for consideration at this time are the following:—

Pelvic hematocele, and extrauterine gestation;
Uterine fibroids;
Retro-displacements of the uterus;
Carcinomatous infiltration;
Accumulated fecal matter.

Any of the foregoing conditions may lead to confusion when the resulting tumor resembles that caused by an inflammatory exudate.

Pelvic hematocele, from whatever cause, gives rise to symptoms first characterized by *shock and collapse*. The blood is poured either into the peritoneal cavity or into the underlying cellular tissue, thus forming a tumor. The latter, unlike that of cellulitis, is at first soft, becoming hard after the absorption of serum. If inflammatory symptoms ensue, they follow those of shock and collapse.

Extrauterine gestation is the most frequent cause of pelvic hematocele. Unfortunately, its existence is often unsuspected until rupture occurs. There are no pathognomonic symptoms of this condition. We may suspect it in a patient whose menstrual function has been disturbed or is absent, if a tumor is slowly formed in the region of one broad ligament, and is accompanied with spasmodic pains in the affected

locality. These symptoms, while put down by many authors as classical, are quite as often absent as otherwise.

Uterine fibroids are attached to the uterus and, if not adhered, move with it. There is no history of inflammation to account for their presence. The tumor is painless, and, instead of diminishing as time goes on, it more often slowly increases in size. In the interstitial and submucous varieties excessive menstruation is a frequent symptom. In the event of adhesions the differentiation is sometimes extremely difficult.

The unnatural position of the fundus in *retro-displacements of the uterus* may give rise to uncertainty as to the nature of the tumor in the posterior cul-de-sac. This is especially so if the fundus is bound down by adhesions. Conjoined manipulation will, in the first place, reveal its absence in front; next, by passing the sound, the tumor is penetrated, which is not the case when due to any other cause.

In *carcinomatous infiltration* there may be slight febrile symptoms. The disease almost always begins in the cervix, which will be found indurated and, during the later stages, ulcerated. It is insidious in its development, and in due time cachexia supervenes.

Accumulated fecal matter ought not to be mistaken for an inflammatory exudate, yet, strangely enough, it more than once has been. A fecal tumor pits upon pressure. An examination per rectum will ordinarily suffice to reveal its true character. In all cases of doubt the colon and rectum should be thoroughly emptied either by an enema or a cathartic.

Course, Duration, and Sequelæ.—No two cases of pelvic peritonitis and cellulitis run exactly the same course, and the duration and sequelæ are most variable. We have seen that pelvic inflammation may exist for an indefinite length of time without giving rise to serious trouble. This, unfortunately, is the exception to the general rule, and usually marked pelvic changes make their presence known in many ways. Pressure symptoms are of frequent occurrence, the location of the resulting pain depending upon the structures impinged upon. If the great sciatic, the crural, or the external cutaneous nerve is involved, pain is communicated respectively to the posterior surface of the thigh, the dorsum of the foot, or the knee. If the psoas muscle of either side is affected the corresponding limb is flexed or abducted. It may be many weeks and even months before the foot can be put to the floor. Involvement of the bladder and the rectum may continue indefinitely, the dysuria and tenesmus becoming most distressing. The rectum is sometimes so distorted as to mold the feces into ribbon-like bands. Pus may continue to discharge for a long time through either the bladder

or the rectum. Amenorrhea, dysmenorrhea, or menorrhagia are frequent sequelæ. In some instances the ovaries are so completely damaged as to destroy entirely their function, and menstruation ceases; in other cases, probably the larger number, excessive menstruation results. At least my experience is in keeping with this statement. In removing appendages damaged by inflammation, menorrhagia has usually been a prominent indication for the operation. Dysmenorrhea, due either to continued inflammation, to distortion of the uterus, or to involvement of the appendages, frequently follows in the train of the disease. I have met with several cases of ovarian dysmenorrhea associated with post-inflammatory pelvic complications. It is not uncommon for inflammatory symptoms to recur at each menstrual period—the result, probably, of an escape of a slight amount of pus or other fluid from the Fallopian tubes. Sterility, which is a frequent sequel, may be due to any of the causes giving rise to disordered menstruation.

Should pus form, the resulting abscess may rupture in any of the directions indicated under the head of pathology. After rupture the abscess may heal and contract, or continue to discharge for an unlimited time; or it may involve the cellular tissue of the entire pelvis, communicating externally by several sinuses.

Prognosis.—This, in severe attacks, should always be guarded. Parturient cases are the most dangerous. In forming a prognosis the cause of the inflammation, the vitality of the patient, her environs, the quantity of effusion, and the presence or absence of septic symptoms should be noted. If an abscess forms, this may exhaust the system before healing spontaneously. Recovery, so far as life is concerned, is the rule, though chronic invalidism only too often results.

Treatment.

The treatment of the various forms of inflammation included in this chapter can best be considered under the following heads:—

1. Prophylaxis;
2. Removal of cause if possible after onset;
3. Prevention of effusion of serum;
4. Treatment of symptoms;
5. Absorption and removal of exudates;
6. Removal of pus and irreparably damaged organs.

Prophylaxis.—The various causes enumerated are to be avoided. No accoucheur can do his full duty to his patient without thoroughly mastering the principles of antisepsis and asepsis. This, in its broadest

sense, implies a full knowledge of those methods having for their object the complete emptying of the uterus. More than this, it implies a familiarity with the evils of prolonged labor, for we have seen that septic inflammation oftener follows in the train of childbirth when the tissues are injured by long-continued pressure. And last, but not least, it implies *cleanliness* on the part of both patient and physician.

There will be fewer cases of sepsis following delivery when Credé's method of expressing the placenta is more generally practised. It is a notorious fact that the average physician has not mastered, simple as it is, the technique of this method. By it the uterus is most thoroughly emptied of all débris and clots, and the danger of leaving portions of the membranes behind is reduced to a minimum. In early abortions the physician should not feel at ease so long as any offensive discharge proceeds from the uterus. Proper rest should always be observed after both parturition at term and abortion. The patient should not resume marital relations until involution of all the organs is complete.

In non-puerperal cases every precaution should be taken in all operative procedures, no matter how slight, to prevent sepsis. In the event of chronic uterine and periuterine inflammation there is always danger of acute exacerbations being excited by operating upon the cervix, or even by introducing the sound. I do not mean to infer that we should refrain from all operations or examinations within the vagina because of the existence of sub-acute or chronic inflammation. I merely wish to caution the student that, when these conditions prevail, he should proceed with care, especially at or near the menstrual period.

Removal of Cause.—When the inflammation proceeds from the retention of septic matter within the uterus the indications are, clearly, to remove it as speedily as possible and to wash away all shreds and débris with an antiseptic, intrauterine injection. If particles of membrane are retained the discharge is offensive, a condition which calls for immediate exploration. The patient should be placed upon her side or back before a good light, the cervix exposed and gently fixed. The uterine cavity should then be thoroughly cleared of all septic products, preferably by means of an irrigating curette.

Before and after the curetting, if an ordinary dull wire curette is used, the cavity should be washed with a hot bichlorid solution (1–5000). It must not be used stronger than this within the uterus, and great gentleness should be observed. Unless the os is sufficiently large to permit the water to escape at the side of the tube a reflux catheter is necessary.

After thoroughly douching the parts in the manner described, the

operator should apply over the entire surface of the endometrium either impure carbolic acid or compound tincture of iodin. I prefer the former unless hemorrhage is troublesome, in which case the iodin will serve both as a hemostatic and an antiseptic.

I have more than once seen, after this procedure, the temperature drop in a few hours from 104° or 105° F. to normal. Should it remain so, it will not be necessary to repeat the intrauterine douching. If, on the contrary, it rises again, the douching must be repeated as often as every four, five or six hours.

In those instances in which the temperature drops to normal and remains so, the condition is one of simple septic intoxication, and the system very quickly eliminates the products of chemical decomposition which it has absorbed. This is not the case, however, when the system becomes more profoundly impressed, probably because of the entrance and multiplication of germs. Here intrauterine douching may do good, or it may prove entirely futile. The curette does not always remove all of the germ-infected tissue, and by persistently using the douche the germs may be kept from multiplying and entering the organism; but to accomplish this it must be used at least every four or six hours. If the temperature be not affected by this treatment at the end of twenty-four hours, the douching will probably do no good and may as well be discontinued. The system, in these cases, is surcharged with the septic poison already absorbed, to which the persistent high temperature is due, and which must be contended against by other measures.

Gonorrheal vaginitis and endometritis should receive the most careful consideration (Chapter XXVI). After the disease has invaded the endometrium the uterine cavity should be carefully irrigated with a 1:5000 bichlorid solution, after which it is packed with iodoform gauze and the vagina filled with the same. This is to be repeated every twenty-four hours. If the discharge persist for a week or ten days, the uterus should be curetted and packed under an anesthetic.

Prevention of Effusion of Serum.—A chill followed by fever and more or less distress in the pelvic region always calls for complete rest on the part of the patient. She should at once be placed in bed and kept absolutely quiet. If the case is not of septic origin, the aim should be to abort the attack and prevent effusion by measures which will, if faithfully carried out, accomplish the desired end in at least a goodly percentage of cases. To accomplish this the indicated remedy, which, in nine cases out of ten, will be either aconite, belladonna, or veratrum viride, is of first importance. Of almost equal importance is the use of

the hot vaginal douche, as recommended by Emmet. To be of service, however, it must be used in such a way as to bring into action the thermic properties of the water (p. 144). The vaginal douche can be advantageously supplemented by hot fomentations over the hypogastrium, hot drinks, etc.

Treatment of Symptoms.—The management of any form of pelvic inflammation, after it is once inaugurated, requires no little tact and judgment. Absolute rest can be afforded only by the coöperation of a skilled nurse who will anticipate and attend to the patient's every want. The diet should be concentrated and nourishing, with the judicious use of stimulants added in septic cases; and the internal remedy should be selected with much care. Cases of septic origin usually call for one of the following remedies: Arsenicum, lachesis, bromin, or mercurius.

The bowels should receive due attention. I cannot agree with some of my confrères that it is a matter of slight importance whether or not the bowels move in these cases for several days. Constipation not only aggravates the existing pelvic inflammation, but, in septic cases, it closes an avenue, and a very important one, for the elimination of the poison. The bowels should, therefore, be moved at least every other day by enemata of warm water, to which may be added, in obstinate cases, either ox-gall or glycerin. When the tympanites is great there is nothing more useful than a saline cathartic. The relief offered by it is often most decided.

Relapses are of frequent occurrence, and the patient should be kept in bed until the acute symptoms have subsided. There is always danger in getting up so long as the temperature remains above the normal or movement causes local pain and distress.

Absorption and Removal of Exudates.—This is often a most difficult task and may require for its accomplishment a long period of time. Until after the subsidence of all acute symptoms we are compelled to rely almost solely upon the vaginal douche and the internal remedy. The douche, by overcoming congestion and stimulating the lymphatics, accomplishes much good and its value cannot be overestimated. Apis mellifica is often most useful during this stage.

As the disease becomes more chronic, other measures are of the greatest utility. The cotton wool tampon medicated with boroglycerid and iodin or ichthyol will promote absorption. These medicaments excite a flow of serum, thus relieving congestion; they also stimulate the lymphatics, while the tampon itself exerts sufficient pressure to hasten absorption.

Galvanism is a therapeutic resource of the greatest value in the re-

moval of old inflammatory exudates and adhesions within the pelvis. It is simply astonishing with what rapidity large inflammatory exudates will often melt away under repeated applications of a current varying from twenty to fifty milliampères, supplemented, of course, by the other measures recommended. (Chapter XI.)

The question of removing encysted serum or pus by operative measures must necessarily depend upon the conditions that exist. It may be given as almost an axiom that encysted non-septic serum, even though large in quantity and easily accessible, does not require operative interference unless the pressure induced by it gives rise to unusual suffering. Nature will ordinarily care for such an effusion as this. On the other hand, if the evidences of pus are clearly marked, the circumstances are very different, and evacuation is, in the larger number of cases, called for. This may be accomplished, when the abscess points into the vagina, either by the aspirator, the trocar, or the bistoury. The abscess cavity should be washed out and, if the bistoury has been used, drained. (Chapter XXXI.)

Abdominal Section and Hysterectomy for Puerperal Sepsis.

Within the last two years the question of radical surgical interference in the treatment of puerperal sepsis has come to the front. Until two years ago the abdominal cavity was not invaded during the puerperium except for the purpose of removing the fetus from above.

The tendency now is to apply to puerperal sepsis the same general surgical principles which are applied to all forms of sepsis. In this country this practice has been especially advocated by Noble, Baldy, Polk, Davis, and Henrotin.

The proposition is to remove the appendages, and, if necessary, the uterus as well, when the focal point of infection is located in one or both of these organs. The propriety of removing pus tubes, should these be responsible for the peritonitis and sepsis, admits of no argument. It is in keeping with that principle of surgery, so well established, that pus in any part of the body should at once be liberated when it becomes a source of infection. The same rule applies to the uterus when this organ is implicated, and the symptoms of sepsis are unaffected by curettement and irrigation. Pus accumulations without the genital tract are, of course, to be dealt with surgically. When the sepsis is general, the so-called lymphatic form of general septicemia, the condition is not amenable to abdominal section. It is many times extremely difficult, as suggested by Polk, to differentiate between the two forms of sepsis. However, it would seem, from the data already

accumulated, that the "let alone treatment" of so-called puerperal fever, which has so long and so disastrously prevailed, is soon to become a thing of the past.

The propositions which present themselves for the consideration of the practitioner in a given case of puerperal infection are:—

1. Is the sepsis due to a ruptured pus tube?
2. Is it due to an infection of the uterus?
3. Is it due to general lymphatic infection?

If due to the first cause, and the uterus is not seriously involved, the abdomen should be opened, the appendages amputated, the peritoneum washed in sterile salt water, and drainage instituted.

If to the second cause, and the symptoms are not abated by curettement and irrigation, the uterus should be removed with the appendages, either through the vagina or abdomen, as the operator may elect. Here the infected uterus is the nidus of the morbid process and hysterectomy remains the only recourse.

If to the third cause, the case will have to be treated symptomatically, for the infection is general. However, no harm can result from making a small exploratory incision, followed by thorough irrigation with sterile hot water at 110°–115° F. Noble* recommends this practice, having sent queries to many obstetricians, "and in no case did any report death when nothing was removed from the abdomen, while recovery was usually rapid."

The point insisted upon by all operators is that radical work should not be left until the patient is practically moribund.

The operative treatment of pelvic abscess and damaged uterine appendages is dealt with in detail in the chapters devoted to these subjects.

Therapeutics.

Aconite.—*The early congestive stage with anxious expression of face;* GREAT RESTLESSNESS, HIGH FEVER, AND RAPID PULSE; burning, cutting, darting pain in bowels, worse from the slightest pressure; abdomen hot to the touch; intense thirst.

Veratrum viride.—*Great cerebral congestion;* violent nausea and vomiting *with cold sweat; heart beats loud and strong with great arterial excitement;* respirations are very slow; face flushed; pupils dilated; especially useful in the acute stage of puerperal cellulitis.

Belladonna.—*Great congestion of the head; strongly pulsating carotid arteries;* colicky pains in the bowels; great anxiety; dyspnea; *light and*

* Am. Gyn. and Obst. Journal, April, 1895.

noise unbearable; SHOOTING, DARTING, STABBING PAINS, WHICH COME AND GO IN QUICK SUCCESSION.*

Bryonia.—Stage of exudation; THE LEAST MOTION AGGRAVATES HER SUFFERINGS; her head aches as if it would split open; stitching, pressing, lancinating pain in the bowels, worse from slightest motion; *tongue white and dry; great thirst; bowels constipated.*

Apis.—*Stinging, thrusting pain similar to that arising from the sting of a bee;* absence of thirst; urine scanty; dyspnea; edema of feet.†

Arsenicum.—*Sudden sinking of strength;* intense internal restlessness; thirst; constant vomiting; burning in bowels; cold, clammy perspiration.

Terebinthina.—*Excessive distention of the abdomen, with weakness and prostration;* peritonitis resulting from pelvic hematocele.‡

Gelsemium.—According to Ludlam, this remedy is especially useful after belladonna, if tardy menstruation is the cause of the congestion; sharp labor-like pains in uterine region extending to back and hips; pulse at first full and bounding, then feeble and thready.||

Colocynth.—*Violent, cutting, tearing pains, relieved somewhat by pressure;* diarrhea and tenesmus of the rectum; frequent tenesmus of the bladder with scanty urine; in the acute stage of pelvic peritonitis with little effusion; pain especially severe in the left ovarian region.

Cantharis.—*Frequent and almost continual desire to urinate, ineffectual or with cutting, burning pain and passing only a few drops of urine at a time, which is often mixed with blood;* burning in the uterine region. The urinary symptoms are of the greatest importance in determining the selection of this remedy in acute inflammation.

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* "The abomen, in *Belladonna*, is swollen up like a drum and very sensitive to the touch, so much so that the patient wants all clothing removed."—*Farrington.* "Uterine congestion is manifested, particularly by a violent stinging, fulness, tension, and urging deep in the abdomen and the sexual organs, with which there is often conjoined a dragging, lancinating sensation around the loins."—*Hartmann.*

† "*Apis mellifica* is indispensable if pelvic cellulitis complicates the case and if we desire to abort the tendency to all forms of pelvic abscess * * * But it needs to be given in a low form and frequently repeated."—*Ludlam.*

‡ "The violent drawing, burning pains in the region of the kidneys, and scanty and bloody and often suppressed urine, with distressing strangury, are excellent additional indications for *Terebinthina*, should they be present."—*Southwick.*

|| "The pulse rises, in *Gelsemium*, during the reaction after the chill, as far above the normal as it has been below it."—*T. F. Allen.*

Mercurius cor.—Purulent exudations; creeping chills; foul breath; vomiting of slime, and slimy stools with straining; edema of feet; weakness and emaciation (Lilienthal).*

China.—Distention and oppression of the abdomen, especially following great loss of blood; much ringing in the ears; difficult, but painless, urination.

Calcaria carb.—*Subacute and chronic cases in leucophlegmatic constitutions; the feet feel cold and damp;* profuse perspiration of the head and upper part of the body; the history of the case shows that the menses have been too profuse and return too often.

Hepar sulph.—Particularly indicated to prevent or hasten suppuration; burning, throbbing pain with chilliness.

Lachesis.—This remedy is especially indicated, according to Guernsey, in pelvic inflammation occurring at the critical age; exacerbation of the soreness after every sleep whether by day or by night; *extreme sensitiveness to pressure;* cannot even tolerate the clothes upon the uterine region.†

Phosphoric acid.—Great distention of the abdomen with marked debility and great indifference to all about her; low fever.

Rhus tox.—Puerperal cases worse at night, especially after midnight; restlessness; *changing the position affords temporary relief;* powerlessness of the lower limbs, she can hardly draw them up; *low fever with dry tongue.*

Hyoscyamus.—Spasmodic symptoms with jerking of the extremities, face and eyelids; emotional disturbances; typhoid state with delirium; the patient throws off the bedclothes.

Iodium.—Implication of mammæ, which become very sore; there is a low cachectic state of the system with feeble pulse.

Sulphur.—Weak, faint spells with frequent flushes of heat; papillary eruptions over the body.

Sabina.—Metritis following menorrhagia or metrorrhagia of clotted and fluid blood, with pain from sacrum or lumbar region to pubes.

Silicea.—Constant chilliness followed by fever with violent heat in the head, worse at night; *especially useful after suppuration with fistu-*

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* "Inflammation of the peritoneum and effusion into this sac is a frequent feature in poisoning by *Corrosive sublimate.* * * * I have myself the highest esteem for this remedy in peritonitis. I have used it here more frequently than bryonia and with more gratifying results."—*Hughes.*

† "In peritonitis *Lachesis* is indicated when the fever still continues and is worse after 1 P. M., and at night. The slightest touch to the surface of the body is intolerable."—*Farrington.*

lous openings which discharge a large amount of thin, unhealthy pus; profuse, sour, or offensive perspiration at night; headache and nervous symptoms resulting from loss of strength; great constipation; constant and ineffectual desire for stool.

Cimicifuga.—*Rheumatic women subject to pleurodynia, rheumatism, etc.;* LUMBAGO; pain and distress in the pelvis with scanty or irregular menstruation; despondency; subacute pelvic peritonitis in rheumatic women.

Opium.—Cases resulting from fright; flushed face; delirium; soporousness; sleepy but cannot sleep; constant vomiting and belching; complete inactivity of the lower bowel.

Arnica.—Pelvic inflammation from traumatism.

Consult:—Stramonium, secale, sepia, platina, pulsatilla, kali carb., and conium mac.

TABLE COMPARING ACUTE INFLAMMATION OF THE VAGINA, UTERUS AND ANNEXA, AND PERIUTERINE TISSUES.

VAGINITIS.	METRITIS AND ENDOMETRITIS.	PERITONITIS.	CELLULITIS.
Most frequent *cause* is gonorrheal infection; difficult to differentiate specific from non-specific form.	Most frequent *cause* is sepsis connected with abortion or parturition.	When primary, most frequent *cause* is extension of inflammation from uterus or tubes; imprudence during menstruation; gonorrheal extension.	Where primary, most frequent *cause* is parturition and abortion; operations upon uterus.
Intensity of *onset* depends upon acuity of symptoms; usually slight chill or chilliness.	In light, non-puerperal cases the initiatory symptoms at *onset* no more marked than in vaginitis; in puerperal cases decided chill.	*Initiatory chill* not marked.	*Initiatory chill* marked.
Febrile symptoms slight.	*Febrile symptoms* usually slight in uncomplicated non-septic cases; marked in septic cases.	*Febrile symptoms* depend upon cause and extent of tissue involved; usually marked, and the pulse is small and wiry.	*Febrile symptoms* depend upon cause and extent of tissue involved; usually marked, and the pulse is full and bounding.
Absence of inflammatory *tumor;* vagina first dry and hot, and then becomes bathed in pus or muco-pus.	Absence of inflammatory *tumor.*	Formation of *tumor*, which is oftener located posteriorly or anteriorly; if lateral, usually high up; hardening of pelvic roof.	Formation of *tumor*, which is oftener lateral; at first soft and doughy, then hard, becoming soft again if pus forms.
Thighs not retracted.	Thighs not retracted.	Retraction of both thighs.	Oftener retraction of one thigh.
Uterus is *movable*, and not increased in size.	*Uterus is increased in size, and movable.*	Uterus but slightly *movable*, and often fixed; displaced in any direction, depending upon location of effusion.	Uterus more movable than in peritonitis; usually displaced laterally.
Pain of a burning character and low down.	*Pain* indefinite; augmented by moving uterus.	More painful than in cellulitis, and sometimes *pain* is very great.	*Pain* depends upon pressure.
No *vomiting*.	No *vomiting* if uncomplicated.	*Vomiting* often marked; worse if ovaries are involved.	*Vomiting* not so marked.

CHAPTER XXIX.

CHRONIC ENDOMETRITIS (CERVICAL AND COR-POREAL); CHRONIC METRITIS (SUBINVO-LUTION; HYPERTROPHY; AREOLAR HYPERPLASIA).

For reasons similar to those given in the preceding chapter, I deem it entirely logical to include in one chapter the several chronic inflammatory affections of the uterus. They all possess symptoms in common, and the principles of treatment observed in all are much more alike than is the case in acute and chronic inflammation of any of the tissues of the uterus. This classification is, therefore, infinitely less confusing to the student than the older one in which the various acute and chronic diseases of the organ are considered seriatim. Then, too, the pathological changes justify the classification adopted, for there is at least an insensible shading of the various forms of chronic inflammation into one another, and, oftentimes, the blending is very distinct. *Chronic cervical endometritis*, and *granular and cystic degeneration of the cervix*, represent, in reality, but different stages of one and the same disease. The general symptoms are practically the same in all, and they can be differentiated the one from the other only by physical examination. So-called *fungoid degeneration of the endometrium* likewise represents but a form of corporeal endometritis and should be so dealt with. Again, subinvolution of the uterus, hypertrophy, and areolar hyperplasia are but stages of *chronic metritis* (although areolar hyperplasia occasionally occurs in nulliparous uteri), and are therefore included under this head.

Chronic Cervical Endometritis and Granular and Cystic Degeneration of the Cervix.

Definition.—By the term chronic cervical endometritis is meant an inflammation, chronic in character, of the cervical mucous membrane, which extends from the os externum to the os internum. It is the most frequent of all gynecological diseases, and is also known as endocervicitis, cervical catarrh, etc.

Anatomy.—The surface of the cervical mucous membrane is greatly increased by the so-called arbor vitæ, which are nothing more than folds or ridges of mucous membrane studded with numerous villi and covered with cylindrical and pavement epithelium. Large numbers of muciparous glands, known as the follicles of Naboth, are between these folds. It is estimated that in a well-developed virgin cervix there are at least ten thousand Nabothian follicles, and it is from them that the alkaline cervical secretion is derived.

FIG. 108.

LACERATION WITH EROSION OF THE CERVIX. (*Martin.*)

FIG. 109.

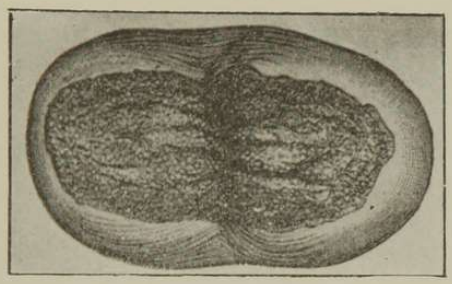
EROSION WITH ENLARGEMENT OF FOLLICLES. (*Martin.*)

Pathology.—The first step in cervical endometritis is hyperemia of the Nabothian follicles. They become engorged and elevated, with dilated mouths, which are filled with a secretion which is at first alkaline and viscid, like the white of an egg; later the secretion becomes more adhesive and tenacious, being loaded with epithelial cells; finally, it assumes a muco-purulent character and is sometimes tinged with blood. It also becomes exceedingly acrid, disintegrating the epithelial layers of mucous membrane, which leaves the underlying surface exposed (Fig. 108). This is known as *abrasion* or *erosion*, and while in the strictest sense of the term it is a form of ulceration,* it is too superficial in character to fall properly into that classification. If the

* Dunglison defines an ulcer as "a solution of continuity of the soft parts." According to the later researches of Ruge and Veit, the epithelium is not entirely destroyed in this condition.

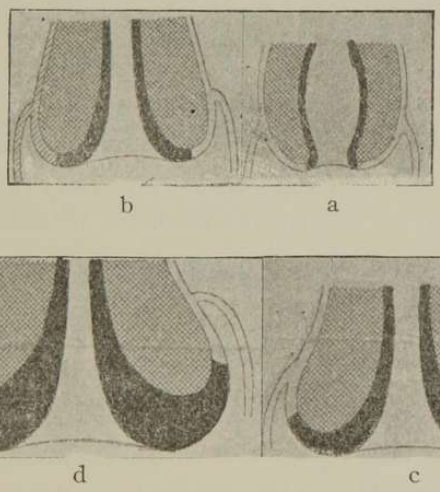
disease is arrested at this point the epithelium is restored and the redness disappears. If, instead, it progresses, the mucous membrane proper becomes implicated and the papillæ undergo proliferative changes and project in the form of granules through the abraded tissue. This constitutes *granular degeneration* (Fig. 110).* Since the papillæ are richly supplied with blood-vessels, the older works describe this condition as "bleeding ulcer" or "cock's-comb granulation." The granulations sometimes increase in size and number until they form a large mass.

FIG. 110.



FISSURED CERVIX WITH GRANULAR MUCOUS MEMBRANE. (*Schroeder.*)

FIG. 111.



ECTROPIUM OF THE CERVIX.

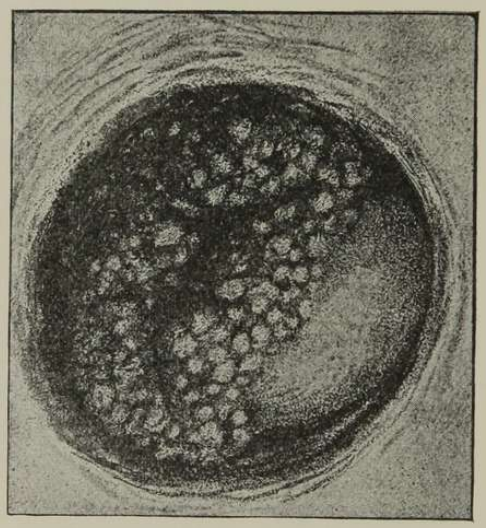
The cervical mucous membrane is hypertrophied as a result of the inflammation and, because of the tenesmus excited, is forced from the cervical canal; (a) represents the normal state and (b), (c) and (d) successive degrees of ectropium. (*Auvard.*)

* Ruge and Veit say that these villous projections are not hypertrophied papillæ, but new formations.

The hypertrophy of the mucous membrane which attends the disease creates a tenesmus which may give rise, even in virgins, to great eversion. The os externum becomes patulous and the cervical canal greatly distorted. The manner in which this eversion is produced is shown in Fig. 111.

If the inflammation is localized in the muciparous follicles it causes the latter to become greatly distended, and finally to burst, thus giving rise to so-called *follicular ulceration*. Extensive involvement of these follicles constitutes *cystic degeneration of the cervix* (Fig. 112). Instead

FIG. 112.



LACERATION OF THE CERVIX, WITH CYSTIC AND PAPILLARY HYPERPLASIA, SIMULATING EPITHELIAL CANCER. (*Mundé.*)

of the extensive changes here shown the enlarged Nabothian glands may assume the shape of polypi.

The foregoing changes indicate the several pathological steps leading from simple catarrhal inflammation of the cervical endometrium to extensive granular and cystic degeneration and ulceration. True inflammatory ulceration is very rarely met with. As already indicated, simple catarrhal inflammation is of most frequent occurrence; granular degeneration also occurs with great frequency; while cystic degeneration, though by no means rare, is much more so than the affection last named. In many cases, however, the only evidence of simple endocervicitis will be an unnatural discharge proceeding from the cervix.

Etiology.—The causes are both predisposing and exciting. Under the first head may be included:—

The various dyscrasiæ, as scrofulosis, tuberculosis, etc.;
Want of fresh air and exercise;
Ill-nourishment;
Improper dress;
Subinvolution.

The exciting causes are:—

Cervical lacerations;
Extension of vaginitis, especially specific;
Excessive coitus;
Prevention of conception;
Undue exposure, especially during menstruation;
Frequent parturition;
Excessive lactation;
Intrauterine stem pessaries.

Of these several causes, the various *dyscrasiæ* are perhaps the most important. Women of lymphatic temperament, especially blondes, are particularly liable to cervical inflammation; in these subjects there is a peculiar tendency to catarrh of all the mucous membranes of the body. Endocervicitis in this class of patients is usually most obstinate.

Cervical catarrh is almost always a complication of *subinvolution*, and it is frequently associated with corporeal endometritis.

Of the exciting causes, *cervical lacerations* are to be ranked of first importance. The laceration, with consequent eversion, exposes the lower part of the mucous membrane to friction against the vaginal walls and to irritation during coitus. The various means resorted to for the *prevention of conception* frequently give rise to cervical catarrh as well as to general pelvic congestion. Cold vaginal injections immediately after intercourse, when all of the sexual organs are unduly flushed with blood, is a most pernicious practice, though but little worse than the use of condoms, or the practice of withdrawal of the male organ immediately before ejaculation. In fact, any cause that tends to keep up a congestion of the uterus and pelvic organs is liable in time to induce cervical catarrh, especially in one predisposed to inflammation of the mucous membranes

Symptoms.—The symptomatology depends more upon the *type* of constitution met with in a given case than upon the extent of the disease. It is a most common thing for the physician to meet with cases of cervical endometritis in which the local evidences of the disease are most marked, though the general symptoms may be entirely wanting; whereas, in other cases, with but slight disease, the general symptoms are most distressing. Some temperaments are much more profoundly

affected than others by any lesion, and as regards those of the uterus this is pre-eminently so.

Leucorrhea is the most common symptom, and may be the only one attracting the patient's attention. The discharge is at first thick, viscid and albuminous, but as the disease progresses, and especially if villous erosion exist, it becomes muco-purulent and not infrequently tinged with blood.

In time other symptoms of a more general character may develop. The patient complains of an ill-defined, *dragging sensation* in the pelvis, which is made worse when she is on her feet for any length of time. *Pain in the back*, which is almost always aggravated at the menstrual period, is of very common occurrence. The *stomach* is frequently implicated in a reflex way, so that the nutrition becomes impaired and nervous symptoms develop. Melancholia, occipital and vertical headache, neuralgia in various parts of the body, and hysterical manifestations may follow in the train of mal-nutrition.

Disordered menstruation likewise frequently attends endocervicitis. Dysmenorrhea occurs oftener than menorrhagia, though if the corporeal endometrium is also involved the latter condition may be the most prominent. *Pain upon sexual intercourse* rarely results unless there exist cervical hyperplasia with the catarrhal condition. In granular and follicular degeneration there may be hemorrhage following intercourse. Other symptoms, such as constipation, disordered micturition, etc., are not infrequent.

Physical Signs.—The extent of the disease can only be determined by local examination. Digital exploration alone is, however, many times uncertain, for should the os not be patulous the finger may not detect anything wrong.

The speculum will more accurately determine the exact pathological changes. The parts are frequently concealed by the unnatural discharge which is present. By carefully removing this the cervical tissue will be exposed. In simple catarrhal inflammation the slight discharge hanging from the cervix may be the only evidence of disease; or the os may be patulous and the mucous membrane everted and congested; or there may be granular or cystic degeneration as shown in Figs. 110 and 112.

If the patient has borne children lacerations are usually found and the eversion is often great. I have even seen the eversion in virgins so great as to cause me strongly to suspect for the time the chastity of the patient. This is not of uncommon occurrence, especially if the disease is associated with cellulitis, and I strongly emphasize the fact be-

cause the condition frequently gives rise to unjust suspicion. A correct decision is so important that I quote in detail the following case from Emmet:—*

"During the spring of 1880 I was consulted by a young, unmarried girl whom I had seen grow up from a child, and whose character was above reproach. I first made a rectal examination with my finger, with the object of avoiding a vaginal one, if the needed information could be obtained. I detected an extensive cellulitis behind the uterus and to the left, but was unable to recognize the exact condition of the uterus, as a mass, very tender on pressure, was felt, which seemed too large for the cervix and not large enough for the uterus. I was surprised to find that this mass was the cervix greatly enlarged in proportion to the size of the uterine body, and that it had the characteristic feel of a laceration. I introduced the speculum, and, to my sorrow, I saw the mucous membrane of the canal everted apparently to the internal os. If I had been placed on the witness stand I could have conscientiously taken an oath that a criminal abortion had been recently performed. As the poor girl got up from the chair the expression of her face was so indicative of all that was pure and innocent that I could ask no questions. During the whole course of my professional life I never watched the progress of another case with such interest. The cellulitis yielded to treatment with unusual rapidity, and to my gratification the everted surfaces rolled in again as the inflammation lessened; the cellulitis at the end of three months had all cleared up and nothing but a virgin os remained."

When in doubt, in a case like that recorded by the eminent specialist just quoted, the only absolute test is time and proper treatment. In virgins the parts will ultimately regain their normal appearance; whereas, if lacerations exist, the rents are only made more prominent by curing the inflammation and hyperplasia.

Differentiation.—Chronic cervical endometritis can be positively differentiated from *vaginitis* only by a specular examination. It is a frequent complication of chronic vaginitis. The symptoms which distinguish it from *chronic corporeal endometritis* are given in the section devoted to the last-named disease. There is some danger of confounding granular and cystic degeneration, particularly if hyperplasia and lacerations exist, with *epithelioma*.

The induration in *epithelioma* is much more marked; there is a peculiar hardness about the os; hemorrhage is more easily excited; and the

* "Principles and Practice of Gynecology," 1884, p. 460.

mucous membrane is attached to the subjacent structures. Every now and then cases will be met with where the uncertainty is very great and a section may have to be removed for microscopic examination. Proper treatment rapidly reduces simple hyperplasia with degeneration, which is not the case if the disease be malignant.

In the event of ulceration we should determine whether or not the destruction of tissue is due to *syphilis*. Syphilitic ulceration of the cervix is not a common affection. It will be recognized by its yellow, opaque color; by its precipitous borders and depressed surface; and by the associated constitutional symptoms.

Prognosis.—When left unmolested the disease may continue indefinitely, becoming worse and worse as time goes on. While treatment will have to be persevered in for weeks, or even months in cases of long duration, a cure can usually be accomplished in the end.

Chronic Corporeal Endometritis and Uterine Fungosities.

The endometrium of the body of the uterus, like that of the cervix, may be the seat of chronic inflammation. When so affected it has been described under the names of chronic corporeal endometritis, internal metritis, uterine leucorrhea, uterine catarrh, etc.

As regards its frequency, corporeal endometritis does not occur nearly so often as does cervical endometritis. So good an authority as the late Prof. Byford, of Chicago, makes this assertion:* "Inflammation limited to the cavity of the body of the uterus is not common, but I am quite sure that I have met with at least two instances." This to me is a most surprising statement to come from one of Prof. Byford's experience, for I am sure that I have many times met with chronic inflammation limited to the corporeal endometrium, or at least not involving the mucous membrane of the cervix. In by far the larger number of cases, however, it occurs in connection with cervical endometritis.

Anatomy.—The mucous membrane of the fundus, like that of the cervix, is studded with numberless follicles which are lined with delicate ciliated epithelium, and open into the uterine cavity much as the glands of Lieberkühn open into the intestines. These follicles are long and curling, their closed extremities projecting toward and into the uterine parenchyma, between which and the fundal endometrium there is no areolar tissue. Numerous capillaries form a network about their mouths, projecting like villi into them and ramifying between them.

* "Medical and Surgical Treatment of Women," page 182.

They exist in the form of simple and compound glands: the first are unbranched tubes; the second possess several branches.

Pathology.—As in acute endometritis, the underlying muscular structure is always more or less involved, though the two affections (chronic metritis and endometritis) are sufficiently distinct to warrant separate consideration.

The follicles described are the chief seat of the disease, which accounts for the exaggerated discharge. The secretion is not only increased, but altered in quality. It is alkaline and thin during the early stage, but in time becomes rust-like and muco-purulent.

The changes in the mucous membrane are most variable. In cases of short duration it is merely swollen and congested. Later on granulations may form not unlike those in cervical endometritis. In the more severe cases partial exfoliation of the mucous membrane occurs, and villous proliferations spring up from the subjacent tissue, owing to exaggerated local nutrition. This last condition constitutes the so-called *villous fungosities or fungoid degeneration* of the endometrium. As time progresses large numbers of the follicles are obliterated and the mucous membrane atrophies; or the openings of the follicles only are obliterated, resulting in distention from the retained secretions. It is claimed by some pathologists that, in cases of long standing, a thin layer of connective tissue, covered by pavement instead of cylindrical or ciliated epithelium, replaces the mucous membrane.

Causation.—Many of the causes giving rise to cervical endometritis may, under favorable conditions, excite fundal endometritis as well. It is only necessary to enumerate, in the disease now under consideration, the following:—

Extension of vaginitis and cervicitis, especially gonorrheal;
Parturition and abortion;
Retention of menstrual discharge;
Membranous dysmenorrhea;
Injury resulting from the sound, intrauterine pessaries, etc.;
Exposure during menstruation.

Extension of vaginitis and cervicitis to the corporeal endometrium is of common occurrence, a fact emphasized in dealing with acute endometritis. It is the specific form of vaginitis which oftener implicates to the endometrium.

Parturition and abortion are not infrequently followed by endometritis because of mechanical injury, or because of some of the products of conception being left behind. In criminal abortion the unskil-

ful use of the sound is very apt to lacerate the endometrium in such a way as to set up inflammation.

The careless and indiscriminate use of the *uterine sound* in the non-pregnant is sometimes responsible for an acute endometritis which may become chronic. If the sound be intelligently used and is clean, there is, however, but little danger of inflammation attending its introduction. This, of course, implies proper observance of the counter indications.

Probably the most important and frequent cause of corporeal endometritis is the *retention of menstrual discharge* because of some obstruction to its exit. Whatever the nature of the obstruction, the retained blood becomes deteriorated and clotted. This irritates the mucous membrane, giving rise to uterine contractions and endometritis.

The pathology of *membranous dysmenorrhea* is so uncertain as to make it difficult to determine in a given case whether this affection is the result or the cause of the endometritis. At any rate, more or less endometritis is always associated with this form of painful menstruation.

I have in another place dwelt upon the danger of permitting patients to wear the *intrauterine stem* while up and about. When these pessaries were more fashionable than now endometritis was more common.

Menstrual suppression from exposure always gives rise to more or less congestion of the endometrium, which may, as time goes on, develop into a chronic catarrh. As is well known, acute endometritis from whatever cause frequently ends in chronic inflammation.

Symptoms.—These, as in endocervicitis, are remarkable for their variableness. In many cases corporeal endometritis of the most decided nature may exist indefinitely without giving rise to any trouble other than a leucorrheal discharge. In most instances, however, the general symptoms are sufficiently marked to attract attention to the uterus, though it cannot be said that they are pathognomonic.

The most constant symptom is *leucorrhea*. The discharge is not nearly so tenacious as that from the cervix, though when the cervical endometrium is also involved there is a commingling of the discharge from both sources. It may be either serous, muco-serous, or muco-purulent in character; or of a brownish, rust-colored tint. The last named quality is very characteristic, though a similar discharge may occur in any disease of the uterus in which there is a slight loss of blood.

In the worst cases the discharge consists of almost pure pus. Again in some forms of senile endometritis it is decidedly watery and, when retained, gives rise to that condition known as *hydrometra*. In cases

of long standing it is often most excoriating, setting up intense pruritus vulvæ.

The symptom which in point of frequency comes next is *disordered menstruation*. The disease is nearly always attended by either menorrhagia, dysmenorrhea, or amenorrhea.

The menorrhagia is due to hypertrophy of the mucous membrane, and in fungoid degeneration the loss of blood is usually very great. As soon as the connective tissue becomes affected pain is associated with the menorrhagia. Pain also characterizes exfoliation of the endometrium. In atrophy of the mucous membrane the menstrual discharge is lessened in quantity and may cease entirely.

Sterility is a frequent, though by no means inevitable, symptom. I have certainly met with cases presenting all the evidences of chronic corporeal endometritis in which conception occurred. If the mucous membrane is much diseased, however, the woman can hardly conceive, for the unnatural discharge is inimical to the life of both the spermatozoa and the ovum.

Pain in some form is rarely absent. It is not in any sense pathognomonic, for it is such as may result from any of the chronic inflammatory affections of the uterus. Patients often speak of it as being of a dragging character, and not infrequently it extends down the inner surface of the thighs. It is always made worse by any physical exercise requiring the patient to be on her feet for any length of time. Deep pressure over the hypogastric region will sometimes reveal tenderness of the uterus. There is often a throbbing, burning sensation in the supra-pubic region. The uterus is more or less tender on bimanual examination, but not nearly so much so as when the disease involves chiefly the muscular structure of the organ. The bowels are usually inactive, and the superadded constipation tends to aggravate the uterine congestion. The urinary function is likewise frequently implicated, the urinary secretion itself presenting all of the varying characteristics of so-called "hysterical urine."

As the disease progresses the *nutrition* sometimes becomes markedly affected. The appetite is impaired, there is often nausea with vomiting, and, if flatulency accompanies these symptoms, as it frequently does, pregnancy may be suspected. There is, too, as in pregnancy, a peculiar tendency to pigmentation of the skin, especially on the forehead and abdomen and around the nipples, which adds to the uncertainty of diagnosis. The pigmentary deposits on the face, together with the emaciation and the dark areolæ around the eyes, give to the patient a peculiar expression to which the term *facies uterina* has been applied.

Any or all of the *nervous phenomena* mentioned under the Hystero-neuroses not infrequently occur. Hysteria, melancholia, neuralgia in any and every part of the body, and even hystero-epilepsy, may develop. Headache is probably the most frequent reflex pain, and it is located, in at least the larger number of cases, at the vertex. Pain in the right hypochondriac region is not an uncommon symptom of chronic endometritis.

Physical Signs.—The tenderness of the uterus on conjoined manipulation, the pain arising from passing the uterine probe, the slightly increased length of the uterine cavity, and the characteristic discharge which has been described, are practically all of the physical signs affording any positive information in making a diagnosis. A leucorrhea issuing from the cervix, with absence of discernible cervical disease, is pretty conclusive evidence that it proceeds from the fundus. The only exception to this statement would occur in cases of pyosalpinx drained through the uterus, a condition which would sooner or later excite endometritis. There is, too, especially in fungoid endometritis, a peculiar tendency to hemorrhage after the introduction of the probe.

Differentiation.—The physical signs enumerated will ordinarily enable the physician to distinguish chronic corporeal endometritis, when uncomplicated, from *cervical endometritis*. When the two affections exist conjointly it may be difficult to determine that the fundal endometrium is involved. A symptom of some value is the patulousness of the internal os, which nearly always exists when the fundus is implicated.

Care should be taken to determine *pregnancy* when this condition is suspected.

Prognosis.—Under the most favorable circumstances, and with all the resources of gynecic art, chronic corporeal endometritis is an exceedingly obstinate affection. Scanzoni affirms* that he has never been able to cure a case of several years' duration, and all writers agree that the prognosis, in diseases of long standing, is most sinister. So much depends upon the coöperation of the patient that, without such coöperation, little can be accomplished. If this can be secured I think that the ordinary cases can be not only greatly relieved, but eventually cured. I speak with much more confidence since adding to my armamentarium proper apparatus for the intelligent use of intrauterine galvanism. The most obstinate cases are those of long duration with much enfeeblement of the constitution and with bad retro-displacement of the uterus. Proper drainage of the organ, which is all-important, is

* "Diseases of Females," Am. Ed., p. 202.

difficult when flexion exists, and profoundly debilitated patients are sometimes unable to tolerate measures having for their object the correction of the displacement.

Chronic Metritis (Subinvolution; Hypertrophy; and Areolar Hyperplasia of the Uterus).

General Considerations and Pathology.—Not infrequently the uterus is found upon local examination to be hard, dense, sensitive, and increased in size. This condition is oftener met with in women who have borne children, or who have had one or more miscarriages. For years the peculiar and marked changes giving rise to this unnatural state were supposed to be the result of a chronic parenchymatous inflammation, and the various text-books dealt with it under the name of Chronic Metritis. Some years ago Prof. T. Gaillard Thomas, drawing his deductions from the pathological findings of Klob, Scanzoni, and others, became convinced that chronic inflammation had but little to do in bringing about this peculiar state of the organ. He sums up his conclusions as follows:—*

"1. The condition ordinarily styled chronic metritis consists in enlargement due to hypergenesis of tissue, especially of the connective tissue, which induces nervous irritability and is accompanied by congestion.

"2. Decidedly the most frequent source of this state is interference with involution of the puerperal uterus. A very large proportion of the cases of so-called parenchymatous metritis are really later stages of subinvolution.

"3. Areolar hyperplasia is often induced in a uterus which has once undergone the development of pregnancy by displacement, endometritis, and other conditions, including persistent hyperemia.

"4. The same influences may possibly induce it in a nulliparous uterus, most frequently they do so in the neck, but such a result is exceedingly infrequent.

"5. However produced, the condition is one of vice of nutrition, engendering hyperplasia of the connective tissue as its most striking feature, and, although attended by many signs and symptoms of inflammation, it in no way partakes of the character of that process."

Thomas therefore teaches that the term chronic metritis is a misnomer and should be discarded, and that the actual condition brought about by the causes enumerated, the most frequent being arrested puerperal

* Thomas and Mundé, "Diseases of Women," page 316, 1891.

involution, is *hyperplasia* rather than *hypertrophy* of the uterus.* He has accordingly proposed the term *areolar hyperplasia* as one more clearly defining the actual pathological changes which the tissues of the uterus undergo. To him the profession is much indebted for his able and scholarly writings upon the subject.

If it be true, as Thomas affirms, that by far "the most frequent cause of this state is interference with involution of the puerperal uterus," then subinvolution is but the first stage of areolar hyperplasia (so-called chronic metritis), and should be so considered; and while hyperplasia is undoubtedly the final step in the pathological process which leads up to it, I think that there is clearly an intermediate stage, which is more correctly defined, according to the definition of Virchow, by the term *hypertrophy*. In proof of this I quote the observations of Finn made at the Institute of Pathological Anatomy in St. Petersburg.†

"1. The normal disposition of the single muscular fiber, as well as of the muscular bundle, remains unchanged.

"2. The muscular fibers do not change in quality, neither is there fatty degeneration as a pathognomonic sign of the disease.

"3. The muscular fibers are always extended in both their length and breadth above their normal standard, but more so in the former direction.

"4. The number of fibers is always largely increased.

"5. The amount of connective tissue in the latter stage of the disease is always relatively diminished, but absolutely enlarged, so that the increase of bulk of the uterus is mainly caused by the hyperplasia of the muscular fibers, the augmentation of the connective tissue influencing it but little."

Klob, on the other hand, says: "The whole uterine connective tissue sometimes proliferates, either without accompanying increase of the muscular substance, or, if this does occur, the connective tissue predominates to such an extent that the muscular substance is comparatively of not much account."‡

It is probable, as suggested by Thomas, that Finn made his examinations during the early stages of subinvolution, whereas the uteri examined by Klob were those in which the changes had existed for a long time. In this way only is it possible to reconcile the statements made

* By *hypertrophy* is meant excessive growth of the elements of tissue already existing; by *hyperplasia*, the development of new tissue —*Virchow*.

† American Journal of Obstetrics, Vol. 1, p. 264.

‡ Thomas and Mundé, *op. cit.*, p. 310.

by pathologists equally distinguished. It seems very strange indeed that later researches bearing upon the subject have not been made. Surely, the dead room furnishes material in abundance, and it is a question which ought not to be difficult to clear up.

Are we justified, then, from the data given, in entirely eliminating inflammation as a causative factor in the production of the affection under consideration, which has for its beginning hypertrophy of tissue and for its ending hyperplasia? I think not. I have elsewhere shown* that three forms of hyperemia are met with, viz.: active hypertrophic; passive venous or congestive; and inflammatory. The first gives rise to hypertrophy, because of exaggerated local nutrition; in the second and third there is thrown out a fibrino-plastic effusion, which contracts, cuts off the capillary circulation of the parts involved, and becomes organized into a low form of connective tissue. As a result the connective tissue is not only increased from this source, but the resulting irritation gives rise to hypergenesis of that already existing, and in time the muscular structure is largely supplanted by it. Now, if these views are based upon sound premises, it is not only possible, but exceedingly probable, that acute metritis, after producing the changes described, will merge into a low form of chronic inflammation which may continue indefinitely; and, while granting that uteri which have undergone the development of pregnancy are infinitely more liable to take on the changes ending in so-called areolar hyperplasia, I do not believe that nulliparous uteri, the seat of chronic endometritis, are exempt from it. That in the vast majority of instances the starting point is subinvolution no one will deny; but let it be remembered that one of the most frequent causes of subinvolution is inflammation, either of the endometrium, the parenchyma, or both; and if we admit the existence of chronic corporeal endometritis—and most authorities are agreed that this is not an uncommon affection—we must also admit the frequent involvement, to a greater or less extent, of the uterine parenchyma, due to the peculiar anatomy of the parts. If this be true, it seems to me that such inflammation may not only be the primary cause of the hyperplasia, but it may persist as a feature of it.

To recapitulate, then, the pathological changes, as I understand them, occur as follows:—

When following parturition or abortion:—

1. The existing hypertrophy of both the muscular structures and connective tissue persists for a certain length of time, owing to arrested involution.

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* *V.* page 127.

2. Hypergenesis of the connective tissue, owing to irritation or exaggerated local nutrition, ensues; or, if the subinvoluted uterus is inflamed, a fibrino-plastic effusion is thrown out, which becomes organized.

3. Then follows condensation of the connective tissue thus formed, which contracts and cuts off the capillary circulation, the whole organ becoming hard, dense, and sensitive.

When occurring in the non-puerperal:—

1. If from any cause (displacement, excessive coition, obstructed pelvic circulation, etc.) persistent hyperemia is engendered, there results hypertrophy of the uterus because of exaggerated local nutrition. Hypergenesis of the connective tissue is probably in excess of that of the muscular structure.

2. If, on the other hand, the hyperemia be due to inflammation, there is poured into the parenchyma of the organ a fibrino-plastic effusion. This in time, as in the puerperal uterus, becomes a low type of connective tissue, which, added to that resulting from the exaggerated nutrition incident to the inflammatory hyperemia, causes a preponderance of this tissue over the muscular. Secondary contraction with condensation does not differ from that following parturition.

Causation.—As will be gleaned from a review of the pathology, any condition, state, or cause tending to keep up a persistent hyperemia of the uterus, either because of direct irritation or by interfering with the return of blood from that organ, is liable in time to induce areolar hyperplasia. Such are:—

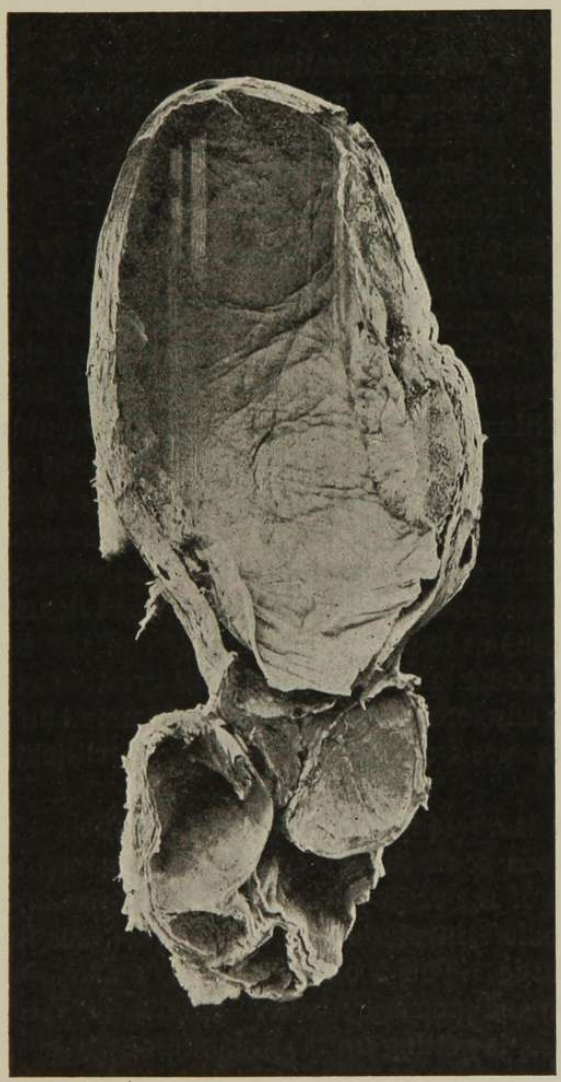
Arrested puerperal involution;
Excessive sexual indulgence;
Cardiac, hepatic, pulmonary, and lung disease;
Uterine displacements;
Neoplasms and abdominal tumors;
Habitual constipation;
Chlorosis, anemia, or malnutrition from any cause;
Ungratified sexual desire;
Prevention of conception.

In order fully to appreciate the importance of *arrested puerperal involution* it is necessary to revert to the physiology of the most remarkable and, to me, most interesting process of normal involution.

A normal nulliparous uterus measures in length, from the external os to the peritoneal investment of the fundus, three inches. In the short space of nine months this diameter is increased to nearly fifteen inches, the transverse to ten inches, and the antero-posterior to nine

and one-half inches. Or perhaps the increase will be more easily appreciated by stating that the area is increased from sixteen square inches to three hundred and thirty-nine square inches (Levret), and that the weight is increased from a little more than an ounce to twenty-eight ounces. (Fig. 113) By the processes of involution a uterus of this size should return in from six to eight weeks nearly to its normal size.

FIG. 113.



A SECTION OF UTERUS AT TERM WITH MEMBRANES INTACT. (*M. R. C. S. Photographed by the Author.*)

Retrograde metamorphosis is inaugurated by the pains of labor, which, by cutting off the capillary circulation and thus interfering with nutrition, lead to fatty degeneration of the muscular fibers. The products of this degeneration are absorbed and the size of the uterus is rapidly diminished. In from twenty-one to twenty-eight days nuclei and caudate cells make their appearance, which develop into new muscular fibers. The uterus at the end of eight weeks becomes normal, or nearly so.

The conditions interfering with this retrogressive process may be enumerated as follows:—

Cervical lacerations;
Getting up too soon after delivery;
Pelvic inflammation;
Retained products of conception;
Non-lactation.

The importance of *cervical lacerations and injuries* cannot be overestimated. If such lacerations healed kindly, the outcome would be different, but they unfortunately often do not. As a result cicatricial tissue is formed, which not only interferes with the circulation of the uterus, but by squeezing terminal nerve fibers gives rise to reflex symptoms, with resulting nervous depression and vice of nutrition. In this way involution is not only arrested, but hypergenesis of tissue, owing to the unnatural and embarrassed circulation, takes place.

There is yet another way by which cervical lacerations interfere with the return of the uterus to its normal state. Lateral tears of any great extent approach so closely the folds of the broad ligaments (even extending into them) as to set up inflammation of the invested cellular tissue. An inflammation thus excited adds greatly to the uterine congestion, as does any form of periuterine inflammation. It is exceedingly difficult to cure a cellulitis of this origin without first repairing the cervix.

Non-lactation is a frequent cause of subinvolution. There exists an almost mysterious connection between the mammæ and the uterus. The application of the child to the breast gives rise to uterine contractions which promote involution. Without this stimulus the uterus is apt to remain large. This is one reason why subinvolution more often follows abortion and premature labor. Another, and to my mind quite as potent a cause, is getting up too soon after early abortions.

The remaining enumerated causes giving rise to undue congestion of the uterus and the pelvic organs are self-explanatory.

Varieties.—Hyperplasia uteri may be limited either to the body or

the cervix; or it may involve the entire uterus. In hyperplasia of the cervix lacerations usually complicate the disease. This must not be confounded with hypertrophic elongation of the cervix, a lesion which is elsewhere dealt with. There probably is more or less hyperplasia in hypertrophic elongation, but the deformity produced in the disease now being considered is very different from that of the latter affection. Again, there may be a circumscribed area of hyperplastic tissue in the uterine wall which simulates a small fibroid.

When the hyperplasia is limited to the cervix the distortion is sometimes of the most marked character. I once saw a cervix thus distorted, which was almost as large as the doubled fist, and which nearly filled the entire pelvis. The patient was referred to me by Dr. Geo. W. Bailey, of Buchanan, Mich. The uterus was immovably fixed by periuterine inflammation; there was a bad cervical laceration, and, as she was about fifty years of age, I much feared malignancy. Subsequent treatment so reduced the disease as to justify trachelorrhaphy, and an ultimate cure resulted. Malignancy is often suggested by the conditions present, and much care is necessary in making a diagnosis.

The cervix is much more frequently affected than is the body, though involvement of the latter is by no means rare.

Symptoms.—These depend somewhat upon the degree of hyperplasia and the part of the uterus affected, but much more upon the complicating lesions.

During the early stages of subinvolution, while the tissues are yet soft and vascular, *hypersecretion* is a prominent symptom. This manifests itself in the form of a profuse leucorrheal discharge and the recurrence of menstruation, or at least a uterine hemorrhage, even though the patient nurse her child. If there be granular degeneration of the cervix a slight hemorrhage often follows coition, or is excited by straining at stool. Owing to the increased weight of the organ displacements are common, and the functions of the bladder and the rectum are more or less interfered with.

As the disease becomes more chronic, and the stage of *hyperplasia* is reached, the symptoms are less acute, but, nevertheless, marked. The leucorrhea and hemorrhage will be governed by the amount of endometritis existing with the hyperplasia—in fungoid endometritis the hemorrhage may be the one symptom for which the patient consults the physician. As the disease progresses, however, menstruation may become less and less in quantity until finally it ceases entirely.

Other symptoms common to both stages are:—

Weight and bearing-down sensation within the pelvis, aggravated by walking, standing, etc.;

Dysmenorrhea;

Gastro-intestinal disorders, as nausea, vomiting, capricious appetite, flatulency, constipation, etc.;

Pain in the back and loins;

Pain and swelling of mammæ, especially just before and during menstruation;

Headache;

Dyspareunia;

Reflex pains in any and every part of the body;

Mental depression and hysterical manifestations;

Vesical and rectal tenesmus;

Sterility.

Dyspareunia is much more common in hyperplasia of the cervix than when the disease is confined to the fundus, though pain on sexual intercourse is sometimes very intense in corporeal hyperplasia.

It will be observed that there are no subjective symptoms attending the disease that are in any way pathognomonic. The same phenomena may result from chronic cervical or corporeal endometritis, and, indeed, from many other lesions of the pelvis; or one or all may be absent in a given case. As already suggested, the symptoms really depend more upon the complications—lacerations, displacements, endometritis, etc.—than upon the changes in the parenchyma of the uterus. This being so, we are compelled to rely largely upon physical signs for diagnostic purposes.

Physical Signs.—In *cervical hyperplasia* digital examination will reveal the cervix tender and enlarged. The external os is ordinarily much dilated, especially if there be laceration with eversion. The cervix has usually descended so as to rest upon the pelvic floor, and it can be distinctly felt through the rectum, upon which it almost always impinges. It is characterized by a peculiar hardness after the stage of hyperplasia is reached, which strongly suggests malignant infiltration.

In *corporeal hyperplasia* the uterus will be found, upon bimanual examination, enlarged, and unnaturally tender. The sound will show increased depth of the uterine cavity. If the abdominal walls are not too fleshy, it may be possible to determine through them an increased thickness of the uterine walls, though, in perhaps the majority of cases of uncomplicated hyperplasia, the uterine cavity remains normal as regards length.

During the early stages of subinvolution the tissues, instead of being harder than normal, are soft, and the uterus is increased in size in all of its diameters.

Differentiation.—There is some danger of confounding the disease under consideration with:—

Early pregnancy;
Uterine fibroids;
Scirrhus of the cervix.

Early Pregnancy.—The pregnant uterus is more globular than is the uterus when the enlargement is due to hyperplasia; it is much softer, and it is often possible to detect, upon conjoined manipulation, a peculiar tenesmus, and sometimes a rhythmical action; it is not tender, and there is usually amenorrhea as well as other signs of pregnancy.

The confusion may, neverthless, be very great, especially if endometritis exist with corporeal hyperplasia, for, with the enlargement of the uterus, there may be also enlargement of the breasts, darkening of the areolæ, nausea, vomiting, etc. Menstruation rarely ceases in hyperplasia, but it must not be forgotten that occasionally menstruation continues during early pregnancy.

Uterine Fibroids.—It is many times utterly impossible to differentiate small fibroids imbedded in the uterine wall from hyperplasia with enlargement. Menorrhagia is usually more marked in the former condition, there is less sensitiveness, and the enlargement is more localized and less uniform. Positive differentiation can only be made by dilating the cervix and exploring with the finger.

Scirrhus of the Cervix.—The following comparison will aid the reader in differentiating between areolar hyperplasia of the cervix and scirrhous degeneration:—

Areolar Hyperplasia.	*Scirrhous Cancer.*
The cervix feels like dense fibrous tissue.	It feels more like cartilage.
The tissues are softened by proper treatment.	They are not so affected.
The body is often implicated.	The body is rarely implicated during the early stages.
Tendency to hemorrhage not marked.	Tendency to hemorrhage marked.
The mucous membrane moves over subjacent tissue.	The mucous membrane is attached to subjacent tissue.
Absence of cachexia.	Presence of cachexia.
No tendency to break down.	Tendency to break down.

It is yet a mooted question whether hyperplasia of the cervix ever takes on malignant degeneration. When cervical lacerations complicate the disease most authorities are agreed that such dgeneration not infrequently occurs.

Prognosis.—There are few cases of hyperplasia of the body of the uterus that can be absolutely cured, so far as restoring the parts to their normal condition is concerned. Much relief can, however, in most instances be afforded, and if the patient is approaching the change of life a complete cure may follow the cessation of menstruation. On the other hand, uterine hemorrhage may continue indefinitely after ovulation ceases, especially if the endometrium is involved. Under the most favorable circumstances much time is required to benefit a case of long-standing corporeal hyperplasia.

When the disease is limited to the cervix the prognosis is not so sinister, for the parts can be gotten at and treatment more advantageously applied. When the changes are due to cervical lacerations the most decided improvement usually follows reparation of the tears with or without partial amputation.

Treatment.

General Treatment.—There are certain general measures applicable to all of the various affections included in this chapter. These should be directed, first of all, toward any diathetic taint that may be present, and to the improvement of nutrition by a properly selected diet. Exercise in the open air, short of fatigue, should be prescribed. Sea-bathing, or, if this is not possible, the daily use of the sitz-bath, will accomplish much good in most cases. Massage and the rest cure are sometimes indicated, though, as a general rule, moderate outdoor exercise is to be encouraged. The bowels should be kept regular and the urinary functions looked after.

Sexual intercourse, if indulged in at all, should occur at long intervals and in the most natural way. On the whole, it is better for the patient to live *absque marito* during treatment. In my experience it is exceedingly difficult to cure or benefit any of the diseases under consideration so long as the patient keeps her pelvic organs constantly congested by any one of the various expedients whose object is to prevent conception.

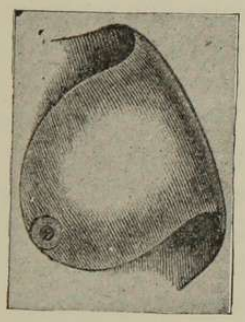
Any or all conditions or causes tending to keep up pelvic congestion should receive attention. The clothing ought to be suspended from the shoulders instead of constricting the waist and crowding the abdominal organs into the pelvis.

Measures having for their object the promotion of uterine contraction and the complete emptying of the organ following delivery at term or abortions should be applied. I have, in dealing with acute pelvic inflammation, especially emphasized this point.

Local Treatment.—In *chronic cervical endometritis* the indications to be covered are:—

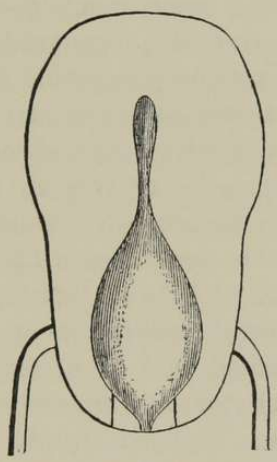
1. Any cause tending to perpetuate the catarrhal process should be removed.
2. The parts should be kept thoroughly clean.
3. Congestion should be overcome by the intelligent use of the hot douche.
4. Medicaments should be applied to the diseased surface.

FIG. 114.



CONOID CERVIX, PINHOLE OS. (*Palmer.*)

FIG. 115.



DILATED CANAL FROM OBSTRUCTION OF OS EXTERNUM; LINES FOR INCISION. (*Mundé.*)

Of the removable *local causes*, we have to do with displacements, lacerations, distorted cervices, periuterine inflammation, etc. In dealing with cervical lacerations we are hardly justified in operating until the local disease has been overcome or greatly improved; the cervix is then repaired for the purpose of promoting its return to a normal state. Pessaries must be used with much circumspection while endocervicitis is at all severe. It is better in these cases to correct the displacement as nearly as possible by means of the vaginal tampon.

The form of distorted cervix calling for operative interference is well shown in Figs. 114 and 115. It is in such conditions as are there shown that quite extensive disease may continue indefinitely without causing the external os to gape. As a consequence, the discharges are retained, the cervical canal becomes dilated, and direct treatment is made difficult. To overcome this condition the hard steel dilators (Fig. 50) should be introduced and the os enlarged. I prefer this method to that of gradual

dilatation by hard rubber dilators (Fig. 49). Mundé prefers to incise the cervix, as is shown by the vertical lines in Fig. 115. In my hands simple dilatation has been quite sufficient.

The *vaginal douche* is useful both for the purpose of cleansing the parts and overcoming congestion by contracting the blood-vessels. I instruct my patients, in dealing with the condition under consideration, to use the douche at least once a day, preferably twice, and always a short time before presenting themselves for treatment.

In dealing with *granular* and *cystic degeneration* it is often necessary to remove the diseased tissue, either with a pair of scissors or with the sharp curette, before much good will come from the use of local medicaments. In cystic degeneration all that may be necessary is to empty all of the cysts by puncturing them with the point of a tenotomy knife, forcing out their contents, and applying to their bases nitrate of silver, or the compound tincture of iodin. The galvano-cautery may be used for the purpose of destroying the cysts. In very extensive degeneration it may be necessary to amputate a portion of the cervix.

As regards *local medication*, I have expressed my views in full in Chapter X. I believe that it will rarely be necessary to resort to the more powerful application of nitric acid, chromic acid, etc., if each case is treated, not in a routine way, but according to the indications which present themselves. Galvanism is of the greatest utility. Since using it I am confident that I am curing my patients in much shorter time than formerly. I append to this chapter several illustrative cases showing its usefulness and the method of its application in general endometritis and metritis. I will simply state at this time that when the disease is limited to the cervix, negative cauterization, with from ten to seventy-five milliampères, will ordinarily change the condition for the better very quickly. The applications should be made from two to three times a week for at least three or four weeks. (*v.* Chapter XI.)

By no means do all cases of cervical endometritis require local treatment other than the patient can administer herself by the use of the hot douche and some liquid medicament. I rarely subject a young unmarried woman to local examination for leucorrhea alone until an effort has been made to cure the discharge by general measures and the more simple local ones just referred to.

Chronic Corporeal Endometritis.—This affection is so frequently associated with, and, indeed, is so often the cause of, menorrhagia and other menstrual troubles that I have, in the chapter devoted to uterine hemorrhage, described my method of dealing with it. The persistent

use of the vaginal douche, intrauterine applications of the compound tincture of iodin, carbolic acid or ichthyol, followed by the boro-glycerid tampon, is the classical method of local treatment, and, it must be confessed, much good often results from this treatment continued for several weeks or months. Galvanism, too, is a most valuable agent, and I rarely resort to the more radical treatment of divulsion and curetting until galvanism has been given a fair trial. Notwithstanding intelligent and faithful use of these methods, we will every now and then meet with cases little improved by them. This is particularly true when fungoid endometritis exists, and it is in such cases that curetting does so much good. After the curetting and the application of the proper medicament (I have found the compound tincture of iodin or the impure carbolic acid sufficiently powerful; Dr. Mundé prefers a 50 per cent. solution of chlorid of zinc), the uterine cavity should be packed with iodoformized gauze. The vagina is then packed with the same material and the patient put to bed, where she is to remain for a week or ten days. Subsequent office treatments for five or six weeks are usually necessary.

The foregoing measures are heroic, but since we are dealing with a most obstinate affection, heroic measures may become imperative. By observing the counter-indications and proper antiseptic precautions there is really but little danger attending the use of the curette, while the good accomplished more than compensates for the enforced confinement. This is especially true if the disease is of gonorrheal origin.

I do not attribute all of the benefit derived from this operation to the curetting alone, for the measures applied promote drainage of the uterine cavity, the importance of which is especially emphasized by Dr. Gil. C. Wylie, of New York. I am convinced that the principle of drainage, as applied to the uterine cavity, is a broad one, and is applicable to all forms of endometritis.

Subinvolution and Areolar Hyperplasia.—The local measures applicable to these conditions do not differ essentially from those recommended for the two forms of endometritis. When we have the management of lying-in cases, we should promote involution, by thoroughly emptying the uterus, and insist upon the patient's remaining in bed until the fundus can no longer be felt above the pubes; we should encourage, unless positive counter-indications prevail, lactation; and, finally, we should advise against the resuming of marital relations until involution of all the genital organs is complete.

The local treatment should be directed toward the removal of those complications upon which the uterine changes in no small degree de-

pend. Such are cervical lacerations, endometritis, granular and cystic degeneration of the cervix, fungoid degeneration of the endometrium injuries to the pelvic floor, uterine displacements, etc. It may be necessary, if the changes in the cervix are very great, to remove a portion of it, as is recommended in hypertrophic elongation of that organ.

The hot douche, if it does good at all, must be used even more persistently than in cervical and corporeal endometritis.

Local alteratives are to be used as in endometritis, and undoubtedly do much good.

The most useful of all agents is, however, *electricity*. I do not resort to electro-puncture, as recommended by Apostoli, but use one or the other pole direct within the uterus. If the parts are very vascular and the tissues soft, or if pain is marked, the positive pole is used direct; if, on the contrary, the tissues are hard and indurated, the negative electrode should be passed into the uterine cavity. I have rarely seen any good come from a current of less than twenty-five milliampères, unless the chief object was to relieve pain, when one of this strength would ordinarily suffice. However, if the patient can tolerate a current of seventy-five or one hundred milliampères, so much the better. At least two applications a week should be made. It must, too, be persisted in for weeks or even for months. (*v.* Chapter XI.)

Illustrative Cases.

Case I.—*Corporeal and Cervical Endometritis.*—Miss ———, æt. 22, had been under my care off and on for three years, suffering from corporeal and cervical endometritis. She suffered from reflex symptoms too numerous to mention, the one giving her the most distress being a severe pain in the right hip. Menstruation was excessive, and during the menstrual period there was a profuse, purulent leucorrhea, which was very excoriating, and gave rise to an intense pruritus. The lips of the os were eroded, and the uterine cavity measured three inches.

The patient would greatly improve under the ordinary methods of treatment, but soon after discontinuing them she would relapse into her former state. I finally resorted to direct, positive galvanization, beginning with twenty-five milliampères and ending with seventy-five. The seances varied in time from one to five minutes, and were repeated twice a week for four weeks. The internal electrode was Martin's flexible platinum instrument, and I was careful to have the metal come in contact with the entire endometrium, including that of the cervix.

Improvement followed the first application, and after the eighth I

discharged her. The uterus was still somewhat larger than normal, but the discharge had ceased, the erosion was overcome, and the cervix had a normal appearance. The patient improved in every respect, and is now, six months later, quite well.

CASE II.—*Areolar Hyperplasia.*—Mrs. ———, æt 52. The uterus in this case was hard, dense and tender, and measured three inches. Menstruation had ceased two years before consulting me. The patient complained of constant pressure and pain in the uterine region. Because of the pain I first used positive galvanization, but after three or four applications the negative pole was used direct. The applications were made twice a week. At the end of eight weeks she reported herself entirely free, not only from the local pain and distress, but from the nervous and mental symptoms as well, which at the beginning were marked.

CASE III.—*Cervical Endometritis.*—Miss ———, æt 19, consulted me for a most distressing dysmenorrhea. I found obstruction at the internal os with a bad chronic cervical catarrh. The catarrh was treated in the usual way and greatly benefited, but the dysmenorrhea persisted. Accordingly, I resorted to forcible divulsion under ether, inserted a cervical plug, and kept the patient in bed for a week. This operation completely relieved the dysmenorrhea, but the cervical catarrh returned worse than before. I then resorted to local negative cauterization with the most happy results. The catarrh was entirely cured by four applications.

The foregoing cases are but a few of the many passing under my observation. The applications, in all instances, were followed by the boro-glycerid tampon and sometimes by direct medication with iodin or carbolic acid. The hot douche and the indicated remedy were also faithfully used in all instances. In addition to these, I will quote in full three cases from Massey's "Electricity in the Diseases of Women."*

CASE IV.—*Chronic Purulent Endometritis of Five Years' Duration. Complete Relief after Eight Negative Cauterizations.*—E. L., married, aged 37 years, was seen first in private practice early in March, 1888. She had suffered from hemorrhage five years before, which had left her with a constant, abundant leucorrhea of a greenish-white color and offensive odor. Menstruation was regular, abundant, and attended with considerable pain. Examination showed an eroded os with thickened lips. Uterus two and a half inches plus, anteflexed, and slightly hypertrophied. At this visit, thirty milliampères, negative, were ap-

Op. cit., second edition.

plied to the endometrium for five minutes. The odor from the discharge was so offensive as to necessitate opening the office windows.

March 12th. Discharge clearer and less abundant. Negative cauterization, eighty milliampères, four minutes.

March 16th. Electrode introduced with greater ease. Negative cauterization, one hundred milliampères, four minutes.

March 18th. Negative cauterization, one hundred milliampères, four minutes. Discharge clearer and much less offensive.

March 20th. Negative cauterization, eighty milliampères, three minutes. Her menstrual period followed several days later, normal in amount and duration, and attended with less pain than at any time for years. Several similar applications were made during the next intermenstrual period, when it was noticed that the discharge was much lessened in amount, and entirely free from odor. The second intermenstrual period was free from discharge of any kind. Eight months later the patient was seen, and stated that she had remained entirely well since.

CASE V.—*Chronic Metritis of Five Years' Duration. Uterus Reduced to Normal Size and Disappearance of Symptoms after Five Applications to Cavity.*—Mrs. M. S., aged 38, mother of one child 10 years old. Five years ago had a miscarriage, and has been ill ever since. Suffers from pain in the right groin, which is sore and tender to touch. Menstruation every three weeks; flow normal, with severe bearing-down pains. Has a continuous intermenstrual backache and leucorrhea.

Examination November 25, 1889, showed an enlarged and prolapsed uterus, adherent to the right. Manipulation caused considerable pain. Os eroded and exuded muco-purulent matter; cavity three and a half inches. Forty-five milliampères, positive, were applied to the cavity for two minutes.

December 9th. Soreness and backache better. Positive cauterization of cavity. Forty-five milliampères, one minute.

December 27th. Menstrual flow since last treatment, unaccompanied by pain for the first time in five years. Cavity three inches. Positive cauterization, forty-five milliampères, two minutes.

December 30th. More pain than usual. Positive cauterization, forty-five milliampères, two minutes.

January 3, 1890. Uterus in normal position and freely movable, with but slight pain. Shortening and slight thickening in region of broad ligament. Cavity two and a half inches, but some leucorrhea continues.

January 17th. Menstruation at third week. Again painless. Leucor-

rhea slight. Positive cauterization, twenty-five milliampères, two minutes.

January 27th. Leucorrhea more watery. Positive cauterization, forty milliampères, three minutes.

February 10th. Menstrual flow normal and painless. Cavity two and a half inches. No leucorrhea since last period.

CASE VI.—*Chronic Metritis of Two Years' Duration. Complete Relief After Three Applications.*—Mrs. M. H., aged 31, was seen at Howard Hospital in July, 1889. She had had eight children and one miscarriage, the latter two years before, since which she has been ailing. Pain in back, left side and head, with abundant leucorrhea. Walking difficult. Examination: Uterus hypertrophied, os slightly lacerated, cavity three inches, purulent discharge from uterus. Tenderness in both ovarian regions. She was given three negative cauterizations of fifty milliampères each at intervals of one week. After the next period she reported complete relief of all symptoms, and the cavity was found to be but two and one-half inches.

Therapeutics.

Hydrastis Canad.—TENACIOUS DISCHARGE; erosion and superficial ulceration of the cervix and vagina; *great sinking and prostration at the epigastrium*, with violent and continued palpitation of the heart; leucorrhea, complicated with hepatic derangement and constipation.*

Calcaria carb.—LEUCOPHLEGMATIC CONSTITUTION; *menses too profuse and too often;* the feet feel cold and damp; albuminous leucorrhea from the cervical canal with great lassitude and debility. "Every current of cool air seems to go through and through the patient."—*Guernsey.*

Conium mac.—Leucorrhea of a white, acrid mucus, causing a burning or smarting sensation; prolapsus uteri complicated with INDURATION, ulceration, and profuse leucorrhea. "One of the best remedies in induration, especially of a scrofulous nature."—*Lilienthal.*

Mercurius.—Lancinating, boring, or pressing pain; discharge variable in character; *all symptoms worse at night; much perspiration, which affords no relief;* MOIST TONGUE, often accompanied with intense thirst; gonorrheal or syphilitic complications.

Kreasotum.—Leucorrhea of a yellow color, staining linen yellow, with great weakness; exceedingly corroding leucorrhea, causing red-

* "The general condition of the patient will often afford the strongest indication for the use of *Hydrastis*, namely, the cachectic state, the weak muscular powers, the poor digestion, and the obstinate constipation."—*Hale.*

ness and itching of the vulva; menses too early, too profuse and too long.*

Sepia.—Pain in uterus, which extends from back to abdomen, with bearing down; crosses limbs to prevent protrusion of parts; *redness, swelling and itching eruption of labia;* great sense of emptiness in pit of stomach.

Murex.—A feeling as though something were pressing on a sore spot in the pelvis (Betts); thick, green, or bloody leucorrhea; sexual erethism.

Graphites.—Particularly when the ovaries are affected; scanty menses; IRRITABLE SKIN; weakness in the back and small of back when sitting or walking.

Borax.—White albuminous leucorrhea; leucorrhea midway between the menstrual periods. "Like all of the other secretions of *Borax*, the leucorrhea has an unnatural warmth or heat to it."—*Farrington.*

Pulsatilla.—Thin, acrid leucorrhea, or thick, white mucus, most profuse after menses; tensive, cutting pain in uterus, which is very sensitive to touch or to coitus; amenorrhea.†

Arsenicum.—Leucorrhea in women of *pale, waxy complexion;* prostration; acrid, free discharge; vomiting immediately after taking food; amenorrhea.

Aurum.—Syphilitic and scrofulous endometritis; induration and prolapsus of the uterus; *great nervous weakness with utter despair.*

Lachesis.—*She cannot bear any pressure, not even of the clothes, over the uterine region;* metritis during the critical age with FLUSHES OF HEAT; sensation as if the pains were ascending toward the chest; *aggravation after sleep.*

Sabina.—Pain from sacrum or lumbar region to pubes; metrorrhagia of clotted and fluid blood.‡

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* "The acridity of the leucorrhea marks clearly the divergence of *Kreosote* from *Sepia*, as well as from *Murex*. This led to the employment of the drug in cancerous and other forms of ulceration of the cervix uteri, and we now choose it when there are burning, sensitiveness, and tumefaction of the cervix, with bloody, ichorous discharges; sensitiveness to touch or to coitus; and a putridity, which is foreign to the other two remedies."—*Farrington.*

† "In simple mucous leucorrhea *Pulsatilla* is often curative; and in dysmenorrhea, when the little blood which flows is black and coagulated, and when diarrhea is wont to occur at the periods."—*Hughes*

‡ "Consentaneous rectal and vesical irritation adds weight to the indications for the choice of *Sabina* in utero-ovarian disorders."—*Hughes.*

Secale.—Subinvolution with putrescence of leucorrheal discharge; great debility, with tingling in lower extremities.*

Caulophyllum.—Insomnia, paraplegia, atony, and relaxed condition of the uterus; hysterical spasms; menses excessive and irregular.

Helonias.—Leucorrhea giving rise to *intense pruritus, with heat and swelling of the vulva;* GREAT DEBILITY; melancholia, with a sensation of weight; soreness and *dragging in the uterus.*

Cimicifuga.—SEVERE PAINS IN THE SMALL OF THE BACK, down the thighs, and through the hips, with heavy pressing down; the patient is *nervous, neuralgic* and *hyperesthetic,* but not so hysterical as the ignatia patient (D. Dyce Brown); sensitiveness of all of the pelvic organs, especially the ovaries; INSOMNIA; MELANCHOLIA.

Nux vom.—Violent aching in the hypogastrium, aggravated by pressure and contact; CONSTIPATION; *aggravation toward morning.*

Sulphur.—Vulva excoriates easily; *frequent flushes of heat;* weak and fainting spells, with strong craving for food.

Iodium.—Acute pain in the mammæ, developed by the metritis; emaciation and low cachectic state of the system, with feeble pulse; ATROPHY OF THE MAMMÆ.

Kali bich.—*Leucorrhea that can be drawn out in long strings, yellow, ropy, stiffening the linen.*

Consult:—Kali carb., MAGNESIUM MUR., stramonium, kali sulph., *rhus tox., nitric acid,* phosphorus, and silicea.

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* "The *Secale cor.* may, perhaps, be the only remedy required in the treatment of subinvolution. I have treated several such cases successfully with it alone. My preference is for the second or third dilution."—*Ludlam.*

CHAPTER XXX.

INTRA- AND EXTRA-PERITONEAL PELVIC HEMATOCELE.

Definition.—An effusion of blood, which becomes organized, either within the pelvic peritoneal cavity or in the subjacent cellular tissue, is called a pelvic hematocele. When the blood is poured into the free peritoneal cavity, it constitutes an *intra-peritoneal hematocele;* when it finds its way beneath the peritoneum, usually between the folds of the broad ligament, it is known as an *extra-peritoneal hematocele*, or a hematoma. In order to constitute a true hematocele in either event it must become encysted. Blood poured into the free peritoneal cavity, which is not shut off by a limiting membrane, is better defined by the term *intra-peritoneal hemorrhage.* The encysted effusions constitute a distinct, morbid condition very different from non-encysted effusions.

Certain terms are used to indicate the location of the effusion. Thus, if back of the uterus, it is called a retro-uterine hematocele; if in the cellular tissue surrounding this organ, peri-uterine; if in the cellular tissue surrounding the rectum or the vagina, peri-rectal, peri-vaginal, etc.

While the tendency in modern literature is to dismiss pelvic hematocele in a few words, under the head of "ectopic pregnancy," I still believe that treatment of the subject naturally follows the study of the inflammatory pelvic diseases.

Intra-Peritoneal Hematocele.

Etiology.—The causes of this accident are both predisposing and exciting. The predisposing causes are:—

Age of sexual vigor;

The various blood affections, as plethora, anemia, and hemophilia;

Uterine diseases.

The exciting causes are:—

Ruptured ectopic pregnancy cysts;

Traumatism;

Intra-vaginal and intra-uterine injections;

Excessive or intemperate coition;

Obstruction of the Fallopian tubes.

A pelvic hematocele rarely occurs before the age of fifteen or after the age of fifty. During the interval between these ages all of the functions pertaining to the sexual organs are active. The *sexual relations* undoubtedly predispose, both directly and indirectly, to the formation of hematocele. Directly, because of the increased congestion of the pelvic organs resulting from the sexual act, and especially from the various means resorted to for the purpose of preventing conception; indirectly, because of the not infrequent occurrence of extra-uterine pregnancy. It is maintained by Lawson Tait that a ruptured extra-uterine pregnancy cyst is, in nearly all instances, the cause of pelvic hematocele. While it is probably a very frequent one, neither the weight of authority nor clinical evidence justifies so sweeping an assertion. I met with one fatal case of intra-peritoneal hematocele in a virgin.

In the several conditions characterized by *intravascular pressure* there is, of course, a greater tendency to rupture of the vessels in all parts of the body. Such a condition prevails in plethora, and plethoric women, particularly if the hemorrhagic diathesis is a feature of the changed blood state, are more liable to have hematocele. Conversely, anemia, chlorosis, and, indeed, all forms of depravity of the blood, predispose to hematocele, notwithstanding the diminished intra-arterial pressure. The explanation here is, that the resistance of the walls of the blood-vessels is weakened; if from any cause a temporary congestion is induced a rupture may occur.

The various *uterine affections* predispose to hematocele because of the increased pelvic congestion to which they usually give rise, and because also of the cervical obstruction which so often results from such affections. The blood, not being able to escape readily from the cervical canal, is retained, the uterus becomes distended, and a reflux through the Fallopian tubes into the pelvic cavity takes place.

Traumatism is not an infrequent cause. The accident may result from lifting, straining, kicks, blows, falls, etc. It follows not infrequently after operations upon the uterus or within the pelvis, though, as a result of oöphorectomy, hemorrhage is oftener effused beneath the peritoneum.

Obstruction of the Fallopian tubes, by preventing the entrance of blood into the uterus during menstruation, may divert the hemorrhage through the fimbriated extremities into the peritoneal cavity; hematoceles from this cause are usually small.

Sources of the Blood.—The hemorrhage may have its origin from several different sources. Undoubtedly, one of the most frequent is a ruptured extra-uterine pregnancy cyst. This will be referred to again in dealing with that particular accident.

It may be derived from the tubes; it is probable that the mucous membrane of the tubes pours out more or less blood in normal menstruation. If, from any cause, it cannot reach the uterine cavity, it takes the direction of least resistance and escapes from the fimbriated extremities of the canals. That this is true is shown by the fact that in many cases of hematocele the tubes are distended with blood. The amount of hemorrhage in these cases is usually not great, and, if the peritoneum is in a perfectly normal condition and the blood not abnormally irritating, the fluid is quickly absorbed and no tumor is formed. The same may be said of hemorrhage from a ruptured Graafian follicle. No great amount of blood ordinarily escapes from this source. Under the head of sterility I have alluded to the improbability of even the majority of extruded ovules finding their way into the Fallopian tubes. The ovule and the slight hemorrhage attending dehiscence of the Graafian follicles escape into the peritoneal cavity. The resulting distress is usually not great, but the frequent attacks of localized peritonitis during menstruation are often due to this cause.

Richet particularly emphasizes the importance of varicosis of the utero-ovarian venous plexus as a causative factor in the production of hematocele. This plexus is often unnaturally enlarged, which condition constitutes "varicocele of the female." Virchow affirms that the veins which make up this plexus, when they become varicosed, frequently contain phlebolites, which give rise to ulceration of their walls. Whatever may be the cause of the weakened condition of these veins their rupture gives rise to profuse hemorrhage, for the plexus is a large one.

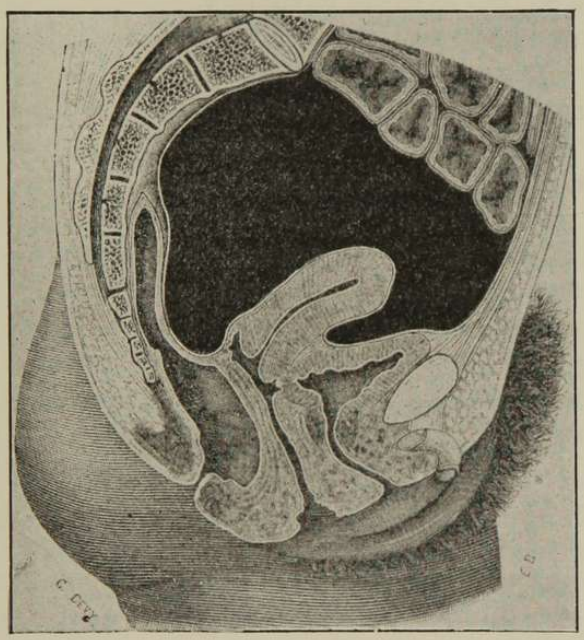
The older authorities taught that a hemorrhage proceeds, not infrequently, from a preëxisting pachyperitonitis. Most modern writers contend that the importance of this condition in the production of hematocele has been exaggerated.

Pathology.—In nearly all instances when blood finds its way into the free pelvic peritoneal cavity, it gravitates, unless prevented from so doing by previously formed adhesions, into the Douglas cul-de-sac. This is because the cul-de-sac is the most dependent part of the peritoneal cavity. In the event of its obliteration by previous disease, the next most dependent part is the utero-vesical pouch. If the quantity of blood is not great, it is limited to one or the other of these pouches.

When, however, more blood escapes than can be contained in either of these localities, it may fill the entire pelvis, and, indeed, extend as high as the umbilicus. A very large hematocele is shown in Fig. 116. Here the uterus and all of the pelvic organs are embedded in, and surrounded by, the encysted fluid.

The contact of the blood with the peritoneum causes the latter to inflame, and a protective lymph is quickly thrown out, which separates the fluid from the intestines and organs above. This neo-membrane at

FIG. 116.



INTRA-PERITONEAL HEMATOCELE.

The coagulated blood completely surrounds the uterus and covers the superior surface of the bladder and the anterior surface of the rectum. The small intestines are pushed upward.

times so closely resembles in appearance the normal peritoneum as to make it difficult to distinguish the one from the other after the abdomen is opened. Intra-peritoneal hematocele, because of this fact, has more than once been mistaken for the extra-peritoneal variety.

If the amount of blood is not great, and does not surround the uterus, the sac is bounded in front by the posterior wall of that organ; laterally, by the utero-sacral ligaments and walls of the pelvis; and posteriorly, by the rectum and posterior pelvic wall. Frequently the ovaries and

tubes adhere to the walls of the sac and are blended with it. Adhesions of the intestines are of common occurrence.

The quantity of the effusion is sometimes limited by a pre-existing false membrane.

The blood, when it first escapes, is liquid. Its watery portions are, however, quickly absorbed, when it becomes semi-liquid and coagulated, and, as time progresses, solid. These are the usual changes. Sometimes it remains semi-liquid or sirupy, and shows no tendency to coagulate. There is usually some septic taint when this is the case.

The walls of the sac vary in thickness, at some portions being quite thick, at others so thin as easily to rupture.

Fig. 116 shows how great is the distortion of the rectum and the bladder by the pressure of the tumor. The rectum is sometimes so impinged upon as to be completely occluded, and the function of defecation is almost always disturbed to a greater or less extent. So, too, is the function of micturition; indeed, in some of the worst cases the pressure upon the urethra may entirely occlude this canal.

When the affection has for its cause a ruptured extra-uterine pregnancy cyst, it may be impossible to find any evidences of the fetus after the abdomen is opened, rupture having occurred before it had sufficiently developed to make its detection an easy matter. A careful search will, in most instances, reveal some of the remains of the chorion. It is this difficulty in detecting the evidences of early extra-uterine pregnancies which has led Tait to make the somewhat sweeping assertion already referred to.

Symptoms.—The *onset* may be either sudden or gradual. A careful inquiry will often reveal a history of certain premonitory symptoms pertaining to the function of menstruation or to the pelvic organs. Menstruation has, perhaps, been more or less disturbed for some time previously to the onset. Some of the signs of salpingitis may have presented; and, in the event of extra-uterine pregnancy, irregular spasmodic pains in the region of one or the other Fallopian tube may have preceded the rupture. Gastric reflexes also occur with more or less constancy in extra-uterine pregnancy. While these premonitory symptoms often occur, the reader must not imagine that they invariably do; indeed, in many instances the patient will have enjoyed perfect health up to the very time of the effusion.

The intensity of the symptoms will depend in large measure upon the quantity of blood effused. The one condition which is more characteristic of hematocele than any other is *syncope*. This is indicated by the

pallor, the feeble and sometimes imperceptible pulse, the subnormal temperature, the hiccough, and, in serious cases, nausea and vomiting.

Pain may occur simultaneously with the syncope or not until reactionary symptoms have set in. It is due to the peritonitis excited, and to pressure upon the organs and nerves of the pelvis. The patient will locate it in the pelvic or sacral regions, in the bladder, or in the rectum. Sometimes pressure upon the sacral and the crural nerves will cause intense suffering in the lower extremities. The pain does not depend so much upon the size of the tumor as upon the degree of peritonitis excited: if the blood is especially irritating, or if it is contaminated with pus, the result of pre-existing pyosalpinx, a small quantity of fluid will give rise to a great deal of suffering.

The *local symptoms* are very characteristic. There is almost always tenderness over the hypogastric region, and if the blood-tumor is large enough to reach above the pelvic brim, dulness as well. A digital examination will reveal a tumor in some portion of the pelvis, usually back of the uterus; or, in the event of a large effusion impinging upon all of the fornices of the vagina, the uterus will be found completely embedded in it. The tumor is at first soft and fluctuating, but soon acquires a variable consistence, and in time, as we have already seen in studying the pathology, becomes hard. There is of course more or less tenderness within the pelvis. Bimanual examination shows either that the uterus is in the center of the tumor; or, if the tumor is limited to the posterior cul-de-sac, that the uterus is pushed forward, and the cervix carried almost above the reach of the examining finger. A rectal exploration may be impossible because of the occlusion of this organ. Much valuable information can, however, ordinarily be obtained by a rectal examination.

The *reactionary symptoms* following the syncope usually manifest themselves within a few hours after the accident. The degree of fever is most variable, though in most cases it is quite marked, the temperature ranging from 102° to 105° F. It is largely due to the inflammatory symptoms attending the peritoneal irritation. The pulse corresponds to the height of the fever, though for a time it is more compressible than it ordinarily is in peritonitis, because of diminished intra-arterial pressure from the loss of blood. The temperature shows exacerbations and remissions, it being usually higher during the day and early part of the night and lower in the morning. The nausea and vomiting likewise depend largely upon the peritoneal involvement; if the peritonitis becomes general, these symptoms are often most distressing. This is true also of tympanites. Sometimes the distention of the bowels is very

great, which condition is frequently associated with nausea and vomiting. Tenderness over the abdomen is likewise a symptom accompanying peritonitis.

Progress of the Disease. — In the event of large effusions the course, under the most favorable circumstances, is usually chronic. It is, nevertheless, surprising with what rapidity nature will absorb, when not interfered with, a large intra-peritoneal hematocele. There is, in most instances, a progressive tendency to recovery either by natural absorption or by spontaneous evacuation. Exacerbations are, however, of frequent occurrence. They result either from new effusions taking place from time to time, or from an extension of the peritonitis. A recurrence of the hemorrhage is more apt to take place in cases of extra-uterine pregnancy, and the patient is never out of danger until the tumor has so far diminished as to preclude the possibility of renewed hemorrhage, or of suppuration. The process of absorption varies greatly in its activity, requiring all the way from two weeks to many months before it is complete.

The patient is often unable to walk for some time after assuming the sitting posture. Uterine displacements are frequent sequelæ. Evidences of the tumor often remain permanently in the form of hard nodules.

Signs of Suppuration.—Suppuration may not occur until some time after the inflammatory symptoms have entirely subsided. Its onset is indicated by a decided chill, or a succession of erratic chills, followed by perspiration, fever, tympanites, etc. The tumor, which had previously diminished more or less in size, increases, and in time becomes soft at some point. Unless artificially evacuated, the pus will find its way either into some of the cavities of the pelvis or through the abdominal wall externally. It most frequently escapes into the rectum, which gives rise to more or less proctitis, the pus being blackish and exceedingly fetid. When the abscess discharges into the vagina the point of rupture is indicated by more or less fluctuation. Fortunately, rupture rarely occurs into the peritoneal cavity and almost never into the bladder. After rupture, whatever may be the point of exit, there is a decided relief of the general symptoms and local distress, though if the discharge continues for an indefinite length of time it greatly prostrates the patient and she may die from sheer exhaustion; or, as is oftener the case, from pyemia.

Diagnosis.—The early symptoms of hematocele are almost pathognomonic. The sudden occurrence of shock, followed by the formation of a retro-uterine tumor, which is at first fluid, becoming gradually

more or less solid as time progresses, and the succeeding inflammatory symptoms—all point to hematocele. The conditions liable to be confounded with it are:—

Ruptured pyosalpinx and pelvic abscess;
Tumors resulting from pelvic cellulitis or peritonitis;
Tumors resulting from extra-uterine pregnancy;
Retro-uterine displacements;
Ovarian and fibroid tumors.

Ruptured *pyosalpinx* and *pelvic abscess* give rise to but little syncope. No tumor ensues except as a result of succeeding peritonitis.

Pelvic cellulitis and *peritonitis* give rise to symptoms which occur in a sequence different from that following hematocele. The inflammatory symptoms precede the formation of the tumor. There is no shock and no syncope.

The tumor resulting from *extra-uterine pregnancy* is of slow formation. It is usually located laterally. There is no shock, no syncope, and no inflammatory symptoms previously to rupture.

Retro-uterine displacements may be complicated by pelvic inflammation. A tumor in the posterior cul-de-sac due to this cause can be penetrated by a sound passed through the cervical canal ; the bimanual will show that the fundus is not in front.

Small ovarian and *fibroid tumors* located in the posterior cul-de-sac ought not to be confounded with hematocele. There is an absence of all of the symptoms characteristic of the latter condition, except the presence of the tumor. Careful inquiry into the history of the case, together with a local examination, will usually determine the true condition.

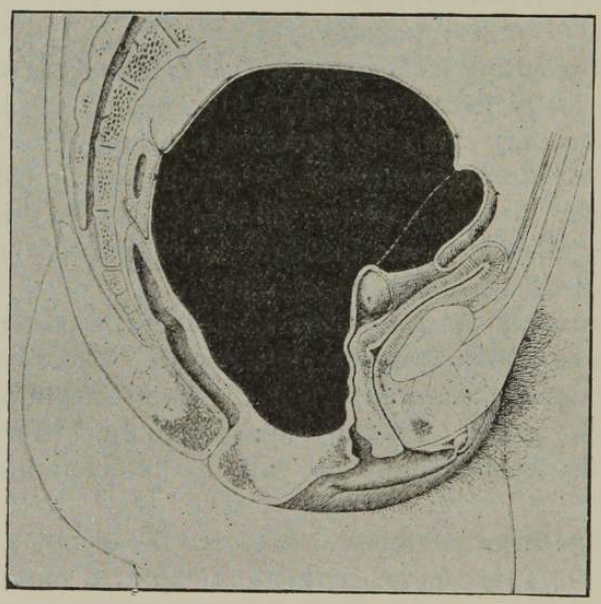
Prognosis.—Intra-peritoneal hematocele is usually a most serious condition, though, except when due to a ruptured extra-uterine pregnancy cyst, immediate death rarely occurs. There are certain factors which should always be carefully noted in determining the prognosis. The hemorrhagic diathesis greatly complicates matters, for there is a tendency in these cases to frequent recurrences of hemorrhage. When the system is previously depressed by any of the constitutional diseases, the tumor is apt to remain soft and fluctuating ; this is always unfavorable. In the event of suppuration a spontaneous rupture into the rectum is unfortunate, for the resulting abscess will frequently continue to discharge indefinitely because of incomplete drainage. In perhaps the majority of cases plastic residues about the uterus remain permanently, to which subsequent ill-health can often be traced. Uterine

displacements often result from the adhesions left behind and from the changed condition of the pelvic organs.

Extra-Peritoneal Hematocele.

Etiology.— The same causes responsible for the intra-peritoneal variety of hematocele are quite as often responsible for an effusion of blood into the subjacent cellular tissue. As already intimated, the accident frequently follows salpingotomies and ovariotomies. It is probable, too, that this form of hematocele is oftener due to extra-uterine pregnancy than is the intra-peritoneal variety. As regards the relative

Fig. 117.



Extra-Peritoneal Hematocele.

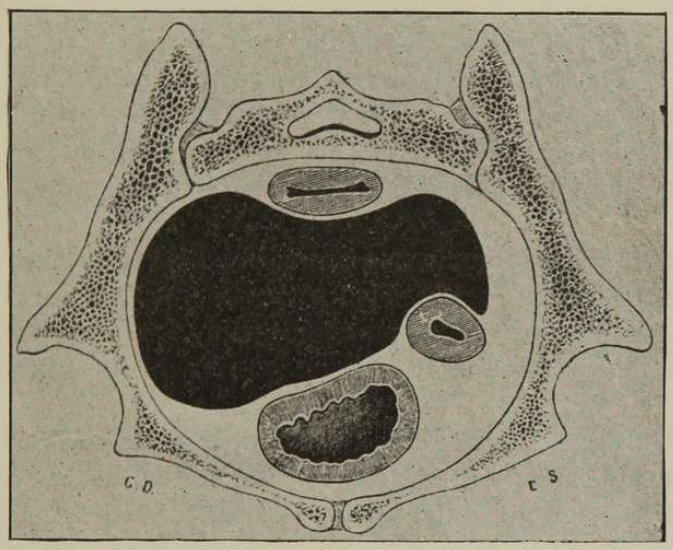
The blood is effused into the pelvic cellular tissue, elevating the pelvic peritoneum and pushing the uterus forward and to one side. All but the cervical portion of the uterus is concealed. (*Auvard and Devy.*)

frequency of the two forms, there exists a difference of opinion among the authorities, owing to the fact that intra-peritoneal hematocele is oftener fatal. The older writers, because of this fact, believed the latter to be by all odds the more frequent form. Information obtained by abdominal surgery has thrown new light upon the subject. We now know that when the blood is limited by the peritoneum, death rarely if ever occurs.

Unquestionably, there are many cases of extra-uterine pregnancy which rupture into the folds of the broad ligament, giving rise to hematocele, which are followed by fetal death, absorption and recovery.

Pathological Anatomy.—Some idea of the size of the tumor and the resulting changes can be obtained by referring to Figs. 117 and 118. Fig. 117 represents a vertical section through the center of the pubes and the center of the sacrum; and Fig. 118, a horizontal section of the

FIG. 118.



EXTRA-PERITONEAL HEMATOCELE.

Transverse pelvic section through rectum, uterus and bladder, showing lateral displacement of uterus. The same pathological condition as represented in Fig. 117.

same case through the bladder, uterus, and rectum. The blood is effused into the folds of the right broad ligament, and the two folds are distended in such a way as greatly to distort all of the pelvic organs. The effusion in this case implicates the cellular tissue along the sides of the vagina and rectum, and carries the cul-de-sac of Douglas to the bottom of the pelvic floor. If limited to one side the uterus is pushed to the opposite; if both sides are implicated, the tumor is usually much greater on one side than on the other. The two tumors may unite in front and back of the uterus. In Fig. 117 the fundus of the uterus is pushed so far to one side that in the vertical section the entire organ is left undisturbed. The cervix is seen projecting through the upper part

of the vagina. The pressure upon the rectum and bladder is sometimes greater than in the intra-peritoneal variety. These illustrations represent very large effusions; the distortion is correspondingly less when the effusion of blood is not great.

Symptoms.—Owing to the fact that the quantity of effusion is limited by the investing peritoneum, the symptoms are not usually so marked as in the intra-peritoneal variety. The patient may have been in perfect health up to the time of the rupture; if the hematocele is due to a ruptured intra-uterine pregnancy cyst, the symptoms of this affection may or may not have preceded the attack. She is first seized with a pain, more or less acute in character, which is referred to the lower part of the abdomen. Associated with the pain there is usually a certain amount of syncope. The degree of pressure upon the bladder and rectum will depend upon the size and location of the tumor; it may be very great and give rise to the chief distress resulting from the accident.

The reactionary symptoms are ordinarily not so marked as in the intra-peritoneal variety. There is less peritonitis, less fever, and less abdominal tenderness. If suppuration ensues, the symptoms do not differ from those attending the disintegration of an intra-peritoneal tumor.

Upon practising the *bimanual*, a tumor will be found in one or both broad ligaments, usually in one only. The uterus, instead of being in the center or to the front of the tumor, as in the intra-peritoneal variety, is pushed to one side. The physical characteristics of the tumor do not differ essentially from those of the intra-peritoneal variety, except that the mass is at first less fluctuating. The subsequent changes are much the same. The tumor is at first soft, becoming more condensed as time progresses, and, in the event of suppuration, again becoming soft.

In every other respect the course and duration do not differ materially from intra-peritoneal hematocele.

Treatment of Pelvic Hematocele.

The physician, when called upon to treat a case of hematocele, should prevent further loss of blood, if it is possible so to do. He should also direct attention to the shock and syncope when these symptoms threaten life. The patient should be placed in bed as quickly as possible, not even waiting to remove the clothing. Cold applications or an ice-bag over the hypogastric region should be at once applied, while heat is applied to the extremities; and, if the shock is at all marked, friction should be resorted to. If the stomach will tolerate it, stimulants should

be administered in the ordinary way ; if, on the contrary, the stomach is irritable, and nausea and vomiting are persistent, hypodermic injections of brandy or sulphuric ether may be used. The symptoms are ordinarily too urgent to allow the use of vaginal injections, either hot or cold. A quart of the normal *salt* solution may, however, be advantageously thrown into the rectum if life is threatend; or it may be used subcutaneously. The indicated remedy should be administered internally. In the event of simple oozing of blood, much good may result from its use. If, however, the hemorrhage proceeds from a large vessel, any form of internal medication will be useless and too much time should not be wasted in temporizing.

The foregoing indications are to be employed in the early treatment of all cases and all varieties of pelvic hematocele. The subsequent management, after the diagnosis has been made, will depend upon the quantity of hemorrhage effused, the location of the tumor, the pressure symptoms, and the advent of suppuration.

In *extra-peritoneal hemorrhage* immediate operative procedures are rarely called for. Indeed, the usual outcome of these cases, under expectant treatment, is recovery. In the event of suppuration, it is, of course, the duty of the physician to treat the case as one of pelvic abscess. A primary operation may be necessary if the effusion be so great as to give rise to intense suffering because of pressure, or if renewed hemorrhages occur from time to time. On the other hand, as long as the case progresses favorably—the tumor gradually becoming smaller, the pressure symptoms growing less and less severe, the peritonitis disappearing—the physician's duty is clearly to watch for alarming developments, and to avert them if it is within his power to do so.

The treatment of *intra-peritoneal hematocele* is conducted upon entirely different principles. No matter what may be the cause of the effusion—whether the result of extrauterine pregnancy or of some of the causes enumerated—there is but one thing to do if life is threatened, as it usually is by the quantity of blood poured out, and that is to open the abdomen, seek the bleeding point, and control the hemorrhage by surgical measures. It seems to me that there is but one side to the argument in favor of so doing. It is in thorough harmony with that broad surgical principle which governs the surgeon in the treatment of hemorrhage proceeding from any torn vessel which is accessible. There is no restricting tissue limiting the quantity of hemorrhage, as in the extra-peritoneal variety. The capacity of the pelvic and abdominal cavities is practically unlimited; and it would be quite as consistent to wait for a severed radial artery to cease bleeding spontaneously, as to

stand by with folded hands while vessels equally large are pouring their contents into the free peritoneal cavity. The technique of abdominal section for this purpose does not differ from that given for ectopic pregnancy. (*v.* Chapter L.)

When an operation is resorted to for the evacuation of the contents of a hematocele sac, the site of opening will be determined by the location of the tumor. In the majority of instances the vagina is the channel through which the contents are most easily reached. The relative merits of the vaginal operation and the abdominal have been the subject of no little discussion. Rosenwasser (*Annals of Gynecology*, September, 1889) decides emphatically in favor of the latter, and in the statistics collected by him the mortality after laparotomy is 9.9 per cent.; whereas after vaginal incision it is 10.5 per cent. He maintains that the danger is not only less in laparotomy, but that the convalescence is shorter and the chances of a radical cure greater. The other advantages insisted upon by him are: the opportunity afforded to simultaneously remove other lesions that may exist, the possibility of keeping the sac more aseptic, and the ease with which the hemorrhage is controlled. Most operators, notwithstanding the statistics presented by Rosenwasser, prefer, at least when the tumor points into the vagina, the vaginal operation.

Operation.—The vagina should be washed with an antiseptic douche and the patient placed in a favorable posture before a good light. The fluid contents of the sac should be first located with a trocar guided by the finger. The opening made by the trocar is enlarged with the scalpel or a pair of scissors. The nozzle of an irrigator is next gently passed into the sac and the contents washed away with a weak carbolic solution. The sac is now carefully packed with strips of iodoform gauze, which will not only control the hemorrhage but will act as an antiseptic as well. If the hemorrhage is at all profuse, the gauze can be left within the cavity for from three to seven days. After its removal a drainage tube should be inserted, through which the cavity is to be daily washed with an antiseptic solution. The tube can be held in place in the cavity by packing loosely about it strips of iodoform gauze; or a T-drainage tube may be used instead of a straight one. The length of time required for the complete obliteration of the cavity will depend upon its size and the thoroughness of drainage. Usually from one to three weeks elapse before the discharge entirely ceases.

The *technique of abdominal section* for pelvic hematocele does not differ essentially from that given for pelvic abscess. Under all circumstances an attempt should be made to shut off the hematocele cavity by stitch-

ing the walls of the sac to the abdominal wound. This is not always possible, in which event the sac should be thoroughly washed out, packed with iodoform gauze, and a drainage tube left in the free peritoneal cavity; or, if the contents of the sac are purulent, it may be wise to reclose the sac from above and make a counter opening through the vagina, as has been done by Mundé in one instance. Mundé opened the abdomen, thinking he had to do with an intra- instead of an extra-peritoneal effusion.

Pozzi advises, in those instances where the tumor is remote from the posterior cul-de-sac, and where it projects toward the abdominal wall, subperitoneal laparotomy. He makes a long incision parallel to the crural arch, after which he detaches the peritoneum as far as the tumor and penetrates the latter without opening the peritoneal cavity. He then passes the finger into the cyst, and by combined vaginal and abdominal touch locates a favorable point through which the drainage tube can be passed into the vagina. An opening is made at this point and a cruciform drainage tube introduced. He thus combines vaginal with abdominal drainage.

Burton speaks very highly of the use of electricity in promoting the absorption of hematoceles. He keeps the patient quietly in bed and uses a galvanic current with large dispersing electrodes over the back and front; or the negative pole direct within the vagina. He begins with a current of ten milliampères, gradually increasing it to one of fifty milliampères.

Von Strauch advocates evacuation of the hematic tumor if it does not grow smaller in a month, even though no evidence of suppuration exists. He prefers the vaginal operation to laparotomy. Credé, strangely enough, advocates rectal section. Kraske also recommends the sacral method.

Therapeutics.

Hamamelis.—*Hematocele with dark, venous blood from uterus;* from accidental causes with diffuse, agonizing soreness over whole abdomen.

China.—Pulse irregular, flickering, imperceptible; *ringing in the ears as of bells;* syncope; SKIN COLD AND CLAMMY; unconsciousness.

Arnica.—Hemorrhage caused by injury, concussion, etc.; *feeling of soreness as from a bruise in the lower abdomen;* hemorrhage associated with internal bleeding, the blood being bright red.

Phosphorus.—Hematocele occurring in women subject to frequent and profuse menorrhagia, the blood pouring out freely and then ceasing for a time; pain in left ovarian region and down the inner side of thigh;

hemorrhagic diathesis with tendency to blood spitting, bleeding from the nose, and *hematuria.*

Millefolium.—Uterine hemorrhage with profuse flow of bright red blood, which is thin; chilliness; congestion of the head, face, lungs, heart, etc.; patient is violent and irritable, even though much prostrated by the loss of blood.

Apis.—*Especially useful for promoting absorption;* STINGING, BURNING PAINS IN THE PELVIS; burning and soreness when urinating; cutting in left ovarian region extending to the right.

Mercurius.—To promote absorption; deep, sore pain in pelvis; dragging in the loin; *chilliness, especially in the evening after lying down, which is not relieved by warmth;* chilliness alternating with heat; PROFUSE PERSPIRATION AT NIGHT WITHOUT RELIEF.

Arsenicum.—Anxiety, restlessness, and chilliness; cannot find rest anywhere; changes place continually; *emaciation with anxious expression of face;* burning or tensive pain in the ovary; *suppuration with symptoms of pyemia.*

Ferrum.—Great erethism of the circulation; *alternate redness and paleness of the face;* very weak; all symptoms worse at night, particularly after midnight.

Consult:—Terebinthina, **secale**, sulphur, kali iod., lachesis, sabina, **ipecacuanha**, and nitric acid.

CHAPTER XXXI.

PELVIC ABSCESS.

General Considerations.—Suppuration, as is elsewhere indicated, occurs not infrequently as a sequel of acute pelvic inflammation, especially if the latter is associated with the puerperal state. The predisposing factors tending to prevent resolution in acute inflammation and to favor suppuration are:—

Tubercular and scrofulous diatheses;

Depravity of the system because of improper food, environment, etc.

It occurs much oftener as a sequel of inflammation when the cellular structure is the tissue chiefly involved, but an effusion resulting from pelvic peritonitis occasionally suppurates. Pelvic hematocele, from whatever cause, may likewise end in suppuration. Abscess of the Fallopian tubes (pyosalpinx) and abscess of the ovaries are more appropriately dealt with in the chapter devoted to the diseases of the appendages; and suppuration resulting from caries of the bones of the pelvis and spine, while constituting a form of pelvic abscess, is a surgical rather than a gynecological affection, and is not, therefore, included in the following description. It should, nevertheless, not be forgotten that pus having its origin in the lesions specified may give rise, secondarily, to acute inflammation of the peritoneum and cellular tissue, which in turn may result in abscess. This is especially true of pyosalpinx. Indeed many of the authorities contend that all true pelvic abscesses, *i. e.*, abscesses which do not have their origin remote from the pelvis, start from pus tubes. These gentlemen ignore entirely cellulitis as a lesion *per se*. I have endeavored to show in the study of the latter affection that this teaching is not warranted by the facts. However, the chief aim of this chapter is to discuss pelvic abscess in its broadest sense from whatever cause it may arise.

In the majority of instances the seat of suppuration is primarily located between the folds of one or the other broad ligament, but if the accumulation of pus is very great it may burrow in any direction and to almost any extent. Skene says:* "I have seen three cases in which pus from an abscess in the broad ligament burrowed outward to the

* "Diseases of Women," 1889, p. 557.

iliac fossa, and then extended upward to the diaphragm, and in one it opened through the lung into the large bronchial tube."

When the abscess is secondary to an effusion of blood or pus in the cul-de-sac of Douglas it is bounded in front by the uterus and the upper part of the vagina. It is easily located in the posterior fornix on digital exploration.

Pathology.—Pus within the pelvis may remain indefinitely without escaping. However, it usually makes its exit in order of frequency as follows: from above Poupart's ligament; into the rectum, vagina, or bladder; at the anus, or through the saphenous openings. Rarely does rupture occur into the peritoneal cavity, though it may.

The encapsulating wall does not differ essentially from that of chronic abscesses elsewhere. As time goes on the transudation products are transformed into connective tissue of greater or less thickness, which constitutes the abscess wall. The interior of the sac thus formed is made up of villous or granular eminences, which consist of loops of blood-vessels buried in transudation corpuscles (Agnew). The leucocytes which give rise to the pus are chiefly derived from these vessels, though in certain localities they are produced in limited numbers by the connective tissue.

Pus, after it is once formed, burrows in the direction of least resistance, and the tissues which exert the greatest resistance are the planes of fascia. The size of the abscess is, therefore, limited only by the fascial attachments, and, as we have seen in the cases cited by Skene, it may dissect the fascia and peritoneum as high as the diaphragm. In peritoneal abscesses the effusion may surround a tube distended with pus so that, in the event of suppuration, there is a small accumulation of pus within a greater, the former remaining after the latter is evacuated.

After evacuation the cavity may gradually cease to discharge and the abscess heal; or it may continue to discharge indefinitely. The obliteration, when it occurs, is due to formation of granulation tissue and to adhesion of opposing surfaces. Obliteration is impossible without complete drainage, and if the opening is small, sinuous, or unfavorably located, drainage may be imperfect.

Should the abscess empty itself into the intestinal canal or the bladder it is liable to contamination by fecal matter or urine. This may keep up the suppurative process indefinitely, and in due time the entire pelvis may become honeycombed.

Symptoms.—The affection, whatever its nature, giving rise to suppuration, will be attended by symptoms peculiar to itself. In pre-ex-

isting inflammation we shall be confronted by an inflammatory history; or should the primary cause which is to result in suppuration be a hematocele, or an extra-uterine pregnancy, there will usually be a history of shock and collapse, followed by inflammation. A *chill*, in most intances, marks the beginning of suppuration. It may be indistinct, but the patient will at least complain of chilliness. This is followed by fever, sweating and prostration. There is often a throbbing sensation at the seat of suppuration. The *pressure symptoms* will depend upon the site of the tumor—if the rectum or bladder is implicated the functions of one or both are disturbed. Pressure upon the vessels and nerves extending to the lower limbs may not only give rise to much pain, but, by retarding the return of venous blood, to great edema as well. As the disease progresses symptoms of pyemia, from absorption of pus, often become marked, and not infrequently the patient is reduced to the point of extreme exhaustion.

The foregoing is the usual history of the formation of pus within the pelvis. Symptoms of suppuration may, however, be entirely wanting. In certain cases there will be, perhaps, a history of pelvic inflammation, but for some reason the patient does not convalesce as she should. A local examination in these cases frequently shows that, instead of becoming absorbed, the inflammatory tumor remains unchanged, or possibly has increased in size. Indeed, it may be that it has already undergone disintegration and there is a large quantity of pus present, as is evidenced by fluctuation, without serious systemic disturbance.

Such an accumulation as that last described is known as a *cold abscess*, and occurs oftener in asthenic patients. The pus in these cases seems to have sterilized itself and contains no virulent bacteria. When the pus is limited to the tubes or ovaries, entire absence of chill, fever, etc., is not uncommon.

On the other hand, a small accumulation of purulent matter deep in the pelvis, with no evidences of fluctuation or softening, may give rise to much general distress. Fluctuation is very often inappreciable in intra-peritoneal abscesses, though soft spots can usually be detected per vaginam.

Differentiation.—We are called upon to distinguish pelvic abscess from the following:—

Nephric and perinephric abscess;
Distention of the Fallopian tubes;
Hematocele;
Extra-uterine pregnancy;
Ovarian abscess.

Nephric and Perinephric Abscess.—These affections rarely give rise to an abscess large enough to extend into the pelvis, though they may. A vaginal examination will demonstrate that the abscess does not originate in the pelvis. The most frequent cause of renal abscesses is an injury, the result of a blow or other forms of traumatism, or a calculus. It may follow the administration of cantharides or turpentine. Perinephric abscess, while occasionally an idiopathic disease, is in most cases a sequence of suppuration of the kidney itself. When the distention is at all marked there is discoloration and tenderness over the corresponding lumbar region. The lumbar muscles are fixed, tense, and brawny. Finally, an examination of the urine will usually reveal the presence of pus, or other abnormalities of this secretion.

Distention of the Fallopian Tubes.—It is often impossible to detect slight distention of the tubes. A tumor from this cause is irregular or ovoid in shape, and frequently finds its way into the retro-uterine space. It may be painless in hydrosalpinx, but palpation gives rise to pain in hemato- and pyosalpinx.

Hematocele.—The classical symptoms of this accident, from whatever cause, are shock and collapse, followed by the sudden formation of a tumor. Inflammatory symptoms sooner or later ensue. Suppuration may occur in due time, when the hematocele is transformed into a pelvic abscess.

Extra-uterine Pregnancy.—Before rupture there is a unilateral and obscurely cystic tumor in the region of one of the Fallopian tubes (in most instances the primary seat is the Fallopian tube). Some of the usual signs of pregnancy may be present, though not infrequently the condition is unsuspected previously to rupture.

Ovarian Abscess.—A suppurating ovary is rarely larger than a hen's egg ; it is very tender on pressure and lies on one or the other side of the recto-uterine pouch, to which it is usually attached by adhesions. It may find its way into the cul-de-sac of Douglas.

Prognosis.—In considering the prognosis there are many points to be noted. The course and duration will depend upon the size of the abscess, the character of its contents, its location, and the nature of its opening, or openings. As regards the life of the patient, much will depend upon her vitality and powers of endurance. Then, too, recovery may be retarded by those constitutional taints—scrofulosis, tuberculosis, syphilis, etc.—which always tend to perpetuate the suppurative process in whatever part of the body it occurs. While spontaneous cures often result, it must be confessed that, owing to the inaccessibility of the parts, the condition is one to be dreaded. Modern surgery has, how-

ever, made it possible to cure quickly many cases that formerly dragged on until the patient died from sheer exhaustion.

Treatment.—As soon as suppuration is suspected the strength of the patient should be sustained by nourishing and concentrated food, free ventilation, etc. The judicious use of stimulants is often beneficial. Hepar sulphur, silicea, arsenicum, and mercurius are the classical remedies in suppuration.

As regards the *surgical treatment* there is the greatest diversity of opinion. A review of the vast amount of literature of the last ten years bearing upon the subject is most interesting. As a rule, the older authors are conservative, whereas the younger men, with few exceptions, teach, with Lawson Tait, that pus within the pelvic cavity is always a source of danger and should not be permitted to make its exit spontaneously. I fully agree with the latter teaching. To me it seems quite as illogical to permit pent-up pus within the pelvis to make its own exit through a route often as circuitous as it is dangerous, as to permit pus within the pleural cavity to take care of itself. I am speaking now of those large accumulations of purulent matter where there is no uncertainty regarding the diagnosis. In the smaller accumulations deep within the pelvis, or confined to the Fallopian tubes, the diagnosis may be uncertain, and an exception to the broad surgical principle of early evacuation, which applies to abscesses in general, may have to be made.

I desire to quote, somewhat in detail, from Lawson Tait. He says: "I had been (previous to 1879), therefore, continually on the lookout for some means of dealing with pelvic abscesses which would bring them as satisfactorily within our means of treatment as are collections of matter in most other parts of the body. This has been furnished by the wide, free, and successful application of abdominal section for the treatment of pelvic and abdominal tumors, and I am now able to give a list of thirty-eight cases, which include the whole of my experience in the novel proceeding, and in which success has been obtained far surpassing anything I have yet seen or heard of. In this comparison, I am, of course, excluding those cases where pointing of the abscess in the vagina is evident at an early stage of the case, but even in these the recovery has always been, in my experience, more protracted than in the six now to be narrated. In addition to this list, there are about twenty others in which I have operated from above, but without opening the peritoneal cavity. These, of course, under the definition of abdominal section I have adopted, are not to be included in the present list; but in every one recovery and cure has been obtained. Fifty-eight

consecutive recoveries, prompt and permanent, in such a grave condition, constitute a result of a most satisfactory kind."

It will be seen by the foregoing that Tait does not practice opening the abdomen when the abscess points toward the vagina; nor does he open into the peritoneal cavity when it is possible to reach the abscess through the abdominal walls without doing so. As I understand his teaching, he reserves abdominal section, when suppuration is evident, for the class of cases in which there is no tendency for the abscess to open either into the vagina or outwardly through the abdominal wall; or in which it has spontaneously opened, but for some reason continues to discharge indefinitely. That abdominal section has a limited range of application in these two classes of cases I think there can be no doubt. However, during the last three years the vaginal route has become the more popular one in dealing with pus confined to the pelvis, especially if the patient is much prostrated. This practice was inaugurated by Péan, who first removed per vaginam a uterus for septic bilateral disease of the adnexa. It was later on popularized in France and Belgium by Richelot, Segond and Jacobs. In this country Pratt, Henrotin, Polk, Edebohls, and others have warmly advocated the vaginal route.

Until two years ago it did not seem to me that the interests of the patient were best subserved by sacrificing the uterus when the disease was confined to the appendages, nor do I now think that the latter organ should be removed if the pus is confined to the tubes and the uterus is not extensively involved. There are, however, many cases of extensive pelvic inflammation, the result in the vast majority of instances of primary tubal disease, in which the uterus is fixed, the endometrium involved, and the pelvic cavity full of exudates, that do not recover fully if the appendages alone are removed and the uterus is left behind. Usually these cases are greatly benefited by salpingo-oöphorectomy, but the diseased and enlarged uterus remains behind as a constant menace to health and comfort. I am not one of those who believe that the uterus is a perfectly useless organ without its adnexa, providing it is not too much diseased. On the contrary, I believe that it is the chief sexual center in many women, and that it constitutes an important part of the pelvic roof. All who have done abdominal work know that there are hundreds of women who have had their ovaries and tubes alone removed and have regained their health perfectly. But there is all the difference in the world between a slightly enlarged and subinvoluted uterus and one that is bound down by adhesions, is twice its usual size, and perhaps helps to form the boundary of a pus cavity. It is hardly possible for a womb thus extensively diseased to

so far return to its normal state as to give rise to no future suffering and inconvenience. I am convinced now, as I look over my case-book, that I have made many salpingo-oöphorectomies, working as I did according to the best light of the day, where it were better had the uterus been removed with the appendages. I have particularly in mind cases of pyosalpinx following in the train of gonorrheal endometritis. In many of these cases there is extensive cervical injury with resulting deposition of cicatricial tissue, and this in itself calls for a second operation if the uterus is left behind.

From the standpoint of ultimate results then, the uterus should be removed in many cases of pyosalpinx and pelvic abscess. As to the relative safety of the two routes—the vaginal and the abdominal—I think that there can be but one argument, and that is in favor of the former. There is no operation involving the opening of the peritoneal cavity attended with greater mortality than are celiotomies made for the removal of pent-up pus, when the entire pelvic cavity is packed with exudates and the intestines are matted together. I believe that all abdominal surgeons dread such cases. The shock attending the operation is tremendous. The hemorrhage is many times profuse and can only be controlled by extensive gauze packing, and the mortality, especially in acute cases, is correspondingly high. Then, too, it is a very grave question as to whether it is best to disturb the adhesions when the intestines are matted together, as must be done if the operation is made from above Not infrequently they will re-form almost as soon as the abdomen is closed, and very often in such a way as to make them more dangerous than before they were broken up. In chronic cases, at least, the action of the bowel is often not seriously interfered with by such adhesions, and it is taking chances to disturb them. If, then, the uterus is to be removed, this (the breaking up of intestinal adhesions) seems to be the only argument, and a questionable one, in favor of the abdominal route. In favor of the vaginal it may be said, first of all, that the mortality is infinitely less than in the abdominal. The statistics will bear out this statement beyond peradventure, though I am aware that there are those who will dispute the statement. This is true whether the free peritoneal cavity is opened into or not, and in many cases it is not necessary to penetrate the peritoneal cavity. It is entirely possible to dig the uterus and its appendages from inflammatory exudates without exposing the intestines, and the lessening of shock which this procedure insures, when it can be done, will surprise one familiar only with the older operation. Another advantage, which is of the greatest importance, is the perfect drainage which the vaginal route

affords. This is secured, too, without the danger of ventral hernia, slight as it is, which attends the abdominal operation. In short, the vaginal route is the most direct one to the pelvic cavity, and the most direct route in all surgical procedures, unless insuperable obstacles exist, is always the best one to select. The argument that it is impossible to retreat in the vaginal operation, after it is once begun, carries with it but little weight, for the reason that with modern technique the surgeon is rarely called upon to retreat; should he be, he can do so even better than when a celiotomy has been attempted. Convalescence is infinitely shorter in the vaginal operation, and the recovery in the class of cases indicated is, I believe, more complete.

There is, nevertheless, one objection to the vaginal route which must be borne in mind, and which I have not seen mentioned in any of the literature dealing with the subject which has passed under my observation. I refer to the persistence of fecal fistulæ when the abscess opens into the bowel. My experience with these cases is yet too limited to speak dogmatically, but I am inclined to believe that spontaneous closure of such fistulæ occurs less often when they communicate with the vagina than when the abscess is opened from above. In large abscesses communicating with the bowel, when the walls are stitched to the abdominal parietes, the cavity can be more readily packed with gauze than it can be when the opening is made from below, which promotes the closure of the fistula.

It is by no means necessary to remove the uterus in all cases of pelvic abscess. On the contrary, when the abscess points into the vagina, in large accumulations, there is nothing more simple than to open and drain it at its most dependent point. Indeed this may be the better way to proceed when the condition of the patient will not permit of more radical work, even though a subsequent hysterectomy may be called for. This is especially true in acute and subacute pelvic inflammations, where the suffering is very great and the prostration marked. On the other hand, when the accumulation of pus is found in laparotomies to be limited to one or the other broad ligament, it may be best to close the abdomen after the appendages are removed and drain the abscess from below. This I did in Case III. and have no reason to regret so doing.

Just when pus should be evacuated in pelvic suppuration will necessarily depend upon circumstances, for, as insisted upon by Thomas, every case is a law unto itself. As a general rule a reasonable delay is wise. It enables the physician to determine positively that suppuration has taken place, and in the event of several suppurating foci the

smaller cavities will coalesce into one. Again, by waiting until the point of exit is indicated, adhesions will have formed, so that there is not so much danger of opening into the peritoneal cavity. It may be impossible to detect small collections of pus deep in the pelvis, and it would be extremely hazardous to cut into pelvic tissue through the vagina for any great depth for the purpose of reaching such collections. If, however, the presence of pus is reasonably certain, exploration should be made at once.

Vaginal Section for Pelvic Abscess.—The operation is performed in the following manner: The vagina is previously made as aseptic as is possible by a 1:1000 bichlorid douche. The patient is then anesthetized, placed before a good light in the lithotomy posture, when the vagina is again thoroughly washed with bichlorid. If the point of fluctuation is prominent an incision may be made at once, either with the scalpel or with scissors. Care must be observed not to injure the large vessels, ureters, bladder, or rectum. The normal relationship of the parts is usually so altered as to make it wise first to introduce an aspirator, or an exploring needle. After the cavity has been located by the needle, sharp-pointed scissors are thrust into it, the needle serving as a guide; the blades are then separated and the scissors withdrawn, when the pus will gush forth. The opening can be further enlarged without injuring the parts by the method of Hilton, which consists of the introduction and withdrawal of some blunt expanding instrument—an ordinary pair of catch forceps, or a uterine dilator. After the evacuation, the cavity is washed with a weak solution of bichlorid (1:10000); or, if there is very much fetor, with a solution of permanganate of potash. The finger should be carried into the sac and all sulci freely broken into. If the granulations are marked they should be destroyed, either with the finger nail or a blunt curette. The abscess cavity is again washed, and, if the parts are readily accessible, the tincture of iodin may be applied to the pyogenic membrane. A double cruciform rubber drainage tube is then introduced, through which the cavity can be irrigated several times a day with a weak permanganate solution. The tube is not removed until all discharge ceases.

Careful watching is required during the healing process. The parts must be kept absolutely sweet and clean, and the opening should not be permitted to close until the sac is entirely obliterated. It may be kept open for a few days after the tube is removed by passing through it a strip of gauze.*

*Dr G. H. Lyman has placed on record (Trans. Am. Gyn. Soc., vol VI), seventeen cases of pelvic abscess treated by the *aspirator*. The results were as follows:

Vaginal Hysterectomy for Pelvic Suppuration.—As is well known, the majority of the French school still use the clamps or forceps for the purpose of securing the broad ligaments, as do many of the foremost surgeons of this country. That the clamp is a conserver of time there can be no doubt, and cases will every now and then be met with where one or more forceps will have to be left attached for the purpose of controlling bleeding from vessels beyond the reach of the ligature. While I have used forceps and clamps many times, the practice has always seemed to me both barbarous and unscientific. These instruments give rise to infinitely more pain than does the ligature, and I believe that the danger of rectal and vesical perforation is correspondingly greater. I have experimented with almost every form of clamp which has been devised for the purpose, and have used them altogether in twenty-two hysterectomies.

As regards the ligature: In the first vaginal hysterectomy done by me, on March 7, 1887, I followed the method of Schroeder, and tied the broad ligaments *en masse* with heavy silk ligature. The difficulties in securing the entire ligament in one ligature are very great, and there is great danger also of the ligature slipping after it is once secured. When this method was in vogue there were many more cases of secondary hemorrhage reported than at the present time. Later on the ligaments were secured in section and the results were much better. The objection, however, to the silk ligature is that it does not come away for a long time, and often never comes away, remaining as a source of irritation in the upper part of the vagina. To obviate this objection catgut was substituted, but it is necessary to have the catgut especially prepared for the purpose. Ordinary carbolized catgut will absorb too quickly, and I had one case of secondary hemorrhage following its use. Messrs. Johnson & Johnson have prepared for me, through Parsons & Son of this city, a ten days' chromacized catgut (Nos. 2 and 3) which answers the purpose admirably. I am now using this ligature in all of my plastic work in and about the vagina, and have

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10 cures; 4 not benefited; 2 injured; 1 improved only. The cavity was simply emptied and left without being washed or injected. In commenting upon these results Maury ("Am. Sys. of Gyn.," vol. 1, p. 731) justly says: "The results reported are probably too favorable, for the following reasons: one of these cases, as shown by the report, was discharged from the hospital while remnants of exudation were still recognized within the pelvis. Some remained only a few days after the operation, one being discharged five days after aspiration, another thirteen, another fourteen days. The report cannot, therefore, be considered conclusive in regard to the question of cure." Personally, I use the aspirator in these cases for diagnostic purposes only.

every reason to feel satisfied with it. For the last two years, with one exception, I have not removed a suture from the cervix, vagina, or perineum, using in all instances this preparation of catgut, and have not had a single failure. I mention this fact to show that it is entirely safe to use it for securing the broad ligaments in vaginal hysterectomy. There is one point in tying the chromacized gut which must be observed or the knot will slip; the single knot in the first hitch should always be used or the ligature will kink.

I first open the anterior and posterior culs-de-sac in the usual way, using for the purpose of incising the cervico-vaginal mucous membrane either a scalpel or Emmet's cervical scissors. If there is plenty of room to do so, the peritoneum is next stitched to the vaginal mucous membrane both in front and behind. This will control the oozing which always results from the separation of the mucous membrane from the cervix. Unfortunately, when the uterus is large or the pelvis very small, this cannot always be done at this stage of the operation, and it is better to postpone this step than to spend too much time for its accomplishment. Nor is it always practicable to stitch the mucous and serous membranes together at any stage of the operation if the uterus is completely imbedded in inflammatory exudates. Next by means of the needle, shown in Fig. 119, a No. 3 catgut ligature is carried into the

FIG. 119.

THE AUTHOR'S NEEDLE FOR VAGINAL HYSTERECTOMY.

base of one of the broad ligaments deep enough to secure the uterine artery of the corresponding side. This is securely tied, the ends caught in catch-forceps and carried above the pubes out of the way. With the uterus firmly dragged down by means of strong guy sutures previously introduced into the cervix, as much of the ligament as is included in the ligature is cut with scissors. The opposite ligament is dealt with in the same way, when the uterus will descend somewhat. The entire ligament on either side is tied and cut off in this manner, usually four on each side being sufficient. The first two ligatures must be passed pretty close to the cervix for the purpose of avoiding the ureters. The upper ligatures should all be passed as close to the pelvic wall as possible, and many times the appendages can be removed attached to the uterus. In the inflammatory diseases, however, this is not always possible, and

the appendages will have to be removed at a subsequent step of the operation. If pus pockets are opened into as the operation progresses, the pus should be washed away with the salt solution and should not be permitted to come in contact with the intestines. Should the intestines get in the way, after the peritoneal cavity is opened, they should be kept back by means of a medium-sized sponge, to which is attached a strong string. After the uterus is removed the appendages, if not removed with it, should be separated, ligatured and cut off, if it is possible so to do, providing, of course, they are diseased, as they usually are if the operation is done for the liberation of pus. A little practice will enable the operator to remove the appendages in nearly all instances, though not in all. In extremely bad cases, where the entire contents of the pelvis are matted together, their removal may be not only impossible but it is sometimes unwise to attempt it. After the uterus is removed it is better to break down the septa dividing the several purulent accumulations, wash the cavities with a normal salt solution, and pack the wound with iodoform gauze. By doing this the peritoneal cavity is not opened into, the shock is reduced to a minimum, and the results are most satisfactory. It is true that the patient will never entirely recover her health, but she will be quite as well as she would have been were the operation done from above, and the risk is infinitely less. It will at least place her in a condition so that if a subsequent operation from above becomes necessary she will be much better able to stand it. It may be best, in certain cases, to divide the uterus anteroposteriorily; or, if very large, to remove it by *morcellement*.

As a final step, in cases where this could not be done at the beginning of the operation, the peritoneum is stitched to the vaginal mucous membrane with a running catgut suture, the stumps of the broad ligaments being drawn down by means of the ligatures attached to them and stitched into the wound. After the wound is completely encircled in this way, the anterior and posterior vaginal walls are brought together at the median line, when the ligature is tied. This will leave a small opening on each side of the median line through which may be passed a strip of iodoform gauze for the purpose of insuring perfect drainage. All ligatures are now cut short and the vagina is packed with iodoform gauze, external dressings applied, and the patient placed in bed.

Should it be impossible to bring the peritoneum down in the manner described, there will remain a good deal of oozing from the wound which will have to be controlled. I think it best in these cases to wash the pelvic cavity with hot sterile or salt water, which will in a measure control the bleeding. After the oozing surfaces are dried with

sponges the edges of the wound should be caught on each side with catch-forceps, and by means of a long dressing forceps a double layer of iodoform gauze, to the center of which is attached a strong string, is carried into the pelvic cavity, pushing the intestines before it. Into this bag are packed long strips of gauze, so that when the string is pulled upon it will plug the wound from above exactly as the posterior nares may be plugged by means of a Bellocq's canula. This is a little point which I am sure will be appreciated by all who try it. The external dressings are applied in the usual way. The gauze drain is removed in from twenty-four to seventy-two hours, when the vagina is kept clean by means of a ten per cent. boric acid douche administered night and morning. The after treatment does not differ from that laid down for celiotomies. (*v.* Chapter XLVII.)

Closure of the Sac and Treatment of Sinuses.—Before abdominal or vaginal section is resorted to, in dealing with sinuses which have existed for some time, various expedients are recommended. If the abscess has opened externally and the sinus is sufficiently large to afford free drainage, an attempt may be made to close the sac by keeping it thoroughly clean and injecting it twice or three times a week with tincture of iodin. Failing in this, the opening should be enlarged, and, if possible, the sac packed with iodoform gauze. The same measures may be tried from below if the abscess has opened into the vagina, and, in a limited number of cases, a cure can be accomplished. When, however, an abscess has opened externally and continues to discharge indefinitely in spite of all efforts to heal it from above, a counter opening should be made through the vagina. This may be accomplished by passing a strong probe through the external sinus and causing its tip to impinge against one of the vaginal fornices. This is cut down upon and, if possible, a perforated rubber tube is drawn from above through the opening thus made. The parts can now be thoroughly washed and injected, and the healing promoted. The tube is to be gradually drawn into the vagina as the sac closes from above.

In the event of fecal contamination care must be observed in making this counter opening. In Case I., the probe passed into the intestine instead of into the abscess, and, had I cut down upon the probe through the vagina, I would have created an entero-vaginal fistula.

I select the following cases as illustrative for the reason that they are somewhat typical, and for the reason also that they show the various methods of operating both from above and below. While my experience leads me to believe that the lower route is the preferable one in the vast majority of pus cases, I do not propose to be restricted to this

route when another seems the preferable one; nor do I intend to confine myself to one technique. Cases are bound to present themselves where a combination of methods is necessary. In operating from above, when I find that the pus is confined to one or the other broad ligament, I do not hesitate to close the abdomen and finish the operation from below; nor should I hesitate to discontinue the operation from below and finish it from above were it necessary. However, Case VII. shows what can be done from below. I cannot imagine a more difficult operation than was this, yet I succeeded in clearing the pelvis perfectly. I could have removed the appendages much more easily from above, but the woman would have had left behind a uterus containing a small fibroid. I believe that her chances for complete recovery were infinitely better than would have been the case had I not removed the uterus, and certainly the danger attending the operation was infinitely less than if it had been done from above.

Illustrative Cases.

CASE I.—*Pelvic Abscess and Fecal Fistula Following Laparotomy Cured by Abdominal Section.*—Patient, æt. 28, married, and referred to me by Dr. A. B. Cornell, of Kalamazoo. A large abscess followed an abdominal section made for the purpose of removing a suppurating dermoid cyst of the right side and a pyosalpinx of the left. The operation was a most difficult one, the numerous adhesions necessitating the application of many ligatures within the abdomen.

The patient rallied from the primary operation, and for the first two weeks did remarkably well. Owing to the large quantity of pus which had escaped into the peritoneal cavity, the drainage tube was not removed until the end of the fourth day. As a result, a sinuous tract was left which, instead of healing, continued to discharge pus, and this so contaminated the abdominal wound that a parietal abscess formed. Notwithstanding these several complications, the patient continued to gain in strength, and in four weeks was up and about. The sinus continued, however, to discharge variable quantities of pus, and evidently there was a large pus-cavity on the right side extending nearly to the umbilicus. At the end of six weeks chloroform was given, the sinus enlarged, and an effort made to carry a drainage tube to its bottom, but owing to the pain excited by the tube the patient could not tolerate it. At the end of twelve weeks the discharge had diminished but little, and further exploration seemed imperative. Accordingly, on April 21st, preparations for any emergency were made, and the abdomen reopened. The sinus led to the base of the left broad ligament down to

the colon, and the accumulation of pus had dissected up what was left of the posterior layer of the right ligament, which, together with the peritoneal investment, formed the abscess wall. At the very bottom of the abscess two ligatures were found which had failed to become encysted. This was undoubtedly the secret of the persistent discharge, and in due time the ligatures would probably have found their way to the surface. The next step in the operation was to stitch the abscess wall to the lower angle of the abdominal wound. A rubber drainage tube was carried to the bottom of the abscess cavity and a glass tube into the Douglas pouch, after which the abdominal cavity was washed and the abdomen closed in the usual way.

The patient again quickly rallied, and promised a speedy convalescence, when on the fifth day she began to have a fecal discharge through the sinus leading to the abscess. This discharge increased in quantity for ten days, notwithstanding the fact that the bowels were moved every other day by the aid of enemata. It then began to decrease, but fecal contamination prevented the abscess from healing entirely, and, conversely, the pus so contaminated the fecal opening as to prevent its spontaneous closure. A probe passed from above would insinuate itself into the bowel instead of into the abscess cavity, and I therefore did not dare to make a counter vaginal opening. Various expedients were tried during the next twelve months to cure the abscess and close the fecal fistula, but in vain. I finally made an extensive dissection of the cicatrix, carefully removed the adherent intestine from the abdominal wall, and closed the opening into it by a series of Lembert sutures. I then passed a drainage tube into the abscess and closed the abdominal wound. On the fourth day fecal matter again escaped externally, but it gradually grew less in quantity, and in about two months ceased entirely. A small pin-head opening persisted for about two months longer, but finally healed perfectly. The discharging sinus closed very quickly after the fecal matter was kept out of it. The patient is now (twelve months later) perfectly well.

CASE II.—*Abscess of the Left Ovary and Broad Ligament Following Puerperal Cellulitis and Peritonitis; Laparotomy; Recovery.*—Mrs. ———, æt. 28, married; patient of Dr. D. M. Nottingham, of Lansing. She presented herself at my clinic on May 23, 1887, and gave the following history: During her eleven years of marriage she had been twice pregnant, the first pregnancy resulting in a miscarriage at the seventh month because of a strain. Her second child was born thirteen months later, from the birth of which she dated her present

trouble. She did not get up well from this confinement. When her baby was four weeks old she was taken with a severe attack of pelvic inflammation, which continued for two months. She finally recovered, and for the following three or four years was fairly, though not entirely, well. She then had another severe attack of inflammation, brought on by undue exposure during the menstrual period, and for the succeeding three years suffered constantly from pressure pains in and about the pelvis. Following this she was stricken with typhoid fever (September, 1886), since which time she had had most excruciating pain in the pelvis, especially in the left ovarian region, which was of a burning, stinging character. There was also a sharp, cutting pain in the corresponding hip and down the limbs. Excessive menstruation, occurring at first every six weeks, dated from the birth of her last child; but the intervals gradually grew shorter until the intermenstrual period was but ten days. The flow was always attended by much pain, which began several days before its onset and gradually increased in severity.

The patient upon coming to the hospital was almost bloodless from the excessive menstrual discharge. She had been compelled to remain in bed almost constantly since her last illness in September. I found, upon making a local examination, the pelvic organs matted together, as a result of previous inflammatory attacks. There was much tenderness, especially on the left side; the uterus was retroflexed and perfectly immobile; the roof of the pelvis was as unyielding as a board. I could detect no evidence of fluctuation, but was positive that pus existed in some part of the pelvis, for the pyemic symptoms were very marked. I did not do then, as I should now do under similar circumstances – operate at once,—but tried for nine months to make an abdominal section unnecessary. The uterus was curetted for the purpose of controlling the hemorrhage, but the operation did no good, and like results attended constitutional and the routine local treatment. Accordingly, on February 23 of the following year I opened the abdomen. The exploring finger came in contact with a mass which was hard, rigid, and completely distorted the left broad ligament. The left ovary and tube could not be distinguished, but the fundus of the uterus was indistinctly outlined in the posterior cul-de-sac. A soft point was felt at the upper part of the mass on the left side, into which an aspirating needle was thrust, but the contents of the sac were too thick to be drawn off through the needle. I therefore opened the sac with a scalpel, and a teacupful of exceedingly offensive pus poured forth. I then enlarged the opening and found that the abscess included the ovary, which was nothing more than a shell. It was impossible to

stitch the abscess walls to the parietal opening, so I broke down and removed its posterior wall, scraped away the secreting membrane, and applied to the entire raw surface, after thoroughly washing the abdominal cavity with sterile water, tincture of iodin. I then dug the right tube and ovary from the inflammatory exudates, tied and removed them. A glass drainage tube was inserted and the abdomen closed. The tube was left in for five days. The patient made a somewhat tedious convalescence, but the improvement was finally of the most decided character. In four months' time she was doing her own work, including her washing, and had gained amazingly in flesh.

CASE III.—Patient, æt. 34, married and two children, the eldest being 15 and the youngest 8. No miscarriages. Menstruation from the beginning occurred every three weeks and was always attended with a great deal of pain, which confined her to bed for one or two days at each period. The flow continued for six days and always gave rise to an intense headache. A few months after the birth of her first child she was taken with a very severe pain in the left side, which extended to the stomach and back. From that time on any unusual exercise, as a long walk or lifting, would bring on this pain. Had never been able to do even light work without producing burning, sickening pain in the left side and back. In 1890 she began to have a discharge of pus from the rectum, which varied in quantity from one-half to one ounce in the 24 hours. This discharge continued for four years and was attended with so much pain that opiates were necessary in order to control it. She was never free from pain unless under the influence of opiates. In June of 1894 I was called by Dr. R. Hathaway, of Wellington, to make an examination. The foregoing history was elicited. The pus which passed the bowels was of the most offensive character. Upon examination I found that the appendages were apparently buried in inflammatory exudates and that there was a mass of some kind corresponding to the left broad ligament. It was only necessary to look at the patient to see that she was a great sufferer.

A week from the time I first saw her I had her in the Huron Street Hospital and opened the abdomen from above. The appendages were dug from the exudates with comparatively little trouble, but I discovered that there was an accumulation of fluid in the folds of the left broad ligament. I therefore closed the abdominal wound, placed the patient in the lithotomy posture at the foot of the table, and, without introducing a speculum, thrust a sharp-pointed scissors, guided by the finger, into the abscess, through the lateral fornix. The scissors were then expanded and withdrawn, thus liberating the pus. The pus cavity

was now washed with a bichlorid solution and packed with gauze, as was also the vagina. The cavity was irrigated daily and repacked. Convalescence was uninterrupted, and in less than three weeks' time the opium was discontinued. The patient weighed before the operation 120 pounds. Now she weighs 190, and a more grateful woman never lived.

CASE IV.—Patient, æt. 34, referred to me by Dr. G. W. Arbuckle, of this city. One child, a young lady. Eighteen years ago she was kicked in the abdomen, which gave rise to extensive and serious pelvic inflammation. Following the attack of inflammation there was a discharge of pus from the rectum, which occurred periodically until the last operation was performed I was called to see her in September of last year. Though not emaciated as was Case III., the skin showed very clearly that the system was contaminated by the absorption of pus. I found on examination that there was a mass on the right side of the pelvis which extended as high as the umbilicus, and that all of the pelvic contents were matted together. One year previously a well known and skillful surgeon opened the abdomen, but found so many adhesions that he closed it again without attempting to do anything. A ventral hernia resulted from this operation. She was much worse following this exploration and appealed to me to do something for her. Menstruation had been very profuse during her entire illness. I opened the abdomen on November 7, 1894, in the presence of the class of the Cleveland Medical College. A knuckle of intestine was found adherent to the old abdominal scar, which was dissected off with some difficulty. The pelvic contents were indistinguishable one from the other. No trace of either ovary or tube could be found. The large mass which could be felt from above on the right side, and which evidently contained fluid of some kind, was as large as a fetal head, and firmly fixed to the pelvic roof. I accordingly separated its upper peritoneal covering in such a way that I could draw it upward and attach it to the lower angle of the wound. Before doing this, however, a quart of most offensive pus was drawn off with an aspirator. Next, by means of quilted sutures, the pus sack was carefully attached to the abdominal opening, but it was not opened at this time. Dressings were applied and the patient placed in bed. Three days later, after the adhesions of the abscess wall to the abdominal wound were firm, so that no pus could find its way into the peritoneal cavity, the patient was again etherized and an opening into the pus cavity made. The cavity was thoroughly washed, and packed with iodoform gauze. More or less gas and some fecal matter escaped from the opening for several days. The wound was

washed and packed daily and in five weeks' time was completely healed. On January 22, 1895, she wrote me: "The operation is a success, and I am better in health than for many years," which is literally true, though she is not as well as I wish she were. There has been no more pus from the rectum and the symptoms of pyemia have entirely vanished, but there is yet a good deal of pain, and the menorrhagia continues. Were I to operate on this case again I think that I should attempt it from below, for if the uterus had been removed there would of course be no more menstruation. In cases attended by excessive hemorrhage this is a point well worthy of consideration.

CASE V.—Patient, æt. 24, married for two weeks when her husband deserted her, leaving her with violent pelvic inflammation, the result of gonorrhea. Professor P. A. Cole, whose patient she was, brought her to the Huron Street Hospital in February of this year and placed her under my care. At the time of entering the hospital the temperature ranged from 100° to 104° F., the pulse from 110 to 150; prostration was very great. Dullness extended above the umbilicus on either side and the entire pelvis was literally packed with exudates. Pain was only partially controlled by the free use of opiates. I felt sure that an attempt to reach the appendages from above would prove fatal at that time, so an exploration was made with the aspirator through the posterior vaginal fornix. At least three pints of serum were drawn off through the aspirator. A director was passed alongside of the aspirating needle which served as a guide for a long sharp-pointed scissors, which was expanded and withdrawn. After the cavity had been washed out it was packed with iodoform gauze. This preliminary operation afforded much relief and the patient rallied in four weeks, so that it seemed best to remove the uterus and afford complete drainage. This was done in April. The uterus was absolutely dug from the surrounding exudates; the pus tubes opened into, but not removed. The peritoneal cavity was not opened, nor were the intestines seen during any step of the operation. It would have been utterly impossible to remove the appendages and an attempt to do so would surely have ruptured the bowel. Then, too, the prostrated condition of the patient forbade taking undue chances. The resulting excavation was packed with iodoform gauze. Convalescence was complete, and the patient, two years later, is perfectly well. I am sure that she would have died had either the uterus or the appendages been removed when she first came to me. By first relieving the system by drawing off the fluid from the Douglas cul-de-sac she rallied sufficiently to justify the more radical

procedure. I do not believe that she could have lived through a celiotomy at the time the uterus was removed.

CASE VI.—Patient, æt. 46, referred to me by Professor H. H. Baxter. Four children, the youngest being 16. For years had more or less pain in the pelvic region, with nausea and vomiting. Profuse attacks of hemorrhage from time to time, so that she was anemic and very much emaciated. An offensive leucorrhea during the intervals between the hemorrhages. Upon examination the uterus was found retroverted, greatly enlarged, exquisitely tender, and firmly attached to the rectum. For six months before I saw her she had been compelled to subsist almost entirely on liquid food because of the condition of the stomach. In March of 1895 she was brought to the Huron Street Hospital, and I removed the uterus and appendages through the vagina. The right tube was distended with pus, and the right ovary was bound down between the fundus and the rectum. The fundus was separated from the rectum with some difficulty, but finally both appendages were removed with the organ. The wound was closed in the usual way and the patient placed in bed. Notwithstanding her extremely prostrated condition the shock was practically *nil*, and the convalescence uninterrupted. She returned to her home three weeks from the day of the operation, and on my first visit to her I found her eating with relish fried oysters, cottage cheese, fried potatoes, pickles, and coffee. The stomach trouble was purely reflex and has almost entirely disappeared.

CASE VII.—This patient belongs to Dr. W. H. Gifford, who has kindly furnished me with the following history: She is 38 years of age, married, and has never been pregnant. Has always been irregular, sometimes missing three or four successive periods. To make a long story short, she was exceedingly anxious to become pregnant, and gave her imagination full sway. In due time enlargement of the breasts and tympanitic distention of the abdomen came—in short, all of the symptoms of pseudocyesis. The baby's toilet was prepared and the nurse engaged, but no baby came. She finally consulted Dr. Gifford, who made an examination and informed her that she was not pregnant and in all probability never would be. There was a sharp hemorrhage from the uterus in December of last year and March of this, which was so unlike her usual periods that she did not think it was menstrual in character. She has suffered intense and gradually increasing pain in the pelvis for the last two years. There was more or less fever with the exacerbations of pain, though there is no history of severe pelvic inflammation. I suspect that the inflammation was of gonorrheal origin,

though I did not examine the discharge for gonococci. She entered Huron Street Hospital on May 8th, 1895, and I operated on the following day. A more difficult operation could not well be imagined. The patient is large and fleshy, the vagina unnaturally small and the pelvis deep. An effort to drag the uterus down after the anesthetic had been given showed that the organ was perfectly fixed. Pus pockets on either side were opened into as the dissection progressed, and at least a teacupful of pus was liberated. I finally delivered the uterus in a mutilated condition. In its interior was a fibroid the size of a small apple. The appendages of both sides were then separated from their surrounding attachments, tied, and cut off. The peritoneal cavity was opened into and the intestines exposed. After the parts were removed the pelvis was washed with sterile water, and as the oozing was persistent the wound was dressed open and packed in the manner described. The operation lasted for over an hour, but the shock was not at all bad. She is now, three years later, well and strong.

CASE VIII.—I am also indebted to Dr. R. Hathaway for this patient. The case was one of sarcoma uteri complicated with pyosalpinx and pelvic abscess. The patient was 42 years of age, and had flowed inordinately for the last four years. The discharge during the intermenstrual period was watery, offensive, and contained "pieces of flesh." She had had four children, the youngest being six years of age. Notwithstanding the fact that she had been under treatment more or less of the time for the four years she had been flowing, the two medical gentlemen under whose care she was did not see fit to make an examination. Dr. Hathaway saw her for the first time on April 20, and at once discovered that the case was a most serious one. Indeed he made the diagnosis for me, and two days later called me to see her. The uterus was found much enlarged, and retroverted so that the cervix was crowded up under the pubes in front. The fundus was exquisitely sensitive. The general condition was in every way bad—the complexion straw-colored, the emaciation marked, and the pulse 120. Inasmuch as an operation promised the only hope of relief it was decided to bring her to the city and make the attempt. A vaginal hysterectomy was made at the Huron Street Hospital on April 27. The broad ligaments were tied and cut in sections with but little difficulty. The left tube contained pus and was removed with the corresponding ovary. The wound was closed in the usual way and the patient returned to her bed. The shock was not great and the patient (two years later) remains perfectly well.

The uterus in this case was eight inches in length, and contained a

sarcomatous tumor the size of an orange, which was attached to the posterior wall of the fundus.

CASE IX.—Patient referred to me by Dr. W. H. Stedman, of Cleveland. She was 48 years of age, and had passed pus through the bowels for the last twenty-one years. Her illness dated from childbirth, at which time she undoubtedly had septic inflammation of the uterus and the pelvic organs. Her suffering had been almost indescribable, and she had reached a point where she was taking four ounces of the tincture of opium a day in order to relieve the pain. When I first examined her an indistinct mass could be felt on the left side, which undoubtedly communicated with the rectum. Early in September of 1894 I opened the abdomen from above, dug the appendages from inflammatory exudates, opened the abscess and drained it through the abdominal wound. In the course of three weeks the cavity had entirely filled in from the bottom and she was permitted to leave the hospital, though against my advice. There was no discharge of pus through the rectum for some four or five weeks after her return home, but at the end of that time she overdid in some way, and was soon as bad as ever. She returned to my clinic in February, and I removed the uterus per vaginam. Of course in doing this the abscess cavity was opened into, as the uterus was part of the abscess wall. The opening into the rectum now communicated with the vagina, and from the first fecal matter escaped through the latter organ, and continued to escape for four months, when I succeeded in closing the fistula by a plastic operation. Twice before I have been so unfortunate as to get into the rectum in making vaginal hysterectomies, but in each instance the fistula closed spontaneously. Undoubtedly the poisoned condition of the patient's system had much to do with perpetuating the discharge. I should have added that forceps, instead of catgut, were used to secure the broad ligaments and that the bleeding was very profuse.

CASE X. — *Pelvic Abscess; Drainage Through Vagina; Vaginal Hysterectomy; Recovery.*—Miss P———, æt. 42, referred to me by Prof. W. A. Tims, of Cleveland. Six years previously she had a fall which gave rise to pelvic inflammation, and which nearly cost her her life. She had several relapses, the last about three months before I saw her, at which time she nearly died from sepsis.

On August 17, 1895, I opened Douglas' cul-de-sac, and relieved her of at least a quart of offensive pus, leaving behind a T drainage tube. This relieved her greatly, and for a time the improvement was marked, but four weeks later a relapse occurred, and it became necessary to remove her to the Huron Street Hospital. At this

time she was much prostrated, the pulse ranging from 120 to 140, and the temperature from 101° to 106° F. Ether was given with the expectation of removing the uterus, but the heart acted so badly that it was deemed best to wash out the pus cavity and improve her general condition before attempting a radical operation. On August 17, 1895, I removed the uterus through the vagina, tying the ligaments off with catgut. There was scarcely any hemorrhage. The uterus formed the anterior boundary of the abscess, and was firmly fixed. On the right side there was a large hydrosalpinx, and on the left a second pus cavity which was filled with horribly offensive pus, and which could not have been reached without removing the uterus. These were both opened, irrigated and packed with gauze. The temperature immediately dropped to normal, and the patient is now perfectly well, attending to the arduous duties incident to the management of a large city charity.

I feel quite sure that this patient would have died had an attempt been made to remove the appendages from above. Her condition was such that she could not have stood the shock attending an operation necessitating the separation of numerous intestinal adhesions.

CHAPTER XXXII.

DISEASES OF THE URETHRA AND BLADDER.

General Considerations.—In treating of vaginitis I dwelt upon the uncertainty of differentiating between the specific and non-specific forms of inflammation attacking the genital and urinary tracts. It was there stated that specific vaginitis oftener involves the urethra than does non-specific, and this is undoubtedly true. Nevertheless, acute urethritis may occur independently of gonorrheal infection. In both forms of inflammation the patient will complain of a burning pain in the urethra, more or less severe, which is greatly aggravated by urination. It is, however, claimed by Skene that the history of the two affections is quite different. "Simple urethritis," he says, "comes on gradually and is often preceded by symptoms of uterine or vesical disease, while the gonorrheal variety comes on rather abruptly and is preceded or attended by acute vaginitis or vulvitis." A microscopic examination usually reveals gonococci in the discharge of specific urethritis.*

In both forms of inflammation painful spasmodic contractions of the canal, interfering with or preventing the flow of urine, are of frequent occurrence.

The mucous membrane, upon *physical examination*, is red, congested and exceedingly sensitive. By using an endoscope or speculum, mucus or pus will be found between its folds.

Acute Cystitis.

Frequency.—Acute cystitis in women is a disease more common than the student is led to infer from the teachings of many of our more prominent gynecological authorities. While it is a lesion not confined to women, yet the anatomical peculiarities of the female bladder are such as to make it more liable to inflammatory attacks than is the male bladder. The uterus and adnexa, posteriorly and superiorly, frequently implicate it in a reflex way or by direct transmission; while the vagina is lined with a mucous membrane often the seat of specific or non-specific inflammation, which is readily conveyed through the

* *v.* pp. 82 and 406.

urethra to the bladder. Again, the numerous injuries following in the train of parturition not infrequently end in vesical inflammation.

Pathology.—In its pathology there is nothing peculiar or remarkable. The changes will vary somewhat according to the severity and violence of the attack, yet they are not unlike those found in inflammation attacking any mucous surface.

At the outset the existing hyperemia gives a bright red appearance to the membrane, which soon becomes swollen and relaxed. At certain points the epithelium will be destroyed, particularly at the summit of the rugæ, between the folds of which, and in the sulci, pus is usually found. These, in brief, are the ordinary changes incident to the disease. Occasionally the destructive process is much more decided, especially in certain cases following prolonged distention. All of the mucous and submucous tissues may become involved, the entire lining membrane of the bladder being shed or cast off *en masse;* usually this occurs only in post-puerperal cases, at which time the general congestion and succulency of all the pelvic organs favor extensive destruction. During parturition, pressure upon the neck of the bladder or upon the urethra causes tumefaction of the parts and consequent obstruction. As a result, the urine may be retained for an indefinite length of time, the dribbling from the over-distended organ deceiving both nurse and physician, until excessive intra-vesical pressure destroys the capillary circulation of the mucous membrane, causing, in due time, its partial or complete death, after which it is exfoliated and cast off. This, at least, is the explanation given by Liston, and it seems a very probable one. Skene suggests that where the distention has been sufficiently great to cause separation, the death of tissue may be due to excessive congestion following sudden emptying of the organ. The succeeding changes are those of chronic cystitis.

Etiology.—The causes of acute cystitis are both numerous and varied, some having already been suggested. There is not a consensus of opinion as to whether it ever occurs as an idiopathic affection. While not so profoundly impressed by the causes giving rise to general pelvic congestion as are the uterus and ovaries, yet the blood supply of all of the pelvic viscera is derived from the same general source, and it therefore requires no great stretch of the imagination to believe that cold or undue exposure may excite cystitis. However, in the vast majority of instances, the trouble can be traced to unmistakable exciting causes, though it is reasonable to believe that women of scrofulous tendencies are more liable to have catarrh of the bladder, when exciting causes exist, than are those free from constitutional bias. At

any rate, the slightest irritation or exposure will, in some women, set up congestion or actual inflammation of the bladder.

Of the various *exciting causes* none is more important than parturition, to the improper conduct of which many a woman owes her invalid life. Cystitis is here produced either by undue and prolonged pressure of the fetal head, by retention of urine, or by septic invasion—all preventable causes in most instances. Of those originating from within the body, abnormalities of the urine are to be noted; yet, in a bladder perfectly healthy, it is difficult to comprehend any unnatural condition of the urine sufficient to excite an inflammation. Unfortunately, many bladders are not perfectly healthy, being at times more or less congested or abraded, a condition that may be transformed into true inflammation by urine loaded with lithates or with pus. Abnormal urine is oftener the result than the cause of cystitis. Of those causes originating from without the body we may enumerate traumatism, the introduction of foreign bodies by masturbators, uncleanly or unskillful catheterization, and unnatural or violent coitus.

The bladder, like all other organs of the body, is predisposed to inflammation by any condition causing chronic congestion. Disorders of the heart, liver, and kidneys act in this way. In acute exanthematous diseases the vesical mucous membrane may sympathize with the tegumentary tissues, and even become seriously involved. Certain drugs (cantharis, terebinthina, cannabis sativa, etc.) possess the power, in doses sufficiently large, to inflame the bladder. As has been intimated under the head of pathology, diseases of contiguous organs may extend to the bladder. Urethritis, especially specific, frequently implicates the organ by extension of inflammation.

Symptoms.—Acute cystitis, while often giving rise to symptoms most decided and pronounced, does not affect the organism as does chronic cystitis. In the simple types of catarrh the symptoms appear suddenly, there being a sensation of distress and weight back of the pubes, with increased frequency of micturition, which is more or less painful. The degree of tenesmus varies according to the extent to which the vesical neck is implicated. The urine is but little changed, is slightly acid or neutral in reaction, and may be clouded. The specific gravity remains normal, and if there is a sediment it will contain an increased quantity of leucocytes, with or without phosphatic crystals.

Even when acute cystitis is purulent from the onset, the general disturbance may not be very great, except, as Richardson observes, in those attacks due to bacterial invasion following labor; in such cases the onset is announced by a severe rigor, followed by a temperature

ranging from normal in the morning to 103° or 104° F. in the evening. The hypogastrium may become very tender and the dysuria and tenesmus unendurable. In the purulent form the changes of the urine are more decided, it being ammoniacal, invariably alkaline, and containing pus and blood in varying proportions. The sediment contains, besides blood- and pus-corpuscles, triple phosphate crystals, bladder epithelium and bacteria.

Those forms of acute cystitis which occur as a local expression of severe constitutional disease—diphtheria, erysipelas and croup—are always of serious import, and demand of the attendant prompt and vigilant treatment.

Differentiation.—There may be some difficulty in differentiating acute cystitis from *acute urethritis*, especially if the subjective symptoms alone are relied upon. Severe pain in the latter affection does not precede, and lasts but a short time after, micturition. It is also said that there is an oozing of pus more or less continuously from the urethra in urethritis; whereas in cystitis pus escapes only during micturition, and the urine which is last passed is more cloudy than that first discharged. The uncertainty of this test is, to my mind at least, very great.

When the pus comes from the *kidneys* there will be more albumin than can be accounted for by the total quantity of pus and blood present in the urine. Again, in renal disease the tube-casts, and the absence of pain during micturition and in the region of the bladder, ought to direct attention to the kidneys.

In *prolapsus uteri* there may be frequent urination not unlike that produced by cystitis, but the normal condition of the urine, and the aggravation arising from standing or walking, will at least suggest the cause of the trouble.

The dysuria arising from the *vesical neuroses* is characterized by its sudden appearance as well as by its sudden disappearance. If there is any change in the character of the urinary secretion it is but temporary. In *adhesions of the bladder* the desire to empty the organ is not urgent except when it becomes partially distended. The urine remains unchanged. *Fissure of the bladder* can be positively determined only by the use of the endoscope, or Kelly's speculum.

Treatment. — In the treatment of acute cystitis and urethritis prophylaxis is of first importance, and the various causes enumerated should be carefully avoided or removed. Unclean catheters should be banished from the lying-in and sick room. I now use almost exclusively Kusner's glass catheter, the proper care of which is given in the chapter devoted to antisepsis. Unless absolutely necessary, catheter-

ism after operations should not be resorted to. Even after abdominal section the patient is usually able to urinate with much less distress than is caused by the introduction of the instrument, and experience has fully demonstrated the harmlessness of permitting healthy urine to come in contact with plastic wounds if antiseptic injections are used. With the possible exception of vesical fistula, I no longer draw the urine after operations, except in those cases where swelling and tumefaction have temporarily occluded the urethra, or where, owing to some peculiarity of the patient, she cannot urinate while in the recumbent posture.

On the other hand, catheterism is frequently called for in post-puerperal conditions, and the importance and necessity of examining the bladder carefully during the first few days of the puerperium should be indelibly impressed upon the mind of the student. A very large proportion of the cases of cystitis date from childbirth, and in no instance should the statement of either nurse or patient be relied upon as regards the passage of urine, especially if there be dribbling. In consultation with Dr. J. W. Wheelock, of Bancroft, Mich., I once saw a parturient woman, moribund, with symptoms of septicemia and uremia, whose bladder reached the umbilicus, giving to the abdomen, so great was the distension, the appearance of tympanitic enlargement. Catheterism rewarded us with two large *pots de chambre* full of urine, the distention having been overlooked by two well-known physicians who had preceded Dr. Wheelock in the case.

Abnormalities of the urine, when they exist, should be corrected, and hemorrhoids, fissures, or any disease of neighboring organs should be removed. *Necessitas tollendæ causæ* applies to the treatment of cystitis quite as much as it does to the treatment of any other inflammation.

During the attack, rest, more or less absolute, should be insisted upon. The recumbent posture should be maintained, and if vesical pain and tenesmus are very great, much relief may be afforded by the hot sitz-bath or vaginal douche. If the urethra is the part chiefly implicated, a stream of warm water falling upon the external meatus for ten or fifteen minutes and repeated three or four times a day is often most useful. Concentrated and irritating urine can be diluted by permitting the patient to drink freely of either water, milk, or some mucilaginous fluid, such as flaxseed tea or slippery elm water. Five grain doses of salol in wafer-papers thrice daily, with or without the same amount of boric acid, is highly recommended for the purpose of keeping the urine aseptic. The diet should be unstimulating and bland, milk being the best of all articles. These precautions, in con-

junction with the indicated remedy, will, in probably the larger proportion of cases of acute aseptic inflammation, accomplish a cure. Aconite, belladonna, cantharis, cannabis sativa, chimaphila, mercurius cor., and arsenicum comprise a list of remedies frequently indicated.

After the duration of a week or longer without manifest improvement the disease will have assumed a subacute or chronic character, and may demand more direct local medication, the method of applying which, together with the therapeutic indications, is given in the succeeding section.

Chronic Urethritis and Cystitis.

Chronic urethritis is occasionally met with as a result of some distortion of the urethra—dilatation, prolapsus, or backward displacement—the latter condition arising from contraction of the utero-sacral ligaments. It is oftener, however, the sequel of acute inflammation and may be exceedingly obstinate and persistent in its course. One of its most frequent causes is want of proper care attending the use of the catheter.

The *symptoms* have to do largely with the function of micturition, there being more or less pain and tenesmus, with a slight discharge of pus. The pus will be washed away by the urine first passed, that left behind, if drawn off subsequently, being comparatively free from sediment. The disease rarely exists for any length of time without sooner or later implicating the bladder.

Chronic Cystitis.—The mucous membrane undergoes the usual changes of chronic inflammation attacking mucous membranes elsewhere, assuming a muddy gray color. The epithelium is freely shed and may be necrosed and ulcerated; or the membrane may be cast off *en masse*, as in the acute variety. The ulceration may extend into, and even perforate, the walls of the bladder. Hyperplasia sometimes takes place at the seat of ulceration, resulting in the development of polypoid material (Skene). As time goes on the submucous intermuscular tissue becomes thickened—partly because of extension of the inflammation and partly because of the vesical tenesmus. When the disease extends to the muscular parietes it is known as *interstitial cystitis;* if the peritoneal coat is implicated, as *epi-* or *peri-cystitis*.

Etiology.—The same causes giving rise to the acute form of inflammation may, when acting less violently, set up the chronic form. Indeed, the latter is a frequent sequel of acute cystitis. Other causes are: foreign bodies, calculi, tuberculosis, cancer, paralysis, displace-

ments of the uterus, perivesical inflammation, and irritating internal medicines.

Symptoms.—These are local and constitutional. The *local* symptoms are caused by the contact of urine with the inflamed walls. There is a desire to urinate as soon as a slight accumulation of the secretion occurs, micturition being attended with pain, tenesmus and frequently spasm. The character of the urine is variable, depending upon the extent and chronicity of the disease. Its specific gravity is usually low, and it contains pus, epithelium, mucus, and, not infrequently, blood-cells. These various abnormal elements give rise upon standing to an albuminous, ropy deposit, more or less abundant. It speedily becomes alkaline and phosphatic and possesses a fetid, ammoniacal odor.

The system is always more or less impressed by the persistence of the disease, sometimes most profoundly so. As time goes on, hypertrophy of the neck of the bladder ensues, which makes complete evacuation impossible. The urine thus retained becomes stale and increases the irritation. A certain quantity of pus and urinary elements are absorbed, so that the patient soon shows signs of cachexia and chronic septicemia. In the worst cases of ulceration there is infiltration of urine into and through the bladder walls, which occasionally terminates in abscess and serious pelvic inflammation; or the disease may implicate the openings of the ureters, giving rise to partial occlusion, the obstruction terminating in distention of these canals together with the pelves of the kidneys. The kidneys may become disorganized and suppurate, death occurring from pyemia and uremic poisoning.

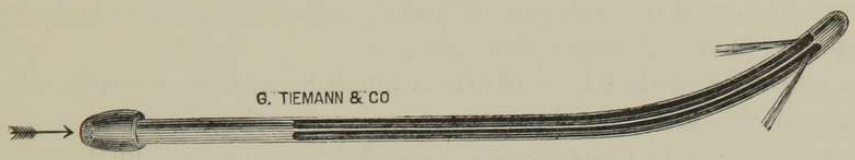
Even in the milder forms of chronic cystitis the patient shows the effects of the disease in various ways. She is constantly broken of her rest, being compelled to get up during the night from five to twenty times for the purpose of emptying the bladder. This in itself soon tells upon her. Nutrition is always more or less affected, the appetite is impaired, and the countenance is indicative of suffering. Nervous symptoms of various kinds sooner or later supervene.

Treatment.—The general measures recommended in acute urethritis and cystitis are to be observed in the treatment of the chronic forms of inflammation. Diluent drinks (gum-arabic water, flaxseed tea, and slippery-elm water) are useful for modifying the acridity of the urine; or five-grain doses of salol and boric acid may be given for this purpose. Drinking freely of some of the mineral waters for the purpose of diluting the urine is also beneficial. The waters most used for this purpose are the Vichy, Bethesda, Waukeshaw, Londonderry Lithia, and Buffalo

Lithia. The diet should be nutritious but bland, it being best to eschew alcoholic beverages, spices, asparagus, etc.

As soon as the evidences of pus become marked, in either urethritis or cystitis, the parts should be irrigated at least once or twice a day. Skene has devised a reflux catheter for irrigating the urethra, which is shown in Fig. 120. With this instrument the urethra can be douched with water as hot as the patient can bear it and as often as necessary.

FIG. 120.

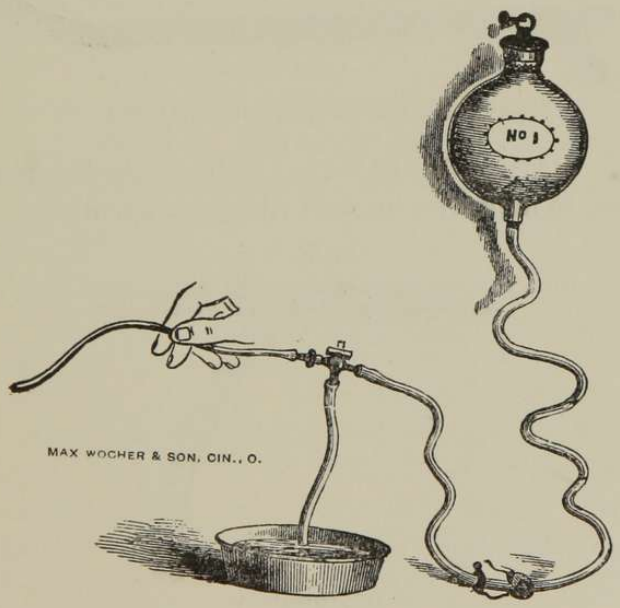


REFLUX CATHETER FOR URETHRA.

It should only be passed as far as the neck of the bladder. The water used may be medicated with hydrastis, calendula, boric or carbolic acid. A two per cent. aqueous solution of ichthyol may be injected into the urethra three or four times a day (Villetti).

Skene has also devised a most simple instrument for washing out the

FIG. 121.



SKENE'S BLADDER IRRIGATOR.

bladder. It consists of a small glass funnel to which is attached a piece of rubber tubing eighteen inches or two feet in length. The dis-

tal end of the tubing is connected with a soft rubber catheter. I have substituted the glass for the rubber instrument. The catheter is introduced into the bladder, and the urine is drawn off through it—enough, however, being left behind to fill the tubing and prevent the entrance of air. The solution to be used is now poured into the funnel, which is raised sufficiently high to force the water into the bladder. After the bladder contains as much of the fluid as the patient can tolerate without pain, the funnel is again lowered and the fluid drained off. This can be repeated until the water returns clear. Care should always be taken to prevent air from entering the bladder.

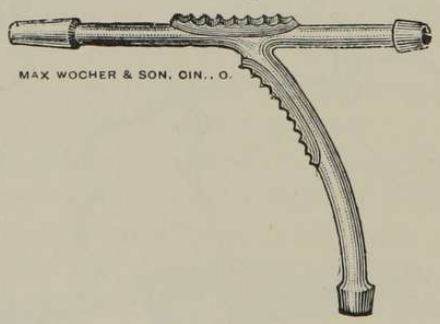
In chronic cystitis I have obtained much benefit from continued irrigation of the bladder by means of the apparatus shown in Fig. 121. At least a gallon of properly medicated fluid can be used in this way, as hot as the patient can tolerate it. I am satisfied that the thermic action of the water is of much value in the treatment of chronic cystitis. The bladder should be sufficiently distended to bring the fluid in contact with all of its folds. The same object may be obtained by intermittent compression of the escape tube, with Skene's reflux catheter (Fig. 122), though the metal instrument soon becomes heated and burns

FIG. 122.

REFLUX CATHETER FOR BLADDER.

the urethra. Wocher's Y (Fig. 123) will enable the physician, with small expense, to improvise his own irrigating apparatus.

FIG. 123.



WOCHER'S Y.

If the urethral tenderness is very great, before introducing the catheter, a few drops of an eight per cent. solution of cocaine should be applied by means of an ordinary medicine dropper.

The choice of fluids to be used in washing the bladder should be governed by circumstances. There is nothing better than a two per cent. carbolic solution to prepare the way for a medicament. Skene prefers a solution of borax or common table salt (one tablespoonful to a quart), and Mundé recommends a tepid 5:100 boric acid solution. If the fetor is very great boric acid may be used as strong as a fifty per cent. solution. Weak solutions of bichlorid of mercury (1:10000) or permanganate of potash (1:1000) may be used for the same purpose. After the bladder is thoroughly washed in this way there should be added to the last pint of water injected the medicament indicated, and the patient be instructed to retain two or three ounces of it for some minutes, so that it may come in contact with the entire mucous membrane. The remedies preferred by me for specific medication are calendula and hydrastis: calendula if there is a great deal of pus, or evidences of ulceration; hydrastis, if the deposit is composed largely of tenacious mucus. The strength of each should be about 1:20.

If good is to be obtained from this treatment, it must be employed at least once or twice a day and persisted in for some time. If the bladder is washed but once or twice a week the improvement will be very slow, hence the nurse or attendant (and any intelligent nurse can do it) should make the treatments, under the direction of the physician. The carefully selected internal remedy is, of course, to be given in conjunction with the local measures recommended.

Chronic cystitis, under the most favorable conditions, usually runs an obstinate course, and, in spite of the foregoing treatment faithfully and persistently carried out, failures will every now and then result. The great difficulty to contend with is the constant contact of irritating urine with the inflamed bladder walls, thus making physiological rest impossible. There is but one way to overcome this difficulty, and that is to make an opening through the vesico-vaginal septum sufficiently large to permit the urine to drain into the vagina as soon as it enters the bladder. This operation is known as *colpocystotomy*. It is not difficult to perform and there is nothing more simple than closing the artificial fistula after the cystitis is cured. I have opened the bladder many times for chronic inflammation, and, except in one instance, have never failed to close the opening on the first attempt. In the instance referred to the light was wretchedly bad, and undoubtedly I coaptated unvivified surfaces.

In a given case of chronic cystitis I proceed, then, as follows: An attempt is first made to cure the disease by the measures which have been recommended. If these fail after a thorough trial, or if the local

treatment is impracticable because of the very great pain which it induces, the patient is given an anesthetic, and an exploration is made. Should there be found sufficient urethral disease—fissure, ulcer, angioma, etc.—to keep up the cystitis by the dysuria and tenesmus excited, and the bladder changes are not great, the lesion is removed and the urethra dilated with some expanding instrument (Pratt's urethral speculum is excellent for the purpose) with the hope of relieving the tenesmus and curing the cystitis. I have succeeded in curing several cases in this way. Drainage may be attempted through the urethra by means of a glass catheter, which is to be removed twice a day and thoroughly sterilized. If these procedures fail, or if hypertrophy of the bladder walls be already marked, I do not hesitate to perform colpocystotomy.

Colpocystotomy.—The patient is placed in the Sims posture and a good-sized male sound introduced into the bladder, the point being made to impinge upon the trigonum vesicæ—midway between the neck of the bladder and the cervix uteri, in the median line. The point of the sound is cut down upon by means of a scalpel, when the sound is removed and the edges of the wound separated by tenacula hooked into either side through the vagina. One blade of an angular scissors is now passed into the opening, which is enlarged to the extent of an inch. Finally, the mucous membrane of the bladder is stitched to that of the vagina by a running interlooped catgut suture. Unless this last precaution is taken it is impossible to keep the wound from healing; even with it, the opening will close unless it is dilated with the finger once or twice a day for the first ten days.

The bladder can now be got at for proper treatment, and washed through both the urethra and the artificial opening. The relief afforded is most remarkable, and the patient usually begins to gain at once. I have had patients gain thirty pounds in four months following the operation. They begin to eat almost immediately, are no longer compelled to get up several times during the night in order to empty the bladder, and the symptoms of septicemia disappear. There is, to be sure, more or less inconvenience and distress caused by the constant dribbling of urine into the vagina and its contact with the external organs. This can be largely overcome by frequent washings and the application of some of the protective ointments or washes recommended for pruritus vulvæ, one of the best of which is Carron oil. I have never succeeded in successfully fitting any of the cup pessaries devised for the purpose of conveying the urine from the fistula into a urinal attached to the limb.

The fistula should not be closed until the inflammation and ulceration are entirely cured. The length of time required to accomplish this is from three to eighteen months. It is a most remarkable fact—one that affords some idea of the suffering incident to cystitis—that patients who have undergone the operation, notwithstanding that they are constantly wet from the dribbling of urine, are usually loath to have the opening closed, so great is the relief experienced. The technique of the operation for closing it does not differ from that required for fistulæ produced by other causes.

Kelly's method of exploring the bladder (p. 122) makes colpocystotomy unnecessary for diagnostic purposes alone.

Ureteritis.

Since Pryor's and Kelly's methods of examining the ureters and bladder have come into vogue, the diseases of the ureters have assumed new importance. In an exhaustive article on *ureteritis*, Mann,* of Buffalo, enumerates its causes as follows:—

1. Injuries incident to childbirth;
2. Previous disease of the bladder;
3. Gonorrhea;
4. Suppuration of the pelvis of the kidney;
5. Pelvic inflammation, tumors, etc.;
6. Tuberculosis;
7. Abnormal conditions of the urine.

To this list of causes there should be added, retro-displacements of the uterus. I once had to do with a case of hydronephosis which was relieved for some months by fitting a retroversion pessary.

Ureteritis may be either catarrhal, purulent or ulcerative. The tube may be increased in thickness to the size of a lead pencil. As time progresses the disease may implicate the kidney pelve. It is said that the left ureter is much oftener affected than the right. Frequent micturition, with pain over one or both ureters, is the most constant symptom. The ureters may under reasonably favorable conditions be palpated. Certainty of diagnosis is, however, only possible by inspection. This is done according to the method described on page 122.

In the treatment of ureteritis the diet should be bland and non-stimulating, the urine should be diluted with some of the alkaline waters, the skin should be kept active and the bowels open. Internally mercurius, cantharis, terebinthina, ferric phos., kali mur., gelsemium,

* Am. Jour. Med. Sci., Aug., 1894.

kali sulph., and arsenicum are to be thought of. The bladder should be frequently washed as in cystitis. Catheterism and direct medication of the ureters may also be of service.

Therapeutics.

Cantharis.—TENESMUS VESICÆ; *constant desire to urinate, passing only a few drops at a time, often mixed with blood;* stinging and burning pains in the region of the bladder before and after micturition, or cutting pains from the kidneys to the bladder; abdomen distended and painful to contact, especially in the region of the bladder.

Apis mel.—Great irritation at neck of bladder with frequent and burning urination; frequent desire with passage of only a few drops; BURNING AND STINGING IN THE URETHRA; useful in cystitis and urethritis caused by cantharis; bladder symptoms are aggravated by drinking water. "It seems as if the sight of water brings about a constriction of the sphincter muscle."—*Farrington.*

Aconite.—High fever; restlessness; *constant urging, yet fearful of evacuating urine on account of painfulness of the act;* micturition difficult, sometimes only drop by drop.

Dulcamara.—Painful pressing down in the region of the bladder and urethra; especially useful in chronic cases with constant desire deep in the abdomen to urinate, *particularly if brought on or perpetuated by exposure to local damp or cold;* urine is very offensive and is loaded with mucus.

Pulsatilla.—Tenesmus and stinging in the neck of the bladder, the pain continuing after micturition; *gonorrheal urethritis with thick, yellow or yellowish-green discharge;* INFLAMED eyes; scanty urine with restlessness; suppressed gonorrhea.*

Equisetum hyem.—Urine high colored and scanty; dysuria with severe pain, especially just after voiding urine; pain and tenderness in region of bladder with feeling of distention.†

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* "In cystitis and catarrh of the bladder we find *Pulsatilla* indicated when there is frequent urging to urinate with pressure on the bladder as if it were too full. There is pain in the urethra. The urine itself is often turbid from the admixture of mucus. Clinically we have not found *Pulsatilla* a first-class remedy in cystitis, but we have found it almost always the remedy in cystic symptoms accompanying pregnancy. It yields to *Cantharis*, *Equisetum*, and *Dulcamara* in cystitis."—*Farrington.*

† "*Equisetum* acts very similarly to *Cantharis* on the kidneys and bladder. There is, however, less escape of blood and less tenesmus vesicæ than may be found under *Cantharis.* The urine is less scalding and does not contain so many fibrinous flakes. *Cantharis* is not called for so often as *Equisetum* when there is an excess of mucus in the urine."—*Farrington.*

Mercurius cor.—Fever with chilliness; violent urging; urine flows in a thin stream, or only drop by drop, containing mucus and pus; *during micturition sweat breaks forth;* SYPHILITIC URETHRITIS; in children who perspire profusely, whose urine is hot and acrid, with sudden irresistible desire to urinate.

Copaiva.—Urethritis with burning at the neck of the bladder and in the urethra; the discharge is of a milky color and of a corrosive character.

Cubeba.—Cutting and constriction after micturition; the discharge is of a mucous character.*

Petroselinum.—Sudden urging to urinate; gonorrhea with sudden urging and strangury. "In the case of a child it will be suddenly seized with a desire to urinate. If it cannot be gratified immediately it will jump up and down with pain."—*Farrington.*

Ferrum phos.—Cystitis with dysuria, which is brought on by standing.

Berberis vulg.—Cystitis associated with cutting lesions; sharp, stitching pains, radiating from the region of the bladder in all directions, particularly downward and forward, filling the whole pelvis with pain.

Cannabis sat.—Sudden urging with difficult urination; cutting pains during micturition between the labia, with *violent sexual desire;* swelling of the vagina; the orifice of the urethra is closed with muco-pus.

Belladonna.—The region of the bladder is sensitive to touch; urine hot and red; shooting pains; cerebral excitement.

Arsenicum.—Burning pain, especially at commencement of urination; chronic cystitis with inability to void the water; symptoms of sepsis; urine turbid and mixed with mucus and pus.

Terebinthina.—Sensitiveness of hypogastrium; tenesmus of bladder with strangury and pain in urethra; *urine retained from atrophy of fundus vesicæ;* catarrh of the bladder in old persons of sedentary habits.

Camphora.—Especially useful after abuse of cantharis and terebinthina; complete suppression of urine; slow and thin stream; burning in urethra and bladder.

Consult:—Elaterium, *eupatorium purp.*, *helleborus*, populus, sepia, hyoscyamus, *lachesis*, *sulphur*, and tarantula.

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* "Both *Copaiva* and *Cubeba* are useful in the irritation attending thickening of the lining membrane of the bladder. Neither remedy has as violent an action as has *Cantharis.*"—*Farrington.*

CHAPTER XXXIII.

DISEASES OF THE URETHRA AND BLADDER (Continued).

Malformations of the Urethra.

Congenital malformation of the urethra is usually associated with more or less malformation of the sexual organs and requires no extended description. The canal may, however, be entirely absent when the genital organs are normal, or it may be imperfectly developed at its lower portion only (hypospadiasis). A more common congenital defect is complete atresia. A case is recorded by Skene in which the delivery was impeded by a distended fetal bladder, caused by atresia. The treatment of these various abnormalities is purely surgical.

An interesting anomaly of the female urethra is recorded by Dr. W. A. Edwards, of Los Angeles. In attempting to catheterize a woman eighty years old he discovered that the external meatus was located in the median line of the anterior vaginal wall, one and one-half centimeters posterior to the clitoris and entirely within the vulvar aperture. The canal, which was two and one-half centimeters in length, apparently traversed the bladder wall before opening into the viscus.

Péan * has placed on record a case of double urethra and bladder in a girl of fifteen.

Stricture of the Urethra.

As in the male, though less frequently, gonorrhea and non-specific inflammation may result in stricture of the urethra, and even in complete atresia. Stricture more or less marked is also met with in long-standing vesico-vaginal fistula when the opening is sufficiently large to permit all of the urine to pass through it. The contraction may involve the entire length of the canal or only a portion of it, being oftener confined to the meatus. In difficult or painful micturition the possibility of stricture should always be borne in mind and the caliber of the canal measured. This is done by means of a sound, carefully inserted. The normal female urethra should admit with perfect ease a No. 12

* Le bulletin médical, Paris, May, 1895.

male sound (English scale). Distortion of the canal without stricture sometimes interferes with its introduction.

The same principles observed in the *treatment* of stricture in the male urethra are applicable to stricture in the female. Gradual dilatation is preferable to rapid if it will accomplish the desired end, as it usually will. This can be done by the repeated introduction of graduated sounds, cocaine being first used if the pain is great. For this purpose Hegar's dilators should be used. No. 15 should be the maximum size. If these measures fail, rapid dilatation under ether may be made, using for the purpose an ordinary smooth steel uterine dilator or Pratt's urethral speculum. The graduated sounds should be passed at frequent intervals after this operation. Electricity, with the negative galvanic pole direct, may also be tried.

Prolapse of the Mucous and Submucous Tissues of the Urethra.

In female children the most frequent cause of this condition is some irritation of the bladder, urethra or rectum, which gives rise to urethral tenesmus. When it is met with in women it is due to parturition. In the latter class of cases the mucous membrane and submucous tissues become, according to Emmet, split or lacerated in the long axis of the canal as the urethra is squeezed between the arch of the pubes and the fetal head. The peculiar loose structure of the tissues causes them to be rolled out from the urethra in advance of the child's head, the mechanism being not unlike that which forces the rectal mucous membrane from the anus.

A slight degree of prolapse is indicated only by the deeper red color of the urethral surface presenting itself at the outlet, for the retraction resulting from cicatrization prevents a more serious displacement. Troublesome symptoms do not always immediately follow the injury, and the patient may not be conscious of the accident for some weeks or months afterward, when the unnatural sensations are often attributed to some displacement or lesion of the uterus. Usually, however, the trouble can be traced back to some particular labor, after which the pain and uneasiness at the neck of the bladder were experienced for the first time. A subsequent examination will reveal prolapse at the outlet of the urethra, occupying, as the case may be, either the entire circumference of the canal, or only the lower or upper portion of its orifice.

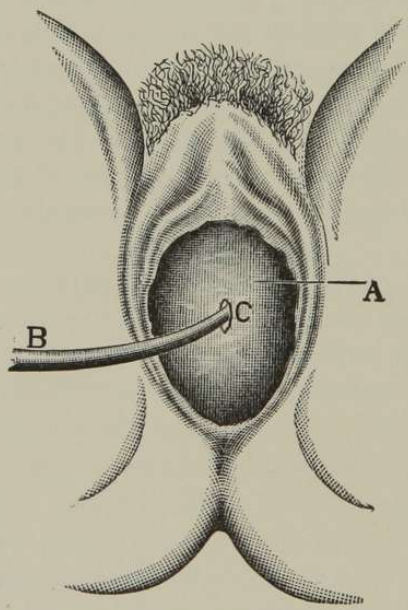
Fig. 124 represents an exaggerated instance of urethral prolapse, which came under my observation during the fall of 1886. The case is the one referred to on page 228. The condition shown had existed

for eighteen years, giving rise to a most distressing reflex asthma, which was entirely cured by removing the prolapsed tissue. The tumor was as large as a hen's egg. A careful physical examination, followed by the introduction of the sound or catheter, is usually sufficient to distinguish the accident from carunculæ, polypi, and venous angiomas.

The condition usually excites more or less pruritus and pain. Occasionally ulceration or gangrene occurs, which may give rise to a sharp hemorrhage.

Treatment.—If the prolapse is at all marked, surgical interference is usually necessary. It may be aggravated by existing pelvic cellulitis or anal fissures, in which event treatment should also be directed to these affections. The tissue was removed in the case shown in Fig. 124 by making a superficial incision around the base of the tumor, transfixing it with a double ligature, tying on each side, as in dealing with hemorrhoids, and cutting the mass away. Seguin first introduces a female catheter into the bladder, and then strangulates the tumor with a ligature thrown around its base. The catheter is not withdrawn until

FIG. 124.



A. TUMOR. B. CATHETER INTRODUCED INTO URETHRAL ORIFICE, C. (*Wood.*)

the base of the tumor is entirely severed. It may also be removed by the galvano-cautery wire, as suggested by Thomas.

Emmet condemns the removal of the mass in the circular variety of urethral prolapse. He says that many times only temporary relief

follows the operation, while a serious and permanent stricture often results. He first reduces the hypertrophied tissues by making an artificial vesico-vaginal fistula, thus diverting the flow of urine from its natural outlet. Then, by the aid of a steel or block-tin sound, he carefully returns from time to time the proplased tissues, which are made to contract by the application of strong tincture of iodin introduced through a conical ear speculum, or some similar instrument. After the urethra is restored as near to its normal condition as is possible by this treatment, he performs an operation for the cure of the prolapse in this way: A button-hole incision is made in the urethra through which the excess of tissue is drawn back from the meatus, secured in its edges, and cut off, after which the opening is closed. This operation is an ingenious one and, when the prolapsed tissues are not too much hypertrophied, is undoubtedly more satisfactory than is the one done by myself. The hypertrophy, however, in the case given, was such as to make Emmet's operation impracticable.

Dilatation of the Urethra.

This may result from growths within the canal, from stricture at or near the meatus, from the introduction of foreign bodies, or from the passage of calculi. In atresia of the vagina, the urethra may be sufficiently dilated to receive the male organ during intercourse. Thorburn cites a case of atresia vaginæ in which the urethral dilatation was so great that injections were given through it into the bladder, the urethra simulating the vagina. Oftentimes there is chronic inflammatory thickening of the mucous membrane.

Symptoms.—Disturbed micturition will attract attention to the urinary organs. Upon physical examination there will be found either a tumor of some kind which has given rise to obstruction of the urethra at its lower orifice, or inflammatory hypertrophy of its mucous membrane. A sound introduced beyond the point of obstruction will reveal the increased caliber of the canal. Urethritis is often associated with the condition, the discharge being purulent or muco-purulent in character.

Treatment.—If the dilatation is not great it may be treated by astringents, hot douches, etc. Any obstruction at or near the meatus should be removed. In the event of cystocele or relaxation of the pelvic floor, these conditions should be corrected. If the dilatation is not overcome by these several methods, Emmet's button-hole operation will afford relief from the distressing symptoms. The opening is made at the most dependent part of the urethra, either with a sound or scal-

pel, or with button-hole scissors especially constructed for the purpose. The mucous membrane of the urethra is then stitched to that of the vagina by a running catgut suture, as in colpocystotomy. If the urethral mucous membrane is very redundant, a portion of it may be excised. This opening affords free drainage and greatly facilitates irrigation, as well as the application of medicaments. Or, Skene's operation for prolapse of the urethra may be resorted to. This consists of an incision half an inch long on either side of the urethra, extending from the vulva upward and outward. With a continuous catgut suture the tissues are attached to the fascia of the sub-pubic ligament. The first row of sutures is buried while the edges of the wound are retracted; the second unites the divided mucous membrane. The tissues are thus gathered together on each side of the urethra and the prolapse is overcome.

Fissure of the Urethra.

The mucous membrane of the urethra, like that of the rectum, is sometimes rent in such a way as to create a fissure. In the urethra it is usually located at its vesical extremity. It may give rise to very distressing dysuria, with tenesmus and spasmodic contractions of the bladder.

The **diagnosis** may be made by exclusion—there being an absence, on physical exploration, of those lesions attended with similar symptoms. The fissure can usually be located by means of Kelly's cystoscope (Fig. 43).

The **treatment** consists of both internal and local medication. Magnesium phos., cantharis, mercurius cor., and cannabis sativa will be the remedies oftener indicated. I have succeeded in curing several cases by protecting the fissure with oleaginous collodion, as recommended by Ludlam. The solution is brought in contact with the parts by means of an ordinary straight medicine dropper, the tip being inserted as far as the neck of the bladder. Suppositories composed of iodoform, bismuth, or belladonna sometimes do much good. If the suffering is very great bougies made according to the following formula may be inserted into the urethra:—

℞. Cocainæ hydrochlorat . . . . . gr. xi.
Ol. theobromæ, q. s.
M. Ft. bacilli . . . . . No. xii.
S.—One night and morning (Garrigues).

As a last resort dilatation may be made and it usually accomplishes a cure. I have, in another place, cautioned against too great dilatation

of the urethra because of the danger of incontinence. The rule laid down by Skene, and it is a good one, is this: Ascertain how large a sound can be passed with ease and then dilate sufficiently to admit another three or four sizes larger. If this rule is carefully observed there will be but little danger of creating incontinence.

Finally, if forcible dilatation fail to produce sufficient physiological rest to cure the disease, an opening may be made into the bladder through the vagina. This will keep the urine from coming in contact with the fissure, and by the time the artificial opening closes spontaneously, the lesion usually will have healed.

Vascular Neoplasms of the Urethra.

An increase in the caliber of the venous radical will give rise to overdistention and the formation of tumors, which are known as angiomas, varices or phlebectases. They are analogous to rectal hemorrhoids and may occupy any portion of the urethra, though the vessels of the urethro-vaginal septum are the ones oftener implicated. These growths, unlike urethral caruncles, are not painful.

The **treatment** is the same as that recommended for urethral caruncles.

Urethral Caruncles.

Skene describes these formations under the head of *Compound Neoplasms*. They are, technically, papillary polypoid angiomas, and vary in size from a millet-seed to a hazelnut. They are of a crimson or deep red color, soft, friable, more or less pedunculated, and exquisitely painful to touch and upon passing urine. They spring from the urethral wall near the meatus. Occasionally they are concealed entirely within the urethra, or they may completely encircle the meatus, resembling the minor degrees of prolapse of the urethral mucous membrane.

Histologically, these growths are made up of fine loops of capillaries, with a limited amount of connective tissue and a varying supply of nerves.

Symptoms.—Pain upon micturition, sometimes very great, is usually the chief symptom for which the patient seeks relief. Dyspareunia and vaginismus may be most distressing. If large enough to interfere mechanically with urination, the act is not only painful, but difficult as well.

These growths can be differentiated from *angiomas* by their greater sensitiveness, their brighter color, and their tendency to bleed. They do not shrink under pressure, as do the vascular neoplasms.

Treatment.—This consists in total ablation of the morbid growths, either by means of scissors, the actual cautery, or caustics. My method of operating is as follows: The patient is placed in the lithotomy posture and the parts exposed; a twenty per cent. solution of cocaine is then applied to the growth or growths by means of absorbent cotton. The tumor is next seized with a pair of tissue forceps and put upon the stretch. It is then removed well into the healthy structures by means of the Paquelin, or the galvano-cautery knife. By this method the extent of tissue destroyed is entirely under the control of the operator, which is not the case if caustics are used.

Should the tumor or tumors be located higher up in the urethra, a speculum will be necessary in order to expose them. Skene recommends Allen's ear polypus forceps for grasping the tumor under these circumstances. When still higher up in the canal it may be necessary to use the snare, for which purpose Blake's polypus snare will be found useful.

Polypi of the Urethra.

Occasionally polypi spring from the urethra. Urethral caruncles may take on a polypoidal form; these have already been considered. Small pedunculated fibromata may also be located in or about this canal. And most rare of all forms are occluded glandules which assume a polypoidal shape. The *treatment* is, in all instances, surgical and does not differ from that given for urethral caruncles.

Irritable Urethra.

The mucous membrane of the urethra, like the mucous membrane of other parts of the body, sometimes becomes irritable or hyperesthetic without any local disease to account for such irritability. The condition is not unlike that of the so-called hysterical rectum so graphically described by Weir Mitchell. It gives rise to frequent micturition, especially after undue exercise or nervous excitement; and pain during sexual intercourse. The most careful examination will fail to reveal local evidences of disease.

The **treatment** is dilatation according to the method recommended for fissures of the urethra. The operation may have to be repeated several times, but in the end will, in nearly all instances, accomplish a cure. Of course proper measures, having for their object the correction of any constitutional bias that may exist, should be observed. Galvanism is also beneficial.

Vesical Calculi.

Stone in the bladder does not occur in women nearly so often as in men. When it does occur the causes are much the same as in the male, the uric acid diathesis being responsible for it oftener than anything else. Foreign bodies are more apt to find their way into the bladder in women than in men, being usually introduced for purposes of masturbation. Thus, through the urethra, hair-pins, matches, and even spools, have been introduced for this purpose, around which incrustations may form.

In all cases of chronic cystitis the bladder should be sounded for stone. When a metallic instrument comes in contact with it the sensation elicited is sufficiently characteristic to make the diagnosis certain. Sometimes the calculus is so large that it can be detected on bimanual examination.

The **treatment** is essentially surgical, and measures should be taken to remove the foreign body as soon as it is detected. If the stone is small, an attempt may be made to crush it through the urethra by forceps or the lithotrite, after which the detritus can be washed away. However, a large stone should not be removed in this way. The bladder is so easily got at through the vagina as to make it unwise to jeopardize the urethra by over-stretching. Indeed, in nearly all instances of vesical calculus there exists a cystitis which is best cured by colpocystotomy. I once removed, per vaginam, a stone weighing nearly six hundred grains, the only anesthetic used being cocaine. Notwithstanding the large opening required, no effort was made to close it and it healed spontaneously in less than three weeks, the drainage afforded curing the cystitis.

Neoplasms of the Bladder.*

The various neoplasms occurring in other parts of the body may have their origin in the bladder. The *villous variety of cancer* is the one most frequently found in this locality. It usually runs a rapid course, yet sometimes the duration of the disease will extend over a period of several years. Cancer gives rise to a good deal of pain and the urine is often tinged with blood. A diagnosis can be made only by the cystoscope. The *prognosis* is unfavorable, though life may be prolonged for an almost indefinite period by removing the growth as thoroughly as possible with a sharp curette through the vesico-vaginal septum, the

* The reader is referred to the excellent monograph on "Tumors of the Bladder," by Sir Henry Thompson, F. R. C. S., London.

hemorrhage being controlled by hot irrigation. Care must be observed not to injure the ureters in the efforts made to remove the disease.

The other neoplasms found in the bladder are pathological curiosities. Cysts containing hair, teeth, sebaceous matter, etc., sometimes, though rarely, exist as indigenous tumors. In the vast majority of instances these substances, when found within the bladder, are of outside origin. Polypi of varying structure—true fibromata, fibroid hypertrophy of the mucous membrane, tubercular growths, etc.—are likewise occasionally found within the bladder. It is exceeding difficult to differentiate these various growths from malignant disease, unless a portion can be removed and subjected to microscopic examination. Tubercle bacilli may be found in the urine in tuberculosis. In all instances an attempt should be made, either through the urethra or through an artificial vesico-vaginal fistula, to remove the neoplasms when they exist.

Vesical Parasites.

In this climate these are almost unknown. They usually reach the bladder either through the urethra, through fistulæ, or by passing downward from the kidneys through the ureters. Vesical parasites are very much more frequent in tropical or sub-tropical regions. *True hydatids* are occasionally met with in the bladder, as in all other parts of the body. The symptoms are those of vesical irritation, with occasional attacks of hematuria. If the parasites pass from the kidneys through the ureters the patient will suffer during their transit from all the symptoms of nephritic colic. An effort should be made to remove them through the urethra.

Hematuria.

So-called hematuria is a symptom of several of the conditions which have already been studied. It may be due to purpura or hemophilia, to simple local congestion, to fungosities of various kinds, to kidney lesions, to calculi, to foreign bodies, or to zymotic and malarial diseases. It is always important to determine the *source* of the blood when it appears in the urine. If there are clots large enough to be visible to the unaided eye, the source of the hemorrhage must be below the secreting structures. If the bladder is the source, the clots are often large and may lodge in the urethra, causing retention of the urine. If the coagulation takes place within the ureters, this will be indicated by the shape and size of the clots; if from the substance of the kidney, the clots, having been formed in the tubules, will be of microscopic size, and the urine will usually have a smoky tint (Vaughan).

Irritability of the Bladder.

The same factors inducing irritability of the urethra may also give rise to irritability of the bladder. It occurs oftener in hysterical and very nervous patients. There are, however, other causes which give rise to frequent micturition by inducing irritability of the bladder. Of these anteversion and anteflexion are the most frequent. Irritability of the bladder is also a common symptom of early pregnancy, and is due both to increased weight of the uterus, the fundus resting upon the bladder, and exaggerated pelvic congestion. Indeed, any condition increasing the blood supply of the pelvis may cause irritability of the bladder. It is often associated with dysmenorrhea, tumors of the uterus and of the ovaries, pelvic inflammation, and periuterine hematocele. In all instances of irritability, however, the urethra should be carefully explored for excrescences and inflammation, and the urine examined for evidences of organic disease of the urinary organs.

The cause of the irritability will sometimes be found in the urine itself, as when it is excessively acid or contaminated with pus or blood. Fine oxalates are often present in the urine of nervous and gouty subjects, and give rise to much irritation. They may be detected with a fairly good microscope. The *treatment* should be directed toward the removal of the cause.

Retention of Urine.

This may result from purely nervous causes, or it may be due to organic disease of the bladder. In nervous cases the urine is sometimes retained for several days, and there may be almost absolute suppression, which condition is known as hysterical ischuria. The retention is often voluntary in cases of irritable carunculæ and other diseases of the urethra, the patient dreading the pain attending micturition. Retention frequently occurs, too, after operations upon the rectum, it being often necessary to use the catheter for several days following divulsion of this organ.

As in the male, it is a frequent symptom in paraplegia, and the bladder should always be watched in cases of paralysis of the lower half of the body. Temporary paralysis of the bladder may also result from over-distention of this organ; after a certain degree of distention is reached, the urine cannot be expelled. This condition frequently prevails in puerperal cases, and the distention may be so great as to produce a dribbling of urine without creating the slightest desire to evacuate the bladder.

It may likewise be due to any of the various lesions or diseases which give rise to pressure upon the neck of the bladder or upon the urethra, the retention being purely mechanical. Impacted fibroid or ovarian tumors, pelvic abscess, retro-uterine hematocele, incarcerated retroversion or retroflexion of a gravid uterus—any or all of these several conditions exert pressure and tend to obstruct the flow of urine.

I have elsewhere cited a case (p. 71) in which the distention was so great as to give rise to suspicions of pregnancy. In all instances in which the patient has not urinated for some time, or in which there is a dribbling of urine, the bladder should be carefully examined for retention. It will be indicated by dulness in the hypogastric region, by bearing down intermittent pains, and by a sensation of distention in the lower abdomen. Care should always be taken to differentiate retention from *suppression* of urine. In all cases of doubt the catheter will clear up the diagnosis. After the retention is temporarily relieved by the introduction of the catheter (in excessive distention the bladder must not be too suddenly emptied), measures should be taken to remove its cause, whatever it may be. In cases of temporary paralysis the catheter may have to be used for several days. Local faradization will here do much good. Belladonna, nux vomica, gelsemium, camphora, and opium are to be thought of as internal remedies. If due to paraplegia, the vesical paralysis is likely to remain as a permanent condition.

Exstrophy of the Bladder.

By *exstrophy of the bladder* is meant a congenital absence of the anterior bladder and corresponding abdominal wall. The posterior wall is exposed and the urine can be seen dribbling from the ureters. The condition is extremely rare. The usual operative treatment consists of closing the opening by plastic measures which cover the undeveloped area with the skin of the abdomen. Rein describes an ingenious operation for exstrophy of the bladder when the opening cannot be closed in the usual way. He proceeds as follows:* "With the patient in Trendelenberg's posture, a long abdominal incision is made, the uterus and left tube and ovary are pushed aside, and a sound is introduced into the left ureter. Another sound is inserted into the rectum and the tips of the two instruments are approximated. An incision is made in the ureter at a point opposite to the tip of the sound and also in the rectum. A glass tube is inserted into the ureter

* Am. Year Book of Med. and Surg., 1896.

and to it is attached a piece of rubber tubing, the other end of which is carried through the rectal opening. The corresponding openings in the ureter and rectum are then united by two layers of silk sutures. The same procedure is adopted on the right side, after which the bladder is entirely extirpated. The patient is then lowered to the dorsal posture, the vesical arteries and their branches are ligated, and the abdominal wound is closed.''

CHAPTER XXXIV.

FISTULÆ OF THE FEMALE GENITAL ORGANS.

VESICAL AND URETHRAL FISTULÆ.

The *varieties* of urinary fistulæ are:—

Vesico-vaginal;
Urethro-vaginal;
Uretero-vaginal;
Vesico-uterine;
Uretero-uterine.

The *location* of the several fistulæ enumerated is clearly indicated by the names given. Of these vesico-vaginal fistula is by all odds the most common. The urethro-vaginal is rarely met with except when the opening is artificially made. The uretero-vaginal and uretero-uterine are still more rare accidents and, when they occur, usually result from some operative procedure within the pelvis.

Pathology.—The extent of tissue lost varies greatly. There may be but a small opening, barely admitting a fine probe, connecting the vagina and bladder; or the whole base of the bladder may be destroyed, together with the urethra. All forms of fistulæ tend to become smaller from secondary contraction as time goes on.

At first the margins are thick, irregular, and, frequently, ulcerated; later on, cicatricial contraction causes them to become thin and firm.

As time progresses, contraction and thickening of the bladder walls take place; and, if the opening between the bladder and the vagina is very large, the vesical mucous membrane may protrude through it. In extensive fistulæ the destruction of tissue may involve the openings of the ureters. The urethra, from want of use, also becomes contracted, and, indeed, atresia of this organ may occur. Often, too, there is associated with the accident injury to the vagina with resulting cicatricial contraction. This may so distort the latter organ as to make it difficult to ascertain the size and location of the fistula.

It is exceedingly difficult to locate *vesico-uterine fistulæ*, and in order

to do so it is necessary to dilate the cervical canal. These fistulæ are usually small.

Uretero-vaginal fistulæ are located in one of the fornices of the vagina. They, too, are very small, admitting the point of a fine probe only.

Uretero-uterine fistulæ so rarely occur as to constitute, when they do, pathological curiosities

Etiology.—The causes of fistulæ may be enumerated as follows:—

Injuries received during labor;
Traumatism;
Ulceration and abscess.

Of these, the injuries and accidents incident to *childbirth* are of first importance. Long-continued pressure of the fetal head is a most prolific cause. It may, on the other hand, follow rapid labor, the tissues being unduly bruised by compression between the fetal head and the bony pelvis. In either event death of tissue ensues from unnatural pressure, and subsequent sloughing gives rise to fistula.

Fistulæ may be produced, it is true, by the unskillful application of the obstetric forceps. However, in by far the larger number of cases the accident results, not from intelligent application of the forceps, but rather from too long deferring its use. After the head has been wedged in the pelvis for a long time the mischief is already done; and, while there is danger of immediate laceration attending the use of the instrument, the primary cause of such laceration is, in neglected cases, long-continued pressure which has made the tissues fragile. I especially emphasize this point because too often the attending physician, with whom the responsibility entirely rests, holds the consultant responsible for an accident which might have been avoided had forceps been applied earlier.

In the various other obstetric operations, especially those involving the destruction of the fetus, there is danger, if the instruments are carelessly used, of lacerating the vaginal walls. When craniotomy is performed care should be taken that the sharp edges of the cranial bones do not produce such injury, or that the crotchet and blunt hook do not slip during traction and injure the vagina.

Of the *traumatic causes*, the most frequent is a fall upon some sharp object. This occurs oftener in children and young girls than in adults. The careless manipulation of instruments within the vagina in the various operative procedures through this canal may give rise to fistulæ. I unwittingly penetrated the bladder in one case of vaginal hysterectomy.

Symptoms.—The first symptom suggesting the presence of the accident is incontinence of urine. This may be partial or absolute, depending upon the size of the fistula. If the opening is very small, part of the urine may be passed through the urethra. In almost all instances, however, in any of the forms of vesical fistula, the entire quantity of urine passes through the unnatural opening. This is frequently the only symptom, though in those cases where there is sloughing of tissue or ulceration, the local pain and distress are sometimes very great; or, if inflammation attends the accident, the usual symptoms of cystitis and urethritis manifest themselves.

When the accident follows parturition, there is usually more or less paralysis of the bladder for several days preceding the formation of the fistula, during which time the frequent use of the catheter is necessary. After the separation of the slough the urine escapes through the vagina. This may remain as a permanent condition; or, if the opening is not large, subsequent cicatrization may result in closure, when the urine will again be passed through the natural channel.

The secondary symptoms of urinary fistulæ are due to contact of urine with the vagina, external genital organs and neighboring surfaces. The labia, the perineum, and the inner surface of the thighs become red, inflamed, and even ulcerated. It is exceedingly difficult for the patient to keep herself free from the urinous odor arising from this condition. Often, too, urinary deposits, consisting of urates and phosphates, form in crusts about the edges of the fistula and within the vagina, giving rise to great irritation.

The foregoing symptoms will clearly indicate that some unnatural condition of the urinary organs exists; but in order accurately to locate the fistula a physical examination is necessary.

Physical Signs.—If an exploratory examination is made soon after delivery, great gentleness should be practised. In the event of a large opening between the vagina and the bladder, the finger will readily pass into the latter organ, and the diagnosis is easily made. Greater difficulty will be experienced if the opening is very small; in that case its exact location is sometimes hard to determine.

In the event of doubt, proceed as follows: Place the patient in the lithotomy posture, before a good light, and expose the anterior vaginal wall. Introduce into the bladder through the urethra a catheter, to which is attached a rubber tube and funnel such as is used for washing out the bladder in cystitis. Through this distend the bladder with some colored fluid—milk or a weak solution of permanganate of potash. If the fluid escapes through the fistula, the location of the latter will be

determined. In the event of vesico-uterine fistula the fluid will escape through the external os. If the opening cannot be located by this method, the colored fluid failing to make its appearance after being forced into the bladder, either through the vagina or through the cervical canal, it is reasonably certain that there is no connection between the bladder and the vagina, or between the bladder and the uterus. This test is not absolute, for there may be a valve-like condition of the vesical mucous membrane, which will prevent the escape of fluid from that viscus. Should such an opening not be found, the fornices of the vagina should be carefully explored for a ureteral fistula. Repeated examinations may be necessary before a small fistula is finally located.

It is sometimes possible, in vesico-uterine fistula, to pass the sound from the bladder into the cervical canal, at which point it is detected by passing a second sound through the external os.

Prognosis.—Simple fistulæ resulting from childbirth are many times spontaneously cured. After the opening once becomes permanent, however, a spontaneous cure never results. The curability by operative procedures will depend upon the size of the opening, its location, its cause, and the complications due to changes within the vagina. Fistulæ involving the base of the bladder are most easily got at and are, consequently, most amenable to treatment. On the other hand, vesico-cervical fistulæ and ureteral fistulæ, particularly the latter, present special difficulties. In dealing with the ureter, it is very difficult to prevent permanent stricture of the canal.

Treatment.—Whenever a urinary fistula is suspected the catheter should be introduced at once in order to make sure that the discharge does not come from the urethra because of over-distention of the bladder. If it is evident that the urine escapes through the vagina, the patient should be placed in a favorable posture for examination, and the opening carefully looked for. If it is small, the urine should be drawn every three or four hours, or else a self-retaining catheter kept constantly within the bladder. For this purpose I know of nothing better than the glass instrument of Kustner held *in situ* by strips of adhesive plaster. I much prefer it for this purpose to the Skene-Goodman catheter recommended by most writers. (Fig. 125.) If the patient cannot tolerate the catheter the urine should be drawn every two or three hours.

It is necessary to keep the patient upon her back in order to prevent the lochial discharge from passing into the bladder. The vagina should

FIG. 125.

SKENE'S MODIFICATION OF GOODMAN'S SELF-RETAINING CATHETER.

be kept absolutely clean by the frequent use of a twenty per cent. boric acid douche. In every respect the most scrupulous cleanliness should be practised. By observing these precautions a cure will result in a goodly per cent. of cases. This is especially true if the fistula attends any of the operations within or through the vagina. In the case referred to, in which it followed vaginal hysterectomy, the opening was large enough to admit the index finger, yet it healed perfectly in less than two weeks.

It is not wise to undertake to close the fistula too soon after parturition—not earlier than three months. The best results cannot be obtained until after the patient has passed through the puerperal changes. It is always wise, under any circumstances, to get the system in the best possible shape before undertaking to close the opening, bearing in mind, of course, the fact that the existence of the fistula may be responsible for the continued ill-health.

OPERATION FOR VESICO-VAGINAL FISTULÆ.

A certain amount of preparatory treatment is usually necessary in order to obtain the best results. If there is local inflammation, this should be treated by frequent douchings with a boric acid solution and suitable medication. If the irritation about the external genital organs is great, Lyster's ointment of boric acid, or some of the applications recommended for pruritus vulvæ, will add greatly to the patient's comfort by relieving the excoriation. All incrustations which form on the edges of the fistula and within the vagina should be removed with forceps at least every two or three days. If there are any evidences of cystitis, this should be dealt with by washing the bladder through the urethra. If the fistula is of long duration, it may be necessary gradually to dilate the urethra in order to insure its patulency when the flow is directed through it. This can be done according to the method described in dealing with stricture of the urethra (page 536). Should there be stricture of the vagina, or cicatricial bands which exert traction upon the bladder, these must be overcome before an effort is made to close the opening. The cicatricial bands should be divided and the canal kept dilated for a suitable length of time. Should it be impossible to remove entirely the scar-tissue, much good can be done by

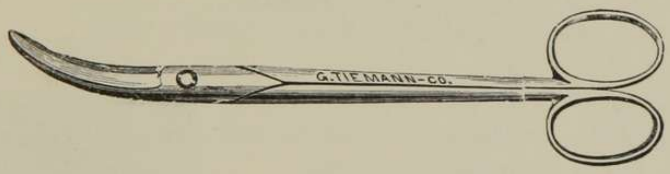
constant distention with vaginal tampons, used for some weeks previously to the operation.

The patient should be placed in Sims' posture before a good light. It is best to administer an anesthetic, not because of the excessive pain attending the operation, but because of the importance of perfect quiet on the part of the patient. Sims' speculum is a *sine qua non*. The operator cannot well get along with less than four assistants—one to hold the speculum and elevate the nates, a second to care for the irrigator and do the sponging, a third to look after the instruments, and a fourth to administer the anesthetic. If but three assistants are available, the operator can himself manage the instruments by having the tray near at hand. It is best to have a variety of needles of various curves and lengths with silk leaders secured in the eyes. The instrument tray should contain: Long handled, curved scissors; at least two tenacula; wire twister; long-handled knife with narrow blade; needles and needle holder; counter-pressure hook; Sims' speculum; and silver wire Nos. 29 and 30. In addition there should be two sponge holders containing sponges of suitable size.

The steps of the operation are three:—

1. Vivifying the edges of the fistula;
2. Introduction of sutures;
3. Coaptating the edges of the fistula and securing the sutures.

FIG. 126.



SIMS' CURVED SCISSORS.

FIG. 127.

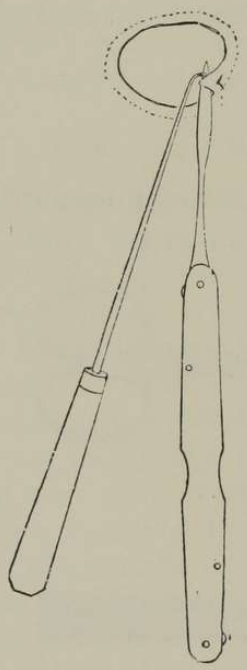
BOZEMAN'S STRAIGHT SCALPEL.

Vivifying the Edges of the Fistula.—The lower edge of the fistula should be first vivified. This is done by first picking up the tissues, either with a tenaculum or tissue forceps, as the operator may prefer. I use almost entirely in plastic work tenacula instead of tissue forceps.

Then with a pair of curved scissors (Fig. 126), or with a long-handled narrow scalpel (Fig. 127), a strip of tissue is removed one-quarter of an inch in width, extending down to the mucous membrane of the bladder Personally I prefer the scissors for this purpose. Care should be taken not to injure the vesical mucous membrane, because it is very vascular and, if injured, hemorrhage into the bladder is liable to occur. A strip of tissue of suitable width can ordinarily be removed in an unbroken piece. After the lower edge of the wound is vivified the upper edge is dealt with in the same way. The denudation should extend sufficiently beyond the angles of the fistula to insure against puckering when the edges are coaptated. The parts should now be carefully inspected in order to ascertain whether or not any point has been left unvivified. If so, this is to be picked up with a tenaculum and snipped off. An unvivified islet of tissue might spoil the whole operation.

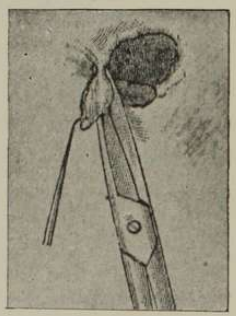
The direction of the long diameter of the fistula will determine the line of coaptation. When it can be done, this should correspond to the axis of the vagina. Should, however, the long diameter of the fistula run transversely, the line of coaptation will have to correspond to the transverse diameter of the vagina.

FIG. 128.



METHOD OF PARING WITH KNIFE. (*Savage.*)

FIG. 129.



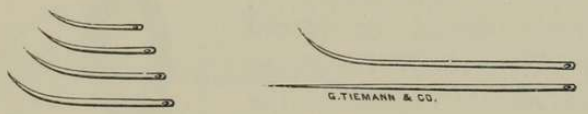
METHOD OF PARING WITH SCISSORS. (*Savage.*)

The hemorrhage is usually not great and can ordinarily be controlled by hot irrigation. Should there be troublesome bleeding from an injured artery, it can be controlled by passing around it a fine cat-

gut suture and tying this upon the vaginal surface. It is not a good plan, if it can be avoided, to leave even a fine catgut suture between the vivified edges of the fistula.

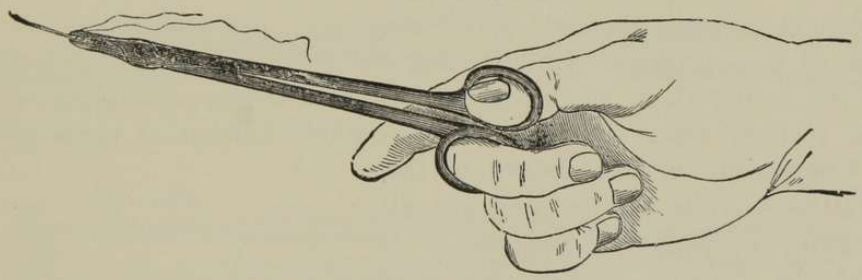
The Introduction of Sutures.—I think that on the whole silver wire will be found the preferable suture, although some operators, notably Skene and Simon, have obtained most excellent results with the use of silk, while others prefer silkworm gut. For all forms of plastic work except fistulæ I prefer chromacized catgut. The wire

FIG. 130.



EMMET'S NEEDLES.

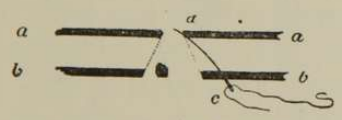
FIG. 131.



SIMS' NEEDLE FORCEPS, WITH NEEDLE.

is easily introduced, the degree of tension can be controlled perfectly, and it is not readily contaminated. A needle of suitable size and length is grasped with the needle holder at the proper angle. The mucous membrane of the upper edge of the wound is held with a tenaculum and the first suture is introduced at the angle farthest from the operator. The method of passing the suture is shown in Fig. 132. The needle should extend only as far as the vesical mucous membrane, and not penetrate it. Counter force is made as the needle is passed either with a counter pressure hook (Fig 133) or with a strong tenaculum, so that no undue tension will be

FIG. 132.



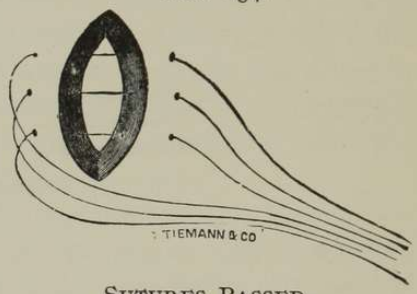
INTRODUCTION OF SUTURES.
a. Vesical margin. *b*. Vaginal margin. *c*. Point of entrance of needle. *d*. Point of exit of needle.

FIG. 133.

EMMET'S COUNTER-PRESSURE HOOK.

placed upon the tissues. After the wire of the first suture is drawn through, the ends are slightly twisted and handed to the assistant who holds the speculum. This suture will now steady the tissues so that the subsequent ones are more readily introduced. They should be placed from two- to three-sixteenths of an inch apart, and should extend on the vaginal surface at least an eighth of an inch from the edge of the wound. The number of sutures used will, of course, depend upon the size of the opening. At each angle of the wound there should be at least one suture extending beyond the vivified tissue, so as to overcome all tension at these points.

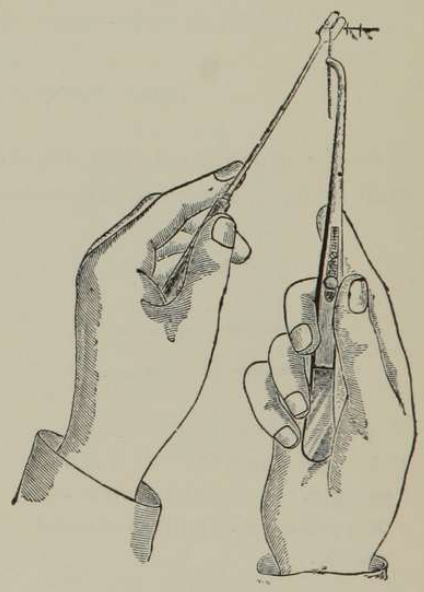
FIG. 134.



SUTURES PASSED.

Coaptation of the Edges of the Fistula.—After the sutures are all introduced temporary coaptation is made by drawing together the ends of the silver wire, in order to ascertain whether or not the edges will be perfectly approximated. A soft rubber catheter is now slipped over the end of an irrigating tube and passed into the bladder, through which the bladder is thoroughly washed and freed from all clots before the wound is finally closed. It is best to keep a continuous stream of the normal salt solution flowing into the bladder until just before the last two or three sutures are twisted, so that no blood may be left behind to give rise to subsequent trouble. The ends of the suture farthest from the operator are untwisted, after which one or two turns are given it near the wound in

FIG. 135.



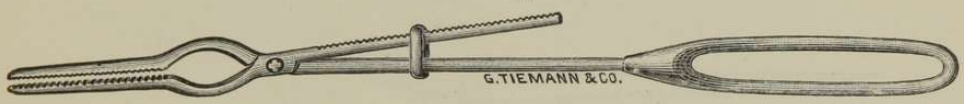
TWISTING THE SUTURE.

order to coaptate the edges. The suture is now slipped into Sims' shield (Fig. 136) and the loose ends grasped in a wire twister (Fig. 138), when sufficient torsion is made to approximate the edges of the wound. The shield, while not absolutely necessary, will at least prevent excessive traction while the suture is twisted. There is always danger of producing too much tension by excessive torsion; the edges of the wound should be simply brought together without any puckering of tissue. If the tension is too great the suture will cut its way through and the operation end in failure. Before the wire twister is removed the suture is shouldered by bending it over a tenaculum placed as near

FIG. 136.

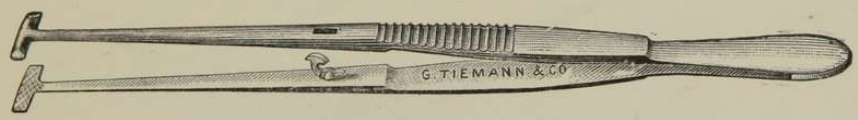
SIMS' SHIELD.

FIG. 137.



THE AUTHOR'S SPONGE HOLDER.

FIG. 138.



THE AUTHOR'S WIRE TWISTER.

as possible to the wound. It is then cut off so that about half an inch of the twisted wire is left lying flat upon the vaginal surface.

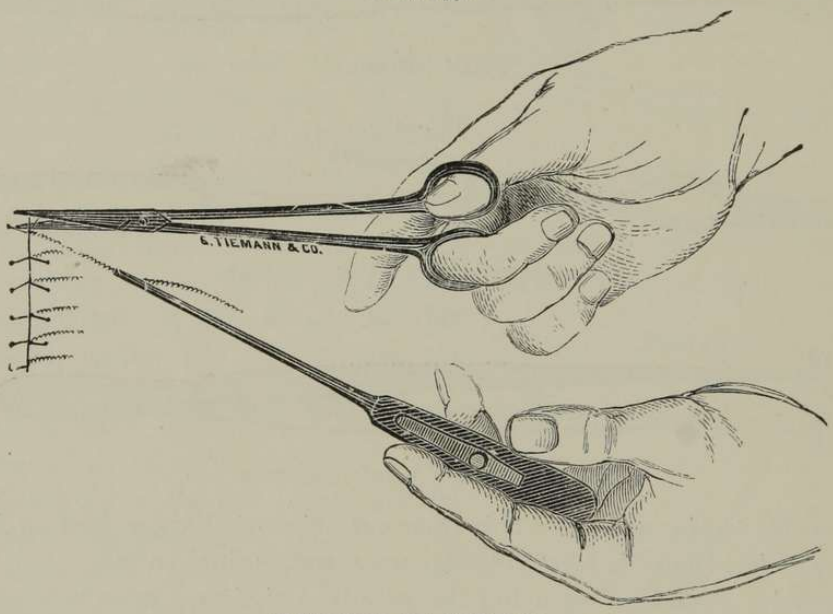
Latterly, instead of securing the wire by twisting, I have been using perforated shot almost exclusively for the same purpose. These can be passed over the two ends of the wires and compressed more quickly than it is possible to secure them by twisting; the tension of the wound can be quite as nicely regulated, and there is little danger of the sutures becoming buried in the tissues and lost. The lead plates, which were formerly considered necessary when the sutures were secured in this way, I never apply; they are entirely superfluous.

Should the size and shape of the fistula cause excessive suture tension after the wound is closed, it will be necessary to overcome this by incisions through the vaginal mucous membrane on the sides of the opening corresponding to the greatest tension; or the wound may be encircled with a purse string, as in Stoltz's operation for cystocele.

After the wound is completely closed, the bladder is again washed through the urethra, all of the water being drawn off. The washing should continue as long as the water is blood tinged. Clots left behind might give rise to severe vesical tenesmus or to obstruction of the urethra. It is, therefore, important to have the bladder perfectly clean before the patient is removed from the operating table. The vagina is finally packed with iodoform gauze, and the usual external dressings, held in place with a T bandage, applied.

After-Treatment.— Most operators advise that a self-retaining catheter be kept in the bladder for several days after the operation. This always gives rise to more or less irritation of the urethra and

FIG. 139.



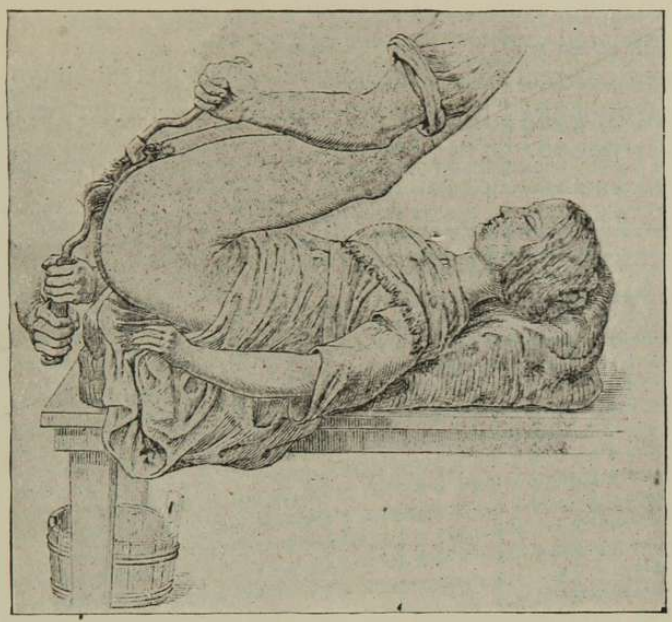
REMOVAL OF SUTURES.

bladder and seems to me an unnecessary precaution. If the catheter is carefully introduced every four hours there is really no necessity for this precaution, and the results in my hands have been quite as satisfactory as when the instrument has been left permanently within the bladder. After five or six days the patient is permitted to urinate spontaneously if she can do so.

Should there be any cystitis left behind after the operation, this should be dealt with according to the method given for cystitis when resulting from ordinary causes. It is often beneficial to wash the bladder once or twice a day for a week or ten days following the operation.

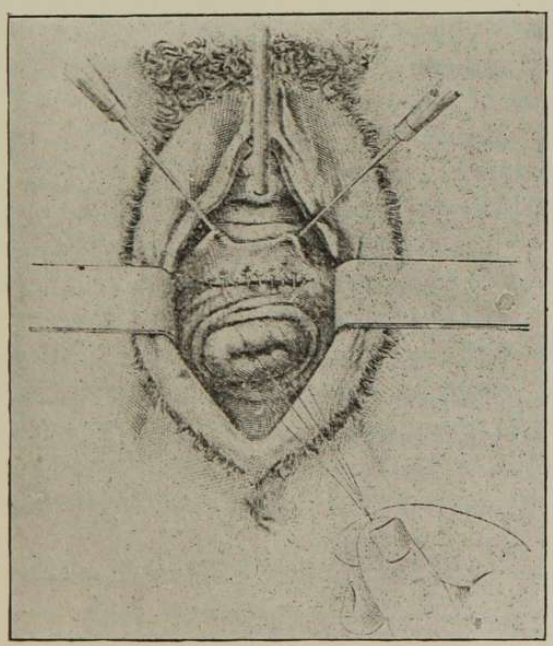
The gauze is removed from the vagina at the end of forty-eight hours,

FIG. 140.



SIMON'S POSITION FOR VESICO-VAGINAL FISTULA. (*Simon.*)

FIG 141.

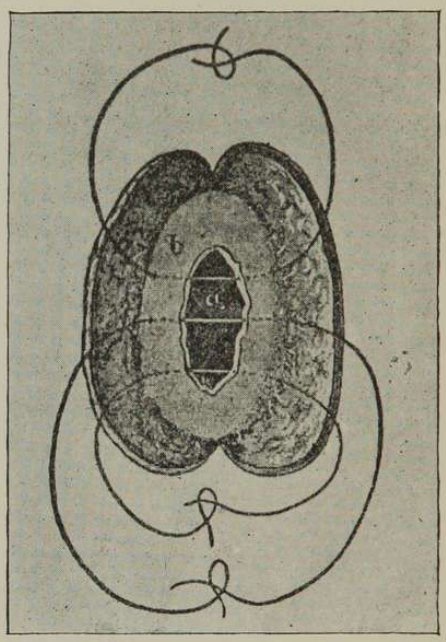


SUTURES TIED. (*Simon.*)

after which the vagina should be kept perfectly clean by douching it once or twice a day with a ten per cent. boric acid solution. The diet should be restricted and the bowels kept open.

The sutures are removed in from twelve to fourteen days, although if the silver wire is used they may be left in for a longer period without setting up irritation. They are removed by placing the patient upon her side before a good light and introducing a Sims speculum. The ends of the twisted wire or the perforated shot are seized with forceps and gentle traction exerted. (Fig. 139.) The point of a wire scissors is then passed beneath the suture, with which it is cut, and the suture withdrawn. If there should be any doubt as to the success of the operation, a test can be made by carefully injecting fluid into the bladder. It must, however, be borne in mind that at the end of twelve or fourteen days union is not very strong, and by unreasonable distention of the bladder the edges of the wound may be forced apart. In case of failure, either complete or partial, subsequent operations will have to be made.

FIG. 142.



OPERATIONS FOR VESICO-VAGINAL FISTULA BY FLAP SPLITTING. (*a*) Fistula; (*b*) vesical wall; (*c*) vaginal wall. (*Walcher.*)

In the foregoing description I have given the technique practised by most operators. It varies somewhat from that described by Dr. Sims, who first employed the quill suture but subsequently discarded it for the interrupted. Bozeman, Baker Brown, Agnew, Simpson, Simon, and many others have modified the operation and have special methods of their own.

Simon's method is particularly unique and original. Its chief features are:—

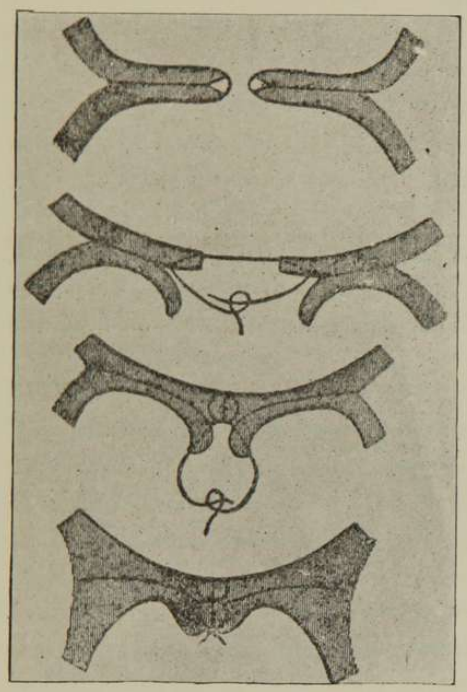
1. Substitution of the exaggerated lithotomy position for the semi-prone.
2. Silk is used for suture material instead of silver wire.

3. The mucous membrane of the bladder, especially if it contains much cicatricial tissue, is invaded. (Figs. 140 and 141).

4. The after-treatment is negative. No permanent catheter is used and the patient is permitted to urinate spontaneously as soon as she is able to do so.

One great advantage of the lithotomy posture is the possibility of using Fritsch's irrigating speculum in this position. I found the position exceedingly useful in an operation in which it was necessary to utilize the anterior lip of the cervix in order to close a large fistula which opened high up in the vaginal fornix.

FIG. 143.



OPERATIONS FOR VESICO-VAGINAL FISTULA BY FLAP SPLITTING. Schematic figure of the different stages. (*Walcher.*)

Modifications of the Technique.—If the operation is unusually difficult and the opening large, it may be best to close it at several sittings. It is also recommended that, when the edges of the wound are exceedingly vascular, instead of vivifying the entire surface at once, a small portion only be denuded and immediately closed with sutures.

The *flap-splitting* method, now so extensively used in operations upon the pelvic floor and perineum, has also been applied to closing various forms of fistulæ opening into the vagina. Those who especially advocate this method are Tait, Herff, Fritsch, Walcher and Sänger. Walcher uses catgut for the purpose of uniting the vesical lips; he then closes the vaginal wound with ordinary antiseptic silk. Figs. 142 and 143 show the successive steps of this operation more clearly than it is possible to describe them by words.

VESICO-VAGINAL FISTULÆ REQUIRING SPECIAL OPERATIONS.

In case of a triangular fistula the wound, when it is closed, will be Y-shaped, whereas a quadrilateral opening will have to be closed by four lines of sutures. Should the fistula be situated close to the cervix,

its anterior lip may have to be utilized in order to close it. This is done by denuding the edges of the fistula in the usual way and then removing a corresponding strip of mucous membrane from the anterior portion of the cervix, so that the edges of the fistula can be attached to the vivified surface of the cervix. In a case of this kind sent to me by Dr. Burk, of Centerville, Michigan, there was an opening into the anterior fornix from the bladder through which two fingers could be passed. It required in all twenty shotted sutures to close the opening. The results were perfect. In this case the fistula was caused by long-continued pressure of the fetal head.

Should the anterior lip of the cervix be destroyed it will be necessary to close the fistula by utilizing the posterior lip, when the uterus will communicate with the bladder and the menstrual blood will be discharged *per urethram*.

Vesico-uterine fistulæ must be dealt with in one of two ways: First, if possible, the fistula is exposed by splitting the cervix upon each side, when the opening into the uterus is closed in the ordinary way; or, if the fistula cannot be so got at, it will be necessary to obliterate the cervical canal and divert the discharges from the uterus into the bladder.

Uretero-Uterine and Uretero-Vaginal Fistulæ.—These forms of fistulæ occur so rarely that the reader is referred to special works upon the subject for an extended description of the methods devised for dealing with them. Four cases were reported during the year of 1891. The first two were by Schatz.* He observed that the urine escaping from the ureter had a specific gravity of from 1003 to 1006, while the specific gravity of that passed *per urethram* was 1030. The urea was entirely absent from the urine coming directly from the kidney and the solid matter in the two urines was as 1:10. Campbell† succeeded in accomplishing a cure in one case by splitting up the uretero-vesical septum and closing the vaginal surface of the cut. Dr. W. H. Baker, of Boston, cured a similar case by dissecting up the ureter, making an opening into the bladder near its neck, into which the ureter was turned and the vaginal wound closed. Since 1891 several cases of uretero-vaginal and uretero-uterine fistula have been placed on record. These fistulæ have been closed in different ways. A great impetus has been given to surgery of the ureters through Kelly's method of cystoscophy. Bandl's method, which he resorted to as early as 1883, is as

* Medical Press and Circular, London, August 5, 1891.

† Virginia Medical Monthly, April, 1891.

follows: The lower end of the ureter is freed by an eliptic incision. An opening is next made into the bladder through which is carried a No. 2 French flexible catheter passed from the urethra. The end of this is made to penetrate the ureter, when the denuded tract, extending from the opening into the bladder to the ureteral orifice, is closed by wire sutures. The catheter is left *in situ* until the newly-created canal is closed. A second catheter is left projecting from the urethra to drain the bladder.

Kelly's Method.—The patient is placed in the Sims or the dorsal posture and the posterior vaginal wall retracted. The uterus is drawn down with forceps. The cervix is stripped of its cellular tissue on the side corresponding to the fistula, when the ureter is dissected free from a half to one inch and its uterine attachment severed. An incision half an inch long is made in the supra-vaginal portion of the bladder antero-posteriorly. After severing the ureter obliquely it is turned into the bladder and fixed by three or more sutures which are so introduced as not to compress it. The incision into the vault of the vagina is finally closed with sutures, or it may be loosely packed with gauze.

Dr. J. M. Baldy, in the March, 1896, number of the *American Journal of Obstetrics*, reports a case successfully operated upon as follows:—

"The ureter an eighth of an inch from its end was perforated by a double suture at two points, both ends of the catgut protruding from its open end. The bladder having been incised to the extent of an inch at the point which was most easily brought into contact with the ureter, the two ends of the catgut suture were successively carried into the bladder and, an eighth of an inch from the incision, made to penetrate the bladder walls and protrude from its peritoneal side. The two ends were now tied, thus drawing the ureter into the bladder and there fixing it. Two such sutures were placed for the sake of additional security. The mucous membrane of the bladder was now united by a continuous catgut suture, then the connective tissue, and finally the peritoneum by a separate continous catgut suture. Care was taken to pass each suture through the outer coat of the ureter as it passed by it, for the sake of the more accurately closing the wound about the ureter and for the additional reason of the more certainly securing the ureter from being pulled from its position. In order to relieve all tension on the ureter, which was considerable at this time, two stout catgut stitches were made to fix the bladder securely to the pelvic wall at the point of the stump of the ovarian artery. The perito-

neum was brought together over all denuded parts of the pelvis possible, a glass drainage tube was placed and the abdomen closed."

It may be necessary to remove the corresponding kidney, as has been successfully done by Zweifel, of Erlangen. A compensatory hypertrophy of the opposite kidney usually takes place.

Urethral Fistulæ.—As a rule, no difficulty will be experienced in closing artificial urethral fistulæ made for the purpose of curing or relieving abnormal conditions of the urethra. There is, in these cases, no loss of tissue, and the opening is closed by the same methods required for the closure of ordinary vesico-vaginal fistulæ. Should there be redundancy of tissue, as is sometimes the case in dilatation of this canal, a sufficient amount may be excised to overcome the existing distortion. The conditions are, however, quite different when the urethra is partially or entirely destroyed by sloughing or ulceration, as occasionally occurs. The formation of an entire new urethra constitutes the highest type of plastic surgery. For work done in this direction the profession owes much to Dr. T. A. Emmet, to whose excellent monograph on the subject the reader is referred.*

During the spring of 1891 I had to do with a case where the urethra and the base of the bladder had been eaten away by syphilitic ulceration. The patient was sent to me by Dr. Bowen, of Manistique, Michigan, and had previously been in the hands of Prof. Nicholas Senn, of Chicago. That distinguished surgeon had, by three operations, succeeded in entirely restoring the base of the bladder. The patient could retain her urine for a short time by placing against the opening a tampon of cotton. The tissues beneath the pubes had been greatly destroyed by ulceration. I succeeded by the following method, which was devised by Emmet, in making a new urethra: Two parallel surfaces about three-sixteenths of an inch wide, and extending from the natural site of the meatus to the opening just beneath the arch of the pubes, were vivified. An unscarified strip about half an inch in width was left between them, to form the tract of the new urethra. In order to approximate the two vivified surfaces it was necessary to overcome the tension by making parallel to, and outside of, each denuded line, an incision into the mucous membrane. At the point of the opening into the bladder the vivified surfaces were shaped in such a way as to adapt themselves to the denuded edges of the fistula. The edges were next approximated by silver wire sutures over a small sized glass catheter, which was kept *in situ* for seven days. The stitches

* "Vesico-Vaginal Fistula," 1868.

were then removed, but owing to the excessive tension (the width of the unscarified surface should have been greater) the edges of the wound corresponding to the middle third of the canal had not healed. By a subsequent operation this opening was closed, but the parts again separated sufficiently to leave a pin-head fistula, which, however, does not leak urine. While the patient now has very much better control of the bladder, the results are not entirely satisfactory. She can retain the urine for two or three hours, though it is still necessary to keep within the vagina a tampon in order to press against the canal. The vesical sphincter, being entirely destroyed by the ulcerative process, can never be restored. She is, however, coming to me for another operation and I shall undertake to narrow the canal at the vesical neck, hoping thereby to improve the retaining power of the bladder.

Closure of the Vagina (Colpokleisis).—This is an operation which, happily, with the conquests of modern plastic surgery, is rarely called for. Cases will, nevertheless, occasionally be met with in which it is utterly impossible, because of excessive loss of tissue, or because of existing vaginal distortion, to cure the fistula. Under these circumstances, in order to place the patient in as comfortable a condition as possible, the vagina will have to be closed. This operation is known as *colpokleisis*.

The operation, as performed by Simon, consists of vivifying transversely the walls of the vagina above the level of the ostium vaginæ and bringing the denuded surfaces together with silver wire sutures. Vidal de Cassis, who first introduced it, vivified the inner surfaces of the labia majora and brought them together by sutures. In the latter method the vulva is closed in an antero-posterior direction, and there is necessarily a cleft below the urethral orifice, through which the urine escapes; consequently, it is useless.

Simon's method is as follows: The mucous membrane is picked up with tenacula at a point where it is most lax; the point selected should be as high as possible. The ring of tissue to be removed is next outlined with the point of a scalpel, when it is dissected from below upward with curved scissors. It can ordinarily be removed in one continuous strip. The sutures are introduced from above downward, *i. e.*, carried underneath the vaginal wound above and reintroduced upon the inner border of the vaginal wound below, being brought out at its outer edge. Care must be observed that neither the bladder, the uterus, nor the rectum is injured by the needle. After all of the sutures are introduced they are secured either with perforated shot or by twisting.

By this operation the bladder and the vagina permanently connect with each other, and all of the discharges from the uterus are made to pass through the urethra. This unnatural state will necessarily give rise to more or less discomfort and the operation is, therefore, never performed except as a last resource. Owing to the fact that there will be more or less urine retained within the vagina, there is danger of the formation of urinary concretions. Usually, though, the patient is infinitely more comfortable than she would be were she compelled to go through life constantly wet by the urinary discharge.

Emmet has described* a new operation for incurable vesico-vaginal fistulæ. Instead of attempting to create a new urethra when this organ has sloughed away and there exists a large opening into the vagina from the bladder, he first restores as much of the vesico-vaginal septum as is possible to do at one or more sittings. He then makes a suprapubic opening into the bladder, stitching the pubic skin to the bladder mucosa, not unlike the method adopted in colpocystotomy. This opening is sufficiently large to drain the bladder completely, and in the case recorded the flow of urine was regulated by a truss-like instrument. The remaining opening from the bladder into the vagina can now be closed without any attempt to restore the urethra. This operation is only applicable to those conditions where the subpubic tissues have been entirely destroyed, and, even here, it is questionable whether colpokleisis is not the preferable procedure.

* American Journal of Obstetrics, May, 1895.

CHAPTER XXXV.

FECAL FISTULÆ.

Fecal fistulæ do not occur so often as do the urinary. When they do occur they are, because of the incontinence of feces and gas, more distressing than are fistulæ giving rise to incontinence of urine only.

Varieties.—These are recto-vaginal, recto-labial, entero-vaginal, and entero-vesical. The frequency of these several varieties is in the order given.

The **causes** are much the same as those responsible for urinary fistulæ, prolonged pressure of the fetal head during labor being the most frequent cause. Cancerous and syphilitic ulceration oftener involve the posterior than the anterior vaginal wall.

Other causes are: direct injury, improperly fitted pessaries, stricture of the rectum with retention of fecal matter, and abscess of the recto-vaginal wall,

Recto-Vaginal Fistulæ.

These are divided into recto-vulvar, inferior recto-vaginal, and superior recto-vaginal, according to their situation. They vary in size from an opening barely large enough to admit a fine probe to one through which one or more fingers can be passed. Those situated in the posterior vaginal fornix are especially liable to be large. The edges are usually clearly defined, and are hard and unyielding.

Symptoms and Diagnosis.—The patient will first be made conscious of the existence of the fistula by the escape of fecal matter and gas through the vagina. The amount of fecal matter which escapes in this way will depend upon the size of the opening through the recto-vaginal wall, and upon the direction of the fistula. If oblique, it may give rise to trouble only when there is diarrhea. The existence of these symptoms will at once suggest a fecal fistula and will call for an examination.

Physical Signs.—In order to detect the opening the patient should be placed upon her back in the lithotomy posture and the posterior vaginal wall exposed. This can be done either by means of the blade of a small Sims speculum passed from above, or, better still, by

the introduction of an expanding bivalve rectal speculum. If the opening is at all large its location will be readily seen; if very small, on the other hand, it may be necessary to inject into the rectum milk or some colored fluid and watch for its appearance through the vagina.

Sometimes when there is much relaxation of the ostium vaginæ air will pass into the vagina when the patient lies upon her side, and its expulsion will give rise to suspicions of a fecal fistula. The only way of determining positively whether the air escapes from the bowel into the vagina is by physical exploration; there would, of course, be no odor attending the expulsion of flatus which finds its way into the vagina through its ostium.

Prognosis.—The prognosis, as in urinary fistulæ, will depend both upon the size of the opening and its location. Those most easily dealt with are located above the sphincter ani muscle; those most difficult to contend with are located near the perineum and involve that muscle. If the vagina is distorted by cicatrices, the difficulty of accomplishing a cure is much increased. As a rule the prognosis is more favorable than in urinary fistulæ.

Treatment.—It is sometimes possible to cure very small recto-vaginal fistulæ by cauterization. An attempt should be made to do this before subjecting the patient to an operation. However, if the opening is of some size, the only resource is denudation and coaptation with sutures. Wound infection, because of fecal contamination, occurs much oftener than is the case with urinary fistulæ. The operation may be performed through the vagina or the rectum, or by flap-splitting through the perineum.

Operation Through the Vagina.—The cases especially suitable for this procedure are those not complicated by cicatrices. The bowels should be thoroughly emptied by purgatives, and an hour or two before the operation the lower bowel should be washed with an enema, followed by a saturated boric acid solution. The usual methods of cleansing the vagina are to be observed. The posterior vaginal wall is now exposed by placing the patient in the lithotomy posture and opening the vagina with a Fritsch or Sims speculum introduced under the pubes. Lateral retractors more thoroughly expose the field of operation. The edges of the fistula are next denuded according to the method recommended for vesico-vaginal fistula. The denudation may or may not extend into the rectal mucous membrane, depending upon circumstances. Ordinarily, I think it is best to go deep enough to include this membrane. Silver sutures are passed in such a way as to include all of the tissues of the posterior vaginal wall, unless the rectal mucous membrane has not been

denuded; in the latter event they extend only down to it. The sutures are secured either by twisting or by perforated shot, as the operator may prefer. In making the denudation and in introducing the sutures the direction of the suture line should be such as to produce the least amount of tension upon the tissues when the sutures are secured. In very large fistulæ this will oftener be transverse. Excessive tension can be overcome by section of the mucous membrane on either side of the suture line.

Operation Through the Rectum.—The same precautions given for the vaginal operation should be observed in preparing the patient. After she is placed in the proper position the sphincter muscle is paralyzed by forcible divulsion. The rectal cavity is next exposed by a suitable speculum, or by the blades of two small Sims specula. The denudation should extend for some distance into the rectal mucous membrane, and should include that of the vagina as well. The sutures are passed from the rectal side, penetrate the vagina about half a centimeter from the edge of the wound, and are reinserted the same distance upon its opposite side, making their appearance at a corresponding point in the rectum. They may, however, be passed from the vaginal side. If the latter method is resorted to silver wire may be used; whereas if the sutures are secured through the rectum, silk or chromacized catgut, is the preferable material, because of the difficulty attending the removal of silver wire through this canal.

Perineal Operation.—The perineal method is especially adapted to fistulæ situated near the perineum within the grasp of the sphincter muscle. When so situated it is difficult to overcome the spasmodic tendency of the sphincter muscle by divulsion alone. It is, therefore, necessary to cut entirely through the perineal body, or what is left of it, when the condition is treated as a complete laceration of the perineum extending upward into the vagina. It can be closed either by the flap-splitting method, or by the older one of uniting the upper and lower edges of the wound with interrupted or with continuous sutures. Personally, I prefer the flap-splitting method.

After-Treatment.—The patient is placed in bed and kept perfectly quiet until the sutures are removed—at the end of eight or ten days. The diet should be light and the bowels confined for the first three days by administering small doses of opium. On the evening of the fourth day they are moved by a cathartic and the lower bowel carefully emptied with an enema. They are again confined for forty-eight hours, at the end of which time they are moved as before. If the metallic sutures are used, they can be left in for an almost indefinite length of

time, though it is usually best to remove them at the end of the tenth day. Silk sutures should not be left in longer than ten days.

Recto-Labial Fistulæ.

In this variety of fistulæ the opening, instead of extending into the vagina, finds its way through one or the other labium. In order to cure it, it is necessary to lay the canal freely open and destroy the sinus, either by dissecting it out entirely or by curetting and closing the tract from the bottom. If practicable, the sinus should be closed by the buried catgut suture; if not, it should be packed with gauze and permitted to heal by granulation.

Entero-Vaginal Fistulæ.

The usual *cause* of these fistulæ is extensive destruction of tissue attending childbirth, there being left an opening into the peritoneal cavity through one of the fornices of the vagina. A loop of intestine may find its way into this opening and become strangulated, giving rise to fistula. This accident may also attend suppurating extra-uterine pregnancy and dermoid cysts. Cancerous ulceration sometimes perforates the peritoneal cavity and may likewise give rise to entero-vaginal fistula, though the condition is rarely due to this cause.

Symptoms and Diagnosis.—If the opening is large, all of the fecal matter will pass through the vagina and none through the rectum. It is easily detected upon digital examination and can readily be seen by the introduction of a speculum. If the discharge proceed from the small intestine, it will be of a liquid character and of a greenish or yellowish color. If, on the other hand, the communication is with the large bowel lower down, it will be more solid and more characteristically fecal in every way.

Treatment.—It will be necessary to close the opening through the vagina, as it cannot be reached through the rectum. If small, an attempt may be made to close it by cauterization, a method which is often successful; if, however, the opening is large, and all of the fecal matter passes into the vagina, the only resource is laparotomy and resection of the intestine. Before doing this the operator must make sure that the rectum and lower bowel are pervious.

Should this operation fail, or should the patient decline to submit to it after a full understanding of the dangers attending it, *colpokleisis* may be performed. Before the vagina is closed, however, it is necessary to make a communication between it and the rectum below the fistula. The opening is best made by compressing the recto-vaginal

septum in the jaws of long curved forceps, one blade of which is passed into the vagina and the other into the rectum. The compression is continued long enough to produce adhesions and to create a slough. After the slough comes away an opening sufficiently large to permit the fecal matter to pass from the vagina into the rectum is created. Colpokleisis is then performed according to Simon's method, which is described in the preceding chapter (p. 565).

Entero-Vesical Fistulæ.

Suppuration within the pelvis, from whatever cause, may give rise to a communication between the intestine and the bladder. This is exceedingly rare, but cases of the kind are occasionally recorded. The amount of suffering caused by it will depend upon the size of the opening and the portion of the bowel which connects with the bladder. When air finds its way into the bladder the condition is known as *pneumaturia*. Should the opening be small and the inconvenience not great, the surgeon will hardly be justified in subjecting the patient to an abdominal section or to suprapubic cystotomy for the purpose of closing it. Should, unfortunately, the opening be large, the urine will be contaminated by fecal matter, which will very soon give rise to cystitis and renal disease. Here the wretched condition of the patient will warrant either laparotomy or suprapubic cystotomy; or, if these be impracticable, high colotomy. The site of the intestinal opening can be surmised by the character of the discharge which finds its way into the bladder and is passed per urethram. Should the connection be with the large intestine low down, this fact may be determined by injecting milk into the bladder and watching for its appearance through the rectum.

CHAPTER XXXVI.

DISPLACEMENTS OF THE UTERUS.

General Considerations.—In dealing with uterine displacements it must be borne in mind that the uterus is a movable organ. This fact has given rise to much discussion as to its normal position. The fundus is pushed forward by a distended rectum and backward by a distended bladder; the entire organ is made to descend by intra-abdominal pressure, and is elevated during coitus. The displacements resulting from a distended bladder are well shown in Fig. 144.

It will be seen that, with the bladder empty, the axis of the uterus is very nearly at a right angle with the axis of the vagina; the fundus rests upon the bladder and is close to the symphysis pubis. The body, because of the rectum, is slightly deviated to the right and is bent more or less forward; the cervix is directed backward.

The uterus is supported by—

Uterine ligaments;
Intrapelvic areolar tissue and pelvic walls;
Supporting power of the abdominal walls;
Upper part of vagina and pelvic floor.

The cervix is held back of the axis of the superior strait by the sacro-uterine ligaments; the fundus is held forward by the round ligaments, gravity and intra-abdominal pressure (Bayer).

The uterus is forced down, by straining or lifting, onto the pelvic floor. The rectal, vaginal and urethral outlets are closed by the muscles and fascia of the perineum proper (H. T. Byford).

The *varieties* of displacement which present themselves for consideration are:—

1. Anteversion, in which the fundus is directed unnaturally forward and the cervix unnaturally backward; the normal uterine curve is less pronounced.

2. Anteflexion, in which the normal curve is increased; the direction of the cervix is but little changed.

3. Retroversion, in which the fundus is directed backward and the cervix forward.

4. Retroflexion, in which the uterus is bent upon itself, so that its

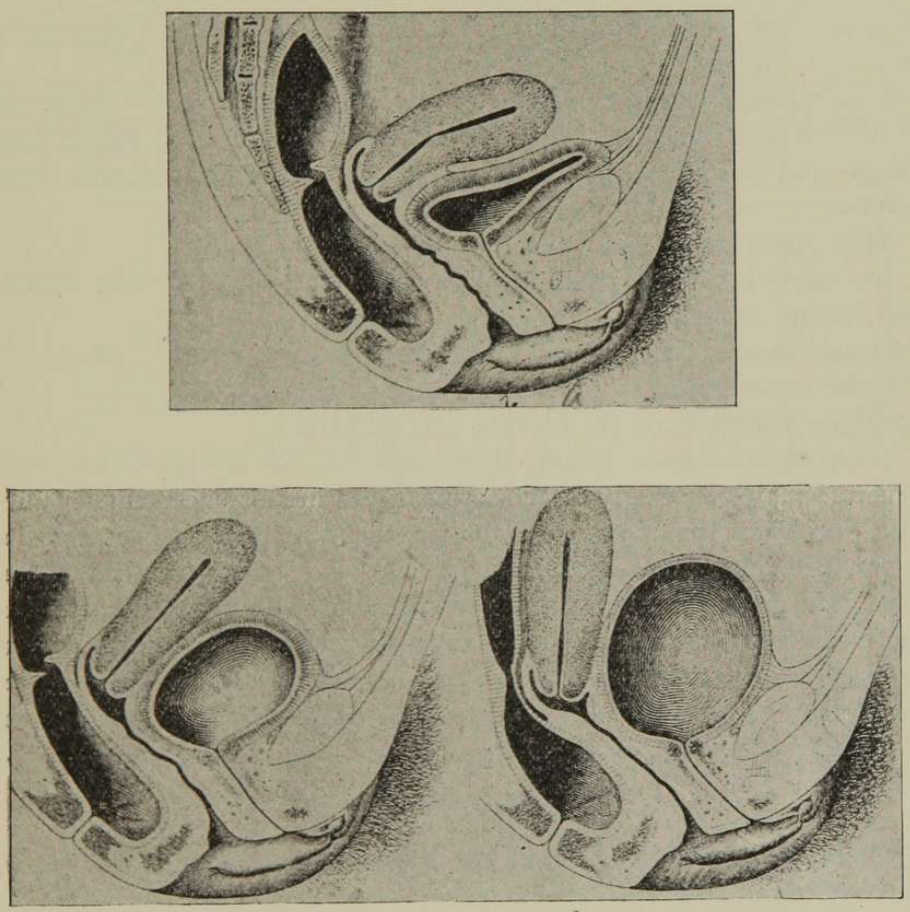
normal curve is reversed; the direction of the cervix is normal or nearly so.

5. Lateroversion, in which the uterus is drawn to one side.

6. Displacement of the uterus as a whole—retroposed. This may result from pelvic tumors or from inflammatory adhesions.

7. Prolapse, usually associated with more or less prolapse of the vagina.

FIG. 144.



VARIATIONS OF THE POSITION OF THE UTERUS CAUSED BY VARIOUS DEGREES OF BLADDER DISTENTION.

8. Ascent, the result of traction from above (ovarian and fibroid tumors).

9. Inversion.

Rarely does one form of displacement exist alone. Thus, anteversion

and anteflexion are always combined, as are retroversion and retroflexion. More or less descensus is usually associated with retro-displacement, and a slight lateral displacement is frequently combined with the other forms.

Etiology.

The causes of the several forms of uterine displacements are numerous. Any condition or disease giving rise to increased weight of the organ tends to produce displacement. Such are the various forms of inflammation (acute and chronic) subinvolution, tumors, pregnancy, etc.

The natural supports of the uterus are diminished by relaxation of the uterine ligaments, injuries to the perineum and pelvic floor, flabby and over-distended abdominal walls, and an abnormally large pelvis.

The causes acting from above are:—

Increased intra-abdominal pressure, the result of pelvic and abdominal tumors or ascites;

Constriction of the waist by improper clothing;

Straining or lifting;

Undue distention of the bladder and colon.

Pelvic inflammation, giving rise to distortion of the pelvic organs in general, may cause any of the forms of uterine displacement. When resulting from inflammatory exudates, the displacement is at first due to the mechanical pressure of the exudate, and, later, to its retraction. Thus an exudate in the right broad ligament will primarily push the uterus to the opposite side; after retraction occurs the fundus will be drawn toward the side of the exudate. Anteversion and anteflexion are frequently caused by retraction of the utero-sacral ligaments—the sequelæ of previous inflammation. (Figs. 145 and 147.)

Symptoms.

The symptoms characterizing the special displacements will receive due attention later on. A few general considerations are worthy of notice at this time.

I have elsewhere called attention to the fact that uterine displacements are ordinarily attended with no distress unless associated with *hyperemia* or *hyperesthesia*.* That is to say, save in acute cases which are the result of traumatism, uterine displacements will and frequently

* *v.* Chapter viii.

do exist for an indefinite period without giving rise to the least discomfort. This is especially true of congenital anteversion and anteflexion —so emphatically so that some eminent authorities deny that these displacements ever require treatment.

It is an indisputable fact that many women go through life with the various forms of displacement without being conscious of their existence. If married they may be sterile, but for this symptom they have never submitted to a local examination. In the larger number of cases, however, either hyperemia or hyperesthesia, or both combined, are sooner or later developed. Then a train of symptoms, more or less intense, succeeds. These symptoms are by no means constant, nor are they pathognomonic. The hyperemia, after continuing for a certain length of time, usually gives rise to hyperplasia and chronic

FIG. 145.

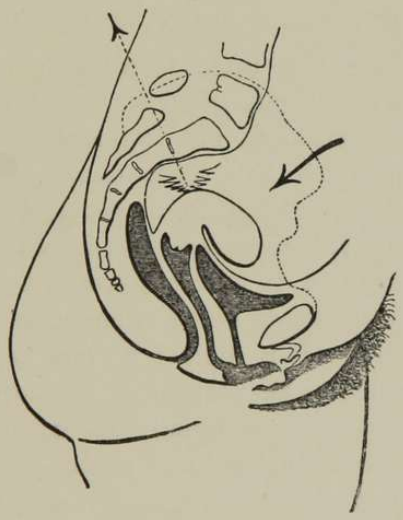


DIAGRAM TO SHOW ANTEFLEXION CAUSED BY CONTRACTION OF THE UTERO-SACRAL LIGAMENTS. (*Schultze.*)

metritis. The increased weight resulting from uterine congestion aggravates the displacement, in whatever form it may be. In this way the uterus is "blood-logged," as it were, and associated with the displacement there is usually more or less prolapse. As time goes on the mucous membrane undergoes hypertrophy, which in turn establishes menorrhagia or metrorrhagia. Dysmenorrhea is likewise a frequent symptom of uterine displacement, especially of anteflexion. It is due both to obstruction and to congestion and hyperesthesia incident to the displacement. Instead of excessive menstruation there may be

amenorrhea, particularly in congenital anteflexions. As already intimated, the cervical stenosis, which is an essential feature of flexion, is one of the most common causes of sterility. Dyspareunia also results in a goodly number of cases. All forms of displacement may give rise to distress upon locomotion. Sacral and lumbar pain and reflex pains in various parts of the body are of common occurrence. In perimetritis, salpingitis, etc., the uterus is usually fixed by adhesions.

It will thus be seen that the symptoms of uterine displacement, when such symptoms exist, are general rather than specific; and that they may be entirely wanting. It will not do, therefore, to undertake the erection of a special uterine pathology based upon displacements, as has actually been attempted by Hewitt, Hodge, and others; nor will it do to ignore the importance of uterine displacements because in a goodly number of cases no inconvenience results from them.

Anteversion and Anteflexion.

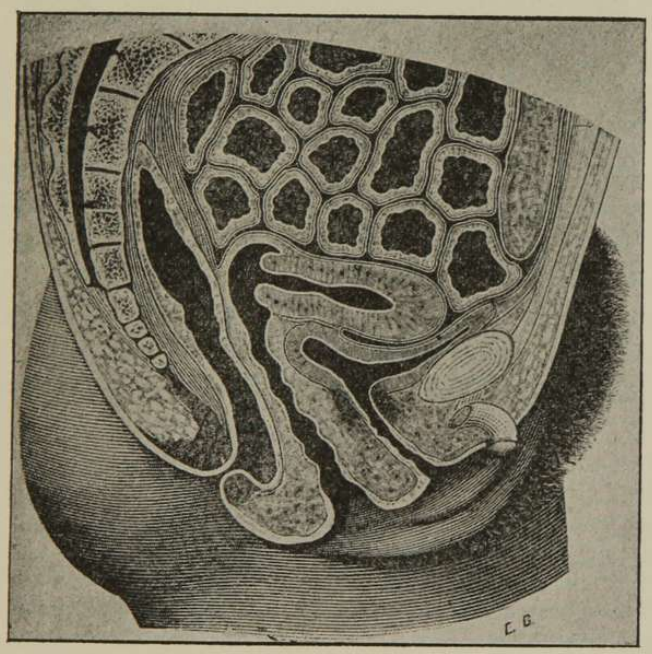
In *anteversion* the womb is tilted forward without any bend in its axis; in *anteflexion* it is not only tilted forward but it is also bent upon its axis. These two conditions are frequently of congenital origin. Any of the symptoms which have been enumerated may result from either form of displacement. Since, however, they are oftener congenital it is hardly wise to exaggerate their importance. The physician is liable to attribute to them, if he can discover no better cause, symptoms which are in reality due to nerve exhaustion, irritable spine, congestion of the ovary, etc. It is well, to be sure, to look to the displacement when an intractable dysmenorrhea or amenorrhea exists. So, too, if rectal and vesical tenesmus, especially the latter, do not yield to ordinary treatment. I have in another place (p. 438) referred to the importance of looking for antedisplacement, particularly if caused by shortening of the utero-sacral ligaments, when there exists an obstinate dysuria which is clearly not due to inflammation of the bladder or urethra. Ovarian congestion and ovaritis may result from embarrassed uterine circulation.

Diagnosis.—In *anteversion* digital examination will reveal the cervix in the hollow of the sacrum, and directed more posteriorly than normal. The finger will detect in the anterior fornix the fundus uteri, which is continuous with the cervix. Upon bimanual examination the entire organ can be got between the two hands and clearly outlined. There is no sulcus just behind the internal os, as in anteflexion. Should doubt still exist, after the possibilities of pregnancy are eliminated, the uterine sound may be passed. The introduction of this instrument

will require some tact because of the backward displacement of the cervix. If necessary the cervix can be drawn down with the volsella or tenaculum, which will facilitate its introduction. No force should be attempted in passing the sound. The handle will have to be carried well back and the instrument given various degrees of curvature before it will penetrate the uterine cavity. By the aid of the sound it is usually possible to distinguish an antedisplaced fundus from a small fibroid tumor, or inflammatory deposits in the anterior cul-de-sac (Fig. 146).

In *anteflexion* the fundus is felt more distinctly in the anterior fornix than is the case in anteversion. The cervix, instead of being directed

FIG. 146.



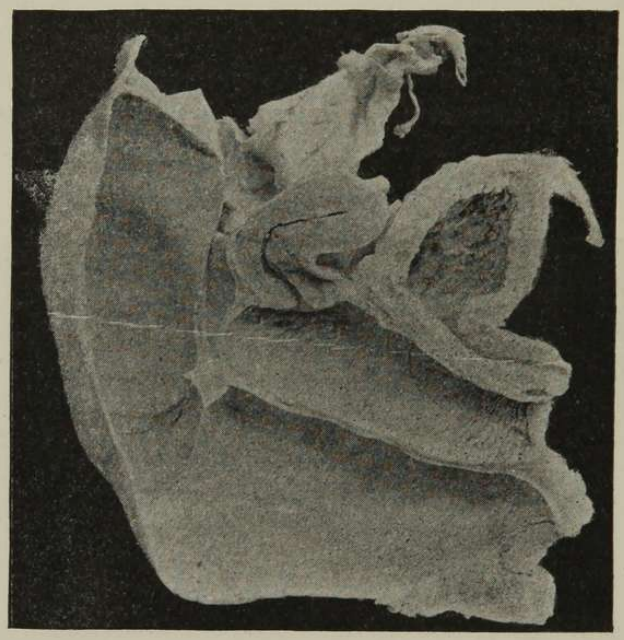
ANTEVERSION OF THE UTERUS.

backward, is directed downward and even forward. By sweeping the finger along its anterior surface there will be felt a sulcus separating the body from the cervix. Occasionally the cervix at the point of flexure is drawn so far anteriorly as to give rise to a condition resembling partial retroversion or retroflexion. The uterus may be low in the vagina. The sound will have to be bent much more acutely in order to penetrate the uterine cavity than is the case in simple version. It is

necessary to give to the instrument a curve corresponding to the degree of flexion before it can be passed. By it the location of the fundus can be determined, as well as its mobility and sensitiveness (Fig. 147).

By practising the bimanual with the sound in the uterus the examiner can also satisfy himself that the tumor in the anterior fornix is

FIG. 147.



ANTEFLEXION OF THE UTERUS.

A half-section of the pelvic viscera of a sterile woman, aged 33. The uterus is small, with its body considerably anteflexed on the cervix, which is very short, the vaginal portion hardly existing, so that the Douglas cul-de-sac lies below the os externum. The bladder coats are hypertrophied. The cervix is drawn backward by contraction of the utero-sacral ligaments. (*Museum R. C. S. Photographed by the Author.*)

not a small fibroid. Should there be difficulty in passing the instrument, the axis of the uterus can be straightened, as in anteversion, by drawing the cervix downward with the volsella; or by pushing the fundus upward through the anterior vaginal fornix.

Before the examination is concluded it is well to carefully explore the vaginal roof for the evidences of adhesions, constricting bands, or inflammatory effusions. The mobility of the uterus should always be ascertained before an attempt is made to reposit it with the sound.

Anteversion and anteflexion are so inseparably blended that I have deemed it wise to consider the two affections conjointly. In most cases anteversion precedes anteflexion, and often neither condition is suspected until after marriage, when the patient may find herself sterile. In dealing with dysmenorrhea in young girls these two forms of displacement, as possible causes, should always be borne in mind.

Treatment.

It is by no means necessary to treat all, or even a majority, of cases of antedisplacement. Certainly no treatment is called for unless distressing symptoms exist. The principles of treatment are the same in both forms, though it is more difficult to overcome anteflexion than anteversion. In either variety the deformity is less easily corrected than is the case with retrodisplacements. In order to elevate the fundus with a pessary it is necessary to exert more or less pressure through the bladder. This will frequently give rise to distress, and many times the patient can better tolerate the disease than the treatment.

In all instances the cause should be removed if possible. This implies the adoption of proper clothing—all constrictions about the waist being overcome—the relief of pelvic congestion due to constipation or irregular sexual habits, the removal of inflammatory exudates by proper treatment, and the stretching, if contracted, of the utero-sacral ligaments by uterine massage and pressure exerted by tampons. In all forms of uterine displacements the viscera above the pelvis should be looked after. Not infrequently abnormal positions of the uterus are associated with relaxed abdominal walls and displacement of the kidneys and stomach.

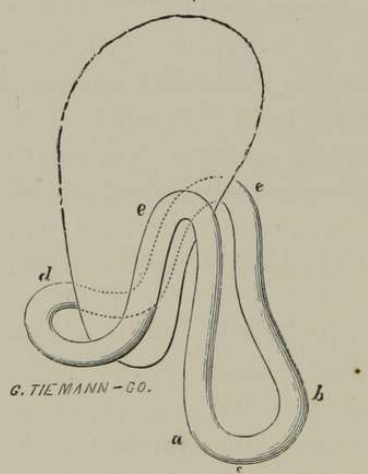
A certain amount of preparatory treatment is usually necessary before a pessary is fitted. This consists in the application of those measures having for their object the relief of pelvic congestion and inflammation. The hot douche, the medicated tampon, and proper rest will afford much relief. It is not only useless but dangerous as well for the patient to undertake to wear a pessary while suffering from pelvic inflammation, even of a chronic type. Properly applied tampons placed in the anterior vaginal fornix will so elevate the fundus and the uterus as to afford marked temporary relief. After the parts are prepared by this treatment a pessary may be fitted.

While the patient is undergoing preparatory treatment an effort should be made to straighten the uterus. This may be done either by the bimanual or by the use of the uterine sound or repositor. If done

according to the former method, the fundus is lifted by pressure exerted through the anterior fornix and by drawing the cervix toward the symphysis. Should there be no adhesions but little difficulty will be experienced in repositing the uterus in this way. On the other hand if the utero-sacral ligaments are contracted, or if the fundus is attached in front by adhesions, it will be impossible to correct the displacement. However, repeated attempts to do so (care always being observed not to use undue force) will in time stretch the adhesions sufficiently to make reduction possible. This is a form of uterine massage which, if intelligently applied, may result in much good. The sound is rarely necessary to reposit the uterus unless the abdominal walls are unduly thick.

When the reposition is made by means of the uterine sound, the instrument should be introduced as far as the fundus, being first curved sufficiently to insure its introduction. The finger of the left hand should now serve as a fulcrum at the center of the sound, when the handle is carried forward toward the symphysis, the fundus being thus retroverted. Finally the sound is carefully rotated (p. 115) and a slight

FIG. 148.



THOMAS'-HEWITT'S ANTEVERSION PESSARY.

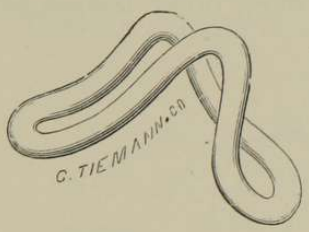
a. b. Anterior bow resting on the anterior wall of the vagina; e. e. Upper end pressing on the anterior surface of the uterus; d. Posterior bow going behind the cervix.

retroflexion induced. Of course no attempt should be made to reduce the displacement by means of the sound if the uterus is fixed by adhesions.

Various forms of uterine repositors have been devised for this especial purpose, but none is superior to the uterine sound if skillfully used.

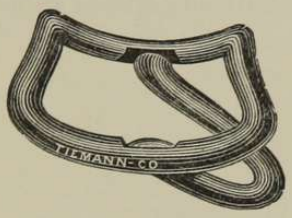
Pessaries in Antedisplacements.—Undoubtedly pessaries in all forms of displacement have been used much too often. This fact has led some writers to make a sweeping condemnation of them, especially in antedisplacements. Ingenuity and mechanical skill are essential requisites in fitting pessaries. Without these much harm may be done. If the physician possesses these qualities he will be able, in all forms of displacement, to do much good with pessaries. However, to obtain the best results careful discrimination is necessary. No two cases can be treated in exactly the same way. A pessary must be selected that will lift the body of the womb by pressure exerted through the anterior

FIG. 149.



GRAILY HEWITT'S ANTEVERSION PESSARY.

FIG. 150.

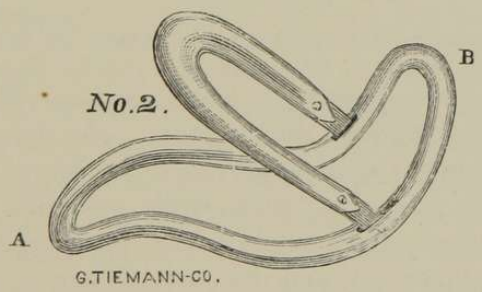


THOMAS' ANTEVERSION BUCKLE PESSARY.

fornix without injuring the bladder, at the same time drawing the cervix forward by obliterating the utero-vesical pouch.

For this purpose the most frequently employed pessaries are Gehrung's, Hewitt's, and Thomas'. Gehrung's is simply a Hodge pessary

FIG. 151.



THOMAS' ANTEVERSION PESSARY.

doubled upon itself. Its two lateral curves rest on the floor of the pelvis, while its superior and inferior arches impinge upon the anterior vaginal fornix, between the fundus uteri and symphysis. This is the manner in which it is used by Mundé, and is, I believe, the preferable

way of inserting it. Gehrung himself fits it so that it rests "with its whole lower arch on the floor of the pelvis, the uterus reclining against its superior curve." My observation leads me to believe that even if the instrument is introduced as recommended by Gehrung, it will in nine cases out of ten assume the position described by Mundé. In this position it does not interfere with coitus. (Fig. 152.)

Graily Hewitt's anteversion pessary is shown in Fig. 149. One point of it rests on the vaginal floor near its entrance, and one high up behind the cervix uteri. Its apex presses the anterior vaginal fornix upward, thus elevating the fundus both by direct pressure and by shortening the anterior vaginal wall. This pessary is made in three sizes, and will sometimes afford relief when other instruments fail in their object.

FIG. 152.

GEHRUNG'S ANTEVERSION PESSARY IN SITU.

Thomas' anteversion pessary is very popular (Fig. 151). It is a modification of Hodge's lever instrument. The pessary is introduced closed, and as the upper arch approaches the cervix the posterior bar is directed into the posterior fornix, while the anterior bar is pushed forward by the finger. The displacement is overcome by the uterus riding between the posterior and the movable bar.

Fig. 153 represents Thomas' open cup anteversion pessary. It is introduced with the movable bar extended. This bar is then thrown forward and the uterus rests in the concave portion of the cup, as shown in Fig. 154.

Stem pessaries I have discarded entirely from my practice, as have most specialists. When drainage is called for there is usually more or

less endometritis and dysmenorrhea associated with the flexion which require for their relief divulsion, curetting and gauze packing (p. 280).

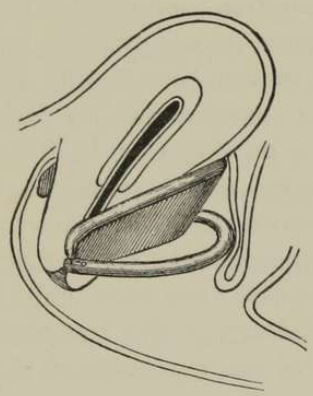
The benefit derived from the use of vaginal pessaries in flexions is due quite as much to the elevation of the entire uterus, thus relieving the embrassed circulation, as to the straightening of the organ.

Whatever form of vaginal pessary is selected there are certain dangers to be borne in mind. When left in the vagina for a long time uncleaned they become incrusted with calcareous matter, and may give rise to serious ulceration, and even bury themselves in the tissues. Cellulitis and metritis have more than once followed from their use. *No pain should result from a properly fitted pessary.* This fact should be impressed upon the patient and she

FIG. 153.

THOMAS' OPEN-CUP ANTEVERSION PESSARY.

FIG. 154.



THOMAS' OPEN-CUP PESSARY IN SITU.

should be instructed to have it removed at once should pain occur. This precaution will largely remove the element of danger. Frequent cleansing douches are to be advised. The proper size of the pessary is to be determined by the shape and capacity of the vagina. It is better to run the risk of selecting too small an instrument than to insert one too large. After its introduction the patient should be directed to walk across the room once or twice, after which an examination should be made in the upright posture. If the pessary has turned it is too small, and a larger one should be substituted.

RETROVERSION AND RETROFLEXION.

As has been shown, the fundus of the uterus is pushed backward whenever the bladder is distended. The displacement becomes patho-

logical only when the fundus remains persistently directed toward the hollow of the sacrum. When the body of the uterus becomes bent upon itself so as to form an angle, *flexion* is added to the version. It is, then, entirely possible to have a retroversion without a flexion; on the other hand, a retroflexion is always combined with version, the latter in nearly all instances preceding the former.

Etiology.—The *predisposing causes* are those of uterine displacements in general. The *exciting causes* are: increased intra-abdominal pressure and diminished uterine support; increased uterine weight from congestion, tumors, etc.; and traction upon the uterus from below. The utero-sacral ligaments are nearly always relaxed in retroversion; they may be contracted in retroflexion.

It will be observed that the various exciting causes are those which are associated with and attend parturition. Injuries to the pelvic floor, subinvolution, and chronic metritis all tend to congest the uterus and to increase its weight. If, now, the fundus is crowded into the hollow of the sacrum by a tightly applied obstetric bandage, a retrodisplacement is almost certain to result. When the fundus reaches a certain point in its direction backward, intra-abdominal pressure is exerted against its anterior surface so that when the patient assumes the upright posture it forces the fundus toward the hollow of the sacrum. Unlike antedisplacements, retroversion and retroflexion occur much oftener in women who have borne children.

Pathology.—The size of the uterus is nearly always increased because of the embarrassed circulation, and not infrequently there is chronic inflammation of both its parenchyma and its lining membrane. The fundus finds its way into the pouch of Douglas, and in marked retroflexion may depress this pouch as far as the pelvic floor; it is also in contact with the anterior surface of the rectum. The external os is patulous, and in women who have borne children the cervix is usually more or less lacerated. The anterior surface of the broad ligaments looks backward and downward, while the utero-sacral ligaments are stretched by the cervix being directed anteriorly. Not infrequently one or both ovaries are displaced with the uterus and often find their way into the posterior cul-de-sac. The ureters may be so compressed as to give rise to dilatation.* The bladder is not so markedly affected as

*I had some three years ago under observation a most interesting case in which obstruction of the ureter was evidently caused by the pressure of a retroverted fundus. For years the patient had suffered from attacks of intense pain in the region of the right kidney. During these attacks a tumor of some kind formed, which resembled in every particular an enlarged floating kidney. It formed

it is in antedisplacements. If the displacement is the result of, or has been followed by, pelvic inflammation, the fundus is usually fixed by adhesions. In flexions the tissues at the point of flexure lose their tone and permit the uterus to bend upon itself.

Symptoms.—These, as in antedisplacements, may be entirely wanting, or of the most marked character. The most constant symptom is a feeling of weakness and pain in the back, especially after being upon the feet for some time. Other manifestations of the displacement are caused by congestion and inflammation resulting from embarrassed circulation. There is a sensation of bearing down and heaviness in the pelvis, with more or less rectal tenesmus. Constipation and hemorrhoids may likewise result from rectal pressure. Menorrhagia and leucorrhea, due to endometritis, are not infrequently present. Any of the so-called "hystero-neuroses" may develop. Dysmenorrhea is much less common than in antedisplacements for the reason that the cervical canal is usually increased instead of diminished in caliber. Pelvic pain due to pressure upon the nerves is often most distressing and not infrequently extends to the lower extremities. Dyspareunia, sterility, and uterine colic are symptoms of less constant occurrence. When conception does take place abortion frequently results.

In acute displacement from traumatism the distress may be very great.

Diagnosis.—In *retroversion* the cervix will be found lower than normal in the vagina and directed forward. By carrying the finger along the posterior surface of the uterus no sulcus can be felt, as in retroflexion. The bimanual will fail to locate the fundus in front. The uterine sound will determine the direction of the canal.

In *retroflexion* the cervix may be normally located; it is usually, however, lower in the pelvis than it should be and looks directly downward or slightly forward. In the posterior fornix the fundus of the uterus will be felt as a rounded body separated from the cervix by a sulcus. The bimanual shows the fundus absent in front. The sound will require a sharp posterior curve in order to insure its introduction. In both forms of retrodisplacement the fundus can be felt through the

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quickly, becoming fully as large as a fetal head, and then subsided quite as quickly, after which the quantity of urine was markedly increased. These attacks occurred as often as once or twice a week, and were usually brought on by undue exercise. On bimanual the uterus was found retroverted and enlarged. I fitted a Hodge pessary and for six months she remained perfectly well. At the end of that time the attacks recurred, necessitating nephrectomy.

rectum; it is, however, lower down, and more readily palpated in retroflexion. In both forms of displacement, too, the entire organ may be retroposed, being fixed by adhesions.

The several affections giving rise to a tumor in the cul-de-sac of Douglas, and hence liable to be confounded with retrodisplacement, are:—

Prolapsed ovary or a small ovarian tumor;
Small myoma in posterior uterine wall;
Inflammatory exudates;
Fecal accumulation.

In none of the foregoing affections *will the sound penetrate the tumor*, as it will in the case of a retrodisplaced fundus. Other differentiating points will be considered *seriatim*.

Prolapsed Ovary or a *Small Ovarian Tumor.*—A prolapsed ovary is exquisitely sensitive and pressure upon it gives rise to a peculiar sickening pain. It is much smaller than the fundus uteri and, unless adhered, more mobile. When a small ovarian tumor occupies the cul-de-sac of Douglas the fundus will be found in front.

Small Myoma in Posterior Uterine Wall.—Bimanual should be practised with the sound in the uterine cavity. The presence of the tumor can then be detected by digital examination per rectum. The fundus is directed forward.

Inflammatory Exudates.—The uterus is more or less fixed. There is usually a history of preceding inflammation.

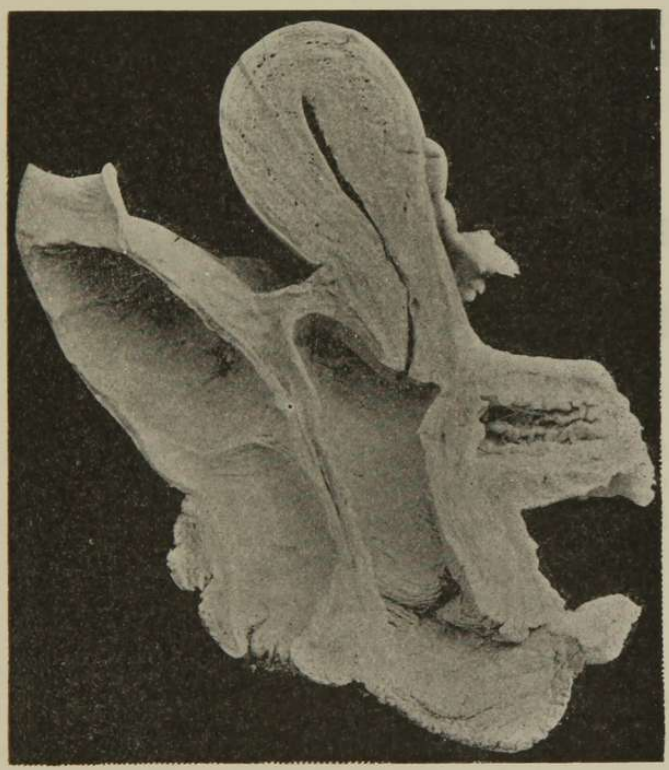
Fecal Accumulation.—This pits upon pressure. In case of doubt the rectum should be emptied.

Prognosis.—In considering the prognosis of retroversion and retroflexion of the uterus it is necessary to note the presence or absence of adhesions, the duration of the displacement, and also the presence or absence of such complications as prolapse of the ovaries, chronic metritis and salpingitis, injuries resulting from parturition, etc. In uncomplicated retroversion the uterus can usually be restored to its normal position by a properly fitted pessary. Flexions are more difficult to contend with, though by partially overcoming the displacement and elevating the entire organ marked relief is often afforded. As a last resort, some of the operations presently to receive consideration may be applied.

Treatment.—The same preparatory measures recommended for antedisplacements are necessary. No attempt should be made to reposit the uterus if acute pelvic inflammation is present. When the undus is fixed by inflammatory adhesions, these may be cautiously

stretched by pelvic massage. This is accomplished by passing one or two fingers into the vagina or rectum, when the uterus and its surroundings are manipulated through the abdomen. The patient should be in the dorsal posture on a couch, while the masseur sits on a low chair at her left side. The uterus is elevated as much as possible by the finger within the vagina or rectum, while the outside hand makes "gentle circular friction motions above the pubes and over Ponpart's ligaments, gradually pressing deeper into the pelvis until the posterior

FIG. 155.



RETROVERSION OF THE UTERUS WITH A VERY SLIGHT DEGREE OF FLEXION.
(*Museum R. C. S. Photographed by the Author.*)

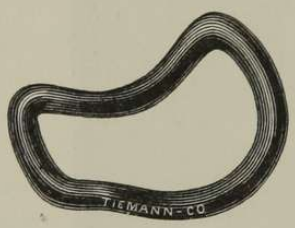
surface of the organ is reached." This treatment may be practised two or three times a week, followed by the usual local applications. Electricity is often of great service in the absorption of adhesions and exudates (*v.* Chapter XI). If a cervical laceration is perpetuating the uterine congestion it should be repaired. Injuries to the pelvic floor are likewise to be overcome by proper operative procedures (*v.* Chapter LII).

Frequent reposition of the uterus previously to fitting a pessary will do much good. It may be accomplished by one or all of the three following methods:—

1. *Bimanual Recto-Vaginal Manipulation.*—With the patient in the dorsal or Sims posture the fundus is pushed forward with the finger of one hand in the rectum, while the cervix is drawn backward with the finger of the other hand in the vagina.

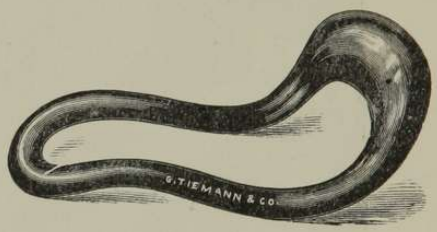
2. *Genu-Pectoral Posture.*—In this position intra-abdominal pressure is reduced to a minimum and gravity alone may carry the fundus forward. It is, however, usually necessary in addition to push the fundus upward either through the vagina or rectum; or to pull the cervix downward, so as to permit the fundus to escape from the hollow of the

FIG 156.



HODGE'S CLOSED LEVER PESSARY.

FIG. 157.



THOMAS' RETROFLEXION PESSARY.

sacrum. As a palliative measure the genu-pectoral posture practised for five minutes twice a day will often do much good.

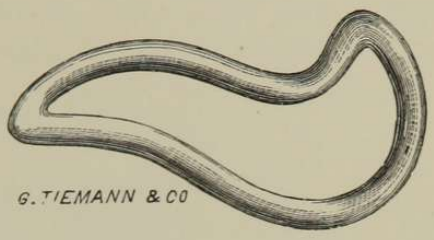
3. *The Uterine Sound or Uterine Repositor.*—Care must be observed not to exert too much force with these instruments. The sound should be used as straight as possible and cautiously turned within the uterus (p. 115).

Retention by Means of Pessaries.—Retrodisplacements can be much more readily overcome by means of pessaries than can antedisplacements. This is because injurious pressure is not exerted upon the neighboring organs when the posterior vaginal wall is stretched. The principle of a retroversion pessary, such as the Hodge, is this: The posterior vaginal wall is carried upward by the instrument and its upper bar gives a *point d' appui* to the posterior fornix. This draws the cervix backward and throws the fundus forward, just as do the utero-sacral ligaments normally. This will not overcome the flexion, but by elevating the entire organ, as already observed, the obstructed circulation is often so much relieved as to do much good.

The intra-vaginal retroversion and retroflexion pessaries most frequently used are Hodge's (Fig. 156), Thomas' (Fig. 157), and Albert

Smith's (Fig. 158). It will be observed that the principle is the same in all. The original Hodge pessary was as wide at its lower extremity as at its upper. Smith's modification consisted of narrowing the lower end so as to conform to the shape of the vagina. This is a valuable improvement. In Thomas' modification the upper bar is made bulbous and the sacral curve is exaggerated. It is, therefore, more useful in cases where the posterior vaginal fornix is much relaxed.

FIG. 158.



ALBERT SMITH'S PESSARY.

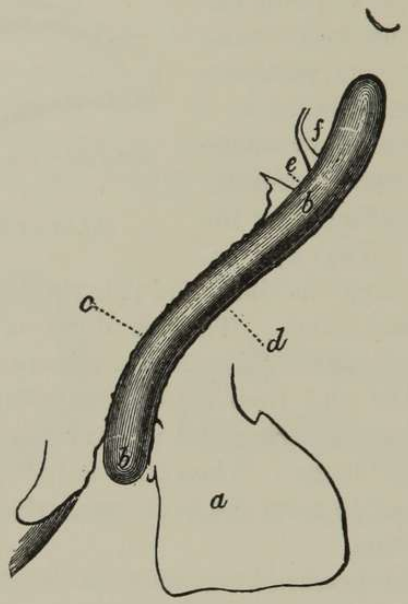
These pessaries are now made almost altogether from vulcanite, which is light and unaffected by the vaginal discharges. The application of heat renders them flexible, and it is therefore possible to mold them into any desired shape. This is done as follows: Place the pessary in hot water; leave for five or ten minutes; remove and mold into the shape desired and then set by immersing in cold water. It may be molded by first smearing the pessary with vaseline and then heating it over a spirit lamp. When the latter method is employed care must be taken not to burn the vulcanite, which will leave its surface rough and irritating.

All of the foregoing pessaries are made in the form of an elongated horseshoe. The curved upper end adapts itself to the posterior fornix, while the curved lower end adapts itself to the lower portion of the vagina. With its upper sacral curve and lower pubic one it therefore corresponds to the vaginal slit, and when within the vagina the concavity of the upper sacral curve looks forward, while the concavity of the lower pubic one looks backward. If properly fitted the vaginal walls grasp it closely both anteriorly and posteriorly. (Fig. 159.) Since, however, the posterior vaginal wall is narrower below than it is above, Albert Smith's instrument is the more scientific. Thomas' modification is especially adapted to those cases where the sacral curve is very pronounced, the vagina long and the posterior fornix relaxed.

In fitting a Hodge pessary, or one of its modifications, a digital examination should first be made for the purpose of obtaining the dimensions of the vagina. A pessary is then selected which will fulfill as nearly as possible the requirements of the case. Should the sacral curve be very pronounced the instrument should be molded accordingly. Should the vagina be comparatively straight it may be necessary to lessen the curve. The instrument should be shorter and nar-

rower than the posterior vaginal wall, so that no tension will be produced when it is in position. The lower bar is then grasped with the index finger and thumb of the right hand, the labia separated with the fingers of the left, and the upper sacral curve turned so that the pessary at its widest part will correspond to the antero-posterior diameter of the

FIG. 159.



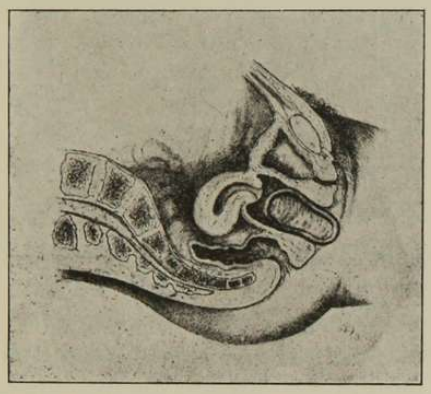
HODGE PESSARY IN SITU IN THE VAGINA.

a. Perineum; *b b*. Pessary; *c*. Anterior, and *d* Posterior vaginal wall; *e*. Anterior, and *f* Posterior lip of cervix. (*Hart.*)

vaginal outlet. It is kept well pushed back toward the perineum, so as not to pinch the tissues anteriorly between the pessary and the pubic bones. After it has passed the ostium vaginæ the index finger is carried under the lower bar and above the upper in such a way as to convey the latter back of the cervix. Unless this precaution be taken the upper bar will, in all probability, pass into the anterior fornix instead of the posterior. When in place the lower end should be just within the vaginal orifice. It is compressed between the posterior face of the pubic segment and the oblique anterior face of the sacral segment. In this position the intra-abdominal pressure acts nearly equally upon both the superior and inferior bars, and the cervix is drawn backward with a corresponding elevation of the fundus. An examination should be made in the erect posture before the patient leaves the consulting room. If the pessary is too small it will show a disposition to turn transversely;

if it is too wide the patient will complain of more or less tension and distress. The lower end should not project below the pubic bones. It may be necessary to introduce several instruments before a proper one is obtained. Experience will, however, enable the physician in most cases to select one of proper size and shape after one or two trials. The manner of introduction is well shown in Figs. 160, 161 and 162. It may be advantageously introduced, in cases where the fundus drops backward after reposition while on the back, in the genu-pectoral posture.

FIG. 160.



INTRODUCTION OF HODGE PESSARY, FIRST STAGE.

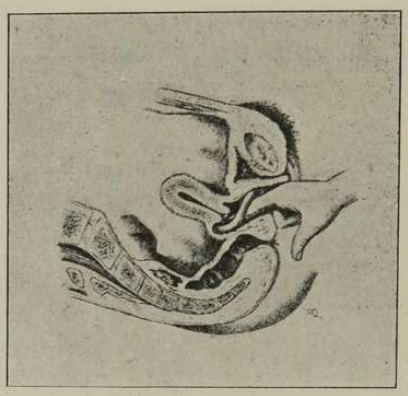
FIG. 161.

INTRODUCTION OF HODGE PESSARY, SECOND STAGE.

Before leaving the office the patient should be instructed to return at once if the instrument causes pain. She should report herself for ex-

amination in the course of three or four days to see whether or not it keeps its proper position. After it becomes evident that the pessary is perfectly fitted she may wear it for an indefinite length of time without removing it. It is best, however, to have it examined every three or

FIG. 162.

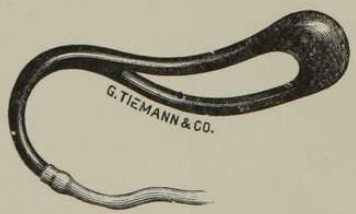


INTRODUCTION OF HODGE PESSARY, THIRD STAGE.

four months. It is necessary to resort to occasional cleansing injections wherever a pessary is within the vagina. So far as any distress is concerned, the patient should be entirely unconscious of its presence, nor should it interfere with coition.

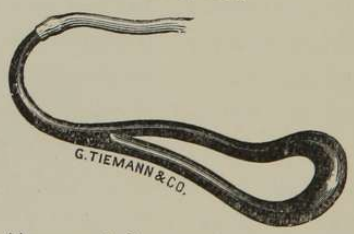
Cases are every now and then met with where, because of the great weight of the uterus, or because of injury done to the pelvic floor and perineum, the ordinary intra-vaginal pessary will not accomplish the desired end. It may then be necessary to utilize an instrument sus-

FIG. 163.



THOMAS' CUTTER'S RETROVERSION PESSARY.

FIG. 164.



THOMAS' CUTTER'S ANTEVERSION PESSARY.

pended from the waist. For this purpose Thomas' modification of Cutter's anteversion and retroversion pessaries is the one most generally used (Figs. 163 and 164). Both of these instruments act by direct pressure. All forms of extra-vaginal stem pessaries are objection-

able, and should be resorted to only when intra-vaginal support is impossible.

When the abdomen is unduly pendulous and large much relief may be afforded by a properly fitting abdominal supporter. It sustains the abdominal walls, lifts them upward, and changes the direction of the intra-abdominal pressure. Those in most common use are Hood's and the London Abdominal Supporter, though one made to order is preferable. Should there be a floating kidney associated with the uterine displacement nephorrhaphy may be necessary.

In spite of the utmost skill in fitting pessaries cases will every now and then be met with where any form of instrument will fail to bring the desired relief. This may be due to relaxation of the perineum and pelvic floor, to laxity of the vagina, to ovarian displacements, or to periuterine inflammation. If it is probable that a cure can be accomplished by restoring the perineum and pelvic floor to their normal condition, this should be done. Indeed, before the more serious operations from above, having for their object the correction of the displacement, are resorted to, reparation of the pelvic floor and perineum should always be made. Failing to afford relief by these measures (and failure will be the rule where an ovary is displaced with the uterus), there are two operations, one or the other of which may be utilized.

The first is known as the *Alexander Operation*. It was revived by Alexander, of Liverpool, although the idea of correcting retrodisplacements of the uterus by shortening the round ligaments belongs, it is claimed, to Alquie, of Montpellier. This operation is especially applicable to backward and downward displacements. After its revival by Alexander it enjoyed a certain degree of popularity, then fell into disrepute, but is again gaining favor with certain specialists. There is, in the first place, great uncertainty in finding the round ligaments; and, unfortunately, the results in many cases are not permanent, the displacement becoming as bad as ever after a certain length of time. I have performed the operation in all ten times. Four of these cases were absolute failures, because of my inability to find the ligaments, or because of their deficient size when found. In one case but one ligament was found. The five remaining cases were entirely successful. The per cent. of failures led me, as it did the majority of specialists in this country, to discard the operation for that of ventral hysterorrhaphy, or fixation of the uterus to the anterior abdominal wall. I have in the dead-room examined the round ligaments of a large number of subjects, and have studied the technique of the operation under the personal demonstration of a number of its warmest advocates. There is

absolutely no way of determining the size of the ligaments before the inguinal canal is opened. If they are very small the most profound anatomist may fail to find them. Possibly, the mistake has been made in the past of giving to the operation too extended a range of application. In my opinion it should be limited to those cases where a careful physical examination fails to reveal serious disease of the appendages and where the uterus is of normal weight and size, or nearly so. The per cent. of cases coming under this head where operative interference is called for is not large, but doubtless the operation is indicated every now and then. As slight as is the danger attending any of the operations requiring for their accomplishment a celiotomy, it is less in the Alexander operation. It will oftener be called for in primiparæ than in multiparæ. In no instance should it be attempted when the uterus is not freely movable.

Technique of the Alexander Operation.—The pubes and lower abdomen and vagina are prepared as for celiotomy (p. 189). The spine of the pubes is located, cut down upon and the incision extended from one to two inches along the upper edge of Ponpart's ligament. By retracting the edges of the wound free exposure of the inguinal opening is obtained. The fibers of the intercolumnar fascia are divided, when the fatty protrusion which occupies the canal bulges forth. A corresponding dissection is made on the opposite side and the fatty protrusions are seized with catch forceps and drawn out. The fibers of the round ligaments spread out in this fatty tissue and may or may not be visible. Existing fascial bands should be snipped while the traction is continued until the ligament *runs*. After both ligaments are thus exposed and freed the uterus is sharply anteverted with a sound. The first ligament is now drawn out until the sound within the uterus moves, when the ligament is firmly anchored to the external ring and the canal with buried silk, silkworm gut, or chromacized catgut sutures, which are made to transfix both the pillars of the ring and the ligament. The superfluous ligament is cut away and the wound closed, with or without drainage, as the operator may elect.

Greig Smith, instead of making two lateral incisions, exposes the openings by "a single curved incision carried just below the pubic spines and embracing both inguinal openings."

Kellogg, of Battle Creek, makes a short incision midway between the external and internal rings, opens the canal by slitting the fibers of the external oblique and its fascial coverings, and draws the ligament through this opening. The ligament can then be fixed in the canal in the usual way and cut off; or the withdrawn portion, before the sutures

are passed, can be made to plug the canal by means of a ligature carried through the opening in the canal and brought out opposite to the internal ring. By this procedure the ligament is folded upon itself within the canal and acts as a barrier against hernia.

Newman enters the canal from the internal ring.

After the operation a retroversion pessary is introduced and should be worn for three or four months. The patient should remain in bed for at least three weeks.

Gastro-Hysterorrhaphy, or Ventral Fixation of the Uterus.—This operation was first suggested by the fixation of the pedicle of ovarian cysts outside the abdomen when this practice was common. It was observed that this procedure corrected the displacements of the uterus; hence the idea of fastening the uterus to the abdominal wall for the sole purpose of overcoming displacements.

It is claimed that gastro-hysterorrhaphy was performed for the first time in 1869 by Kœberle. To Olshausen, however, is due the credit of systematizing it. In this country Howard A. Kelly, Polk, Wylie, Mundé, and others have been foremost in popularizing it. Its value is now fully established.

Operative Technique.—The technique of the operation, simple as it is, has been made difficult to comprehend by the operative details insisted upon by most of the authors. I shall, therefore, endeavor to give as simple a description of it as possible.

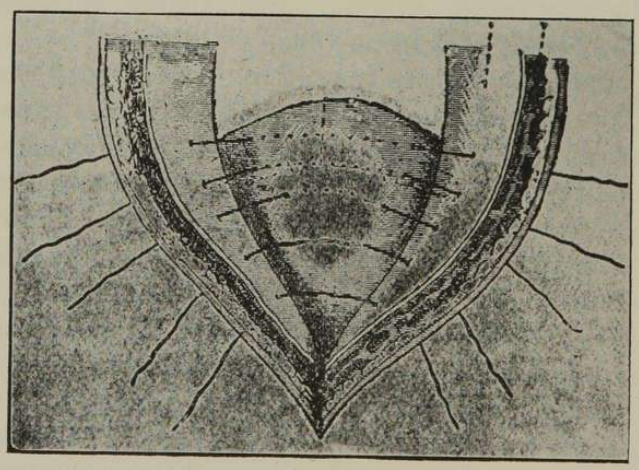
The usual antiseptic precautions are to be observed. The abdomen is opened in the median line as for oöphorectomy, the patient being in the Trendelenberg posture. After separating any adhesions that may exist, the fundus is lifted from the hollow of the sacrum and held forward by means of a sponge on a fixed handle carried into the Douglas pouch. The appendages are ablated or not, according to the indications; if diseased, they are, of course, removed. It is safer, I think, in ovarian prolapse to remove the displaced ovary. A curved needle armed with No. 2 chromacized catgut is then carried through the fascia, rectus muscle and peritoneum of the left side, the needle entering the peritoneal cavity three-quarters of an inch from border of the wound. It is next made to penetrate the posterior surface of the uterus on a level with the attachments of the Fallopian tubes, when it is brought out on the opposite side of the wound. A second suture is passed a quarter of an inch higher through the abdominal wound and a quarter of an inch further back on the uterine surface. Usually two sutures are all that are required. When these sutures are tied the posterior surface of the fundus is brought firmly against the abdominal wall, after which the abdominal

wound is closed in the usual way (*v.* Chapter XLVI). By passing the sutures through the posterior surface of the uterus instead of the anterior, as shown in Fig. 165, intra-abdominal pressure, when the patient assumes the upright posture, necessarily crowds the fundus forward; whereas if the sutures penetrate the uterus from the front it is apt to force it backward.

Segale, of Genoa, strips the peritoneum from that portion of the abdominal wall which comes in contact with the fundus. He passes the sutures through the entire thickness of the abdominal wall.

It is advised by some operators that, after the introduction of the sutures, the anterior uterine surface over the area occupied by the sutures, and the opposite peritoneal surface of the abdominal wall, should be irritated with the point of a scalpel in order to promote adhesions. I do not deem this necessary. Great care should be observed that no loop of intestine finds its way between the uterus and the abdominal wall. After the abdomen is closed a retroversion pessary is introduced into the vagina; this should be worn for some weeks for the purpose of sustaining the uterus until the utero-abdominal adhesions become firm. The patient is kept in bed for some time longer than is ordinarily

FIG. 165.



GASTRO-HYSTERORRHAPHY. (*Leopold.*)

necessary after celiotomy, so that the newly-formed adhesions may not be prematurely stretched. Drainage is unnecessary except in cases where extensive adhesions have been separated.

Results and Prognosis of Gastro-Hysterorrhaphy.—It cannot be said that this operation is as free from danger as is the Alexander. Under

modern antiseptic methods, however, the mortality is very low. Nevertheless, the operation should be reserved for those cases of retrodisplacement which cannot be overcome in the ordinary way, as, for instance, when the fundus is bound down by adhesions or the ovary is prolapsed. It is true that occasionally the cure is not permanent, but I am inclined to believe that this is often due either to faulty operative technique or to want of care in the selection of cases. During the last two years much has been said in the journals regarding the operation, both *pro* and *con*. I have now made forty-four gastro-hysterorrhaphies, with the following results: One death; four relapses; six patients greatly improved, and thirty-three cured. The fatality resulted from hemorrhage from a needle puncture in the uterus. The patient was a bleeder and I was not called until she was pulseless. The abdomen was speedily reopened, when the blood could be seen oozing from the suture tract. It was controlled with much difficulty by carrying around the bleeding points a second ligature. Transfusion and powerful stimulants were resorted to, but she did not rally. The needle used in this case was a full curved Martin with cutting edges. I have now modified the Martin needle by having the cutting edges ground off. It is a great advantage to have the needle flat near the eye to keep it from turning in the needle-holder. I have heard of three deaths occurring in the hands of other surgeons from the same cause. This is an element of danger which is not mentioned in any of the reports which have passed under my observation.

My failures were due in three instances to the fact that I expected too much from the operation and performed it when a hysterectomy should have been made. I believe that the uterus should be removed with the appendages when it is extensively diseased and much increased in size. The adhesions will almost invariably stretch and permit the organ to fall backward and downward when this condition exists. This is well shown in Plate X. In this case the abdomen was opened nine months before the patient came to me, by another surgeon, who broke up the adhesions, left the appendages unmolested, and attached the uterus in front. In three months she was worse than before the operation. On opening the abdomen the second time the fundus was found in the hollow of the sacrum, with the right ovary enlarged and fast at the bottom of the Douglas cul-de-sac. The adhesion (*a*) was six inches long, not thicker than a knitting needle, and extended from the fundus to a point just above the bladder. It is evident that if the uterus was to be saved in this case the appendages should have been removed and the small fibrous tumors projecting from its walls

enucleated. Had this been done I am inclined to believe that the operation would have been a success. I deemed it wise to remove the uterus with the appendages and the patient convalesced uninterruptedly, though she remains a physical wreck because of the opium habit.

The fourth failure resulted from a severe fall four months following the operation, which tore the uterus from its attachment in front.

The six cases which I classify under the head of "greatly improved" were immeasurably benefited by the operation, but not entirely relieved. In four I think that the succeeding prolapse, which was the chief trouble, was due to the fact that the abdominal sutures were passed too low down in the abdominal wound. My experience leads me to believe that these sutures should be passed some distance above the reflection of the peritoneum upon the bladder, so that the uterus is left well elevated.

In the remaining two cases I attributed the prolapse to the fact that the pelvic floor should have been repaired before the operation from above was made. Both have been greatly relieved by subsequent operations from below.

Noble* reports one case of powerless labor and two of obstructed labor, caused by ventral fixation. In one case labor was obstructed by a tumor at the superior strait, consisting of the imprisoned and hypertrophied fundus and anterior wall of the uterus. The Porro-Cæsarian operation was necessary.

Vaginal Fixation of the Uterus.

Duerssen, Mackenroth, A. Martin, Pratt, and others have practised vaginal fixation of the uterus for retrodisplacement, with more or less success. The operation is made as follows: A short transverse incision is made just above the cervix, and a long one, extending from the neck of the bladder to this, is made in the median line of the anterior vaginal wall. The bladder is separated from the cervix as far as the reflection of the peritoneum, and from the vagina on either side of the median incision. The peritoneum is stripped from the anterior uterine wall as high as possible, when the fundus is anteverted by means of a tenaculum or provisional traction sutures placed higher and higher towards its fundus. The fundus is then stitched to the anterior vaginal wall by chromacized or silkworm gut sutures, which also close the vaginal wound. A pessary is introduced and the usual after-treatment applicable to all plastic operations observed.

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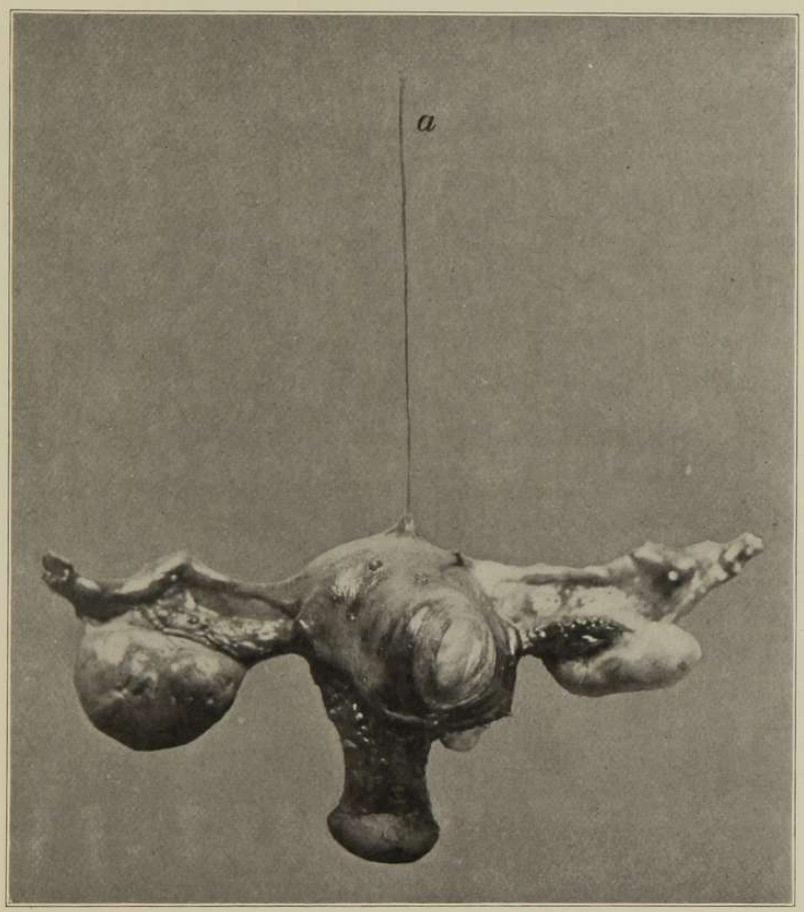
*Am. Gyne. and Obs. Journal, Nov., 1896.

PLATE X.



UTERUS AND APPENDAGES REMOVED BY VAGINO-ABDOMINAL METHOD. Several small Fibroids in Fundal walls. (*a*) Attenuated adhesion six inches long resulting from ventral fixation nine months previously. (*Wood*).

Dr. E. P. Nourse, of Indiana, has recently made a suggestion in the *American Journal of Obstetrics* which deserves more than passing notice. In either forward or backward displacements he recommends that the cervix be first incised on either side the vaginal juncture; in retrodisplacements the anterior lip is put upon the stretch while the cervical sutures are being passed; in forward displacements, the posterior. I have in several trachelorrhaphies applied this principle where there existed displacement, with good results. My former assistant, Dr. C. A. Hall, reports three successful cases operated upon by this method, in the January, 1897, number of the *Journal of Orificial Surgery*.

Experience thus far has proved that ventral fixation does not seriously interfere with pregnancy, though it does sometimes precipitate an abortion. In a few instances irritation of the bladder has persisted for several weeks, but it has invariably passed away in time.

Whenever abdominal section is made for other purposes, and the uterus is found retrodisplaced, it should be fixed to the anterior abdominal wall before the abdomen is closed.

Wylie, of New York, shortens the round ligaments within the abdomen for the purpose of overcoming retrodisplacements. He folds these structures upon themselves, and at their middle portion, some distance from the uterus, sutures them, first scraping the peritoneum between the folded surfaces. Bode, of Dresden, transfixes the round ligaments near the internal abdominal ring with a needle threaded with aseptic silk. He then passes the needle through the corresponding uterine cornu at the insertion of the ligaments. After the two ligatures are tied the ligaments are shortened to an extent corresponding to the distance between the two knots. Polk brings the round ligaments together in the form of an X above the bladder, securing them in this position with sutures. Dudley folds the round ligaments in front of the uterus and stitches them to its anterior surface by silk sutures, after denuding the approximated peritoneal surfaces. All of these operations overcome the displacement by shortening the round ligaments, as does the Alexander. The general verdict is that none of these methods is as satisfactory and permanent in results as is ventral fixation, though time may modify this opinion.

Abdominal hysterorrhaphy without laparotomy, as formerly practised by Kaltenbach, Howard A. Kelly, Roux, and others, has justly fallen into disrepute. The operation is infinitely more dangerous than is laparotomy for the same purpose. By it there is great danger of injuring the intestines, as an example furnished by Roux emphatically demonstrates. This operator, feeling some misgivings at the moment

of passing the needle, opened the abdomen and found that a loop of intestine would have been penetrated had he persisted.

Illustrative Cases.

CASE I.—*Retroversion of the Uterus with Procidentia of the Second Degree; Perineorrhaphy and Gastro-Hysterorrhaphy; Recovery.*—Patient, æt. 36. Referred to me by Dr. L. T. Van Horn, of Rives Junction, Michigan. Married for fourteen years. Had had two children. Uterine trouble dated back to the birth of first child. She had an operation some years previously upon the cervix and perineum, but the newly made perineum was of the most superficial character and was absolutely useless, although its antero-posterior diameter measured at least two inches. There was constant soreness in the back with a great deal of pain in the left ovarian region. She described this pain as being of a pressing sensation, as though there were a ball pressing against the pelvis. The menses were quite regular, but exceedingly painful. She also suffered greatly from headache.

Physical Examination.—The os rested upon the perineum, the uterus was retroflexed, and the left ovary was beneath the fundus.

The patient was placed upon the operating table November 11, 1892. The perineum was first repaired by the author's method and a large retroversion Hodge pessary placed in the vagina. The abdomen was then opened, the appendages removed, and the fundus stitched with two wire sutures to the anterior abdominal wall. No drainage was introduced. The abdominal walls were at least four inches thick and some difficulty was experienced in passing the sutures. The patient convalesced nicely and returned to her home on December 24th. She is now (six months after the operation) quite well.

CASE II.—*Obstinate Retroflexion of the Uterus with Cystic Degeneration and Prolapse of the Right Ovary; Gastro-Hysterorrhaphy and Salpingo-oöphorectomy; Recovery.*—Patient, æt. 24. Referred to me by Dr. Walker, of Salem, Michigan. For three years she had been almost entirely incapacitated for all work because of a constant distress and bearing-down sensation in the pelvic region, which completely unnerved her. I found upon digital examination retroflexion of the uterus, with prolapse of the right ovary, which was evidently greatly enlarged. The patient was placed under palliative treatment for three months, but in spite of every effort I could not keep the ovary out of the cul-de-sac, where it was constantly squeezed and irritated. She very willingly consented, as a final resort, to abdominal section.

On February 1, 1892, the abdomen was opened and the right ovary,

which was four or five times its normal size, removed. The fundus was stitched to the anterior abdominal wall in the usual way. The left ovary was not enlarged, though it was attached to the floor of the pelvis by adhesions. These were broken up and the appendages of the left side left intact. This was done at the urgent request of the patient, who was about to be married and desired very much to have children. The abdomen was closed without drainage.

The temperature reached 101° F. on the morning of the second day, and there was evidently a slight localized peritonitis; but under a saline cathartic and bryonia this quickly subsided, and the convalescence was rapid and complete. She returned to her business, and is now doing with perfect ease the work of a milliner.

CASE III.—*Intractable Dysmenorrhea following Ovariotomy for the Removal of a Large Ovarian Cyst; Retroflexion; Oöphorectomy and Gastro-Hysterorrhaphy; Recovery.*—Patient, æt. 38. Referred to me by Dr. S. S. Moffatt, of Washington, D. C. Married; sterile. Had been a victim of dysmenorrhea from girlhood. Four years previously to consulting me she underwent an operation for the removal of a large ovarian cyst. She did not convalesce well, and there was left behind a distressing hernia of the abdominal wound. The dysmenorrhea became more marked after the removal of the cyst.

Dr. Moffatt had exhausted all ordinary measures to overcome the dysmenorrhea. I therefore reopened the abdomen in January, 1891, removed the appendages of the opposite side, and stitched the uterus to the anterior abdominal wall. The scar tissue of the old wound was entirely removed and, owing to the thickness of the abdominal walls, wire tension sutures were introduced. The wound was then closed with silk sutures. The patient was exceedingly nervous and her mental condition closely bordered on insanity. She made a somewhat tedious convalescence, but finally recovered. There have been no signs of menstruation since the operation and the uterus remains permanently fixed in front.

CASE IV.—*Gonorrheal Salpingitis; Ventral Fixation of Uterus.*—Mrs. P., æt. 28. Referred to me by Prof. George H. Quay, of Cleveland. Very fleshy; suffered from pelvic distress and pain during the previous eight years. She came to me first for an abscess of the vulvo-vaginal glands. Examination under ether. The uterus was fixed and the appendages adherent. Laparotomy in March, 1896. Trendelenberg posture. The appendages were dug from inflammatory exudates, and the uterus fixed in front with two silk ligatures. The abdominal wound was closed with silk. She was delirious for several days follow-

ing the operation; otherwise the convalescence was uninterrupted and complete.

CASE V.—*Gastro-Hysterorrhaphy for Retroflexion with Adhesions.*—Mrs. S., æt. 23. Referred to me by Dr. F. F. Schneerer, of Norwalk, O. Had been married for three years; never pregnant. Dysmenorrhea very severe since she began to menstruate, but much worse since marriage. Uterus was retroflexed, prolapsed and adherent.

On June 15th the uterus was dilated, curetted, and packed with gauze. The abdomen was then opened, the adhesions broken up, and the uterus fixed in front with two chromacized catgut sutures. The abdomen was then closed in the usual way with three successive rows of catgut.

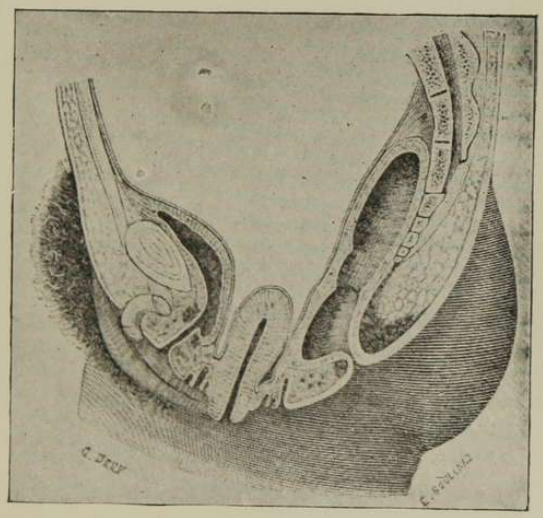
The patient convalesced uninterruptedly, and on the tenth day menstruated with almost no pain, and has been comparatively free from pain since. She writes me under date of November 25, 1897, that she is pregnant and expects to be confined in December. Gestation has been perfectly normal in every way.

CHAPTER XXXVII.

DISPLACEMENTS OF THE UTERUS.—(Continued.)

Lateral displacement of the uterus is frequently associated with the forms studied in the preceding chapter, and when slight is of no consequence. As has been shown, slight lateral version, because of the position of the rectum, is physiological. Pathologically it results, in

FIG. 166.



UTERO-VAGINAL PROLAPSE.

nearly all instances, from inflammatory exudates in one or the other broad ligament, or from tumors within the pelvis. The treatment, therefore, should be directed to the condition giving rise to the displacement.

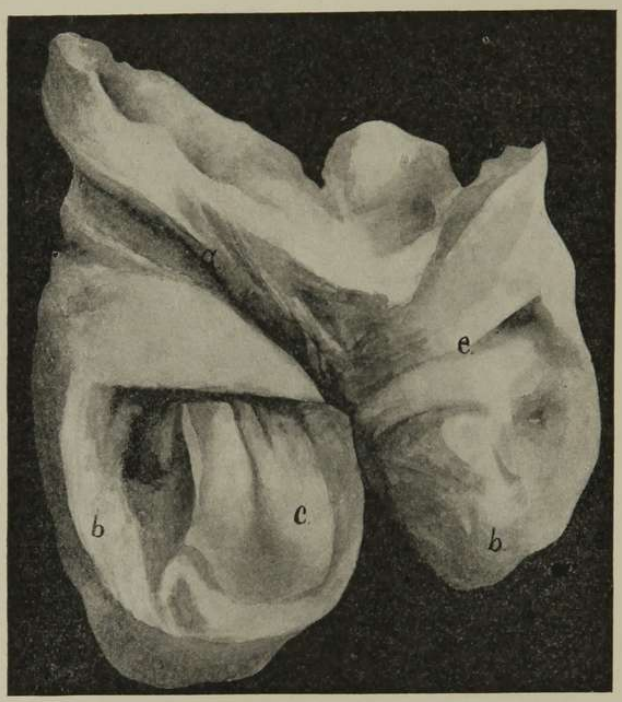
PROLAPSE OF THE UTERUS.

It is customary to speak of three degrees of prolapse or descent of the uterus. In the *first degree* the organ is somewhat lower in the pelvis than normal, though its axis corresponds to the plane of the inlet.

In the *second degree* the cervix reaches the ostium vaginæ and the axis of the uterus corresponds to the pelvic mid-plane.

In the *third degree* the uterus is wholly or in part outside of the vagina, and its axis corresponds to that of the pelvic outlet. This is known as complete procidentia (Fig. 166 and Plate XI).

FIG. 167.

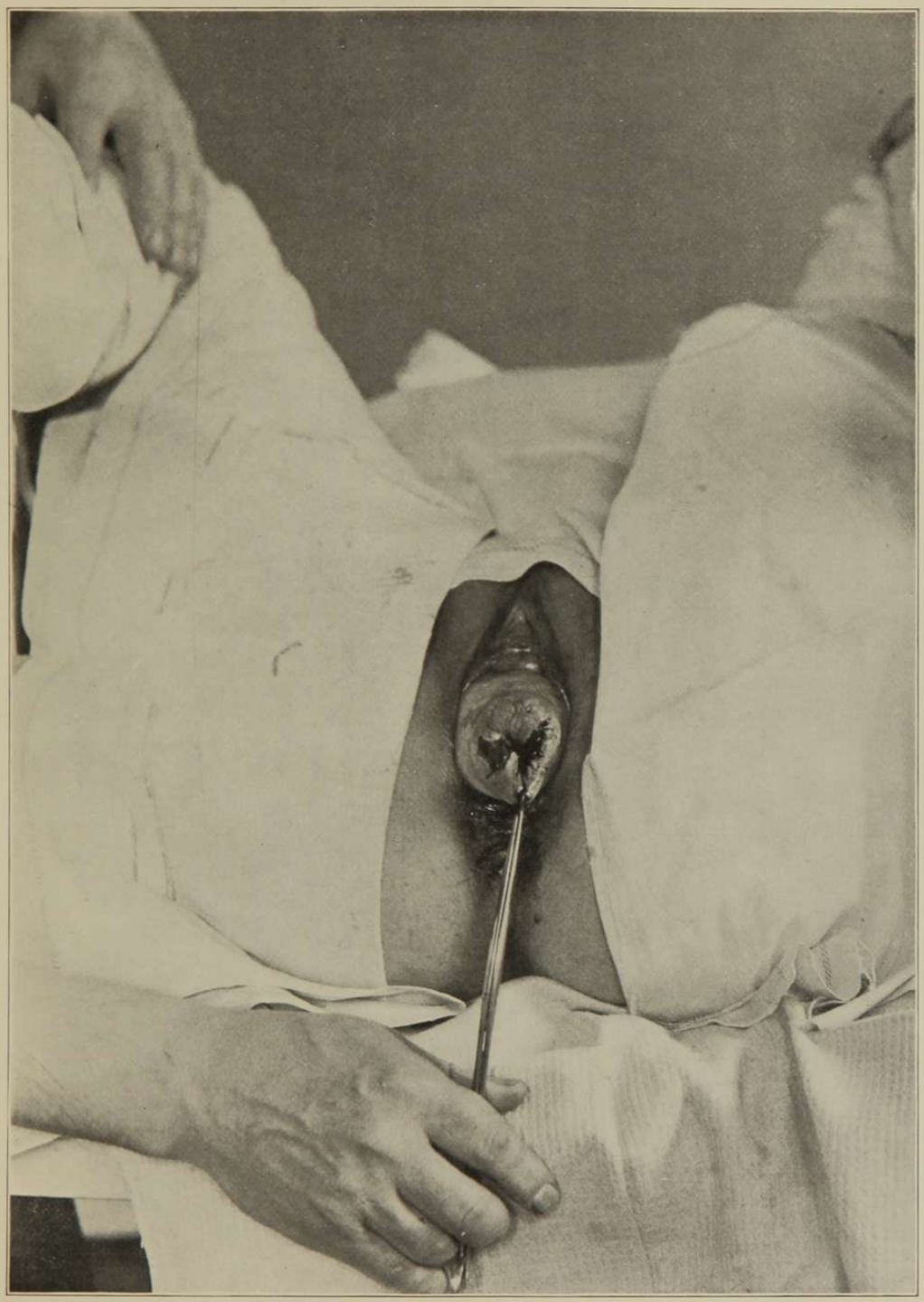


COMPLETE PROLAPSE OF THE BLADDER, UTERUS, AND RECTUM.

(*a*) Left labium; (*b*) edge of left vaginal wall, which has been cut away to expose (*c*) uterus, and (*d*) bladder; (*e*) anus, through which the rectum (*b*) protrudes for over two inches. The ovaries and broad ligaments are stretched and brought down to the level of the external labia, but are healthy in structure. The greater part of the bladder has been carried downward beyond the labia, together with the inverted anterior wall of the vagina. The patient had been thus diseased for many years. (*Museum R. C. S. Photographed by the Author.*)

Etiology.—Anything that tends to weaken or destroy any of the natural uterine supports will predispose to prolapsus uteri. Of the various causes, parturition is unquestionably the most important. The imperfect involution of the organ leaves it heavy and congested. The uterine ligaments likewise undergo imperfect involution and are, consequently, easily stretched. Added to these there is frequent relaxation and injury of the pelvic floor and fasciæ, which weakens the support from

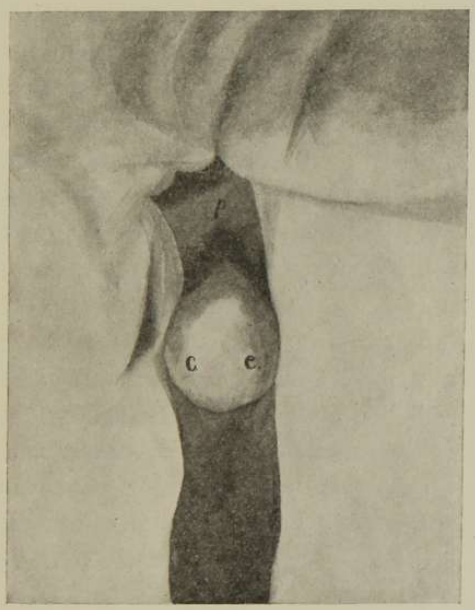
PLATE XI.



COMPLETE PROCIDENTIA OF THE UTERUS WITH ULCERATION OF THE CERVIX. (*Wood.*)

below. If, in this condition, muscular exercise is excessive, the organ is crowded more and more toward the pelvic outlet, and backward, until finally it makes its appearance externally. The mechanism is the same in nulliparæ when from any cause the connective tissue surrounding the uterus and vagina becomes relaxed. The rectum, bladder, and vagina may be prolapsed with the uterus, giving rise to rectocele and cystocele (Fig. 167).

FIG. 168.



COMPLETE PROCIDENTIA OF THE UTERUS, VAGINA, AND BLADDER. (*Wood.*)
(*p*) Pubes; (*c*) cervix; (*e*) enterocele. The cul-de-sac of Douglas is filled with intestine. From a patient aged 67.

The usual form of complete procidentia is shown in Fig. 168.

General feebleness of tissue and senility also tend to produce procidentia. The displacement is much more common in elderly women. It is often secondary to vaginal prolapse; this gives rise to straining during stool and micturition, which tends to increase the uterine prolapse.

So long as the fundus of the uterus remains directed to the front, intra-abdominal pressure tends to force it forward. When, however, the axis of the uterus corresponds to that of the vagina, intra-abdominal pressure acts continuously to force it from the vaginal orifice. The uterus must therefore be retrodisplaced before complete procidentia can occur.

Pathology.—Structural changes are usually associated with the prolapsed organ. The cervical mucous membrane is everted and erosions and even extensive ulceration from friction are of frequent occurrence. Endometritis, with metritis and hypertrophy, exists in nearly all instances. The vagina becomes markedly hypertrophied in complete procidentia and its cavity may be entirely lost by the eversion. Its rugæ are destroyed, and from long exposure to friction its epithelial layer becomes so thickened as to resemble true skin. There is, even in descensus of the first and second degrees, more or less prolapse of the anterior and posterior vaginal walls, with resultant rectocele, cystocele, and sometimes urethrocele. The uterine appendages are necessarily carried downward with the uterus and, not infrequently, are inflamed.

Symptoms.—These will depend upon the degree of the prolapse and upon the complicating factors. The most frequent subjective symptom is a bearing-down sensation. If the uterus presents externally the patient will herself suspect the cause of the trouble. Difficult or painful micturition is an early and often a prominent symptom, though, strangely enough, in some cases of complete procidentia micturition is not especially difficult. There is likewise more or less rectal irritation. The descent is increased upon assuming the erect posture, and if the procidentia is of the first or of the second degree it is relieved by lying down. Menstrual disturbances in women who have not passed the menopause are not necessarily very great, though menorrhagia may be troublesome. Walking is interfered with and the general distress is aggravated by muscular exertion, especially lifting.

Should the displacement occur suddenly, as a result of severe muscular exertion or a fall, which is rarely the case, the symptoms of shock and pressure may be most marked.

The **physical signs** are pronounced. Upon vaginal examination the uterus will be found either low down in the vagina or completely protruding from it. The degree of prolapse can best be determined by completing the examination in the erect posture. The uterus is usually increased in length. Prolapsus uteri will have to be differentiated from—

Inversion and polypus;
Rectocele;
Cystocele;
Hypertrophic elongation of the cervix.

Inversion and Polypus.—In inversion of the uterus the os cannot be found, and the bimanual will show absence of the fundus above.

PLATE XII.

Uterus shown in Plate XI. removed by the Pratt Method. Hypertrophic Elongation of Cervix. (*Wood*).

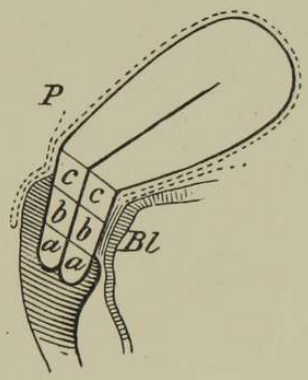
In polypus the uterus will be found above and, unless adhesions exist, can be penetrated with the sound.*

Rectocele.—This is nearly always associated with uterine prolapse. A degree of rectocele sufficiently marked to simulate complete procidentia is of exceedingly rare occurrence. The uterus will be found above the rectocele. The tumor can be penetrated per rectum, either with the finger or the sound.

Cystocele.—A sound introduced into the bladder will penetrate the tumor. The uterus is found above.

Hypertrophic Elongation of the Cervix.—The uterine cavity is greatly increased in length and the bimanual will show the fundus in its normal position.

FIG. 169.



DIVISION OF THE CERVIX INTO VAGINAL, INTERMEDIATE, AND SUPRAVAGINAL PORTIONS. (*Schroeder.*)

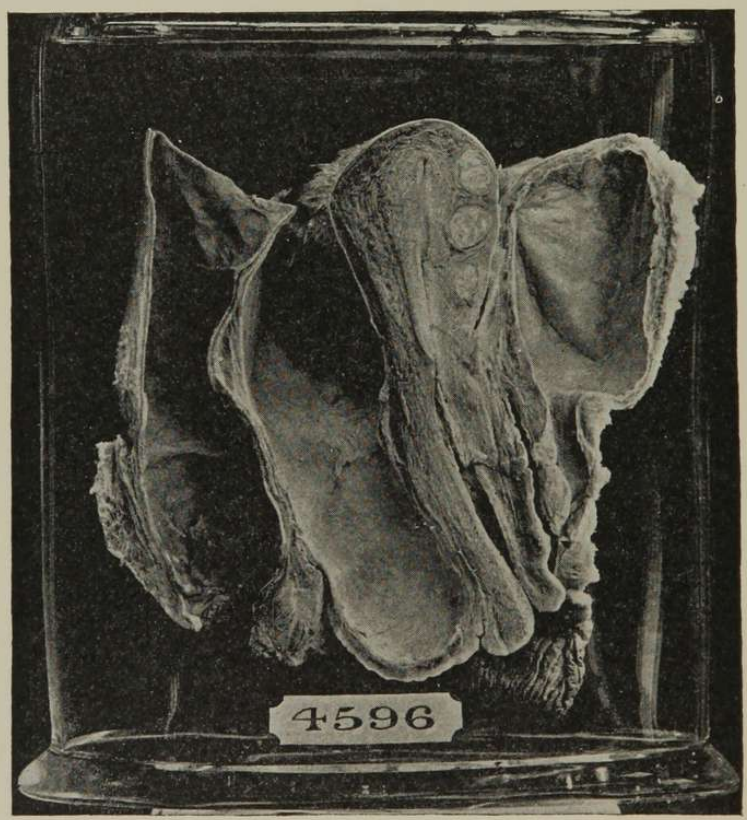
a. a. Vaginal portion; *b. b.* Intermediate portion; *c. c.* Supravaginal portion; P. Peritoneal cavity; Bl. Bladder.

Prolapsus may be associated with hypertrophy of the cervix. The cervix is anatomically divided into three portions—the vaginal, intermediate, and supravaginal (Fig. 169). If the hypertrophy is confined to the vaginal portion it is usually congenital, when the cervix projects into or from the vagina without disturbing either the bladder or the

* I once removed a soft myomatous tumor springing from the cervix which projected into the vagina and which was as large as a fetal head (*Medical Counselor*, Vol. xi, p. 116). Adhesions had obliterated the cervical canal and at the most convex portion of the tumor there was an opening corresponding very closely to the external os. After breaking down the adhesions under ether, the sound passed into the uterine cavity for nearly five inches, so that the diagnosis was made certain. The confusion, however, without the anesthetic, was very great.

rectum. When the intermediate portion is involved it drags down with it the anterior vaginal wall and bladder without disturbing the posterior. When, however, the hypertrophy begins in the supravaginal portion it implicates both the anterior and posterior vaginal walls as well as the bladder. These facts must be borne in mind in operating for elongation of the cervix, care being observed not to open either the bladder or the pouch of Douglas. In Figs. 170 and 172 the bladder is but slightly displaced, though in Fig. 170 the cul-de-sac of Douglas is on a level with the anus. This can only be explained on the theory that posteriorly the hypertrophy began (in Fig. 170) in the supravaginal portion of the cervix, whereas in front it began in the infravaginal portion.

FIG. 170.



A vertical section of the female viscera showing hypertrophic elongation of the cervix uteri with eversion of the vagina and descent of Douglas' pouch to the level of the anus. The peritoneal surface of the body of the uterus is covered with fibrous membrane, the result of peritonitis, and in its anterior wall are three small myomatous tumors. (*Museum R. C. S. Photographed by the Author.*)

Prognosis.—This will depend upon the degree of the prolapse, the age of the patient, and the existing complications. Usually the condition becomes more and more aggravated as time goes on unless operative interference is resorted to. Prolapse of the first or of the second degree may be overcome by properly fitted pessaries. When, however, procidentia becomes complete a cure is rarely accomplished by palliative measures, although the patient may be made more comfortable by them. In nearly all cases, except when the patient is very old and complete procidentia has existed for a long time, a cure is possible by proper surgical interference.

Treatment.—An effort should first be made to remove the cause or causes of the displacement. The treatment, therefore, should be directed to chronic metritis or endometritis, if these affections exist; or to the reparation of existing tears of the cervix or injuries of the pelvic floor. All clothing should be suspended from the shoulders in order to reduce intra-abdominal pressure to the minimum. If the abdomen is pendulous the patient should wear an abdominal supporter. The bowels and bladder should likewise receive attention. Excessive

FIG. 171.

MARCKWALD'S METHOD OF AMPUTATING THE CERVIX IN HYPERTROPHY. (*Schroeder.*)

muscular exertion is, of course, injurious. The genu-pectoral posture will afford much relief, bringing rest to the uterine supports. When the uterus can be got into the vagina, astringents, such as the saturated solution of alum, or powdered tannin sprinkled upon glycerin tampons, will do much good.

If hypertrophic elongation of the cervix exists the lips should be

amputated according to the method of Marckwald (Fig. 171). This is done by splitting the cervix laterally and excising a wedge-shaped mass from each lip, after which the vaginal and cervical mucous membranes of each lip are stitched together with interrupted catgut or silver wire sutures. Hegar removes the tissues by a circular amputation, and attaches the vaginal to the cervical mucous membrane with a circular row of interrupted sutures. The bladder must be previously located by means of a sound. Care must also be observed not to injure the rectum or pouch of Douglas.

FIG. 172.

HYPERTROPHIC ELONGATION OF THE CERVIX WITH PROLAPSE.

A median vertical section of pelvic organs of an adult female. The cervix uteri is much hypertrophied and elongated. The vagina is prolapsed, being completely everted. In descending with the vagina the uterus has drawn down its peritoneal investments. The walls of the bladder are thickened. (*Museum R. C. S. Photographed by the Author.*)

Some difficulty may be experienced in replacing the uterus in complete procidentia. Before attempting to do so the rectum and bladder should be emptied. If necessary the patient can be placed in the genu-pectoral posture, when pressure upon the cervix is made and the prolapsed uterus pushed upward. Too much force should not be exerted, especially in elderly women, as there is danger of producing sloughing.

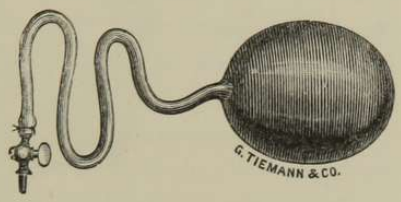
In many instances the reduction requires fifteen or twenty minutes for its completion.

After the uterus is reduced an attempt should be made to sustain it in its normal position by a pessary. Slight cases of procidentia are frequently associated with more or less retrodisplacement and may be corrected by a Hodge pessary, or one of its modifications. If the

FIG. 173.

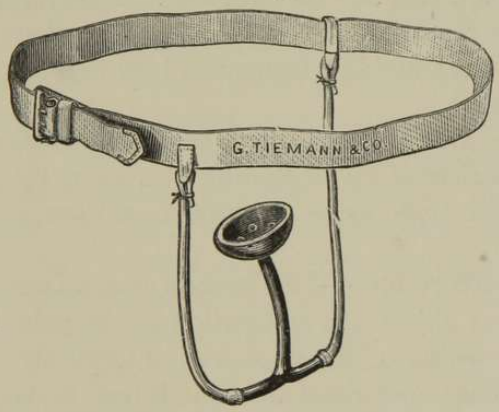
INFLATED SOFT RUBBER PESSARY.

FIG. 174.



INFLATED BALL PESSARY.

FIG. 175.

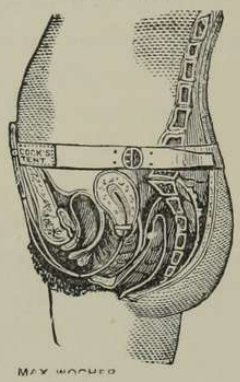


THOMAS' CUTTER'S CUP PESSARY FOR PROLAPSE.

rectocele and cystocele are at all marked, Greenhalgh's pessary with transverse bars is preferable to the ordinary form. When this instrument cannot be retained relief may be afforded by an inflated soft rubber pessary (Figs. 173 and 174). These act by distending the vagina; hence as time goes on a larger instrument will be required. Any pessary which sustains the parts by simply distending the vagina is objectionable. Nevertheless, every now and then cases will be met with where operative interference is impracticable, when much relief may be obtained from the use of instruments of this kind. When the sustaining power of the pelvic floor is entirely destroyed some form of vaginal stem pessary is ordinarily preferable to elastic or air pessaries. Of these

Thomas' modification of Cutter's cup pessary (Fig. 175) is one of the best. Fig. 176 shows Babcock's silver stem uterine supporter in position, which acts on the same principle. The Mackintosh uterine supporters

FIG. 176.



BABCOCK'S UTERINE STEM PESSARY.

have also been much used for this purpose. Any form of vaginal stem pessary should be removed at night while the patient is in the recumbent posture, and she should be instructed how to reintroduce the instrument upon arising.

In all instances where the patient cannot tolerate a pessary, much relief will be experienced by sustaining the parts by properly applied tampons medicated with some astringent solution, or with powdered tannin.

Operative Interference.—The various operations for uterine prolapse have for their object the restoration of the pelvic floor and perineum and the narrowing of the vagina by anterior and posterior colporrhaphy. After these operations are done it may be necessary to fix the uterus from above to the anterior abdominal wall. These various operations are described in Chapter LII. *Episeiorrhaphy* alone is now rarely resorted to for procidentia. In most instances where entire reliance is placed upon it for the purpose of keeping the uterus within the vagina, prolapse again takes place.

Dr. E. C. Dudley has recently described * a new operation for prolapse which he terms *lateral elytrorrhaphy*. The operation is performed by placing the patient in the Sims posture and holding the cervix well back by means of a suture which attaches the posterior lip to the lip of the internal blade of the speculum, a hole being made in the latter for that purpose. A semicircular denudation, one-third of an inch wide, is

* American Journal of Obstetrics, December, 1894.

then made on the vaginal wall on either side of the cervix, their concavity looking towards the cervix. These are closed upon themselves by passing silkworm gut sutures through their long diameter. Next, a strip, one-fourth of an inch wide, is denuded along each lateral sulcus, which extend from the lower point of the former denudation to either side of the orifice of the urethra. These are closed by a series of interrupted sutures which are passed obliquely from without inwards. When the sutures thus placed are tied the anterior vaginal wall is made to slide upward and backward on the posterior. The result of the operation is to hold the cervix backward and the fundus forward, while the existing relaxation of the vaginal walls is overcome. If the perineum is also injured it can be repaired by one of the recognized methods.

Dudley reports uniformly good results from the operation. It has not, however, been very warmly endorsed by the profession, which is possibly accounted for by its somewhat complicated technique.

Le Fort has also devised an ingenious operation for keeping the uterus within the vagina. It consists in removing a vertical strip of mucous membrane of varying width from opposite vaginal walls and stitching the vivified surfaces together.

Gastro-hysterorrhaphy, supplemented if necessary by an operation on the perineum, vagina, and cervix, may be done when hysterectomy is not advisable. It is especially indicated if the prolapse is complicated with abdominal tumors which in themselves justify laparotomy.

As a final resort, especially in women who have passed the menopause, the uterus may be removed. Since the technique of vaginal hysterectomy has been improved upon the vaginal walls can be kept from prolapsing. Pratt's bloodless method is especially applicable to this condition (*v.* Chapter XLII). After the uterus is removed the stumps of the broad ligaments should be secured in the vaginal wound and the pelvic floor restored from below. Anterior and posterior colporrhaphy can be done at the same sitting, or subsequently, if necessary. Three years ago I operated in this way on a woman sixty-five years old whose uterus had been down into the world for twenty-one years, and who had a tear through the recto-vaginal septum two inches in depth. The rent in the septum was restored by flap-splitting at the time the uterus was removed. The patient convalesced nicely and has perfect control of the sphincter muscle.

The case shown in Plates XI and XII was dealt with in the same way. The patient had suffered from complete procidentia for ten years. The uterus was removed on February 25, 1897, by the Pratt method. The pelvic floor was completely relaxed, and was repaired at the same sit-

ting by the flap-splitting method. The stumps of the broad ligaments were stitched into the vaginal wound with chromacized catgut sutures. The peritoneum in front and behind was also stitched to the vaginal mucous membrane. There was almost no shock attending the operation, and the patient has made a complete and perfect recovery.

Prolapse of the rectum, while not distinctly a gynecological affection, may be associated with uterine prolapse (Fig. 167); or it may occur independently. The following case is so unique that I desire to record it under this head. Miss ———, æt. 34. She had had prolapse of the rectum since four years of age, and, although an educated woman, supposed for years that it was the normal condition of girls and did not worry over the matter in the least. As time passed the procidentia became more and more marked, so that the bowel would come down for four or five inches at each defecation. It could only be returned by assuming the knee-chest posture and mechanically replacing it with the fingers. At times there was a good deal of hemorrhage, but strangely enough up to a few days before the operation she experienced no serious inconvenience other than a slight incontinence of feces and gas when the bowels were loose, notwithstanding that she was the principal of a large school and her duties were arduous. Some three days previously to the operation, while sitting on a commode, she cut herself seriously, and had it not been for the timely arrival of her medical attendant, Professor George S. Quay, she would have bled to death. Immediately after the above accident she was removed to the Huron Street Hospital and examined under ether. Six inches of the bowel was easily drawn into the world; it was intensely congested and the mucous membrane was enormously hypertrophied. At the upper limit of the prolapsed tissue there was a stricture through which the index finger could barely be passed. This stricture evidently occurred during childhood from some inflammatory action, and as the fecal matter descended from above it crowded the canal before it in such a way as to create the procidentia. I was sure, too, that the cul-de-sac of Douglas had descended with the bowel, and that if an amputation were made at the upper limit of the prolapse I should penetrate the peritoneal cavity. However, I could see no other way to proceed except to make the radical operation, and so, with great care lest the exaggerated Douglas pouch should contain a loop of small intestine, removed six inches of the gut close to the anal margin. The precaution was taken to secure the proximal end of the rectum with forceps before the tissues were entirely severed so that it might not slip beyond reach.

After the amputation I found myself, as I expected would be the

case, in the peritoneal cavity. Before securing the cut border of the rectum to the skin surface I removed a V-shaped mass from the posterior portion of the sphincter and brought the divided edges of the muscle together with buried sutures of chromacized catgut. Next, quilted sutures were passed, about one inch from the cut border, into the rectum and brought out upon the skin surface at nearly the same distance. Four of these were used. This is a suture I devised to sustain the cutaneous sutures in the American operation and which I described in full at the Denver meeting of the American Institute of Homœopathy. A good sized rubber drainage tube was passed into the peritoneal cavity in front of the gut and after the tension sutures were secured the cut end of the bowel was nicely approximated to the skin surface by means of a continuous chromacized catgut suture. The patient was removed from the table in good shape and convalesced uninterruptedly. She had complete control of the bowel from the first, which she did not have before the operation, and to-day, two years later, is perfectly well.

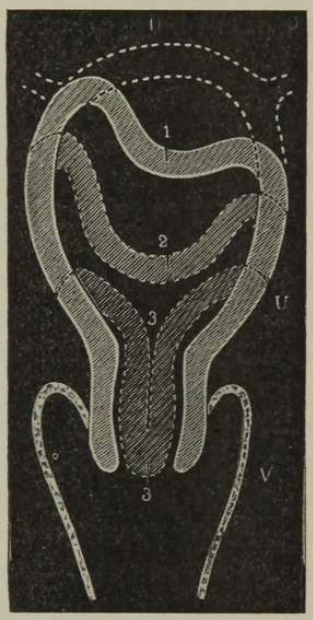
This case is somewhat unique for the following reasons: First, the degree of prolapse was much greater than is usually the case. Second, the long continued duration of the trouble before an operation was finally resorted to. Third, the manner in which the peritoneal membrane was carried down with the bowel, demonstrating most emphatically the necessity of exercising care in operating upon any form of procidentia of the rectum. And, finally, the manner in which the operation was performed. I devised the technique after the patient was placed upon the table and am not aware that just such a procedure has before been resorted to. I refer to the manner of securing the bowel with the tension sutures and to the method of overcoming the relaxation of the sphincter. At any rate, the results are all that can be wished for, and I hardly believe that the technique could have been improved upon in this particular case. As a matter of fact, I presumed, before making an examination under ether, that the condition was one of hemorrhoids, and was much surprised when I found that the bowel could be prolapsed for six inches.

Inversion of the Uterus.

The term "inversion" is applied to invagination of the uterus on itself in such a way that the organ is turned inside out. The accident may occur suddenly, as after parturition, or it may be produced gradually, the result of some intra-uterine growth. A very large per cent. of the cases reported are directly traceable to labor and the puerperal

state. It is a rare accident, occurring but once in two hundred thousand cases of labor (Montgomery).

FIG. 177.



THE SEVERAL DEGREES OF INTRA-UTERINE INVERSION REPRESENTED SCHEMATICALLY.

U, uterus; V, vagina. (*Auvard and Devy.*)

Fig. 177 shows, schematically, the several stages of uterine inversion, which may remain partial or become complete. If complete, the inverted fundus projects into the vagina, and often externally. The organ may become hard or remain soft and vascular. If the cervical canal constricts the parts, congestion is usually marked and the constriction may give rise to gangrene and sloughing. The Fallopian tubes are drawn within the inverted cup and are more or less constricted by the upper peritoneal ring. Loops of intestine may also find their way into the newly created cavity. Adhesions rarely form between the opposing peritoneal surfaces.

If the uterus is not prolapsed the position of the bladder remains unaltered; should there be prolapse, a cystocele is formed.

Etiology.—Inversion of the uterus may occur in any one of the following ways:—

1. The fundus is drawn down by improper traction upon the cord during parturition.

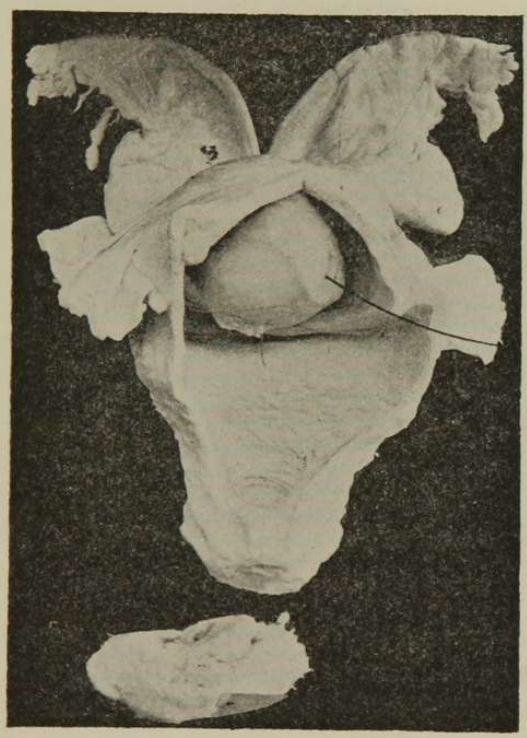
2. Prolapse of some part of the fundus is caused by degeneration of the walls of the uterus. This is made worse by uterine contractions and by pressure from above. The form of degeneration varies. Scanzoni believes it to be in most instances fatty. According to A. R. Simpson, sarcomatous degeneration is the most frequent form responsible for the accident.

3. A polypoidal tumor, either malignant or non-malignant, excites uterine contractions. The contractions force the tumor downward, dragging a portion of the fundus with it. The inversion may remain partial, the fundus not escaping from the os externum; or it may completely dilate the cervical canal and pass into the vagina or escape externally (Figs. 178 and 179).

4. Inversion from below upward may take place. Here there is first eversion of the cervix, when the lower part of the uterine body first passes into the cervical canal. This is the passive inversion of Mat-

thews Duncan, and is produced by uterine inertia and not by uterine contractions. Pressure from above, such as is made in Crede's method of extracting the placenta, may produce this form of inversion.

FIG. 178.



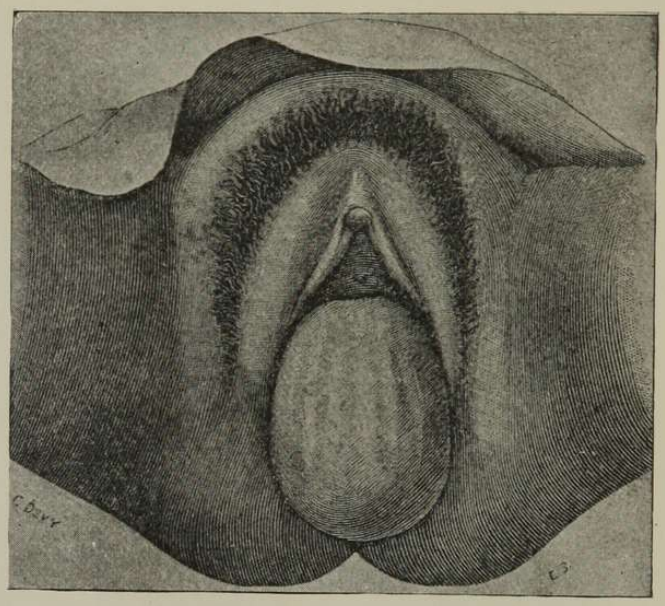
AN UNIMPREGNATED INVERTED UTERUS, WITH THE VAGINA, OVARIES AND OTHER PARTS.

Bristles are placed in the uterine orifices of the Fallopian tubes, which by the inversion of the uterus have come to open obliquely into the upper part of the vagina. Below is a polypus which was attached to the fundus of the uterus at the rough spot now seen on the side of the Fallopian tube. A ligature was applied near this attachment and it sloughed off just before the patient died. (*Museum R. C. S. Photographed by the Author.*)

It will thus be seen that the factors tending to produce inversion are those which alter the consistence and structure of the uterine tissues. During parturition the organ is, of course, greatly enlarged and the cervix dilated, so that it is a very easy matter to drag the fundus downward by improper management of the third stage of labor. General debility and wasting diseases also act as predisposing causes. Severe muscular exercise and pressure from above may force the fundus into the uterine cavity.

Symptoms.—If the inversion occurs suddenly during parturition the patient will complain of a feeling as though something had given

FIG. 179.



INVERSION OF THE THIRD DEGREE.

way, followed by a bearing-down sensation in the pelvis. The hemorrhage is usually severe. The large mass within the vagina interferes with micturition. Shock and even fatal collapse may result from the accident. If the condition is not corrected and the patient's life is spared, the symptoms of chronic inversion present themselves. These are variable. Usually hemorrhage, either in the form of menorrhagia or metrorrhagia, is the most prominent symptom; associated with the hemorrhage are pelvic pain and distress, difficult micturition and defecation, backache, painful locomotion, and the constitutional symptoms due to unnatural loss of blood. Leucorrhea is also a prominent symptom.

Physical Signs.—When *acute* the large vascular fundus will be found in the vagina, while the hand externally will fail to locate, in its usual place, the hard contracted uterus. In its stead there will be found a truncated body low down in the pelvis.

In *chronic* cases there will be detected upon digital examination a polypoidal body within the vagina which can be traced to the cervix; or if the inversion is associated with prolapse the fundus will project from the vagina. If the inversion is not complete, the fundus not hav-

ing escaped into the vagina, intra-uterine exploration will locate it within the uterus. In the event of complete eversion, the continuity of the tumor with the inner surface of the cervix will be noted. The uterine canal is much shortened and the sound will not penetrate it for more than an inch or an inch and a half. Occasionally adhesions form between the cervical canal and the fundus, so that the latter cannot be penetrated by the sound.

The bimanual is next practised. The fundus is not found in its normal position and, if the abdominal walls are not too thick, the characteristic depression can be detected. If the conditions are unfavorable for successful bimanual the absence of the fundus in its normal position may be determined by drawing the tumor within the vagina downward and examining per rectum. A sound now passed into the bladder will come in contact with the finger in the rectum, showing the absence of the uterus between the two.

By careful examination of the tumor it is usually possible to locate the opening of the Fallopian tubes.

The condition will have to be differentiated from prolapsus uteri and from hypertrophic elongation of the cervix (p. 606).

Termination.—A spontaneous cure of uterine inversion is of rare occurrence. Jewett reports* four spontaneous reductions in one hundred cases. Unless corrected the hemorrhage and discharge, together with the friction resulting from the unnatural location of the fundus within the vagina or externally, greatly prostrate the patient. There is constant danger of strangulation with consequent septicemia.

Treatment.—An effort should be made to reinvert the uterus as soon as the accident is discovered. Immediately after delivery this is not usually difficult. The placenta should be completely detached and the fundus boldly pushed upward with one hand, while pressure is exerted from above with the other. The hand should remain in the uterine cavity until the uterus contracts firmly down upon it.

In cases of long standing the treatment is much more difficult, although Audige records a case of thirty years' duration in which a cure was accomplished.

An effort may be made to restore the fundus to its normal position by—

Manual reduction;
Reduction by gradual compression;
Taxis with instruments.

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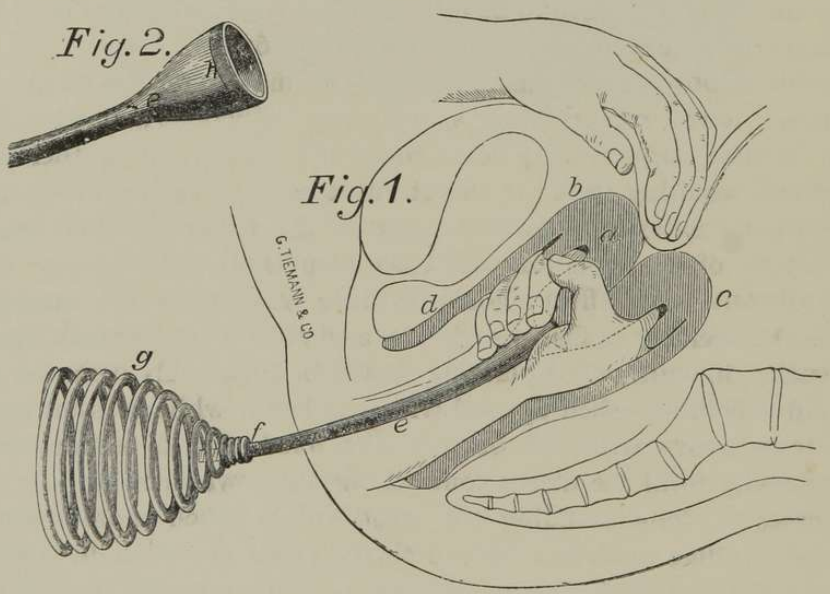
*Am. Medico-Surg. Bull., Feb. 15, 1895.

Too much persistence should not be practised. Failing with these measures, especially in chronic cases, we are then justified in resorting either to amputation or vaginal hysterectomy.

Manual Reduction.—After anesthesia the fundus is grasped with three fingers of one hand, while the other hand steadies the uterus through the abdominal wall. An attempt may be made either to reinvert the fundus *en masse*, or to reduce it gradually by inverting first one cornu and then the other. Courty makes, if necessary, several longitudinal incisions through the circular fibers of the cervix in order to overcome the contraction. He then exerts counter pressure upon the truncated end of the uterus with two fingers in the rectum, while the attempt is being made to reinvert the fundus. Tate, of Cincinnati, exerts also counter pressure through the dilated urethra, an unjustifiable procedure it seems to me. After the fundus is pushed into the uterine cavity Emmet advises closure of the cervix with sutures if the reduction is not complete.

FIG. 180.



WHITE'S UTERINE REPOSITOR.

Reduction by Gradual Compression.—The patient is prepared by hot vaginal douches and rest in bed, in order to reduce congestion as much as possible. This preparation is also important before manual reduction is attempted. Gradual pressure may be exerted by an air pessary (Fig. 174), by a cup stem pessary fixed on an abdominal belt, by a colpeurynter, or by tamponnement with iodoform gauze. Pozzi prefers the

latter method. He packs with some force long strips of gauze around and above the tumor. These are removed every two or three days. The patient is kept in a horizontal position during the treatment. Evacuation of the bowels and bladder should be carefully looked after. Pozzi maintains that this treatment will accomplish all that can be done by other methods of gradual compression, and that it possesses the advantages of being simple and safe. No special instrument is required.

Taxis with Instruments.—Special repositors have been devised for the purpose of exerting taxis. Fig. 180 represents White's repositor. It consists of a staff with a soft rubber cup attached to one extremity, which fits over the fundus, and a spiral spring attached to the other, which is applied against the chest of the operator. This instrument is useful, but long-continued pressure by it is liable to produce sloughing. Thomas' method of opening the abdomen and dilating the cervical ring with an instrument similar to a glove-stretcher is no longer recommended. J. M. Baldy,* of Philadelphia, says that he has seen the abdomen opened, the cervix dilated with dilators, and traction exerted from above with a stout cord passed through the fundus into the vagina, without avail. He, therefore, considers all of these methods distinctly illogical and dangerous, and believes they should be set aside in favor of the safer method of vaginal hysterectomy after a reasonable attempt has been made to overcome the inversion with the vaginal tampon.

Of the *radical operations*, the inverted fundus may be amputated, or the entire uterus removed by vaginal hysterectomy. The choice between amputation and hysterectomy will depend upon circumstances. As a general rule I think vaginal hysterectomy, as now practised, is the preferable operation. If the fundus is in the way, the cervix can first be secured in an elastic ligature, by which means hemorrhage is controlled, and the tissues below amputated. This step will enable the operator to remove the cervix and secure the broad ligaments with but little difficulty.

If simple amputation be resorted to, care must be observed not to permit the stump to retract into the abdominal cavity. An elastic ligature is thrown about the neck of the tumor, below which two or three wire sutures are made to transfix the cervix antero-posteriorly. The uterus is then removed half an inch below the sutures and the bleeding points of the stump secured with catgut. The edges of the wound are next approximated with the wire sutures previously passed. These are left long enough to project from the vagina, so as to prevent retraction of

* Medical and Surgical Reporter, July 25, 1891.

the stump. Superficial sutures may be placed between the deeper ones if necessary to insure perfect coaptation of the mucous membrane covering the stump. The elastic ligature is removed after the wire sutures are secured. This method is preferable to amputation by the écraseur. As a precautionary measure it might be well to apply the elastic ligature while the patient is in the Trendelenberg posture so that the intestines, should a loop be in the truncated cavity of the fundus, may not be caught in the ligature and injured.

CHAPTER XXXVIII.

MYOFIBROMATA OF THE UTERUS.

Definition.—Myofibromata of the uterus are the result of localized hypertrophy, from increased nutritive activity of the uterine muscular and connective tissue. They are composed of both connective tissue and muscular elements, and are, therefore, both fibromatous and myomatous in character. The fibrous and muscular tissue rarely exist in equal proportions, the one or the other preponderating. In by far the larger number of cases the fibrous tissue is in excess, and for this reason, until a few years ago, they were classified by all writers under the head of fibromata. Senn maintains* that all fibrous tumors containing muscular fibers should be classified with the myomata and not with the fibromata, "as the muscle fibers constitute, from a hystogenic standpoint, the essential part of the tumor." I think that the term myofibroma more clearly defines the nature of these growths.

Pathology.—When first formed, they consist largely of muscular fibers of the non-striped variety, and are simply outgrowths from pre-existing muscle tissue. Kleinwächter (*Der Frauenartz*, Berlin, Sept., 1894) claims that myomata are originally developed from the muscular coats of the arteries of the uterus; Virchow traces their origin to hyperplasia of existing muscular fibers; and Runge to round indifferent cells. Ricker† states that there is strong reason to believe that uterine myomata are of embryonic origin. Ricker believes with Coblenz that relics of the Wolffian duct are decidedly to be found in the uterine wall; and that all myomata originally arise from "some abnormal growth of muscle around the Wolffian duct in the uterine wall, or around the epithelial debris from the Müllerian duct—relics which may even be distinct diverticula not entirely effaced after the fusion of that duct with its fellow to form the uterus."

Embedded in the stroma of non-striped muscle tissue are glands lined with ciliated columnar epithelium similar to the epithelium found in the uterine glands. As time goes on these growths usually undergo fibrous

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* Pathology and Surgical Treatment of Tumors, p. 478.

† Virchow's Archiv., Vol. cxii., Nov., 1895.

transformation, the fibrous tissue developing at the expense of the muscular, although rarely, if ever, supplanting it entirely. When the muscular tissue preponderates the tumors are usually very vascular and contain large sinuses (telangeiectasis). After undergoing fibrous changes, the vessels are surrounded by a mass of fibrous tissue which has a tendency to obliterate them (Gibbes).

Varieties.—In the beginning all fibroid tumors are located in the walls of the uterus, and are, therefore, interstitial or intramural (Fig. 181).

FIG. 181.

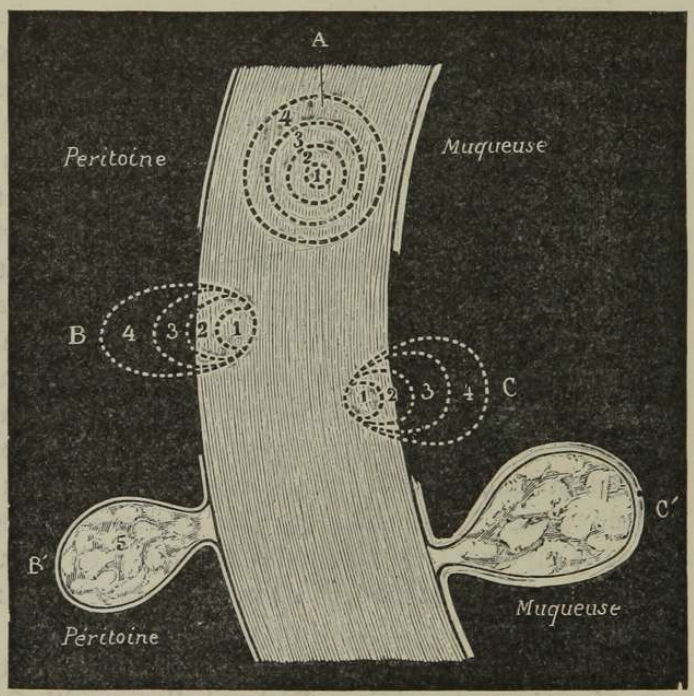
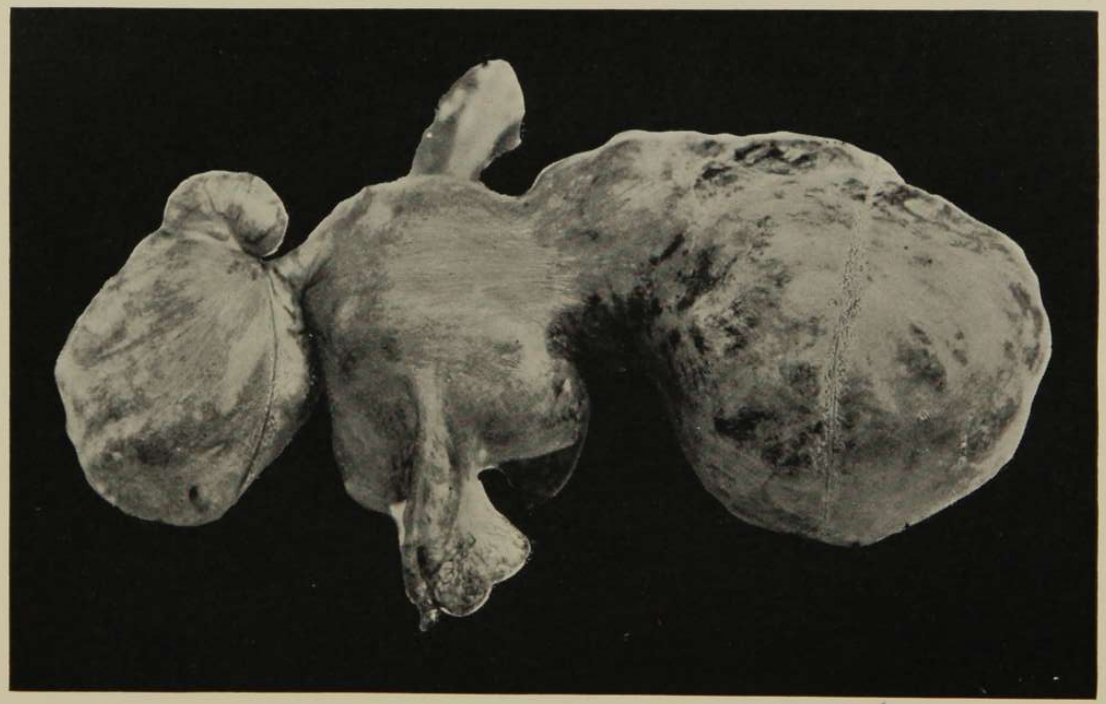


DIAGRAM SHOWING THE BEGINNING OF UTERINE MYOFIBROMATA AND THEIR MODE OF GROWTH. (*Auvard.*)

A. Interstitial tumor, which remains interstitial (1, 2, 3, 4). B. Tumor, which was at the beginning interstitial, but which has developed in the direction of the peritoneum, becoming gradually transformed into a pedunculated subperitoneal tumor, B′. C. Tumor, which was at the beginning interstitial, but which has developed in the direction of the uterine cavity, becoming gradually transformed into a submucous polypus, C′.

They may grow either toward the peritoneal cavity, becoming subserous (Plate XIII. and XIV.); toward the uterine cavity, becoming submucous (Plate XV.); or into the folds of one or both broad

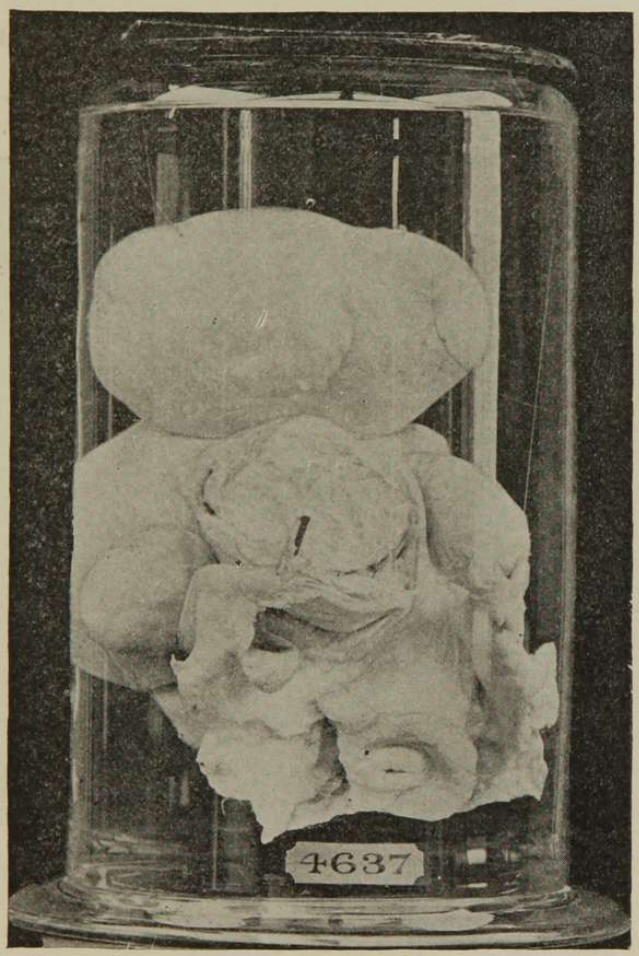
PLATE XIII.



UTERUS AND APPENDAGES WITH NUMEROUS INTERSTITIAL AND TWO LARGE SUBSEROUS MYOFIBROMATA. The smaller of the two is studded with sarcomatous nodules. A pus tube is seen hanging from below. (*Wood*).

ligaments, becoming intraligamentary (Plate XVI.). Hence, clinically, four varieties are distinguished—interstitial, subserous, submucous and intraligamentous. The tumor may, however, remain indefinitely in the walls of the uterus, assuming large dimensions. Should it approach either the serous covering of the uterus or its mucous lining, the surrounding parenchyma will be excited by its presence and the resulting

FIG. 182.



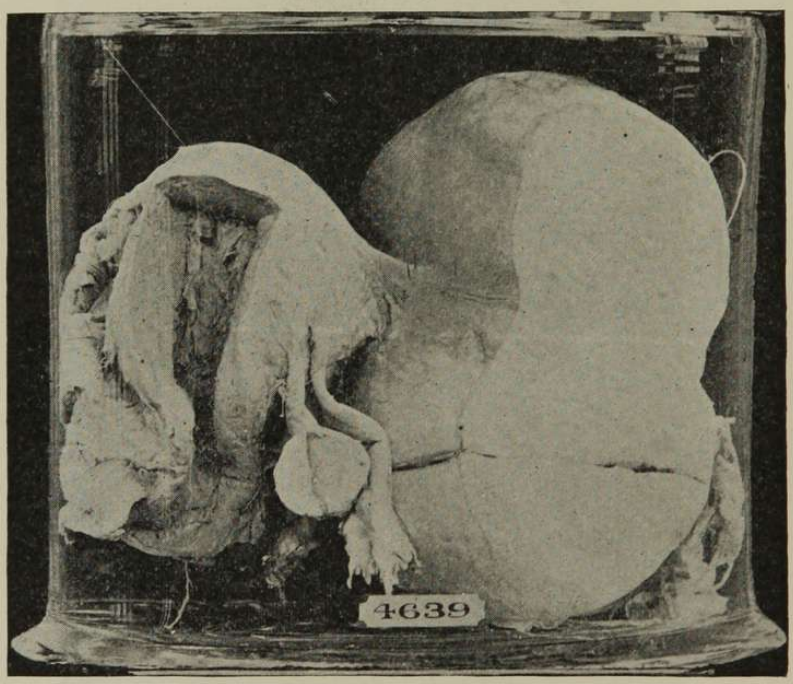
A uterus in the walls of which are eight or nine large myomatous tumors. The tumor cut open is imbedded in the posterior wall of the womb. (*Museum R. C. S. Photographed by the Author.*)

contractions will force it still farther toward the abdominal or the uterine cavity, as the case may be. Later, the broad base is often converted into a slender pedicle, producing the so-called pedunculated subserous

or the pedunculated submucous fibroid, as the case may be. The last-named condition constitutes a fibrous polypus. (*v.* Chapter XL.)

Number, Size, and Location.—The number of myofibromata varies greatly—from one to fifty. Thomas records a case where the uterus, removed from a negress, contained thirty-five tumors, varying in size from that of a marble to a fetal head. They are oftener located in the body of the uterus, but may develop in any part of the organ. The posterior wall of the fundus is the most frequent location; the rarest of all is the cervix. In size they range from that of a hazelnut to tumors weighing one hundred pounds or more.

FIG. 183.



A uterus, enlarged by pregnancy, attached to the right side of which is a perfectly solid myofibromatous tumor, ten inches in its vertical diameter. It is attached to the uterus by a thin band of connective tissue four inches in length. (*Museum R. C. S. Photographed by the Author.*)

Structure.—As already intimated, the proportion of the muscular and fibrous tissue varies greatly. When the former preponderates, the tumor is soft, vascular, and grows rapidly. The muscular fibers blend insensibly with those of the uterus. Upon section, the tumor is of a pale flesh color. If the fibrous element is in excess, the consistence is firm and it cuts like cartilage.

PLATE XIV.

Uterus Containing Multiple Myofibromata. Hematosalpinx of Right Side. (*Wood.*)

Myofibromata of the uterus are enclosed in a layer of loose fibrous tissue surrounded by a muscular layer; this is the so-called capsule. But few blood-vessels penetrate their substance, although the capsule and contiguous structures often contain large venous sinuses, which supply nutrition to the growth by transudation. Occasionally, as has been shown, they possess a cavernous structure of dilated blood-vessels (Gusserow).

Microscopically they consist of non-striped muscular fibers embedded in a fibrous stroma (Fig. 184). The fibrous tissue may be separated

FIG. 184.

MICROSCOPIC VIEW OF UTERINE MYOFIBROMA. (*Pozzi.*)

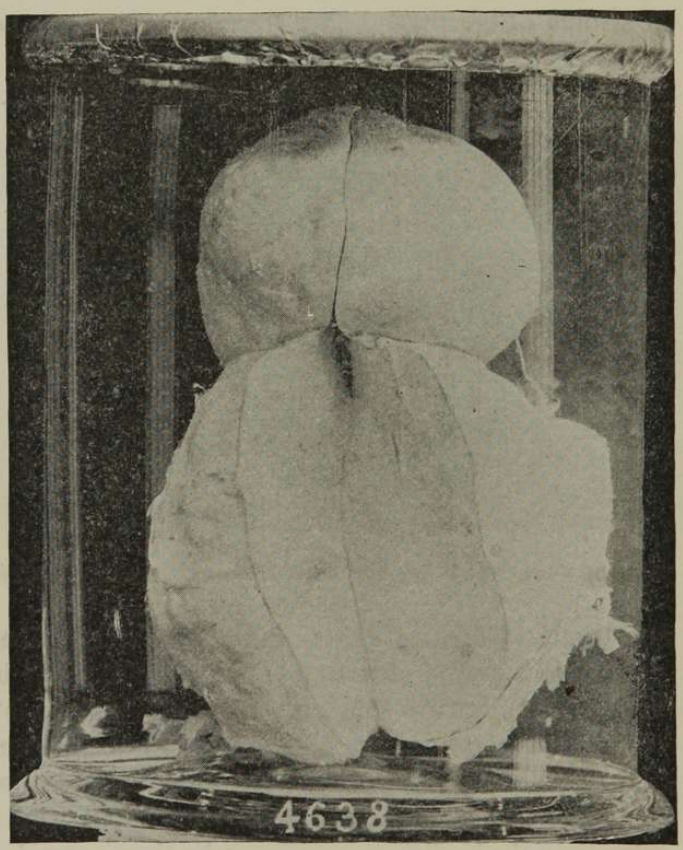
by lymphatic tissue (Klebs). Lorey has traced nerve fibers into the substance of fibroid tumors, although the substance itself is not sensitive. Submucous tumors are sensitive while the capsule is yet intact, because of the nerve supply of the mucous membrane (Freund).

Mode of Growth.—Subperitoneal tumors grow toward the peritoneal cavity. They may be either pedunculated or sessile, the size of the pedicle varying greatly in different cases. As they extend toward the peritoneal cavity they drag the uterus with them, and often greatly distort this organ. The traction induced in this way has been known to separate the body of the uterus from the cervix (Virchow). Should a tumor not find its way into the peritoneal cavity, but remain in the pelvis, incarceration may occur. Occasionally the pedicle becomes twisted, as in ovarian tumors; the result of this is edema and gangrene which may end in fatal peritonitis. Should the pedicle become completely separated, the nutrition may be maintained by the growth attaching itself to surrounding structures.

Interstitial tumors are rarely single, and many times cause an enormous increase in the dimensions of the uterine walls.

Submucous tumors are first attached by a broad base. Sooner or later pedunculation is produced by uterine contractions, though the size of the pedicle is variable. These tumors constitute the most frequent form of uterine polypi. Their presence acts as a foreign body and gives

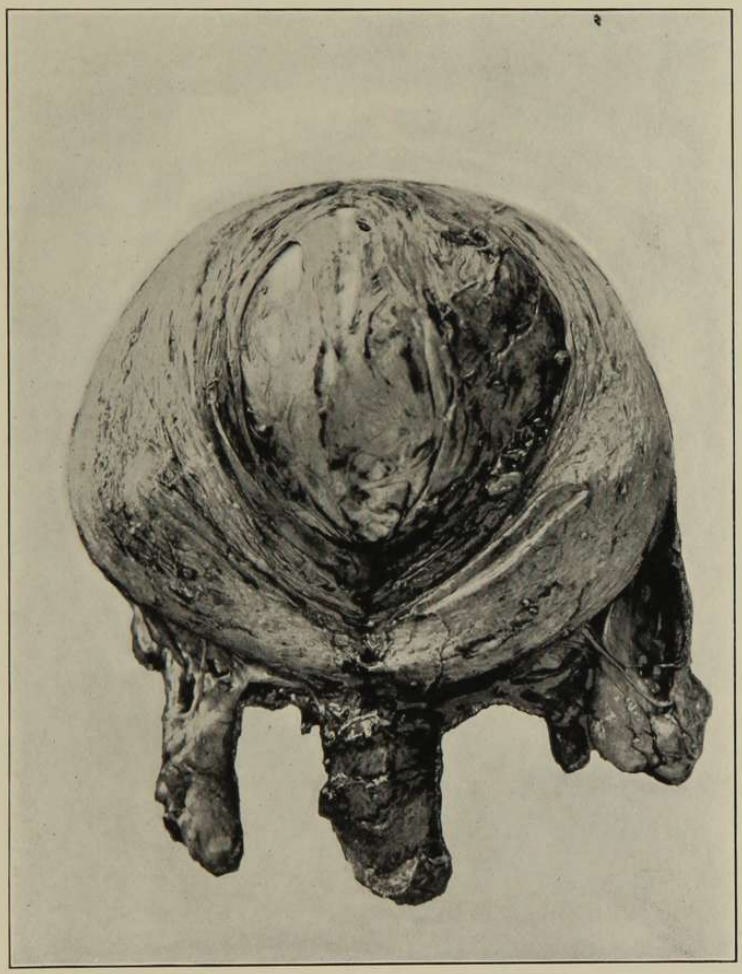
FIG. 185.



A uterus with two large fibrous tumors, which were situated between it and the rectum. They had probably grown just beneath the peritoneum of the posterior wall of the uterus and are situated one above the other. The patient was 91 years old and carried the tumor for thirty-seven years. (*Museum R. C. S. Photographed by the Author.*)

rise to uterine contractions. There is, therefore, a natural tendency for the uterus to extrude them and force them into the vagina. Should the capsule rupture they may be expelled piecemeal or *en masse*, a process known as spontaneous enucleation (Hart).

PLATE XV.



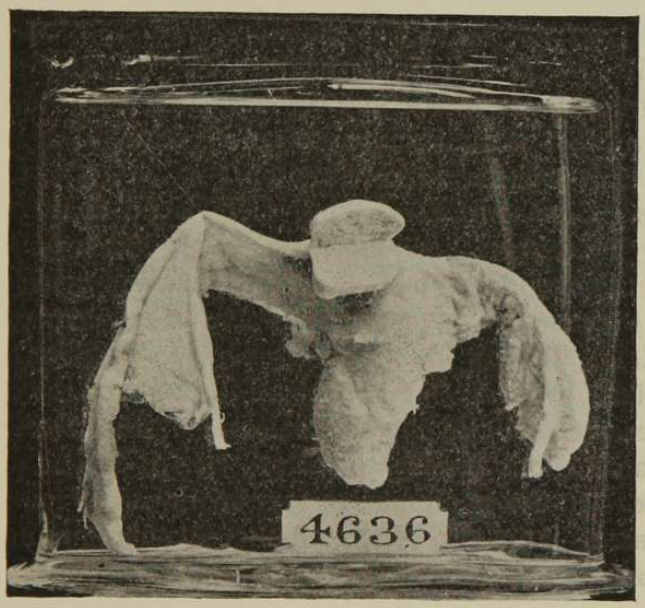
Uterus Containing a Submucous Fibroid in which Sarcomatous Degeneration has Begun. (*Wood*).

Retrogressive Metamorphoses.—These are:—

Suppuration;
Softening;
Induration;
Calcification;
Malignant degeneration.

Suppuration.—Suppuration may follow or accompany any of the other degenerative changes mentioned. It occurs much oftener in submucous than in the other two varieties. Occasionally it is met with in subperitoneal tumors. The most frequent cause of suppuration is interference with the circulation, resulting from uterine contractions. It may also be due to operative interference (Hart).

FIG. 186.



A uterus with the Fallopian tubes, ovaries, etc. A fibrous tumor of the shape and size of an ovary is attached by a broad band of peritoneum to the angle of the fundus of the uterus, near the right Fallopian tube. There are no interstitial tumors. (*Museum R. C. S. Photographed by the Author.*)

Softening.—This results from fatty or myxomatous degeneration. Gusserow has found fatty degeneration in fibroid tumors. Myxomatous degeneration gives rise to spaces between the layers of the tumor, which become distended with mucus. This may be the beginning of so-called fibro-cystic tumors of the uterus, though recent investigation points to

the lymphatic origin of fibro-cystic tumors of the uterus in the majority of instances. Edema is oftener due to twisting of the pedicle, though it may result, in interstitial growths, from pressure or thrombosis; when it occurs there is either a gradual or rapid increase in the size of the tumor.

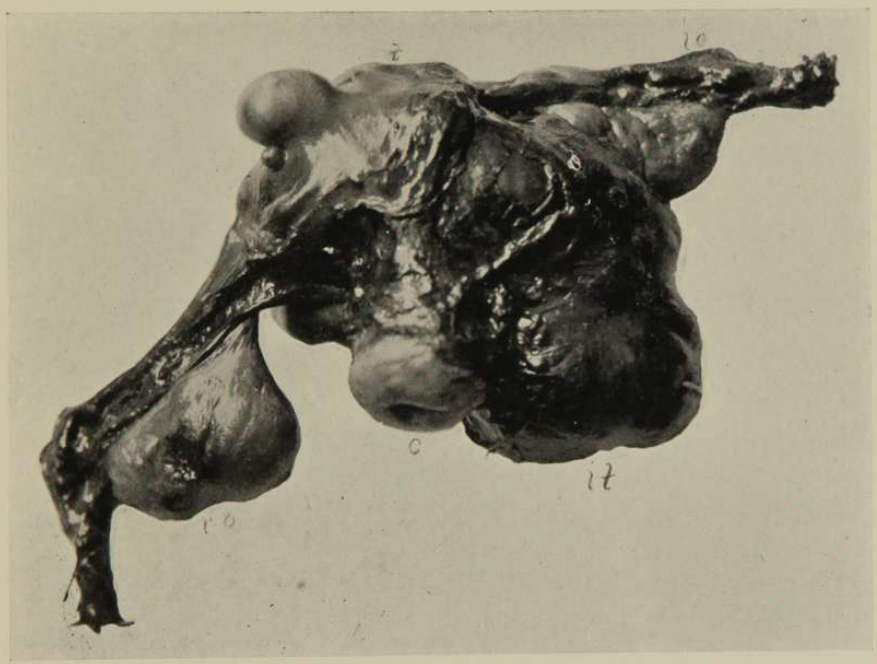
Induration.—This change is connected with the menopause, either naturally or artificially induced. It is due, according to James Y. Simpson, to atrophy and shrinking of the muscular tissue, with subsequent contraction of the fibrous.

Calcification.—Calcification is caused by a deposition of lime salts and is a species of calcareous infiltration. The growth is permeated with phosphate and carbonate of lime. I have in my possession a tumor removed post-mortem which has completely undergone this change. The entire uterus is stone-like in hardness, and the sawed surface has the appearance of a calcareous mass. The process is similar to the transformation of pulmonary tubercles which undergo cretaceous degeneration; or to the formation of a lithopedion. The resulting changes impair the nutrition of the tumor, and the mass—the so-called womb stone of the older authors—may be expelled per vaginam. Not infrequently suppuration is associated with calcification.

Sarcomatous Degeneration.—I think there is no doubt that fibroid tumors may undergo malignant degeneration. Such at least is the testimony of the majority of modern pathologists and gynecologists. I have noted sarcomatous degeneration in five of my own cases (Plates I. and XIII.). Virchow has reported several cases (Senn). A specimen is described by A. R. Simpson where the body of the tumor when cut into presented all the characteristics of a true fibroid. Several islands of sarcomatous degeneration were located in the midst of the fibrous tissue. In nearly all modern text books can be found instances of similar cases. I am also convinced that myofibromas may undergo true carcinomatous degeneration (Plate XV.). I once had under observation for three years a case of myofibroma of ten years' duration. It suddenly increased in size, and operative interference became imperative. An exploratory incision revealed not only carcinomatous degeneration of the tumor, but of nearly all of the pelvic viscera. It is hardly probable that the growth could have existed so long had it been malignant from the onset.

Martin (*Annals of Gynecology* for February, 1889) records six cases of fibroma uteri in which sarcomatous changes were met with. In all instances the patient had been under treatment by ergotin for a long time. This drug succeeded in every case in controlling the abnormal

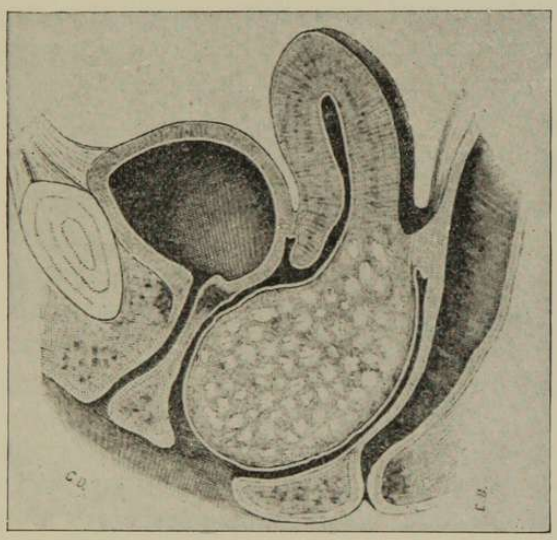
PLATE XVI.



Intraligamentary myofibroma. c, Cervix; f, Fundus; l o, Left ovary; r o, Rigth ovary containing dermoid tissue; i f, Tumor growing into folds of left broad ligament. (*Wood.*)

hemorrhages and in apparently reducing the volume of growths. This same author also notes nine cases of myoma associated with carcinoma. In some of the cases the carcinomatous disease had invaded the cavity of the uterus without extending to the tumor. Martin is of the opinion that myomas are never destroyed by carcinoma, though the two diseases may exist together. Cushing* has also recorded an instance of fibro-sarcoma of the uterus. Coe † and Liebmann ‡ have both observed uterine fibroids which have undergone cancerous degeneration, a microscopical examination showing groups of round cells invading the general fibrous structure.

FIG. 187.



FIBROID SPRINGING FROM POSTERIOR WALL OF CERVIX.

Myofibromata of the Cervix.—When myofibromata are located in the cervix, they may spring from either wall and grow downward into the cellular tissue beside the vagina, or upward toward the peritoneal cavity (Fig. 187). They greatly distort the cervix, and, because of their low position, frequently become incarcerated. Some difficulty in diagnosis may arise from the danger of confounding them with inversion of the uterus (p. 606). Fortunately, they are rarely located in this region.

* Medical Record, May, 1889.

† American Journal of Obstetrics, January, 1889.

‡ Centralblatt für Gynekologie, November, 1889.

Etiology of Myofibromata.—It is possible to study only the circumstances under which these growths appear, for as to their exact cause nothing certain is known. That there is an exaggerated local nutrition is unquestionable. But just why exaggerated local nutrition should in one instance produce an excess of fibrous tissue, in another an excess of myomatous tissue, and in still another simple hyperplasia of the uterus, or simple hypertrophy, it is hard to determine. Uterine myofibromas have never been observed as congenital tumors (Senn). From the fact that they are the most frequent new formations found in the uterus, it is evident that the cause, whatever it may be, is operative in many instances. It is estimated by Klob that forty per cent. of the women who reach the age of fifty have myofibromata. While this estimate is probably too high, there is no doubt, as is clearly shown by dead-room examinations, that a goodly per cent. of women of all ages have uterine fibroids, though in many instances their presence is not suspected during life.

Under the head of *predisposing causes* it will be necessary to note:—

Environment;
Race;
Age;
Celibacy;
Child-bearing;
Menstrual disorders;
Heredity.

Environment.—Schroeder found in his polyclinic that among the poorer classes the proportion of carcinomas to myomas was as 100 to 61; in his private practice, which was largely among the wealthier classes, it was as 100 to 332. This is in keeping with the theory that uterine congestion with resultant exaggerated local nutrition is a potent factor in the production of these neoplasms, for the overfeeding, the sedentary habits and the unnatural sexual stimulation incident to the life of the modern society woman, all tend to keep her pelvic organs blood-logged. The disparity is not so marked in the more recent statistics furnished by American authorities.

Race.—It is said that the African race is particularly liable to myomas.

Age.—The age of greatest sexual activity, 25 to 40, predisposes to myofibromata. The larger number of cases occur between the ages of 30 and 40. When met with after the menopause, it is probable that in nearly all instances they had existed for some years previously to the cessation of the flow.

Celibacy.—The statistics of different authors are conflicting as regards

the influence exerted by celibacy upon the production of myomata. Emmet believes that celibacy predisposes to their formation. On the other hand, of the 959 cases recorded by Gusserow, 672 were married women.

Child-bearing.—Sterility frequently precedes the appearance of uterine fibroids, and it was therefore supposed that the congestion incident to uninterrupted menstruation predisposes to their formation. The more probable explanation is, that the tumor or tumors existed long before giving rise to symptoms attracting attention to the uterus, and were, therefore, the cause rather than the result of sterility.

Menstrual Disorders.—The various menstrual disorders attended with congestion of the uterus and the pelvic organs predispose to the formation of myomas by bringing to the uterus exaggerated local nutrition. Here, as with sterility, it is difficult to determine in a given case whether the dysmenorrhea, which frequently precedes the detection of the tumor, is the cause or the result of the growth.

Heredity.—The statistics bearing upon this point are most unsatisfactory. It is probable that in the past hereditary influences have been very much overestimated.

From a bacteriological standpoint nothing is as yet known regarding the origin of myofibromas. It is possible that some micro-organism finds a favorable soil in the tissues of the genital tract which have been altered by congestion or inflammation and gives rise to them.

Fabricius* found in forty-two cases of myoma twenty-five instances of tubal disease. In two cases only was the disease unilateral. I have met with extensive tubal disease in twelve cases of myoma uteri. (Plates XIII and XIV). Here again it is difficult to determine the causal relation of the appendicular disease. I have elsewhere called attention to the frequent association of carcinoma uteri with lesions of the appendages (*v.* Chapter XLI).

Symptoms.—These vary greatly in different cases. They are by no means dependent upon the size of the tumor. A large growth may exist for an indefinite length of time without creating the least distress, while a small one may cause the most excruciating pain.

The symptoms can be advantageously studied under the following heads:—

Hemorrhage;
Leucorrhea;
Dysmenorrhea;

* Centralblatt für Chirurgie, Leipzig, Sept., 1895.

Pain and pressure symptoms;
Sterility and abortion.

Hemorrhage.—Hemorrhage occurs either in the form of menorrhagia or metrorrhagia. It is much more profuse when the tumor grows toward the uterine mucosa. The blood does not proceed from the body of the tumor but from the endometrium, which is hypertrophied and frequently undergoes fungoid degeneration. More or less interstitial metritis attends the growth of the tumor, which also predisposes to hemorrhage. The patient often becomes greatly exsanguinated from the loss of blood, and even sudden death may be produced by it. In case of fatal hemorrhage the blood proceeds from a ruptured uterine sinus. The quantity of blood lost by no means depends upon the size of the tumor. A small polypoidal mass projecting into the uterine cavity will sometimes give rise to a most persistent flow of blood; whereas a large interstitial or subserous myoma may not excite any hemorrhage whatever.

Leucorrhea.—The leucorrheal discharge, when it exists, is due to the same causes—endometritis and metritis—which produce hemorrhage. It is of a serous nature and, unlike that resulting from cancer, is odorless, except in those cases where necrosis of tissue has occurred.

Dysmenorrhea.—Painful menstruation results both from mechanical pressure exerted by the tumor, and from increased congestion arising from its presence. It is usually more severe in submucous growths, especially if pedunculation has begun. The pain is labor-like in character, and is due to exaggerated uterine contractions. In the interstitial and subserous varieties the suffering is due to distention of the tumor with blood at the period.

Pain and Pressure Symptoms.—Pain frequently occurs during the intermenstrual period, although it is usually aggravated by the onset of the catamenia. In those instance where the tumor is enclosed in a firm capsule and grows uniformly in all directions, it is due to the tension attending the growth of the tumor. There is a sensation of increased weight and bearing down with large tumors. Excessive pain is often excited by the pressure of the tumor upon neighboring structures, and not infrequently extends down one or both thighs. Pain from this cause may be confined either to the anterior or the posterior surface of the limb, depending upon the nerves involved. The veins passing to the lower extremities may likewise be implicated sufficiently to produce varicosis. Occasionally the ureters are obstructed, though this accident occurs less frequently with myomatous tumors than with carcinoma; nevertheless, the pressure may be great enough to give rise

to hydronephrosis. In the case referred to on page 630 there was complete obstruction of the right ureter. Dysuria from pressure upon the bladder or urethra is not an infrequent symptom. If the tumor presses against the rectum, there will be constipation, or, occasionally, diarrhea. All of the pressure symptoms are aggravated during menstruation. Should incarceration occur, complete intestinal obstruction may ensue.

Sterility.—Sterility is present in about thirty-three per cent. of all cases of myoma occurring in married women. Should conception take place, the presence of the tumor will frequently cause abortion.

Physical Signs.—Ordinarily the diagnosis is much more easily made than is the case with ovarian tumors. Great difficulty may, however, sometimes arise, especially if inflammatory symptoms are associated with the growths.

Small interstitial fibroids may be overlooked. If the conditions are favorable, the bimanual will reveal an undue thickening in some portion of the uterine wall. If in doubt, a sound should be passed, when the thickening of the wall can be more readily detected on making the bimanual. Should the tumor be located in the posterior wall, the unusual thickness of tissue intervening between the sound in the uterus and the finger in the rectum will be recognized; the localized hardness can also be determined by the finger in the rectum.

If *pedunculated submucous fibroids* do not project from the os, the cervical canal must be dilated or incised. The finger can then be introduced into the uterus and the diagnosis readily made. Care must be taken not to confound this condition with inversion of the uterus (p. 606).

The examiner will be called upon to distinguish small myomas from—

(*a*) *Ante- and Retroflexion.*—In ante- and retroflexion the tumor, which is felt through the posterior vaginal fornix, will be penetrated by the sound. Unless the fundus is adhered, it can be lifted out of its unnatural site and the presence or absence of a myoma determined by practising the bimanual.

(*b*) *Chronic Metritis.*—In chronic metritis there is usually more or less tenderness; the os is patulous and the uterus symmetrical. Many times a differential diagnosis is impossible.

(*c*) *Early Pregnancy.*—If pregnancy is suspected the sound must not be introduced. The ordinary symptoms of pregnancy are seldom wanting. The cervix is soft, and, indeed, the whole uterus when got between the two hands is much softer than it is in the case of myomas. The vulvo-vaginal surfaces possess a peculiar bluish tint

which is characteristic. It is entirely possible for conception to occur when the uterus contains one or more small tumors.

In the diagnosis of *large myomas* it will be necessary to proceed systematically. The various conditions giving rise to distention of the abdomen are fully discussed in Chapter XLV. When the tumor passes into the general abdominal cavity there will be dulness on percussion over an area corresponding to its outlines, unless at a point where a loop of intestine intervenes between it and the abdominal wall. The growth is traced by palpation into the pelvis. There may be detected upon auscultation a *bruit* or *souffle*, which is due to enlarged arteries and veins supplying the tumor. Upon vaginal examination a mass, more or less intimately connected with the uterus, will be found. It is continuous with it in interstitial and submucous growths, whereas in subserous fibroids with a long pedicle it is sometimes more difficult to determine the attachment to the uterus. Ordinarily, however, the tumor will move with the uterus when the latter is dragged down by means of the volsella. The sound will determine the length, direction, and distortion of the uterine canal. The length is not greatly, if at all, increased in subserous tumors; in the interstitial and submucous varieties the canal is usually not only increased, but greatly distorted as well.

Large myomas may be confounded with—

(*a*) *Ovarian Tumors.*—The history of menorrhagia is less marked and the uterus does not merge into the tumor, as is the case with myomas. The uterine cavity is seldom, if ever, increased in size, and unless the tumor is attached to the fundus by adhesions the uterus moves independently of it. An ovarian cyst is more soft and elastic than is a myoma. (Numerous exceptions.)

(*b*) *Advanced Pregnancy.*—The usual signs of pregnancy should be looked for: the uterus is of softer consistence; the fetal movements and heart-beats can ordinarily be detected; there is amenorrhea instead of menorrhagia. The abdomen has been more than once opened by experienced surgeons for the purpose of removing myofibromas when the enlargement was due to pregnancy. Senn has twice met with this experience, which goes to emphasize the necessity of great caution on the part of less experienced examiners.

(*c*) *Hematocele and Inflammatory Deposits.*—In the case of hematocele there will be a history of shock and collapse followed by inflammatory symptoms. If the tumor is due to inflammatory deposits, the history of inflammation can be elicited. Both inflammation and hematocele may complicate myomatous tumors.

(*d*) *Cancer of the Uterus.*—The pain is usually greater than in myomas, the discharge more offensive, and the hemorrhage more irregular (numerous exceptions). In cases of suppurating submucous fibroids it may be necessary to resort to the microscope before an accurate diagnosis can be made.

Progress and Termination.—The clinical history of the ordinary hard myofibroma and the rapidly-growing edematous myoma is usually very different. The former is hard, slow growing, and usually comes to a standstill at the menopause; the latter occurs at any age, the symptoms are more urgent, and it is seemingly not affected by the menopause or by the removal of the appendages (Tait).

Should pregnancy occur in a uterus the seat of a myofibroma, the growth may increase in size with the development of the uterus. Occasionally, *pari passu* with the process of evolution, retrograde metamorphosis, or even complete absorption, may take place. It is supposed that this is brought about by a process of fatty degeneration similar to that which the uterus undergoes during the parturient period. In three cases of small myomas observed by me the tumors disappeared after parturition.

Any of the forms of myoma may delay the menopause indefinitely. When menstruation finally ceases, and senile uterine changes are established, the tumor ordinarily stops growing because of the diminished vascularity of the pelvic organs. There are, however, innumerable exceptions to this rule.

Spontaneous cures sometimes result either by pedunculation and extrusion of the tumor, or by disintegration, the fragments being expelled per vaginam. Spontaneous expulsion in this way can only occur in interstitial and submucous tumors. It is brought about by the capsule giving way, usually the result of ulceration; uterine contraction will, in these cases, expel the tumor *en masse* or piecemeal.

Prognosis.—Uterine myomas, if uncomplicated, rarely cause death. The prognosis is much more unfavorable when the muscular element preponderates than in the hard variety of tumor. Death, when it results, may be due to hemorrhage, to uremia from compression of the ureters, to septicemia from suppuration and disintegration of the tumor, to acute peritonitis, or to malignant disintegration. According to Winckel, death ensues after a longer or shorter duration of the disease in at least ten per cent. of all cases. Fatty degeneration of the heart and so-called brown atrophy may result from large tumors. A compensatory hypertrophy of the heart is not uncommon in large tumors.

It becomes necessary, therefore, in determining the prognosis in a

given case to note the variety of the tumor, its location in the pelvis, the age of the patient (the nearer she has approached the menopause the more favorable the prognosis), and the existing symptoms, of which hemorrhage and anemia are the most important. Generally speaking, it may be said that, as regards life, the prognosis is favorable. The presence of the tumor, nevertheless, frequently gives rise to years of suffering and much anxiety. Complications are liable at any time to arise, which may place the patient's life in jeopardy.

CHAPTER XXXIX.

MYOFIBROMATA OF THE UTERUS.—(Continued.)

Treatment.

The *treatment* of myofibromata of the uterus resolves itself into (*a*) palliative and (*b*) curative.

Palliative Treatment.—In the larger number of cases nothing more than palliative treatment is called for. This should be directed to the hemorrhage, to uterine displacements if they exist, and to the pressure symptoms.

It is not always possible to control the *hemorrhage* even though all ordinary resources are exhausted. For its immediate control the recumbent posture, the internal remedy, the vaginal tampon, and the hot douche may be brought into requisition. The patient should, during the intermenstrual period, abstain from any cause tending to produce pelvic congestion. Sexual excess is for this reason pernicious, though temperate and normal sexual indulgence is not to be proscribed. Constipation will likewise give rise to congestion of all the pelvic organs. Attention should also be paid to the functions of the liver and the skin.

The remedies useful in polypi of the uterus, and in menorrhagia and metrorrhagia from other causes, are the ones most frequently indicated in the treatment of hemorrhage resulting from uterine fibroids;* and the same principles of treatment adopted for the relief of menorrhagia due to endometritis are here applicable. I have more than once succeeded in controlling hemorrhage for a greater or less length of time by the application of the sharp curette. This instrument is especially indicated if the presence of the tumor or tumors delays the menopause.

Should the immediate control of the hemorrhage be necessary the vagina will have to be plugged. In using the vaginal tampon for this purpose it should be applied in a most thorough manner. There is no better tampon material than iodoform gauze (p. 155). In most instances the excessive loss of blood can be controlled in this way. The hot douche, if its hemostatic properties are to be obtained, must be

* *v.* p. 281 and Chapter XL.

used in large quantities, and at a temperature of not less than 115° or 120° F. (p. 144).

A still more valuable palliative agent is electricity. I speak of it as a palliative agent only, because I believe that myomas are rarely if ever entirely cured by its use. Electro-puncture, as practised by Apostoli, Englemann, and others, I never use. It seems to me infinitely more dangerous than laparotomy, but galvanism applied in the usual way will frequently do much good and even check the growth of small tumors. The technique of its application is given in Chapter XI. It is only necessary at this time to add that benefit will often follow the use of the milder currents—twenty to fifty milliampéres—continued for a period of from two to six months. If carefully and intelligently localized within the uterus, a current of this strength is not dangerous and the benefit is often most marked. My experience with this agent leads me to believe that it is most useful in small interstitial and submucous myomas. I have never accomplished any good with it in the treatment of subserous growths or very large myomas of any variety. As a conservative measure, then, in the type of cases described, electricity, unless the conditions are urgent, should be faithfully tried before radical surgical treatment is decided upon.

Surgical Treatment.—In interstitial and submucous tumors the hemorrhage may be controlled by incising the investing coat through the uterus, the incision extending into the superficial layer of muscular fibers. The practice inaugurated by Amussat, and popularized by McClintock, Nélaton, and others, of making incisions at the sides of the cervical canal, is also recommended by certain authors. In both of these instances, the hemorrhage is relieved by diminishing the vascular supply of the uterus and tumor.

Radical surgical treatment will vary according to the character, the location, and the size of the fibroid. It resolves itself into:—

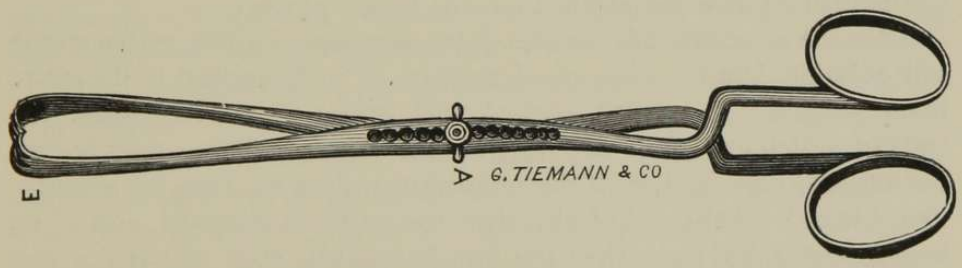
Vaginal enucleation and vaginal myomectomy;
Salpingo-oöphorectomy;
Ligature of the uterine arteries;
Vaginal hysterectomy;
Abdominal hysterectomy;
Vagino-abdominal hysterectomy; and
Supravaginal amputation or incomplete hysterectomy.

Vaginal Enucleation and Vaginal Myomectomy.—If the tumor project into the uterine cavity, and especially if pedunculation has taken place, it is entirely practicable, unless unusually large, to remove it through the vagina. However, when it is necessary

forcibly to dilate the os, incise the capsule, and shell out the tumor, the operation is not only exceedingly difficult but hazardous as well. I confess that I undertake an operation of this kind with much more hesitancy than I do an abdominal section for the removal either of the entire uterus or its appendages. Nevertheless, when the tumor makes its appearance at the external os, or is partially within the vagina, especially if the capsule is already disintegrated, an attempt should be made to enucleate and remove it per vaginam. The danger here is much less than would be incurred by abdominal section.

The patient should be prepared as for any capital operation, especial care being devoted to disinfection of the vagina (*v.* Chapter XII). It is particularly important to have the bowels and bladder emptied. The lithotomy posture is the preferable one. After being anesthetized, the parts are exposed by the aid of suitable retractors and a careful exploration made. The surgeon should determine as accurately as possible the relation of the tumor to the interior of the uterus. Pressure from above by an assistant will crowd the uterus to the outlet of the

FIG. 188.



GREENHALGH'S TUMOR FORCEPS.

vagina and will greatly facilitate the operator's manipulations; it is even possible to depress the uterus so far that a speculum is unnecessary. The operator then grasps the cervix in a strong volsella and makes a deep incision through the capsule with the point of a scalpel guarded by the finger. An effort is next made to peel the capsule from the tumor, which process is facilitated by grasping its edges with T pressure forceps. The finger should be used as much as possible for this purpose. After the tumor is exposed it is seized with strong volsella forceps (Fig. 188). By traction upon the volsella thus placed the tumor is drawn downward with a slight rotary movement, while the forefinger continues to detach the capsule.

The various cutting instruments devised for the purpose of aiding in

the process of enucleation are exceedingly dangerous, and most of the inventors have discarded them. Thomas and Mundé state that they now use Thomas' well-known spoon saw much less frequently than formerly. The great danger attending the use of all such instruments is the liability of perforating the walls of the uterus. If the finger cannot reach far enough to complete the dissection, a strong steel male sound may be used. Pozzi has devised a strong blunt enucleator, which may be used instead of the sound. By sweeping this over and around the tumor the deep lines of adhesion can be separated.

If the tumor is very large it may be necessary to incise it by means of a scalpel or scissors before it can be delivered (morcellement). Péan removes many interstitial growths by this method. He detaches the cervix, as in the first step of vaginal hysterectomy, and incises it laterally. Then by means of specially constructed forceps he removes the growth or growths piecemeal. Care must be observed, as the enucleation is about to be completed, not to invert the uterus by excessive traction. Should this accident occur, the attachments of the tumor should be cut away, the parts washed with an antiseptic solution, and the fundus returned to its normal position. It is sometimes exceedingly difficult to distinguish an inverted uterus from the tumor proper.

After the enucleation is completed the capsule is washed with a sterile salt solution and the compound tincture of iodin applied to its entire inner surface. It is then packed with strips of sterile gauze, the ends of which are left projecting from the vagina. These may be left behind for forty-eight, or if the temperature does not rise, for seventy-two, hours. At the end of this time the gauze is removed, and if no hemorrhage takes place the parts may be washed once or twice a day with the normal salt solution. Should there be marked bleeding, it will be necessary again to introduce the gauze.

The enucleation should be completed at one sitting if it is possible to do so. The exhaustion of the patient may compel the operator to desist before the mass is entirely enucleated. The danger from sepsis and hemorrhage is very great in incomplete operations. The uterine cavity should, therefore, be washed at least twice a day with a two per cent. carbolic solution, and full doses of ergot given, with the hope of expelling the remainder of the tumor by inducing uterine contractions. Should septic symptoms supervene, another attempt, which is usually successful, should at once be made to complete the enucleation.

When the tumor is pedunculated the operation is much simplified Fibroids of the cervix can nearly always be removed per vaginam.

Salpingo-oöphorectomy.—In July, 1872, Lawson Tait removed the appendages for the purpose of controlling hemorrhage caused by a bleeding uterine myoma. The result was that in a few months the hemorrhage ceased and the patient recovered perfectly.* Up to seven years ago Tait had removed the appendages in two hundred and seventy-two cases for the same purpose. He concludes most emphatically from his experience that oöphorectomy, for the purpose of controlling the intractable hemorrhage resulting from myofibromas, is a perfectly justifiable procedure. As to the results, of the fifty cases recorded up to 1882 only two proved to be failures. Of these, one was of the soft variety. Tait has met with six cases of very soft myomatous tumors, none of which were benefited by salpingo-oöphorectomy. On the other hand, Senn maintains† that salpingo-oöphorectomy yields the best results "in soft multiple myomata occurring in women from twenty to thirty years of age." I myself believe that the operation has a broad field of usefulness in bleeding tumors of medium size which otherwise do not distress the patient, especially where the more formidable one of hysterectomy is counter-indicated because of the condition of the patient. The uterus should be curetted either at the same sitting or previously. Hegar and Trenholme have also done much to popularize this method of treating myofibromas.

Salpingo-oöphorectomy for myofibromata may be either very simple or very difficult. If the tumor is small the appendages are easily secured and removed. On the other hand, when the tumor is large, and especially if complicated by adhesions, the difficulties may be not only very great but even insuperable. When one ovary is found it is wise to locate the second before securing the first, for but little relief would be afforded by the removal of one ovary only. If it is decided to proceed with the operation, the tumor is rotated in such a way as to expose as much as possible the appendages first to be removed. Inasmuch as it is not improbable that there exists a "menstruation nerve" (Johnstone) which runs the entire length of the Fallopian tube, it is important to secure the tube close to the uterine cornu. This is best accomplished by first passing a ligature (catgut or silk) around the tube and ovarian artery, as near the uterus as is possible; the ligature is tied and cut off. A second ligature is passed around the pelvic extremity of the ovarian artery, which is also tied. The tube and ovary are then encircled by the free ends of the outer ligature, secured with one hitch, and cut away while

* Birmingham Medical Review, May, 1889.

† New York Medical Journal, November, 1893.

the assistant exerts traction. By observing this precaution the danger of secondary hemorrhage is reduced to a minimum and every vestige of the appendages is removed. The stump is then touched either with the actual cautery or pure carbolic acid. I believe that the benefit to be derived from salpingo-oöphorectomy, when performed for myo-fibromata, depends quite as much upon the lessened circulation incident to tying the ovarian arteries as upon the abrogation of the menstrual function. The uterine circulation may be still more cut off by carrying a second ligature through the folds of the broad ligament of either side, nearly down to the uterine artery, and tying. Byron Robinson ligates in this way one-half or two-thirds of the uterine arteries which course along the sides of the body of the uterus to anastomose with the ovarian. The ligature should be passed by means of a blunt pointed needle to avoid laceration of the vessels. I use for this purpose a full curved Martin needle whose point and cutting edges have been ground off. The opposite appendages are secured and removed in the same manner. The abdominal wound is then closed in the ordinary way. Drainage is rarely necessary.

Ligation of the Uterine Arteries.—This is a procedure which was first suggested by Rydgier for the purpose of controlling uterine hemorrhage in bleeding myomas. Martin, of Chicago, in this country, and Gottschalk,* of Germany, have been its warmest advocates. The chief objects of the operation are summarized by Martin † as follows:—

1. By a comparatively simple procedure to deprive an abnormally over-nourished uterus of the bulk of its blood supply by ligating the main channel and trunk of the uterine arteries.

2. To still further deplete the uterus in desperate cases by including, when practicable, not only the uterine arteries of both sides, but also the ovarian artery of one side.

3. To cut off the nutrition of the uterus by ligating a large proportion of its nerve communication as well as its blood supply.

My experience in this operation is limited to one case in which it was entirely successful. I believe that it is indicated only in those instances where the patient is so exsanguinated that she cannot tolerate, or will not submit to, a more radical procedure. It is performed as follows:—

The usual antiseptic régime.

The exaggerated lithotomy position under anesthesia.

Exposure of the cervix with retractors.

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* Centralbl. f. Gynäk., No. 39, 1893.

† Jour. Am. Med. Assoc., Aug. 11, 1894.

Transfixation of cervix with a heavy guy suture.

Disinfection of cervical canal by applying impure carbolic acid.

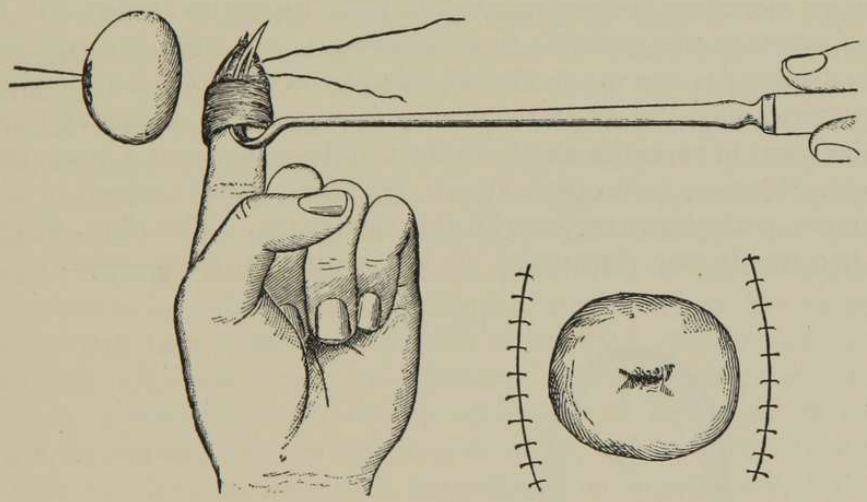
An incision one inch long on either side of the cervix in the lateral vaginal fornices.

Separation, through these incisions, of the bladder in front for a height of two inches by means of the index finger; this pushes the ureters out of the way.

A No. 3 chromacized catgut ligature is carried through the base of the broad ligament from behind forward, which includes two-thirds of its width. This is firmly tied and the opposite side dealt with in the same way.

The two incisions are closed either with interrupted or continuous sutures, the cervical guy removed, and the vagina packed with iodoform gauze. The various steps of the operation are shown in Fig. 189. I believe that a full curved needle held with a holder is preferable to a

FIG. 189.



TECHNIQUE OF TYING THE UTERINE ARTERIES. (*Martin.*)

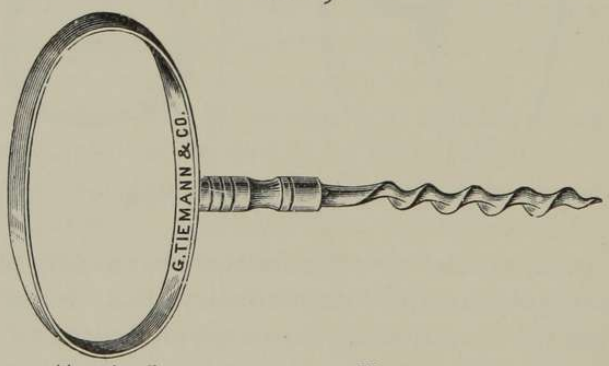
needle on a fixed handle. Martin locates the ureters by bougies before the operation is begun. I do not believe that this is necessary. I think, too, that the operation should be supplemented by the thorough application of the curette to the endometrium.

Vaginal Hysterectomy.—During the last three years many uteri have been removed through the vagina for myofibromata. This route has been especially advocated by Péan, Carle, Sänger, Terrier, and Leopold. Outside of France I do not think that vaginal hysterectomy is much

resorted to for the removal of large tumors. It is especially applicable to those growths which can be readily delivered through the parturient canal without *morcellement*. The technique of the operation does not differ from that recommended for carcinoma (*v.* Chapter XLII), except that it is not so necessary to hug the pelvic walls. In tumors larger than a fetal head I prefer the combined vagino-abdominal method.

Celiotomy for the Removal of Myofibromata.—In the first edition of this work, which was issued a little more than three years ago, I expressed myself as follows: "Only a small per cent. of fibroid tumors give rise to symptoms sufficiently urgent to justify or demand laparotomy for their removal. The operation is not warranted at all until other resources having for their object the relief of distressing symptoms have been exhausted. The conditions are very different from those which present themselves in ovarian tumors. As we have seen in studying the prognosis of fibroids, death rarely ensues from the mere presence of a uterine fibroid. Then, too, the dangers attending hysterectomy are infinitely greater than those attending ovariotomy. The average mortality in hysterectomy is from twenty to twenty-five per cent., whereas the mortality in ovariotomy is not over five per cent. This disparity is due to the greater difficulty in controlling hemorrhage in hysterectomy, the greater tendency to sepsis from sloughing of the pedicle, and to excessive shock incident to the removal of a large, solid tumor. Finally, as has been shown, the tumor usually ceases to grow after the patient passes through the menopause. Therefore, so long as her life is not threatened or her health seriously impaired by

FIG. 190.



TAIT'S CORKSCREW FOR HYSTERECTOMY.

hemorrhage or by pressure symptoms, it is not necessary to interfere with the growth except in a palliative way. On the other hand, should an interstitial or subperitoneal fibroid greatly interfere with the patient's

comfort, or threaten life because of pressure or hemorrhage, laparotomy is indicated. After the abdomen is opened the choice between salpingo-oöphorectomy and the removal of the growth can be made. If the tumor is small and intimately attached to the uterus, salpingo-oöphorectomy is undoubtedly—in the light of the statistics furnished by Tait, Hegar, and others—the preferable operation. If the tumor is large, and especially if it is of the soft, myomatous variety, it is best to end the laparotomy by removing it, together with as much of the uterus as may be necessary."

I quote thus in detail for the purpose of showing how rapid have been the strides made in the evolution of the technique of hysterectomy for the removal of myofibromata. The "pedicle problem" has been solved by doing away with the pedicle entirely, and the mortality attending hysterectomy is rapidly approaching that which attends ovariotomy. Men like A. Martin, Carle, Zweifel, Brennecke, Leopold, and others have a mortality record of from two to five per cent., an average of two and six-tenths per cent.; and out of two hundred and eighty-one operations made in the United States by various operators the mortality was but seven and eight-tenths per cent., which is less, according to Winckel, than is the mortality from the disease itself. A general adoption of the Trendelenberg posture has done much toward making these results possible. In the light, then, of these statistics we are justified in advising operative interference when a similar course three or five years ago would have been considered ill-timed and unwise. Nevertheless, there should be clearly defined indications before a hysterectomy is undertaken. It must be borne in mind that the statistics quoted have been made by men of large experience and unusual facilities. Hysterectomy, by whatever method performed, should always be looked upon as a major operation and should not be undertaken by one who has not especially fitted himself for work of the kind. I have very little patience with those men who are constantly belittling the danger attending either abdominal or vaginal hysterectomy. A careful analysis of the many cases which find their way into the journals will reveal the fact that the attendant death rate is in inverse proportion to the experience of the operator, and but a comparatively small per cent. of the fatalities find their way into print. If, therefore, a uterine myoma is quiescent, giving rise to no inconvenience in the way of pressure, deformity, or bleeding, let it alone, especially if the woman is approaching the menopause. At least nothing more than palliative treatment is here necessary. On the other hand, if it is growing, if the pressure symptoms, deformity, and bleeding are marked, and especially

if the patient is young and unmarried, an operation is justifiable after all of the facts have been presented to her and her friends. She should, however, be given the opportunity to first try one or all of the minor procedures which have been recommended if she so desires, unless radical measures are made imperative by symptoms of malignancy or by distressing complications.

Total Abdominal Hysterectomy.—The usual preparatory treatment should be carefully followed out. Especial care should be observed in rendering the vagina aseptic. The Trendelenberg posture will be found invaluable. The length of the abdominal incision should correspond to the size of the tumor. The tumor and uterus are delivered with corkscrews (Fig. 190) or a large volsella forceps (Fig. 191). The intestines are protected either with large flat gauze sponges or with long strips of gauze packed about the uterus. If necessary to keep the intestines from protruding, the abdominal wound may be partially closed with one or more provisional sutures after the tumor is eventrated. The ovarian artery of either side is next secured, outside of the ovary and tube if possible, in strong ligatures. Strong catch forceps are applied close to the uterus, and the broad ligaments severed to a point corresponding with the tissues in the grasp of the ligature. The uterine extremities of the ovarian arteries may be secured with ligatures instead of forceps if the operator prefers. Two more ligatures are now passed, which include the broad ligaments, down to the level of the internal os, and the ligaments again severed. Bleeding points from the tumor side are caught in forceps. The uterus is now separated from the bladder by making a semi-circular incision one-half inch above the vesico-uterine fold of peritoneum through the serosa only. This flap of peritoneum is separated from the tumor and cervix with the finger or scissors and the anterior vaginal fornix opened into. The dissection should hug the cervix closely in order not to injure the bladder. If necessary the bladder should be located by moderately filling it with sterile water. The dissection is carried laterally to the anterior surface of the broad ligaments, care being observed not to injure the uterine arteries. The posterior pouch is now opened into, the operator being guided by the finger of the left hand passed through the anterior opening. The remaining portion of the broad ligaments, which contains the uterine arteries, is now transfixed with a pedicle needle close to the cervix and the ligature tied. This ligature should be left long. The opposite artery is secured in the same manner, when the uterus and tumor are cut away. Usually there will be quite free bleeding from the raw surfaces left from the separa-

tion of the bladder and the rectum. Any spurting arteries should be secured with fine catgut. The peritoneum is now stitched to the vaginal mucous membrane in front and behind with running catgut sutures. This step of the operation is facilitated by gentle traction upon the sutures attached to the uterine arteries, which were left long. These sutures are now cut off and several strips of gauze carried into the vagina; or the opposing peritoneal cavity may be closed with a running catgut suture and the vagina packed from below. The abdominal wound is closed and dressed in the usual way. The gauze drain is removed from the vagina in from forty-eight to seventy-two hours.

In perfectly clean cases drainage is unnecessary and the peritoneal cavity may be entirely closed with the running catgut suture.

Vagino-Abdominal Hysterectomy is not applicable to large growths. When, however, it is possible to drag the uterus and tumor down it will be found much easier to separate the cervix from the bladder and rectum from below than from above. The uterine arteries are then secured and the base of the broad ligaments severed, when the patient is placed in the Trendelenberg posture and the operation completed from above according to the method described.

I will next briefly describe the technique of supravaginal amputation, or *incomplete hysterectomy*, *i. e.*, where the cervix is left behind.

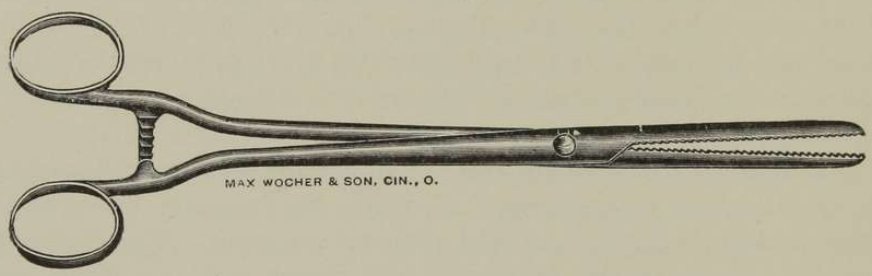
The patient is to be prepared as for ovariotomy. The abdominal incision is made in the ordinary way, except that in dealing with large tumors it is sometimes necessary to make it very long—even extending from the pubes to the ensiform cartilage. The tumor, if large, is lifted from the abdominal cavity by one or more corkscrews, or by a large volsella. The surgeon will first observe the relations of the appendages to the tumor. Should the growth spring from the fundus of the uterus, it probably has not carried the appendages with it and the ovaries and tubes will be found low in the pelvis. On the other hand, if its origin is in the lower uterine zone, the ovaries and tubes will be located high up at the sides of the growth. The bladder should be located by passing a sound into it. An elastic ligature (a piece of strong rubber tubing will answer every purpose) is thrown about the base of the tumor as far down onto the cervix as it is possible to place it. After this is drawn tight and secured in the blades of a strong catch forceps, the hemorrhage will be entirely under control. As a general rule this ligature will include the ovaries and tubes; should it not, it will be necessary to ligate and sever the appendages separately. Instead of the elastic ligature some operators

prefer to use for temporary constricting purposes either the clamp or the *serre-nœud* (Fig. 193). The tumor is now cut away two or three inches above the elastic ligature, after which the stump is cared for by one of two methods presently to be described and the abdomen closed. The after-treatment does not differ essentially from that which follows all abdominal sections.

FIG. 191.

BILLROTH'S TUMOR FORCEPS.

FIG. 192.



SPENCER WELLS' LIGHT STRAIGHT FORCEPS.

Management of the Pedicle.—A great variety of methods have been introduced for the management of the pedicle. They resolve themselves naturally into the extra- and intra-peritoneal methods.

Of the various *extra-peritoneal* methods Hegar's is probably the most simple and the one oftener used. The elastic ligature, which was placed about the pedicle for the purpose of temporarily controlling the hemorrhage, is left permanently *in situ*. The stump is then secured in the lower angle of the wound, the parietal peritoneum being stitched to that covering the pedicle below the ligature. If necessary, the ligature may transfix the pedicle instead of encircling it (Fig. 194). To prevent retraction and slipping of the ligature, it is best to transfix the pedicle above the ligature with a couple of strong transfixion pins passed transversely. The ends of the elastic ligature are permanently secured with a strong piece of silk. As much of the stump as can be is now excised, after which it is cauterized either with a saturated solution of chlorid of zinc or with the Paquelin. The elastic ligature usually comes away in ten or twelve days.

Fig. 1.

Fig. 2.

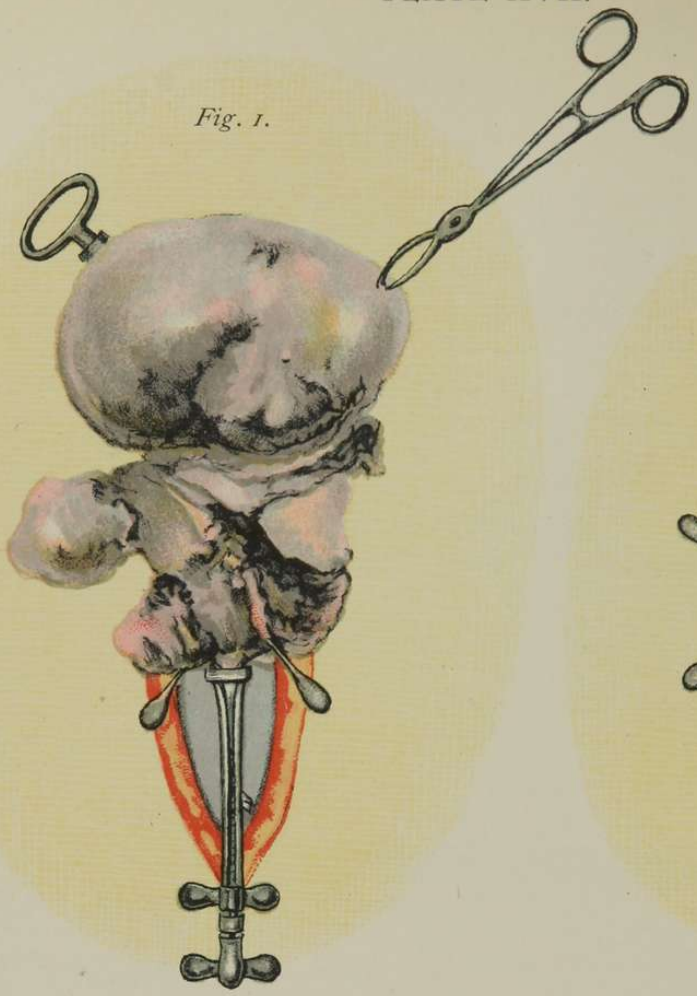
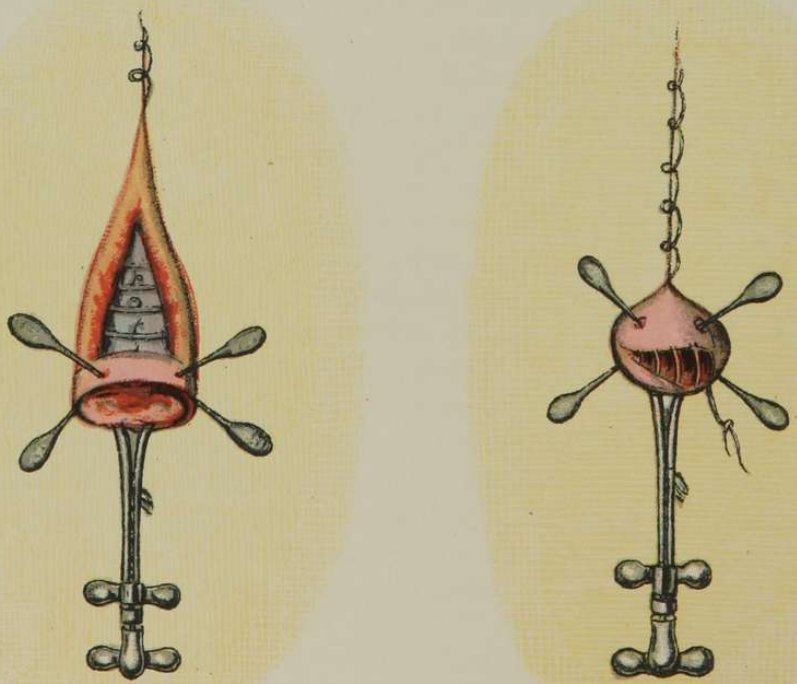


Fig. 3.

Fig. 4.



EXTRA-PERITONEAL TREATMENT OF THE STUMP. (*Wood.*)

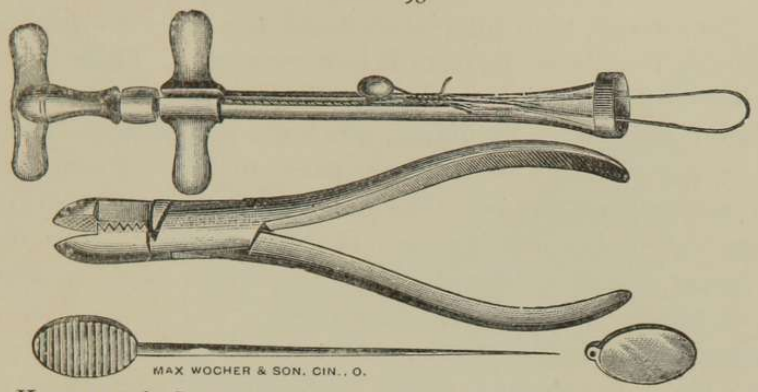
Fig. 1.—Serre-nœud applied below transfixion pins.

Fig. 2.—Uterus and tumor amputated; abdominal peritoneum stitched to peritoneum of stump below wire.

Fig. 3.—Peritoneum closed with running catgut suture.

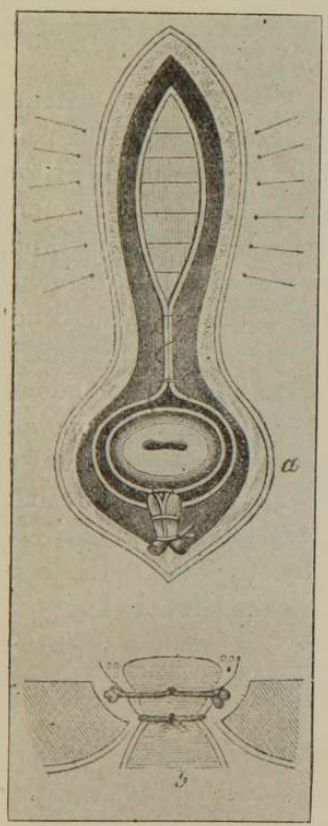
Fig. 4.—Abdominal wound closed with same; n[illegible] peritoneum.

FIG. 193.



KOEBERLE'S SERRE-NŒUD AND WILCOX'S TRANSFIXION PIN.

FIG. 194.



EXTRA-PERITONEAL METHOD OF TREATING PEDICLE. (*Hegar.*)

(*a*) Method of closing abdominal wound; (*b*) Method of transfixing pedicle by elastic ligature.

The *serre-nœud* may be used instead of the elastic ligature (Fig. 193). The wire of the *serre-nœud* is kept from slipping by two steel pins placed above it. The stump is secured in the lower angle of the wound, exactly as in the method of Hegar, the two opposing peritoneal surfaces being carefully stitched together. The cautery is applied to the surface of the stump; or its raw surface may be covered with peritoneum. (Plate XII).

Bantock's Method. — I will describe Bantock's method as he himself has carried it out many times in my presence. A temporary elastic ligature is thrown around the tumor as low down as it is possible to apply it. Frequently it includes the upper portion of the vagina. The upper half of the tumor is then cut away, leaving a stump at least four inches long. A longitudinal incision is made anteriorly through the peritoneum and underlying muscular layer, extending downward as far as the internal os. The peritoneum, together with its subjacent structures, is next stripped from the stump to a point corresponding with the lowest point of the incision in front. The wire of the *serre-nœud* is placed

around the stump thus created, but does not include the peritoneum. Transfixion pins are placed above the wire, when the stump is trimmed. The elastic ligature is now removed. There is left, as it were, a hood of peritoneum encircling the stump. This is stitched to the parietal peritoneum by quilted silkworm-gut sutures, underneath which are placed strips of iodoform gauze to prevent cutting. This hood of peritoneum not only shuts off the stump entirely from the peritoneal cavity, but catches any discharge that may drop from the stump proper. Any excess of peritoneum which projects above the surface of the abdominal wall is cut away.

This operation is ingenious and, in the hands of Bantock, most satisfactory. It is, however, a much more difficult operation than are Hegar's and Péan's, and, even in the hands of the originator, the time required for its completion is much greater.

Bantock packs about the stump iodoform gauze. If the bleeding is profuse and is not controlled by the *serre-nœud*, he carries deep sutures under the bleeding points, and ties them.

Intra-peritoneal Treatment of the Pedicle.—The mortality attending ovariotomy fell at once after the intra-peritoneal treatment of the pedicle became popular. There are many objections to the extra-peritoneal method of treating the pedicle in hysterectomy. It is necessary for the stump to slough before the ligature or *serre-nœud* cuts its way through. This is always attended with danger of sepsis, though the disintegrating process is without the peritoneal cavity. The convalescence is much more tedious than is the case in ovariotomy when the pedicle is returned to the abdominal cavity. Then, too, a vagino-abdominal fistula occasionally results, requiring for its closure a second operation.

These various objections have induced operators to experiment with the intra-peritoneal method of dealing with the pedicle; and, indeed, as we have seen, the tendency is to do away with the pedicle entirely by removing with the tumor the whole uterus, together with the cervix. Those who have especially popularized the intra-peritoneal method are Schroeder, Kelly, Sänger, Byford, and Baer. Schroeder was one of the first operators who practised the intra-peritoneal method of dealing with the stump.

The operation, as performed by most American surgeons, is as follows:—

The patient is placed in the Trendelenberg posture and the abdomen opened. The tumor and uterus are delivered if possible. A single ligature is passed next to the pelvic wall and tied. A similar ligature is passed on the opposite side. The uterine ends of the ovarian arteries

PLATE XVIII.

Fig. 1.

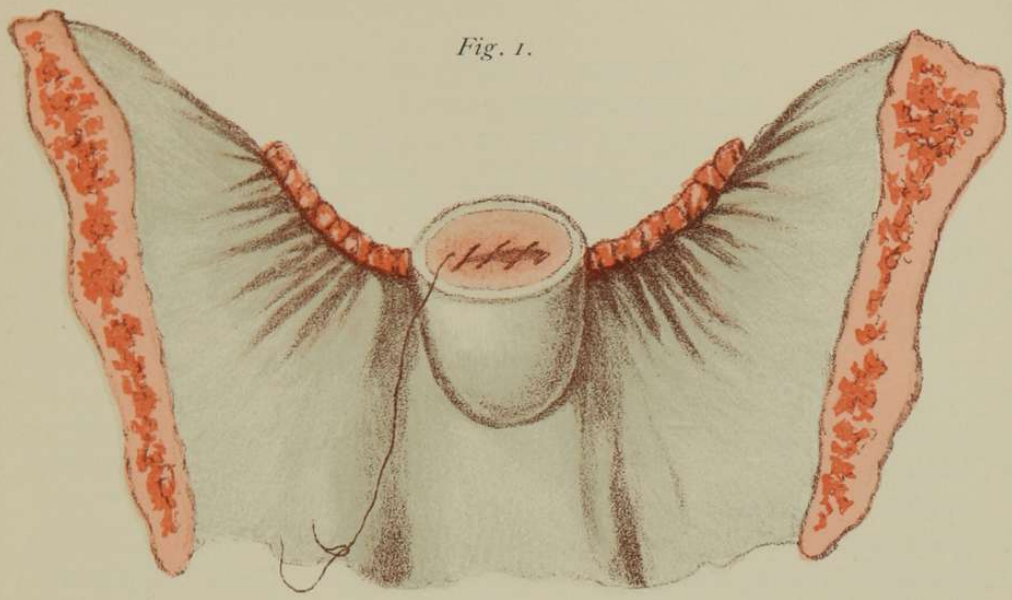
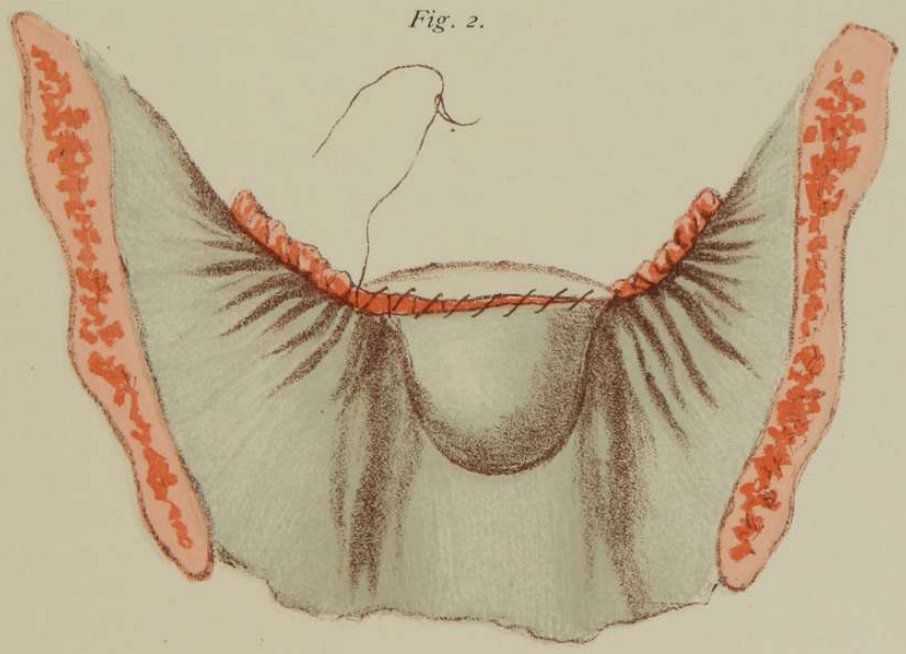


Fig. 2.



SUPRA-VAGINAL AMPUTATION OF THE UTERUS. (*Wood.*)

Fig. 1.—Broad ligaments tied en masse and cut away; stump closed by superimposed layers of catgut.

Fig. 2.—Closure of peritoneum over stump; lower stumps of broad ligaments included in suture.

are secured by two long hysterectomy forceps (Fig. 192.), one on either side close to the uterus. The broad ligaments are severed between the outer ligatures and the forceps. An incision through the peritoneum is next made to encircle the uterus two inches above its bladder reflection, and the peritoneum stripped down in front and behind to a point corresponding to the internal os. Next the uterine arteries are secured close to the cervix in order to avoid the ureters. The uterus is then amputated, and a transverse wedge of tissue excised from the stump, the cervical mucous membrane being exsected with it.

All bleeding vessels are secured with catgut ligatures. The cervical canal is touched with the Paquelin. The stump is then closed with a continuous catgut suture, which is buried in the tissues, the peritoneum being brought together over its surface by a running suture. (Plate XVIII.) The elastic ligature is finally removed, the parts thoroughly cleaned, and the stump dropped into the peritoneal cavity. The abdomen is closed without drainage.

The original operation of Schroeder has been modified by various surgeons, though the principles observed by all are much the same. A decided innovation has been made by Baer, of Philadelphia. This operator secures all of the vessels of the broad ligaments in ligatures, and does not pass a single ligature into or about the cervical tissue proper. The stump is completely covered by the taut folds of peritoneum left behind.

Kelly* removes the uterus, tumor, and appendages in the following way, which is a slight modification of Pryor's method. The operation consists of the following steps:—

1. "Opening the abdomen.

2. "Ligation of the ovarian vessels near the pelvic brim, either on the right or on the left side, clamping them towards the uterus and cutting between.

3. "Ligating the round ligament of the same side near the uterus, cutting it free, and connecting the two incisions, in order to open up the top of the broad ligament.

4. "Incision through the vesico-uterine peritoneum from the severed round ligament across to its fellow, freeing the bladder, which is now pushed down with a sponge, so as to expose the supravaginal cervix.

5. "Pulling the body of the uterus to the opposite side to expose the uterine artery low down on the side opened up. The vaginal portion of the cervix is located with thumb and forefinger, and the uterine

* Johns Hopkins Hospital Bulletin, March, 1896.

artery, seen or felt, is tied just where it leaves the uterus. It is not always necessary to tie the veins.

6. "The cervix is now cut completely across just above the vaginal vault, severing the body of the uterus from the cervical stump, which is left below to close the vault.

7. "As the last fibers of the cervix are severed or pulled apart, while the body of the uterus is being drawn up and rolled out in the opposite direction, the other uterine artery comes into view and is caught with artery forceps about an inch above the cervical stump.

8. "Rolling the uterine body still further out, the right round ligament is clamped, and cut off, and lastly the ovarian vessels are clamped at the pelvic brim, and the removal of the whole mass, consisting of uterus, tubes, and ovaries, is completed.

9. "Ligatures are now applied in place of the forceps holding the uterine artery, round ligament, and ovarian vessels. If the surgeon prefers, these may be tied as they are exposed without using forceps.

10. "After the enucleation the operation is finished in the usual way, (*a*) by closing the cervical tissue over the cervical canal, and then (*b*) by drawing the peritoneum of the anterior part of the pelvis (vesical peritoneum and anterior layers of broad ligaments) over the entire wound area, and attaching it to the posterior peritoneum by a continuous catgut suture."

In the *extra-peritoneal* treatment of the stump the pedicle is separated by pressure necrosis. In order to prevent the tissues from actually putrefying, various means have been resorted to. Bantock simply applies absorbent wool, and maintains that this alone is quite sufficient. Applications of tannin, alum, and strong perchlorid of iron have been used for the same purpose. The elastic ligature keeps up a continuous tension, which controls hemorrhage and promotes the separation of the stump. If the *serre-nœud* is used, a few turns of the screw should be made every second or third day, or oftener should there be hemorrhage. Care must be observed not to strangulate the tissues too rapidly with the *serre-nœud* or extensive sloughing may be produced. Gauze, which should be frequently changed, is kept packed around the pedicle so as to absorb all discharge. After the separation of the pedicle there is left a deep granulating excavation. Ordinarily this becomes level with the skin in the course of a week or ten days, and in the course of another week skins over.

It sometimes becomes necessary to combine the intra- and extra-peritoneal methods of treating the pedicle. In conducting the *combined treatment* where the pedicle cannot be brought outside of the abdominal

cavity without exerting too much tension upon it, it is first secured by one or more ligatures, the ends of which are fixed in the inferior angle of the wound so that the pedicle is suspended by the ligatures. The *serre-nœud* or elastic ligature may be used in the usual way. The pedicle is drawn for some distance into the abdomen while its margins are stitched to the parietal wound, so that the discharge cannot escape into the abdominal cavity. Bantock's method of dealing with the pedicle leaves behind a sufficient amount of peritoneum to permit of the adoption of this method very nicely, should it be necessary. Some operators have surrounded the pedicle with mackintosh sheeting in order to shut it off from the general peritoneal cavity (Greig Smith).

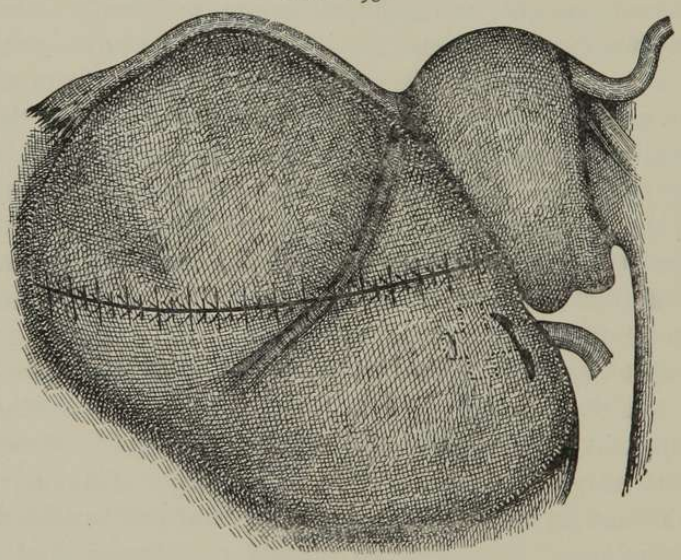
When the tumor is enucleated through the abdomen Dudley recommends, when it is possible so to do, stitching the resulting cavity into the abdominal incision and treating it as an open wound; or the cavity may be rendered extra-peritoneal by stitching its edges to the parietal peritoneum with catgut, when the abdominal incision is closed with interrupted sutures which are also carried through the edges of the uterine incision. When the oozing from the cavity persists Senn anchors the uterus with pins and packs the wound with gauze. After the bleeding ceases, usually on the third day, the gauze is removed and the wound closed with sutures. If the tumor approaches the uterine mucous membrane the latter may be incised, the tumor bed packed with gauze, which is carried through the cervix, and the incised peritoneal surface united firmly over the packing with catgut sutures. The edges of the peritoneum should be inverted.

Notwithstanding the objections which apply to the extra-peritoneal method of dealing with the stump, there is in its support the fact that the mortality, in the hands of the average operator, is somewhat less than that attending the intra-peritoneal method. Total hysterectomy is still too recent an operation to be fairly compared with either of the foregoing methods. I venture to prophesy, however, that in a comparatively short space of time it will entirely supplant the incomplete operation, except in those instances where it is necessary to expedite the work, because of the condition of the patient, by fixing the pedicle externally. No one who has witnessed the uninterrupted and almost painless convalescence of a total hysterectomy will care to return to the older method, unless, indeed, the mortality attending the more radical operation is greater. I believe that future statistics will be on the side of total hysterectomy, either abdominal, abdomino-vaginal, or vaginal. The claim made by Senn and others, that the removal of the cervix with the uterus is an unnecessary mutilation, is hardly valid, for the

reason that as a rule the cervix is more or less diseased and the patient is better off without it than with it. During the last year I removed a cervix from a woman who had submitted to supravaginal amputation, because of the pain and reflex symptoms which its presence caused. The choice of the three forms of total hysterectomy will be determined by the size of the uterus, the capaciousness of the pelvis, the thickness of the abdominal walls, and the complications in the way of adhesions.

Myomectomy.—Myomectomy, or the enucleation of large subperitoneal and interstitial fibroids through the abdominal cavity, was first introduced and popularized by A. Martin, of Berlin. He operates as follows: After controlling the hemorrhage by a temporary elastic ligature he splits the capsule by a long incision, turns out the tumor, closes the capsule by stitching its edges together with interrupted sutures, and, if it approaches the vagina, drains through this canal.

FIG 195.



MYOFIBROMA OF THE BROAD LIGAMENT; MYOMECTOMY WITH DRAINAGE PER VAGINAM. (*A. Martin.*)

Myomectomy is especially useful when the tumor is located deep in the folds of the broad ligament (Fig. 195). These tumors have no pedicle and cannot be dealt with in the ordinary way. Instead of closing the capsule, as recommended by Martin, and draining from below, it may be stitched to the abdominal incision, as recommended for incomplete ovariotomy, its cavity being tightly packed with iodoform or sterile gauze. However, when the whole uterus can be removed with the tumor this is the preferable procedure.

In pedunculated subperitoneal tumors, when the pedicle is not thicker than the finger, it can be transfixed, tied and cut off, the stump being either cauterized or covered with peritoneum. Or, if the pedicle is too large to be dealt with in this way, a wedge-shaped piece may be removed from the uterus with it and the wound closed by interposed layers of catgut. Unless the pedicle is very small in subserous and interstitial tumors, I think that supravaginal amputation is safer and more satisfactory than is simple myomectomy.

Removal of Myofibromata During Pregnancy. — Fortunately, the victims of uterine myomata are frequently sterile. When conception does occur, peculiar dangers attend gestation, although according to M. Hofmeier these dangers have been greatly exaggerated. Early abortions, which are of frequent occurrence, must be reckoned among these dangers, although premature expulsion of the ovum is in such cases to be accounted a piece of good fortune. Pregnancy in many instances causes the tumor to grow very rapidly, so that pressure symptoms soon become marked.* This is especially true of interstitial myomas and myomas springing from the cervix. Not infrequently the growth undergoes edematous softening. The *treatment* will be determined by the circumstances. In the case of pedunculated submucous tumors which project into the vagina, the pedicle should be ligated and divided. Should the tumor spring from the cervix and grow toward the vagina, an attempt may be made to enucleate it without interrupting gestation. Small subserous and interstitial tumors, situated high up, may be left unmolested if the pressure symptoms are not distressing, with the hope that pregnancy may proceed to term. On the other hand, if life is threatened by the impulse which the growth of the tumors has received, it will be necessary either to provoke a miscarriage or to open the abdomen. If the physician is inexperienced in abdominal surgery it will probably be safer for him to empty the uterus if it is possible to do so. There is, however, very great danger of fatal hemorrhage following this course. In two cases coming under my observation the hemorrhage was only controlled by applying powerful styptics directly to the endometrium. Had I again to contend with similar cases I should pack the uterus with iodoform gauze. Supravaginal amputation, in the hands of an experienced abdominal surgeon, is, in my opinion, attended with little greater danger than is the induction of abortion.

* In a goodly per cent. of cases the tumor is not seriously affected by pregnancy and in several instances I have seen growths, when small, disappear during pregnancy and the puerperum.

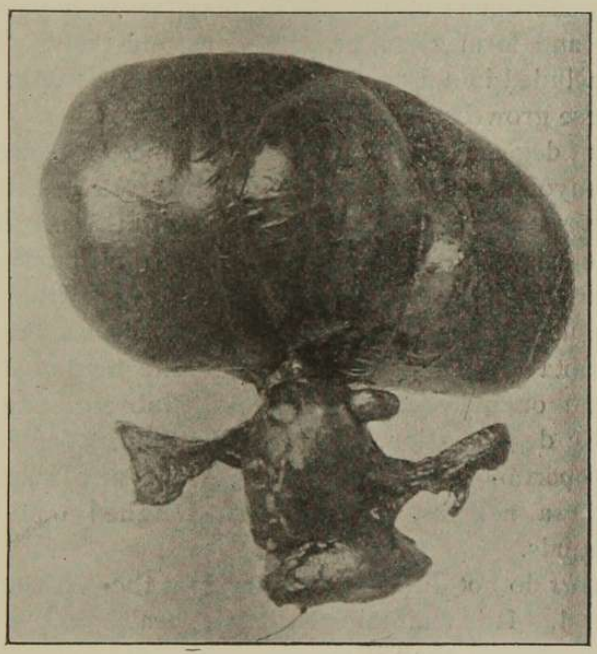
Indeed, in large tumors laparotomy is usually called for in the end, in order to relieve the embarrassed organs. In this connection, the following case is both interesting and instructive: On November 15, 1893, the late Prof. N. Schneider requested me to see with him a young woman, twenty-eight years of age, whom he saw for the first time three days previously. She had been married six months, and the menses had been suppressed for four months. Her abdomen was enormously enlarged, emaciation was extreme, and the digestion and circulation were greatly embarrassed. The abdominal enlargement was symmetrical but peculiar. It was almost pyramidal, the umbilical region being the most prominent. The tenderness was very marked. Digital examination revealed the cervix in the hollow of the sacrum, to the left, and almost obliterated. In the anterior fornix a large globular mass, continuous with the tumor above, could be distinctly felt.

Whether the body felt was an extra-uterine fetus, an intra-uterine fetus, or an adventitious growth, we could not determine. The patient declared that she felt motion up to two weeks before the examination was made. There was no history of false labor and no history of shock and collapse, such as usually attend primary rupture in extra-uterine pregnancy. The fetal heart sounds could not be heard. As a girl, the abdomen was large, though the menstrual discharge was never excessive.

It was clearly evident that the patient was dying from exhaustion induced by the pressure of the tumor, whatever its nature. She was removed to the Huron Street Hospital in an ambulance and placed under an anesthetic on November 17th, two days after our first examination. An attempt was first made to dilate the cervix and explore the uterine cavity. The sound penetrated the uterus for a distance of two inches, but, for reasons which will appear later, the fetus could not be felt with the finger. Accordingly, after plugging the uterus and vagina with gauze, the abdomen was opened. The incision, which was central, brought into full view the tumor shown in Fig. 196. An incision extending from the pubes to the ensiform cartilage was required in order to deliver it. The uterus contained a four months' fetus and the cervix contained a second tumor as large as a fetal head. This was why the finger and sound could not be made to penetrate the uterine cavity. Several smaller tumors projected from the surface of the fundus. There was but one thing to do under the circumstances, namely, remove the uterus and appendages with the tumor. In this opinion Prof. Schneider concurred. This was done by first throwing about the cervix, low down, an elastic ligature. The cervix was then amputated

above the ligature, after which the *serre-nœud* was applied and the ligature removed. The abdomen was washed with sterile water, and the utero-vesical pouch, which continued to ooze blood, was tamponed with a Mikulicz plug. This was the only form of drainage used. The abdomen was closed in the usual way. The uterus and tumor weighed twenty-four pounds.

FIG. 196.



A PREGNANT UTERUS, TOGETHER WITH A SUBSEROUS FIBROID WEIGHING TWENTY-FOUR POUNDS, REMOVED BY SUPRAVAGINAL HYSTERECTOMY. THE BRISTLE PENETRATES THE CERVICAL CANAL. (*Wood.*)

The patient rallied from the operation, but died thirteen hours later from shock. I firmly believe that had the abdomen been opened a month earlier her life might have been spared. The case is a most interesting one for several reasons: It illustrates the impulse sometimes given to the growth of myofibromata by pregnancy; it illustrates the difficulties which may attend the diagnosis of rapidly growing tumors complicating pregnancy; finally, it illustrates also the difficulties and dangers which may be encountered in attempting to empty the uterus through the cervical canal.

C. E. Fisher, J. M. Lee, Elder, Frank, J. T. Kelley, Leopold, Fehling, Hardon, Cameron, Bernardy, Murphy, Bantock, and many

others have successfully removed myofibromata during pregnancy. Fisher's and Lee's cases are recorded in the Homœopathic Text-Book of Surgery. The general concensus of opinion is that operative interference is not called for unless life is seriously threatened by the size of the tumor. If the pregnancy continues to term it may be necessary to resort either to hysterectomy or to the Porro operation.*

Fibro-Cystic Tumors of the Uterus.

Uterine myofibromata of the uterus may, as we have seen, undergo degeneration and form cysts, or, rather, pseudo-cysts. The resulting fluid is not included in a special cyst wall, hence the term "cystic," as applied to these growths, is somewhat misleading.

This form of degeneration is of rare occurrence, although it may take place in any myomatous tumor of the uterus. Its cause is uncertain. Koeberle suggests a possible lymphatic origin in certain instances (lymphangiectasis). It may also be due to myxomatous degeneration. Whatever the cause, serum finds its way between the bundles of fibrous tissue throughout the mass. The spaces thus formed are divided by septa or trabeculæ, which in time become broken down, producing one or more large cavities. Subserous tumors oftener undergo cystic degeneration. Fibro-cystic tumors sometimes grow to enormous proportions. Stackard reports a case† where the tumor removed from a negress, post-mortem, weighed one hundred and thirty-five pounds.

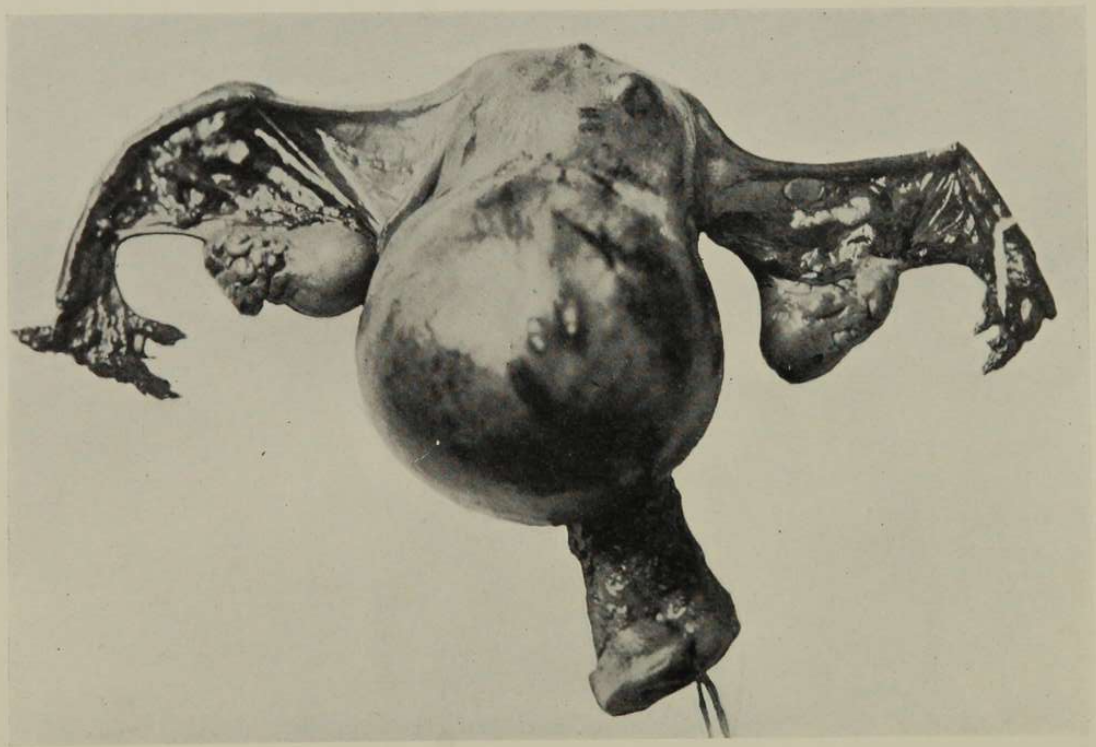
The *symptoms* do not differ essentially from those of large myofibromata in general. It is maintained that the health of the patient is less often seriously affected than is the case with solid tumors (Mundé). If the cavity or cavities are at all large, fluctuation may be detected. It is then extremely difficult to differentiate fibro-cystic tumors from ovarian cysts. As a rule, in these cases, the differentiation is not made before the abdomen is opened, the surgeon until then thinking that he has to do with an ovarian tumor. Even if tapping is resorted to there is nothing pathognomonic about the character of the fluid. It was claimed by Atlee that fluid which coagulates as soon as exposed to air, and in which is formed a colorless blood-clot, is sufficiently characteristic to distinguish fibro-cystic tumors of the uterus from ovarian cysts. Later observation has not confirmed this claim.

The examiner will, then, be led to suspect the presence of a fibro-

*Am. Journal of Obs., May, 1895, and British Gynecological Journal, Nov., 1896.

† Medical Record, Aug. 16, 1884.

PLATE XVI.—A.



Dermoid Cyst of Uterus (Posterior View).

Left ovary the size of a small egg, one half of which contains a cyst, the other half being as hard as cartilage. Vagino-abdominal hysterectomy. (*Wood.*)

cystic growth when a large, indistinctly fluctuating tumor exists for a long time without seriously compromising the general health of the patient; when physical exploration connects such a tumor with the uterus; when the uterus is drawn upward toward the abdominal cavity; and, finally, when the uterine cavity is markedly increased in size. The uncertainty of diagnosis previously to opening the abdomen is, notwithstanding the foregoing symptoms, usually very great.

The *treatment* does not differ from the treatment of myofibromata in general, except that the attachments in fibro-cystic tumors are usually more extensive and the vascularity greater. Should extirpation prove too hazardous after the abdomen is opened, the cyst cavity may be stitched to the abdominal wall, as is recommended in incomplete ovariotomy. The cavity is then packed with gauze. As a palliative measure, tapping may be resorted to when more radical treatment is not expedient. This, however, should never be done if it is possible to remove the tumor without too great risk.

Electricity is entirely inapplicable in dealing with these growths.

Dermoid Cysts of the Uterus.

The recorded cases of dermoid cysts of the uterus are extremely rare, and almost nothing is said in gynecological text-books regarding them. The patient from whom the specimen shown in Plate XVI. was taken was forty-six years of age and had been practically incapacitated for work for some years. The uterus was exquisitely sensitive on practising the bimanual and before anesthesia I thought the condition to be one of pyosalpinx. Under ether a mass as large as the double fist was found projecting from the posterior uterine wall, which was quite as hard as an ordinary myomatous tumor, though rather too symmetrical for a myoma. The uterus was removed by the vagino-abdominal method.

On opening the tumor it was found to contain a pultaceous mass which differed in nowise from that found in dermoid tumors of the ovary. The cavity of the tumor did not communicate with the uterine cavity.

Dr. W. W. Stewart, of Columbus, Ga., reports a similar case in the November, 1893, number of the *Medical Record*, except that the cyst was on the anterior instead of the posterior uterine wall. The cyst suppurated, attached itself to the anterior uterine wall and was successfully opened and drained by Dr. Stewart.

Illustrative Cases.

Case I.—*Vagino-Abdominal Hysterectomy for a Submucous Fibroid Weighing Ten Pounds; Recovery.*—Miss P., æt. 40, referred to me by

Prof. Martha A. Canfield, of Cleveland, Ohio. Patient is a professional nurse; had flooded for three or four years. First noticed tumor five years previously. During the last year the abdomen increased in size very rapidly; pressure symptoms were distressing, and deformity of abdomen very noticeable.

Operation on October 19th, 1895, at Dr. Canfield's private hospital. The vagino-uterine tissues were first separated through the vagina, and the uterine arteries secured with catgut. Patient was then placed in the Trendelenberg posture, a long incision made, and the tumor delivered with corkscrews. The broad ligaments were tied in sections and the uterus cut away; the vaginal mucous membrane and peritoneum were stitched together with running catgut sutures. Gauze drainage through vagina. Abdominal wound closed with continuous and interrupted catgut and subcutaneous silk sutures. Shock was very slight, and patient was removed from the table in good shape. Temperature never above 100° F., and the patient was walking about the room on the seventeenth day.

CASE II.—*Supravaginal Amputation for a Large Multiple Myofibroma; Extra-Peritoneal Treatment of Stump; Beginning Sarcomatous Degeneration.*—Miss C., æt. 45, referred to me by Dr. Emily Barnes Robinson, Cleveland. First noticed the tumor some twenty years ago, and for a time flooded excessively, but latterly the menstrual discharge was not exaggerated. During the year previously to consulting me, however, the constitutional symptoms became marked, and her health rapidly failed. She was emaciated, her limbs were swollen, and the skin was of a dirty straw color. The tumor extended above the umbilicus and caused much deformity.

Operation on March 17th, 1897, at Dr. Martha A. Canfield's private hospital. Tumor was delivered with the patient in Trendelenberg posture through a long incision. Owing to her weak and prostrated condition I did not dare attempt complete hysterectomy, and so transfixed the pedicle with pins, applied an elastic ligature and amputated the uterus above the pins (Plate I.). The peritoneum was carefully stitched to the stump of the pedicle, and the abdomen closed with successive layers of catgut. Patient did not have a bad symptom, and has recovered her health perfectly.

CASE III.—*Complete Abdominal Hysterectomy for Large Myofibroma of Uterus.*—Patient, æt. 52, referred to me by Dr. A. C. Buell, of Cleveland. Had suffered for years with much pelvic distress which had caused profound and even alarming melancholia. A mass was felt

in the lower abdomen, which extended above the umbilicus and was intimately attached to the uterus.

Operation made on October 15th, 1896. Trendelenberg posture; long incision. Abdominal walls very thick; tumor delivered with large forceps; peritoneum and raw surfaces closed with running catgut. Gauze drainage through vagina. Wound closed with interrupted silk. No bad symptoms at any time, and at this writing, March, 1897, the patient is perfectly well.

CASE IV.—*Large Subserous Myofibroma, Causing a Large Umbilical Hernia; Myomectomy; Salpingo-oöphorectomy; Recovery.*—Miss M., æt. 44. Enlargement of the abdomen began sixteen years ago, and steadily increased in size until her general health was greatly compromised by pressure upon the abdominal and pelvic viscera. She consulted me one year ago, at which time I advised an operation, but fell into the hands of an electrician who promised to cure her by that agent. Her distress was greatly increased by an enormous umbilical hernia, which permitted a large portion of the small intestine, the omentum, and part of the transverse colon to protrude through it.

The abdomen was opened on October 25th, 1897. An incision extending from the pubes to the ensiform cartilage was required to deliver the tumor, which proved to be a myofibroma springing from the posterior portion of the fundus. The pedicle was two inches in diameter. Several smaller tumors were located in the uterine wall. I placed an elastic ligature about the cervix, transfixed the pedicle with pins, and cut the tumor away. The ovaries and tubes on both sides were diseased, and were accordingly tied off with catgut. A *serre-nœud* was applied immediately above the fundus, and the perietal peritoneum was carefully stitched to the stump. The omentum contained six or eight cysts, varying in size from a walnut to an orange, which were emptied and tied off. Enough of the abdominal wall was cut away to destroy entirely the hernial sac. The abominal wound was closed with silk tension sutures and interrupted catgut, and the usual dressings applied. The *serre-nœud* was removed on the fourth day, and the stump of the pedicle was cut away on the tenth day. Convalescence was uninterrupted, and the patient made a complete recovery.

CHAPTER XL.

POLYPI OF THE UTERUS; THERAPEUTICS OF UTERINE MYOFIBROMATA AND POLYPI.

Polypi of the Uterus.

Varieties.—Since the term *polypus*, as ordinarily applied, signifies the form of tumor only, it is proper to include under the head of polypi of the uterus the following varieties:—

1. Fibrous polypi, which are pedunculated submucous fibroids in the process of extrusion;
2. Mucous polypi, springing from the mucous membrane;
3. Enlarged cystic follicles, which have become pedunculated;
4. Placental polypi, the result of the retention of a portion of the placenta, following abortion or labor at term.

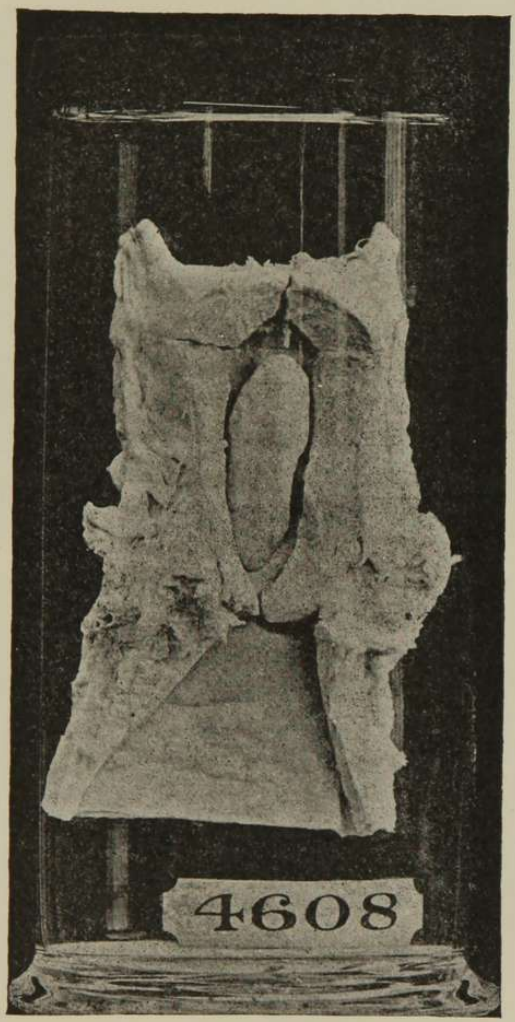
1. **Fibrous Polypi.**—These are nothing more than myofibromata forced into the uterine cavity by uterine contractions. They have their origin in the muscular wall of the uterus, in the larger number of instances springing from its body. When incised, they show the same firm consistence as do fibroid tumors. They vary in size from that of a walnut to that of an adult head, and are usually of a symmetrical or pyriform shape. Fig. 197 shows such a polypus yet within the uterine cavity. Fig. 198 shows a tumor partly projecting from the external uterine orifice, while Fig. 199 shows one completely extruded from the vagina, with the pedicle much elongated and constricted by pressure.

After the polypus passes into the vagina, if large, it may interfere with the functions of the bladder and the rectum. Occasionally the tumor becomes adhered to the vagina, suggesting that the growth is of vaginal origin.

In the preceding chapter it was noted that when an interstitial myofibroma grows toward the uterine cavity it excites uterine contractions, by which process pedunculation and extrusion are accomplished. As the tumor becomes more and more polypoidal in shape, the uterus becomes less and less tolerant of its presence. The length of the pedicle varies greatly. It may not be long enough to permit the polypus to be forced from the uterus, or its length may permit it to hang without the vagina.

Fibrous polypi are, as a rule, sparingly vascular. The menorrhagia and metrorrhagia, which so frequently result from their presence, are due to existing endometritis, the blood proceeding from the uterine mucous membrane.

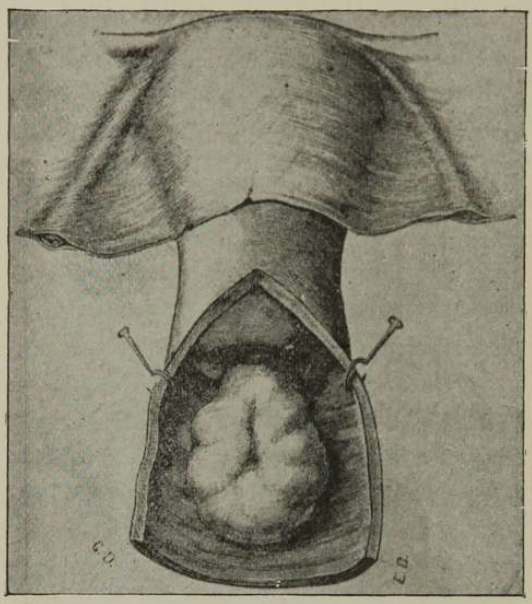
FIG. 197.



A UTERUS CONTAINING A FIBROUS TUMOR IN THE PROCESS OF PEDUNCULATION.
(*Museum R. C. S. Photographed by the Author.*)

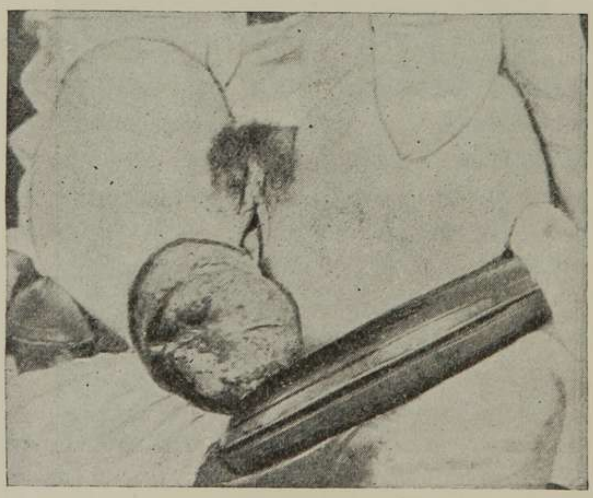
2. **Mucous Polypi.** — These are oftener attached in the cervix. They rarely attain a size larger than that of a walnut, and usually are smaller than this. They are soft and present to the eye a deep-red appearance. Unlike fibrous polypi, they are extremely vascular, and

FIG. 198.



SUBMUCOUS FIBROUS POLYPUS PROJECTING INTO VAGINA. (*Auvard.*)

FIG. 199.



FIBROUS POLYPUS SPRINGING FROM CERVIX. (*Wood.*)

The patient suffered for six years with a tumor of some kind within the vagina which was supposed to be prolapsus uteri. The tumor escaped from the vagina three days before I saw her, when, owing to constriction, it rapidly enlarged and became exceedingly offensive. The temperature at the time of entering the hospital was 106°, but quickly dropped to normal after the tumor was removed.

are made up, histologically, of the same structure as that of the mucous membrane from which they spring. Occasionally, microscopical section shows also stratified epithelium similar to that found in the vaginal portion of the cervix. When this epithelium is found these growths may

FIG. 200.

VASCULAR MUCOUS POLYPUS GROWING FROM INNER WALL OF UTERUS.
(*Museum R. C. S. Photographed by the Author.*)

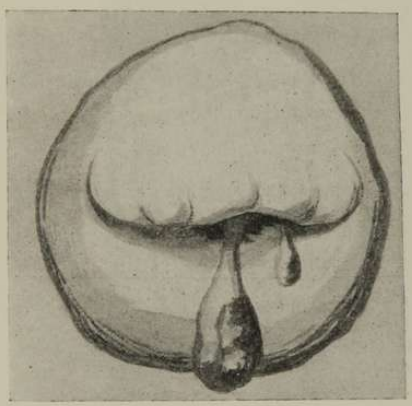
be the starting point of malignant disease (Underhill). When they spring from the body of the uterus, the ducts and cysts are lined with ciliated, cylindrical epithelium (Hart). Fig. 200 shows a very large mucous polypus springing from the body of the uterus. This location, as already indicated, is most unusual. Fig. 201 shows the usual appearance of these growths when attached to the cervix. They are rarely single, and frequently as many as eight or ten exist together.

3. **Enlarged Cystic Follicles which have Become Pedunculated.**—These have already been referred to under the head of cystic degeneration of the cervix (p. 456). They are known also as glandular polypi. They are merely hypertrophied Nabothian follicles distended with fluid. More or less hypertrophy of the cervical canal attends their growth. The glands of the body of the uterus proper may likewise undergo degeneration. Such a condition is shown in Fig. 202. These polypi rarely become larger than a bean, though they may reach a size equal to that of a pullet's egg. They are usually of a benign character.

A few cases are reported where these growths, springing from the cervix, have developed to a size sufficient to fill the vagina, and even to protrude from the vaginal orifice. When they attain this size they are made up of tissue partly glandular, partly colloid, and, in nearly all instances, partly cancerous or sarcomatous.

Pfannenstiel* reports a most interesting case of this kind. The

FIG. 201.



MUCOUS POLYPI. (*Schroeder.*)

FIG. 202.

ENLARGED PEDUNCULATED CYSTIC FOLLICLES. (*Beigel.*)

patient was 53 years of age and had always been healthy. Five years after the menopause she began to have local distress. An examination revealed a polypus springing from the anterior cervical wall which extended to the vulva. The tumor consisted of a grape-like mass. It was removed with a sharp spoon curette and its base seared over with the Paquelin. A microscopic examination showed it to be sarcoma. The entire uterus was then removed per vaginam, but the growth returned six months later in the left half of the vaginal cicatrix. Up to that date the author was able to find recorded in the literature only eleven cases of the kind.

Thomas, Mundé, and Fenger, of this country, have each reported similar cases.

Under the head of "Adenoma of the Uterus," Coe (*Journal of the American Medical Association*, July, 1891) states that there is but one variety of true cervical adenoma, and that is malignant. This asser-

* Münchener Medicinische Wochenschrift, September, 1891.

PLATE XIX.

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Fig. 1. MALIGNANT ADENOMA. (Advanced.)
Fig. 2. BENIGN ADENOMA. (*H. D. Beyea.*)

tion is based upon the fact that the disease is not confined to the mucous membrane, but invades the underlying muscular layers. The growth of the tumor is exceedingly slow. It is, nevertheless, fatal unless removed. Coe advises total extirpation as the only treatment to be considered; curetting appears to hasten the tendency to malignancy. Pozzi also includes under the head of cancer of the corpus uteri, adenoma of the uterus. Malignant adenoma is, according to the author last named, the initial process of cancer of the mucosa. Wm. S. Stone, of New York,* also believes that adenomata of the uterus are always malignant, although they may represent a transitional step between simple glandular hypertrophy and carcinoma. While the disease may invade the muscular layer of the uterus, it remains confined to the mucous membrane, according to Stone, longer than does true carcinoma. The treatment should be the same as for carcinoma.

4. **Placental Polypi.**—These are formed by the incomplete detachment of the placenta, a few of the villi remaining behind. Around this small mass of placental tissue blood coagulates and fibrin is deposited. Polypi of this origin may continue to increase in size until a tumor of some dimensions is produced. This condition is classified under the head of "Polypi," simply because of the shape of the tumors formed; they are not new formations. These formations are also known as *fibrinous* polypi.

Malignant deciduoma is a disease which has recently been described by Beach,† Fraenkel, Kossmacin, Hart and Barber, Schauta and others. It may be associated with hydatidiform mole (Fig. 26); and it is not improbable that placental polypi may sometimes be associated with malignant degeneration.

Symptoms.—*Hemorrhage* is the most frequent and constant symptom of all forms of uterine polypi. In fibrous polypi it is due to endometritis resulting from the presence of the tumor; in mucous polypi it proceeds from both the tumor and the hypertrophied uterine mucous membrane. It manifests itself first in a gradual increase in the menstrual flow; and as time goes on it may become intra-menstrual, not infrequently exsanguinating the patient. The quantity of blood lost by no means depends upon the size of the tumor, a very small mucous polypus sometimes giving rise to profuse and even fatal hemorrhage.

The anemia induced by the loss of blood is, in some cases, most striking—at times suggesting the cachexia of carcinoma. Should an

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* New York Medical Journal, July 27, 1895.

† Annals of Surgery, May, 1895.

offensive leucorrhea accompany the hemorrhage, there is danger of mistaking it for malignant cachexia.

The next most constant symptom is *leucorrhea*. Like the hemorrhage, it is due to the existing endometritis. It is rarely offensive except when the polypus sloughs.

Menstruation is often most painful. The suffering is due to the polypus interfering with the exit of the menstrual blood, as well as to the exaggerated uterine contractions resulting from the presence of the tumor.

Sterility must also be included under the head of symptoms. It is due both to mechanical causes and to the endometritis which is excited by the presence of the growth.

Diagnosis.—If the tumor does not protrude from the uterine cavity into the vagina, it will be impossible to determine the cause of the uterine enlargement without first dilating the cervical canal. Sometimes the tumor presents itself at the external os only during menstruation. It is, therefore, well to make an examination at this time when the presence of a polypus is suspected. In fibrous polypi a bimanual examination will show that the uterus is enlarged. After the cervix is dilated the finger and sound will indicate the situation of the pedicle, as well as its size.

Should the polypus be of placental origin, it is easily detached by a dull wire curette. It is rarely necessary to dilate the cervix in dealing with this form of the disease.

Mucous polypi springing from the cervix can ordinarily be detected by digital examination. Their characteristic form and color will be observed after the speculum is introduced.

There will be no difficulty in detecting the presence of a fibrous polypus when it finds its way into the vagina. There is, however, some danger of mistaking a large polypus thus located for an inverted fundus uteri. This mistake has more than once been made. The uncertainties are increased when inflammation and adhesions exist. In order to differentiate the two conditions let the examiner proceed as follows:—

First, determine, if possible, the location of the fundus uteri by abdomino-vaginal examination. If it is in its normal position the vaginal tumor is probably a polypus. Should it be an inverted fundus, and the conditions are favorable, the truncated end of the uterus may be detected through the abdominal wall. If the abdominal walls are unusually thick or tender, so that the bimanual is unsatisfactory, the sound may be passed into the bladder and the finger into the rectum.

In this way the presence or absence of the fundus between the finger and the sound can be determined. If the tumor within the vagina is a polypus, and adhesions do not exist between its pedicle and the cervix, the sound will penetrate the uterine cavity for at least two and a half or three inches; if it is an inverted fundus, the sound cannot be passed.

It must not be forgotten that partial inversion is frequently associated with a polypus.

Prognosis.—The prognosis, in the absence of malignancy, is usually favorable. If the polypus endangers life it is because of the hemorrhage excited or because of sepsis resulting from necrosis or strangulation of the tumor. Mucous polypi springing from the cervix are removed with but little difficulty. The removal of fibrous polypi may be attended with greater risk. Ordinarily, however, when pedunculation is complete there is no special difficulty attending their removal.

Treatment.—This is entirely surgical. A polypus of any description should be removed as soon as it is discovered, unless urgent counter indications exist.

Mucous polypi may be seized with a pair of strong catch forceps and twisted off or excised. It is my practice to touch the base of a tumor thus removed with the Paquelin cautery.

Placental polypi are easily removed with a curette, after which the uterine cavity should be cleared with gauze and the compound tincture of iodin applied.*

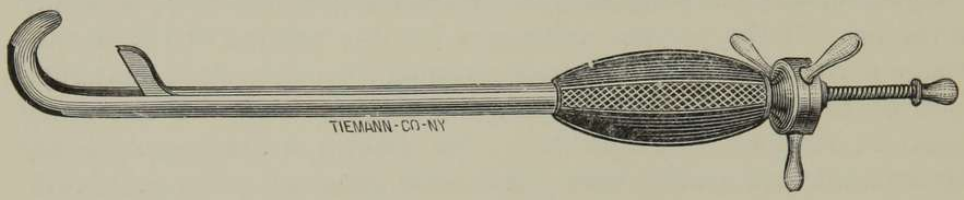
In dealing with *fibrous polypi* it is important to determine accurately the location and size of the pedicle. The cervix may be dilated, either rapidly under ether, or by the use of tents or the Barnes bags. Personally, I prefer the rapid method. If it is possible to locate the pedicle, it may be divided with curved scissors guarded by the finger, or with a polytome (Fig. 203). Unfortunately, this cannot always be done, the size of the tumor interfering with the manipulations. In this event, if the pedicle is not too thick, it may be separated by torsion. When cutting instruments are used great care must be observed not to injure the walls of the uterus, the scissors or polytome at all times hugging the surface of the tumor. The possibility of a partial inversion should constantly be borne in mind, for there is always danger, when this complication exists, of cutting into the uterine tissue. The old practice of separating the pedicle by ligature or écraseur is now

*Rosenburg reports, in the *Internationale Klinische Rundschau*, November, 1889, a case of abortion at the sixth month, where the placenta could not be removed and became septic. As a forlorn hope, vaginal hysterectomy was performed. The patient made a speedy and perfect recovery. (p. 447.)

practically abandoned. If the écraseur is used, it is better to connect the wire with the galvano-cautery.

A very large tumor may so interfere with intra-uterine and intra-vaginal manipulations as to make it necessary to incise the mass before attacking the pedicle; or the cervix may be incised laterally if necessary for the purpose of increasing the working room.

FIG. 203.



AVELING'S POLYTOME.

Should the hemorrhage not be controlled by the cautery, gauze packing may be resorted to. Indeed, it is my practice, if the patient is anesthetized, to direct treatment toward the endometritis, which is rarely absent, at the time of removing the polypus. The uterus is therefore curetted and the uterine cavity packed with gauze (p. 280).

I think that it is entirely possible to relieve by *internal medication* many of the distressing symptoms, particularly the hemorrhage, which are incident to uterine myofibromata and polypi. Whether or not these growths can be actually cured by internal medication is a question about which there is a wide difference of opinion. I cannot better express my own views on this subject than to quote the words of Dr. Ludlam. He says:* "In claiming that these tumors are curable in their incipiency by means that are so mild and variable, I do not forget that there are many sources of failure which might lead to a wrong inference respecting the efficacy of this entire plan of treatment. It is not unusual for these growths to increase or decrease in size very rapidly, and sometimes to disappear spontaneously. A retrograde metamorphosis may take them out of the way, the climacteric may arrest their development, and other changes may cut off their nutrition and cause them to wither. These cures by limitation are often placed to the credit of such agencies as animal magnetism, spiritualism, electricity, and other imponderables, even of medical treatment. But making due allowance for all these exceptional cases, I apprehend it remains that very great good of a positive kind may be done by means of fitly chosen internal remedies."

* "Medical and Surgical Lectures on the Diseases of Women," 1888.

Malignant adenoma, according to Stone, is oftener limited to the body of the uterus. Menorrhagia and metrorrhagia are common symptoms, and the bleeding frequently lasts for years and is not controlled by curetting. Hysterectomy should be resorted to if one or more curettings fail to control the hemorrhage.

Therapeutics of Myofibromata and Polypi.

Calcaria iod.—Menses too early, too long, and too profuse; acidity of the stomach; milky leucorrhea, with itching and burning.*

Lachesis.—Uterine region feels swollen; *will bear no contact, not even of the clothing;* bearing down pains; uterine and ovarian pains relieved by the flow of blood; leucorrhea, copious, smarting, stiffening the linen and staining it greenish; suitable at the menopause, with flushes of heat, hot vertex, metrorrhagia, and fainting.†

Belladonna.—*Much bearing down in the pelvis;* metrorrhagia of bright red blood, or thick, decomposed, dark red blood; *the genital organs are sensitive, and there is much throbbing in them;* plethoric patients; menses too early and too profuse.

Secale cor.—Menses too profuse and last too long, with tearing and cutting colic; cold extremities; cold sweat; great weakness and small pulse. Passive hemorrhage of fetid or dark blood; leucorrhea, brownish and offensive ‡

Trillium.—Gushing of bright red blood from the uterus on the least

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* "The indications for *Calcarea iodid* in the treatment of uterine myomas are not well understood. It seems to be more effectual in causing a gradual diminution of the tumor than any other remedy, and in doses too small to act on the theory of calcification of the growth and interference with its nutrition. It is significant that the most celebrated mineral waters for the cure of fibroids contain a large amount of lime salts. Good results have been reported from the third decimal trituration. It has also been recommended in the shape of ten grains to a pint of water, a teaspoonful to be taken after each meal, gradually increasing to a tablespoonful. This may act very similarly to *Chlorid of Calcium* in possibly causing a calcareous degeneration of the tumor; but, as it has been found that the coats of the arteries are also likely to undergo the same degeneration, the remedy may become a dangerous one. It seems quite probable that it can influence the nutrition or development of these tumors in a certain number of cases without being given in a sufficient quantity to induce the degeneration alluded to."—*Southwick.*

† "*Lachesis* seems possessed of remarkable virtues as a resolvent, particularly where there is defective involution of the womb."—*Ludlam.*

‡ "I have frequently obtained temporary ameliorations of the symptoms produced by the pressure of a fibroid with an apparent shrinking of the tumor by the use of *Secale cor.* in a low attenuation. The drug is, however, usually given by

movement; weak sight; anxious look; patient is pale and faints easily; flow returns every two weeks.*

Ferrum.—ANEMIA FROM LOSS OF BLOOD; sticking, shooting pains in the uterus; menses too late, too long lasting and profuse; the flow is watery and is preceded by labor-like pains; hysterical symptoms after menses; *alternate redness and paleness of face.*

Sabina.—Menses too profuse and too early, with colic and labor-like pains in uterus; stitches from below upward in vagina; metritis with hemorrhages; *blood dark and corroding and sometimes offensive.*

China.—Uterine hemorrhages of dark, clotted blood, with fainting and muscular twitching; *prostration from loss of blood.*

Platina.—*Painful sensitiveness in the region of mons veneris and genital organs;* induration of uterus and frequent sensations as if the menses would appear; pruritus vulvæ; *voluptuous tingling, with anxiety and palpitation of the heart;* vulva painfully sensitive during coitus.

Plumbum.—Hemorrhage, with sensation of a string pulling from the abdomen to the back; climacteric period; dark clots alternating with fluid blood or bloody serum, with a sensation of fullness in pelvis.

Sulphur.—Menses too late and of short duration, or suppressed; before menses headache; cough in the evening; nose-bleed; bearing down in pelvis toward genitals; stitches or pressing pain in region of liver; constipation, stools hard, knotty, insufficient; skin rough and scaly.

Conium mac.—*Induration and prolapsus of the uterus with lancinating pains;* acrid and burning leucorrhea, preceded by pinching pains in abdomen.

Ledum.—*Fibrous tumors with menorrhagia;* displacement of uterus; profuse leucorrhea; abundant urination.

Consult:—*Sabina*, hamamelis, pulsatilla, nitric acid, calcaria carb., *china*, ipecacuanha, and sepia.

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hypodermic injections in from three to six drops of Squibb's solution two or three times a week. Simpson recommends the following formula:—

Ergotinæ	℥ij
Aquæ	℥vj
Chloral hydrate	℥ss.

Twelve minims of the solution to be used at each injection."—*Cowperthwaite.*

* "*Trillium* seems to be especially adapted to the menorrhagia and the metrorrhagia which are almost always present in cases of interstitial and intrauterine fibroids, for, like *Secale*, it is of little use in uterine hemorrhage unless, from pregnancy or otherwise, the muscular fibers of the womb have been decidedly developed."—*Ludlam.*

CHAPTER XLI.

MALIGNANT DISEASES OF THE UTERUS.

Carcinoma.

General Considerations.—W. Rodger Williams, F. R. C. S., estimates, in a recent article* on carcinoma of the uterus, that at the present time there are no fewer than eight thousand victims of cancer of the uterus in England and Wales. If this estimate is approximately correct the importance of the subject cannot be overestimated. According to the most reliable data, malignant diseases of all kinds are increasing. In the United States there were in 1850, nine deaths from cancer in every one hundred thousand inhabitants; in 1860, eleven; in 1870, sixteen; in 1880, twenty-six, and in 1890, thirty-three. In England alone it is claimed that there are always thirty thousand cases of cancer (Krauss). In women, next to the mammary glands, the uterus is the most common seat of the disease—hence the subject should receive the most careful consideration from the hands of all medical men.†

The Origin and Nature of Carcinoma.—We know much pertaining to the conditions under which malignant disease is most apt to develop, but we are yet in doubt as to its primal cause and exact nature. The embryonic theory of Conheim is still upheld by many. According to this theory, all tumor formations have their origin in a matrix of embryonic cells; without these cells, according to Conheim, there can be no true tumor, either innocent or malignant, even though intrinsic and exciting causes exist. Conheim teaches that these cells are always of congenital origin and can be traced back to embryological formation; that in the growth of the embryo they are displaced or arrested in their development, and remain latent until favorable conditions exist for their proliferation, which is the beginning of all true tumors. Senn has modified this theory, and, while maintaining that the tumor matrix is always composed of embryonic cells, teaches that the embryonic cells may be of post-natal origin. Thus, in the healing

* British Gynecological Journal, February, 1896.

† Essay presented by the author to the International Homeopathic Congress, London, August, 1896.

of a flesh wound, or a fracture, certain cells, instead of undergoing transformation into tissue of a higher type, remain in a latent immature state for an indefinite period of time. Under the influence of either hereditary or acquired causes they may form the essential starting point of a tumor. The constitutional or hereditary cause of a tumor implies on the part of the organism a diminution of physiological resistance. The local causes, on the other hand, may diminish the physiological resistance of the tissues in the immediate vicinity of tumor matrix only.

Warbasse* observes that a great obstacle in the acceptance of Conheim's theory is the fact that "these hypothetic separated cells cannot be discovered, and experiments have done little to support the theory."

Ribbert† has modified this theory somewhat and concludes "that tumors originate before and after birth from a partial or complete separation of cells or groups of cells from their organic connection, traumatism being an influence capable of causing the epithelial metastasis."

In 1887, Scheuerlen reported a cancer bacillus which had been obtained by culture. Experiments were made with cultures from these bacilli on lower animals, but the results were negative.

More recently there have been discovered in malignant formations certain intercellular organisms, which has added force to the so-called parasitic theory of cancer. Some of the prominent workers along this line are Verneuel, Van Nissen, Plimuer, Scheuerlen, and Wickham. Balbiani described five different species of sporozoa, namely, coccidium, gregarineum, sarcosporidium, myxosporidium and microsporidium. These sporozoa are found in all animals, from the highest to the lowest, and some of them give rise to serious epidemics in animals (Warren). The coccidium is the species said to be found in cancer. The last named consists of a finely granular mass of protoplasm and during its early period is encysted in an epithelial cell. At this stage, it has no enveloping membrane, but possesses an indistinct nucleus. Later on it separates from the epithelial cell and undergoes segmentation and sporulation and enters new cells and thus multiplies (Steinhaus).

Von Müller‡ found in one case of carcinoma involving the posterior lip of the cervix, three large cyst-like bodies with a clear, glistening membrane that would not stain. These contained smaller cysts, together

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* Annals of Surgery, January, 1896.

† Am. Year Book of Med. and Surg., 1897, p. 629.

‡ Archiv für Gynaekologie, Berlin, 1895.

with other non-encysted intra-cellular bodies which he regarded as parasitic ameboid organisms.

Senn sums up the microbic theory of cancer in the following words:— "*To prove the microbic origin of carcinoma it is necessary for bacteriologists to demonstrate the presence of the same organism in every carcino matous tumor. They must isolate the organism and cultivate it outside of the body upon artificial nutrient media, and with pure cultures they must reproduce the disease in some of the lower animals. This has so far not been done and until it is done we have no right to claim for carcinoma a microbic origin.*"

Those who teach that cancer is of parasitic origin maintain that the part played by heredity has been greatly overestimated in the past. Indeed some of the advocates of this theory would entirely remove cancer from the domain of heredity and place it among the infectious diseases. However, experiments on lower animals along this line have yielded almost negative results. Wehr claims to have successfully transferred cancer from man to dogs; and Hana succeeded in transferring a typical epithelium from a rat to two other rats (Warren). Senn, on the other hand, claims that there is not a single authentic case on record where cancer has been transferred from one individual to another, or from one locality to another in the same individual, by inoculation. In those instances where the disease appears on opposing surfaces, or where it recurs at some distant point from its primary seat, he maintains that auto-inoculation must be preceded by certain local pathological conditions which furnish the essential soil for cancer. To my mind a more reasonable explanation of the cases of supposed auto-infection is to be found in the dissemination of the disease through the lymphatics and blood, a point to which I shall again refer under a succeeding head.

There nevertheless exists certain evidence tending to prove the infectiousness of cancer which cannot well be ignored. Thus Shattock cites an instance where four patients, living under a common roof, and unrelated by blood, were attacked by cancer within a period of thirteen years. Chapman has placed on record three successive cases of cancer of the rectum, also unrelated by blood, who were occupants of the same house. A still more striking instance is that recorded by Powers. Three housekeepers, unrelated, slept in succession in the same bedroom for several years. All were in good health at the time of their installment. The first died of cancer of the stomach; the second of cancer of the liver; and the third of cancer of the breast. Feissinger* reports

* Lancet, April 27, 1894.

four cases of cancer coming under his observation which were traced to dressings from a scirrhus of the breast. Sipple* cites a case where, following a celiotomy for cancer of the peritoneum, cancerous nodules appeared in almost all the suture wounds of the abdominal wall. In a case of my own where an exceedingly rotten uterus was removed through the abdomen the cancer returned in the abdominal wound. Another instance is on record where cancer followed an exploratory puncture, the needle presumably conveying cancer infection.

Unfortunately, nothing is said in the records of any of the foregoing cases as to the existence or absence of heredity. While undoubtedly the importance of hereditary influence has been over-estimated in the past, it does not seem to me that we are justified in ignoring it *in toto*. I need but cite the following instances taken from Broca to add force to the argument:—

First generation: Madam Z. died of cancer of the breast, 1788, aged 60.

Second generation: Four married daughters; two died of cancer of the breast and two of cancer of the liver.

Third generation: Madam B. had seven children, all but two of which succumbed to cancer, one son dying in infancy.

Madam C. had five daughters and two sons; the sons remained free from cancer, but all of the five daughters fell victims to the disease.

In this remarkable record we are again confronted with the possibility that the disease might have been conveyed from one member of the family to another by contagion; but this is hardly probable in view of the fact that in most instances a number of years intervened between the deaths of the several members of the family.

Different authors have traced an hereditary predisposition in from 7 to 13 per cent.

Since the question is as yet unsolved I shall, without further amplifying the arguments *pro* and *con* which have been adduced to maintain the two prevailing theories of cancer (embryonic and parasitic), conclude this part of my subject by affirming:—

1. That Conheim's embryonic theory, as modified by Senn, or as elaborated by Ribbert,† appeals to me as the most reasonable theory of tumor formation yet enunciated.

2. That while the inoculability of cancer has not yet been proved beyond peradventure, with the evidence in our possession the possibility

* Central bl. f. Gynaek., No. 4, 1894.

† Deutsch. Med. Woch., 1895, Nos. 1–4.

of inoculation from one human being to another, or from one locality to another, does not seem improbable.

3. That these two theories are not incompatible, *inasmuch as the embryonic matrix may be the essential nidus for the reception of the microscopic parasites which are supposed by many to be the primal cause of cancer.*

With this summary of the data in mind, I shall proceed to consider their bearing upon—

The Etiology of Carcinoma of the Uterus.

We are informed by Schroeder that 33 per cent. of all cancers in women occur in the uterus, and that in at least 90 per cent. of all uterine cancers the disease begins in the cervix. It is well known that the involution of the blastodermic layers is more irregular at the natural orifices of the body; and that the squamous epithelium of the *sinus urogenitalis* blends with the cylindrical epithelium of Müller's ducts at the external os. Embryonal cells are found in excess at this point and not infrequently they are displaced. The two varieties of epithelium of different embryonal origin, and of different shape, create a tendency to plastic paramorphism. Here, then, we have, if the theory of Conheim is correct, the essential tissues in abundance for the production of cancer. We learn, further, from the statistics of Hofmeyer that less than 5 per cent. of uterine cancers occur in nulliparæ; and from Winckel's statistics that of multiparous women the victims of cancer the average number of children is something over eight. These facts speak volumes and at once direct attention to child-bearing as a causative factor. Personally I have met with but one case of cancer of the uterus in a virgin; and in a very large per cent. of the cases occurring in nulliparous women it is probable that the cervix has been in some way injured, or has been everted by inflammation. We are, I believe, forced to look to injuries of the cervix as the probable explanation of the large number of cancers following in the train of childbirth. In cervical laceration an effort is made on the part of nature to heal the rent and in a majority of instances a low type of tissue is formed, which contains many embryonic cells of post-natal origin. In the surrounding tissues are numerous embryonic cells of fetal origin. The cicatricial plug interferes with the circulation of the uterus and constant congestion is maintained. There is usually eversion attending the laceration and the cervical mucous membrane is at all times irritated by friction. The entire organism is more or less unfavorably impressed by the local disease and, altogether, there is induced a condition which dimin

ishes local physiological resistance and which permits the embryonic cells to take on vicious action; or, possibly, permits of the entrance of specific organisms, if such there be, into the tissues.

The important part played by irritation and traumatism in the production of cancer is shown by the predilection which the disease has for those organs and structures most exposed to irritation and traumatism. The gall bladder, the pylorus, the mammary glands, the lips, and the scrotum are all subject to special forms of irritation and injury and we find these several organs especially prone to cancer.

At any rate, what concerns the physician most is that cancer of the uterus occurs with overwhelming frequency in women who have borne children; that it is connected in a certain way with injuries of the cervix; that the larger number of cases are met with after devolution of the sexual organs is inaugurated (thirty-five), at which time the physiological resistance is on the wane; that it is associated with various diseases which perpetuate undue congestion of the pelvic organs; and, finally, that it can be prevented in the larger number of instances by correcting the several conditions which have been enumerated as exciting factors.

Both E. Martin and Winckle have called attention to the importance of the acute infectious lesions of the vagina and uterus, especially gonorrhea, in the causation of uterine cancer by direct irritation. I am not, however, aware that any of the authorities have noted the somewhat frequent existence of disease of the uterine appendages with carcinoma uteri. I desire in this connection to call attention to the following cases which have passed under my observation during the last year:—

Case I. — Patient referred to me because of obstinate constipation, with hemorrhoids. Gonorrheal history. Three children. Suffered much pain through pelvis. Menorrhagia and offensive leucorrhea. Examination revealed a suspicious induration of the cervix and a tender fluctuating tumor in the Douglas pouch the size of a fetal head. The uterus measured five inches and was firmly fixed. The uterus and appendages were removed on January 7th of this year by the vagino-abdominal method. Sections of the cervix showed unmistakable signs of malignancy. The tumor proved to be a hydrosalpinx of the right side. At present the patient is perfectly well.

Case II.—(Fig. 204.) Patient aged 35. Gonorrheal history. One child. Uterus retroflexed, firmly attached to the rectum, and exquisitely sensitive. Cervix enlarged and suspiciously indurated. Depth of uterine cavity five and one-half inches. Patient exsanguinated from loss of blood and greatly emaciated. Uterus and appendages removed by

PLATE XX.

A Uterus whose Mucous Membrane is the Seat of Malignancy. Double Pyosalpinx.
(*Wood.*)

vagino-abdominal method on January 15th of this year. Both appendages firmly adherent. Up and about her room on the seventeenth day. Microscope showed scirrhus of the cervix.

CASE III.—(Fig. 205.) Patient aged 46. Mother of 12 children. Flowed excessively for years and was thoroughly exsanguinated and prostrated. The slightest touch per vaginam very painful. Cervix at least four times its normal size, badly lacerated, everted and indurated. Depth of uterus five and one-half inches. Vaginal hysterectomy on March 5th of this year. The mass seen on the left side is an ovarian cyst, the size of an orange. Right appendages adherent. Right ovary cirrhotic. Convalescence uninterrupted. The scirrhous condition of the cervix is plainly shown in the illustration. The disease had also implicated the corporeal endometrium.

CASE IV.—(Plate XXI.) Patient aged 38. Three children. Had been an invalid for years. No history of specific trouble obtained. Menorrhagia and offensive leucorrhea of long duration. Curetted on February 10th for diagnostic purposes and the pathologist reported "malignant adenoma." Although the curretting was carefully performed the resulting shock came very near proving fatal. The uterus and appendages were removed on February 19th, 1896, by the vagino-abdominal method. Both tubes were distended with pus and the ovaries were mere shells. The adhesions were very firm. Convalescence uninterrupted. There was found on microscopic examination diffuse carcinoma of the fundal mucous membrane.

Plates XXI and XXII also show uteri removed for carcinoma and sarcoma of the uterus associated with disease of the appendages.

I have in my record book ten additional cases where malignant disease of the uterus was associated with disease of the appendages. I am convinced that the two conditions co-exist much oftener than is supposed. Joseph Price and others called attention to the fact that uterine fibroids not infrequently result from inflammatory diseases of the appendages; but the specialists have seemingly ignored the important bearing which lesions of the tubes and ovaries may have upon the production of uterine cancer.

In another interesting case recently operated upon by me for the second time, I removed two years ago an enormous hydrosalpinx of the left side, together with the appendages of the right. The patient continued to flow excessively in spite of the best directed treatment. One year later I removed the uterus and found a diffuse carcinoma implicating the corporeal endometrium.

It is not improbable that the constant congestion which the inflam-

matory diseases of the appendages perpetuate so lowers the physiological resistance of the tissues as readily to permit of vicious development of the embryonal cells, which exist in abundance in and about the cervix; or it may be that the specific disease which is so often responsible for lesions of the appendages, so alters the tissues of the cervix and endometrium by direct action as to give rise to cancer.

It is to be noted in studying the etiology of carcinoma uteri that the larger number of cases occur at or near the menopause. This is, according to Thiersch, because the submucous connective tissue loses at this time its resistance and is more easily invaded by the epithelial cells.

Out of 2270 cases observed by Gusserow—

2 were under 20 years,
81 were between 20 and 30 years,
476 were between 30 and 40 years,
771 were between 40 and 50 years,
600 were between 50 and 60 years,
258 were between 60 and 70 years,
82 were over 70 years.

It will be observed from the foregoing that the number of cases occurring under the age of twenty (two) is very insignificant; yet cancer of the uterus has been discovered in children. Mundé has met with a case in a girl of eighteen, and Zweifel removed the uterus, per vaginam, from a girl of thirteen, for epithelioma of the cervix. I have under observation at the present time a woman of twenty-two with a hopeless cancer of the cervix.

The social status is no longer considered as an important factor in the production of cancer, the more recent statistics showing that it occurs with equal frequency in the rich and poor.

The African race, although especially liable to myofibromata of the uterus, was long supposed to enjoy greater immunity from carcinoma of the cervix than do other races. Kelly* has recorded two cases of cancer of the cervix in negresses. More recent statistics show that there is very little difference between the two races in the frequency of the disease.

Mental depression or shock, it is believed by many, predisposes to carcinoma. It is more common in low, damp countries than in higher altitudes.

I am firmly convinced, by the evidence at our command, that all cancers are at their beginning local; and that they become general only after advancing to a point where the surrounding and remote structures are implicated, either through the lymphatics or the blood.

* "Transactions of the Southern Surgical and Gynecological Association," 1891.

PLATE XXI.

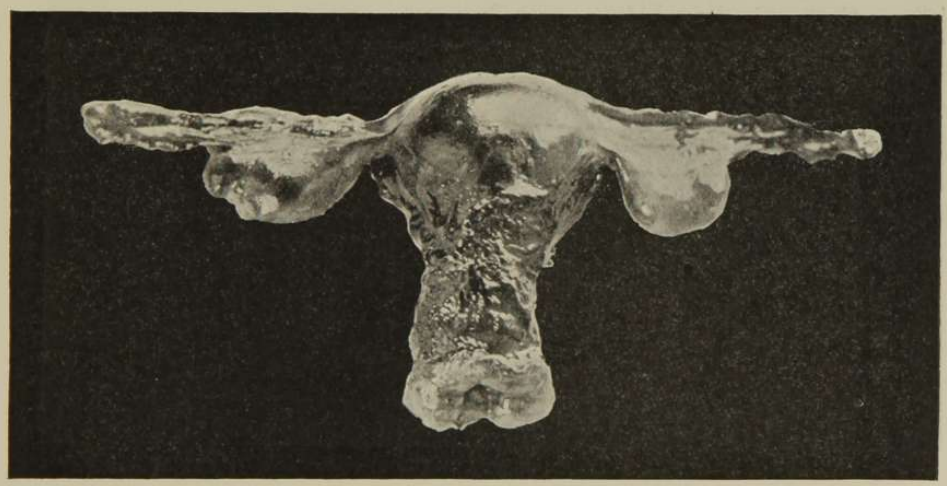
Carcinoma of the Body of the Uterus Removed by the Vagino-Abdominal Method. *a*, Hydatid of Morgani; *b*, *b*, Uterine Arteries Dissected from Broad Ligament Folds. (*Wood.*)

There are now on record thousands of cases of cancer, proved beyond doubt to be such by the microscope, which have been operated upon and which remain well. The evidence bearing upon this point is so overwhelmingly convincing that I do not believe that it admits of argument. Unfortunately, it is not always possible to carry the knife beyond the diseased area.

Carcinoma of the Cervix.

Histology and Pathology.—The old division of cancer into *encephaloid*, *scirrhous* and *epithelioma* is to a large extent arbitrary, for after the tissues are broken down it is impossible to determine the original form of the disease. In fact the general plan of the histological structure is the same in all. In scirrhous cancer the fibrous stroma predominates; and in encephaloid the cellular element. The term "epithelioma"

Fig. 204.



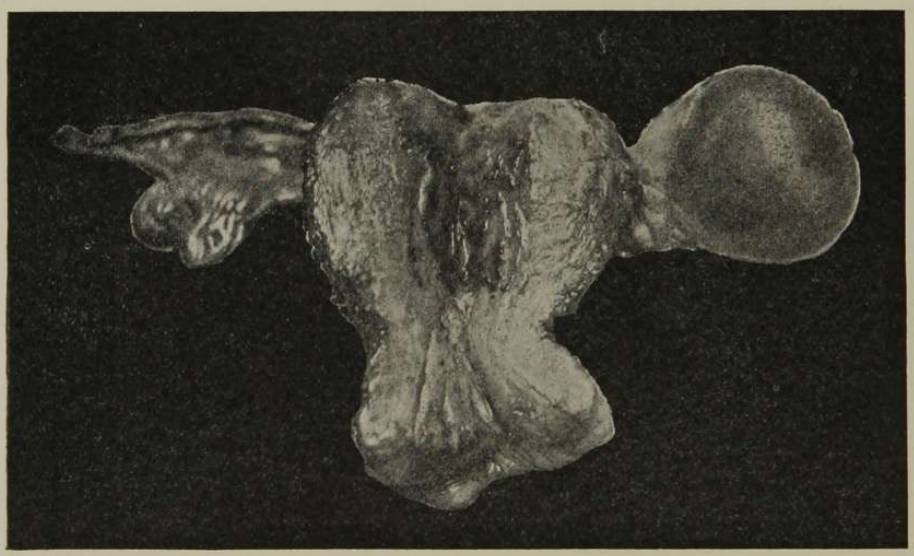
Carcinoma of Cervix. Appendages Dug from Inflammatory Exudates. (*Wood.*)

was formerly applied to more superficial growths. Williams, Thiersch, Waldeyer, and others teach that all uterine cancers spring either from squamous or cylindrical epithelial cells. Virchow, on the other hand, maintains that the scirrhous and the encephaloid varieties start from the connective tissue cells. Senn says: "All carcinomatous tumors are composed of epithelial cells and an alveolated stroma of connective tissue." Cervical cancer may assume a papillary form and project into the vagina (Fig. 206); it may excavate the cervix (Fig. 209); or it may involve the entire uterine mucosa together with its underlying muscular

structure (Fig. 213). As the disease progresses, it may implicate the bladder, rectum, ureters, vagina, and peritoneum.

Dr. Russell's series of cases* tend to show that the inherent tendency of cancer of the uterus is to remain localized within the pelvis. In thirty-seven cases of cancer of the uterus operated upon the results were as follows: 38 per cent. died with recurrence, in none of which could a distinct history of metastasis to other organs be elicited. In ten autopsies on inoperable cases made in Johns Hopkins Hospital, metastasis beyond the pelvic and retro-peritoneal lymph glands was found in but one. In four cases the pelvic and retro-peritoneal lymph glands were implicated. Veit,† on the other hand, says that he has often

FIG. 205.



CARCINOMA OF CERVIX WITH SMALL CYST OF LEFT OVARY AND CIRRHOTIC DEGENERATION OF RIGHT. (*Wood.*)

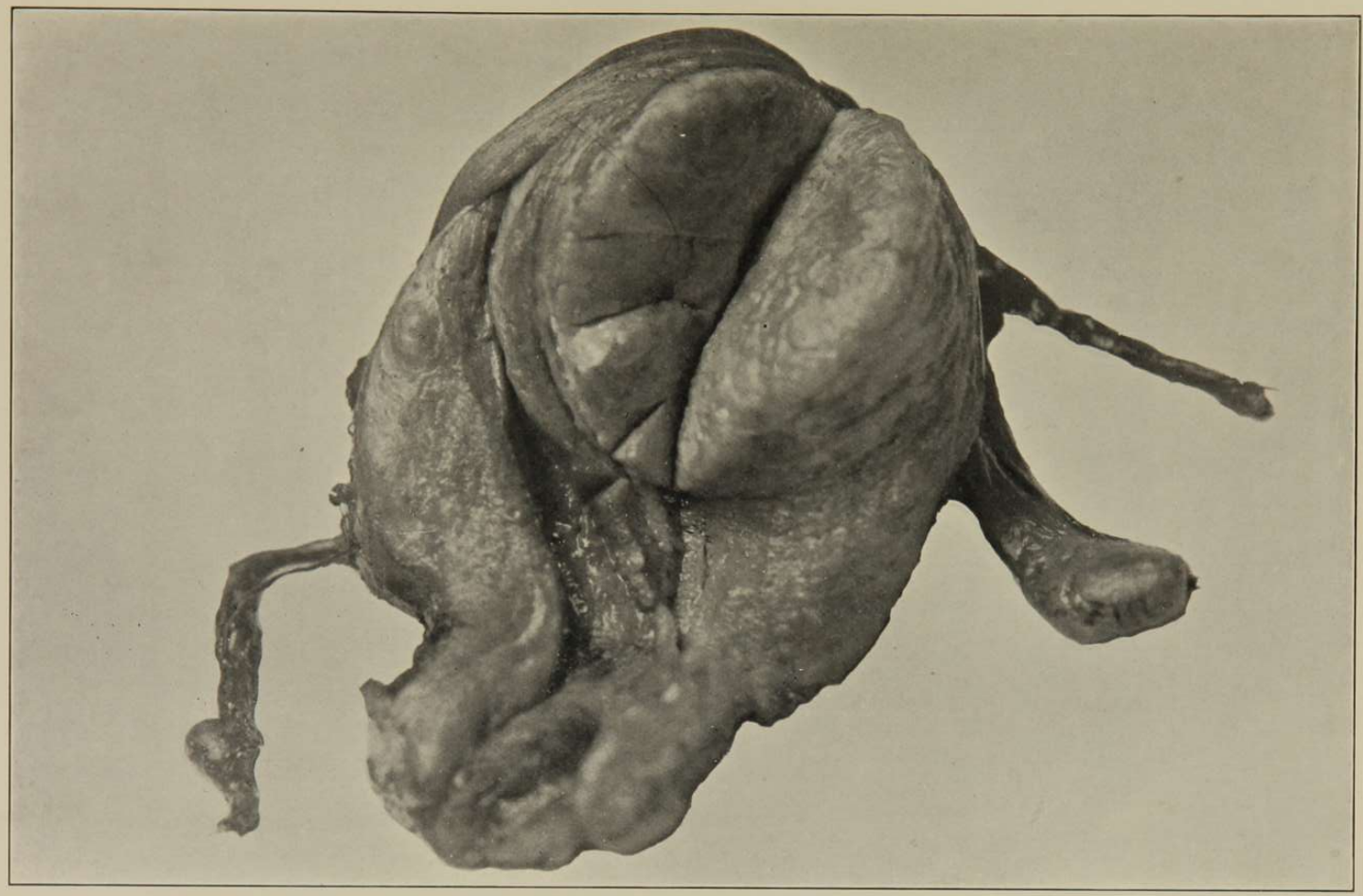
found cancer cells in the lymphatics of the broad ligaments and believes that the large per cent. of recurrences are due to this fact.

General dissemination occurs, according to Williams, in about 20 per cent. of all cases. It may take place through the blood stream, the proliferous cells being detached from the primary neoplasm and carried to remote parts of the body. The lungs and the liver are the organs most frequently implicated. I recently saw a case in which the left

* Johns Hopkins Hospital Bulletin, 1896.

† American Journal of the Medical Sciences, Nov., 1895.

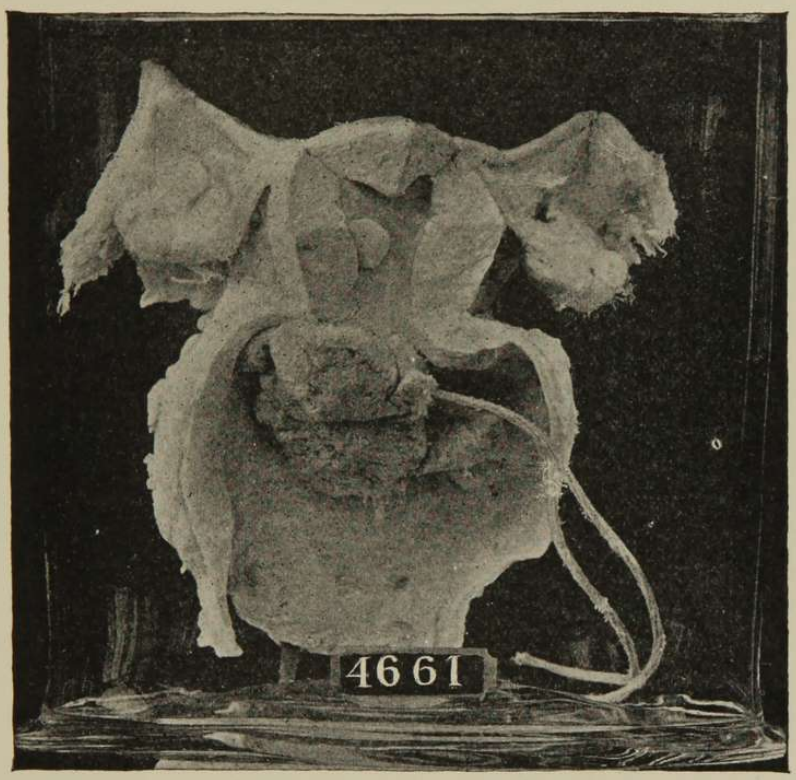
PLATE XXII.



CANCER OF THE CERVIX WITH A FIBRO-SARCOMA OF THE FUNDUS. THE APPENDAGES OF BOTH SIDES ADHERENT. (*Wood.*)

axillary vein was plugged with a cancerous embolus. It much oftener occurs through the lymphatic system, the lymphatics of the cervix, portio, and corpus communicating by numerous anastomoses. The peri-uterine tissues and the glands of the groin all communicate with the uterus through the lymphatic system.

FIG. 206.



EPITHELIOMA OF THE CERVIX.

A ligature is tied around a part of its base, its substance having been broken through. The uterus is enlarged and its cavity dilated; on its left wall there is a small flat growth, half an inch in diameter, like a mucous polypus. The ovaries are both adherent to the sides of the uterus and the broad ligaments are thickened. (*Museum R. C. S. Photographed by the Author.*)

Seelig* examined carefully twelve uteri removed by operation for cancer of the cervix and found that the disease extended from the cervix to the body of the uterus through the intra-muscular lymph spaces which accompany the blood-vessels. It extends, according to Seelig, through the external muscular layer rather than along the mucosa.

* American Journal of the Medical Sciences, June, 1895.

This extension takes place very early—hence the importance of total hysterectomy even though the disease is apparently limited to the cervix.

Symptoms.—The symptoms vary greatly in different cases. One of the earliest and most constant is *hemorrhage*. If the patient has passed the menopause, it is often noticed for the first time after straining at stool or after coitus. Before the menopause it frequently begins as a menorrhagia, menstruation sooner or later becoming irregular without any apparent cause. It occurs earlier in epitheliomata growing toward the vagina. During the first stages it proceeds from the vascular stroma of the growth, the numerous delicate vessels readily rupturing. Later on, if profuse, it is due to destruction of one of the larger vessels. Immediate death is rarely caused by hemorrhage.

The next most constant symptom is a *vaginal discharge*. This frequently alternates with menorrhagia. At first it is watery and not particularly offensive. After necrosis of tissue takes place it is tinged with blood, and possesses a most penetrating and offensive odor. This odor cannot well be described, yet it is peculiarly characteristic, and when once observed will be readily recognized. The leucorrhea becomes excoriating, and the irritation of the vulva and thighs is sometimes very great. Decomposing blood-clots and threads of gangrenous tissue are often expelled with the discharge during the later stages of the disease.

Pain does not occur until infiltration of the adjacent structures takes place. There is nothing about the pain of carcinoma that is characteristic, although it is usually spoken of as shooting, lancinating, or stabbing in character. The patient not infrequently locates it in the center of the pelvis, from which it radiates to the lower portion of the back and groins, or extends down the inner sides of the thighs. Unlike the pain of chronic inflammation of the uterus, it is usually aggravated at night. It is often most distressing and even insupportable.

Thorton* calls attention to sacral pain as a symptom of uterine cancer. It extends to the trochanters in many cases and is greatly aggravated by lying down.

Cachexia sooner or later makes its appearance. It is due to the absorption of débris, to the exhausting serous discharge, and to the hemorrhage which so frequently attends the disease. In time a malignant toxæmia is induced, due to the diminution of albumin and red blood corpuscles, with an increase in the watery constituents of the

* British Medical Journal, February, 1896.

blood. As a result the skin takes on a peculiar sallow or dirty straw-colored tint.

Early and progressive *emaciation* is very characteristic of cancer. The nutrition becomes seriously impaired. This is due to various causes, one of the chief being the offensive fetor resulting from the discharge.

The disease frequently involves the *bladder* and the *rectum*, seriously interfering with the functions of both of these organs. When it extends toward the bladder dysuria may be the first symptom calling the attention of the patient to the pelvic organs. Not infrequently the ulceration extends into the bladder and a vesico-vaginal fistula is thus formed. If the rectum is invaded defecation becomes painful, or even impossible.

Physical Signs.—Unfortunately, in by far the larger number of cases, the physician does not have an opportunity to practise physical exploration until after the disease is considerably advanced. Few women deem an examination necessary until some of the symptoms which have been studied make their appearance. The disease during its early stages will be found almost invariably located at the external os; thence spreading, as the case may be, upward along the cervical canal, downward into the vagina, or into the deeper tissues of the cervix. After the stage of ulceration, the finger will feel an irregular surface with hard, unyielding margins; or, in the case of papillomatous tumors (cauliflower excrescences), a soft, friable mass projecting into the vagina. Upon withdrawing the finger it will be stained with blood and the characteristic odor will be recognized.

In *scirrhous cancer*, the cervix is increased in size, its surface is irregular or nodulated, and the tissues are indurated. The tenderness is not marked. The mucous membrane covering the diseased area is fixed to the underlying tissues.

The experienced examiner will be able to obtain more definite information from digital exploration than from a specular examination. Great care must be observed in using the speculum after the ulcerative process has begun. The irregularly ulcerated surface, with unyielding margins, will be seen through the speculum; or, should the case be one of cauliflower excrescence, a papillomatous mass will project into its field.

In case of doubt, the final test must be the microscope. If a portion of the tissue is removed and prepared for microscopical examination, there will be found irregular cells of an epithelial type, with one or more large nuclei, surrounded by a fibrous stroma with alveoli. These cells are characterized by their large size and by their prominent round

or oval nuclei, which contain one or more bright red nucleoli. It is the mode of distribution of the cells in the meshes of the fibrous stroma that determines malignancy; there is no *pathognomonic* cancer cell.

While the foregoing symptoms are characteristic of a typical case of cancer of the cervix, it is necessary to remind the reader that the disease may reach an advanced stage before any of the symptoms enumerated make their appearance. The pain may be nearly or entirely absent. The offensive discharge is not always present, even when there exists necrosis of tissue. Hemorrhage is by no means a constant symptom. The physician should, therefore, be upon his guard. Since hysterectomy has become a popular and beneficent operation, it is all-important that an early diagnosis should be made. *Slight, irregular hemorrhages, occurring during the intermenstrual period, or after coitus, call for immediate local examination.* If, upon making such an examination, there should be found induration of the cervix with an easily bleeding erosion, a wedge-shaped portion of tissue should be excised for microscopical examination.

Differentiation.—The conditions which simulate cancer of the cervix are:—

Syphilitic ulceration;
Areolar hyperplasia of the cervix;
Papillary erosion, with ectropium and cicatricial deposits;
Sloughing fibrous polypus;
Retention of the products of conception;
Sarcoma of the cervix.

Syphilitic Ulceration.—Syphilitic ulceration of the cervix is a very rare condition. Usually there are present condylomata. The condition yields to proper treatment. The constitutional manifestations of the disease are rarely wanting.

Areolar hyperplasia of the cervix and papillary erosion, with ectropium, resemble carcinoma only at the beginning of the latter disease. If an immediate diagnosis is important the microscope should be resorted to. If the chances are that the condition is not malignant, proper treatment may be prescribed; this will improve both areolar hyperplasia and papillary erosion. The well-known test of Spiegelberg should also be applied. In carcinoma there is, according to Spiegelberg, fixation of the mucous membrane to the underlying indurated tissues, with rigidity of the cervix. The last-named condition is indicated when an effort is made to dilate the cervix by means of laminaria tents.

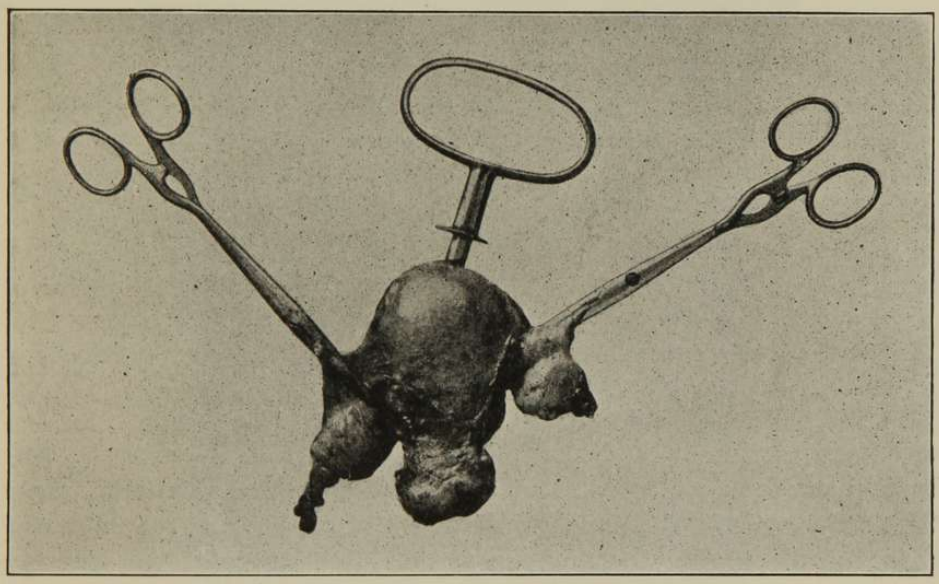
Sloughing Fibrous Polypus.—The tissues are firmer and do not break

down as easily as does carcinomatous tissue. The mass is more sharply defined, because the surrounding structures are less infiltrated.

Retention of the Products of Conception.—These lie loosely in the cervical canal and are easily detached. It should not be forgotten that carcinoma may make its first appearance during the puerperium.

Sarcoma of the Cervix.—Sarcoma of the cervix is an exceedingly rare condition. As a rule, sarcoma of the cervix grows more slowly than does carcinoma. It is impossible to make a positive differentiation without resorting to the microscope. Practically, the distinction between the two affections is not important, for the treatment is the same in both.

FIG. 207.



BEGINNING CANCER OF CERVIX. (*Wood.*)

I am always suspicious of a cervix which bleeds easily and which is not speedily improved by proper treatment, and whose everted mucous surface is elevated above the surrounding structures. I do not believe that a uterus thus affected should be unceremoniously sacrificed; nor is this necessary. By means of cocaine a section can be painlessly removed and subjected to microscopic examination. Uncertainty existed in the uteri shown in Figs. 207 and 208. The patient from whom the specimen shown in Fig. 207 was taken was placed on the table prepared for a trachelorrhaphy. Upon exposing the cervix the tissues looked suspicious and I removed a section and submitted it to a pathologist. I

also curetted and postponed operative interference until a later date. Both the curettings and the sections removed from the cervix showed unmistakable evidences of malignancy. The uterus was removed some days later, when it was found that the entire endometrium was involved in the cancerous process. At least two of the bystanders who were present at the preliminary operation thought me unduly cautious and advised me to go on with the trachelorrhaphy.

Figure 208 shows very nicely malignant nodules projecting from a cervix which was lacerated and badly everted. This happens to be the only double uterus I have ever removed. The patient is 45 years

FIG. 208.

CARCINOMA OF CERVIX IN A DOUBLE UTERUS. (*Wood.*)

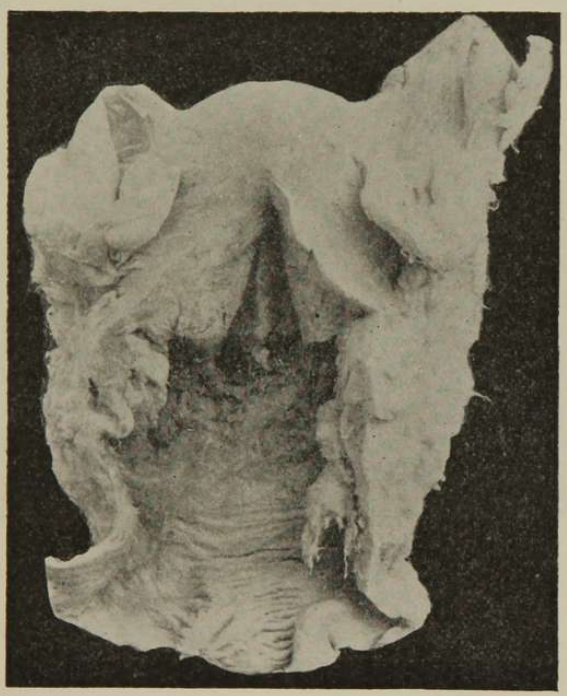
of age and has had four children. The evidences of malignancy were beyond question and, without perhaps as thorough an examination of the pelvic organs as I should have made, I presumed that the unnatural shape of the uterus was due to a projecting fibroid. There are two cervical canals and there is nothing to indicate in which cavity the pregnancies occurred. Two weeks from the date of the hysterectomy the right breast was amputated for cancer.

Progress of the Disease.—In cancer of the cervix the bladder is implicated in about 40 per cent. of all cases. It first invades the cellular tissue between the bladder and the uterus, finally attacking the mucous membrane. Fistulæ result in 20 per cent. of all cases. The ureters are still more frequently disturbed. Complete obliteration of one or both ureters occurs in 50 per cent. of all cases. Infiltration takes place, either at the opening of the ureters into the bladder, or higher up at the sides of the cervix. Occasionally the bladder, rectum, and vagina are converted into a common cloaca. The peritoneal cavity

is rarely opened into. As the disease advances a protective lymph is thrown out, and adhesions form between the peritoneum and the uterus. The extent and direction of the invasion are well shown in Figs. 209 and 210.

Prognosis.—The prognosis, as regards life, will depend largely upon the progress made by the disease when first detected. During its early stage the general opinion is that cancer is a local disease. If this opinion is correct (and judging from the large number of operative cases now on record it is), it means that cancer may be cured provided

FIG. 209.



MEDULLARY CANCER OF THE CERVIX INVADING THE VAGINA.

The cervix is entirely ulcerated away, and the bladder is also implicated. The body of the uterus appears healthy, though the ovaries are adherent to it. (*Museum R. C. S. Photographed by the Author.*)

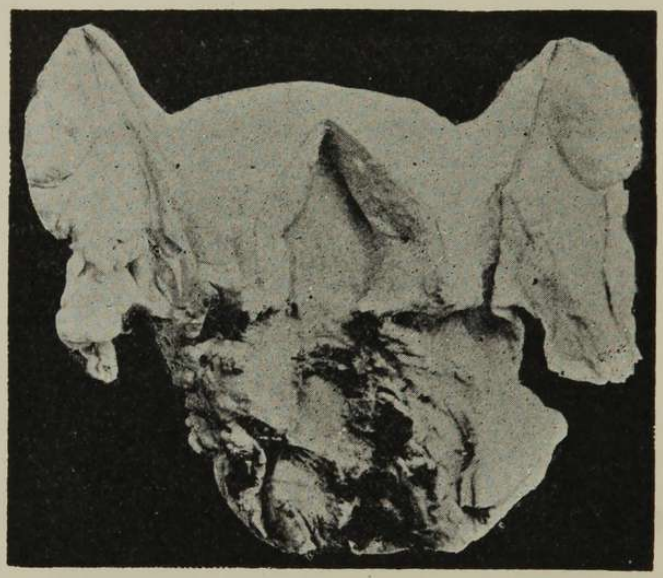
all of the diseased tissue can be removed. So long, therefore, as it is confined to the uterus, and does not involve the surrounding structures, it is curable. Unfortunately, the surgeon does not meet with it at this stage, except in a small per cent. of cases. It will take another decade to educate the general profession to the importance of early diagnosis in carcinoma uteri.

After the disease is no longer confined to the uterus the prognosis is preëminently unfavorable.

Its *duration* is most variable—from six months to four or five years. The average duration is two years; it will, however, depend upon the succeeding complications liable at any time to arise.

Cause of Death.—*Exhaustion* is one of the most frequent causes of death. It is due to hemorrhage, to leucorrhea, and to the compromised

FIG. 210.



A UTERUS, THE CERVIX OF WHICH, TOGETHER WITH A PART OF THE VAGINA, IS DESTROYED BY CANCEROUS ULCERATION.

The ovaries are slightly enlarged, and their surfaces are puckered. (*Museum R. C. S. Photographed by the Author.*)

and impaired nutrition. The last condition is due to inability to take food, as well as to the exceedingly offensive odor almost never absent.

Uremia is the next most frequent cause of death. It results from the occlusion of the ureters. *Peritonitis* occasionally terminates life, though general peritonitis is of rare occurrence. When it does occur as a complication, it is due to a sudden giving way of adhesions, with consequent contamination of the peritoneal cavity. *Hemorrhage*, as has already been shown, rarely, if ever, causes immediate death; the long-continued drain will, however, greatly prostrate the patient and hasten fatal exhaustion. *Venous thrombosis* may result in sudden death by the formation of emboli, or it may give rise to phlegmatia dolens.

Finally, death may result simply from the *absorption of septic products* derived from the breaking down of tissue.

Carcinoma of the Body of the Uterus.

The statistics of Schroeder show that cancer is located in the body of the uterus in less than two per cent. of all cases. The observation of more modern writers is not in harmony with this statement. It is probable that formerly many cases of carcinoma of the body of the uterus were overlooked for the reason that explorative dilatation and curetting were less frequently practised than at the present time

Pathology.—The disease originates either in the mucous membrane or in the uterine parenchyma. When it springs from the mucous membrane it projects into the uterine cavity in the form of a soft, friable mass; when it has its origin in the uterine parenchyma, localized nodules project either toward the mucous membrane or towards the peritoneal surface. (Figs. 211 and 212.)

Fig. 211.

Carcinoma of the Uterus with Cystic Distention of the Right Ovary. Cancerous Nodule in the Left Cornu. (*Wood.*)

The various *factors* enumerated as causes of carcinoma of the cervix are also causes of carcinoma of the body of the uterus, except that the larger number of cases occur between the ages of fifty and sixty instead of between forty and fifty. A much larger per cent. of cases also occur in nulliparæ.

Symptoms.—*Pain* is a much earlier and more constant symptom than is the case with carcinoma of the cervix. It is severe, intermittent, and lancinating in character.

Hemorrhage is also a more prominent symptom than in carcinoma of the cervix. It is at first due to increased vascularity of the endometrium; later, it is caused by the breaking down of tissue. The characteristic *cancerous discharge* follows necrosis of tissue. In time cancerous cachexia manifests itself.

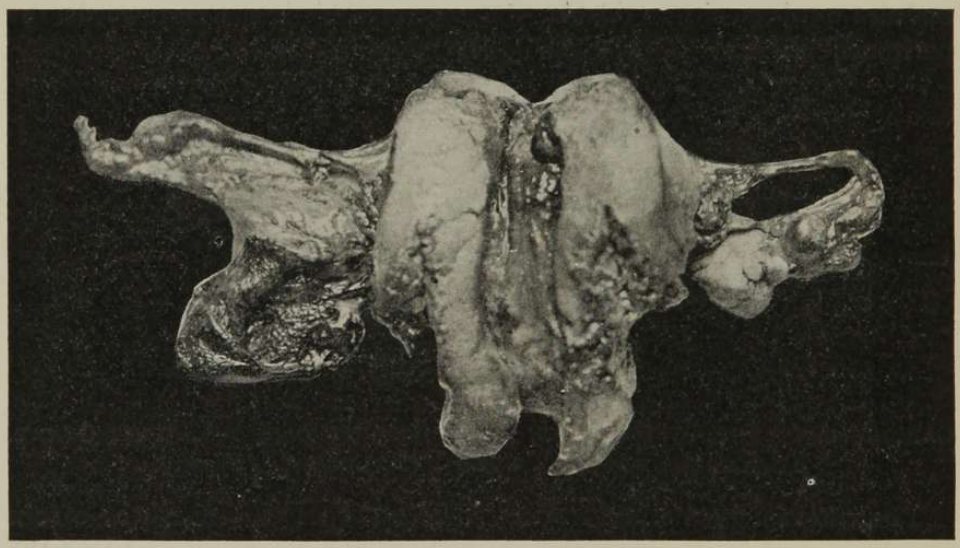
Physical Signs.—The bimanual will show enlargement of the uterus. There is more or less induration with tenderness on pressure. The cervix is free from disease during its early stages, although the os is often patulous. The introduction of the uterine sound gives rise to hemorrhage.

Carcinoma of the body of the uterus will have to be distinguished from—

Retained portions of placenta and cystic degeneration of the chorion;
Fungoid endometritis;
Myomatous tumors and large fibrous polypi;
Sarcoma of the uterus.

As regards the first three conditions, pain is seldom severe; the dis-

FIG. 212.



CARCINOMATOUS NODULE SPRINGING FROM LEFT CORNU OF UTERUS, WITH DOUBLE PYOSALPINX. (*Wood.*)

charge, except in the first, is not offensive. Upon making a microscopic examination of the products obtained by curetting, the evidences of malignancy are wanting.

Myomatous Tumors and Large Fibrous Polypi.—These growths are more liable to be mistaken for carcinoma while undergoing degeneration. There will be a history of menorrhagia long continued. The uterine sound will show an increased depth of the cavity of the uterus. Hemorrhage does not attend the passing of the sound. If the cervix is dilated, the finger will fail to detect the soft, fungoid, carcinomatous

mass projecting from the mucous membrane which is present in cancer. Before the ulcerative process has set in it is extremely difficult to differentiate between carcinoma springing from the substance of the uterus and myomas. In case of doubt the microscope should be resorted to.

There is more uncertainty in the diagnosis of cancer of the body of the uterus and its lining membrane than in the diagnosis of cancer of the cervix. As has seen shown, the disease is much more rarely located in the body than in the cervix, but I do not believe that the disparity is as great as the older writers teach. In the examination of curettings the microscope is not infallible, for the reason that the whole depth of the uterine glands is rarely obtained by the curette, and it is sometimes exceedingly difficult to distinguish a simple glandular hypertrophy attending endometritis from cancer, or from malignant adenoma. I have, therefore, formulated the following rule by which I am governed: *In a given case of menorrhagia occurring in a woman over forty years of age, which cannot be accounted for by systemic or peri-uterine disease, and which is not controlled by one or more curettings, the uterus should be removed forthwith.** In at least a dozen hysterectomies made by me upon these indications the microscope has proved beyond all doubt the wisdom of the course pursued. I believe that menorrhagia due to non-malignant endometritis, with absence of serious peri-uterine or systemic disease, is always benefited by the intelligent and thorough application of the curette. The rule which I have formulated is most emphatically applicable if the woman is approaching the age of fifty, if there is a recurrence of hemorrhage or discharge after the menopause, or if she presents a family history of cancer. In sarcomatous disease of the fundus the curette will usually bring away enough tissue to make the diagnosis certain.

Progress.—As the disease progresses it frequently involves the cervix and neighboring organs. Perforation occasionally occurs into the peritoneal cavity, setting up peritonitis. Metastasis to distant organs may also result.

Prognosis.—If the condition is detected early the prognosis is more favorable than in carcinoma of the cervix, for the reason that there is

* In a series of one thousand cases of post-climacteric hemorrhage collected in the Schauta clinic, Vienna, Neumann (*Monatsh. f. Geburtsh. v. Gynäk., Bd. 1., H. iii., 1895*), found in fifty-four per cent. of the total number cancer of the cervix. Neumann believes that when chronic and severe bleeding occurs in a woman who has passed the menopause, and who is failing in health and becoming anemic, it is almost certain that cancer of the body of the uterus exists, providing the hemorrhage is not accounted for by cancer of the cervix.

less likelihood of the surrounding structures being involved. If not interfered with, the prognosis is grave. Death is due to the same causes enumerated under the head of cancer of the cervix.

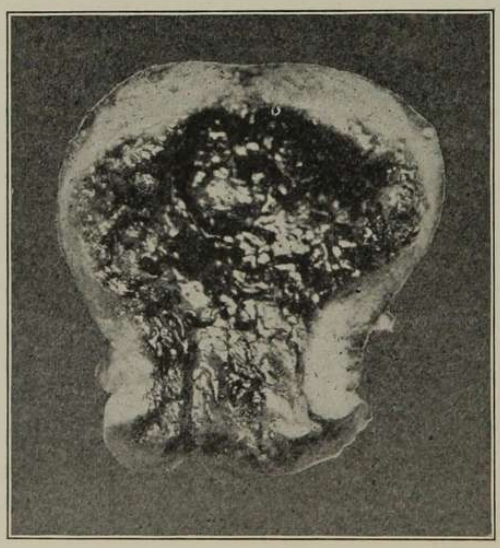
Sarcoma of the Uterus.

Sarcoma, according to Cohnheim, is a connective-tissue tumor of an embryonic type. According to Senn, "sarcoma is an atypical proliferation of connective-tissue cells from a matrix of fibroblasts of congenital or post-natal origin."* Sarcomatous tumors were formerly known as *recurrent fibroids*.

When met with in the uterus they occur in two forms: (1) Diffuse sarcoma of the mucosa; (2) fibroid sarcomatous tumors. Sarcoma is rarely located in the cervix.

Diffuse Sarcoma of the Mucosa. The proliferation of round or fusiform cells infiltrates the mucous membrane, and gives rise

Fig. 213.



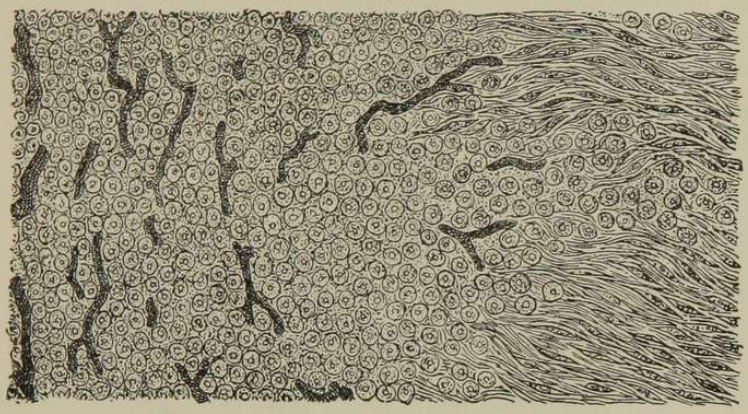
Diffuse Carcinoma of the Mucosa. (*Wood.*)

to thickening. In time there appear "soft, villous, or lobulated tumors, having an encephaloid aspect, and reproducing an embryonic type of connective tissue" (Virchow.) These fungoid masses are soft, irregular, and easily broken down. In appearance they are grayish white.

* "Carcinoma represents the malignant tumors of the tissues of epiblastic and hypoblastic origin. Sarcoma represents the malignant tumors of the tissues of mesoblastic origin."—Senn.

Deep excavation of the mucous membrane does not occur, as in carcinoma (Fig. 213). Sometimes there are found mixed tumors composed of the histological characteristics of carcinoma and sarcoma. A microscopical examination of the mucous membrane will reveal masses infiltrated with closely set round cells, with occasional spindle cells. (Figs. 214 and 215.)

FIG. 214.



DIFFUSE SARCOMA OF THE UTERINE MUCOUS MEMBRANE. (*Wyder.*)

The neoplasm is separated from the peritoneum on the left by a well-marked layer of healthy muscular tissue several millimeters thick; the superficial portions toward the cavity of the uterus, on the right, are beginning to disintegrate. In the deeper parts are seen the connective tissue fibers, rich in fusiform cells with long and short processes. Between them is an amorphous basement-substance with a large accumulation of cells, the nuclei of which appear to resemble those of the others. In the superficial portions the bands of the connective and muscular tissues have entirely disappeared, being replaced by round cells. The tumor is rich in vessels about which are foci of hemorrhage. In no part of the tumor can there be found any trace of mucous membrane or of glands.

Fibroid Sarcomatous Tumors.—These growths, like benign myofibromata, may be either interstitial, subperitoneal, or submucous. It is maintained by some authorities that they are nothing more than malignant fibroid tumors; it is now well known that fibroids frequently undergo sarcomatous degeneration (Plates I and XIII). They arise in the uterine parenchyma, but their isolating capsule is not distinct, and they are deeply rooted (Plate XXII). On section their consistence is soft and homogeneous. Occasionally they undergo degeneration, and are converted into muco-sarcomata or cysto-sarcomata. This form of sarcoma contains more spindle-cells than does the diffuse variety.

Etiology.—While the larger number of cases occur at or near the menopause, numerous instances of sarcoma of the uterus have been

met with in women under twenty years of age. Of seventy-five cases analyzed by Guesserow, twenty-five were childless, four of the twenty-five being virgins. This contrasts markedly with carcinoma of the cervix and body of the uterus.

Symptoms.—The symptoms of *diffuse sarcoma of the mucosa* do not differ essentially from those of carcinoma of the body of the uterus. There is an increase in the volume of the affected organ. A serous discharge, alternating with hemorrhage more or less profuse, is a frequent, though not a constant, symptom. Cachexia is of a later occurrence than in carcinoma of the uterus. Pain is not an early symptom. There is also less fetidity of the flow during the early period, and ulceration does not set in until late.

FIG. 215.

CELLS FROM A SPINDLE-CELLED SARCOMA FROM THE NECK OF THE UTERUS. (*Pernice.*)

In the beginning of *fibroid sarcomatous tumors* there is nothing to distinguish them from benign fibroids. There is hemorrhage, odorless hydrorrhea, some pain from pressure, and an increase in the size of the uterus. After ulceration of the neoplasm occurs, the hemorrhage becomes more profuse and the leucorrhea offensive. The discharge contains peculiar, rice-like particles, which are broken down sarcomatous

nodules. Inversion of the uterus not infrequently results in consequence of sarcoma. There is complete fusion of the tumor with the contiguous tissues, which makes enucleation impossible. Repeated recurrences after removal are a peculiar feature of sarcoma. Metastatic deposits have been found in the lungs, liver, vertebræ, and lymphatic glands. The treatment does not differ from that of carcinoma of the uterus.

CHAPTER XLII.

MALIGNANT DISEASES OF THE UTERUS.
(Continued.)

Treatment.

In the treatment of the various malignant affections of the uterus, I have deemed it best to consider under one head carcinoma and sarcoma of both the fundus and the cervix. The same principles of treatment are applicable to the several forms of malignancy, whether the disease is located in the body or the neck of the organ.

If it be true that carcinoma is, at its beginning, a local affection, becoming general only as it extends by contiguity of tissue, or by the absorption of broken-down débris, the possibilities of curing the disease depend entirely upon an early diagnosis and early operative interference. This applies to carcinoma wherever located, but emphatically so to carcinoma of the uterus, because with no other removable organ of the body is it so difficult to reach beyond the parts primarily affected. That the disease does, at the beginning, localize itself in the uterus is, I think, clearly proved by the large number of operative cases now on record and by the observations of Russell referred to on page 684. Nevertheless, it is an unfortunate fact that at least fifty per cent. of all cases of carcinoma and sarcoma of the uterus will have passed beyond the operative stage before coming under the observation of the specialist. The treatment, then, naturally resolves itself into—

(*a*) Prophylactic;
(*b*) Palliative;
(*c*) Curative.

Prophylaxis.—I again repeat that I believe that a very large per cent. of uterine cancers could be prevented by the timely correction of the diseases and injuries which have been studied as etiological factors. I believe that every woman who has a serious laceration of the cervix, with eversion and deposition of cicatricial tissue, should have it repaired. This is especially true if there be an hereditary predisposition to cancer. Trachelorrhaphy, in skilled hands, is a most simple operation, and the danger attending it is practically nil. Usually, too, when the condition

of the cervix which I have described exists, there are certain disturbances of the general system which in themselves call for correction of the local lesion. I have in another place (*North American Journal of Homeopathy*, July, 1895) made a plea for the removal of all lesions of the lower orifices of the body at one sitting. Diminished physiological resistance is the very foundation of cancer, whether the disease start from a matrix of embryonic tissue, whether it be due to parasites, or whether it has its origin in protoplasm unfavorably impressed by heredity. This diminished physiological resistance is brought about by malnutrition; and malnutrition, especially in women, is oftener due to lesions of the lower orifices of the body than to other causes. Pratt, of Chicago, has created in this country a school of surgeons known as "orificialists." While wild and exaggerated claims have been made by many of Dr. Pratt's followers, and much harm has been done by a class of men who are ill-fitted to assume the responsibilities of surgery, I am firmly convinced that many surgeons are ignoring certain principles emphasized by Pratt which, if intelligently applied, would work untold good in the prevention and cure of organic diseases. Space will not permit of entering into an extended discussion of the so-called orificial philosophy. From an experience which is not altogether small, I am led to believe that the nutrition of the body can be profoundly impressed for evil by certain lesions of the lower orifices of the body; and that by correcting such lesions the patient can many times be lifted from a state of invalidism to health. Orificial surgery not only removes the local irritation, which in itself predisposes to cancer, but it places the system, especially when aided by intelligent internal medication, in shape better to resist disease and degeneration.

Lesions of the uterine appendages should receive attention, and in gonorrheal pyosalpinx, where the uterus is much enlarged and diseased, I believe that it should be removed with the appendages. Usually the results are more satisfactory when this is done, for a uterus thus affected remains a menace to its possessor and may take on malignancy. I now have under my observation a woman, 36 years of age, from whom I removed, eighteen months ago, a pair of pus tubes. She returned to her home in the interior of the State and twelve months later presented herself with a uterine cancer advanced far beyond the operative stage.

Fibroid tumors of the uterus are no longer considered as harmless as they formerly were. During the last year I have removed two uteri for fibroids which had undergone sarcomatous degeneration. The specimen shown in Plate XIII was removed from a maiden woman aged

40. The larger mass on the left was incarcerated within the pelvis and was rapidly strangulating the bowel. The smaller one on the right floated upward and rested beneath the spleen. Total abdominal hysterectomy was made with the patient in the Trendelenberg posture. The smaller tumor was studded with sarcomatous nodules. The tumor and uterus weighed fifteen pounds.

The specimen shown in Plate XV. was removed from Mrs. S., aged 40, a widow and childless. Eight months ago I amputated the breast for a scirrhous cancer. She had suffered for years from pelvic distress, dysmenorrhea and menorrhagia. The uterus distended the hypogastric region. The operation was made through the abdomen. The fibroid was of the submucous variety and had assumed malignant degeneration. It is yet too early to determine in either of these cases whether or not a permanent cure has been accomplished.

Senn* maintains that transformation of innocent into malignant growths is not uncommon. While I by no means believe that all, or even the majority, of myofibromas call for operative interference, I do believe that these growths should be carefully watched and if evidences of malignancy develop they should be removed at once.

Women who are victims of badly lacerated cervices and who will not, or can not, undergo an operation, should submit to local examination at least every six months.

Palliative Treatment.—This includes the management of the hemorrhage, the pain, and the leucorrheal discharge. The *hemorrhage* can often be favorably influenced by the use of the indicated remedy. I have but little faith in the action of large doses of ergot for this purpose, especially when the disease is limited to the cervix. If the indicated remedy is not sufficient, and the hemorrhage is great enough to exhaust the patient or to threaten her life, local medicaments must be used. One of the least objectionable of these is the saturated solution of alum; and the patient should always have at hand a sufficient quantity of this agent to use whenever necessary. Cold water may be resorted to for the same purpose. Should the hemorrhage still persist, a tampon, saturated with a weak solution of perchlorid of iron, may be placed against the bleeding surface. To obtain the mechanical effects of the tampon, others must be packed about it in such a way as to exert decided pressure upon the cervix (p. 154). If the fetor is marked iodoform gauze may be used for tampon material. Should the

* Pathology and Surgical Treatment of Tumors, p. 61.

hemorrhage proceed from the body of the uterus, a solution of alum, heated, may be injected into its cavity.

The nurse should be instructed as to the methods of controlling hemorrhage, especially if the patient reside some distance from the attending physician. The patient should be advised to abstain from sexual intercourse and to observe care in straining at stool. Indeed, constipation should always be guarded against, for if the rectum is distended with hard fecal matter it not only adds greatly to her distress, but predisposes to hemorrhage.

After infiltration of tissue, *pain* becomes the most prominent and most distressing symptom. When the disease is confined to the cervix, much relief may be afforded by the local use of anesthetic and narcotic agents (p. 152). Iodoform is not only a powerful disinfectant, but it is also a local anesthetic of much value. It may be applied directly to the parts by means of a powder blower; or it may be mixed with almond oil (ɪ3–℥ɪ) and applied by means of a tampon. The fluid extract of opium, either in the form of suppositories or applied directly to the ulcerated surface, is beneficial. The fluid extract of belladonna is also a useful agent, particularly if the pain is of a throbbing character. A suppository composed of one grain of the fluid extract of opium and one-quarter of a grain of the fluid extract of belladonna and repeated as often as necessary is an old and well-tried method of using these agents combined. Equal parts of chloroform, glycerin, and sweet oil is another old formula and at times a most useful one (Ludlam). This preparation may be applied on a tampon. A solution of hamamelis, or a saturated solution of hydrate of chloral, may afford relief when other remedies fail or their effect becomes exhausted. Ichthyol, in a fifty per cent. glycerin solution, is also a useful application.

In contending with pain, invaluable service may be obtained from the properly selected homeopathic remedy. Before resorting to opium the cold tar compounds should be exhausted, and the physician is urged to withhold the internal administration of opium as long as it is possible to do so without permitting his patient to suffer too greatly. It is even claimed by some of the best men in the homeopathic school that the use of opium is never necessary in contending with pain of any kind. I cannot refrain from congratulating the prescriber who is sufficiently skilled to dispense with the use of this agent in the disease under consideration. No one deprecates more than I the internal administration of opium, especially in cancer. I am nevertheless compelled to admit that during its later stages I am many times unable to control the almost intolerable suffering incident to it without resorting to some of the forms of opium.

Its use is attended with unpleasant consequences which I should be only too glad to avoid. These consequences are, however, in my opinion, more than offset by the relief afforded. The disease, after reaching a certain stage, is inevitably fatal, and it has always seemed to me that it is the duty of the physician to bring to its victim all possible means of relief. If he cannot keep her comfortable without opium, I believe he should administer it in doses sufficiently large to accomplish the desired end. However, the drug should not be given until it is absolutely necessary; it quickly exhausts itself and has to be repeated in ever-increasing doses until the amount required is sometimes enormous. It is best administered hypodermatically.

The *leucorrheal discharge* is to be contended against by the frequent use of antiseptic and disinfecting agents. Of these a solution of permanganate of potash is one of the best. It should be used as a douche (20:1000), and repeated as often as necessary. After the parts are cleansed with this solution, an iodoform suppository containing two grains of iodoform may be introduced into the vagina. Carbolic acid (one to fifty) is also a powerful disinfectant, and possesses anesthetic properties as well. A solution of thymol (five per cent.) or bichlorid of mercury (1:5000) may also be used for this purpose. Hot water alone, administered in large quantities, will not only cleanse the parts, but will many times greatly relieve the suffering (*v.* Chapter X).

Erythema of the vulva, during the later stages of cancer, is often most distressing. The parts should be protected by some of the ointments recommended for pruritus vulvæ. Equal parts of olive oil and lime-water applied to the vulva will often afford marked relief. A solution of chlorate of soda is also highly recommended by some writers.

Lucas recommends the following dressing for uterine cancers:—

℞. Benzoin,
Iodoform,
Magnesia carbonate, aa. ℥ii.

It should be applied after the raw surface has been freely exposed. Lucas claims that this dressing overcomes both the fetidity and acridity of the secretions.

Lutand exposes the raw surface with a speculum and insufflates the following powder daily: Salycilic acid, gr. iv; boric acid, ℥i; iodoform, ℥ii; essence of eucalyptus, q. s.

A more formidable palliative measure, which is surgical in its nature, is *curetting*. It is especially useful in those cases where the disease occurs in the form of soft, friable masses projecting either into the uterine cavity or from the cervix. The hemorrhage, the offensive discharge, and the

pain are largely due to these papillomatous growths. If removed by the curette, the relief afforded is often most marked. The hemorrhage is temporarily controlled, the offensive discharge ceases for a greater or less length of time, and the pain is most decidedly ameliorated. Moreover, the symptoms of sepsis, due to the absorption of necrosed tissue, will disappear for the time being. As a palliative measure, then, the use of the curette is of the first importance.

In most instances I deem it best to place the patient under the influence of an anesthetic before the curette is applied. There should be at hand the various preparations of iron for the purpose of controlling hemorrhage, as well as a Paquelin cautery. After the speculum is introduced the cervix is supported by the volsella, and Simon's sharp spoon curette is expeditiously but *thoroughly* applied, all of the necrosed tissue being scraped away. A stream of hot bichlorid should be kept playing upon the parts during the operation, as the hemorrhage is usually very profuse. The raw surface is now seared over with the Paquelin cautery. Ordinarily, this will control the hemorrhage; if not, a solution of perchlorid of iron may be applied. A strip of iodoform gauze is finally carried into the uterus if the case is one of carcinoma of the body, or packed into and about the cervix if the disease is limited to the neck. Additional strips of gauze are packed into the vagina. These can be left in for two or three days, after which they are removed and the parts kept thoroughly clean by antiseptic and disinfecting injections.

Besides the various local measures which have been enumerated, it is important to maintain the nutrition of the patient by nourishing food and by proper hygiene. Owing to the offensive discharge, the sick-room should be kept thoroughly ventilated; if the patient can have at her command two rooms, so that one can be aired while she is occupying the other, such an arrangement will be advantageous.

It seems unwise to inform the patient that she is the victim of incurable malignant disease, unless it is absolutely necessary, because of business affairs, to do so. If the facts are known to her the effect upon the mind is most distressing. Since she is liable to live for months, or even for years, there is no reason why she should be informed of the inevitable end. Of course her immediate friends should be made familiar with the diagnosis and prognosis—this for the physician's protection. Again, it is never wise to prophesy too closely as to the probable duration of life. The physician can only state the average duration of the disease, at the same time emphasizing the fact that certain complications may suddenly terminate life.

Therapeutics.—Many vaunted specifics for cancer have been from time to time put forth, but as yet nothing reliable in the way of a "cure all" has been accomplished. Personally, I have pinned my faith to the homeopathic remedy and I believe that, when properly selected, it will do all that any form of internal medication known at the present time can do in the way of staying the progress of the disease. The remedies most useful are those capable of profoundly impressing the system when given to persons in health. Prominent among them is arsenic and its compounds. I have done more with arsenicum iodid than with any one other remedy. Hydrastis, lachesis, conium, and the preparations of lime and potash are often serviceable. These remedies, the indications for which I give below, will do much in the way of palliation and in maintaining a favorable condition of the system. However, and I wish to emphasize this point: *I do not believe that there is one single authentic case of cancer on record cured by internal medication.* I know that many cures are reported in homeopathic literature and some of them by excellent diagnosticians; but I am unable to find one single instance where the diagnosis has been verified by microscopic examination. I am conscious of the fact that this statement is not altogether fair for the reason that an opportunity to make a microscopical examination does not very often present itself in non-surgical cases. I record in footnotes several reported cures and grant that the evidence is worthy of serious consideration. The uncertainties of diagnosis surrounding each case must, however, be borne in mind.

Six months ago a woman, 38 years of age, consulted me. She had been bleeding almost continuously for twelve weeks, the discharge being offensive, and the skin of a dirty straw color. On examination I found the uterus enlarged, the cervix lacerated, everted, and indurated, and the mucous membrane lining the cervical canal abraded. I felt confident that the condition was one of malignancy, but, to make sure, curetted, and removed under cocaine a section from the cervix. The curettings and the cervical tissue were examined by a pathologist in whom I have perfect confidence. His diagnosis, and he seemed sure of his ground, was that of fungoid endometritis with cystic degeneration, and erosion of the cervix. When I came to operate a week later, I could but feel that the pathologist had been mistaken, and was greatly tempted to remove the uterus. However, I decided to work along conservative lines, and accordingly repaired the cervix, removing a large amount of diseased tissue. This was again submitted to microscopic examination, and the opinion first given confirmed. The patient con-

valesced uninterruptedly, and the cervix to-day presents a perfectly healthy appearance.

I present this record for the purpose of showing how valueless are the recorded cures of cancer where the diagnosis is unconfirmed by microscopic examination.

Granting, for the sake of argument, that cancers have been cured by homeopathic medication, the per cent. of such cures is so small as to make it unsafe to rely on internal remedies in operable cases. Sixty-six per cent. of the uterine cancers which came to me in 1895 were inoperable. In a goodly number of these cases the gentlemen who had them in charge followed, instead of instituting a careful local examination, the lead of a blind symptomatology which proved disastrous to their patients. With our present knowledge of cancer of the uterus, and with the statistics of hysterectomy for the disease now accessible, there rests with the general profession a tremendous responsibility. It is the family physician to whom the specialist must look for the early recognition of the disease.

During the last three years the treatment of inoperable cancers and sarcomas with the toxins of erysipelas and bacillus prodigiosus has received much attention. Coley * summarizes the cases treated by him up to May 1, 1894, as follows: Twenty-five cases of inoperable sarcoma, eight of inoperable carcinoma, and three of carcinoma or sarcoma were treated with the mixed toxins. Improvement followed the treatment in carcinoma in a number of cases, but there were no cures. Six of the sarcomas were apparently cured. One was a case of recurrent sarcoma of the hand which had been removed surgically six times; the patient emained in perfect health two years after beginning the treatment. In another case a very large and presumably malignant tumor disappeared under the mixed treatment. In twenty-four additional cases treated since the above date, all of which were inoperable, the results were encouraging. Thirteen of the cases were sarcoma and eleven carcinoma. Of this number three of the sarcoma cases were supposed to be cured. In none of the carcinomas did the tumor entirely disappear, though in nearly all the progress of the disease was favorably affected. Coley begins with a minimum dose of the toxin and gradually increases it until a reactionary temperature of 103° or 104° F. is produced. He believes that the action of the erysipelas toxin is greatly increased by the toxin of the bacillus prodigiosus.

Coley concludes his article on the subject as follows:—

* Am. Jour. Med. Sci., Jan. 19, 1895.

1. "The mixed toxins of erysipelas and prodigiosus exercise an antagonistic and specific influence upon malignant tumors, which influence, in a certain proportion of cases, may be curative.

2. "This influence is slight in most cases of carcinoma (including epithelioma), most marked in sarcoma, but varies with the different types, the spindle-celled form showing by far the greatest influence.

3. "The action of the toxins is not merely local in character but systemic.

4. "The toxins should be used only in clearly inoperable cases, or after primary operation to prevent recurrence.

5. "The results will vary greatly with the strength of the preparation, the most virulent cultures giving the best results."

I have tried the mixed toxins in three cases of carcinoma and one of sarcoma. All were inoperable. In one of the carcinomas (carcinoma of the breast) the progress of the disease was unquestionably interrupted and the patient temporarily benefited. It, however, resumed its former course after remaining quiescent for three months. In two cases of carcinoma of the uterus the results were nil, although the injections excited a high fever and profound reactionary symptoms.

The sarcoma patient was a woman of sixty-four. I opened the abdomen and found the pelvis packed with sarcomatous tissue. The spleen and liver were also involved. She rallied from the operation and injections of the toxin were begun at the end of two weeks. She seemingly improved for a time, but at the end of six weeks suddenly died, probably from heart clot. At no time were reactionary symptoms induced by the injections, notwithstanding that the maximum dose recommended by Coley was increased threefold. I do not believe that the toxin had anything to do with the sudden death.

Coley begins with one minim of the filtrate, or one-half minim of the infiltrated toxin, and gradually increases the dose each day until the reaction temperature reaches 103° to 104° F. Care must be observed in prostrated or elderly patients not to carry the reaction too far or death may result. The chill preceding the fever is something terrible.

Coley's experiments suggest to my mind the possibility that the carefully selected homeopathic remedy might accomplish more in the treatment of carcinoma were it brought in direct contact with the disease by hypodermatic medication. While it cannot be claimed that the toxin of erysipelas is homeopathic to cancer, its action is certainly along homeopathic lines. I believe that a carefully conducted series of experiments with the homeopathic remedies used hypodermatically in

cancer is worthy of most serious consideration. The well-known action of arsenic locally adds additional force to the suggestion.

Beck,* while admitting that accidental erysipelas, like many other infectious diseases, has an influence on malignant lesions, claims that the same effects may be caused by injections of *zinc chlorid*, *arsenic*, *potassium iod.*, and many other substances. Wyeth † maintains that sarcoma may be cured by any form of septic infection, though he admits that the sepsis of erysipelas exercises the most powerful curative influence.

Bernhart‡ reports highly satisfactory results from parenchymatous injections of a solution composed of six parts of salicylic acid to sixty of alcohol. Thirty minims are injected into the growth in eight or ten different places.

Valliet || has obtained almost equally good results from the hypodermic use of absolute alcohol alone.

Adamkicwicz (Warren), imitating Koch's method of treating tuberculosis, treats cancers with a serum which he terms "cancroin" and which he obtains by macerating minute fragments of cancer in water. His success has been indifferent.

Pyoktanin has also been used subcutaneously in malignant tumors with alleged success. The once vaunted specifics, chian turpentine and condurango, have long been entirely discarded.

While the results thus far obtained in the treatment of malignant neoplasms by toxins and agents used subcutaneously are far from satisfactory, I do not think that they should be ignored. They at least suggest possibilities which should encourage all serious investigators in this field of research.

Homeopathic Therapeutics.

Arsenicum.—Cancer of the uterus, with burning, agonizing pain, and secretion of fetid, brown or blackish ichor; faintness; BURNING PAINS, even felt while sleeping; ACRID AND CORRODING LEUCORRHEA; emaciation, with excessive debility; restlessness; symptoms of septicemia.§

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* Chicago Med. Recorder, August, 1894.

† Jour. Am. Med. Assoc., June 30, 1894.

‡ Central bl. f. Gynäk. No. 39, 1893.

|| Allg. Med. Central Zeit., No. 67, 1894.

§ "He (Mr. Johnstone) quite agreed with Dr. Wood that *Arsenic* was the remedy which produced the best effects in carcinoma, whether used in the iodid or in the oxid form. The use of *Arsenic* was warranted, not only by the totality of symptoms, but also by the effect which was produced by toxic doses continued over a

Hydrastis Can.—Ulceration of cervix and vagina, with sympathetic affections of the digestive organs; the *discharge is tenacious, thick and ropy;* pruritus vulvæ, with sexual excitement *

Conium mac.—HARDNESS OF UTERUS, WITH INTOLERABLE LANCINATING PAINS THROUGH THE PELVIS; acrid, burning leucorrhea, preceded by pinching pains in the abdomen; *carcinoma following chronic inflammation and induration of ovaries;* scanty menstruation, especially in sterile women.

Kali bich.—*Leucorrhea yellow and ropy*, with pain and weakness across small of back; dull, heavy pains in hypogastrium.

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long time. Mr. Jonathan Hutchinson and others had noticed that when arsenic had been prescribed in appreciable doses for a considerable time it had actually produced epithelia of the skin, so that was an indication for the use of *Arsenic* in carcinomatous processes."—*Mr. Johnstone's discussion of the author's essay on "Carcinoma of the Uterus" presented to the International Homeopathic Congress, London, Aug., 1896.*

* "The only case in which he (Dr. Pope) had had a successful result from *Hydrastis*, covered a remark made this morning, viz.: 'That it was the *early* condition of the disease in which good results might be hoped for.' He saw a lady many years ago with a small, hard, adherent nodule in the breast, the nipple being retracted. The usual pain of carcinoma was present, and the case left no doubt in his mind as to its nature. He advised her to see Dr. James Paget and take his opinion as to the expediency of the removal, because it was then that removal would do good if it ever would. The patient could not make up her mind to do this, but said she would think about it, and he accordingly prescribed *Hydrastis* for her to take at once. In about a month or five weeks she came to him again, and all appearance of the carcinoma had gone. He had never heard of the patient since, and that was more than twenty years ago."—*Dr. Pope's discussion of the author's essay on "Carcinoma of the Uterus."*

"*Hydrastis* was the remedy, both locally and constitutionally, to which he (Dr. Burfurd) would pin his faith; and if he was restricted to one remedy the remedy would be that. Under certain circumstances he believed he had caused total elimination of the growth by *Hydrastis*. But the difficulty was that it had to be given for a long period of time, and the question comes up, 'were they justified in exposing the patient to the risks of delay.' The physician feeling that, felt called upon to apply for surgical relief, when probably he could do just as well himself. That was the difficulty which physicians were in—the devastating results which might ensue where therapeutic treatment was being applied which might in the long run prove satisfactory. Dr. Wood's view was, that theoretically operation was without doubt the correct treatment. When a man undertook to remove malignant growths by surgical means it was desirable that he should be perfectly certain that he had removed them and had not left any fragments behind. It was not impossible to imagine a time would come when somebody would do for the human race with carcinoma what Jenner had done with smallpox and Hahnemann had done with therapeutics generally."—*Dr. Burfurd's discussion of the author's essay on "Carcinoma of the Uterus."*

Phytolacca.—Menses too frequent and too copious; metrorrhagia; ropy leucorrhea towards morning; hunger soon after eating; urine dark-red, with painful micturition.

Thuja.—CAULIFLOWER EXCRESCENCE PROJECTING FROM CERVIX; erosions of os uteri; aphthæ.

Graphites.—Violent lancinating, stitching pains through the uterus down to the lower extremities; inclined to obesity, with a history of delayed menstruation; swelling of the feet; the discharge is glutinous, or watery; itching blotches on various parts of the body.

Kreosotum.—*Burning sensitiveness and tumefaction of the cervix with bloody ichorous discharge;* the genital tract is sensitive to touch and to coitus; *great putridity of discharges.*

Belladonna.—BEARING DOWN SENSATION AS IF THE INTERNAL ORGANS WOULD ESCAPE EXTERNALLY; pains are of a shooting, tearing character, coming on suddenly and finally leaving as suddenly; hemorrhage profuse and offensive; *the parts feel dry and hot internally.*

China.—Especially useful to overcome the effects of the long-continued hemorrhage and leucorrhea; the patient is worse every other day; *flatulency, which is not relieved by the discharge of flatus.*

Lachesis.—Cancer occurring in women approaching or passing through the menopause; frequent hemorrhages; FLUSHES OF HEAT; the pain is sometimes very violent, as if a knife were thrust through the abdomen.

Bovista.—Menses every two weeks, much dark and clotted blood; burning in the genitals; yellow, green, acrid, corrosive leucorrhea, leaving green spots on the clothes; painful weighing down in vulva, and weight in small of back after midnight; pains around navel; abdomen bloated.*

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* "A patient had been under a dozen medical men for years, always ill. One man thought he was suffering from one thing, and another from another, and at last a tumor appeared. He (Dr. Clifton) did not think it cancer at first, but ultimately he sent the patient to Sir James Paget, who sent him to Sir Prescott Hewett. He had a letter from that gentlemen saying that 'this bears unmistakably all the microscopical characteristics of epithelioma, and we advise operation.' The gentleman did not agree to that and put himself under his (Dr. Clifton's) treatment. Just at that time he had been reading up the provings of *Bovista;* it had no relation to the epithelioma, but it had all the characteristic symptoms which the patient had been suffering from for years, and which symptoms had subsided after the tumor appeared. He therefore gave him *Bovista*, which did the patient a great deal of good generally and arrested the growth. He then put him on *Phytolacca*, not because it produced anything like the symptoms—he did not believe they had any medicine which would produce symptoms like cancer—but the patient had

Phytolacca dec.—Menses too frequent and too copious; mammæ painful; griping and cramps in abdomen; limbs cold, head and face hot; night sweats; discharge fetid, ichorous; glands inflamed, and become swollen.

Kali phosphoricum.—It is claimed that the pain in cancer is greatly subdued by this remedy, and that the offensive odor from the discharges is lessened. Paroxysms of neuralgic pains; palpitation from a weakened condition, or direct nervous excitement.

Kali sulphuricum.—Epithelial cancer; slimy, thin, decidedly yellow or greenish discharges of watery matter from the vagina; the symptoms worse in the evening in a heated atmosphere, and better in a cold open atmosphere. *

Magnesium phosphate.—Intensely sharp pains through abdomen which are of a spasmodic nature, often accompanied with a feeling of constriction.

Calcium sulphate.—Discharge of pure pus or sanious matter; suppuration of the neighboring glands.

Consult:—Phosphorus, *rhus tox.*, sepia, sulphur, murex pur., secale, *tarantula*, trillium, and zincum met.

Curative Treatment.

Vagino-Abdominal Hysterectomy.—I have given this somewhat

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other symptoms which *Phytolacca* removed. The symptoms came on again after some time, but *Phytolacca* again removed them. That gentleman had been one of his best patients."—*Dr. Clifton's discussion of the author's essay on "Carcinoma of the Uterus."*

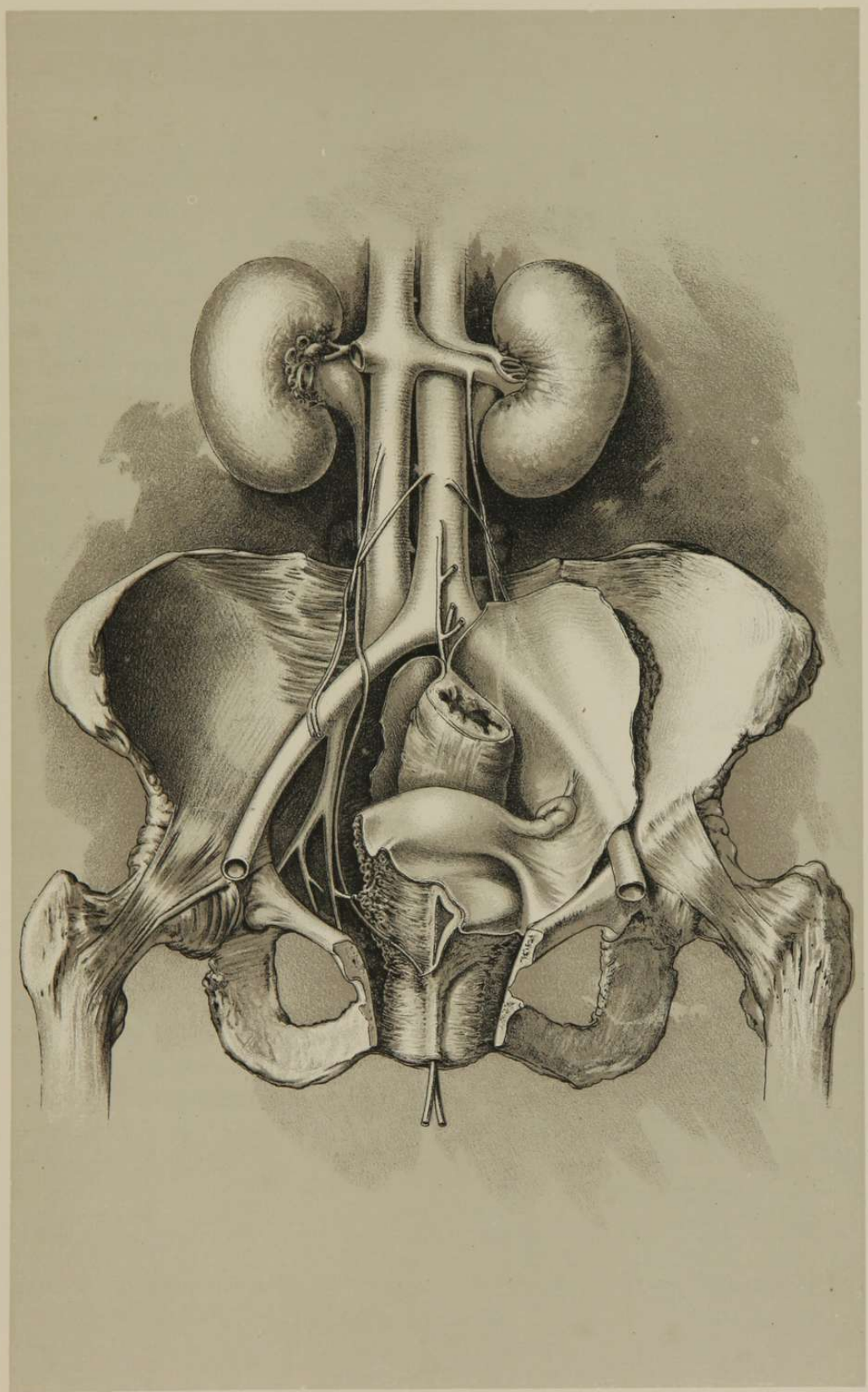
* "William W., a factory worker, came to me on September the 4th. He suffered from epithelioma, which was situated on the right side of the nose, almost immediately below the corner of the eye, and about the size of a two-shilling piece. The eye itself seemed to be affected, either sympathetically or through irritation excited by the discharge, which might have found its way into the eye from the edge of the eyelid, which, however, was not greatly destroyed. Be that as it may, there was conjunctivitis, palpebreum and bulbi, with dulness of the cornea. The ulcer at the side of the nose had existed for four years. At first there was a slightly red spot which was a little raised and swollen. Later on it became covered with a horny-like scab, which after a time fell off and left a sore. This spread slowly but steadily. The patient had during the time of its existence consulted a great number of doctors. He had also been treated for two months by a specialist for the eye, after it had become implicated; but all without effect. *Potassium sulphate* was now given him, a dose night and morning, and externally a lotion of potassium sulphate was used. After only a few days the inflammation disappeared. The ulcer also began to heal under the steady treatment. By the 8th of October, the sore had cicatrized so that only a spec was left, and the patient was able to resume work again on the 9th of October."—*Schüssler.*

extended review of the literature of the therapeutics of cancer quite as much to show that at the present time our chief reliance in the treatment of this most formidable disease must be placed in surgery, as to call attention to the work that is being done along this line. The first complete vaginal hysterectomy for carcinoma was made in 1813 by C. J. M. Langenbeck, but Czerney, in 1878, was the first to successfully revive the operation. Abdominal hysterectomy, as performed by Freund, was practically discarded for the vaginal operation because of the high mortality. Few specialists longer advocate high amputation of the cervix as a curative measure. Total hysterectomy, either vaginal, abdominal, or vagino-abdominal, is the only radical procedure which should be thought of. Up to two years ago the percentage of immediate recoveries was so largely on the side of the vaginal method that few abdominal hysterectomies were made for cancer. During the last two years, however, particularly in America, there is a tendency to revert to the abdominal, or the combined vagino-abdominal method. This practice is the outcome of the more favorable results following total ablation of the uterus for fibroids. The mortality attending abdominal hysterectomy is now but little greater than that attending ovariotomy. The "pedical problem" was solved by total extirpation, which was immensely facilitated by the Trendelenberg posture. As long as the disparity in the results of the two methods was so great, operators were loath to abandon the vaginal for the abdominal route. The outcome was that there were devised almost as many different methods of performing vaginal hysterectomy as there were operators. However, the great difficulty of cutting "wide of the diseased area" while working through the vagina alone has been generally recognized; and, since the Trendelenberg posture has so simplified abdominal hysterectomy, many surgeons prefer to work close to the pelvis through the abdomen. One needs but study the lymphatics of the uterus (Figs. 24 and 25) to appreciate that the Pratt method of enucleation is entirely inapplicable to carcinoma. During the last three years I have been doing the combined operation and am more than delighted with it. It is performed as follows: The patient is first placed in the lithotomy posture and the cul-de-sacs opened in the usual way, as large a cuff of vaginal tissue being removed as is possible. The uterine arteries are next secured in catgut or silk ligatures, as the operator may elect, and the broad ligaments severed on either side for a distance corresponding to the tissue included in the ligatures. This frees the cervix from the bladder, rectum, and the base of the broad ligaments. The patient is next placed in the Trendelenberg posture, the abdomen opened by a long incision, and a

corkscrew introduced into the fundus. By means of the corkscrew the entire uterus is elevated and the ovarian arteries secured by ligatures introduced as close to the pelvic wall as it is possible to carry them. A couple of catch forceps secure the uterine ends of the arteries, when the ligaments are severed one-quarter of an inch from the ligatures. (Fig. 207.) The peritoneum in front is next turned back, after the method of Kelly, and the intra-ligamentary cellular tissue carefully explored for enlarged glands. Succeeding ligatures secure the remaining portions of the broad ligaments, all hugging the pelvic wall as closely as possible, except those passed through the bases of the ligaments, when the tissues are divided with scissors. It is necessary in this locality to observe care not to injure the ureters. Kelly and J. G. Clark locate the ureters by inserting under cocaine, before the patient is placed on the operating table, bougies into them. (Plate XXIII.) If this is impracticable the dissection should be carried upward along the uterine artery with the handle of the scalpel, when the ureter will be exposed as a "glistening cord" (Kelly). The glands at the bifurcation of the iliac artery are not infrequently involved and should be carefully enucleated, as should other enlarged glands if they exist. After the ureters are located more of the tissue about the uterine arteries can be removed if deemed necessary. The broad ligament stumps are next nicely covered by peritoneum with a running catgut suture, as in hysterectomy for fibroids, the vaginal mucous membrane being first stitched to the peritoneum in front and behind. A small opening into the vagina is left for drainage, through which several strips of gauze may be carried; or, in clean operations, the opening may be entirely closed without drainage. The abdomen is closed in the usual way. Strict antisepsis is observed throughout.

Plate XXI shows a uterus removed by the vagino-abdominal method. One has but to contrast this with Plate XII, which shows a uterus removed by the Pratt method, to see the superiority of the combined operation when extensive ablation of tissue is important. Nevertheless, cases will every now and then be met with where, because of the age or prostration of the patient, or because of the thickness of the abdominal walls, the operation will have to be done through the vagina.

Vaginal Hysterectomy.—Supravaginal amputation of the cervix, as practised by Verneuil, Schroeder, and others, still has its advocates; but since vaginal hysterectomy has become a popular operation comparatively few surgeons perform cervical amputation, even though the disease is apparently limited to the cervix. Indeed, vaginal hysterectomy is not essentially more formidable than is the incom-



Hysterectomy for Cancer of the Uterus (J. G. Clark).

Bladder removed to show bougies in ureters.

plete operation, and by it both hemostasis and antisepsis are more easily attained. It is utterly impossible to determine, in a given case of cancer of the cervix, whether the disease is limited to the cervical portion of the uterus. It is a well-known fact that in the majority of instances it is not so limited; consequently, the broad principle of extensive ablation which applies to carcinoma of other parts of the body, applies with double force here. It is true that it is not always possible to determine, previously to the removal of the uterus, whether the disease is limited to the organ as a whole. This fact is forced upon us by the return of the disease in a certain per cent. of cases after total extirpation. It must not be forgotten that vaginal hysterectomy is a comparatively recent operation. Unquestionably many uteri have been removed per vaginam that ought to have been let alone. The operation is justifiable under certain conditions only; these conditions should prevail before it is attempted.

Vaginal hysterectomy is indicated only when the disease implicates the fundus, and the uterus is yet mobile; and when no evidences of its invasion beyond the uterus can be obtained by careful examination. I do not believe that the surgeon is justified in operating by this method alone if the vagina is even slightly involved at its fornices, if the uterus is fixed, or if large glands can be detected in the folds of the broad ligaments or extending along the utero-sacral ligaments. Indeed, I do not believe that any form of hysterectomy is justifiable if it is evident that the disease has extended beyond the uterus, unless the chances of recurrence are clearly explained to the patient and her friends. A most careful examination should, therefore, always precede the operation. Much information can be obtained by the bimanual, if embarrassing obstacles do not exist. The cervix should be dragged down with the volsella and an exploration made through the rectum. In case of doubt, a more extended examination should be made under an anesthetic. Even the most thorough examination under the most favorable conditions may fail to reveal enlarged glands in the folds of the broad ligaments; hence the immense advantage of working through the abdomen.

Operation.—The patient should be prepared for the operation as for abdominal section (*v.* Chapter XII). The bowels, and especially the rectum, should be thoroughly emptied, and the vagina carefully disinfected. Antisepsis of the vagina is secured by frequent douching with a 1:3000 bichlorid solution. A preliminary curetting, where papillomatous masses are abundant, may be advisable. Unless this precau-

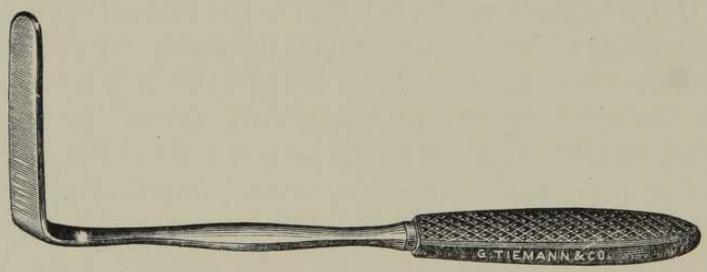
tion be taken there is danger of infecting the peritoneum with the cancerous discharge during the operation.

After the patient is anesthetized she should be placed before a good side light in the lithotomy posture and the vagina scrubbed with green soap and a 1:1000 bichlorid solution. The vulva and pubes are again scrubbed and shaved, and finally washed with a normal salt solution. The external parts are then wiped dry with a sterilized towel, washed in ether and sprinkled with iodoform. The thighs and perivulvar parts are protected with a perforated gauze sheet.

The cervix is well exposed by three or four retractors (Fig. 216), when it is seized with a pair of bullet forceps. The uterine cavity is packed with gauze and the cervical canal is closed by three strong guy sutures which are passed through both lips and tied. The volsella is now removed and the cervix and uterus dragged down by means of the guys.

The bladder is located by introducing a sound through the urethra, and sweeping it over the anterior portion of the cervix. An incision is then made with a scalpel through the mucous membrane above the diseased area, completely encircling the cervix. The scalpel is now discarded and further dissection is made with blunt, curved scissors, or

FIG. 216.



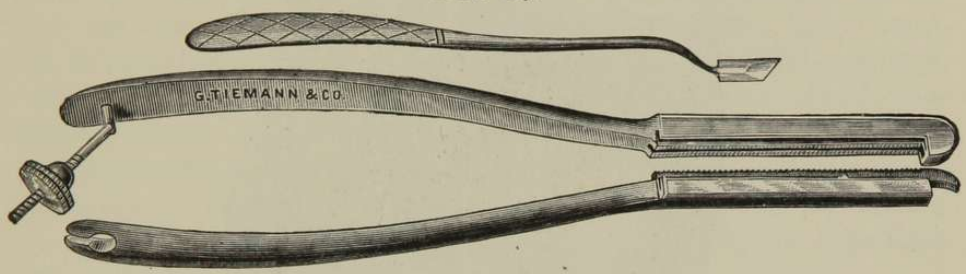
SIMONS' RETRACTOR.

with the finger. Care must be observed in separating the bladder from the cervix with the finger, for there is danger of perforating the bladder. It is safer to hug the cervix in front with a pair of blunt-pointed cervical scissors. When the peritoneum is reached in front it should be pulled down with a tenaculum and nicked with the scissors, when it is incised or torn laterally as far as the anterior surface of the broad ligaments. The peritoneum in front and behind is then caught in forceps, which are also attached to the vaginal mucous membrane. The dissection is extended posteriorly toward the Douglas cul-de-sac, which is opened into, and then enlarged with the finger or with a dilat-

ing instrument (Sims' uterine dilator is very useful for this purpose). The tissues are separated laterally as far as the base of the broad ligament on either side.

The broad ligaments may be secured either with forceps or with ligatures Unquestionably, the forceps method is the easier and more expeditious one. Their use, however, is not without certain objections that do not apply to the ligature; there is danger of sepsis as well as obstruction of the bowel. Clamps and forceps devised especially for the purpose and long enough to include the entire broad ligament in its blades (Fig. 217) may be applied, or several smaller

FIG. 217.



LEE'S MODIFICATION OF GREIG SMITH'S BROAD LIGAMENT CLAMP.

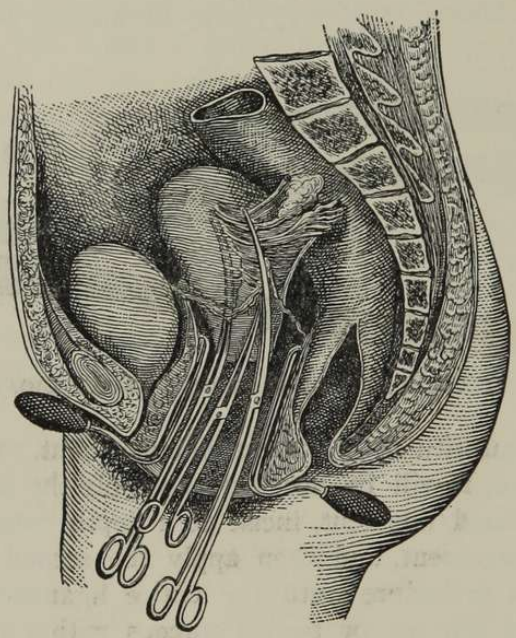
forceps may be substituted for the special instrument. When the smaller forceps are used, it will be necessary to apply the first to the lower border of the broad ligament, incise to a depth corresponding to the blade of the instrument, and then apply the second above the first, and repeat this procedure until the entire ligament is secured and severed. I have left ten or twelve forceps within the vagina when used in this way. The broad ligament on one side is first dealt with in the manner described, after which the second can be secured with much less difficulty. After the uterus is cut away the edges of the wound are brought together between the forceps on either side with one or two sutures; the peritoneum is included in these sutures. The vagina is again thoroughly washed with a normal salt solution; iodoform gauze is then loosely packed about the forceps in the vagina. The forceps, which are left behind for from twenty-four to forty-eight hours, afford sufficient drainage, and, as a rule, little or no hemorrhage follows their removal (Fig. 218).

When the ligature is used a special needle is necessary (Fig. 119). After the mucous membrane has been dissected from the cervix to the bases of the broad ligaments, the first ligature is introduced about three-quarters of an inch from the lower border of one of the ligaments.

In order to avoid the ureters, it should be placed as near the cervix as is possible without including diseased tissue. This ligature will ordinarily secure the uterine artery. After one is placed on either side, the ligaments can be incised nearly to the upper border of the ligatures. Second ligatures are placed above the first, and the ligaments again divided for a sufficient depth. This process is repeated until both ligaments are tied off and the uterus detached and removed.

After the uterus is removed the peritoneum in front and behind is stitched to the vaginal mucous membrane with a running catgut suture,

FIG. 218.



VAGINAL HYSTERECTOMY. APPLICATION OF FORCEPS AND SECTION OF THE BASE OF THE BROAD LIGAMENT. (*Péan.*)

which should include the stumps of the broad ligaments laterally. By doing this subsequent vaginal prolapse is prevented.

It is, I think, a good plan, when the broad ligaments are secured by ligature, to introduce at least one or two sutures in such a way as to bring both edges of the wound together at its middle.

The question of drainage will be decided by the predilections of the operator. Personally, I think it best when the forceps are not used to secure drainage for at least two or three days. This can best be done by carrying several strips of iodoform gauze into the wound. I do not deem it wise to leave the wound entirely open, as is recommended by

some operators. In one of my cases where this was done the intestines came down into the vagina when the gauze was removed. Twenty-four hours after the removal of the gauze the vagina should be cleaned by frequent irrigation with a ten per cent. boric acid solution. If the douche is given soon after the gauze is removed there is danger of the fluid finding its way into the peritoneal cavity. The vulva should be washed with a 1:1000 bichlorid solution and protected with an ordinary antiseptic dressing, held in place with a T bandage

Whether the appendages should be removed with the uterus will depend upon circumstances. In all instances where the operation is done for malignancy they should be removed. In non-malignant lesions they should be removed if extensively diseased, if it is possible so to do. Unless perfectly normal, I think it best to remove them even though they are non-adherent. I have had several cases where the ovaries, left behind, gave rise to much trouble from subsequent inflammation.

The *after-treatment* does not differ from that recommended for abdominal section (*v.* Chapter XLVII). The patient should be kept in bed for at least two weeks, and prevented from undue exertion for some time longer. The same complications liable to arise after laparotomy may follow vaginal hysterectomy, and, if they do occur, should be dealt with in the same way.

Accidents Attending Hysterectomy.—Injury to the ureters is the most frequent accident. This is best prevented by hugging the cervix as closely as possible during the operation, and, after the tissues are separated in front, by holding the bladder out of the way with a retractor. It is announced by the ordinary symptoms of uremia, or by the formation of a uretero-vaginal fistula (p. 562). The bladder is likewise occasionally injured. If opened into during the operation, it should be closed at once by silk or catgut sutures. A still rarer accident is perforation of the rectum. This, however, will not happen unless the operator is exceedingly careless.

When death occurs, it may be due to hemorrhage, shock, septicemia, peritonitis, uremia, or intestinal obstruction. Death from hemorrhage was very much more frequent before the technique of securing the broad ligaments was fully mastered. Shock may be due either to the loss of blood, or to the difficulties attending the operation. It is much less severe in short operations than in operations requiring a long time for their completion.

I do not believe that the published statistics of hysterectomy for carcinoma, notwithstanding the fact that they are based upon the results obtained by some most celebrated operators, fairly represent the per cent.

of cures possible under more favorable conditions. Undoubtedly, many of the recorded operations were made upon inoperable cases. It seems to me utterly useless to resort to vaginal hysterectomy after the disease has extended beyond the uterus, implicating the vaginal tissues and the surrounding structures within the pelvis to such an extent as to fix the organ. It should be borne in mind, however, that the fixation may be due to inflammatory conditions, and should there be a history of pelvic inflammation the patient should be given the benefit of the doubt. I have operated on less than thirty per cent. of the cases of carcinoma of the uterus which have come to me for advice and treatment. If the cases are properly selected, the results obtained are certainly most satisfactory. The average immediate mortality following vaginal hysterectomy should not be greater than five per cent.; and several operators have reduced it as low as two and five-tenths per cent.

Modifications of the Operation.—If there is difficulty in securing the broad ligaments, the uterus may be inverted by grasping its fundus through the posterior cul-de-sac with volsella forceps and drawing it down into the vagina. This will twist the broad ligaments in such a way as to make them much more easily got at. It may be necessary to incise the perineum in order to obtain sufficient room to work within the vagina. Martin stitches the peritoneum to the mucous membrane of the vagina, both in front and behind, with interrupted sutures as soon as the bladder and rectum are separated from the cervix; this controls all oozing from the resulting raw surfaces. Fritsch begins his dissection at the lateral fornices and secures the uterine arteries as the first step in the operation. Schatz does not detach the bladder until the last step of the dissection. Olshausen guards against infection of the peritoneum by deferring the opening of the culs-de-sac as long as possible. Müller seeks to control the hemorrhage by pressure upon the abdominal aorta. Sänger recommends the thermo-cautery for dividing the vaginal culs-de-sac. Fritsch and Czerny turn the uterus forward instead of backward. Montgomery passes a large sponge, to which is attached a tape, into the posterior cul-de-sac as soon as it is opened, so as to keep the intestines back and prevent blood from entering the peritoneal cavity—a most useful expedient when the intestines crowd down into the wound. Otto Zuckerkandl makes a transverse incision, between the ischiatic tuberosities, through the perineum, so as to increase the space at the ostium vaginæ. It may be necessary to resort to one or more of these modifications in a given case. Jacobs, Péan, and the majority of the French school resort to morcellation of the uterus. This may be done by either splitting the organ antero-pos-

teriorly or laterally, after the cervix has been liberated in front and behind. Forceps are used to secure the broad ligaments. It may be necessary to leave one or more forceps attached to the upper border of the broad ligaments when bleeding points cannot be well secured in ligatures, even though the bases of the ligaments have been tied off.

Woelfler and Zuckerkandl practise parasacral and pararectal incision when it is impossible to remove the uterus through the vagina. Kraske extirpates not only the coccyx but the inferior part of the sacrum as well, thus creating a large opening through which the cancerous uterus can be removed. Hegar, instead of removing the coccyx and a portion of the sacrum, depresses them after severing their lateral attachments. The bones are replaced after the hysterectomy is completed. These operations are necessary only when the uterus is so large as to make it impossible to remove it through the vagina. It is exactly this condition which, in ninety-nine cases out of a hundred, is associated with infection of the periuterine structures—hence any form of hysterectomy is counter-indicated. I allude to them for the sake of completeness only.

Doyen * proceeds as follows:—

1. Cervix seized by two volsellæ, and circular incision made.

2. Douglas' pouch opened—then utero-vesical space opened into, after bladder separation.

3. Anterior hemi-section, "hand over hand," until fundus is reached, when it (the fundus) is pulled out of the vulva.

4. Left broad ligament taken between index finger (behind) and thumb in front, and clamp applied from *above downward*, including entire ligament, which is then cut between clamp and uterus. Right ligament treated in the same manner. (Doyen aims to leave tubes and ovaries in a fairly large number of instances.)

5. Clamps brought down, twisting broad ligaments, and dressings applied.

The Landau brothers, of Berlin, have slightly modified Doyen's operation. They proceed thus:—

1. Cervix seized and circular incision made in the usual way.

2. Freeing the uterus wholly from peri-cervical tissue, and opening into the anterior peritoneal pouch.

3. Seizing fundus and luxating uterus and adnexa into the vagina, then forming pedicles on either side by rupturing infundibulo-pelvic ligaments and all adhesions, and bringing uterus, tubes and ovaries out-

* Summarized for me by Prof. H. H. Parmelee, of Toledo.

side of the labia. Formation of pedicles completed by lastly piercing through Douglas' pouch from above and freeing cervix completely.

4. Hemostasis of both pedicles under the fullest and freest vision, beginning above or below, using ligatures or forceps as one may choose.

5. Division, and light gauze dressings.

Dr. Pratt's now well known method of performing vaginal hysterectomy has received much and favorable attention. I have the impression, nevertheless, that however well adapted it may be to hysterectomy for non-malignant diseases of the uterus, it is not the best method of removing cancerous uteri. The broad principle of extensive ablation of tissue can hardly be observed by hugging the uterus in the process of dissection. I have performed the operation several times for myofibromata and prolapsus uteri. I deem it but just to Dr. Pratt to give his own description of the operation, which is as follows:—

"The uterus is first dilated and packed with antiseptically-prepared candle-wicking, to render it firm and easily distinguishable from surrounding tissues. The very tip of the cervix is then seized by a small double vulsellum or transfixed by guy ropes, and, while an assistant is drawing the uterus downward to its easy possibilities, the mucous membrane covering the outer surface of the cervix is amputated with sharp scissors, curved at the tip, as close to the end of the cervix as is practicable, the cut being made completely around the cervix. A spud is then employed to skin the membrane of the cervix from below upward as far as the ligamentous fixation of the uterus at the junction of the neck and body. The dissection should progress evenly around the entire circumference of the cervix, as this permits the symmetrical descent of the uterus and brings the entire field of operation easily within view. The ligamentous attachments at the upper end of the cervix are to be completely exposed by a spud, and from this point onward the dissection must be made either with tenaculum and scissors, or with a sickle-knife, such as I have devised for this work. Where the vagina is sufficiently copious the thumb and finger of either hand may displace the tenaculum, and, where these can be employed, are superior to it, as they aid in discriminating the boundary line between the uterus and the surrounding tissues. By cutting all ligamentous attachments close to the surface of the uterus it is possible to avoid the wounding of any large-sized blood-vessel. The dissection is to be carried on evenly around the circumference of the uterus until it reaches in front the point where the peritoneum is reflected from the anterior surface of the uterus upon the posterior surface of the

bladder, and at the back where the peritoneum is reflected from the posterior surface of the uterus upon the anterior surface of the rectum. At these places the peritoneum is to be seized with a tenaculum and snipped with scissors, the openings to be enlarged by divulsion, either with a pair of forceps or with the fingers, until the wound extends on either side to the lateral margins of the uterus. The finger can now be introduced into the peritoneal cavity at the posterior opening, and by flexing it the lower part of the broad ligament and its contents can be brought into easy view, the assistant, by traction upon the guy ropes or vulsellum, drawing the uterus to the opposite side. The dissection can now progress on one side of the uterus by the aid of scissors or the hysterectomy knife, until the uterus descends sufficiently to permit the operator to curve his finger around the upper margin of the broad ligament, after which the dissection can be continued until the attachments of the broad ligament at one side of the uterus are entirely severed. The uterus can be split if necessary.

"In making this dissection the uterine artery is usually observed pursuing its tortuous course upward between the folds of the broad ligament. It bulges into the wound so plainly, and its pulsation can be so easily detected, that it often serves as a landmark in the dissection, although the only safe rule is to adhere to the proposition that the dissection must constantly hug the uterine tissue, a diversion from this rule to the extent of the sixteenth or even thirty-second part of an inch being often followed by profuse hemorrhage.

"Before completely severing the broad ligament, it is well to seize one or both of its margins with a pair of T-forceps, so as to place the margins of the peritoneum entirely at the command of the operator. With a double vulsellum the side of the uterus which has been liberated by the dissection is now to be seized and dragged downward. The forefinger of the operator is to be placed back of the remaining broad ligament, and the tissues severed either from below upward or above downward, as is most convenient, care being taken as before to secure control of the margins of the broad ligament by T-forceps before the dissection is completed.

"The T-forceps, which were fastened upon the margins of the broad ligaments, are now to be seized one at a time, and traction employed to bring the ovaries and Fallopian tubes into view. This can be done in the majority of cases, when they can easily be removed, and the peritoneal wound thus made can be closed by a continuous catgut suture. If, in removing the tubes and ovaries, the dissection be carried close to the organs, it is usually a bloodless procedure. Occasionally, however, ad-

hesions will prevent the ovaries from being brought into view, in which case they can be carefully loosened from their attachments by the finger or blunt scoop, or may be left unmolested, at the discretion of the operator. The resulting raw surface is now covered with peritoneum by a running catgut suture whose end is left long; the same service is to be accomplished upon the opposite side, when all that remains to be done is the closure of the wound. The operator now has at his command the two long catgut threads already mentioned. By means of one of these threads the broad ligaments are stitched together, thus cutting the circular opening at the vault of the vagina into two smaller circles. The thread employed to coapt the sides of the broad ligament may now be carried around the anterior or smaller circle, while the remaining thread may be made to constrict the posterior or larger of the circular openings. After these small openings have been closed, either of the threads can be employed to close the wound in the vagina. In accomplishing this it is better to do submucous work, as there is no tension upon the wound and but little force is required to hold the parts in position.

"In cases of cancer, where the cervix has been destroyed and the upper extremity of the vagina is infected, the guy ropes are to be placed half an inch beyond the ulcerated margin and the dissection carried on as already described.

"In vaginal hysterectomy for fibroids, in most cases it will be necessary to split the uterus in an anterior-posterior direction and remove the fibroids as they are encountered."

If animal ligatures are used much care must be observed in securing them. I have lost two patients by the slipping of catgut ligatures. However, by a little extra care catgut can be made perfectly secure (p. 509). Silk ligatures used in close proximity to the vagina are liable to become infected and cause trouble. Dr. Herman Grad has recently described * a very ingenious though simple plan whereby silk ligatures can be easily untied and removed through the vagina. Fig. 219 so clearly represents the technique of the Grad ligature as to make a written description of it unnecessary.

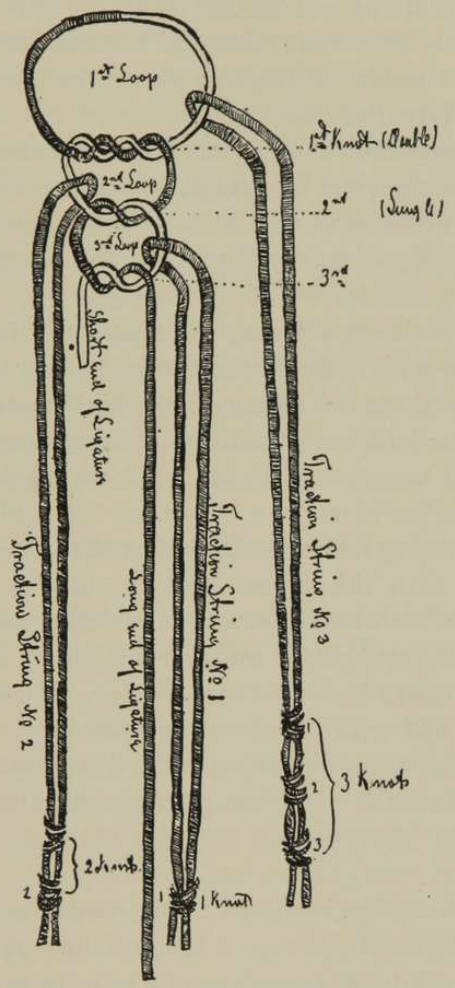
Illustrative Cases.

CASE I.—*Diffuse Sarcoma of the Mucous Membrane of the Uterus of Over Two Years' Standing; no Tangible Infiltration of the Broad Ligaments, Bladder, Vagina, or Rectum; Total Extirpation of the Uterus*

* Am. Gyn. and Obstet. Journal, February, 1897.

*and Left Ovary; Opening into the Rectum; Recovery.**—Mrs. L., æt. 52, of Cohoctah, Livingston county, Michigan. She presented herself at my clinic January 5, 1887. Her mother is living, aged sixty-nine years, and has always enjoyed the best of health, having a perfect

FIG. 219.



THE GRAD LIGATURE, TRACTION STRINGS IN POSITION.

family history. Her father died twenty-one years ago at the age of sixty, death being caused by some form of ulceration of the leg, which had existed for thirty years and which was supposed to be the sequela of mercurialization. Her father's sister had a similar sore which, during a period of twenty years, made its appearance at variable intervals.

* Transactions of the Homeopathic Medical Society of the State of Ohio, 1887.

The patient has been married for thirty-four years, having borne six children at term and having had one miscarriage. The oldest child, a son, is thirty-two years of age; the youngest twelve. The miscarriage occurred three years after the birth of the last child. Her labors were always difficult, and at the last confinement the placenta was adhered and had to be forcibly removed. She did not get well from this labor, and afterwards was troubled with prolapse of the uterus, the cervix at times presenting externally.

She began to menstruate at sixteen, and up to the birth of her last child the menses were normal in quantity, quality and duration. During the last twelve years, however, this function has been painful, the discharge being usually watery or light colored, though at times dark-red or green.

Two weeks before the miscarriage she suffered from an attack resembling peritonitis and flowed excessively before the fetus was expelled. From this time on menorrhagia and metrorrhagia became prominent symptoms, and her attending physician, attributing the unnatural flow to local congestion, endeavored to check it by scarifying the cervix.

This treatment proving ineffectual, he dilated the cervix and explored the uterine cavity with the finger, finding, in the language of the patient, "a mass," which he failed to remove after repeated efforts.

Three weeks later medicated uterine injections were resorted to, which temporarily controlled the hemorrhage. In a few weeks the discharge recurred, and with it were pieces varying in length from one to three inches, which (again to use the language of the patient) "resembled chicken-lights." These pieces continued to pass for about six weeks, when they disappeared and did not recur until two years ago.

Meanwhile, the floodings recurred at intervals varying from one to three months, and lasted from one to four weeks. These attacks were accompanied with an intense neuralgic-like pain in the abdomen.

Two years ago she suffered from an unusually severe attack of this character, which was followed by metrorrhagia, continuing four months. The discharge was thin, watery, inoffensive and not unlike the washings of fresh meat. Since last September she has flowed continuously, shreds of membrane at all times being present in the discharge.

The patient had, upon entering the hospital, a decidedly cachectic appearance, but the cachexia more closely resembled that of anemia than malignancy. Although weighing one hundred and sixty pounds, her flesh was soft and unnatural.

A local examination, made on the above date, revealed the following condition: The uterus was enlarged and prolapsed; the cervix was greatly hypertrophied; the os was dilated and gaping; the cervix was badly lacerated and contained much cicatricial tissue; both vaginal walls had descended with the uterus, causing a cystocele and a rectocele; the perineum had been torn down to the sphincter vaginæ, and the ostium vaginæ was greatly dilated.

The uterus was so heavy that I could not, or rather did not dare, reposit it with the sound. With the aid of the volsella, however, the organ could be dragged downward far enough to expose the cervix externally, showing that there could be no adhesions of the fundus. I could discover no nodules involving periuterine cellular tissue; nor was there any evidence of involvement of the bladder or rectum.

Under chloroform a sufficient amount of tissue was removed, with the curette, to make an examination. Macroscopically, this resembled pieces of membrane not altogether unlike scrapings of fresh meat; microscopically, the closely set round cells, with an occasional spindle cell, pointed unmistakably to sarcoma.

January 22, 1887, the patient was again brought under the influence of an anesthetic, and the cervix dilated sufficiently to admit the index finger.

The whole endometrium was found to be in a degenerated condition, the uterine cavity being filled with a soft, friable mass springing from it. With Simon's spoon-curette I removed the diseased tissue as thoroughly and completely as possible, afterwards washing the cavity with a two per cent. carbolized solution. Churchill's iodin was then applied to the entire raw surface, a glycerin tampon introduced, and the patient placed in bed.

The usual precautions were observed to guard against peritonitis, but the operation was followed by an attack which was more or less general, the temperature at one time reaching 104° F. There was at least two ounces of the morbid tissue removed, which was of a grayish-white color, soft and pulpy in consistence.

By February 2d the inflammatory symptoms had subsided, though there was a profuse and somewhat offensive discharge of pus from the uterus, the cervix remaining dilated.

After thoroughly cleansing the cavity another application of iodin was made, which temporarily improved her condition in every way. At the end of three weeks, however, the unfavorable symptoms returned, when vaginal hysterectomy was decided upon. This was done on

March 7, 1887, in the presence of the senior and junior classes of the University of Michigan, and Dr. J. M. Lee, of Rochester, N. Y.

Never having before seen or performed the operation, I followed as nearly as possible the description given by Schroeder. After using an antiseptic vaginal injection, and after anesthesia had been induced by the use of whiskey,* the patient was placed in the lithotomy posture before a good light. An effort was first made to drag the uterus down sufficiently with strong volsella forceps, but the tissues of the cervix were so friable that the instrument would tear its way out. The cervix was, therefore, pierced with a needle properly threaded, which was carried as closely as possible to the utero-vaginal junction. The long ends of the silk in the hands of one assistant gave complete control of the organ, and made it possible to drag the cervix down to the ostium vaginæ. Owing to the displacement of the anterior vaginal wall, a large-sized male sound was introduced into the bladder. Guided by the sound, an incision was made through the mucous membrane of the anterior lip, and with one of Emmet's cervical knives the bladder was dissected from the cervix as far as the peritoneum in front. Next the cul-de-sac of Douglas was opened into with scissors, and the incision carried laterally far enough to free the cervix upon the two sides.

The index and little fingers of the left hand were next passed over the broad ligaments from behind and into the utero-vesical pouch. Cutting on these two fingers, the peritoneum was divided anteriorly. Seizing the uterus through the posterior opening with forceps, the organ was retroverted and the fundus dragged into the vagina. The left broad ligament was next transfixed with a quarter-curved Peaslee perineal needle, which carried with it a heavy piece of braided silk. After withdrawing the needle the ligature was cut in the center, and each half of the ligament tied separately. By the aid of a Wilson perineal needle another silk ligature was thrown around the entire ligament and firmly tied. For fear these ligatures might slip, the unnecessary precaution of including the entire mass in the jaws of strong Spencer Wells ovariotomy forceps was taken. The forceps cut the ligatures and necessitated the application of second ones. With scissors this ligament was now severed about an inch from the uterus, when its fellow on the opposite side was treated in the same way —an easy task compared with the difficulties in managing the first. The tubes and ligaments showed no evidences of sarcomatous infiltration; the left ovary, however, presented evidences of cystic degenera-

* I have entirely discarded whiskey as an anesthetic.

tion, and was accordingly removed. After thoroughly cleansing the pelvic cavity, a cruciform drainage tube was inserted, the stump of each ligament being fixed in the corresponding angle of the vaginal wound by a wire suture. The vagina was packed with antiseptic cotton, and the free end of the drainage tube protected by plugging it with the same material.

Two knuckles of small intestine and a portion of the omentum descended after the uterus was retroverted, but by carefully avoiding them they were not injured. The patient was on the table just sixty-five minutes, and was placed in bed with her pulse somewhat softened, but regular. It required four hours for her to regain consciousness.

During the first twenty-four hours following the operation the temperature did not rise above 101° F. It then fluctuated between this point and normal until the evening of the 12th, when it reached 103° F. This rise followed upon the removal of the tube, and I decided to reopen the wound, and, in some way, permanently restore drainage. Accordingly, the patient was anesthetized and I forced my finger through the vault of the vagina into the pelvic cavity. In my effort to break up any existing pus pockets that might have formed, I was not a little surprised to find my finger in contact with a scybalous mass in the rectum, the accumulation of pus having destroyed the integrity of the intestine.

The idea of the opening into the rectum affording complete drainage did not at that time occur to me. An effort was made to heal it over a rectal tube, which measure, owing to the intolerance of the rectum, had to be discarded after twenty-four hours. During the following eight or ten days water injected into the rectum would pass out through the vagina, and a profuse flow of pus was discharged per rectum. Fecal matter not infrequently made its appearance through the vaginal opening, and as enemata were ineffectual in moving the bowels, a full dose of oil was given on the sixteenth day after the operation. A large proportion of the liquid feces following the administration of the oil passed into the vagina, and small quantities of hardened feces continued to pass through the unnatural opening for twelve days longer. With these exceptions the bowels moved regularly and normally after the twenty-eighth day, and at the end of six weeks the fistula was entirely closed. The patient has remained well up to the present date, July, 1893.

I believe that this is the first vaginal hysterectomy made by a member of the homeopathic school, as it is also the first recorded case in Michigan, and I report it somewhat at length at this time because of its historical interest.

CASE II.—*Carcinoma of the Body of the Uterus; Operation; Recovery.*—Mrs. M., æt. 31; referred to me by Dr. E. F. Chase, of Dexter, Michigan; was married at nineteen. She is the mother of three children, the youngest being six years old. For three years preceding the operation she was kept almost exsanguinated by excessive uterine hemorrhages and an offensive leucorrhea. Occasionally growths resembling "bloody polypi" would come away. The uterus had been thoroughly curetted five times without benefit. Before coming to the clinic I resorted to the curette under anesthesia for diagnostic purposes. The curettings were submitted to Professor H. Gibbs, Professor of Pathology in the University of Michigan, who found "unmistakable evidences of malignancy." On November 4, 1890, I performed vaginal hysterectomy, securing the broad ligaments with forceps. Both ovaries and tubes were removed, the right ovary being as large as an orange and cystically degenerated (Fig. 211). The operation lasted but twenty minutes, and at least five minutes of this time were consumed in securing a portion of the left broad ligament, which had slipped from the grasp of a newly-fashioned forceps which, to my regret, I experimented with. There was quite a good deal of capillary oozing, and I very foolishly, as subsequent events proved, crowded iodoform gauze into the vaginal wound for the purpose of controlling it without stitching the surfaces of the vaginal mucous membrane together.

Shock was intense, owing to the prostrated condition of the patient before the operation. After rallying from this she got on splendidly for the first ten days, having scarcely any temperature and but little pain. The forceps and gauze were removed at the end of thirty-six hours. With the removal of the gauze the omentum was drawn into the vagina. This was carefully washed with a 1:10000 bichlorid solution and returned to the abdominal cavity, after which the vagina was again packed with iodoform gauze. No bad results followed this accident, but on the tenth day urine began to escape through the vagina and, three days later, none passed through the urethra. A vaginal exploration revealed a piece of the gauze protruding through the vaginal wound. After this was removed the fistula quickly healed under frequent vaginal injections, and the patient is now (December, 1893) perfectly well. She left the hospital December 2d, just one month from the day of her operation.

CASE III.—*Vaginal Hysterectomy for Carcinoma During Menstruation.*—Mrs. S., æt. 36. Referred to me by Dr. W. H. Gifford, of Cleveland. Has been an invalid for years, and during the last six months has been confined to her bed the greater part of the time.

Complains of an almost constant pain in the pelvis, which is much aggravated by motion, or by assuming the upright posture. Uterus is retro-displaced, adherent, enlarged, and the cervix presents to the eye an angry vascular appearance, with an ulcerated area on the anterior lip. There is no specific history. She is much exsanguinated from the loss of blood, menstruation continuing for from ten days to two weeks, and recurring every four weeks.

Menstruation began on the morning set for the operation, and, owing to the patient's nervous state, I deemed it wise to proceed with the operation. The uterus was first curetted, irrigated and packed, and the cervix closed by three interrupted guy sutures. The parts were exceedingly vascular, but the hemorrhage was controlled by stitching the peritoneum in front and behind to the vaginal walls as soon as the peritoneal cavity was opened into. Catgut was used throughout.

Patient made an uninterrupted recovery and is now (two years later) perfectly well.

CASE IV.—*Vagino-Abdominal Hysterectomy for Cancer.*—Mrs. L., æt. 54. Referred to me by Prof. P. A. Cole, of Cleveland. Began to flow three years ago, and during the past year has lost much blood. Offensive vaginal discharge during last year. Physical examination reveals extensive involvement of the cervix, though the fundus seems free from disease. Vagino-abdominal hysterectomy in March, 1896. Patient very fleshy, and on opening the abdomen the disease was found to have invaded the broad ligaments and the pelvic glands at the bifurcation of the common iliac artery. The broad ligaments were tied off close to the pelvis, and opened up at their bases, and the uterine arteries, after locating the ureters, dissected up for an inch and a half. The pelvic glands in the region of the iliac arteries were removed. As large a cuff of vaginal tissue as was possible was cut away. The peritoneum was stitched to the vaginal mucous membrane in front and behind, and a gauze drain inserted. Patient convalesced nicely, gaining in every way, but in nine months the disease returned at the site of the cicatrix, and, in spite of the use of the toxins of erysipelas and prodigiosus, is rapidly progressing to a fatal termination.

Had I realized the extent of involvement of the pelvic organs I should not have operated in this case.

CASE V. — *Vagino-Abdominal Hysterectomy for Carcinoma of the Uterus with Intractable Hemorrhage; Salpingo-Oöphorectomy for Hydrosalpinx Eighteen Months Previously.*—Patient æt. 35. Referred to me by Dr. A. L. Ambrose, of Hanover, Michigan. Eighteen months ago I made a laparotomy for a large hydrosalpinx of the left

side. Both appendages were removed at that time. She bled very profusely from the raw surfaces incident to the first operation, gauze packing being necessary to control the hemorrhage. Has always been a bleeder. She improved for a time after the first operation, but continued to flow excessively until the discharge became very offensive and emaciation marked. On examination a mass was found to the left as large as a fist, which was attached to the uterus.

On March 28, 1896, a vagino-abdominal hysterectomy was made in the usual way, except that the peritoneum was not stitched to the vaginal mucous membrane until after the uterus was removed, and then from above. The colon was firmly attached to the fundus of the uterus, and had to be dissected off with much care. Adhesions were cut with scissors and some uterine tissue left attached to the intestine. The tumor on the left side proved to be an intra-ligamentary cyst. The adhesions were very strong between bladder and uterus, and it required much time and care to separate them. The cyst was removed with the uterus. The usual intra-peritoneal toilet was applied; gauze drainage through vagina; all adhesions tied with catgut. The abdomen was closed with interrupted silk sutures, after dissecting out old cicatrix. Removed from table in good shape, and not much hemorrhage. Convalesced slowly, though uninterruptedly, and at this date (December, 1897) is infinitely better than before the operation, though not strong.

CASE VI.—*Vaginal Hysterectomy for Cancer During Pregnancy.*—Patient æt. 40. Referred to me by Dr. W. H. Gifford, of Cleveland. Has been married for a number of years, and was very well up to eighteen months ago, when she was taken ill with severe pelvic pain, and vesical irritation; had been bedridden for eighteen months. Examination revealed a boggy tumor in posterior cul-de-sac, which was exquisitely tender. Operation on May 31, 1895, at the Huron Street Hospital. Had been flowing regularly and profusely. The discharge was very offensive; the cervix showed marked symptoms of malignancy. I suspected pregnancy, and so informed the husband; but in my opinion the history called for immediate operative interference. Used chromacized catgut for tying off the broad ligaments. The uterus contained a three months' fetus. Patient convalesced uninterruptedly, and there is no sign of a return of the disease at the present time, December, 1897.

CASE VII. — *Vagino-Abdominal Hysterectomy for Cancer of the Uterus; Complete Removal of the Broad Ligaments and Appendages with the Uterus.* — Mrs. A., æt. 63. Referred to me by Dr. R.

Hathaway, Wellington, O. Has had an offensive discharge from the vagina for the last three years, and Dr. Hathaway urged her to come to me for operative interference two years ago. Falling into the hands of another physician, she was deterred from coming on the promise that the disease could be cured by curetting. Growing steadily worse, she consulted me on August 17, 1896. She was beginning to lose in flesh; the cervix was fairly rotten; the discharge intolerable, and the cachexia marked. However, the uterus did not seem to be fixed, and I was under the impression that it could be removed without very much difficulty. The operation was done on August 24, 1896, by the vagino-abdominal method. After getting into the operation I found that the uterus was so rotten that it could not be removed en masse. I tied the ligaments off close to the pelvic wall; removed several large pelvic glands at the bifurcation of the common iliac artery; cut away as much of the vaginal tissue as was possible, and stitched the vaginal mucous membrane to the peritoneum in front and behind.

I would not have undertaken the operation had I realized how far advanced the disease was. However, with the exception of a mural abscess, which resulted from contamination of the abdominal wound by the septic uterus, she convalesced fairly well, and has gained twenty-five pounds in flesh. An examination made in April, 1897, shows that the disease is returning. While the operation has given her a short respite, I regret that it was done. When the disease so speedily returns it deters others from submitting to operative interference who might be saved by the timely use of the knife.

CASE VIII.—*Vaginal Hysterectomy for a Fibroid Sarcoma of Fundus, with Beginning Epithelioma of the Cervix.*—Patient æt. 54. Referred by Prof. G. J. Jones, Cleveland. Small sarcomatous tumor in fundus which projects into the uterine cavity (Plate XXII). Patient has been in ill-health for the last four years; has had a continuous discharge from the uterus for three years. She is beginning to emaciate, and her skin shows cachexia. The cervix is everted, infiltrated and ulcerated.

Vaginal hysterectomy on February 22, 1897. Both appendages removed with the uterus. Tumor was so large that it could only be delivered through the vagina by inserting into it a corkscrew from below. Peritoneum stitched to vaginal mucous membrane. Gauze drainage. With the exception of an attack of cystitis, produced by an unclean catheter, convalescence was uninterrupted.

CHAPTER XLIII.

CYSTIC AND ALLIED DISEASES OF THE UTERINE APPENDAGES.

The cystic and allied diseases of the uterine appendages may be classified as follows:—

1. Adenoid ovarian tumors:—
   - (*a*) Simple cysts;
   - (*b*) Multiple cysts;
   - (*c*) Proliferous cysts;
   - (*d*) Dermoid cysts;
   - (*e*) Papillomatous cysts.

2. Cysts of the broad ligaments and Fallopian tubes:—
   - (*a*) Papillomatous cysts;
   - (*b*) Parovarian cysts;
   - (*c*) Enlargement of the hydatid of Morgagni;
   - (*d*) Hydrops folliculorum;
   - (*e*) Cysts of the Fallopian tubes, and tubo-ovarian cysts.

3. Solid ovarian tumors:—
   - (*a*) Fibroma (solid and cystic);
   - (*b*) Carcinoma (solid and cystic);
   - (*c*) Sarcoma (solid and cystic).

The diagram shown in Fig. 221, taken from Doran, clearly indicates the supposed seat of origin of each variety of tumor given in the foregoing classification. The student is advised to study this diagram carefully. He must, however, bear in mind that many points concerning the origin of these benign and malignant growths are as yet unsettled.

Adenoid Ovarian Tumors.

Simple Cysts (Fig. 220).—The coats of these cysts during their early formation are membranous, translucent, and, histologically, do not differ in any way from the natural structure of the Graafian follicles. They were long supposed to have their origin in a Graafian follicle, either before or after its rupture, and the so-called follicular cysts (follicular degeneration of the ovary) are undoubtedly dilated Graafian follicles. The origin of simple cysts has not, however, been definitely settled. If the theory of Conheim is correct they may spring from a matrix of embryonic cells in the Graafian follicle. Other pathologists teach that all ovarian cystomata grow from an ingrowth of epithelium into the stroma of the ovary (Warren). According to Senn "the

majority of simple ovarian cysts undoubtedly originate from embryonic tubal rests." Rokitanski teaches that they may develop from the corpus luteum after the blood has been absorbed.

FIG. 220.

A TYPICAL MONOCYST OF OVARY WEIGHING TWENTY POUNDS. (*Wood.*)

The walls of simple cysts are of variable thickness and simply possess a surplus of material, the elements being identical with those of ordinary fibrous tissue. The epithelium lining their inner coat corresponds to that of the *tunica propria* of the follicle (Doran).

There is hypersecretion of the follicle, which gives rise to, or is associated with, hypertrophy of its walls. The walls vary in thickness from an inch or more to the extreme point of tenuity.

Just why the Graafian follicles should undergo these remarkable changes we do not know. Previous cirrhotic changes of the ovary may prevent normal rupture of the follicles. It is probable that some irritation—chronic congestion or inflammation—is the starting-point of the difficulty; or it may be that the follicles are so deeply seated in the stroma of the ovary that, although the contained ovum is ready for extrusion, it cannot find its way to the surface, the succeeding changes giving rise to hypersecretion of fluid and hypergenesis of the follicle walls. This is simply a theory; yet it is in harmony with the clinical fact that very frequently ovarian tumors are preceded or attended by dysmenorrhea, chlorosis, anemia, etc.—conditions which would tend to interfere with the function of ovulation.

FIG. 221.

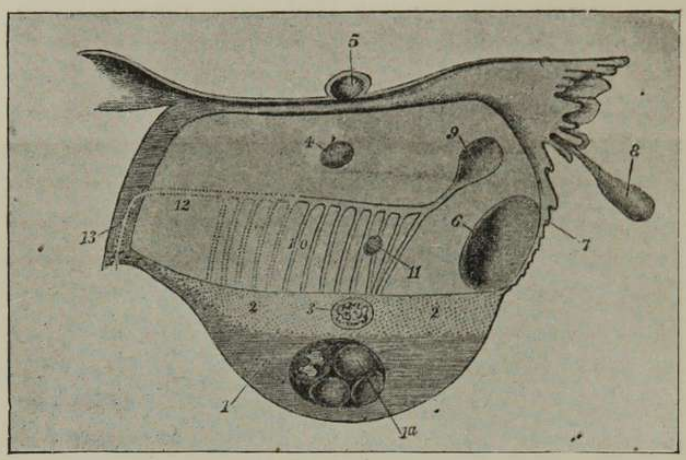
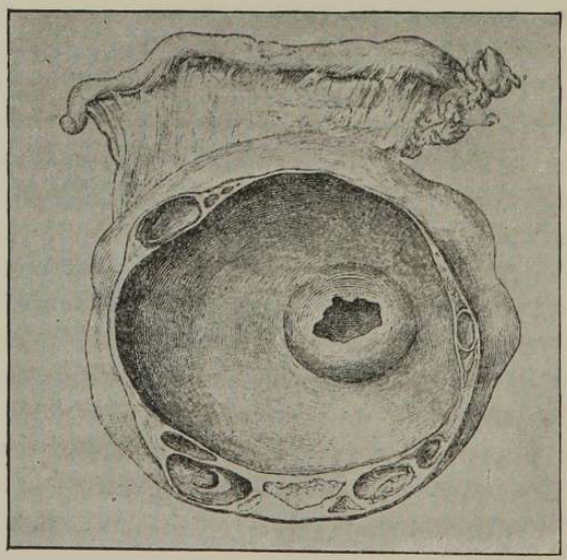


DIAGRAM OF THE STRUCTURES IN AND ADJACENT TO THE BROAD LIGAMENT. (*Doran.*)

1*a*. Multilocular cystic tumor developed in parenchyma of ovary. 3. Papillomatous cystic tumor of ovary in (2) tissue of hilum of ovary. 4. Simple broad ligament cyst, independent of parovarium (10) and Fallopian tube. 5. A similar cyst in broad ligament above tube, but not connected with it. 6. A similar cyst close to (7) ovarian fimbria of tube. 8. Hydatid of Morgagni—this never appears to form a large cyst. 9. Cyst developed from horizontal tube of parovarium. 11. Cyst developed from a vertical tube—cysts of this kind form the papillomatous tumors of the broad ligament. 12, 13. Track of obliterated duct of Gärtner; papillomatous cysts are said to be developed along this track.

FIG. 222.



MULTILOCULAR OVARIAN CYST. (*Doran.*)

Multilocular Cysts.—These were supposed to be formed exactly as are simple cysts, except that two or more Graafian follicles in apposition grow simultaneusly (Fig. 221, 1*a*), one cavity generally predominating. It is now taught that the epithelium lining the internal layer of these cysts, whatever their origin, is polymorphous, the long columnar-shaped cells predominating. These proliferate and form pouches which become closed and result in secondary cysts in the walls of the primary. At any rate, as time goes on the septa separating the several cysts are absorbed or broken down, so that the tumor, while it does not always become converted into a unilocular cyst, is transformed into a cyst containing from two to four or five loculi only. These cysts are limited in size only by the containing power of the abdomen.

Proliferous Cysts.—These are also known as *compound*, *composite* and *complex cysts*. They have the same origin as those already given, although they may be located in any part of the body where epithelial structures are found. Waldeger teaches that they are developed from Pflüger's ducts; and Malassez from the epithelial covering of the ovary. They are characterized by endogenous and exogenous growths—the former springing from the inner surface of the parent cyst, the latter from its outer surface.

These cysts vary greatly in fertility. There may be but a single cluster of secondary cells hanging within the cavity of the parent cyst or upon its outer surface; or cysts may grow from all sides of the parent cyst, compressing each other to suicidal repletion. Smaller cysts frequently grow from the outside of the secondary cysts, from which another group may spring.

Contents of Simple and Multiple Cysts.—In simple cysts the fluid may be perfectly colorless, hyaline, or of a pale yellow or straw color. It is usually thin and limpid. Its specific gravity varies from 1007 to 1018, and the quantity from an ounce to one hundred and fifty pounds.

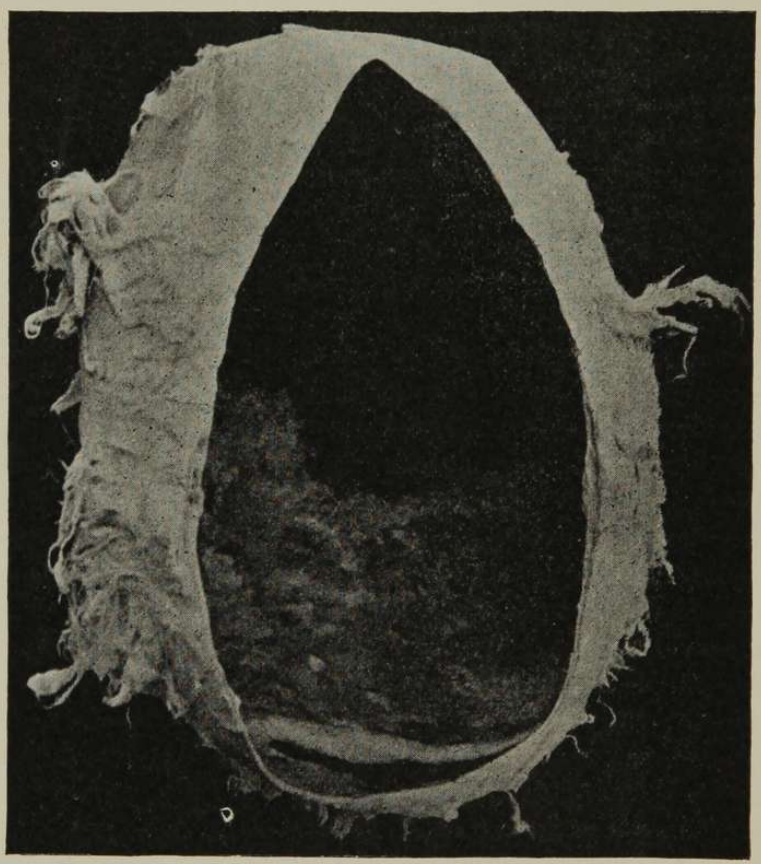
In multilocular cysts all kinds of fluid may be found in the different loculi. In the chief loculus it may be thin, not differing from that found in simple cysts; other loculi may contain a firm, jelly-like, or colloid material, or pus, blood, etc. The contents of proliferous, like those of multiple cysts, are variable.

Chemically, Eichwald divides the contents into two classes: (1) The mucous series, which consists of mucin, mucus, peptones, colloid material, and the material of colloid globules; (2) the albumin series, which consists of albumin, albumin peptones (fibrin peptone), metalbumin, and paralbumin.

Microscopically, the following substances are found: crystals of cholesterin, blood corpuscles, pus cells, compound granular cells, inflammatory globules of Gluge, epithelial cells, globules of fat, and disintegrated blood. The granular cell is the microscopical product most uniformly present; the other substances enumerated are not of so constant occurrence.

Dermoid or Cutaneous Piliferous Cysts.—These cysts frequently

FIG. 223.



A DERMOID CYST WHICH CONTAINED HAIR, TEETH AND FATTY MATTER.

Its exterior is covered with long, shaggy adhesions, through which it was supplied with sufficient blood to maintain its nutrition, the pedicle having atrophied. A thick mass of hair is seen on its inner wall. (*Museum R. C. S. Photographed by the Author.*)

develop before puberty, and, while occasionally found in combination with other cysts, they are always congenital in origin.

Causation —The generally accepted view of the origin of these

growths is that they are due to the displacement of the external blastodermic layer during the formation of the fetus. The epidermis and other structures found in the contents of dermoid cysts are developed from this layer, and if it is included in that portion of the middle layer from which the ovary is formed the rudiments of a dermoid cyst are left in the ovary (Williams). However, tissues and organs are found in dermoid cysts which spring from the mesoblast and hypoblast as well as from the epiblast, which fact has led Johnstone to believe that they originate from the Graafian follicle, which contains the germ of all varieties of tissue.

Formerly it was thought that they were due to the early inclusion of an imperfectly developed ovum within one perfectly developed. Still another hypothesis was that they result from the imperfect development of an impregnated ovule. The first theory is hardly tenable; as for the second, it is only necessary to say that dermoid cysts are found in young children, as well as in all parts of the body, and cannot, therefore, possibly depend upon conception.

Pathology.—The cyst wall is composed of two distinct layers, an inner and an outer. The former is not unlike the skin in structure, its lining membrane being composed of pavement epithelium. Underneath the epithelium is a layer corresponding to the cutis, though the papillæ are irregularly rounded without any regard to parallel rows. The tegumentary appendages—sebaceous and sweat glands, hair follicles, etc.—are contained in a mass of loose areolar and adipose tissue which underlies that corresponding to the cutis. In this layer there is also frequently found laminæ or spiculæ of bone, frequently of an irregular shape, though having the true structure of bone. Rudimentary or perfectly formed teeth are also found in this layer; or they may project from the stroma of the cyst wall (Fig. 224).

The *contents* of dermoid cysts are variable. The fluid is generally of a pultaceous, greasy nature, and consists of cast-off epithelial cells. The solid substances are tufts of hair* (Fig. 223), balls of fat, and teeth, varying from one to one hundred in number. Other substances —bone, brain substance, muscular fibers, and nerves—are occasionally found.

These cysts usually contain but one loculus, though they are sometimes compound.

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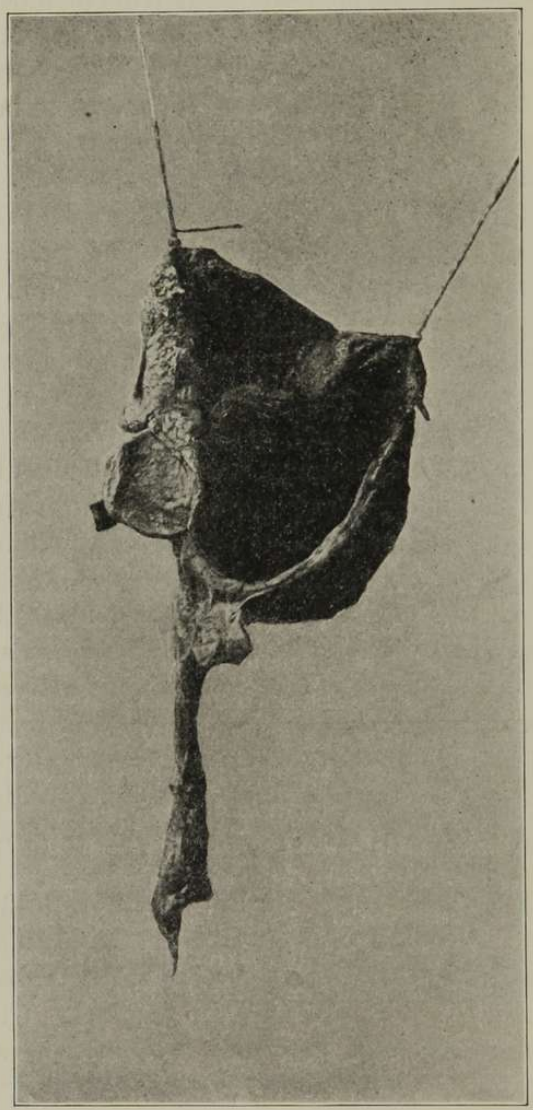
* Mundé found in one case a switch of hair which, after being immersed in ether, measured five and a half feet in length and was as thick as the wrist in its entire length.

Papillomatous Cysts.—These cysts are also known as papillary proliferous cysts. They contain variable quantities of papillomatous or cauliflower growths. (Plate XXIV.)

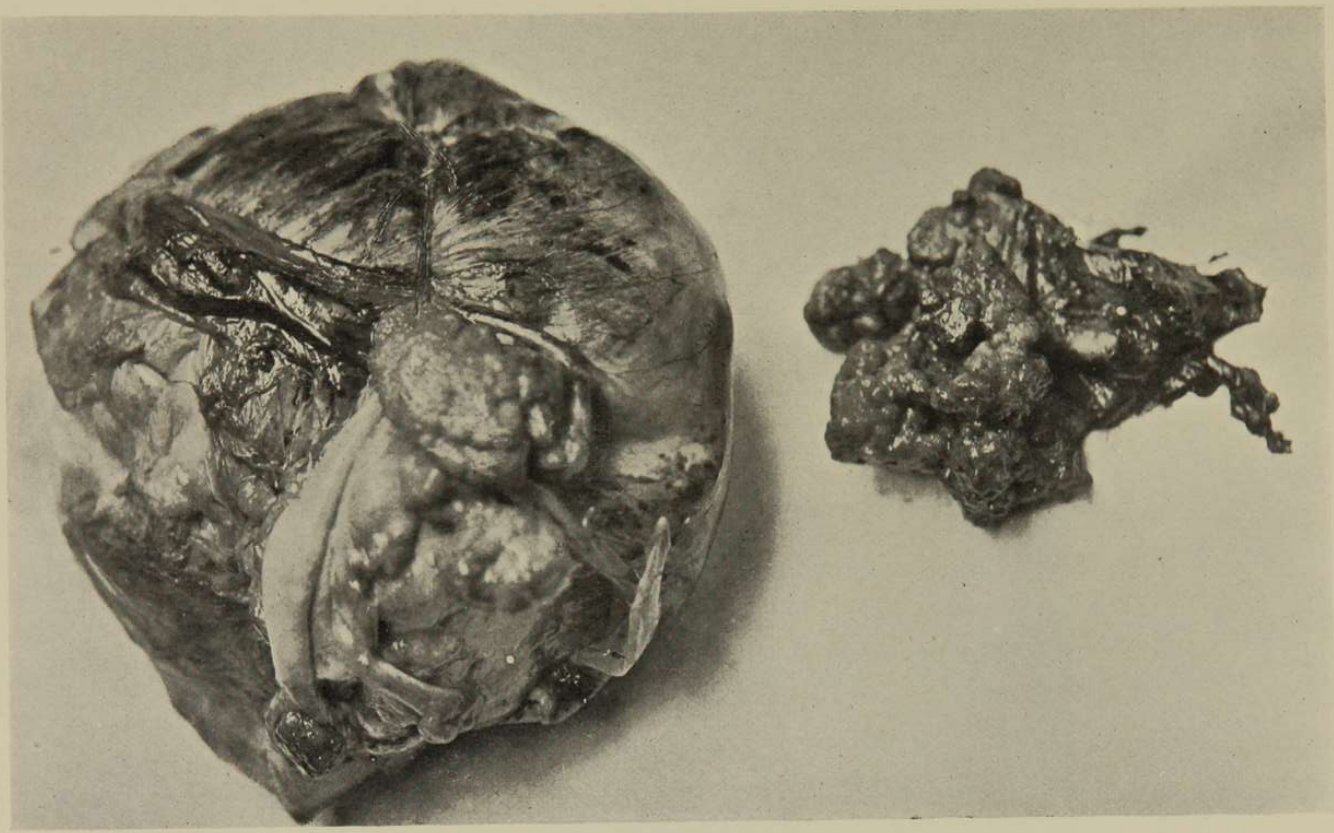
FIG. 224.



DERMOID CYST OF RIGHT OVARY WITH UNIVERSAL ADHESIONS. (*Wood.*)

Papillomatous growths are occasionally found in common multilocular ovarian tumors commingled with adenomatous masses. Papillomatous ovarian cysts usually have a short pedicle, or the tumor not infrequently is intraligamentary.

PLATE XXIV.

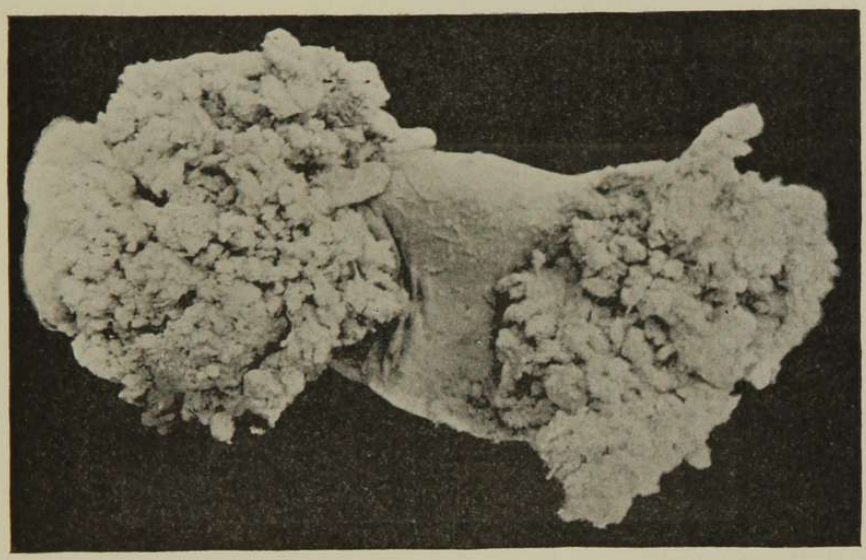


TUMOR OF RIGHT OVARY AS LARGE AS A FETAL HEAD, COVERED WITH PAPILLOMATOUS GROWTHS; LEFT OVARY FIRMLY ADHERENT AND A COMPLETE PAPILLOMATOUS MASS. (*Wood.*)

Cysts of the Broad Ligaments.

Papillomatous Cysts.—These may be either uni- or multilocular. Their cavities contain the same papillomatous growths as are found within papillomatous cystic tumors of the ovary. Masses of the tissue may invest the uterine appendages (Fig. 225), completely covering the ovarian surface. There is a great tendency for these growths to infect the peritoneum. Doran believes that papillomatous growths

Fig. 225.



Papillomatous Disease of the Broad Ligaments, Completely Hiding the Appendages.

These growths may have been enclosed at an early stage in a cyst-wall. (*Museum R. C. S. Photographed by the Author.*)

of the ovary and the broad ligament spring from the tubes of the Wolffian body in the hilum and parovarium (Fig. 221–2).

Papillomata, wherever found, may be either benign or malignant. They consist of hypertrophy of the papillæ either from the interior or exterior of the glandular cyst. During their early formation they are nothing more than warty growths such as may occur from any surface or any part of the body. They are, however, liable at any time to undergo malignant degeneration; hence the necessity of early operative interference before the surrounding structures are implicated. They frequently give rise to ascites.

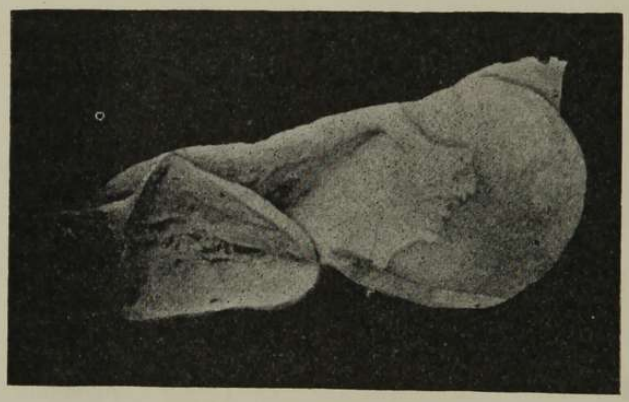
Parovarian Cysts (Figs. 226 and 227).—These cysts are found between the layers of the broad ligament. They are thin-walled and

almost invariably unilocular. Their contents consist of a clear watery fluid of low specific gravity which is non-albuminous. Small parovarian cysts may be pedunculated.

Enlargement of the Hydatid of Morgagni.—This small body, shown in Fig. 221–8, rarely develops into a cyst large enough to call for operative interference.

The other varieties of cysts included in the classification require no extended description at this time. The *cysto-fibroma* and *myxo-adenoma* are simply forms of degeneration of solid tumors. *Hydrops folliculorum*, *cysts of the Fallopian tubes*, and *tubo-ovarian cysts*, are dealt with in the chapter devoted to chronic diseases of the appendages.

FIG. 226.



AN OVARY WITH THE BROAD LIGAMENT AND FALLOPIAN TUBE.

There is a thin-walled parovarian cyst, two inches in diameter, between the layers of the broad ligament. The terminal part of the Fallopian tube is attached over its surface. The anterior layer of the broad ligament is partly dissected off from the cyst. (*Museum R. C. S. Photographed by the Author.*)

SOLID TUMORS.

Fibroid Tumors of the Ovary.—These growths consist chiefly of fibroid tissue resulting from hypertrophy of the stroma of the ovary. They are of exceedingly rare occurrence, and it is probable that fibroid tumors of the uterus involving the ovary have been more than once mistaken for ovarian fibromas. Occasionally muscular fiber-cells are found here and there throughout the mass. Ovarian fibroid tumors vary in density, and not infrequently contain loculi or cysts, constituting the so-called fibro-cystic ovarian tumors. Sometimes they possess a loose vascular texture and resemble in their appearance malignant growths (Williams).

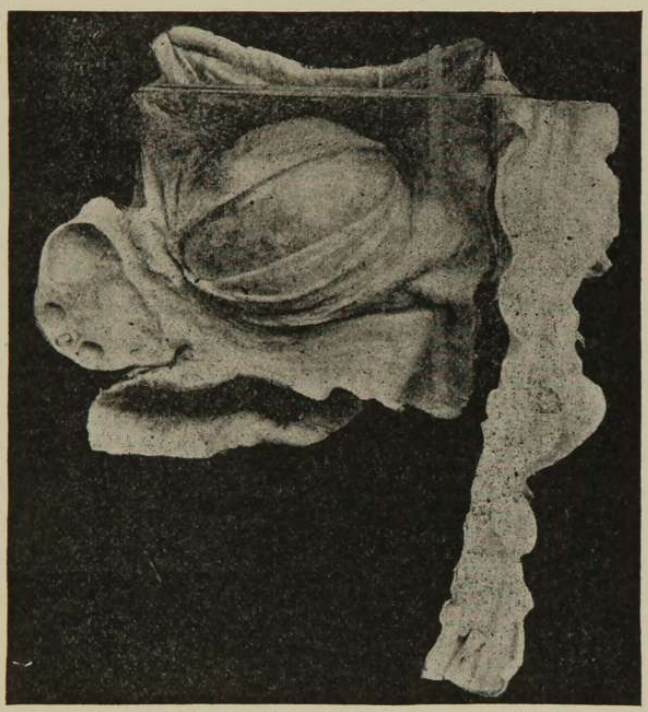
PLATE XXV.

Fibroid Tumor of the Left Ovary the Size of a Fetal Head; Hematosalpinx of Same Side. (*Wood.*)

So long as the tumor does not undergo cystic degeneration it never attains a large size—usually not larger than a fetal head. (Plate XXV.) Fibro-cystic tumors, on the other hand, not infrequently attain a large size, often growing very rapidly.

In the event of cystic degeneration, the partition dividing the cysts often consists of a very vascular fibrous mass from which hemorrhages

FIG. 227.



PAROVARIAN CYST.

The Fallopian tube, which is much elongated, is seen above. The posterior layer of the broad ligament has been horizontally divided, so as to expose the cyst, which appears to be unilocular, and very thin-walled, without any intra-cystic growths. The ovary, laid open, lies to the left. (*Museum R. C. S. Photographed by the Author.*)

may proceed, filling the cyst cavity with blood. Occasionally they undergo certain degenerative changes, becoming calcified or gangrenous, or they may suppurate. The last two changes are usually due either to twisting of the pedicle or to traumatism.

Solid tumors of the ovary composed largely of muscular tissue are also occasionally met with.

Carcinomata.—Carcinoma of the ovary is more frequently met with

than is fibroma. It may be either primary or secondary, being oftener secondary to ovarian adenoma. Any of the forms of cancer attacking other parts of the body may implicate the ovary. The peculiar character of the ovarian tissue, composed as it is of a fibrous stroma with a dense investing membrane, of Graafian follicles, and of intra-follicular epithelium, which is ever growing, especially favors the development of the various forms of cancer.

Malignant cystic tumors of the ovary may occur in one of two ways: First, the walls of a benign cystic tumor may undergo cancerous degeneration; second, infiltration and disintegration may take place in the structure of scirrhous or medullary cancers, as in fibromata, thus forming a cyst. As has been stated, the papillomata are particularly prone to undergo malignant degeneration.

Sarcomata.—Sarcomas frequently undergo cystic degeneration, so that they are met with both as solid and cystic tumors. In many instances they grow rapidly and reach a very large size. Histologically they present the characteristics of sarcoma found in other parts of the body. Formerly the excessive amount of solid material in polycystic tumors was supposed to indicate sarcoma, and undoubtedly cases of benign tumors were many times incorrectly classified as sarcomata.

The Pedicle of Ovarian Tumors.—The pedicle varies in length and thickness as well as in consistence. It may be long and slender—not larger than the little finger; or it may be broad and thick. It is composed of the Fallopian tube, broad ligament, ovarian ligament and vessels. It is, of course, covered by peritoneum. The blood, the nerve, and the lymphatic supply of the tumor pass through the pedicle.

A considerable space may intervene between the broad ligament and Fallopian tube and the utero-ovarian ligament, so that the tumor may seem to have two pedicles. Not infrequently the Fallopian tube is much elongated and usually it is thickened.

CHAPTER XLIV.

CYSTIC AND ALLIED DISEASES OF THE UTERINE APPENDAGES—(Continued).

SYMPTOMS.

Simple and Multilocular Cysts.—The symptoms of an ovarian cyst will depend upon its size and location. When small it may exist for an indefinite length of time without giving rise to trouble. If, however, it remain within the pelvic cavity, the neighboring organs are usually impinged upon in such a way as to cause inconvenience; or pain may result from sensitiveness of the tumor itself. Dysuria is often excited by the tumor pressing upon the bladder. If it fall into the posterior cul-de-sac, there will be more or less irritation of the rectum; and should it become incarcerated, complete obstruction of the bowel may result. The uterus is pushed forward or backward according to the location of the tumor.

The *menstrual symptoms* also vary greatly. I have already noted the fact that ovarian tumors are frequently preceded or accompanied by dysmenorrhea. If but one ovary is involved, the menstrual function is not necessarily affected in any way; or, indeed, if but a portion of one ovary is left intact, ovulation may occur as usual, and menstruation is not necessarily painful. Coe* says he has seen a corpus luteum in the wall of a large cyst, showing that ovulation may persist even though but a remnant of ovarian tissue is left behind. Amenorrhea is a more frequent symptom than is menorrhagia, though excessive menstruation is sometimes the result of ovarian tumors. The reflex symptoms are often sufficiently marked, even with small tumors, to cause suspicions of pregnancy. The stomach may be more or less disturbed, so that there is a tendency to flatulence, which increases the size of the abdomen. The breasts may also undergo reflex changes, which adds to the uncertainty of diagnosis.

When the cyst increases in size and becomes large it passes into the abdominal cavity, unless it is held in the pelvis by adhesions. The pressure upon the pelvic organs is now relieved, and until the tumor

* Clinical Gynecology, 1895, p. 627.

becomes sufficiently large to interfere with the abdominal viscera the patient suffers less than when it was confined to the pelvis. As it becomes larger there will be a sensation of fulness because of the pressure upon the stomach and bowels. Respiration is interfered with, giving rise to dyspnea; the digestion is disordered, and the pressure upon the kidneys, liver, and other organs adds greatly to the patient's discomfort. As time goes on emaciation becomes marked and there appears a peculiar expression of the face which is known as the *facies ovariana*.

Edema of the lower extremities, from pressure, occurs as a late symptom. Gastritis not infrequently supervenes as the case progresses from bad to worse. The patient can no longer digest or assimilate food; nutrition reaches its lowest ebb; and, worn out by the dyspnea and other symptoms resulting from pressure, death ensues.

Dermoid Cysts.—These cysts frequently make their presence known at or about the period of puberty, when the changes incident to that period cause them to take an active growth. They grow slowly, and usually do not attain a size larger than that of an adult head.* Owing to the thickness of the walls and the nature of the contained fluid, fluctuation is generally very indistinct, and it may be impossible to detect it at all. The osseous contents may be felt projecting through the cyst wall. Dermoid cysts frequently undergo suppuration, especially during pregnancy and parturition. As a result, adhesions occur oftener than in simple or multiple cysts, and their contents may escape through the bladder, bowel, or abdominal wall. Unfortunately, spontaneous cures rarely result in this way, and without operative interference suppuration will continue indefinitely. Rupture seldom if ever takes place into the abdominal cavity. The appendix vermiformis is frequently found attached to the cyst wall.

Cysts of the Broad Ligament.—Those cysts of the broad ligament which arise from dilatation of the remains of the Wolffian body or vesicles of the tube are always of small size and rarely become larger than an egg. They hang from the surface of the ligament by a long, slender pedicle, have very thin walls, and are covered by peritoneum. Their contents are of a perfectly innocent character, and they seldom give rise to trouble. They are rarely detected except upon post-mortem examination, or upon abdominal section for other causes.

The so-called *parovarian cysts*, on the other hand, because of their

*I removed during the spring of 1893 a dermoid cyst which, together with its contents, weighed thirty-four pounds.

size, are of greater importance. The parovarium, or organ of Rosenmüller, analogous to the epididymis in the male, is a small body situated between the folds of the broad ligament and between the outer extremity of the ovary and the Fallopian tube (Figs. 13 and 221).

These cysts are formed by a distention of one of the tubes of the parovarium, and, in exceptional instances, may become large enough to fill the abdomen. They occur oftener in young women, grow slowly, and ordinarily do not attain any considerable size. They are usually single, and the constitutional symptoms attending their growth are not marked.

While in many instances they are pedunculated, yet there is a greater tendency for them to burrow between the folds of the broad ligament than is the case with ovarian cysts. They are distended with a watery, limpid fluid of low specific gravity, seldom exceeding 1005, the fluid containing a trace of albumin, which usually requires both heat and nitric acid to precipitate it. Owing to the thinness of the cyst walls, fluctuation is more distinct than in ovarian cysts.

Fibroid Tumors of the Ovary.—The symptoms of fibroid tumors of the ovary do not differ essentially from pedunculated subserous fibroid tumors of the uterus. Indeed, in many instances it is utterly impossible to differentiate the two conditions. I have on three different occasions opened the abdomen expecting to find a subserous fibroid when the cause of the enlargement was a fibroid of the ovary. It will not do to rely upon the mobility or fixity of the tumor in differentiating the two, because a subserous uterine fibroid possessing a long pedicle is often quite as mobile as is a fibroid tumor of the ovary. These growths are differentiated from cystic tumors of the ovary by the fact that they are hard and give no evidences of fluctuation. They grow much less slowly than do cancers and the constitutional symptoms are not usually so profound. However, any of the solid tumors, either benign or malignant, when undergoing cystic degeneration, may increase in size with great rapidity.

Cancer of the Ovary.—Thomas formulates the following symptoms as suggesting malignant involvement of the ovary:—

1. Rapid development of a solid tumor in the ovary;
2. Marked depression of the vital forces and general condition of the patient;
3. The occurrence of edema pedum and spanemia with a small tumor, which are, consequently, dependent upon the general blood state, and not the result of pressure by the tumor;
4. Lancinating and burning pains through the tumor;

5. Cachectic appearance;
6. The occurrence of ascites without evidences of cirrhosis or other hepatic diseases, organic disease of the kidneys, or of the heart, or chronic peritonitis.

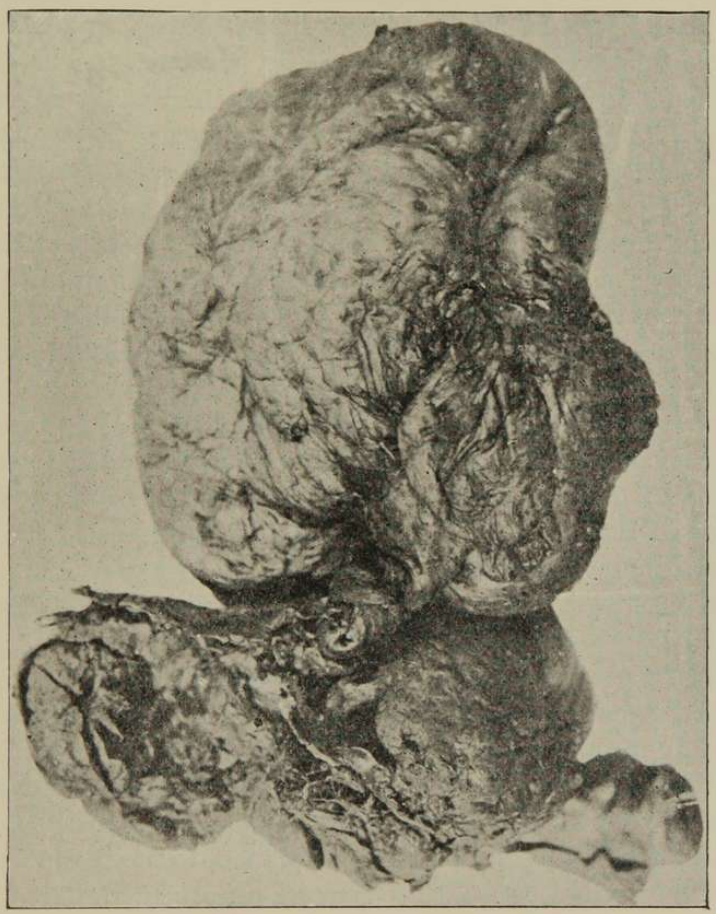
Let the reader bear in mind that while the foregoing symptoms suggest malignancy, too much reliance cannot be placed upon them. Indeed, let him ever bear in mind, when dealing with abdominal tumors, that there is nothing so utterly unreliable as subjective phenomena. During the college session of 1890–91 I had this fact most emphatically impressed upon me by the following case:* The patient, an American, æt. sixty-three, was referred to me by Dr. Mills, of Howell, Michigan. The abdomen was large and evidently contained a tumor of some kind; it apparently was cystic, but not monocystic. Until coming to the hospital she worked daily with but little inconvenience. There was no pain, no disturbance of digestion, and the appetite was good. On making the first examination, however, two symptoms—early emaciation, and the quantity of ascitic fluid which seemed to be present—aroused my suspicions of malignancy, and I so announced to the class and to her medical attendant, who was present. Other than these symptoms there were absolutely no evidences of malignancy. On April 24th I made an exploratory incision and found the pelvis completely filled with the products of malignancy. I carefully closed the wound after removing the ascitic fluid. The patient came very near dying from immediate shock, and was only saved by the most energetic measures. She finally rallied, passed through the night splendidly, and the next morning was feeling unusually well, with pulse and temperature normal. At 10 A. M. she began to vomit typical "coffee grounds" matter, and rapidly passed into a state of collapse, dying two hours later. A post-mortem was made four hours after death by Dr. Rogers, assistant pathologist of the University. The peritoneum was studded with cancerous nodules, as was also the omentum. The omentum was closely adherent to the tumor. The tumor sprang from the right side, and the pelvis and abdomen were literally packed with tumor, uterus and broad ligament, all of which were implicated in the cancerous process, and from the entire surfaces of which projected malignant nodules (Fig. 228). The intestines were dark, nodular, and matted together. The liver was indurated, and contained one nodule which was undoubtedly cancerous. The gall-bladder was enormously distended and contained nearly a pint of fluid. The stomach was so soft that it could be readily torn with the

* North American Journal of Homeopathy, July, 1891.

finger, and was filled with a peculiar dark grumous matter similar to that vomited just before death.

Notwithstanding these fearful inroads of malignancy, there were no subjective symptoms, other than those mentioned, suggesting the condition present. It is true that the patient had been under the care of

FIG. 228.



CANCER OF UTERUS AND ADNEXA. (*Wood.*)

her physician at various intervals for years, but until the tumor made its appearance her symptoms yielded kindly to treatment, and she had never been *seriously ill.*

COURSE AND TERMINATION.

The course and termination of ovarian tumors will depend upon the age of the patient and the nature of the tumor, as well as upon the

many contingencies liable to arise. Monocystic tumors of the ovary grow, as has been shown, more slowly than do multiple cysts. Solid fibroid tumors often continue indefinitely without giving rise to serious trouble, and are not necessarily fatal unless they undergo some of the forms of degeneration which have been referred to. On the other hand, malignant tumors grow with great rapidity and speedily terminate life by undermining the patient's health, or by giving rise to serious complications, unless their progress is interrupted by operative procedures. Ovarian sarcoma and carcinoma of the papillary variety are extremely malignant and grow with great rapidity (Pfannestiel). Proliferous cysts likewise grow with great rapidity, while a dermoid cyst may be carried through life without the patient being aware of its existence; however, suppuration is liable to arise at any time. The slow growth of parovarian tumors has already been noted. These growths do not usually return after tapping; but, owing to the uncertainty of diagnosis, we are not justified in resorting to tapping as a curative procedure. This point will be referred to later on.

The *contingencies* requiring consideration are:—

Spontaneous cures, and cures by internal medication;

Twisting of the pedicle;

Rupture of the cyst;

Inflammation of the interior of the cyst;

Hemorrhage from the interior or exterior walls of the cyst;

Adhesions;

Obstruction of the bowel.

The *spontaneous disappearance of ovarian cysts* by absorption alone is extremely doubtful, notwithstanding the fact that instances of the kind have been recorded. Nearly all specialists are agreed that so long as the fluid remains within the cyst absorption is impossible. Should rupture occur, and the contained fluid escape into the peritoneal cavity, it is entirely possible for the fluid to be absorbed; or should rupture fortunately take place into the bladder, bowel, or Fallopian tube, the contents may escape through one of these channels. Post-mortem evidence is not wanting to show that a tumor may gradually atrophy from insufficient nourishment by twisting of the pedicle.

I am aware that, especially in homeopathic literature, many cases of alleged cures following the administration of the indicated remedy are reported. Some of them are reported by men whose authority as gynecological specialists is fully established. Nevertheless, the possibilities of curing these cases by internal medication are so remote that a cyst

should not be permitted to continue without operative interference until life is jeopardized by its excessive growth. I have so often had come to me patients on whom internal medication had been unsuccessfully tried, and who should have been operated upon months before, that it almost leads me to regret that such cures were ever reported. In alleged cures, the uncertainties of diagnosis should always be borne in mind.

Twisting of the Pedicle.—This is not an infrequent accident, the axillary rotation of a tumor free from adhesions twisting the pedicle so as to obstruct its circulation. In the *New York Medical Journal* for May, 1891, Robertson reports five cases of twisting of the pedicle of tumors occurring in the practice of Lawson Tait. Tuholske* also reports two cases of the accident, in one of which the pedicle was twisted one and a half times and in the other two and a half times. In one of Lawson Tait's cases the tumor doubled in size in three days. This, as suggested by Robertson, is due to the fact that the twisted pedicle allows the arterial blood to pass into the tumor long after the venous blood is cut off. Rapid increase in the size of a tumor should cause one to be on the alert for twisted pedicle. In one of Tait's cases the patient was seventy-eight years old. The twist occurred while she was getting into bed, and the tumor rotated on its axis between three and four times. After operating the patient made a good recovery. In another case gangrene set in as the result of strangulation; and in still another the tumor was filled with pus, the twist probably occurring more gradually. In all of the five cases reported, adhesions had formed to the surrounding structures, through which the nutrition was almost entirely derived, the circulation of the pedicle being cut off. Cases are also reported by Jahreiss† and Travers.‡

The twist may be only partial, so that the circulation is not entirely destroyed, and gradual atrophy of the tumor, as observed under the head of spontaneous cures, may take place. Unfortunately, this termination is of exceedingly rare occurrence. The pedicle, as a result of the twisting, may become entirely separated from its attachment, when the tumor will be found either loose within the abdominal cavity, or attached to some of the surrounding viscera by adhesions.

Rupture of the Cyst.—Every operator of experience has met with instances where cysts have ruptured and discharged their contents into

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* St. Louis Courier of Medicine, December, 1890.

† Münch. Med. Woch., December 10, 1895.

‡ Lancet, November, 1895.

the peritoneal cavity. The accident is especially liable to occur when the cyst walls are thin and tense, and when the case is complicated by pregnancy. Other causes are: direct violence, concussion, a fall or sudden blow.

The *symptoms of rupture* are those of shock with subsequent peritonitis. The shock is sometimes very great, and, if associated with hemorrhage, death may ensue at once. The extent of peritonitis excited will depend upon the nature of the fluid, being much more marked when the latter is gelatinous or puriform.

As has already been shown, a spontaneous cure may follow the rupture Oftener, however, if the patient recover from the shock and peritonitis, the tumor will refill.

Inflammation of the Interior of the Cyst.—The same causes which give rise to rupture may give rise to inflammation. When tapping was commonly practised the accident was met with much oftener than it is at the present time. In multilocular cysts the inflammation may be limited to one loculus. When the inflammation is succeeded by suppuration, as frequently occurs, all of the symptoms of septicemia and pyemia may ensue; or the decomposed fluid may find its way through adhesions either into one of the cavities of the body, or externally through the abdominal wall. Dermoid cysts are particularly liable to undergo inflammation and suppuration.

Hemorrhage from the Interior or Exterior Wall of the Cyst.—This may result from injury which does not give rise to rupture. It is often associated with papillomatous degeneration. The symptoms will depend upon the quantity of hemorrhage and upon the seat of the effusion. If very great all the symptoms of shock will present themselves. If the blood escapes into the free peritoneal cavity the ordinary symptoms of hematocele follow. Peritonitis is not infrequently excited by the accident. When a large quantity of blood is poured into the cyst cavity, the tumor is suddenly distended; this form of hemorrhage is oftener the result of twisting of the pedicle.

Adhesions.—Adhesions are of frequent occurrence. The tumor may attach itself to any of the pelvic or abdominal viscera, or to the abdominal walls. The liver, the stomach, and the diaphragm may thus become attached to the tumor. As a result, the contents of a cyst undergoing degenerative changes may find their way into any of the hollow viscera contained within the pelvis and abdomen, or even through the diaphragm into the lungs and pleural cavities.

When adhesions exist, a history of peritonitis can usually be obtained.

Obstruction of the Bowel.—This may be due either to direct pressure of the tumor, or to inflammatory adhesions following inflammation and suppuration. Its presence is announced by the usual symptoms attending obstruction.

Terminations.—Death may result from—

Exhaustion;

Asphyxia;

Suppuration and pyemia;

Peritonitis;

Collapse and shock from rupture of cyst;

Intestinal obstruction;

Uremia;

Hemorrhage either into the cyst or into the free peritoneal cavity from the external surface of the cyst;

Twisting of the pedicle.

Death is usually caused by a combination of two or more of the foregoing causes. The surgeon having in charge a patient with an ovarian tumor should constantly bear in mind the complications liable at any time to arise. He should, moreover, if the patient declines to submit to immediate operative interference, hold himself in readiness to open the abdomen, unless positive counter-indications exist, as soon as dangerous symptoms manifest themselves. A high temperature, instead of counter-indicating an operation, usually calls imperatively for surgical interference, for it is due, in the vast majority of instances, to suppuration. I have seen the temperature drop in a few hours from 105° F. to normal after removing a suppurating multilocular cyst.

Prognosis.—While the course of the several forms of ovarian tumor which have been studied is most variable, the tendency in all is toward a fatal termination unless interrupted by surgical art; and while a tumor, in a given case, may exist for years without giving rise to serious trouble, the instances where this is so are of such exceptional occurrence as to have little influence in determining the probable outcome of the disease. In the vast majority of instances, the end is only a question of time, if the tumor is unmolested. On the other hand, the average mortality of the best ovariotomists is but three per cent.—so that the whole outlook is at once changed by the intervention of art.

CHAPTER XLV.

CYSTIC AND ALLIED DISEASES OF THE UTERINE APPENDAGES—(Continued).

DIAGNOSIS.

General Considerations.—The existence of an ovarian cyst may be suspected if the abdomen is enlarged by a tumor which has made its appearance gradually, and which does not present the ordinary signs of pregnancy; which has grown from below upwards; which is mobile; which is not tender; and which does not affect the general health until the tumor is large enough to interfere with the functions of the abdominal viscera. Subjective symptoms alone, as I have already emphasized, are entirely insufficient for purposes of diagnosis. Nothing short of thorough physical exploration will suffice; and even then the physician will many times be left in doubt until after the abdomen is opened. Extended experience in abdominal surgery begets modesty. In the language of Tait, "Exact abdominal diagnosis is an impossibility, and he who asserts to the contrary is either rash or inexperienced."

The uncertainties of diagnosis, instead of making the physician less thorough in his methods of examination, should make him more so. So much is at stake in dealing with abdominal tumors that anything less than thoroughness is criminal. More than once has the abdomen been opened for the purpose of removing an ovarian tumor when no tumor was found; or when, instead of an ovarian tumor, a pregnant uterus was discovered. Besides these sources of error, the chastity of virgins is frequently impugned when the cause of the enlargement of the abdomen, instead of being a pregnant uterus, is an ovarian tumor. For these reasons, as well as for many more which suggest themselves, the examiner cannot proceed with too great care when he suspects the existence of a tumor of any kind within the abdomen or the pelvic cavity.

In the chapters devoted to physical diagnosis, I have dwelt at length upon the manner of conducting physical examinations. I shall, there-

fore, at this time touch only upon those points especially important in examining for abdominal tumors.

The examiner should proceed at all times with extreme gentleness. If pain is caused by palpation or by the bimanual, contraction of the abdominal muscles will be excited. Whenever there is any doubt as regards the contents of the abdomen or pelvis an anesthetic should be administered. This is especially true in dealing with nervous and hysterical patients, or with young girls who have never before been subjected to local examination.

Pain excited by the manipulations of the surgeon does not necessarily indicate disease. Indeed, hard pressure upon any of the structures within the pelvis or the abdomen will give rise to more or less pain. Suffering may also be induced by the carelessness of the examiner who has not properly cared for his nails, or who is unduly awkward. Again, the examiner should constantly bear in mind the possibilities of pregnancy. Unless he does there is danger, even in the examination of supposed virgins, of unwittingly producing abortion. No matter what the patient's station in life may be, or what her environment, the examiner's only safety will lie in looking upon the girl or woman as a being capable of conception. Too often errors have arisen from the physician's relying implicitly upon the patient's statement regarding the persistence of the catamenia.

Finally, the surgeon should not assert the results of his examination with too much positiveness. He may, it is true, be able to make his diagnosis with almost absolute certainty. Unfortunately, this is not always the case, and after exhausting every known method and every precaution, he will every now and then open the abdomen only to find himself mistaken. He should, therefore, be careful to explain to the patient and her friends that an element of uncertainty always prevails. This precaution may save him much future embarrassment.

Preconceived ideas are formed usually because the surgeon has had presented to him, either by the patient or by her medical attendant, a history which leads him to suspect an ovarian tumor. Upon examination he finds that the abdomen is unquestionably enlarged, but does not take the precaution to eliminate the misleading conditions presently to be dealt with.

The surgeon must proceed in his physical examination entirely unbiased by the patient's history. This is true in the case of respectable married women as well as in young unmarried women. In the first instance, the patient may consider herself pregnant because she has experienced sensations similar to those experienced during previous

pregnancies; or she may not consider herself pregnant because the usual symptoms attending previous pregnancies are absent. In the case of young single women, the symptoms of pregnancy, if they exist, may be suppressed. The surgeon must, too, bear in mind that pregnancy may occur after amenorrhea has existed for a long time.

A distended bladder may give rise to uncertainty of diagnosis before the catheter is introduced; or a loaded rectum or sigmoid flexure may lead one to suspect the existence of a tumor other than fecal, hence the necessity of having both the bowels and the bladder thoroughly emptied before the examination is begun. A still more important precaution is the use of an anesthetic when there is very great tenderness or rigidity of the abdominal walls, or when there is much flatulence.

Palpation and percussion should be conducted in such a way as to cause the least possible amount of pain. The entire hand or the entire finger should be used instead of the tips of the fingers, for the latter will cause sufficient pain to incite contraction of the recti muscles. The hands should also be warm and the patient placed in a position favorable to the relaxation of the muscles.

Excessive thickness of the abdominal walls, excessive tenderness, the simultaneous existence of tumors and pregnancy, rupture of the cyst walls, and peritonitis, constitute real difficulties which may tax the skill of the examiner to the utmost.

DIFFERENTIATION.

I shall follow Doran's* classification in differentiating the various conditions giving rise to abdominal distention. It is as follows:—

CLASS I.—**A Tumor or Tumors more or less Distinct.**

1. A central tumor, distending lower part of abdomen.

A. *Freely fluctuating.*

Ovarian cyst, with one cavity greatly predominating over the others;
Broad ligament cyst;
Encysted dropsy of peritoneum;
Distended bladder;
Hydramnios.

B. *Fluctuating in parts.*

Ovarian cyst, multilocular;
Ovarian cyst with much solid matter;
Fibro-cystic uterine tumor;

* Op. cit., p. 174.

Pregnancy (later stages).

C. *Solid, no fluctuation.*

Solid ovarian tumor;
Fibroid uterine tumor;
Pregnancy (earlier stages).

2. A tumor distending lower part of abdomen, not central in position.

A. *Fluctuating.*

Renal cyst or retro-peritoneal cyst in the neighborhood of the kidney;
Cyst of omentum or mesentery;
Hydrosalpinx (extreme cases);
Ovarian cyst (rare);
Cyst in abdominal walls.

B. *Solid.*

Extra-uterine pregnancy (tumor may be central);
Scybala in cecum or sigmoid flexure;
Enlarged spleen (extreme cases).

3. Two or more tumors distending lower part of abdomen.

Bilateral ovarian tumors (especially small dermoid cysts);
Multiple subperitoneal uterine fibroids;
Hydatid disease of peritoneum.

CLASS II.—**Abdomen Distended; no Distinct Tumor.**

1. Fluctuation distinct.

Ascites (all cases, including those where an ovarian or other tumor may exist).

2. No fluctuation.

Tympanites and phantom tumor;
Obesity;
Pendulous abdomen.

CLASS I.—A TUMOR OR TUMORS MORE OR LESS DISTINCT.

1. **A Central Tumor, Distending Lower Part of Abdomen.**

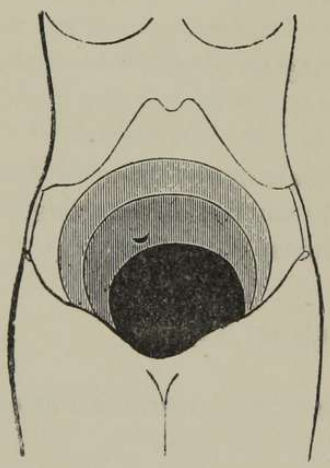
A. *Freely Fluctuating.*

Ovarian Cyst, with one cavity greatly predominating over the others.—This will give rise to dulness on percussion in the lower part of the abdomen. It occupies the middle line, or is slightly to one side, and can be located by palpation. The area of dulness does not change. It is movable *en masse* only or not at all. There is resonance in the flanks unless ascites is present. The umbilicus remains normal. A

vaginal examination will reveal the pelvic origin of the tumor, and the fluctuating wave can often be distinctly felt by the finger in the vagina. A differentiating table is given on page 762. (Figs. 229 and 230.)

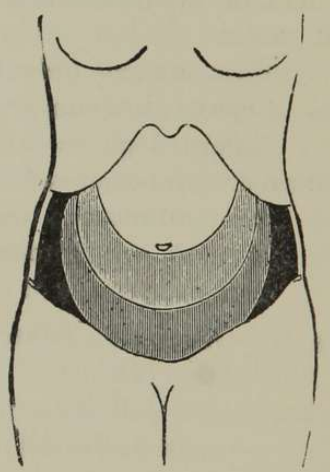
Broad Ligament Cysts.—A parovarian cyst gives rise to the same area of dulness as does an ovarian cyst. Fluctuation is usually more distinct because of the thinner walls. Its more intimate connection with the uterus, as is shown by vaginal examination, together with the history of the case, will suggest its parovarian origin. *Papillomatous cysts of the broad ligament* are differentiated from the ovarian cysts with much difficulty. Frequently they are closely incorporated with the uterus and are firmly fixed low in the pelvis.

FIG. 229.



AREA OF DULNESS IN OVARIAN CYST.

FIG. 230.



AREA OF DULNESS IN ASCITES.

Encysted Dropsy of Peritoneum.—The intestines are bound down by adhesions between which and the anterior abdominal wall ascitic fluid accumulates. An effusion of this kind makes its appearance suddenly, preceded, usually, by a history of peritonitis. The abdomen, instead of being prominent, is more or less flat. The area of dulness is unchangeable. Fluctuation is limited.

Distended Bladder.—Distention from this cause is of recent origin. It is centrally located in the lower abdomen, and, unless the result of paralysis, gives rise to much discomfort. It hardly seems possible that this condition could be mistaken for ovarian tumor, yet it has been. In all cases of doubt a catheter should be passed.

Hydramnios.—Dropsy of the amnion sometimes complicates preg-

nancy so that the amniotic fluid may be greatly in excess. This condition, owing to the fact that the uterine walls are usually very thin, and fluctuation more or less distinct, may simulate an ovarian tumor. Ordinarily, a careful examination will reveal the changes incident to pregnancy—softening of the cervix, changes in the breasts, etc. The subjective symptoms of pregnancy are rarely wanting. Hydramnis is frequently due to albuminuria.

B. *Fluctuating in Parts.*

Ovarian Cyst, Multilocular.—The symptoms do not differ from those resulting from a unilocular ovarian cyst, except that fluctuation is much less distinct.

Ovarian Cyst with much Solid Matter.—May be either benign or malignant. The constitutional symptoms depend upon the character of the growth. It is exceedingly difficult to differentiate this condition from a fibro-cystic uterine tumor. A solid or semi-solid ovarian tumor is usually more mobile than is a fibro-cystic uterine growth.

Fibro-Cystic Uterine Tumor.—Is usually of slow growth at first. It seldom occurs before the age of thirty, is comparatively rare, and usually gives rise to no emaciation. There is menorrhagia more often than amenorrhea. Frequently the lobulated surface of the tumor can be detected. Upon vaginal examination it will be found continuous with the uterus, and sometimes can be moved with it. Not infrequently the uterine cavity is increased in depth.

Pregnancy (*later stages*).—So difficult is it at times to differentiate between pregnancy and an ovarian cyst that I deem it wise to add the following table, taken from Peaslee, which I have slightly modified:—

Normal Pregnancy Five and a Half Months or More.	*Ovarian Cysts, Second or Third Stage.*
Enlargement sudden and rapid; symmetrical, or inclined slightly to right side;	Enlargement gradual; symmetrical till in the third stage;
Features, natural healthy;	Features emaciated, anxious;
Superficial veins of abdomen not enlarged. Edema of ankles not uncommon after seven months;	Veins are enlarged; edema in late stages, from pressure;
Fluctuation not very distinct, unless much liquor amnii;	Usually distinct in monocysts; often absent in polycysts;
Menstruation, arrested (exceptions);	Not arrested till third stage has commenced;
Vaginal touch detects softening and apparent shortening of the cervix, and enlargement of the uterus;	No changes in these respects; but uterus is displaced, usually behind the cyst;

Ballottement gives impulse of fetus;	No result; very rarely is imitated;
Fetal heart-sounds detected;	None;
Movements of fetus felt;	None;
Enlargement of mammæ;	Occurs in exceptional cases only;
Umbilical areolæ in first pregnancy;	None;
Has developed within six to nine months;	Has developed within one to three years;
Follicles around the nipple equally developed in both mammæ; become white on stretching the skin;	Unequally developed, and remain of same color as the areolæ.
Exception.—If fetus be dead, of course, the movements and heart-sounds cease.	

C. *Solid, no Fluctuation.*

Solid Ovarian Tumor.—This may be either fibroma, carcinoma, or sarcoma. When malignant, cachexia, ascites, and general symptoms of anasarca, which rarely if ever attend benign tumors of the ovary, are prominent. These growths are distinguished with much difficulty from pedunculated fibroid tumors of the uterus, though usually they are more mobile than the latter. There is an entire absence of fluctuation.

Fibroid Uterine Tumor.—If sessile, there is an intimate connection between the uterus and the tumor. Uterine fibroids are of frequent occurrence, whereas solid ovarian tumors occur but rarely. A uterine fibroid grows slowly, and is usually attended by menorrhagia. There is tenderness in the lower abdomen during menstruation. There is no fluctuation, and the uterus moves with the tumor.

Pregnancy (*earlier stages*).—The well-known signs of pregnancy will of course be looked for. In determining the character of the tumor the examiner will observe that upon bimanual it is, if due to pregnancy, pyriform, symmetrical, and more or less resilient. The fundus of the uterus moves in harmony with its lower portion.

2. **A Tumor Distending Lower Part of Abdomen, not Central in Position.**

A. *Fluctuating.*

Renal Cyst or Retro-Peritoneal Cyst in the Neighborhood of the Kidney.—With renal cyst there is usually a history of urinary troubles, with the occurrence every now and then of pus, blood, or albumen in the urine. Nephritic colic, from an impacted calculus, frequently precedes the formation of a renal cyst. Edema of the lower extremities occurs early, and emaciation late. The tumor is unilateral,

commences in the lumbar region, and grows forward and downward. The intestines lie in front, instead of behind the tumor. There is clearly no connection between the pelvic organs and the tumor. Should aspiration be resorted to, the fluid will contain urea, urates, and chlorides. A large renal cyst is of rare occurrence.

Cyst of Omentum or Mesentery.—This is of exceedingly rare occurrence. It chiefly occupies the middle line, though seldom exactly median. Fluctuation is usually obscure, but sometimes some degree of mobility is present. It is not connected with the pelvis.

Hydrosalpinx (*extreme cases*).—Under this head may also be included hematosalpinx and pyosalpinx. In rare instances any of these conditions may give rise to an enlargement of the Fallopian tube, which causes it to become abdominal. A distended tube is, however, usually confined to the pelvis, and is detected only upon rectal and vaginal exploration. The tumor is evidently closely connected with one side of the uterus. Pain is often a very prominent symptom. Distention of the tube is ordinarily associated with menstrual irregularities of some kind.

Cyst in Abdominal Walls.—This causes prominent bulging of the parietes. It is rounded and is intimately attached to the abdominal walls, following closely their movements. It gives rise to dulness over the palpable area.

B. *Solid.*

Extra-Uterine Pregnancy (*tumor may be central*).—An extra-uterine pregnancy cyst may become solid after the death of the fetus. The fluids are then absorbed and the tumor appears as a hard, irregularly rounded mass, fixed in some part of the lower abdomen or pelvis. It is intimately connected with the uterus, which is always enlarged. The history should be carefully inquired into, for the symptoms elicited by physical examination may closely resemble uterine myoma.

Scybala in Cecum or Sigmoid Flexure.—Fecal tumors are seldom large enough to be mistaken for ovarian cysts. They may occur in any part of the large intestine, and are usually preceded by a history of constipation alternating with colic and diarrhea. They give rise, upon manipulation, to a peculiar doughy feel, and ordinarily can be indented by pressure. As a final test an effort should be made to thoroughly empty the bowels.

Enlarged Spleen (*extreme cases*).—The conditions giving rise to enlargement of the spleen sufficient to simulate ovarian tumor are leucocythemia, cancer, syphilis, and amyloid degeneration. Occasion-

ally the enlargement may be great enough to extend into the pelvis. It appears first under the left false ribs and extends downward and inward toward the middle line. The enlarged organ, from its close contact with the parietes, gives rise on percussion to absolute dulness over its entire surface. Sometimes the characteristic notched border can be felt. Smaller splenic tumors are slightly mobile. The constitutional symptoms attending the several affections responsible for the enlargement are rarely absent.

3. Two or more Tumors Distending Lower Part of Abdomen.

Bilateral Ovarian Tumors (*especially small dermoid cysts*).—A sulcus may be felt between them. In most instances, however, one tumor so completely overshadows the other that the existence of the smaller one is not suspected until after the abdomen is opened.

Hydatid Disease of Peritoneum.—Hydatid growths springing from the peritoneal surface, or, more frequently, from the liver, often reachenormous proportions, and by distending the abdomen may simulate an ovarian cyst.

A vaginal examination will show that the growth does not have its origin in the pelvis. Percussion will locate the area of dulness high up; fluctuation is more obscure and circumscribed than in ovarian cysts, and frequently the so-called hydatid fremitus can be felt. The tumor grows very rapidly from above downward. If the diagnosis is doubtful a fine aspirating needle may be introduced and the obtained fluid examined. As a rule it is perfectly colorless, transparent, of low specific gravity (1007 to 1009), and alkaline or neutral in reaction, though occasionally it may be acid. There are no organic substances. Microscopical examination will reveal the characteristic hooklets.

Class II.—Abdomen Distended—no Distinct Tumor.

1. *Fluctuation Distinct.*

Ascites. — The following table, from Peaslee, which I have but slightly modified, cannot be improved upon in differentiating between ascites and large ovarian cysts:—

Ascites.	*Large Ovarian Cyst.*
Previous ill-health;	Good health previously;
Enlargement comparatively sudden;	Enlargement gradual;
Face full, puffy, leaden;	Face emaciated, peculiar;
Patient on back—enlargement is symmetrical, flat in front;	Enlargement is not usually symmetrical, never till third stage; prominent in front;

Patient on the side—flatness on sides;	No change of flatness;
Patient sitting up—abdomen bulges below;	Little, if any, change of abdomen;
Skin of abdomen, smooth, tense, shining;	Abdominal integuments natural, or merely thinned;
On superficial view, abdomen very much enlarged. Edema of extremities in all cases, and, at last, of abdomen also;	Superficial view, less enlarged. Edema only in exceptional cases;
Floating ribs not bulging;	Chest conical from bulging of the false ribs;
Navel prominent and thinned;	Navel not thinned;
More distinct in erect position;	More distinct in recumbent position;
Percussion gives a clear tympanitic sound at highest portion of abdominal cavity, in all positions. Is dull elsewhere, and changes with the position; (*v.* Fig. 230.)	Clear sound only at parts not corresponding to the cyst, and in both flanks; dulness over it in all positions; (*v.* Fig. 229.)
Vaginal and rectal touch detect fluctuation at once;	Fluctuation less clear, and may not be reached at all, or does not exist in case of polycyst;
Uterus normal in size, mobility, and position; sometimes prolapsed;	Uterus displaced behind the cyst, generally;
Hydragogues and diuretics produce temporary relief;	These remedies, as a rule, produce no effect;
Exceptions.—If there be a very large accumulation, may be dulness at highest point of abdominal cavity—patient being on the back (or the intestines may be glued down; deep percussion may elicit tympanitic sound); one or both flanks may be clear, from gas in the colon.	*Exceptions.*—May be tympanitic sound in cyst, if it communicate with intestine; one or both flanks may be dull from feces in the colon.

2. *No Fluctuation.*

Tympanites and Phantom Tumor.—The patient is usually hysterical and the condition is more apt to occur as she approaches the menopause. The abdomen may be distended to the size of a pregnant uterus at full term, so that the existence of either pregnancy or of a tumor of some kind is suspected. Frequently there is an arching of the back which causes the recti muscles to become tense, and which adds greatly to the confusion.

The examiner will observe that there is no fluctuation; nor do the evidences of a solid tumor exist. If he can divert the patient's attention by conversation or otherwise, relaxation of the recti muscles will frequently take place, and the actual condition be determined; or, if

the patient be placed under the influence of an anesthetic, the swelling will quickly and entirely disappear, and the resulting flaccidity of the abdomen will permit a thorough examination of its contents to be made.

When the patient believes the enlargement to be due to pregnancy (pseudocyesis) her suspicions are based, not only upon the tympanitic enlargement of the abdomen, but also upon the suppression of the catamenia, which in the vast majority of instances is due to physiological changes incident to the menopause. Usually the patient is exceedingly anxious to become a mother, and the mental condition is such as to cause her to exaggerate every sign suggesting the possibility of pregnancy. The examiner will also observe that the mammary glands are not altered and that the uterus has not undergone the usual changes of pregnancy, the bimanual showing it to be of normal size and perfectly mobile.

Obesity.—Obesity sufficient to give rise to abdominal enlargement simulating an ovarian tumor occurs oftener at or about the menopause. When associated with tympanitic distention the condition may greatly confuse the inexperienced examiner.

It will be noted, on exploration, that the enlargement is symmetrical. When the patient assumes the sitting or upright posture the abdominal walls are thrown into pendulous folds, the umbilicus remaining normally depressed. They can be grasped between the two hands, when their great thickness will be indicated. The sensation elicited by palpation is that of a doughy enlargement which yields on firm pressure. The obesity is general, involving the entire body—the face, limbs, breasts, etc. Percussion will indicate resonance instead of dulness. It should be remembered that deep percussing is necessary when the abdominal walls are unusually thick.

Pendulous Abdomen.—Sometimes the abdomen becomes so pendulous as to extend half way to the knees. The walls can be grasped and pinched between the two hands, and there will be an entire absence of all signs indicating either a tumor, ascites, or pregnancy.

ADDITIONAL LESIONS.

It will now be necessary, in order to make this chapter complete, briefly to consider certain other conditions, with which the abdominal surgeon should be perfectly familiar, although they are not included in the schema studied.

Cancer of the Pylorus.—A tumor resulting from cancer of the pylorus is small, hard, and movable, and is situated in the epigastrium

a little to the right of the median line. In its later stages it becomes fixed. Pressure gives pain. The gastric symptoms are always prominent.

Fibroid Thickening of the Pylorus.—This is felt as a localized induration in the same location as the preceding condition. It rarely reaches the dimensions of a tumor. It is extremely difficult to differentiate this affection, during its early stages, from cancer. Pressure upon an indurated pylorus ordinarily causes much less pain than is the case with cancer.

Morbid Growths of the Stomach.—These are, in at least ninety per cent. of all cases, malignant—scirrhous cancer being the form oftener attacking the stomach. If located on its posterior surface, which is rarely the case, it may drag the stomach downward as far as the umbilicus. Palpation causes pain. The enlarged viscus is usually movable, at least not becoming fixed until the later stages of the disease. The constitutional symptoms are marked.

Molar Pregnancy.—The ordinary signs of pregnancy usually exist, except that the abdominal tumor increases much more rapidly than is the case in normal gestation, and the uterus grows to a greater size. The enlargement will be recognized as uterine, and sooner or later the characteristic discharge (p. 80) will make its appearance.

Solid Growths of the Kidney.—These are carcinoma, adenoma, and the several varieties of sarcoma. Any one of these conditions may give rise to an enlargement sufficiently great to fill the whole abdominal cavity. They will be recognized by the dulness produced on percussion over the lumbar region, which extends forward, by their fixity in the region of the kidney, and by the urinary changes which are usually present.

Solid Growths of the Liver.—Usually cancerous or sarcomatous. The tumor is oftener located in the right lobe. It will be recognized as a solid resisting enlargement protruding from under the ribs of the right side. Unless adhesions exist, the liver will move upward and downward during respiration. In cancer the characteristic knobs on the surface of the liver can often be felt. The various malignant growths springing from this organ are limited in size only by the capacity of the abdomen.

Solid Tumors of the Gall-Bladder.—Clinically, a gall-bladder distended with gall-stones, with thickened walls the result of inflammation, is a solid tumor. The various malignant lesions of the liver may also implicate the gall-bladder. The enlargement is located at the edge of the liver, and extends downward and inward toward the umbilicus.

The natural globular, ovoid, or pear shape of the gall-bladder is usually preserved. There is more or less mobility in lateral directions. Absolute dulness over the enlarged area rarely occurs.

Tumors of the Colon.—These growths are either adenoma, adenosarcoma, or cancer. The adenomata are usually polypoidal in shape. In the vast majority of instances they are found in the descending colon, are freely movable for some inches in all directions, and seldom attain a size larger than that of an orange. Cancer locates itself in any part of the large bowel, and gives rise to an indefinable thickening, fixed or slightly movable. When any of these growths are located in the sigmoid flexure, it is possible to detect them by rectal exploration. The intestinal excreta will often indicate the nature of the growth.

Solid Growths of the Omentum.—Any of the forms of malignant disease—colloid cancer being the most frequent—may involve the omentum. Such growths give rise to a very irregular surface and are either hard or boggy, depending upon the proportion of colloid material present. Not infrequently ascites exists with the disease. It is sometimes possible to determine by palpation and deep percussion whether the growth overlies the intestines.

Hematometra.—The tumor is clearly of uterine origin. It is the result of retention of menstrual blood, caused by some obstruction to its exit, located either at the cervix or in the vagina. The menstrual blood does not make its appearance externally, although all of the symptoms of puberty are present. The symptoms of menstruation, minus the flow, recur at regular intervals. The only symptom of pregnancy that exists is enlargement of the uterus. The history, together with a physical examination, will clear up the diagnosis.

Hydrometra.—Occasionally an obstruction will occur in the cervical canal after the menopause which gives rise to an accumulation of watery fluid within the uterus great enough to suggest an ovarian cyst. The uterine walls are sufficiently attenuated to permit of fluctuation. The accumulation occurs gradually. On physical examination the sound will locate the obstruction and determine the cause of the enlargement.

Ovarian Abscess.—Ovarian abscess is usually located in the recto-uterine pouch, on one or the other side, where it is adhered. The tumor is rarely larger than a hen's egg, is obscurely fluctuating, and very tender.

Distention of the Gall-Bladder with Fluid.—The tumor is fixed under the liver, is painless or slightly painful, and is pyriform or ovoid in shape. It may contain either bile, pus, or water.

Nephric and Peri-Nephric Abscess.—It is not always possible to determine whether an accumulation of pus in the region of the kidney has its origin in the organ itself or in its surrounding structures. Indeed, the two conditions are usually associated. If the suppurating process has continued for some time there may be discoloration of the skin overlying the kidney, with tenderness on pressure. The evidences of fluctuation are not always present. In case of doubt, aspiration may be resorted to.

DIAGNOSIS OF SMALL OVARIAN TUMORS.

Ovarian tumors in their early stages may be confounded with—

Retroversion or retroflexion of a gravid uterus;
Small fibroid tumors of the uterus;
Pelvic hematocele;
Pelvic cellulitis;
Accumulation of feces in the rectum;
Tubal or ectopic pregnancy.

Retroversion or Retroflexion of a Gravid Uterus.—The ordinary symptoms of pregnancy are rarely wanting. On physical examination the cervix will be found high up, and there will be felt in the posterior fornix a softish, solid tumor, which is continuous with the cervix uteri. Unless the fundus is adhered it can be pushed out of the hollow of the sacrum by placing the patient in the genu-pectoral posture, drawing the cervix down with a volsella, and exerting pressure upon the fundus either through the posterior fornix or the rectum.

Small Fibroid Tumors of the Uterus.—The ordinary signs of pregnancy will be wanting. Upon bimanual the tumor will be found intimately connected with the uterus, moving with it. Menorrhagia is more frequent than amenorrhea. Usually it is possible to palpate both ovaries, and thus determine their normal condition.

Pelvic Hematocele.—There will be a history of the sudden formation of a tumor, with the usual symptoms of shock and collapse attending hematocele. The tumor is oftener located in the folds of the broad ligament, though it may be in the posterior cul-de-sac. It is suddenly formed, and unless resolution is interrupted by suppuration, gradually diminishes.

Pelvic Cellulitis.—There will be a history of inflammation, followed by the gradual formation of the tumor. Pelvic cellulitis frequently involves the ovary.

Accumulation of Feces in the Rectum.—The characteristic pitting

on pressure will be detected. In all cases of doubt the rectum should be flushed with a large enema.

Tubal or Ectopic Pregnancy.—The symptoms of pregnancy may be present. An elastic tumor will be detected in the region of one or the other Fallopian tube, presenting an obscure sensation of fluctuation. The uterus is enlarged somewhat, frequently displaced, and the cervix is softened. There is often a history of paroxysms of crampy, colicky pains in the region of the tumor. Irregular hemorrhages from the uterus are not infrequent. The decidua is usually expelled during an attack of hemorrhage.

TAPPING FOR DIAGNOSIS.

The only circumstances under which tapping for diagnosis is now justifiable is the existence of some intercurrent disease—bronchitis, pneumonia, pleurisy, etc.—which is sufficiently severe to counter-indicate ovariotomy, and which is made worse by the tumor pressure; or the existence of great ascites with a small tumor, when the presence of the tumor is doubtful. It is, indeed, questionable if, in the latter condition, exploratory incision in the hands of an experienced operator is not preferable to tapping.

Those who maintain the advantages of tapping for the purpose of diagnosis claim that it can do no harm, and that it is a perfectly safe operation; that much information can be obtained by an examination of the fluid; and that, should the cyst be parovarian, tapping will result in a cure, making laparotomy unnecessary.

That tapping is a perfectly harmless operation is not in keeping with the records of the past. Should the trocar penetrate a solid fibroid tumor, or a malignant growth, fatal hemorrhage may ensue. Inflammation and suppuration have more than once followed tapping and aspiration. There is also danger of injuring the intestines, it not always being possible to determine their presence or absence between the tumor and the abdominal parietes.

It is true that the fluid can be examined, and by it some idea of the nature of the cyst determined. Unfortunately, however, the character of the fluid obtained affords by no means positive information as to the character of the tumor. In the first place, the fluid may be of such a nature as not to pass through the trocar or aspirating needle. Again, in multilocular cysts, the fluid, as we have seen, is often very different in different loculi. Nor is the fluid of any form of tumor sufficiently characteristic to afford pathognomonic evidence of its nature. For instance, it is exceedingly difficult at times to distinguish the fluid ob-

tained from a parovarian cyst from that obtained from a unilocular ovarian cyst. Finally, parovarian cysts are by no means always cured by drawing off the fluid. It must be remembered, too, that in most instances parovarian cysts are removed by abdominal section with but little difficulty.

Method of Tapping.—Since this operation will occasionally be called for, I will briefly describe the proper method of its execution.

The trocar or aspirating needle should be absolutely clean. If the quantity of fluid is very great, I think the trocar is preferable to the aspirator. The bowels and bladder should be emptied, and the patient placed at the edge of the bed upon her side. The site of the puncture is thoroughly washed with a 1:1000 bichlorid solution. Four or five drops of a four per cent. solution of cocaine are injected into the site of the incision, midway between the umbilicus and pubes, in the median line; or ethyl chlorid may be used to freeze the parts. This site is the preferable one, unless previous percussion has determined the existence of intestine underneath it. General anesthesia is rarely called for unless the patient is extremely nervous. A small incision is made through the skin with a sharp scalpel. A rubber tube two or three feet in length should be attached to the tapping trocar, the distal end being immersed in a pan of antiseptic fluid, so as to prevent the entrance of air into the cyst cavity. The trocar is then thrust into the tumor and the fluid permitted to escape.

Previously to passing the trocar a many-tailed binder is placed about the abdomen, and as the fluid is drawn off this should be tightened. After the instrument is removed, iodoform is sprinkled over the site of the incision, and a small pad of antiseptic gauze applied, held in place by a strip of adhesive plaster; or the wound may be sealed with a collodion dressing. The patient should be kept in bed for at least three or four days. In the event of alarming reactionary symptoms the abdomen should be opened at once.

CHAPTER XLVI.

OVARIOTOMY.

The General Principles of Abdominal Surgery.—In the present chapter I shall consider the general principles of abdominal surgery as applied to the various gynecological operations calling for abdominal or vaginal section. This will save needless repetition in dealing with those affections requiring removal of the appendages for other causes, and removal of the uterus wholly or in part.

The abdominal surgeon is compelled to work under many difficulties which do not exist in ordinary operations. His manipulations are necessarily restricted, and he has to do with organs which, though not in themselves essential to life, are in close proximity to those which are. In many instances manipulations within the abdominal cavity have to be done largely by the sense of touch. It is rarely, if ever, possible to determine positively the condition of the abdomen and its contents previously to an exploratory incision; and even after the abdomen is opened the confusion is often very great. Again, no two cases calling for abdominal exploration present exactly the same conditions. It is, therefore, impossible to give set rules to govern the operator in all cases. Only general principles can be dealt with. Were one to dwell upon all the details covering the many modifications which have been made in the past, an entire volume would be required. The abdominal surgeon must, first of all, be competent to contend with any contingency which may arise—from transfusion or infusion in cases of collapse to fixation of a severed ureter or resection of a kidney. He must, in addition, possess tact, ingenuity, and coolness. These several qualities are acquired only by extended study, observation and experience. To obtain them a perfect familiarity with the anatomy of the abdomen is the first requisite; the second is an equal familiarity with the various pathological changes liable to distort any of the pelvic or abdominal organs; and the third and last is a thorough knowledge of certain surgical principles which are as broad as is surgery itself. No surgeon can be called "experienced" until he has so thoroughly mastered these principles that he can, when necessary, create a tech-

nique of his own if he finds that the methods usually followed are inapplicable to the case in hand.

In Chapter XII, I have dwelt in detail upon the necessary preparation of the patient previously to abdominal section. The reader, if he is a believer in antisepsis or asepsis, is advised to study this chapter carefully. The principles therein dealt with must be observed before the patient is placed upon the operating table.

When to Operate.—With few exceptions the proper time for ovariotomy is as soon as the diagnosis of a troublesome tumor is made. Ordinarily there is nothing gained by delay. An ovarian tumor of any size will, in ninety-five cases out of a hundred, run an inevitably fatal course, unless its progress is interrupted by surgical interference. It is true that, when the tumor is small and still confined to the pelvis, it may exist indefinitely without serious trouble resulting from its presence. The various contingencies which have been studied—inflammation, suppuration, adhesions, etc.—are, nevertheless, liable at any time to arise. This is especially true of dermoid cysts. A woman is, therefore, never safe while she is carrying an ovarian tumor, and it is best to remove it as soon after its discovery as is expedient.

It is not advisable to operate during *menstruation* if it can be avoided. Formerly, the near approach of this function was considered an imperative counter-indication to immediate operative interference. While it is best to set a day for the operation which anticipates menstruation by at least three or four days, or which will correspond to the same length of time following its cessation, the observance of this precaution is now looked upon as of much less importance than formerly. More than once I have operated at the beginning of the flow, the excitement incident to the operation bringing it on prematurely, and I have never yet had cause to regret so doing.

Formerly, it was also considered unjustifiable to operate during *pregnancy*. Pregnancy is, however, no longer a counter-indication to ovariotomy. On the contrary, early pregnancy complicating a growing ovarian tumor makes ovariotomy all the more imperative. The mortality attending the operation is not greatly increased by the existence of pregnancy; nor does the operation cause abortion even in the majority of instances. As regards the mortality, Olshausen furnishes the following data: Up to the end of 1885 Schroeder had performed ovariotomy during pregnancy in twelve cases, Tait in six, Sir Spencer Wells in ten, and Olshausen himself in eight. But one patient of the total of thirty-six died.

Rubeska* reports thirteen successful operations during pregnancy; and during the last three years many similar operations have been successfully performed.

All authorities are agreed that it is best, if possible, to operate previously to the fourth month. After this time the greater turgidity of the pedicle, as well as of all the pelvic organs, makes the operation more difficult.

The *age of the patient* is no bar to ovariotomy. The operation has been successfully performed by Küster on a child eighteen months old; it has more than once been successfully performed on children six, even, and eight years old. Young girls from fifteen to twenty years of age are usually good subjects for the operation.

As regards the other extreme, Bantock, Janvrin, Schroeder, Miner and others have made successful ovariotomies upon women from sixty-five to eighty-one years of age. Of course great decrepitude, or the existence of organic disease, would make the operation, in extreme old age, unjustifiable. There is always a tendency for elderly patients to contract bronchitis from undue exposure, or to suffer from hypostatic congestion of the lungs. I removed a tumor from a woman seventy-six years of age which weighed forty pounds. She died from sheer exhaustion at the end of the second week. As I now look back upon this case I believe that she could have been saved by the infusion of the normal salt solution.

Operating Table.—Any ordinary table of sufficient height and narrowness will answer for this purpose. Its height should depend upon the height of the operator—varying from three feet to three feet eight inches. There is nothing more trying to a tall surgeon than to work for a long time over an operating table which is too low. A common, narrow kitchen-table, if sufficiently strong, will answer very well. If not long enough, one of corresponding height can be placed crosswise at its head. An ordinary extension table can be made to answer every purpose by drawing it out to the desired length and placing two leaves lengthwise. Krüg's Trendelenberg frame (Fig. 59) can be attached to any table; or the Trendelenberg posture can be improvised by means of a kitchen chair. The table should be properly protected by clean quilts and a sheet, over which is a pad.

Clothing.—The patient should be properly prepared for the operation by wearing clean flannel next to the skin, over which should be worn a clean night dress. It is advisable, especially with feeble women,

* Monatsh f. Geburtsh. u. Gynäk., 1895

to protect the chest by placing under the flannel jacket a layer of cotton-wool. The limbs should be well protected in a pair of sterile operating drawers.

Preliminary Details.—After being placed upon the table and the clothing properly arranged, the abdomen is exposed by removing the antiseptic pad. A final scrubbing is given the abdomen with a 1:1000 bichlorid solution, when the pubes and lower abdomen are again shaved. The parts are then washed with a normal salt solution, dried with a sterile towel and washed with ether. All but the immediate site of the operation is protected by towels wrung from hot sterile water. In large cystic tumors a suitably fitted mackintosh will keep the patient dry. This is prepared by making an oval opening about seven inches long by six broad, around the inner edges of which is spread adhesive material. If the opening is of suitable size, it will fit closely to the abdomen, leaving an exposed area extending from the pubes to the umbilicus, six inches in width at its widest point. The mackintosh will protect the clothing and leave the patient perfectly dry and clean after the operation is concluded. Over the mackintosh, as well as above, below, and at its sides, are spread towels wrung from a sterile solution.

Temperature of the Room.—Formerly, it was thought necessary to operate in a room whose temperature was not less than 80° F. This is sufficiently great to prostrate both the operator and the patient. While it is not wise to operate in too low a temperature, that of 72° F. is quite warm enough. The bodily temperature of the patient can be maintained by proper clothing, and the cooling of the peritoneum and abdominal contents can be prevented by the application of soft, warm sponges and cloths.

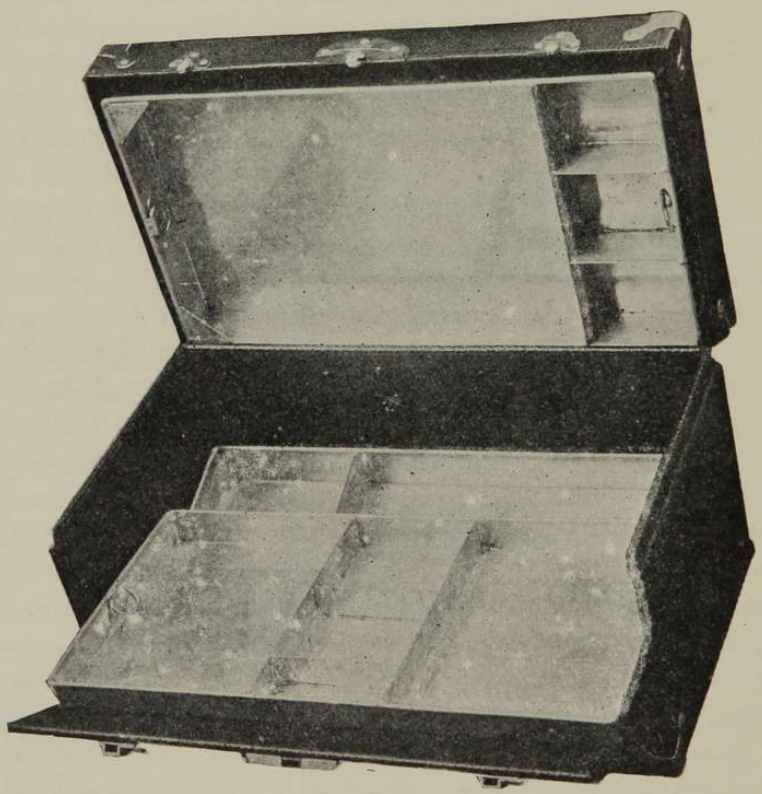
Arrangement of Instruments.—After the instruments have been properly cleaned, they should be arranged in suitable trays placed conveniently near the operator. It is best to have the cutting instruments in one tray, and the blunt instruments, together with the hemostatic forceps, in another. I have had made for me by Likly & Rockett, of Cleveland, an instrument case, composed of a series of aseptic metal trays, which is most convenient for all gynecological work (Fig. 231). The instruments can be arranged by an assistant before leaving the office, and all that the surgeon has to do in operations outside of the hospital is to sterilize one or more of the trays, when he is ready to begin work. The following instruments and appliances will be required:—

Three trays for instruments and two bowls for sponges;

Twelve small pressure forceps (six Pratt T's and six straight; Fig. 223);

Three large pressure forceps;
Two mouse-toothed peritoneal forceps;
Scissors, elbowed.
Two scalpels;
Cyst or large pressure forceps;
Pedicle needle;
Long free needle with large eye;
Ovariotomy trocar and canula with tube;
Three trocar-pointed or quarter-curved needles;

FIG. 231.



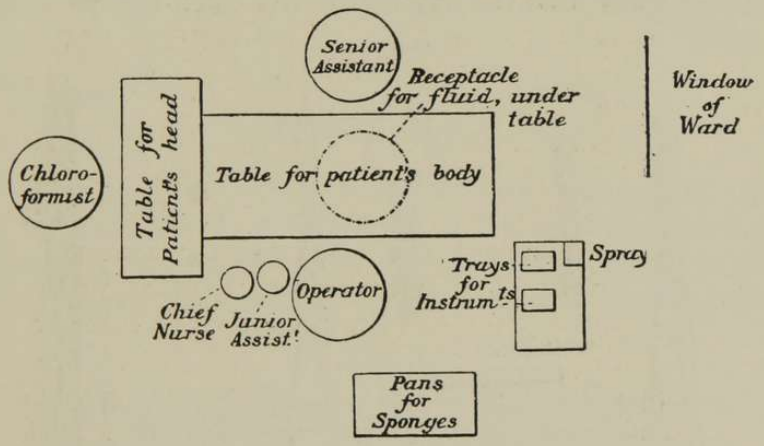
THE AUTHOR'S INSTRUMENT CASE.

Three Martin's full curved needles;
Two sea sponges and twelve long gauze sponges (p. 194);
Four glass drainage tubes of assorted sizes;
A piece of rubber dam, ten inches square, for drainage tube;
Dressings, including sterile cotton, adhesive plaster, collodion, and a many-tailed binder;
Abdominal retractors.

In addition to the foregoing there should be conveniently at hand an aspirator, a Paquelin cautery, a *serre-nœud* (Bantock's modification of Koberle's), with pliers for fixing the wire (Fig. 193), and two Wilcox pedicle pins.

The Paquelin cautery may be necessary in case of obstinate oozing; the *serre-nœud* and transfixion pins are to be in readiness should it be necessary to deal with a fibroid tumor or with a solid ovarian tumor intimately attached to the uterus. It is also well to be provided with an elastic ligature sufficiently long to throw about the base of the tumor, should the operation end in hysterectomy. I have excluded from this list the wristlets and thigh belt recommended by the English operators. Their application seems to me entirely unnecessary, and I

FIG. 232.



POSITION OF TABLES, OPERATOR, ASSISTANTS, ETC., DURING OVARIOTOMY. (*Doran.*)

never yet have taken the precaution to secure the wrists or to apply a binder to the thighs during a laparotomy. A fine needle threaded with fine silk should always be at hand in the event of intestinal injury.

The forceps and sponges are carefully counted before the operation, and a record of their number made. This is very important, for, unless the precaution be taken, there is danger of leaving behind in the abdominal cavity sponges or forceps which have been introduced for the purpose of controlling hemorrhage.

Usually one assistant is all that is necessary, especially if the operator has had extended experience. It is, however, wise to have at hand a second assistant whose duty it is to aid the first should complications arise calling for his services. In removing very large solid tumors, the second assistant is often called upon to support the tumor while the

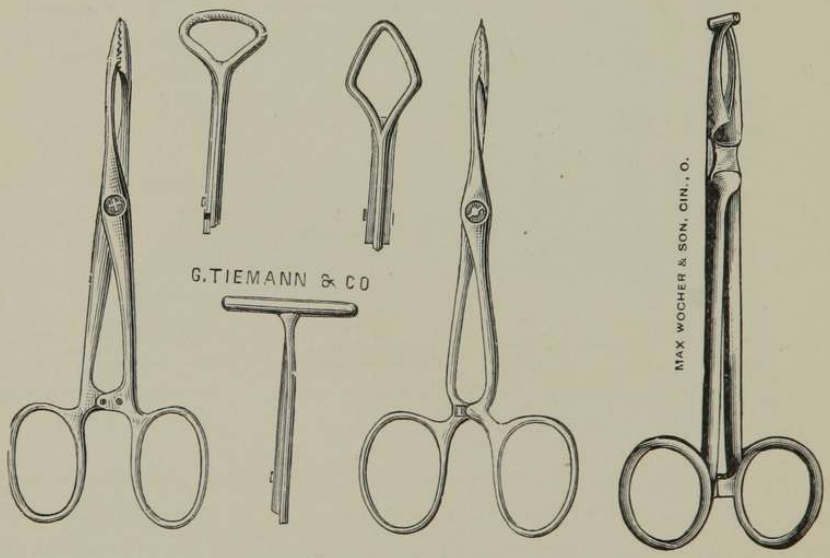
pedicle is being tied. He can also hold the edges of the abdominal wound together while the first assistant attends to the sponging and aids the operator in securing the sutures.

Fig. 232 will explain the proper position of all who take part in the operation, as well as the proper arrangement of the tables, the instruments, and the receptacle for the contents of the cyst.

Anesthetics.—Unless the patient is suffering from bronchitis, or from kidney lesion, ether is by all odds the preferable anesthetic. Elderly patients with a tendency to bronchitis will sometimes bear chloroform better. Chloroform and oxygen (Norton's method) is becoming a very popular anesthetic. The urine should always be examined previously to the administration of any anesthetic.

Abdominal Incision.—After the patient is thoroughly anesthetized the operator takes from the tray four or five catch-forceps (Fig. 233),

FIG. 233.

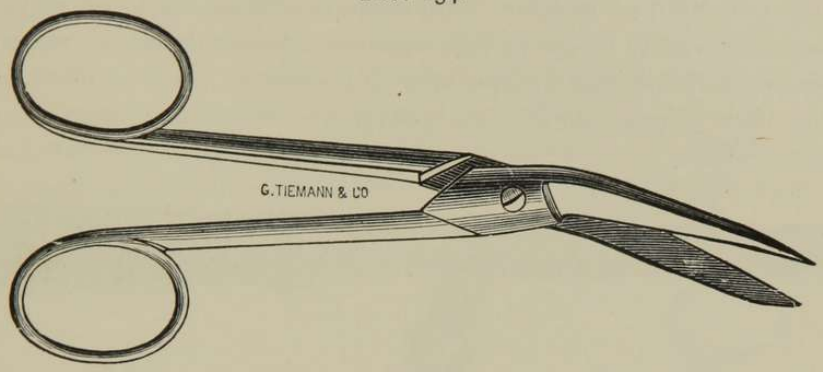


CATCH-FORCEPS.

a pair of elbowed scissors (Fig. 234), and a suitable scalpel. The catch-forceps he places upon the sterile towel above the field of operation so as to have them conveniently at hand. There is a most decided advantage in having the scissors elbowed. An incision is now made through the skin and superficial fascia of the median line, with one stroke of the knife. The average length of this incision is three inches. Spurting arteries are at once caught in catch-forceps, which are permitted to remain attached until after the peritoneum is opened; ordinarily a few minutes' compression will control the bleeding from

any vessel severed at this stage of the operation; it is rarely, if ever, necessary to resort to ligatures or torsion. If the abdominal wall is much stretched by the tumor, it is usually possible to make the incision between the recti muscles so that the sheath of neither is opened into. This cannot be readily done when the abdominal walls are not stretched,

FIG. 234.



ELBOWED SCISSORS.

as in oöphorectomy. Indeed many surgeons recommend that the incision be made directly through one of the recti muscles instead of the linia alba. A small area is next cleared of subperitoneal fat, through which the peritoneum is caught by two mouse-toothed forceps (Fig.

FIG. 235.

MOUSE-TOOTHED FORCEPS.

235), the first assistant holding one and the operator the other. The peritoneum is incised between them and the forefinger inserted into the

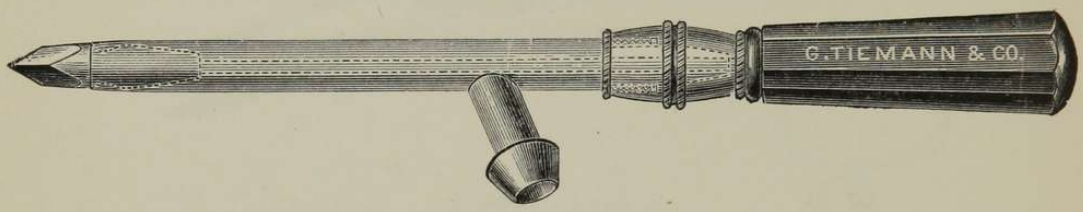
FIG. 236.

DIRECTOR FOR DIVIDING PERITONEUM.

abdominal cavity. The abdominal parietes are lifted away from the tumor or the intestines, and the peritoneum opened nearly as far as the skin wound by means of the scissors. The director shown in Fig. 236, and recommended by many surgeons for this purpose, is entirely superfluous.

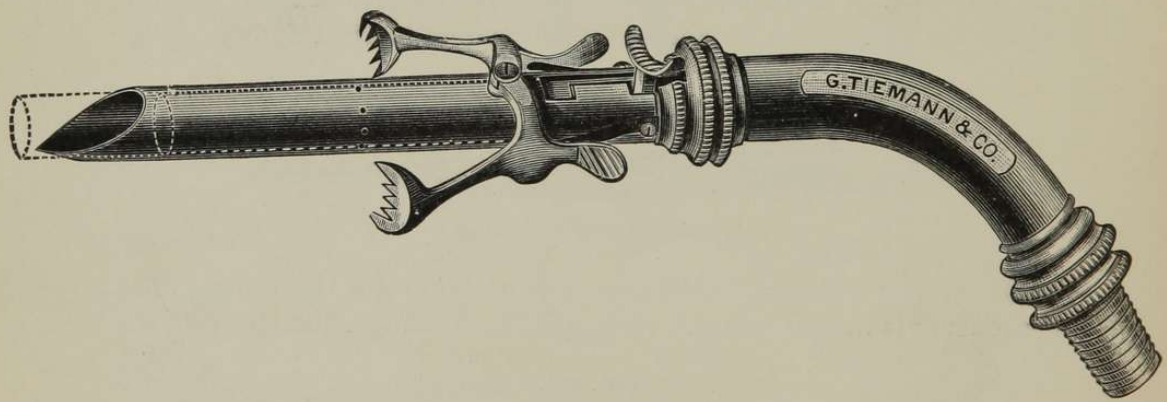
The length of the incision will necessarily depend upon the nature of the operation, as well as upon the length of the operator's fingers. In oöphorectomy, and in thin-walled unilocular cysts, it need not be over two inches. On the other hand, it is sometimes necessary, in removing large, solid growths, to make the incision the entire length of the abdomen. I cannot see the advantage of endeavoring to work through too small an incision. To make it sufficiently large to enable the operator readily to get at the contents of the abdomen, when extensive intra-abdominal manipulation is necessary, seems to me better practice than to work under the restrictions and embarrassments inci-

FIG. 237.



EMMET'S OVARIOTOMY TROCAR.

FIG. 238.



SPENCER WELLS' OVARIOTOMY TROCAR.

dent to a short incision. A long incision does not in the least prejudice the prognosis. When the work is done under the direction of the eye in the Trendelenberg posture a reasonably long incision is always demanded.

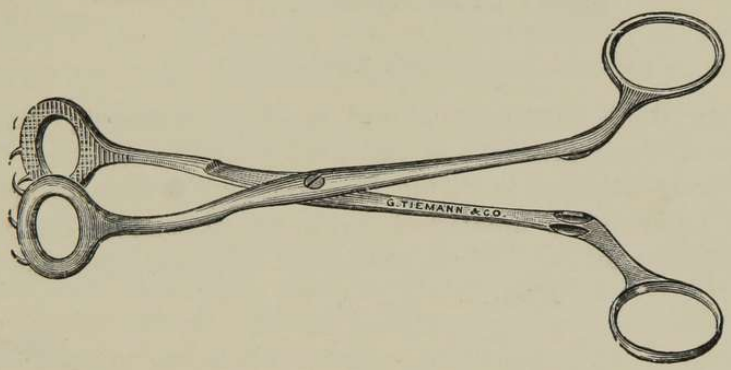
Occasionally the tumor is so intimately adhered to the peritoneum as to make it difficult to distinguish the latter from the cyst wall. More than once has the peritoneum been stripped from the abdominal wall,

the operator laboring under the impression that he was removing the adherent cyst wall from the peritoneum. The existence of such adhesions may be suspected if the hemorrhage attending the abdominal incision is greater than normal. Ordinarily the operator will recognize that he is stripping the peritoneum by the deep red color of the underlying structures.

If there is ascitic fluid this should be permitted to escape as soon as the peritoneum is opened, the assistant pressing upon both flanks in order to force it out. Ascites is especially liable to exist when there are cancerous or papillomatous growths within the pelvis.

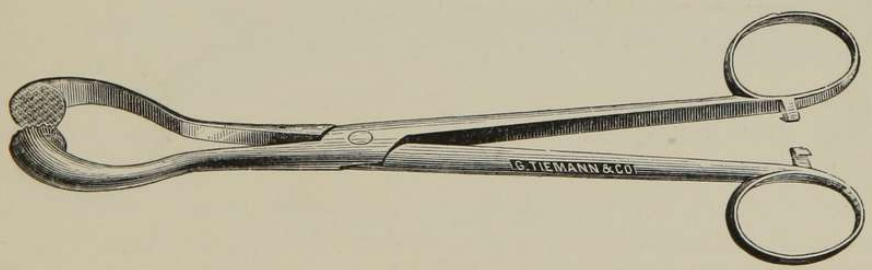
Intra-Abdominal Manipulations.—An ordinary ovarian cyst will be recognized after the abdomen is opened by its smooth, shining, white

FIG. 239.



WILCOX'S CYST FORCEPS.

FIG. 240.



SPENCER WELLS' CYST FORCEPS.

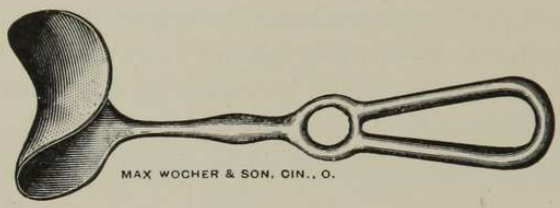
surface. The operator should now wash his hands in sterile water and make an exploration with his finger or fingers. Should the intestines make their appearance, they are kept out of the way by the assistant, who places sponges about the tumor in such a way as to prevent their protrusion.

Tapping the Cyst.—The abdominal wound is now held apart by suitable retractors (Figs. 241 and 242). After the cyst is exposed

FIG. 241.

VOLKMAN'S RETRACTOR.

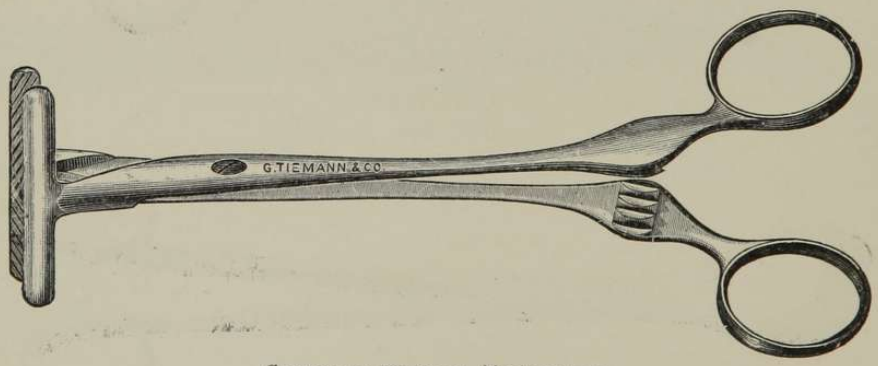
FIG. 242.



FRITSCH'S RETRACTOR.

and the operator is reasonably sure of its nature, a tapping trocar (Figs. 237, 238) is thrust into it, and the fluid permitted to drain off. As the cyst wall collapses it should be seized with cyst forceps (Figs. 239, 240), and pulled upward through the abdominal incision. By doing this the intestines will be prevented from escaping and the fluid

FIG. 243.



SPENCER WELLS' T-FORCEPS.

from finding its way into the peritoneal cavity. At this stage, should a piece of adherent omentum be withdrawn with the cyst, an effort should be made to detach it with sponges; if this cannot be done it should be caught in catch-forceps and its distal end divided. If the cyst does not completely collapse, it is probable that it is multilocular. After the large loculus is emptied the trocar is carefully thrust into the smaller ones, thus emptying them one by one, if it is possible

to do so. Sometimes the fluid will be too thick to pass through the canula, in which event it will be necessary to withdraw the canula and make an incision into the cyst large enough to admit the hand. The edges of the opening in the cyst are then grasped on each side with strong T-forceps (Fig. 243), the hand introduced, and the contents scooped out. While doing this the patient should be turned on her side, sterile towels or sponges being first packed between the cyst and the abdominal walls, so that none of the cyst contents may find their way into the abdominal cavity.

If there are no adhesions the cyst, after it is emptied, can be drawn through the incision and its pedicle secured. If, on the other hand, adhesions exist they must be dealt with according to the methods presently to be described. The advantage of emptying the cyst before undertaking to separate the adhesions lies in the greater readiness with which adhesions can be treated and resulting hemorrhage controlled. There is also less danger of lacerating the intestines and other important abdominal and pelvic viscera.

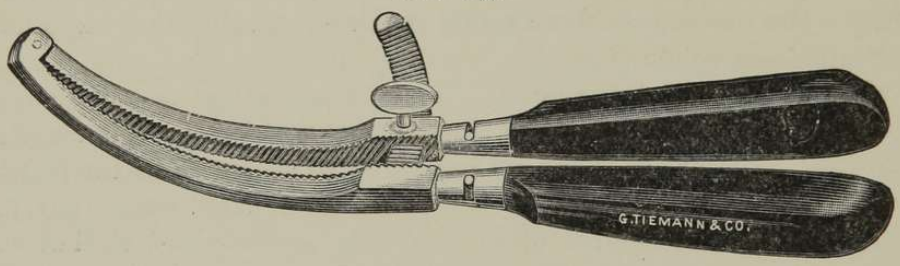
Management of Adhesions.—In the management of adhesions it is necessary to bring into action fingers, sponges, forceps, scissors, and ligatures. Recent adhesions can ordinarily be separated by the fingers alone, or by the use of sponges. On the other hand, when they become firm their separation often taxes the patience and skill of the operator to the utmost. Those existing between the omentum and tumor are the most easily dealt with. If they cannot be separated by the finger or by sponging, they may be caught between two catch-forceps and divided; the proximal end can afterwards be tied with catgut. Adhesions to the abdominal parietes can also be separated in most instances by the use of sponges. In the worst cases, unfortunately, this cannot be done, and they may be so firm as to make it necessary to leave the cyst wall, or portions of it, behind. Special care must be observed in separating adhesions from the intestines, the liver, and the lower part of the pelvic cavity in close proximity to the ureters and the large vessels. Long adhesions may be first caught in catch-forceps, separated, and tied after the cyst is removed. If there is much oozing of blood this must be temporarily controlled by sponge or gauze packing. It may be necessary, before the abdomen is closed, to sear the parts with the Paquelin, or to apply directly to the bleeding surface a solution of iodin. The T-shaped forceps (Fig. 233) are exceedingly useful in dealing with oozing of this kind. They may be left on five or ten minutes. Care should be taken to secure bleeding points as they are created, for, unless this is done, there is danger of overlooking them

before the abdomen is closed. When a ligature is necessary I prefer to apply it at once and remove the forceps. The experienced surgeon will not leave too many forceps attached to bleeding points and oozing surfaces within the abdomen while he proceeds with his work.

Treatment of the Pedicle.—In the past all sorts of methods have been resorted to for the purpose of securing the pedicle. It has been burnt off, crushed off, tied entire, tied in sections, and secured in clamps and left outside of the abdomen to slough away.

At the present time the methods of securing the pedicle have practically resolved themselves into one—the ligature. The mortality of ovariotomy dropped at once when the extra-peritoneal method was discarded and the intra-peritoneal adopted. In nearly all instances it is entirely possible to deal with the pedicle so that it can be dropped into the peritoneal cavity.

FIG. 244.



KEITH'S OVARIOTOMY CLAMP.

For a long time the clamp and cautery was the proper method of dealing with the pedicle. Of the more modern surgeons Keith was the chief advocate of this method, and in his hands it reached its highest degree of perfection. I believe that he used it up to the time of his death. The clamp represented in Fig. 244 is first applied, and the tissues of the pedicle crushed. The pedicle is severed about an eighth of an inch from the clamp, after which the cautery is applied until there is left a "thin, gray, translucent band of anemic but still living tissue" (Greig Smith). The clamp is now removed, and after making sure that all hemorrhage is controlled, the pedicle is returned to the abdominal cavity.

Properly prepared silk (p. 192) is the ligature now almost universally used for securing the pedicle, though in all ordinary cases I prefer No. 2 or 3 chromicized catgut. The size of the silk will vary according to the vascularity and size of the pedicle. It is not necessary that it should be large, yet it should permit of sufficient traction to secure the stump very firmly.

The ligature is made to transfix the pedicle by means of a pedicle

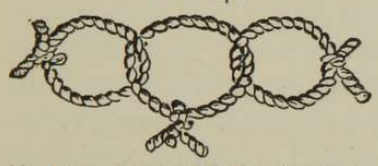
needle, or Cleveland's ligature forceps (Fig. 245). A medium sized full curved Martin needle, whose point and edges have been filed off,

FIG. 245.

CLEVELAND'S LIGATURE FORCEPS.

makes an excellent pedicle needle; or an aneurism needle, with a good sized eye, may be used. After the needle is made to transfix the pedicle the ligature can be secured according to one of two methods. In the first method the ligature is cut in two, the two ends thrown over each other so that when tied on either side there can be no splitting of the pedicle. It is best first to secure silk ligatures in a friction-knot; the tumor is then cut away, leaving about half an inch of the pedicle above the knot. The ligatures can now be tightly drawn and secured with a final hitch. When the catgut is used I prefer to secure both the uterine and pelvic ends of the ovarian artery in separate ligatures, which makes secondary hemorrhages from the stump almost impossible. An unusually broad pedicle should be tied in a number of sections as shown in Fig. 246.

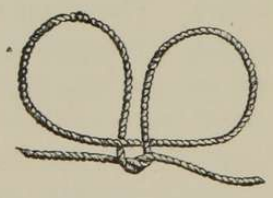
FIG. 246.



TRIPLE INTERLOCKING LIGATURE TIED. (*Greig Smith.*)

The second method is that known as the Staffordshire knot, first adopted by Lawson Tait. It is shown in Fig. 247. In order to understand the method of making this knot, let the reader pass a double string between two fingers of the left hand. Throw the loop of the string over the ends of the fingers; then place one of the free ends under the loop and one over it. If the two free ends are now tightened by a knot he will find that the fingers, representing the two sides of the pedicle, will be drawn closely together. This is a very satisfactory knot, especially for small pedicles. If the pedicle is very large and thick I prefer the first method.

FIG. 247.



STAFFORDSHIRE KNOT.

After the pedicle is secured, whichever method is adopted, it is my

practice to apply to the surface of the stump pure carbolic acid. Perhaps this is an extreme precaution, but it is a practice observed by many of the German operators. It is an additional safeguard against infection of the stump and there is less tendency for the pedicle to contract adhesions after the acid has been applied. The raw surface, when it can be done, may be covered with peritoneum.

The opposite ovary is now explored, and if it is seriously diseased is also removed.

Cleansing the Peritoneal Cavity.—If no fluid has escaped into the peritoneal cavity, and there have been no adhesions, all that is necessary to do is to close the abdominal wound without drainage. On the other hand, if the intra-abdominal manipulations have been extensive and the oozing at all marked, or if some foreign substance has escaped into the abdomen, especially septic fluid or colloid material, it is necessary to take every precaution to cleanse the abdominal cavity most thoroughly before closing it. There is no better way of accomplishing this than by free irrigation, a procedure popularized by Keith and Tait. Irrigation of the peritoneal cavity is, however, less often resorted to than it was a few years ago. When it is possible to reach contaminated areas with the sponge I think it best to forego irrigation. The chief danger of irrigation lies in the lodging of infected matter high up among the intestines and other viscera by the stream of water. It is nevertheless imperative when the peritoneal contents become soiled by foul discharges, or when the operation is undertaken for septic peritonitis. A special apparatus, consisting of a siphon arrangement through which the water is conducted into the abdominal cavity, has been devised for this purpose. However, I think it is quite as well to pour the water from a pitcher while the operator or his assistant separates the abdominal wound with the two hands. The abdomen is completely filled with the normal salt solution, the intestines being so manipulated as to wash away any septic matter or débris which may have been left behind. The water is then removed by pressing upon the flanks and forcing it out, and by sponging. The washing is repeated as often as may be necessary to remove the débris. If there is general oozing that cannot be controlled by the ordinary measures, the abdomen may be left filled with the salt solution. Warm water used in this way is also exceedingly valuable in overcoming shock. I have seen patients almost in a state of collapse rally quickly after its use. The temperature of the water should be about 110° F.

Should none of the contents of the cyst have found their way into the abdominal cavity, it is only necessary to remove any sponges or

forceps which may have been placed in the abdomen during the operation, and to clean the Douglas and the lateral pelvic pouches. This is best done by sponges attached to sponge holders or long forceps. It is, to be sure, a good thing to leave the peritoneal cavity clean; on the other hand, it is entirely possible to overdo the matter of cleansing it. There is no doubt that much injury has been done in the past by the extreme measures resorted to in completing the toilet of the peritoneum. Too much rubbing and friction in the effort to remove every particle of fluid will only cause unnecessary irritation. If the fluid that is left behind is not septic, the peritoneum will absorb a reasonable amount of it without either disturbing the system or prejudicing the prognosis. A few drachms of pure blood will do no harm whatever, though the surgeon should be sure that all active bleeding is under control. Indeed Clark's and Wegner's observations (*Johns Hopkins Hospital Bulletin*, April, 1897) go to show that the peritoneum is capable of caring for a large quantity of fluid (from three to eight per cent. of the bodily weight in one hour) providing it is prevented from accumulating in dependent pockets and dead spaces, even though the peritoneum contains a large number of pyogenic organisms.

Drainage.—The object of drainage is to remove the fluid which the peritoneum secretes as a result of the irritation incident to the operation, as well as to remove the products of the oozing from sero-sanguinolent surfaces. The absorbing power of a healthy peritoneum is very great, and in most instances the fluid secreted is absorbed. However, it occasionally happens that it is impossible to control all oozing of blood; or it may be impossible to remove all of the foreign matter which has found its way into the peritoneal cavity. It is, therefore, notwithstanding modern antisepsis, occasionally necessary to resort to drainage, though the surgeon who practises antisepsis will undoubtedly have less occasion to drain than the one who does not. In my last one hundred celiotomies I used the glass drain but eight times and the gauze drain but twelve times.

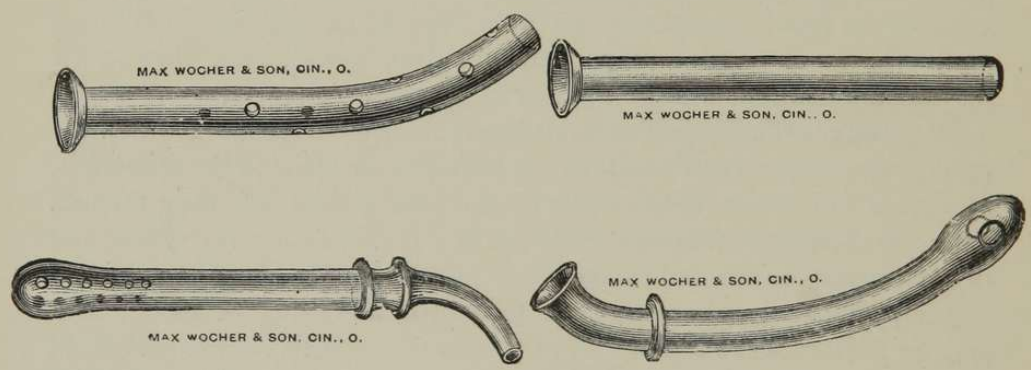
Clark (*Op. cit.*, p. 59) proposes to overcome the accumulation of fluid within the pelvic pouches by postural drainage. Muscatello has demonstrated the existence of an intraperitoneal current which carries fluids and small particles towards the diaphragm regardless of posture. The rapidity of absorption was, however, increased many fold by suspending the animal with its head down. The lymph stream may be directed toward the abdomen, and pelvic accumulations prevented, by elevating the foot of the bed following celiotomies, 20 degrees. This posture should be maintained for twenty-four to thirty-six hours. Clark

emphasizes the importance of overcoming all oozing before the abdomen is closed and thoroughly washing and cleansing the peritoneal cavity with the normal salt solution; care should also be observed to cover all raw surfaces with peritoneum. He leaves behind from 500 to 1000 c. c. of the salt solution. Clark offers this method as "a prophylactic measure against post-operative peritonitis, but *not as a curative measure after the peritonitis is established.*"

I have resorted to the postural method of drainage in fourteen cases. In two of these pus had escaped into the peritoneal cavity and I certainly would have left behind a drain under the older régime. All of the fourteen cases recovered, though I am inclined to believe that the temperature, in the pus cases was higher than it would have been had abdominal or vaginal drainage been applied.

I have, in Chapter XII, described the method of Mikulicz, of

FIG. 248.



GLASS DRAINAGE TUBES.

Vienna, who uses iodoform gauze for the purpose of packing large bleeding or absorbing cavities in the abdomen, bringing one end of the gauze out of the abdominal wound. The deodorant quality of the gauze prevents it from becoming offensive, and it can be left in place for several days. Thus used, it not only acts as a hemostatic but as a capillary drain as well.

When the object is not to control hemorrhage, but simply to afford an exit for the fluid which gravitates into the cul-de-sac of Douglas, glass drainage-tubes are preferable. Those shown in Fig. 248 are the ones most commonly used. They are nothing more than glass tubes of various sizes and patterns. The upper end of each is flanged so that it cannot slip into the abdominal cavity. Care should be taken to select a tube sufficiently long to reach the bottom of the cul-de-sac

of Douglas, while the flange rests upon the skin surface, thus preventing injurious pressure upon the rectum. I prefer a small tube open at the end and non-perforated. Douglas' pouch being the most dependent part of the abdomen, the fluid gravitates into it and can be drawn off through the tube. The upper end of the tube is protected either by a sheet of rubber slipped over it, which should be sufficiently large to enclose a tampon of gauze placed over the mouth of the tube; or by a piece of rubber tubing slipped over the narrowed neck, in tubes constructed for the purpose. A very simple device for drawing off the fluid is an ordinary glass syringe, to which is attached a piece of rubber tubing long enough to reach the cul-de-sac through the tube. This should be used every half hour as long as free oozing persists; later, every one, two, or three hours is quite often enough, depending upon the quantity of fluid secreted. If not more than two drachms of serosanguinolent fluid are secreted during an interval of two or three hours, the tube is no longer needed and should be withdrawn, after which the opening in the lower end of the wound is closed by tying the provisional sutures, which were introduced for that purpose. The utmost cleanliness must be observed in the management of the tube. The hands of the assistant should be sterilized each time before drawing off the fluid and fresh gauze applied after each dressing. A strip of gauze or a piece of sterile lamp-wicking carried into the bottom of the tube will afford capillary drainage which is sufficient when the amount of fluid secreted is not great.

Closing the Abdominal Wound.—After making sure that all hemorrhage is controlled, the operator may proceed to close the abdominal wound. Many plans for doing this are in vogue. The method most generally adopted is the interrupted silk suture passed through all of the tissues—peritoneum, fascia and skin, or, peritoneum, fascia, muscle and skin, as the case may be. The surgeon should aim to have as broad a union as possible. It is, therefore, best to include all of the tissues in the sutures. About three sutures are inserted to the inch. Before they are passed a large, flat gauze sponge should be placed over the intestines underneath the wound in order to catch any hemorrhage that may result from the needle punctures. I prefer the trocar-pointed straight needles for this purpose. They readily penetrate the tissues, and no needle holder is required. After the sutures are all passed the ends on either side are caught in catch-forceps. The surgeon now has the forceps and sponges counted. He then removes the sponge which was placed underneath the wound while passing the sutures, and makes a final exploration to make sure

that there has been no hemorrhage. The omentum should next be drawn down and spread out over the intestines. The assistant, unlocking the catch forceps attached to the ends of the ligatures, lifts the abdominal wound by them. In septic cases I make it a practice to carefully sponge the abdominal wound before it is closed with a 1:1000 mercury solution. If the wound has not been contaminated it should be washed with the normal salt solution only. The surgeon now proceeds to tie the ligatures, beginning at the lower end. If a drainage-tube has been introduced, the first one or two ligatures are tied in a bow-knot, so that when the tube is withdrawn the ligatures can be drawn tight and the opening closed. Care must be taken not to produce too much tension upon the sutures in tying. The irritation thus produced may result in stitch-boil abscesses in spite of every antiseptic precaution. After the edges of the wound are nicely coaptated, and the sutures all tied, the latter are cut close to the knots by grasping all of them in one hand and quickly severing them, one by one. Should the skin surface not be nicely coaptated, it can be brought together by a continuous catgut suture.

During the last two years I have used in a very large per cent. of my celiotomies the continuous chromicized catgut suture No. 2 for closing the abdominal wound, and have every reason to be satisfied with the method. The peritoneum is first closed, then the muscles and fascia, and finally the skin. I am of the impression that the wound is firmer than that secured by interrupted silk sutures and the resultant scar is certainly less conspicuous. In young, unmarried girls the skin may be approximated by Halstead's subcutaneous silk suture, which leaves but a linear cicatrix. I now use the interrupted through and through silk sutures only in instances where I fear wound infection from the septic nature of the operation; or when, because of the condition of the patient, the element of time is important.

Dressing the Wound at the Close of the Operation.—The mackintosh is now removed and the abdomen washed with a 1:1000 bichlorid solution and dried with a sterile towel. The wound is next dusted with iodoform, or iodoform and boric acid (1 : 5), as the operator may prefer. Over this is loosely placed iodoform or bichlorid gauze. Next a large pad of sterile absorbent cotton is made to cover the gauze. A many-tailed binder is finally applied, which will, when firmly secured with safety pins, support the abdomen and hold the dressings in place.

When no drainage is used I prefer to hermetically seal the wound according to the method described on page 198. If a drainage-tube has been introduced, the dressings are nicely fitted about the tube at the

lower end of the wound. Care must be observed not to permit the bandage to exert undue pressure upon the tube; it should, however, be sufficiently tight to keep the tube from being forced out should the patient retch. The patient is now placed in bed and given in charge of the nurse. The bed should be protected with a mackintosh and covered with a drawn sheet arranged in several folds. The knees are supported by a pillow placed underneath them. If the operation is performed in the room where the patient is to remain, all instruments, appliances, tables, receptacles, etc., should be removed before she recovers from the anesthetic.

In the foregoing description I have confined myself to ordinary cases of ovarian cysts, where the adhesions, if present, are not sufficiently extensive to prevent the removal of the tumor. I have also presupposed the existence of a pedicle capable of ligature and management in the usual way. It now becomes necessary to discuss the management of those cases where no pedicle exists, or where it is impossible, because of extensive adhesions or other complications, to remove the cyst wall.

Incomplete Ovariotomy.—Incomplete ovariotomy may end in exploratory incision when the surgeon finds that, owing to the complications before mentioned, or owing to the existence of malignancy, it is unwise to proceed further. He then closes the wound, with or without drainage, as the conditions suggest. Simple exploratory incision, except in malignancy, should, however, be of exceedingly rare occurrence.

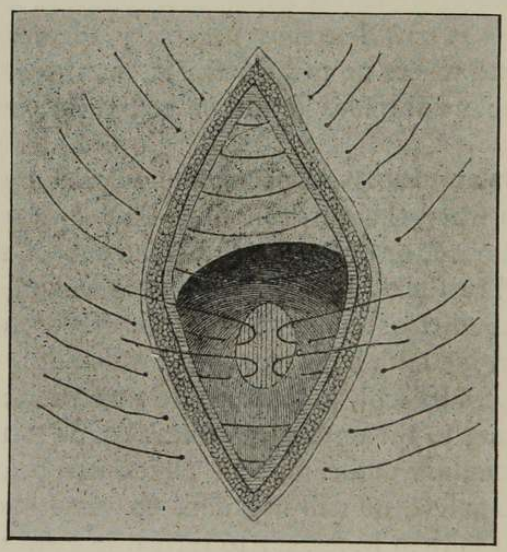
In other instances he will, perhaps, have undertaken to remove the cyst wall, but owing to the extensive adhesions, or to the fact that the cyst is intra-ligamentary and cannot be enucleated because of its deep attachment in the pelvis, he will not dare to close the wound in the ordinary way. It is then necessary to retreat in good order. All hemorrhage must first be checked by securing the vessels on and within the tumor, as well as those within the abdominal cavity. The surgeon, by carefully inspecting all points that were adherent, must convince himself that the intestines have not been injured. The abdominal cavity is then cleansed as thoroughly as possible; if the contents of the cyst have escaped into it, it may be necessary to combine abdominal drainage with drainage of the cyst.

If the abdominal wound is longer than usual, its upper part should be closed by sutures. The opening made in the cyst is now enlarged and stitched to the walls of the incision, as is shown in Fig. 249. The sutures are passed in such a way that about a quarter of an inch of the peritoneum is brought in contact with the cyst wall. After the sutures

are tied the cyst will be entirely cut off from the peritoneal cavity. This is the same method as that adopted in the management of extra-uterine gestation cysts which cannot be removed, and in the treatment of pelvic abscess. The surgeon should break down any septa that may shut off loculi from the main cyst, and wash the cavity with a weak carbolic solution, or with strong iodin. A drainage-tube is finally placed at the most dependent portion of the cyst, through which the cavity can be washed as often as is necessary in order to keep it clean; or the cavity may be packed with gauze.

It is surprising how quickly a large cyst cavity thus treated will contract and fill in with granulations. I have seen a large suppurating

FIG. 249.



INCOMPLETE OVARIOTOMY.

ovarian cyst, which contained nearly three gallons of purulent matter, become completely obliterated in less than two months following the operation.

Encapsulated Ovarian Cysts.—In studying the pathology of ovarian tumors, it was shown that cysts occasionally grow down between the layers of the broad ligament. As the tumor continues to enlarge it distends these layers and separates them. I have seen a cyst of this kind dissect the anterior layer of the broad ligament and the peritoneum nearly to the diaphragm. The capsule is, therefore, formed by the layers of broad ligament. It is usually of a very pale red color,

which contrasts strongly with the white, glistening cyst wall ordinarily met with. The parts are greatly disturbed by the cyst growing in this way. Sometimes the cyst may burrow deeply enough to attach itself to the pelvic fascia, when its close proximity to the ureters and the large vessels makes these important structures exceedingly liable to be injured.

It occasionally happens that there is sufficient space between the uterus and the tumor to form a true pedicle, notwithstanding the presence of the capsule; if so, the capsule can be removed entire with the tumor. Unfortunately, this is rarely the case. In most instances it will be necessary to enucleate the cyst from the capsule. An effort is first made to brush or sponge the capsule from the cyst wall as the latter is being withdrawn. Sometimes the adhesions are so slight as to make it possible to do this; oftener, however, it is necessary to incise the capsule high up and to dissect it off with the fingers, scissors, or with the handle of a scalpel. During the dissection care should be observed not to perforate or lacerate the capsule in any way.

When the hemorrhage proceeds from spurting vessels, these must be caught and tied with fine catgut; or, should it amount to nothing more than an oozing, it may be controlled by gauze packing. As the enucleation proceeds, the base of the cyst is finally reached at the deepest part of the capsule, when an effort should be made to detach the cyst entirely. It is while endeavoring to detach the cyst at its base that large vessels and the ureters are liable to be injured.

It is now necessary to care for the emptied capsule. Sometimes it is possible to constrict its base into a pedicle, when it can be transfixed, tied, and cut off, in the ordinary way. If, however, the mass of tissue included in the ligature is at all great, its free edges should be brought together above the ligature by a continuous chromicized catgut suture. If the base of the capsule lies so deep in the pelvis as to make this method of treatment impracticable, the capsule should be drawn through the abdominal wound, the greater part of it cut away, and the remainder stitched to the edges of the wound, as in incomplete ovariotomy (Fig. 249). Care should be taken to see that neither intestine nor omentum protrudes through any openings in the capsule; indeed, such openings should be entirely closed so that the interior of the capsule is perfectly cut off from the peritoneal cavity. A glass drainage-tube is now placed in the capsule. Finally, the peritoneal cavity is cleaned, and, if necessary, drained at the side of the capsule, the principles of drainage already given being observed.

In suitable cases the capsule may be drained through the vagina as in myomectomy (p. 656).

It may be impossible to remove the base of the cyst from the capsule. Indeed, it is sometimes necessary to leave portions of the cyst behind in non-encapsulated cysts. In instances of the kind, an effort should be made to remove as much of the solid growth from the base left behind as is possible. It is hardly necessary to add that drainage is here imperative.

Causes of Death After Celiotomy.

The chief causes of death after celiotomy are:—

Hemorrhage;
Sepsis;
Intestinal paralysis;
Shock; and
Uremia.

Hemorrhage.—The symptoms of hemorrhage are pallor, rapidity and weakness of the pulse, anxious expression of the face, dilatation of the pupils, sub-normal temperature, and cold clammy perspiration. When these symptoms supervene following celiotomy, the operator should lose no time in reopening the abdomen and seeking the bleeding point. While preparations are being made to do this, the patient should be placed in the Trendelenberg posture and a saline solution thrown into the rectum. If the symptoms are very profound, cutaneous or intravenous infusion may be resorted to. Prompt action in these cases will save many lives. Unfortunately, the hemorrhage is frequently not recognized until the condition of the patient is such that she is unable to stand the second operation.

The symptoms and treatment of *sepsis* have elsewhere received consideration.

In the greater number of cases of so-called *shock* hemorrhage has taken place. However, in certain instances, profound shock may result without hemorrhage, especially if the heart has undergone brown or fatty degeneration, as a result of myofibromata. In these instances hypodermic injections of nitroglycerin, one one-hundredth of a grain, with rectal injections of whiskey and the saline solution, will prove useful. If necessary the saline solution can be introduced into the system through a vein, or subcutaneously.

Intestinal paralysis and intestinal obstruction are frequent causes of death after celiotomy. In intestinal paralysis, normal peristalsis of the bowel is at a standstill. It may be due either to diminished intra-

abdominal pressure incident to the removal of a tumor, or to shock to the sympathetic nervous system.

The abdomen becomes distended, and there is frequently nausea and vomiting. An effort should be made at once to open the bowels with a saline cathartic. Hypodermic injections of one-fiftieth of a grain of strychnia three or four times a day are useful. Simple intestinal paralysis is differentiated from paralysis due to sepsis by the absence of fever and the slower pulse.

When the bowel is obstructed vomiting and retching become constant and uncontrollable. After the usual efforts have been made to secure a bowel movement no time should be lost in reopening the abdomen.

Uremia.—Partial or complete suppression of the urine may occur after celiotomy. It is often due to the anesthetic, but may also result from shock to the sympathetic nervous system incident to the operation. The urine becomes more and more scant, until in fatal cases it is entirely suppressed. An effort should be made to re-establish the secretion by the application of warmth over the kidneys, by an infusion of a saline solution under the skin and into the rectum, and, if the symptoms are alarming, by the infusion of from twenty to thirty ounces of the saline solution into the venous system. The function of the kidneys should be supplemented by the action of the skin and intestinal canal.

In the February, 1897, number of the *American Journal of Obstetrics* there is an article by Dr. John Van Rensselaer, of Washington, D. C., entitled "Venesection and Saline Infusion in the Treatment of Uremia." In this article Dr. Van Rensselaer states that he has treated many cases of uremic convulsions by infusion of the normal saline solution, and with the most gratifying results. Dr. Van Rensselaer also supplements infusion by blood-letting when the intra-arterial pressure is marked. I surmise that outside of surgical work cases will every now and then present themselves where blood-letting can be advantageously combined with infusion. However, when the patient has already bled excessively, and uremic symptoms follow, it would be clearly illogical to further tax her strength by venesection. While revising this chapter I have had to do with a most interesting case of uremia in which life was unquestionably saved by the use of the normal salt solution. The patient is seventy years of age and I removed the uterus for carcinoma. The operation was a difficult one, though the resulting shock was less than was to be expected in a woman of seventy. The urine was scant from the first and in ten hours was completely suppressed, with succeeding delirium and coma. The usual treatment

was applied, including hypodermatic injections of pilocarpine, with negative results. The operation was done on Wednesday, December 22, 1897. On the following Friday, at 6 P. M., I injected into the subaxillary cellulary tissue, on both sides, thirty-five ounces of the normal salt solution. At 9 o'clock there was drawn from the bladder an ounce of urine. The injection was repeated at 10, in the region of the umbilicus and thighs, making a total of seventy ounces. During the night there was secreted four ounces of urine which contained albumin and hyaline and granular casts. From that time on the quantity of urine gradually increased until it became normal, while the symptoms of uremia rapidly disappeared. The patient (January 5, 1898,) is favorably progressing in her convalescence.

CHAPTER XLVII.

OVARIOTOMY (Continued).

After-Treatment—Illustrative Cases.

After-Treatment.—The after-treatment of ovariotomies, or celiotomies made for any purpose, cannot be properly carried out without the coöperation of an intelligent nurse. There is no class of nursing that requires greater skill than does the nursing of abdominal cases. It has been said by a well-known surgeon that the fate of every patient undergoing laparotomy is determined before she is removed from the operating table, but to this statement I cannot entirely agree. The best directed efforts of the surgeon may be defeated by the ignorance or the wilful neglect of the nurse. This is especially true if a drainage-tube is used; so long as the tube is *in situ* the abdomen is exposed to contamination from without. The most rigid antisepsis may have been observed by the operator and his assistants and yet the abdominal cavity may be infected through improper care on the part of the nurse. She should, therefore, first of all, be thoroughly familiar and in sympathy with the details of antisepsis and asepsis. She should know how to use the catheter and the ice-cap. She should be perfectly capable of taking the pulse and the temperature. She should know how to prepare and administer nutritive enemata. She should be able to empty the drainage-tube as often as may be necessary. She should keep an accurate clinical record, to which the surgeon can refer at each visit. She should be able to recognize symptoms of shock, collapse, and internal hemorrhage. And, finally, she should possess sufficient moral courage rigidly to adhere to the surgeon's directions, despite the pitiful appeals which patients often make for cold water or unlimited quantities of ice.

Notwithstanding the numerous requirements indicated in the foregoing, the after-treatment of an ordinary case of celiotomy consists mainly in *not doing* certain things which are harmful. After the patient is placed in bed she should be kept as quiet as possible until she returns to consciousness. The bed should be previously warmed by means of a warming-pan or hot water-bags; but these should be removed before the patient is placed in bed. Unless this is done there is great danger

of burning her. It has been my misfortune to have had several patients, while under the influence of anesthetics, severely burned by hot water-bags or bottles. No matter how emphatically the nurse is cautioned regarding their use, they are liable to come in contact with the skin surface and do harm. I have, therefore, discarded them entirely, except for the purpose of warming the bed previously to transferring the patient to it.

If the patient has been properly dieted for the operation, vomiting may not be excessive. Ordinarily, however, vomiting will continue with more or less persistence for the first twenty-four hours following the operation. The patient will also complain, in most instances, of intense thirst. Cold water will aggravate both the vomiting and the thirst; consequently, nothing but hot water should be given, and that in small quantities and as hot as the patient can sip it. It is worse than useless to undertake to force nourishment while there is irritation of the stomach, for the vomiting will only be aggravated by it. Should vomiting persist, relief may be obtained by washing the stomach with a glass of warm (not hot) water, and encouraging the patient to eject it at once; more or less bilious matter will be thrown off with the water.

If the patient cannot tolerate the hot water, and the thirst is marked, it may be ameliorated by an enema consisting of a pint of warm saline solution. The water in the rectum is absorbed, and the intense thirst more or less relieved.

Stimulants are counter-indicated unless to overcome serious shock and collapse. They may then be used in the form of hypodermic injections of brandy, or as enemata. If administered hypodermically, a drachm of brandy or the best rye whiskey may be used at each injection, and as often as is necessary; if administered per rectum two ounces of brandy in a quart of warm salt solution should be thrown into the lower bowel. In operations attended by much shock or hemorrhage one or two quarts of the normal salt solution may be thrown into the rectum while the patient is yet in the Trendelenberg posture. In the event of heart failure, hypodermic injections of strychnia sulph., digitalin, strophanthus, or glonoin, may be resorted to. In addition to the foregoing, the general measures useful for overcoming shock, under whatever circumstances it occurs, should be applied. The external application of warmth, friction of the body, lowering the head, cloths wrung from hot water applied to the precordial region—any or all of these measures may be brought into requisition if necessary.

If the heart grows steadily weaker and more rapid in spite of the foregoing measures, infusion should be resorted to. This is accom-

plished by constricting the arm above the elbow and exposing, by an incision an inch and a half long, the median cephalic or basilic vein. Around the exposed vein are placed two catgut ligatures, three-quarters of an inch apart, when the lower one is tied. An opening is now made into the vein, into which a small canula is inserted, when the upper ligature is tied. To the canula is attached a piece of rubber tubing, six feet in length, which has at its proximal end a glass funnel. Through this apparatus, from twenty to forty ounces of the normal salt solution can be introduced into the venous system. It should be delivered at a temperature of 100° F. and in order to do this a coil of the tubing should be kept immersed in a vessel of water of about 120° F. The fluid is bound to cool, more or less, as it passes through the tubing. Care should be observed to prevent air from entering the vein and the funnel and tubing should be filled before the latter is attached to the canula. The quantity of fluid introduced will depend upon the patient's pulse. Strict asepsis should be observed throughout the operation.

Large quantities of the normal salt solution may be introduced into the system through the cellular tissue by means of a funnel, tubing and an aspirating needle. The points usually selected are the sub-axillary regions and the groins, though the cellular tissue in any part of the body surface may be utilized. It is a much slower process than is intravenous infusion, but the method is so simple that any physician can apply it. Should it not be possible to obtain the funnel and tubing an ordinary douche bag can be used; or, for that matter, a clean Davidson syringe.

I am satisfied that many lives might be saved by the intravenous or subcutaneous infusion of normal salt solution were the operation resorted to early enough. It should, however, be used before the patient is practically moribund; nor should it be limited to exsanguinated cases. During February of this year I saw with Dr. A. Gleason, of Cleveland, a woman twenty-two years of age who had miscarried six months previously, and supposed herself again three months pregnant. She had a pulse of one hundred and sixty and a temperature of 102° F.; the abdomen was distended and very tender and the picture of sepsis was complete. There was a history of shock and collapse from which she rallied slowly three weeks previously to my first visit. The urine presented no evidences of renal insufficiency. She was removed to the Huron Street Hospital and placed under ether. The bimanual revealed no circumscribed mass within the abdomen. The uterus was quickly dilated and curetted, with negative results. The patient became col-

lapsed and death seemed imminent. I speedily opened a vein of the left arm and injected twenty ounces of the salt solution into it. The pulse, which had become imperceptible, soon increased in volume and the patient improved in every way. Hypodermatic stimulation was necessary for the following twenty-four hours, but she finally recovered perfectly. I am inclined to believe that the saline solution in this case not only saved the life of the patient from its immediate effect upon the heart, but that its action was beneficial in neutralizing the septic condition of the system. I have since used intravenous infusion in four cases of profound sepsis with the most strikingly favorable results.

If the patient can urinate spontaneously, she is permitted to do so from the first; if not, the catheter must be used as often as every six or eight hours (*v* Chapter XII). After twenty-four hours, if the vomiting ceases, small quantities of nourishment may be given. It should at first be of the blandest character. A good article to begin with is crust coffee, in teaspoonful doses every hour, increasing the amount hour by hour, if the stomach will tolerate it. In the course of eight or ten hours a tablespoonful of koumiss, weak beef tea, or milk with lime water, may be substituted for the crust coffee. The patient's condition does not call for nourishment during the first twenty-four hours following the operation. Even if it is not ejected by the stomach the system will rarely assimilate it in any quantity and more harm than good follows its administration. Usually patients are not hungry, and symptoms of prostration, should they supervene, are best overcome, not by food substances, but by stimulants.

Unless a drainage-tube has been introduced, the patient should be permitted to lie in the position which affords her the most comfort. She should not, however, be permitted to throw herself about in the bed. When she turns it should be with the help of the nurse. She should be encouraged to lie in one position at least two hours at a time.

If the case runs a normal course, there should be but slight rise in the temperature and pulse. The pain is ordinarily much less after the removal of large ovarian cysts than it is after oöphorectomy. The bowels should be moved on the third day by an enema. The dressings should be changed on the ninth day, at which time a part of the stitches, if silk, may be removed. It is usually best to leave behind every other suture for a couple of days longer, though, if there are evidences of irritation, all should be removed at once. After the stitches are removed, it is well to support the edges of the wound for a week or ten days with strips of adhesive plaster, around which the abdominal bandage is placed.

It is quite safe for the patient to sit up in bed on the fourteenth day; and it is entirely possible for her to get out of bed, even after most severe operations, on the sixteenth or eighteenth day without serious risk. At the end of the twenty-first day, or, if she does not gain strength rapidly, at the end of the twenty-eighth day, she may return to her home. She should be instructed to wear an abdominal supporter or bandage for at least six months. Unless this precaution be taken there is danger of hernia resulting from stretching of the cicatrix.

Such is the course which a normal case of ovariotomy, in these days of antisepsis and asepsis, will run, in perhaps the majority of instances The reader must not, however, imagine that every case will terminate so favorably and give rise to so little anxiety. Certain complications are liable at any time to arise, and this chapter would be incomplete did they not receive consideration.

The Pulse and Temperature.—While, as has been intimated, the pulse and temperature ratio should remain normal, they frequently become perverted, even markedly so, without interrupting the favorable progress of the case. Thus, it is not uncommon for the temperature to rise a degree, or even two degrees, during the first two or three days succeeding the operation. This is usually due to the resorption of fluid which is either left behind or is poured into the abdominal cavity because of the peritoneal irritation attending the operation; or is purely a reactionary temperature and need not cause the slightest anxiety, unless certain symptoms prevail. I have more than once known the temperature to rise in this way without any other evidence of peritonitis, pain being absent, and the patient suffering not the least inconvenience. If, however, the rise in temperature is associated with pain in the bowels of a sharp lancinating character, and with other symptoms indicating peritonitis, it is, of course, significant, and requires especial attention.

The pulse, too, may become perverted without a corresponding rise in the temperature. I have known it to be as high as 140 for three or four days following the operation, while the temperature remained perfectly normal, or nearly so. In all of my cases where this occurred convalescence was uninterrupted, the pulse-respiration ratio becoming normal in due time. It is difficult to explain the very great rapidity of the heart's action in instances of this kind. Possibly the shock attending the operation, although not manifesting itself in other ways, so affects the inhibitory apparatus of the heart as to permit the latter to run away with itself; or, as suggested by Mundé, it may be due to purely mental causes. At any rate, this disparity between the pulse

and the temperature no longer alarms me when the patient seems to be doing well in every other respect. If the temperature is subnormal with a pulse of this kind, the disparity is usually due to septic peritonitis. Septic peritonitis, however, impresses the system so profoundly that other symptoms of this most dangerous complication stand out prominently.

Tympanites.—This is a frequent and distressing complication; it is ordinarily an expression of peritonitis or localized sepsis, though flatulence may occur without inflammation. When not a feature of peritonitis, it is due to the disturbance of the intestines during the operation, and to the diminished intra-abdominal pressure resulting from the removal of large growths. The indicated remedy—colocynth, china, lycopodium, bryonia, etc.—will often afford most decided relief when more radical measures are not called for. Sometimes it is due to partial intestinal paralysis, and is greatly benefited by an occasional hypodermic injection of strychnia (one-fiftieth of a grain). If relief is not afforded by internal medication, a rectal tube should be passed which will often permit the gas to escape. If the latter expedient fail, turpentine or peppermint enemata may be tried. Finally, if these several measures are unsuccessful, the existence of peritonitis is probable, in which event the saline cathartics should at once be resorted to.

Septicemia and Peritonitis.—I include these two complications under one head, for the reason that peritonitis, in by far the larger number of cases, is due to septicemia. The fact that a slight increase in temperature not infrequently supervenes after laparotomies has already been noted. If this rise be due to the resorption of a limited amount of fluid, or even septic matter, the system is perfectly able to eliminate the poison, and the case will progress to a favorable termination; in obstetric parlance, this is nothing more than a slight septic intoxication.

On the other hand, if infection from without has occurred during the operation, or if septic matter has been left behind in such quantities, and of such a character, as profoundly to impress the system, the surgeon will have to contend with the double complication of septicemia and peritonitis. These complications usually manifest themselves during the first few days following the operation; rarely do they appear after the seventh day. If the convalescence has progressed normally for the first five or six days, the sudden rise in temperature is usually due to causes other than septicemia.

The *symptoms* of septicemia and peritonitis are: a high temperature, pain, tympanites, vomiting, and prostration. Some of these symptoms

usually stand out more prominently than others. The tympanites and vomiting are particularly obstinate. There is something more than a simple elevation in the gastric region which may be present in perfectly normal cases. The distention of peritonitis is "drum-like," and it may be sufficiently great to interfere with respiration.

If the frequent association of the two affections (septicemia and peritonitis) was fully comprehended by the surgeon of even fifteen years ago, certainly the treatment was conducted upon the most unscientific principles. The practice of administering opiates, then in vogue, is now deprecated by surgeons of all schools. In their stead the saline cathartics are used. This practice was, I believe, inaugurated by Tait, and it is one of the most satisfactory procedures in abdominal surgery.

As soon, therefore, as symptoms of septicemia and peritonitis present themselves, an effort should at once be made to move the bowels with a saline cathartic. A seidlitz powder may be given, and repeated in the course of four hours if the first does not produce the desired result. If the stomach is irritable, as it usually is, it is best to give the dissolved powder in small quantities at intervals of five minutes. Should this fail, small doses of calomel may be given in 1-10 grain tablets every half hour until fifteen or twenty are taken, followed by teaspoonful doses every half hour of Rochelle or Epsom salts, until four or five doses are taken (Mundé). The action of the cathartic may, if necessary, be supplemented by an enema composed of equal parts (two ounces) of sulphate of magnesium, glycerin and water, to which is added two drachms of oil of turpentine. The cathartics are purely eliminative in their action. The free movement of the bowels will ordinarily relieve the tympanites, the vomiting, and the high temperature.

If the bowels remain obstinately closed in spite of the cathartics and enemas, there is probably an intestinal obstruction, and no time should be lost in reopening the abdomen and seeking the cause of the obstruction. It is true that this is a most desperate procedure, for, no matter how simple the primary operation may have been, it is quite a different thing to open the abdomen with the intestines enormously distended with gas. After the obstruction is overcome, the intestinal distention should be relieved by making, with a fine hypodermic needle, numerous punctures into them, through which the gas is permitted to escape; or it may be necessary to incise the gut and permit its contents to escape before the bowels can be returned. The intestines are then returned to the abdominal cavity, the abdomen is washed with the normal salt solution in which the intestines are left floating, and the abdominal wound reclosed. A drainage tube under the circumstances is imperative. In

these desperate cases infusion of the normal salt solution is most useful.

If the vomiting persists, the stomach must be given absolute rest by administering all nourishment through the rectum. The rectal food should be given in such form as to produce the best possible results with a minimum of disturbance. This object is attained by using food which has been previously digested and which possesses great nutritive properties. A favorite nutrient enema of mine is half an ounce of bovinine and four ounces of peptonized milk, to which may be added, if indicated, an ounce of brandy. This should be repeated every four or six hours, as the exigencies of the case demand.

This chapter would be incomplete without a list of the homeopathic remedies oftener used in contending with the conditions and complications described, together with their indications. I have so often seen good results follow the administration of properly selected homeopathic remedies in the conditions dealt with, as to make me confident that the abdominal surgeon who does not use them is depriving his patient of most valuable agents. I am also sure that the homeopathic surgeon will be compelled to resort to opium much less often than will the surgeon who is unfamiliar with the specific action of the remedies whose indications I give. However, nearly all surgeons now restrict opium, in the after-treatment of celiotomies, to those cases where the pain and restlessness are so great that it is utterly impossible to keep the patient quiet without its aid. It is then best administered in the form of hypodermic injections of morphia.

Therapeutics.

Colocynth.—Abdomen distended and painful; great tympanites; incarcerated flatus; cramp-like pain in both sides of abdomen; *severe colicky pains, mostly around the navel;* great restlessness and loud screaming on change of position; relieved by drawing knees up.

Bryonia.—Griping pains about the navel; constant painful cutting pains in the intestines, with the feeling as though some one were digging her with the fingers; great sensitiveness of abdomen; ALL SYMPTOMS AGGRAVATED BY THE SLIGHTEST MOTION.

Belladonna.—Distention of abdomen; the transverse colon protrudes all the way across the abdomen from incarcerated flatus; loud rumbling and pinching in the abdomen; SHOOTING, DARTING, CUTTING PRESSURE IN HYPOGASTRIUM; *tenderness even to slight pressure, especially over ovarian region;* CEREBRAL EXCITEMENT.

Arsenicum.—Rumbling in bowels; violent pains in abdomen, with great anguish; *frequent hiccough, with constant nausea and vomiting;*

ineffectual retching; VOMITING IMMEDIATELY AFTER EATING OR DRINKING; *intense thirst; great restlessness;* SYMPTOMS OF SEPSIS.

Hypericum.—Especially indicated in nervous patients who suffer a great deal of pain, without inflammatory symptoms; tympanitic distention of abdomen; cutting in belly in region of navel; stitches in small of the back; ACHING PAIN AND SENSATION OF LAMENESS IN SMALL OF BACK; *jerking and twitching of the limbs;* DYSURIA.

Coffea.—*Sleeplessness;* fear of death; *pain seems unendurable;* colic, as if the stomach had been overloaded; cannot suffer the clothes to be tight over the abdomen; continuous pinching pain in the iliac region.

Lycopodium.—Spasmodic contraction in the abdomen; colicky pain in the right side of the abdomen extending into the bladder, with frequent urging to urinate; ACCUMULATION OF FLATUS, WHICH BECOMES INCARCERATED; *great fermentation in the abdomen, with rumbling;* discharge of much flatus per anum; deposits of uric acid in urine.

China.—Distention of abdomen with griping, and here and there a sharp pain; MUCH FLATUS, WITH RUMBLING; emission of flatus; *especially useful after the loss of a large amount of blood, with dyspnea, ringing in the ears,* etc.

Nux vomica.—Pressure under the short ribs, as from incarcerated flatus; colic, with pressure upward, causing dyspnea, and downward, causing urging to stool and urination.

Ipecacuanha.—CONSTANT NAUSEA, WITH RETCHING; vomiting of ingesta, and then of bilious matter; flatulent colic, with frequent stools; *cutting about umbilicus.**

Illustrative Cases.

It is my object to present, in the following series of illustrative cases, such only as are typical of certain conditions and complications dealt with in the text.

CASE I.—*Ovariotomy for Ruptured Cyst; Recovery.*—Patient, American, æt. 46. Referred to me by Dr. W. A. Winslow, of Sylvania, Ohio. Married for 25 years. Four children; labor normal in all instances. Had always enjoyed good health up to a year before entering the hospital (October 3, 1892), at which time menstruation ceased. The menses were suppressed until the following August, when there was a slight flow. During the suppression she was free from headache, flashes of heat, and all of the usual symptoms attending the menopause.

* *v.* Therapeutics of Acute Inflammatory Affections of the Pelvic Organs. p. 448.

About three months before coming to the hospital she noticed for the first time an enlargement in the right groin, which grew very rapidly, the abdomen becoming greatly distended. Some four weeks before entering the hospital her husband, during sleep, struck the abdomen with his elbow. This was followed by severe and intense pain, with the symptoms of shock and collapse. The temperature immediately rose to 103° F., and for two weeks she was confined to her bed with peritonitis. She entered the hospital October 3, 1892. The tenderness and abdominal pain were at that time most distressing. The temperature ranged from 100° to 102° F.

On October 11th the abdomen was opened. The cyst wall was so intimately attached to the anterior abdominal wall that it was unavoidably incised. The sac was adherent to the entire anterior and lateral abdominal parietes, though the adhesions, being of recent origin, were separated by the fingers and by sponges with no great difficulty. There was much oozing from the site of the adhesions, which was controlled by sponge packing. A large quantity of ascitic fluid was within the abdominal cavity. The pedicle was easily secured and cut away, after which the abdomen was thoroughly washed with sterile water, a drainage tube inserted, and the wound closed.

The temperature immediately dropped to normal, and remained so throughout the convalescence. There was no shock following the operation. The drainge-tube was withdrawn on the second day; the stitches were removed on the seventh; the patient sat up in bed on the tenth, and was discharged perfectly well on November 3d, just one month from the day she entered the hospital and three weeks from the date of the operation.

CASE II.—*Large Unilocular Ovarian Cyst, with Hemorrhage into its Interior; Great Rapidity of Pulse following Operation without Corresponding Rise in Temperature; Recovery.*—Patient, æt. 23. Referred to me by Dr. Young, of Pioneer, Ohio. She entered the hospital on April 29, 1892. Two years previously to that time the abdomen began to increase in size. For fourteen weeks before entering the hospital the enlargement was uniform, centrally located, and was so large as to cause marked difficulty in breathing when lying down. The menses continued normal and her general health was not seriously compromised, though pressure symptoms had begun to manifest themselves.

The abdomen was opened on May 3d. The contents of tumor were drawn off through a trocar and were of a peculiar grumous character, probably the result of hemorrhage into the interior of the cyst. There

was but one cyst, and its collapsed wall was drawn through the abdominal wound with perfect ease. After securing the pedicle, the abdomen was closed with six interrupted sutures and the patient placed in bed.

The tumor and its contents weighed thirty pounds. The temperature never rose above the normal, though the pulse for three days succeeding the operation ranged from 120 to 140. After this time it gradually dropped to normal. The sutures were removed on the seventh day, and the patient left the hospital three weeks from the day of the operation.

CASE III.—*Intraligamentary Cyst, Dissecting the Peritoneum in front as far as the Liver; Complete Enucleation of Cyst; Death.*—Patient æt. 32. Referred to me by Dr. H. M. Warren, of Jonesville, Michigan. Nationality, English; married. Entered the hospital on December 15, 1891. She began to menstruate at 14, at which time the menses were scant and recurred every two weeks, becoming regular at 21. Two years before entering the hospital she had typhoid fever, and for seven months following this attack she suffered from symptoms of malaria. Was married one year previously to consulting me. Two weeks before marriage she had a severe bearing-down pain in the uterus which continued after marriage. There was much pain in the bowels, with a feeling of distention.

Had one miscarriage at the fourth month, which occurred in March. Flowed for ten days after miscarriage. Had much leucorrhea, which was yellow and very excoriating. Had much pain around the left side of the body from the spinal column to the umbilicus. Appetite was poor and emaciation great; the bowels were regular. The abdomen was extremely enlarged and the ordinary symptoms of fluid confined within a cyst presented themselves.

The operation was performed January 12, 1892. Upon exposing the cyst, instead of the smooth, glistening surface which is characteristic of ovarian cysts, its surface was very red and was covered with large vessels. The contents were fluid and readily passed through the tapping trocar.

After the cyst was emptied it was found firmly fixed at its base. An incision was made into the capsule and the enucleation extended to the base of the broad ligament below, and to the lower border of the liver above. There was much bleeding, which was controlled with difficulty by sponge packing and ligatures. I succeeded, however, in completely enucleating the cyst, when there was left behind an enormous cavity. The capsule was tied in sections and removed, its edges being brought together with continuous catgut sutures. A strip of gauze was placed

in the lower end of the capsule and left projecting from the abdominal wound. Weight of cyst and contents, fifty pounds. Time of operation, two hours.

The patient was removed from the operating table suffering greatly from shock. The temperature very soon began to rise, and on the following day it was evident that the gauze was not draining the cavity as it should. This was removed and a drainage tube inserted. The temperature gradually increased, prostration became more and more marked, and death occurred on the sixth day from sepsis. A subsequent examination showed that the cavity left behind was not thoroughly drained. The mistake was, undoubtedly, in not stitching the emptied capsule to the abdominal wound and packing the cavity with gauze. I hoped to avoid the prolonged convalescence necessarily attending the healing by granulation.

CASE IV.—*Large Proliferous Cyst Weighing Forty Pounds; Convalescence Uninterrupted.*—Patient æt. 46. Referred to me by Dr. Byron Deffendorf, of Fowlerville, Michigan. Began to menstruate at 17; flow was normal and painless. Married at 18. Has had four children; labors all easy and natural. Had been troubled for a number of years with occasional severe attacks of pain in the stomach which seemed to be caused by indigestion.

About four years before consulting me she noticed a growth in the left side which gradually increased in size. The menses were regular and painless but scant. Bowels were regular. The abdomen was enormously distended, and the pressure symptoms distressing.

The abdomen was opened on February 20, 1891. The cyst was multilocular and proliferous. It was necessary to incise the cyst wall, introduce the hand, and break down the smaller cysts. The adhesions were not extensive and the collapsed cyst was withdrawn through the abdominal incision without difficulty. The left ovary had undergone cystic degeneration and was as large as a hen's egg. This was removed, a drainage tube introduced, and the abdomen closed by interrupted silk sutures. The temperature did not rise above the normal, and the patient left the hospital on March 12th, twenty days after the operation.

CASE V.—*Large Fibro-Cystic Tumor of the Ovary, with Long Pedicle, Giving Rise to Enormous Distention of the Abdomen from Ascitic Accumulation; Operation; Recovery.*—Patient æt. 39. Referred to me by Dr. L. S. Morris, of Lee's Corners, Michigan. Menstruated at 14; was not regular and has always had more or less dysmenorrhea. Married at 15. Has had seven children, the eldest being 21, and the

youngest 8 years of age. The last labor was very severe, after which she had puerperal fever, being confined to her bed for fifteen weeks. Five weeks following the last labor she noticed for the first time a tumor in the left lower abdomen. This continued for about a year and then disappeared for two years. At the time of entering the hospital she complained of much pain in the vertex, and constant backache. The appetite was good.

A physical examination revealed a large, solid tumor in the lower abdomen which was mobile and seemingly connected with the uterus. There was at the time of the first examination no ascites. The tumor caused much distress because of the pressure upon the rectum, giving rise to hemorrhoids and constipation.

As immediate operative interference did not seem imperative, and as the University Hospital was about to close for the summer vacation, the patient was sent home to return in the fall. In the following October she reëntered the hospital. The abdomen had, during the interval, increased greatly in size and the patient was much distressed in various ways. Upon examination there was found a large, solid tumor floating in fluid. It was entirely possible to practise abdominal ballottement. While lying upon the back, the tumor, if suddenly pressed downward, would float upward and strike the abdomen with a distinct *choc en retour*. It was surrounded by a tympanitic corona produced by the intestines floating upon the ascitic fluid

The diagnosis was somewhat uncertain. Owing to the large quantity of ascitic fluid I feared malignancy. The general health, however, did not indicate malignant degeneration. At any rate, it was very evident that an exploratory incision was necessary. This was made on October 28, 1892. The ascitic fluid at once escaped from the abdominal incision. A large fibro-cystic tumor of the ovary was found high up on the left side, almost in contact with the diaphragm. The pedicle was at least eight inches long. Owing to the great amount of solid matter in the tumor, it was necessary to extend the incision upward nearly to the sternum. The tumor was then removed with perfect ease and the pedicle tied and seared with the Paquelin. Cystic degeneration had begun in the opposite ovary, which was as large as the first, so this was also removed. The abdominal cavity was thoroughly washed with sterile water and a drainage tube introduced. Convalescence was uninterrupted, and the patient was discharged twenty-one days after the operation. The solid portion of the tumor weighed nineteen pounds.

CASE VI.—*Parovarian Cyst Weighing Twenty Pounds; Operation; Recovery.*—Patient æt. 33. Referred to me by Dr. A. Farnsworth, of

Saginaw, Michigan. Unmarried. When 11 years old she was seriously ill from getting her feet wet. Menstruation began at 15. Health good until six years ago, when she first noticed an enlargement low down in the pelvic region. She suffered no pain with this, except during the menstrual flow, which was profuse. Her appetite was good, she slept well, and had attended to her duties as postmistress up to the time of entering the hospital, October 23, 1890.

On October 24th, the abdomen was opened in the usual way. The cyst was found to be parovarian, the walls being very thin. It was partly intraligamentary, but was enucleated without serious difficulty. The tube and ovary were bound down by adhesions and were, therefore, removed. The folds of the capsule at its base were stitched together by a running catgut ligature and the tissues cut away above it. Owing to the free oozing from the surfaces of the capsule, the abdomen was washed with sterile water and a drainage tube introduced. Time of operation thirty minutes.

The drainage-tube was removed on the third day, after which the temperature ran up to 101° F., and fluctuated between 100° and 102° F. for the succeeding six days. During this time *Arsenicum iodide* 3x was administered. She was discharged on November 26th, and ultimately recovered her health perfectly.

CASE VII.—*Exploratory Incision for Papillomatous Degeneration of Ovaries; Profuse Hemorrhage, which was Controlled by Extensive Gauze Packing.*—Miss A., æt. 53; had suffered for years with profuse menorrhagia and metrorrhagia, which nearly terminated her life upon several occasions. I examined the patient some three years previously to the operation and found the pelvis packed with a hard, solid tumor intimately connected with the uterus and presenting all the characteristics of a myoma. Two years previously to the operation the uterine hemorrhages ceased and the patient had seemingly passed through the menopause. The enlargement within the pelvis remained quiescent for a year; then it suddenly began to increase in size and at the time of the exploratory operation the pressure symptoms were most distressing. It was utterly impossible to determine the character of the tumor by physical examination. The uncertainties of the case were presented to the patient and her friends and an exploratory incision was agreed upon.

I was assisted by Prof. D. A. MacLachlan and Dr. Mary Denison. After incising the peritoneum, a large quantity of ascitic fluid, tinged with blood, escaped. The finger was cautiously introduced, but notwithstanding the great care observed most profuse and alarming hem-

orrhage set in. It was very evident that the patient would quickly succumb unless this was controlled. The incision was, therefore, enlarged above and below, when the pelvis and lower abdomen were found completely filled with papillomatous growths. To have attempted to remove these would have been homicidal. Accordingly, I packed over and about the bleeding surfaces iodoform gauze—introducing in all four yards—leaving the end projecting from the lower angle of the wound. The abdominal incision above this was then quickly closed. The patient was removed from the table in a state of collapse, but by the energetic use of stimulants internally, per rectum, and hypodermatically, she rallied and lived for eight weeks. A portion of the gauze was removed on the third day, the remainder being left behind for four days longer. Of course, there was left a large cavity to fill in by granulation. This cavity was for the first six weeks kept perfectly sweet by irrigation through drainage tubes; but large portions of the papillomatous growths sloughed away, and in spite of every effort the patient succumbed at the end of two months from blood poisoning.

This case illustrates most emphatically the utility of gauze packing in controlling hemorrhage. Without it I do not believe that the hemorrhage could have been controlled, and the patient undoubtedly would have bled to death on the table.

CASE VIII.—*Proliferous Cyst, Weighing Twenty Pounds; Celiotomy; Recovery.*—Mrs. S., æt. 40, was referred to me by Dr. Sapp, of Salineville, Ohio. In April, 1895, Dr. Sapp removed a large polypus from cervix. There was no evidence of an abdominal tumor at that time, but soon after this operation the abdomen began to enlarge rapidly and on coming to me it was as large as a full term pregnancy. Cervix very soft, and breasts suspiciously enlarged and areolæ darkened; uterus measured five inches. Trendelenberg posture. Tumor weighed twenty pounds, and proved to be a degenerated proliferous cyst attached to left side by a broad pedicle. I had to break down the septa and scoop out contents with the hand, which gave rise to much loss of blood. The omentum and appendix vermiformis were attached to the tumor. The appendix was amputated and its stump covered with peritoneum. The right ovary, though slightly enlarged, was unfortunately left behind. The patient urged that it should be if there was the slightest hope of saving it. The abdomen was flushed with sterile water, and the wound closed with interrupted silk sutures. Patient removed from table in fair shape. On the third day the temperature ran up to 101° F., but quickly subsided after the bowels were moved with a seidlitz.

The operation was done on October 9th, 1895, and the patient ulti-

mately regained her health perfectly. However, in March, 1897, Dr. Sapp writes me that a tumor of the opposite ovary has made its appearance and a second operation will have to be done.

This case shows the wisdom of removing both appendages when a large multilocular cyst is operated upon, should the second ovary manifest the slightest evidence of disease.

CASE IX.—*Fifteen-Pound Monocystic Tumor of Ovary, Containing Dermoid Tissue in Its Walls* —Mrs. B., æt. 32; referred by Dr. Jay Meade, of Lorain, Ohio. Three months ago had a miscarriage at fourth month, when the present trouble supervened. Abdomen the size of a womb at term. Tumor mobile; uterus pushed back and measured four and a half inches; constant pain in abdomen.

Operation on November 13th, 1895; long central incision. Tumor delivered without tapping, and was attached to left side by a broad pedicle which was tied in sections with No. 2 chromicized catgut and the stump covered with peritoneum by a running suture. Right ovary twice the normal size and cystic; so was removed. Wound closed, without drainage or flushing, with continuous and interrupted catgut sutures, and subcutaneous silk suture. Shock slight, and patient was removed from table in good shape. Temperature never above 99.5° F. Recovery complete and perfect.

CASE X.—*Laparotomy for a Large Multilocular Ovarian Cyst with Rupture; Hemorrhage into the Peritoneal Cavity, and Peritonitis; Recovery from Operation; Death During Eighth Week from Intestinal Obstruction.*—Mrs. G., æt. 22; referred to me by Dr. S. L. Thorpe, of Cleveland. Abdomen began to enlarge six months before I saw patient. One babe ten months old. Three weeks ago she was seized with acute pains in abdomen, followed by symptoms of septicemia, with rapid pulse and prostration. I was called as counsel March 8th, 1896, and had her removed to the Huron Street Hospital on the following day in an ambulance. I endeavored to build her up before operating, but she steadily grew worse and the abdomen was opened on March 14th. The pulse was 150 when the operation was begun and the temperature 104° F. The tumor proved to be a semi-solid multilocular cyst springing from the right side. One of the loculi had ruptured, and the abdomen was full of a gelatinous material and clotted blood. The loculus which had ruptured was gangrenous. The tumor was quickly delivered through a long incision with the patient in the Trendelenberg posture. The pedicle was secured in catgut and severed. Large pieces of rotten tissue were adhered to the posterior cul-de-sac, and were scooped out with the hand. The omentum was adhered to

the tumor and gangrenous. The entire omentum was tied and cut away. Abdomen freely flushed with sterile water; glass tube inserted into the Douglas pouch and a Mikulicz drain packed into the anterior cul-de-sac, to overcome free oozing from this point. Abdomen closed with interrupted silk. Operation thirty minutes.

Death from heart failure seemed imminent for twenty-four hours, but by the free use of stimulants the patient rallied, convalesced uninterruptedly, and went home at the end of the fourth week. She recovered sufficiently to call upon her neighbors, but at the end of the eighth week was taken with symptoms of obstruction of the bowel and died eight days later. A second operation was not permitted, nor was a post-mortem.

CASE XI.—*Laparotomy for a Small Dermoid Tumor; Operation; Recovery.*—Patient, æt. 30; referred to me by Dr. W. A. Tims, of Cleveland. One child born dead two years ago. Very small woman. Much pain and distress in pelvic region. Examination showed tender mass in posterior fornix the size of double fist. Laparotomy. Before opening the abdomen the tumor was pushed from pelvis into peritoneal cavity, which seemed to leave so little room for the intestines that as soon as the peritoneum was incised they forced themselves out of the wound. Intestines were wrapped in warm sterile towels, and the tumor delivered without tapping; Staffordshire knot. Left ovary cystically degenerated and was removed. Long incision necessary. Wound closed with catgut. Operation thirty minutes. Convalescence complete. The tumor proved to be a small dermoid which contained several teeth, pieces of cartilage and a lock of hair. The operation was done on June 20th, 1895.

CASE XII.—*Intraligamentary Cyst of Right Side, the Size of a Fist; Operation; Recovery.*—Mrs. E., æt. 28; was referred to me by Dr. John B. Claypool, of New Bedford, Pa. Patient had suffered from dysmenorrhea and very great pelvic distress for five years.

Abdomen opened on October 6th, 1896, at the C. M. C. clinic. Intraligamentary cyst on right side the size of fist. The ovary of left side double normal size and bound down by adhesions. Right broad ligament tied and cut off; left appendages removed. Trendelenberg posture. Ahesions of omentum to uterus, cyst, bladder and peritoneum in front. Removed section of omentum. No drainage. Wound closed with interrupted silk. Convalescence uninterrupted and recovery complete.

CASE XIII.—*Large Proliferous Cyst, Weighing Eighty Pounds, Removed from a Girl Twenty Years of Age; Recovery.*—Miss H., referred

by Dr. R. J. Cummer, of Cleveland. Abdomen began to enlarge one year before I saw her, and gradually increased in size until at the time of the operation it was enormously distended, with pressure symptoms so marked that the patient could not lie down. Respiration and the heart's action were so much embarrassed that I deemed a preliminary tapping justifiable. Accordingly on September 5th, 1896, an effort was made to draw off the fluid, but owing to its tenacious character it would not pass through the trocar. Operation on September 12th, 1896; chloroform. Universal adhesions and much oozing; cyst proliferous with much solid matter. In spite of every precaution a good deal of the fluid found its way into the peritoneal cavity. The pedicle was broad and was tied in sections with silk. Abdomen was flushed with four or five gallons of normal salt solution, all cavities being carefully cleansed; glass drain; incision closed with interrupted silk. Pulse 160 and almost imperceptible following the operation; was 140 when she was placed on the table. Patient was placed in the Trendelenberg posture, and one quart of salt solution, containing two ounces of brandy, thrown into the rectum. The tumor and contents weighed eighty pounds. Heart stimulants were necessary for four or five days. From September 12th to September 17th three quarts of serum were removed through tube. At this time the tube was removed. Patient made a splendid convalescence, and is now, March, 1897, in perfect health.

CHAPTER XLVIII.

INFLAMMATORY DISEASES OF THE UTERINE APPENDAGES.

General Considerations.—In the chapter dealing with acute inflammation of the uterus and the periuterine tissue, I devoted some space to the consideration of acute salpingitis and ovaritis. Acute inflammation of these organs was, however, considered rather in the light of a complication of general pelvic inflammation than as a distinct pathological entity, and rightly so. When the pelvic contents are implicated in a general inflammatory attack the most deft diagnostician will be unable to determine, in at least the larger number of instances, the extent of involvement of the ovaries and tubes.

In the chapter referred to, I mentioned certain symptoms which, if present, would lead the student, in acute pelvic inflammation, to suspect the involvement of the ovaries and tubes (p. 441). These are: excessive tenderness in the region of the ovaries, pain, nausea and vomiting. Additional evidence may be obtained in reasonably favorable cases by palpating the enlarged and tender ovary or ovaries, though I especially emphasized the necessity of care during physical exploration while acute inflammation of any of the pelvic organs exists. It remains for me, then, in the present chapter, to discuss the acute forms of inflammation of the uterine adnexa, not in detail, but to such an extent only as will enable the student intelligently to comprehend those chronic forms of inflammation which are so frequently the sequelæ of acute inflammation.

If the reader will refer to Fig. 250 he will obtain some idea of the intimate lymphatic connection existing between the uterus and its appendages. This illustration will enable him to understand why it is that the tubes and ovaries are so often secondarily involved in diseases of the uterus. The continuity of the mucous membrane lining the uterus and the Fallopian tubes, and the close proximity of the ovaries to the fimbriated extremity of the tubes, are additional reasons why salpingitis and ovaritis so often follow in the train of metritis.

Varieties.—I shall adopt the classification of Pozzi, slightly modified, because it serves to indicate the various pathological changes which

the appendages, when they become diseased, may take on. This classification is as follows:—

I. Non-cystic oöphoro-salpingitis.	*a.* Acute catarrhal;	
	b. Acute purulent;	
	c. Chronic parenchymatous (pachysalpingitis).	Hypertrophic, or vegetating variety; Atrophic, or sclerous variety.
II. Cystic oöphoro-salpingitis.	*a.* Hydrosalpinx, or serous;	
	b. Hematosalpinx, or hemorrhagic;	
	c. Pyosalpinx, or purulent.	

Non-Cystic Oöphoro-Salpingitis.

Etiology.—Acute metritis and endometritis are the chief sources of the disease. It is maintained by Championnière that the propagation occurs, in all instances, through the lymphatics. As proof of this, he cites the fact that, in at least the majority of cases, the uterine extremity of the tube is not involved, the external two-thirds being the part chiefly affected. Pozzi teaches that this indemnity is apparent only, for the microscope shows that the tissues of the inner third are markedly inflamed. While it will not do to ignore the rôle played by the lymphatics, especially during the puerperal state, it is probable that the disease, in the greater number of cases, extends from the uterus to the tubes by continuity of tissue. This is emphatically so in specific endometritis.

The frequent association of metritis with salpingitis is often overlooked when the symptoms of the former overshadow those of salpingitis. An intense metritis may be associated with slight salpingitis without the latter condition being known; and, conversely, if the disease is primarily located in the tubes or the ovaries the metritis may pass unrecognized —hence the possibility of failing to determine the simultaneous existence of the two affections.

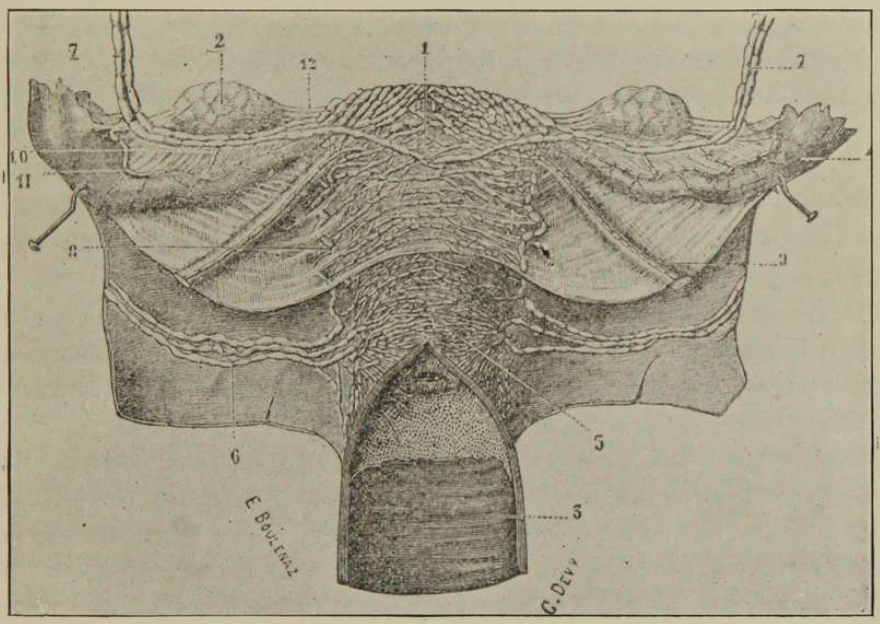
I have in another place (p. 407) discussed *gonorrhea* as a cause of endometritis and pelvic inflammations in general. Tait maintains that the uterus and tubes may become infected by gonorrheal virus without the preëxistence of distinct vaginitis. There can be no question that the significance of gonorrhea as a causative factor has not yet received the attention which its importance warrants, though it is possible that an exaggerated significance has been given to it by Noeggerath. The fact that the gonococcus of Neisser is not always found in the pus taken from pus-tubes by no means proves a non-gonorrheal source of infection.

Marx* has observed several cases of perimetritis in children asso-

* British Medical Journal, Sept. 4, 1895.

ciated with vulvitis. He believes that severe pelvic pain in young girls, associated with fever, is often due to pelvic inflammation which involves the tubes and ovaries. If the girl recovers, as she usually does, she is liable to have a good deal of trouble during puberty, and when she marries the symptoms may become acute through excessive coitus. Marx believes that it is wrong to place the responsibility on the husband in many such cases.

FIG. 250.



LYMPHATICS OF UTERUS.

1. Lymphatics coming from the body and fundus of uterus. 2. Ovary. 3. Vagina. 4. Tube. 5. Lymphatics coming from the cervix. 6. Lymphatics to the iliac glands. 7. Lymphatics to the lumbar glands. 8. Anastomoses uniting the vessels of the cervix and of the body. 9. Small lymphatics in the round ligament to the inguinal glands. 10, 11. Lymphatics of the tubes. 12. Ovarian ligament. (*Poirer.*)

The next most frequent cause is *puerperal infection*. Membranes retained after abortion become septic, thus giving rise to metritis and succeeding salpingitis. Should, however, gonorrheal infection precede abortion or parturition, the real cause of the difficulty may be overlooked. The puerperal state, in instances of this kind, tends to propagate the gonorrheal virus, and doubtless many cases of puerperal

peritonitis and cellulitis are due to gonorrheal metritis with secondary involvement of the tubes, ovaries, and periuterine tissues.

The other causes are those which may give rise, if operative, to metritis or general pelvic inflammation. They include the improper use of the sound, operations upon the cervix, unskilful obstetric operations, and the want of proper surgical or obstetric cleanliness.

Tubercular salpingitis is rarely met with as an idiopathic affection. It is usually associated, when it occurs, with tubercular involvement of other abdominal and pelvic viscera. During the last year I have seen three cases associated with tubercular peritonitis. In those rare instances where it is met with as an isolated lesion, its origin may be in tuberculous spermatozoa which find their way into the tube. This explanation will not, however, apply when the affection occurs in virgins. In such cases, according to Pozzi, the tubercle bacillus is first introduced into the circulation through the lungs or digestive tract, and finally lodges in the tube. A case is reported by Hugon* of probable metastatic salpingitis in a young woman who suffered from tuberculosis of the knee.

The *eruptive diseases*—scarlatina, variola, etc.—are, according to Tait, frequently responsible for disease of the tubes and ovaries. This author, together with Freund, also believes that congenital malformations of the tubes, with atrophy, predispose to salpingitis.

Symptoms.—In subacute and chronic salpingitis and ovaritis, *pain* is an almost inseparable feature. It is frequently worse on the left side, and, if unilateral, oftener located on that side. It is more or less persistent and is aggravated by walking or by jars of any kind. It extends down the thighs, to the back, and may involve, in a reflex way, the breast of the corresponding side. It is almost always intensified immediately before and during menstruation, giving rise to that form of dysmenorrhea known as "ovarian." Occasionally the pain is great enough to prevent the patient from standing erect. Dyspareunia, more or less marked, is rarely absent. This is due to the fact that the inflamed ovary is nearly always prolapsed, as well as to general pelvic tenderness. A digital or bimanual examination will, if the ovary is pressed upon, give rise to a peculiar sickening sensation, which persists for some time after the pressure is removed. In rare instances the suffering is relieved by the onset of the menstrual flow.

Menstruation is oftener excessive than deficient in quantity. This is due to the general pelvic congestion perpetuated by the disease, as well

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*Journal de Médecine de Bordeaux, June, 1895.

as to the fundal endometritis which is rarely, if ever, absent. When the ovaries become cirrhotic, partial or complete amenorrhea may ensue.

Wm. C. Wood states* that in all cases of salpingitis passing under his observation there has been a severe pain over the region of the liver. Wood believes that the constancy of this pain is more than a mere coincident. This is a symptom which I have never before seen mentioned in connection with salpingitis.

The subjective symptoms alone are not sufficient for diagnostic purposes, and, especially if an abdominal section is contemplated, a careful physical examination should be made under anesthesia. Even then it is not possible to detect microcystic or cirrhotic degeneration of the ovary or simple catarrhal salpingitis. In chronic salpingitis, if the conditions are favorable, the tube can be felt as a resisting, hard, tense cord.

Differentiation.—The following affections will call for differentiation:—

Metritis;
Lumbo-abdominal neuralgia;
Ovaralgia.

Metritis.—It is unnecessary to repeat the special symptoms belonging to this affection. Indeed, when the tube is inflamed, traces of a preceding metritis usually exist. Should the symptoms of metritis still preponderate, it is utterly impossible to determine with any degree of positiveness the extent of involvement of the tubes and the ovaries. If the inflammation is limited to the uterus the increased weight of the organ, together with its mobility, will at least suggest that the appendages are not seriously implicated.

Lumbo-Abdominal Neuralgia.—This is due, in the large number of instances, to some affection of the uterus. The pain is located in the abdominal wall and is made worse by superficial pressure.

Ovaralgia.—Ovaralgia, or neuralgia of the ovaries, is not infrequently associated with inflammation. Nevertheless it often occurs as an idiopathic affection, if, indeed, it is right to speak of any neuralgia as "idiopathic." The pain is usually confined to one side. There may be anesthesia of the corresponding side of the body (Charcot). It comes and goes in quick succession. The attacks are oftener met with in hysterical patients and in women who are victims of neuralgia in other parts of the body.

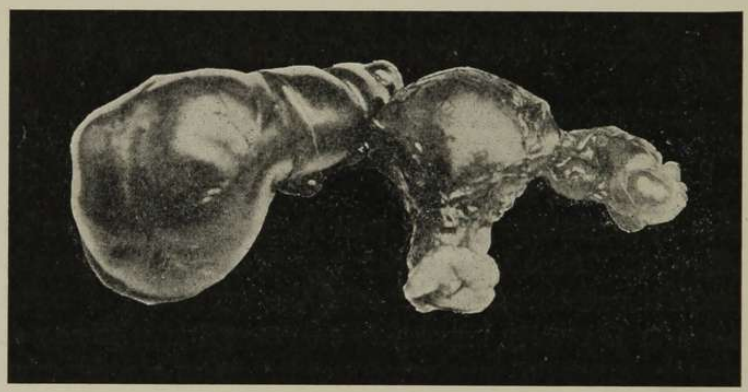
Since inflammation of the tubes is nearly always associated with that of the ovaries, it is rarely possible to determine with any degree of

*New York Medical Journal, Oct. 26, 1895.

precision, even after a most careful local examination has been made, which organ is chiefly affected. We are led to suspect that the ovary is chiefly involved when the enlargement is oblong; when it is mobile and some distance from the uterus; when the sensitiveness is very great; and when dysmenorrhea is a marked symptom.

Prognosis.—Chronic salpingitis and ovaritis, whatever may be the form of inflammation, is an exceedingly obstinate affection. Owing to the fact that all of the pelvic organs are periodically congested by the menstrual function, it is impossible to bring to the diseased appendages physiological rest so long as menstruation continues. The lining membrane of the tubes cannot be got at for treatment as can the endome-

FIG. 251.



UTERUS AND ADNEXA.

Beginning Carcinoma of the Cervix with Double Hydrosalpinx. (*Wood.*)

trium. There is, too, a peculiar tendency for the tube to become occluded both at its uterine and its ovarian extremity, so that the secretions are pent up. Nevertheless, relative cures may occur, even though pus is present, though in nearly all cases the tube remains more or less altered after an acute attack of salpingitis. Sterility is a frequent sequela, though not an absolute one if the disease does not involve the appendages of both sides. The symptoms are, in nearly all instances, most persistent, and attacks of peritonitis are of frequent occurrence. These attacks are supposed to be due to a few drops of muco-pus escaping from the tube into the peritoneal cavity, or to irritating fluid escaping from ruptured ovarian follicles.

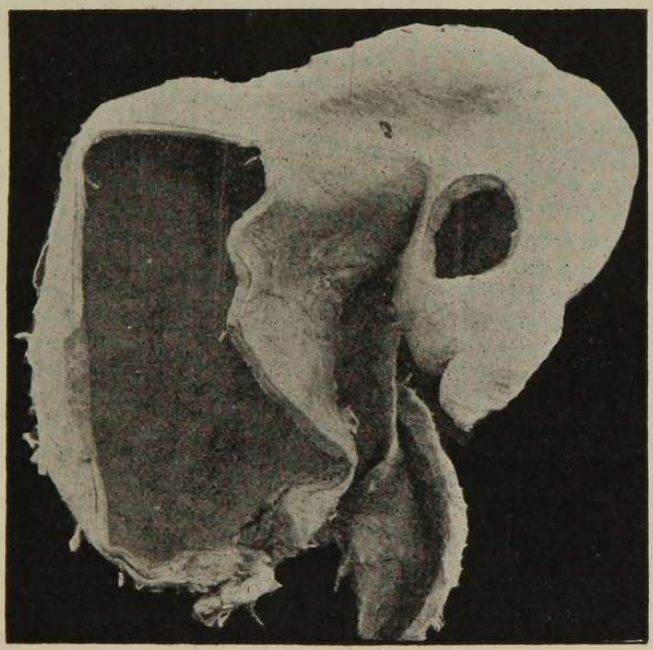
CYSTIC OÖPHORO-SALPINGITIS.

Of the three forms of cystic salpingitis *pyosalpinx* is the most frequent. This, it is claimed, may be transformed into hydro- or

hematosalpinx. The method by which this is brought about is somewhat uncertain. It is probable that the germs are spontaneously destroyed and the inflammatory process arrested, when the pus undergoes a species of clarification and is converted into serous fluid. This at least is the explanation of Pozzi, who believes that the great majority of cases of hydrosalpinx originate in this way. A hematosalpinx may result from rupture of the vessels in the walls of a pyosalpinx, the sac becoming filled with blood. A more frequent cause of hematosalpinx is, however, Fallopian pregnancy, the ovum dying after rupture and the tube remaining distended with blood. It may also be associated with hematometra, due to obstruction within the cervix or vagina.

Hydrosalpinx.—(Figs. 251, 252, 253, and Plate XXVI.) Tubal dropsy rarely attains a very large size. It is not improbable that the large tubal cysts reported by the older authorities were in reality dis-

FIG. 252.



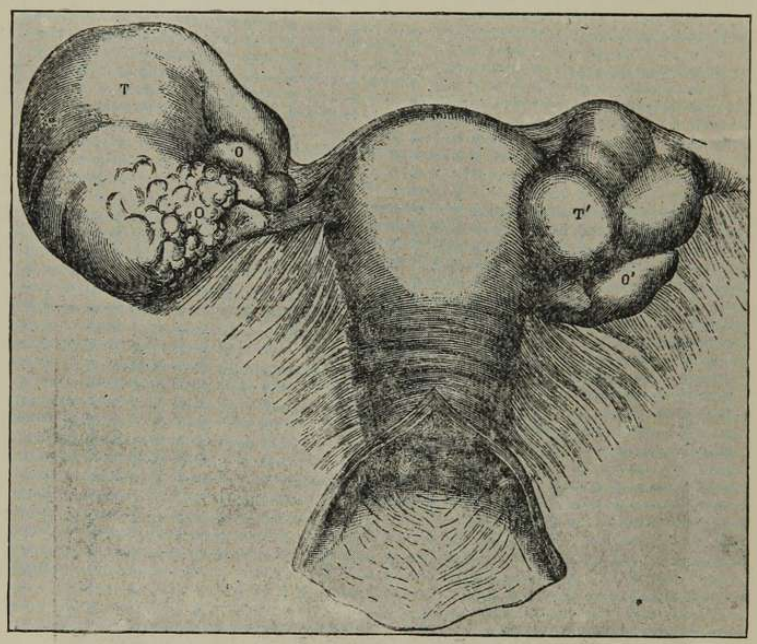
HYDROSALPINX.

A dilated left tube which weighed, inclusive of its fluid contents, 1 lb, 6 oz. From a single woman, aged 23. The right Fallopian tube weighed, including its contents, 4 lb, 11 oz. (*Museum R. C. S. Photographed by the Author.*)

tended tubes connected with true ovarian cysts. They may, however, attain a size equal to that of a fetal head. The walls of the cyst are thin and present a bluish white color.

Hematosalpinx.—The tumor produced by a true hematosalpinx is usually not larger than the fist. The contents consist of a mixture of blood and pus, or of blood and serum. It is necessary to exclude from the category of hematosalpinx those slight effusions of blood due to inflammation of the walls of the tube which are susceptible of spontaneous resorption.

FIG. 253.



DOUBLE HYDROSALPINX. (*Beigel.*)

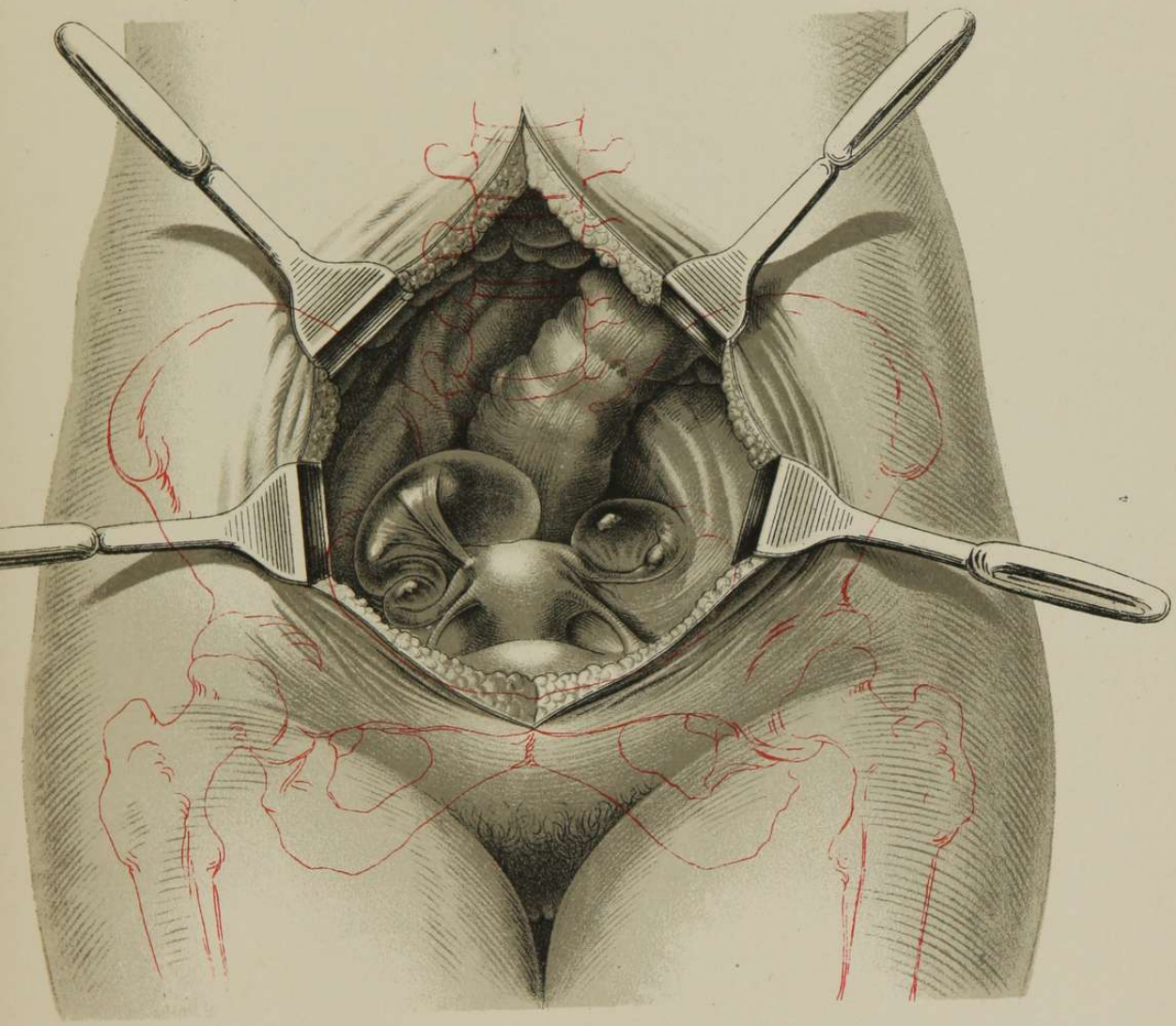
T, right tube with abdominal mouth closed; *o*, right ovary; T′, left hydrosalpinx; *o′*, left ovary degenerated into a cyst

Pyosalpinx.—Purulent cysts of the tubes and ovaries vary in size from that of a small pear to that of an adult head. The sac is also of variable thickness. The pus presents a creamy yellow appearance and is often most offensive, especially if the cyst communicate with the bowel. Not infrequently the ovary contains disseminated abscesses; or it may be so intimately attached to the fimbriated extremity of the tube as to become an integral part of the cyst.

The *ovaries*, in both cystic and non-cystic diseases of the tubes, may undergo any of the changes described under the head of pathology (p. 825). Tubo-ovarian cysts are not uncommon (Figs. 254 and 255).

Symptoms.—Grouping the three forms of cystic enlargement of the tubes and ovaries under one head is in entire harmony with clinical

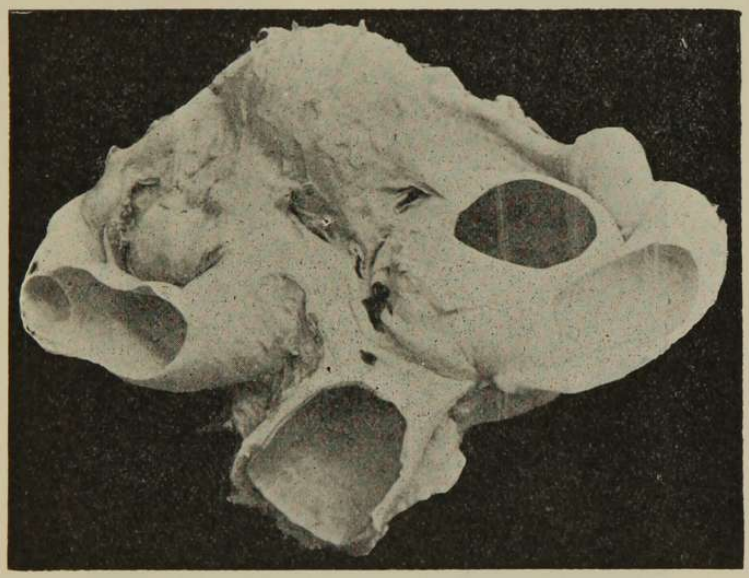
Plate XXVI.



Uterus with translucent, dilated and convoluted Fallopian tube on either side. (T. S. Cullen)
Johns Hopkins Hospital Reports.

facts. That is to say, so far as both subjective phenomena and local symptoms are concerned, it is usually impossible to differentiate the three affections from one another. It is true that during the acute period of pyosalpinx the symptoms are more intense and the usual systemic disturbances attending the formation of pus in any part of the body may present themselves. In due time, however, the pus within the tube usually becomes sterile and, if the encystment is complete, the system will tolerate its presence without serious constitutional disturbance. Should the tube rupture, or the pus escape through the fimbriated ex-

FIG. 254.



TUBO-OVARIAN CYST.

A uterus with its appendages. Both Fallopian tubes are much dilated, especially the right. This has formed a communication with the corresponding ovary, which is dilated into a cyst over two inches in diameter. There are numerous adhesions on the surface of the uterus, the result of chronic peritonitis. (*Museum R. C. S. Photographed by the Author.*)

tremity into the peritoneal cavity, inflammation is more apt to result than when the fluid from a hydrosalpinx escapes into the pelvis. The frequent recurrence of chills and fever, given by the older authors as conclusive evidence of pyosalpinx, does not in fact take place even in the larger number of cases. I have repeatedly found pus within the tubes when the most careful cross-questioning failed to elicit any of the supposed classical signs of pyosalpinx.

Pozzi refers to another symptom of cystic oöphoro-salpingitis the

value of which, he maintains, has been much exaggerated, namely, the sudden escape of sanguineous, purulent, or serous fluid from the cervix, which may be frequently repeated. Pozzi believes that in at least the larger number of cases presenting such a history the fluid does not proceed from the tube, but rather from the uterine cavity, and that it is due to an endometritis associated with more or less cervical stenosis. In support of this view he cites the fact that cystic tubes are usually obliterated at their uterine extremity. He nevertheless admits that it is sometimes possible to force the contents of distended tubes through the uterus and into the vagina by bimanual pressure.

FIG. 255.

TUBO-OVARIAN CYST.

The uterine half of the tube is much elongated, thick-walled, and tortuous; it has been laid open and lies posteriorly. The outer half of the tube is extremely dilated. Masses of papillomatous growths spring from the mucous membrane of the tube. The ovary, which is seen below, forms a large single cyst which does not communicate with the interior of the dilated tube. (*Museum R. C. S. Photographed by the Author.*)

The symptoms of hydrosalpinx are not usually so marked as those of the other two varieties of cystic disease, though the pain may be very great.

PLATE XXVII.

DOUBLE NON-CYSTIC SALPINGO-OÖPHORITIS.

U, U, Uterine extremity of tubes; F, F, Fimbriated extremity; a, a, Adhesions. Hydatid of Morgagni. (*Wood.*)

The amount of blood contained in a hematosalpinx is not ordinarily great enough to produce serious constitutional disturbance.

The *general symptoms* of the three forms of cystic disease are those of pelvic peritonitis with which all are so often associated. In all, *pain* will draw attention to the appendages. Upon physical examination a tumor will be found on one, or, if bilateral, on both sides of the uterus. Care must be observed in practising the bimanual not to rupture the cyst. I have on four different occasions ruptured tubal cysts in examining under anesthesia, notwithstanding that reasonable care was exercised in making the examinations. In three of the cases the abdomen was immediately opened and pus found in the free pelvic cavity. In the fourth, the patient was carefully watched for untoward symptoms, but none occurred, the contents of the cyst doubtless being sterile. All of the cases operated upon recovered. However, the ease with which rupture was produced demonstrates the danger attending all cystic diseases of the appendages.

If the appendages of both sides are involved, the uterus is always more or less fixed. Usually the distended tubes will be found in the posterior cul-de-sac, where they are adhered; or they may be so embedded in inflammatory exudates as to be indistinguishable from the general contents of the pelvis. Local examination always gives rise to more or less pain. It is rarely, if ever, possible to detect fluctuation, unless a large distended tube is adhered in the posterior cul-de-sac and pushes the uterus forward. It occasionally happens in pyosalpinx that the adhesions to the contiguous parts are so intimate that the tube loses its identity and cannot be enucleated. The subperitoneal tissues may become involved in the suppurative process, when the condition is converted into a true pelvic abscess.

Differentiation.—It is, then, by no means possible to determine at the bedside which of the three forms of tubal disease exists; nor, from the standpoint of treatment, is the uncertainty of differentiation very important. Whether the tube contains pus, blood, or serum, if the distention is at all marked, operative interference is called for. Lawson Tait goes so far as to say that a classification of these cysts, based even upon the character of the fluid which they contain, is thoroughly impracticable.

From the standpoint of prognosis, on the other hand, it is important to determine the probable character of the fluid which distends the cyst. All authorities agree that pyosalpinx is more dangerous than hemato- or hydrosalpinx. This is because of the intense peritonitis which usually results from the escape of pus into the pelvic cavity.

A gonorrheal history, or a history of sepsis associated with parturition or abortion, will lead the examiner to suspect that the tube is distended with pus. Unfortunately, it is by no means always possible, as we have seen, to obtain a history of gonorrhea, even though the source of infection be of this origin.

Other conditions suggesting pyosalpinx are: the presence of extensive adhesions, frequent repetitions of pelvic inflammation, and, possibly, the occurrence of erratic chills, such as suggest pus in other parts of the body. It will not do, however, as I have already intimated, to eliminate pyosalpinx because this last symptom is wanting.

Both hydro- and pyosalpinx are nearly always bilateral, whereas hematosalpinx is frequently confined to one side only. This last fact suggests that Fallopian pregnancy is often responsible for blood cysts.

Hydrosalpinx gives rise to adhesions much less often than do the other forms of tubal distention. The bimanual is also less painful when the cyst contains serum only.

Zweifel* makes the following observation regarding pyosalpinx: "In cases in which streptococcus and kapselcoccus were found there was often every evening marked remittent fever. In cases of tubercular pyosalpinx the fever rose from time to time; wherein it differs from gonorrheal pyosalpinx, in which there was usually no fever at all when the patient was lying quietly in bed. If disturbed by the examination the temperature rose at once and shortly after fell. In no case of gonorrheal pysosalpinx was there swelling of the inguinal glands, while in pyogenic cases swelling was the rule."

Cystic oöphoro-salpingitis may be confounded with—

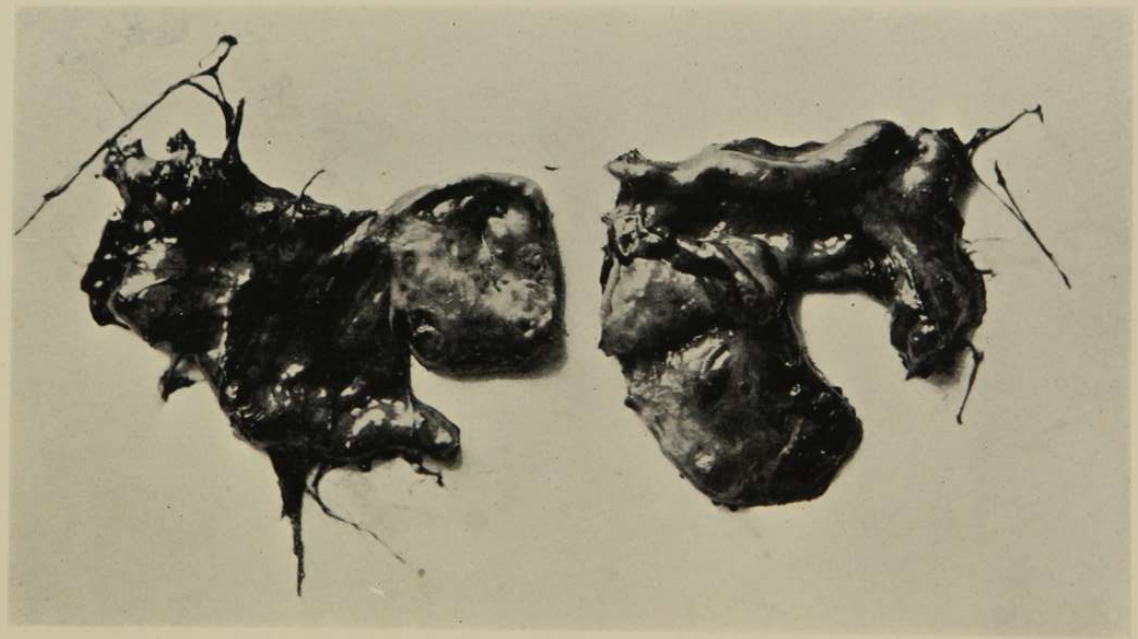
Uterine myofibromas;
Fibro-cystic tumors of the uterus;
Small ovarian cysts;
Early tubal pregnancy;
Intraligamentous cysts.

Uterine Myofibromas.—There is an entire absence of fluctuation; the uterus is mobile; the depth of the cavity is increased; and the tumor is intimately blended with the uterus, except in pedunculated subserous fibroids. Notwithstanding these differentiating points I have on several occasions opened the abdomen expecting to have to deal with myofibromas only to find tubo-ovarian cysts intimately attached to the uterus.

Fibro-Cystic Tumors of the Uterus.—The difficulties of differentiation

*Annual of Universal Medical Sciences, 1892.

PLATE XXVIII.



TUBES AND OVARIES DUG FROM INFLAMMATORY EXUDATES; PACHYSALPINGITIS. (*Wood.*)

are sometimes very great. The size of the uterus is usually increased; the pain is not so marked; and in most cases the inflammatory history is wanting.

Small Ovarian Cysts.—The tumor is more remote from the uterus; there is an absence of tenderness; and no history of pelvic inflammation can be obtained. Often it is impossible to distinguish a small ovarian cyst from a distended ovary.

Early Tubal Pregnancy.—The uncertainty previously to the period of rupture is very great. The increase in the size of the uterus is usually more marked than is the case with tubal disease. The ordinary symptoms of pregnancy—suppression of the menses, changes in the breasts, etc.—may exist. The irregular spasmodic pain associated with tubal pregnancy is very much like the pain incident to cystic tubal disease.

Intraligamentous Cysts.—These dissect the folds of the broad ligament so that they are in intimate contact with the uterus. There is an absence of inflammatory symptoms.

Two most curious and interesting cases are cited by Doleris* of adherent enterocele in the cul-de-sac of Douglas, in which the conditions simulated very closely an inflammatory tumor of the appendages. The diagnosis was made only after the abdomen was opened.

The Pathology of Non-Cystic and Cystic Diseases of the Uterine Appendages.—In *simple catarrhal salpingitis* (acute and subacute) the secretion is increased and there is more or less swelling and redness of the mucous membrane. There may also be shedding of the epithelium, wholly or in part, with thickening of the villi. The infiltration of the tube wall is usually very slight, though the swelling is sometimes great enough to be detected upon bimanual examination. The ostium abdominale may remain patulous, but is often closed.

In *purulent salpingitis* (acute and subacute) there is often found a pus-forming organism such as the gonococcus, staphylococcus aureus and albus, and streptococcus. In recent cases the gonococcus is the most common germ present. Purulent salpingitis may result either from sepsis following abortion, or labor at term, or from gonorrhea. The folds of mucous membrane are often increased, and frequently there are formed small pus cavities, or cysts of like character (Chrobak).

In *pachysalpingitis* (chronic parenchymatous) there is excessive development of the tube wall due to increase of connective tissue rather than to hypertrophy of the muscular. The mucous membrane is usually

* Pozzi, "A System of Gynecology," p. 389.

involved to a greater or less extent, its folds being hypertrophied. The tube and ovary are adherent and the ostium abdominale is nearly always closed, though the uterine orifice may remain pervious. Both the tube and ovary are usually attached either to the cul-de-sac of Douglas or the posterior surface of the broad ligament. The general adhesions are often extensive. Vegetations not infrequently spring from the surface of the mucous membrane. (Plates XXVII and XXVIII.)

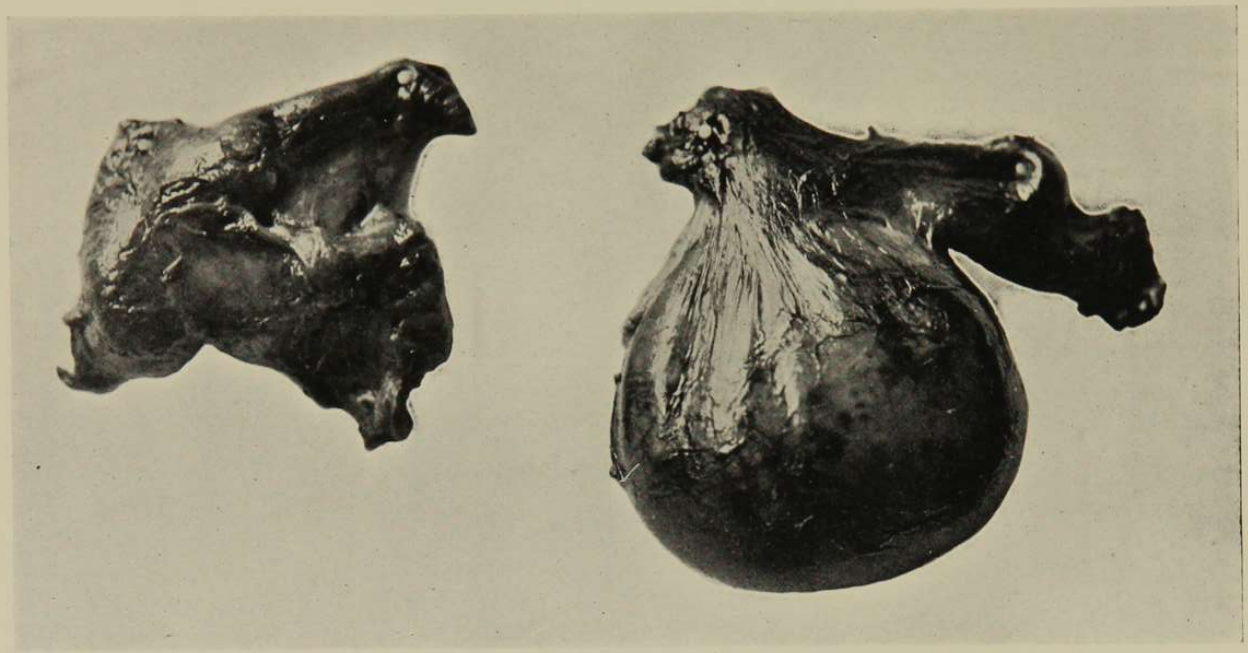
In *cystic distention* of the tube, which is frequently preceded by one of the non-cystic forms of salpingitis, there is agglutination of both its uterine and fimbriated extremities. The dilatation is oftener located at its external two-thirds, though it may involve its whole length. The pavilion attaches itself very often to the ovary, which may become fused with the cyst. Adhesions may attach the appendages to any part or organ of the pelvis, but oftener to the Douglas cul-de-sac. A suppurating cyst of the broad ligament or ovary may communicate with the tube. Microscopically, ramifying vegetations are found projecting from the lining membrane of the tube. Its walls are infiltrated with embryonic cells. All of the vessels are markedly dilated.

If the *ovary* is the seat of chronic inflammation, it may localize itself either in the follicles of the gland or in its fibrous tissue. In the first instance there is an increase in the number of follicles, resulting, according to Tait, from hyperemia. Instead of a general involvement of the follicles the follicular hypertrophy may confine itself to a few only, which condition constitutes a variety of cystic degeneration (Rokitansky). This form of cystic degeneration frequently gives rise to great suffering and most profuse menorrhagia.

Fibrous hyperplasia may be the most characteristic feature of ovarian inflammation. Here there is destruction of the follicles and an arrest of the development of the proper ovarian cells. Secondary contraction follows the hyperplasia and gives rise to so-called *cirrhotic degeneration*. This is nearly always attended with dysmenorrhea of a most serious character. In time it gives rise to amenorrhea more or less absolute. It is not uncommon to find one ovary cirrhotically degenerated, with marked enlargement of the opposite ovary (Fig. 205, and Plates XXIX and XXX).

In still another condition there may be great enlargement of the ovary due to hypertrophy of both the follicular and the fibrous elements of the gland, the relative proportions of the two structures remaining normal. Tait observes that the tubes are nearly always hypertrophied

PLATE XXIX.

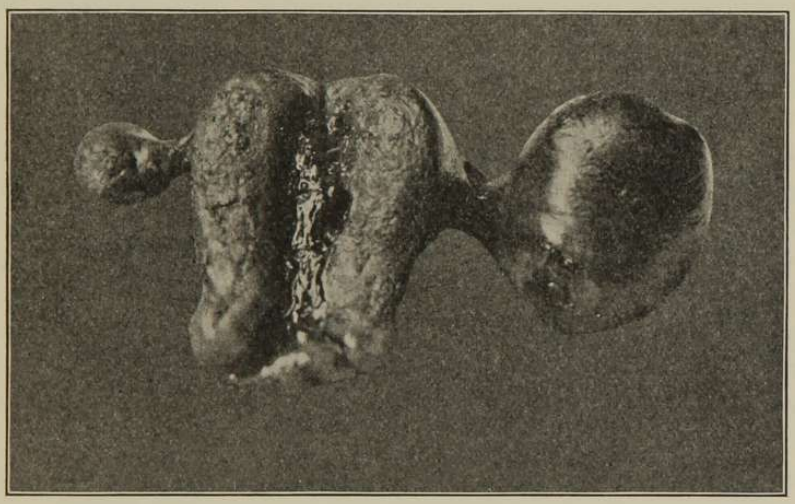


PURULENT SALPINGITIS WITH CYST OF RIGHT OVARY; CIRRHOTIC DEGENERATION OF LEFT OVARY; LEFT OVARY AND TUBE BURIED IN INFLAMMATORY EXUDATES. (*Wood.*)

with the ovary. He says: *"I have removed ovaries for intractable pain and hemorrhage which weighed as much as ten hundred and twelve grains, yet the most careful and minute examination of the organ revealed nothing more than an absolutely normal structure."

The ovary may be destroyed by suppuration. An abscess of the ovary unassociated with disease of the tube is, however, an exceedingly rare condition. The pus may be disseminated throughout the ovary, or one large abscess may occupy the center of the organ. In eleven of my cases the ovary was a mere shell and contained from one to three ounces of pus. Or the ovary and tube may form together a tubo-ovarian cyst (Figs. 254 and 255).

FIG. 256.



UTERUS AND ADNEXA.

Diffuse sarcoma of endometrium with cyst on left ovary; right ovary dug from inflammatory exudates. Left ovary in Douglas cul-de-sac. (*Wood.*)

Tuberculosis of the tube and ovary is a more common disease than was formerly supposed. As a rule, when any portion of the genital canal is the seat of tuberculosis the tubes are implicated. Not infrequently tubercular salpingitis is secondary to tubercular peritonitis. When the tube is primarily involved the infection may have its origin in tubercular semen; or, in involvement of distant organs, the infection may be conveyed through the blood.

Miliary tubercles are sometimes found on the ovary. The disease

* *Op. cit.*, p. 430.

may implicate the entire organ or be limited to its surface. The uterus, tubes and ovaries may be matted together in one mass.

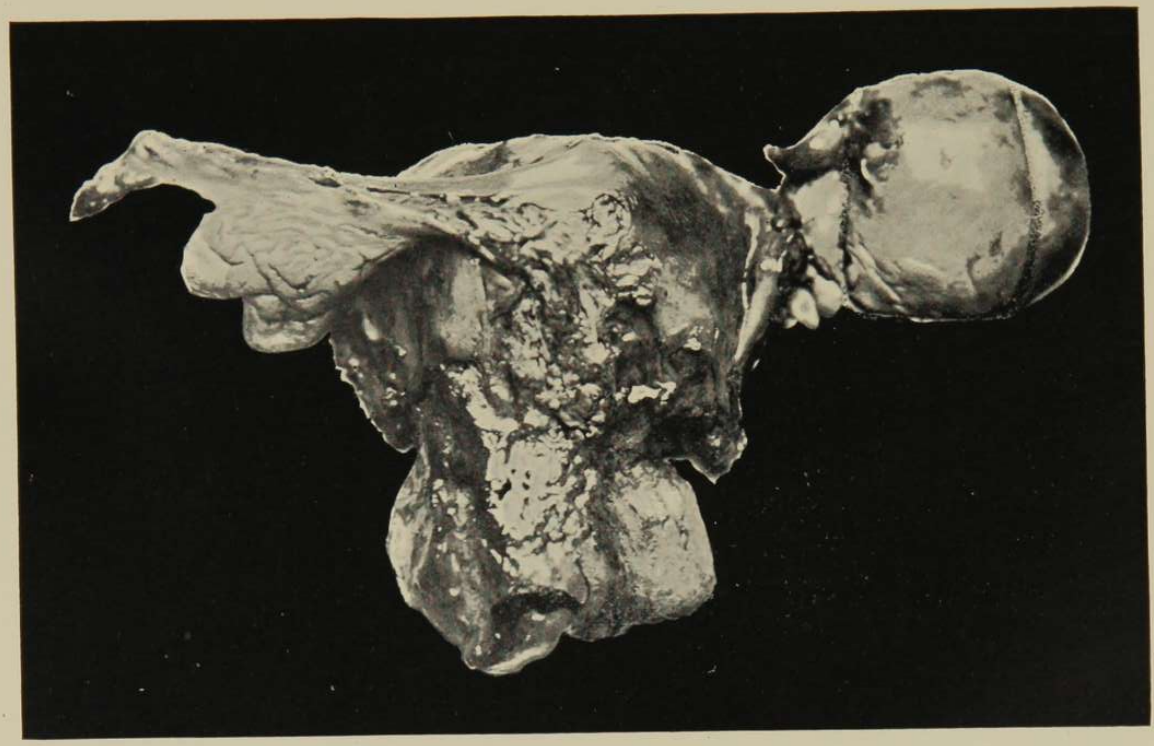
The symptoms and treatment of tubercular salpingitis and ovaritis differ in no wise from the symptoms and treatment of the non-tubercular forms of inflammation of these organs. If the general condition of the patient is not too bad salpingo-oöphorectomy or salpingo-oöphorohysterectomy is indicated. Care should be taken in operating not to contaminate or infect the peritoneal cavity.

Progress and Termination: Prognosis.—In the various forms of *non-cystic inflammation of the tube* a relative cure is entirely possible. Undoubtedly too many tubes and ovaries have been sacrificed by enthusiastic laparotomists. Whether or not an absolute cure can be brought about after the tubes undergo interstitial changes, even by the most careful and skilful treatment, is very doubtful. It is, however, usually possible to make the patient fairly comfortable, even though such changes are the result of gonorrheal inflammation. Unfortunately cases are every now and then met with where, although no cystic distention exists, the dysmenorrhea and menorrhagia, as well as the general suffering, are such as to make salpingo-oöphorectomy the only resource. This should not be resorted to until all ordinary measures have been exhausted. Life is not endangered as it is in pyosalpinx, for in the latter affection rupture is liable at any time to occur and cause fatal peritonitis. I think it can be safely said that with the means now at our command, ablation of the appendages is unnecessary in at least ninety per cent. of all cases of non-cystic salpingo-oöphoritis unassociated with general pelvic inflammation and exudation.

The duration of the affection is often prolonged and the physician has to contend with the periodical congestion incident to menstruation. Nevertheless, a healthy conservatism has sprung up during the last few years and specialists are resorting to salpingo-oöphorectomy much less frequently than in the past.

The curability of *cystic accumulations* is quite another matter. A woman is not for a moment safe while carrying within her pelvis a distended tube. In the first place, it is utterly impossible, as we have seen, to determine the exact character of the fluid within the cyst previously to its removal. Attacks of inflammation are of frequent occurrence, and should rupture take place serious and even fatal peritonitis may be excited. In fact, these accumulations are rarely if ever cured spontaneously, though occasionally adhesions form between the rectum and the vagina, through which their contents may escape. Unfortunately, an abscess opening into either of these cavities, espe-

PLATE XXX.



Uterus and Appendages (Posterior View).

Cyst of right ovary the size of a small orange; left ovary cirrhotic; uterus firmly adherent to rectum; vaginal hysterectomy. (*Wocd.*)

cially into the rectum, usually continues to discharge indefinitely, giving rise to tenesmus, shooting pains, diarrhea, etc. In rare instances the contents escape externally.

The suffering in cystic distention is frequently very great, and this in itself calls for radical measures. The pain is due to plastic adhesions and to distortion of the pelvic viscera, which result from the frequent attacks of inflammation. The menstrual symptoms, particularly dysmenorrhea and menorrhagia, are usually marked. When the ovarian stroma is entirely destroyed menstruation may cease entirely.

Cirrhotic degeneration also gives rise to so much suffering and dysmenorrhea that many times permanent relief short of removal is impossible.

CHAPTER XLIX.

INFLAMMATORY DISEASES OF THE UTERINE APPENDAGES (Continued).

Treatment of Non-Cystic and Cystic Oöphoro-Salpingitis.

The *conservative treatment* of inflammation of the Fallopian tubes and the ovaries is applicable to the non-cystic forms only. In that large class of affections so frequently met with, where endometritis or metritis has extended beyond the uterus and has implicated the appendages in a simple catarrhal or interstitial process, conservatism is eminently proper, for much relief may be afforded and a relative cure accomplished in a goodly per cent. of cases. The principles of treatment applicable to these affections do not differ essentially from the treatment of general pelvic inflammation (p. 443). Rest, especially during and just before the menstrual periods, is of the first importance. The hot douche administered in such a way as to bring into action its thermic properties is invaluable; it may be advantageously supplemented by the hot bath, or by sea bathing. Uterine drainage should be secured and proper medicaments applied to the endometrium. Electricity is, I am convinced, an agent of inestimable value in contending with non-cystic tubal disease. My method of applying it is to localize the galvanic current within the pelvis by passing a suitable electrode into the vagina with a large dispersing pad over the abdomen. In this way a current of from twenty to forty milliampères should be used for from five to ten minutes at each séance, and repeated twice or three times a week. Tampons of cotton wool medicated with iodin, ichthyol, etc., should be inserted after any form of local treatment. When the endometrium is implicated the uterus should be curetted, irrigated, and drained with gauze. Finally, the carefully selected remedy should be administered.

I desire to emphasize the necessity of patience and persistence in carrying out the line of treatment indicated in the foregoing. There are so many factors to contend against, that the physician will be disappointed if he expects to accomplish a cure in a few weeks' time. Of this fact the patient should be apprised. With a possible abdominal section confronting her, she is usually most willing to coöperate with

her physician in carrying out any kind of conservative treatment. Unless the suffering is very great, and the symptoms most urgent, I do not believe that we are justified in resorting to laparotomy in non-cystic tubal affections without at least a six months' trial of conservative treatment.

In dealing with the *cystic diseases*, on the other hand, blind conservatism is most reprehensible. A woman who has a distended Fallopian tube, and who suffers from frequent attacks of peritonitis, can have no greater misfortune come to her than to fall into the hands of a physician incapable of comprehending the dangers which beset his patient. The medical attendant advises against an operation and the case progresses from bad to worse until finally a point is reached where an operation, if done at all, must be done when she is practically moribund. I have in the list of illustrative cases appended to this chapter recorded several cases thus neglected.

Salpingo-oöphorectomy, under favorable circumstances, is not a dangerous operation. If, however, the patient is suffering from acute peritonitis, the result of rupture; if her strength has been depreciated by long continued suffering; if, in short, the operation is done as "a last resort," the circumstances are very different. The abdominal surgeon who does his full duty will save a certain per cent. of these neglected cases, but his mortality record will suffer accordingly.

Salpingo-Oöphorectomy for Inflammation of the Appendages.—Salpingo-oöphorectomy, when performed for the inflammatory diseases of the tubes and ovaries, may be a very easy or a very difficult operation. It is usually more difficult than is an ordinary ovariotomy. The reasons for this are, that the abdominal walls are not stretched by the presence of a large tumor, and associated with the disease of the appendages there are usually extensive adhesions which distort all of the pelvic organs.

The *preparatory treatment* does not differ from that recommended in Chapter XII. The Trendelenberg posture will be found of great advantage. The incision is made in the middle line, extending from about two inches above the pubes to two or three inches below the umbilicus; an incision of from two to three inches in length will ordinarily afford sufficient room. Upon opening the peritoneum the omentum and intestines are, if not adherent, pushed forward, and the surgeon passes the two fingers of his right or left hand downward toward the fundus uteri. The fundus will serve as a guide for future operations. The extent of the adhesions is most variable. The omentum is not infrequently attached to the bladder, intestines, or uterus; when

this is the case, these adhesions should be first detached. The omentum may also attach itself to the tube and ovary, which are sometimes lifted from the pelvis by it. In dealing with omental adhesions which cannot be separated in the ordinary way, it is best to cut them between two catch-forceps; later, a ligature can be applied to their proximal ends. The surgeon next explores the appendages by passing the fingers of his right hand over the fundus of the uterus along the broad ligament and Fallopian tube on either side. Not infrequently the distortion is so great as to make it exceedingly difficult to distinguish the various pelvic structures and organs from one another. Usually, however, the fundus of the uterus will afford a landmark by which the surgeon can locate the tubes. It may be that the ovary and tube, though diseased, are easily drawn up through the abdominal wound. If so, they are secured in a double catgut ligature and tied off. In other instances, perhaps the majority, the tube and ovary are firmly fixed deep in the pelvic cavity, the most frequent site of the adhesions being the cul-de-sac of Douglas. A great deal of force may be required to free appendages thus adhered.

If the operation is once undertaken, there are very few instances where it ought to be abandoned. A possible exception to this rule occurs in those cases where the adhesions are universal, and where the patient's condition will not warrant extensive intra-abdominal manipulations. When this condition prevails it may be best to close the abdomen and operate through the vagina. If it is possible, in these cases, to open the tube and drain it through the abdominal wound, it may be wise to proceed in this way. However, Lawson Tait has taught the profession that, unless the circumstances just enumerated exist, incomplete salpingo-oöphorectomy ought rarely, if ever, to occur. I have never yet left a salpingo-oöphorectomy incomplete when I deemed it best to remove the appendages, and always suspect the surgeon who meets with an unusual number of "inoperable" cases of lacking in either courage or skill.

In dealing with adhesions deep in the pelvis it is best to depend entirely upon the sense of touch. After determining the actual limits of the diseased organs, they are gradually unfolded from below until a pedicle is formed. Even after they are unfolded in this way the tube and ovary cannot always be brought out of the abdominal wound, for the changes within the broad ligament may leave them so unyielding as to make this impossible. It is here necessary to enlarge the abdominal wound and secure the ovary and tube within the abdomen in one or more ligatures. Tait, in these cases, carries his finger down to the

pelvic insertion of the broad ligament and causes a series of minute tears at this point through the peritoneum and fibrous fascia. This leaves the ligament elastic and distensible without endangering the vessels running through it.

The hemorrhage following the separation of extensive adhesions is sometimes very great and it should be temporarily controlled by sponge or gauze packing. After the appendages are removed, if the hemorrhage still persist, a solution of iodin may be applied to the bleeding surfaces, or the parts may be seared over with the Paquelin cautery. Any spurting arteries are, of course, secured by forcipressure, or by ligatures. It may even be necessary to leave several forceps attached to the bleeding points for some hours after the operation. Usually, however, if the hemorrhage is simple oozing, it can be controlled by gauze packing.

In dealing with distended tubes, especially if the contents are purulent, care should be taken not to permit the pus to escape into the peritoneal cavity. If there is danger of rupture it is best to evacuate the tube with an aspirator and close the opening thus made by pressure forceps. If pus escape into the peritoneal cavity, or if the oozing is very profuse, irrigation with a hot sterile salt solution may be resorted to. It is my practice in these cases to leave the abdomen distended with the salt solution. When extensive adhesions have been separated, and especially if the peritoneum has been contaminated by pus, a drainage tube is usually necessary.

It is nearly always necessary to remove the appendages of both sides, although the disease may be very much more extensive on one side than on the other. Tait especially emphasizes the importance of this practice. Even though the disease of the opposite side is not extensive, it is very liable to become so after the first operation. If, however, the patient is especially anxious to have the appendages of one side conserved, her wish should receive due consideration, though the probabilities of a second operation should be presented to her.

The *after-treatment* of salpingo-oöphorectomy does not differ from the after-treatment of laparotomies in general.

The necessity of removing the uterus with the appendages in suppurative diseases of the latter organs is fully discussed in Chapter XXXI. This subject has received much and serious consideration during the last three years both in this country and abroad. If the uterus is not greatly enlarged, and is mobile, it may, in my opinion, be safely left behind, though I make it a practice in these cases, before the abdomen is opened, to dilate, curette, irrigate and pack the organ. Indeed, the

conservative treatment of non-cystic diseases of the appendages comprehends uterine curettement and drainage. The uterus cannot, however, be safely curetted in cystic salpingo-oöphoritis unless the abdomen is to be immediately opened. In those instances, on the other hand, where the uterus is fixed, enlarged, lacerated, and the appendages of both sides are diseased, I believe that the interests of the patient are best conserved by removing it with the appendages. It is bound to remain a source of menace to her if left behind, and there is more or less danger of its taking on malignant changes (p. 680). When hysterectomy is performed it may be done by the vaginal, vagino-abdominal or abdominal method, according to the indications.

Conservative Operative Treatment of the Diseases of the Ovaries and Tubes.—Recently Noble, Polk, Kelly and others have advocated more conservative measures in dealing with cystic and suppurative diseases of the ovaries and tubes. These gentlemen propose, instead of removing the appendages, to tap cysts and drain them; to open up pus tubes, wash them out, and stitch the mucous membrane of the tube to the peritoneal surface; to break up adhesions and fix the uterus in front. That they have met with a fair degree of success cannot be denied, and if the patient is willing to take her chances on treatment of this kind she should be given an opportunity to put it to trial. I am inclined to believe, however, that not a very large per cent. of the suppurative diseases of the ovaries and tubes can be safely dealt with in this way. Nevertheless, the reaction is a healthful one, and while it may not be wise to leave ovaries and tubes behind which have undergone extensive changes, undoubtedly too many slightly diseased appendages have been sacrificed. Kelly* recommends excision of par-ovarian cysts without the removal of the ovary and tube.

Illustrative Cases.

I have selected from my series of cases of inflammation of the appendages the following, as typically illustrating the benefit to be derived from salpingo-oöphorectomy when the operation is indicated. In the chapter devoted to the hystero-neuroses I have referred to several additional cases in which salpingo-oöphorectomy was done for various nervous troubles. It is not necessary at this time to introduce further evidence illustrating the utility of the operation under proper circumstances. I will simply add that, especially if done for nervous lesions, discrimination should be made with the utmost care. In all of my

*Johns Hopkins Hospital Bulletin, March, 1897.

cases, except when life was immediately threatened, both internal and local measures were exhausted, either by myself or by the medical gentlemen who referred the patients to me, before laparotomy was resorted to.

CASE I.—*Pyosalpinx, the Result of Gonorrheal Infection; Salpingo-Oöphorectomy, Followed by Intestinal Obstruction; Reopening of the Abdomen at the End of Forty-eight Hours; Recovery.*—Patient, American, æt. 24. Referred to me by my former assistant, Dr. C. M. Thurston, of New Castle, Indiana. Married for five years. Entered the hospital November 7, 1892. Menses came on at the age of twelve and she has not been well since. The menses have always been irregular, too profuse and very painful. The pain during menstruation is located in the uterus and ovaries; indeed, there is constant soreness and suffering in both of these regions. There is a history of gonorrheal infection four years ago, since which time she has been very much worse in every respect. Following this attack she was for a long time very low with pelvic inflammation. Attacks of pelvic peritonitis since then have been very frequent. She has been compelled to leave her husband because of excessive venery. Menstruation is now very profuse and each period leaves her greatly exhausted. There is more or less increase of temperature during the periods. Appetite good; bowels constipated. The urine is either scanty and high colored, or light colored and profuse. It contains small quantities of albumin, pavement epithelium, a few crystals of oxalate of lime, red blood cells and pus. The albumin is no more than can be accounted for by the presence of pus.

A physical examination shows very great tenderness of all of the pelvic organs, with retroversion of the uterus and fixation. An ill-defined mass is distinguished at the left of the uterus, but gives rise to no evidence of fluctuation.

Because of the excessive pain, the dyspareunia, and the intractable uterine hemorrhage, celiotomy was recommended. The abdomen was accordingly opened on November 24, 1892. The adhesions of the omentum to the uterus and left tube were very firm and had to be cut. The pelvis was filled with inflammatory exudates, the result of the frequent attacks of peritonitis. It was, however, possible to distinguish the fundus of the uterus by carrying the finger along the left broad ligament. The corresponding tube was found distended with pus and firmly fixed in the cul-de-sac of Douglas. The ovary was implicated in the suppurative process, constituting a true tubo-ovarian cyst. It required a great deal of force to peel the cyst from the posterior layer of the broad ligament and from the cul-de-sac. I finally

succeeded in doing this by first securing the tube at its uterine extremity and afterwards tying in sections the broad ligament at the pelvic extremity of the tube. The tumor was filled with inspissated pus in which no gonococci were found. The left tube and ovary, though not greatly enlarged, were firmly adherent and were removed. The right ovary showed well-marked hyaline and cystic degenerative changes.

There was left behind, after removing the cyst, a large bleeding surface which continued to ooze in spite of sponge pressure and the application of iodin. I therefore packed this surface with iodoform gauze, leaving one end projecting from the lower extremity of the wound. This was the only form of drainage used.

The patient rallied from the operation, but twenty-four hours later began to develop symptoms of intestinal obstruction. These became more marked until the end of the second day, when it was clearly evident that the only way to save her life would be to reopen the abdomen. This was done forty-eight hours after the first operation. A knuckle of intestine was found attached to the site of the adhesions, which was the cause of the obstruction. The intestines were enormously distended with gas, and immediately upon reopening the wound forced themselves from it. They were punctured in numerous places with a fine hypodermic needle in order to permit the gas to escape; the abdomen was then washed with sterile water, a glass drain inserted, and the abdominal wound reclosed. It was with great difficulty that the intestines were returned to the abdominal cavity.

The vomiting soon ceased, the temperature dropped to normal, flatus began to pass *per anum*, and from this time on the patient made an uninterrupted recovery. She reports herself, four years later, in perfect health.

I am sure that, had the second operation not been done, she would have died from the intestinal obstruction.

CASE II.—*Pyosalpinx of Right Side with Cystic Degeneration of the Ovaries; Retroflexion of the Uterus; Salpingo-Oöphorectomy and Hysterorrhaphy; Recovery.*—Patient æt. 28; referred to me by Dr. G. D. Green, of Mason, Michigan. Married, and has had two children, both being dead. She entered the hospital December 1, 1891, and gave the following history: Mother suffered more or less from lung trouble. Father died of phthisis two years ago. Has one brother with weak lungs. When young she was the picture of health. Began to menstruate at sixteen; this function has always been irregular, occurring every two or three weeks. Menses too profuse, the discharge being dark and often clotted. There has always been, too, a dysmenor-

rhea of a most marked character. The pain is in the uterine region, appearing before, and continuing during, the flow. It extends to the back and is of a most excruciating character. Has a profuse, excoriating leucorrhea between the menses, which compels her to wear a napkin during the entire interval.

Her first child was born six years ago, labor lasting ten hours. Was in bed for fourteen or fifteen days, and did not get up well. The second birth was premature, occurring two years ago. Soon after the last confinement she had a severe attack of peritonitis, the result of a fall, since which time there has been almost constant pain in the right side, extending down the inner side of the corresponding limb to the middle of the thigh. This pain is very intense and deep-seated. She is now compelled to keep her bed during the entire menstrual period. The menstrual pains are labor-like in character, gradually growing worse as the period advances, and continuing for some days after the flow ceases. Headache is almost constant, and is worse after menstruation; it is located at the base of the brain and forehead. Appetite is poor, particularly during menstruation.

A bimanual under ether showed the fundus of the uterus retro-displaced, but it could be lifted out of the hollow of the sacrum. The products of inflammation were clearly outlined in the right broad ligament. The tube of that side was enlarged and evidently distended. Both ovaries were enlarged to at least three times their normal size.

The abdomen was opened on December 12, 1891. The right ovary and tube were firmly adhered and were removed with some difficulty. The left tube was not enlarged, but the ovary was clearly diseased and the appendages of that side were accordingly removed. The fundus was stitched to the anterior abdominal wall by means of two silk sutures. The intervening peritoneum was irritated with the point of a scalpel for the purpose of exciting adhesions. The abdomen was closed in the usual way without drainage. An examination of the appendages after their removal showed the right tube distended with pus; both ovaries had undergone cystic degeneration.

The patient convalesced with hardly a bad symptom. The abdominal sutures were removed on the seventh day, those passed through the uterus being left behind for three days longer. She returned home four weeks from the time of the operation and is now (eighteen months later), except for the flushes of heat which still distress her more or less, perfectly well.

CASE III.—*Hydrosalpinx of Right Side with Cystic Degeneration of Corresponding Ovary; Interstitial Salpingitis of Left Side with Cirrhotic*

Degeneration of Left Ovary; Salpingo-Oöphorectomy; Recovery.— Patient, æt. 34; referred to me by Dr. E. A. Lodge, of Milford, Michigan. She entered the hospital October 10, 1891, and gave the following history: Was very healthy until menses occurred, at fourteen, since which time she has never been well. Suffered from intense neuralgia of the head from fourteen to twenty. Menses always lasted from five to seven days, recurring about every twenty-four days.

Was married at twenty-four, and has never been pregnant. The uterus has been displaced to the right and backward for several years. During menstruation she suffers from a most excruciating pain in the ovarian region which completely prostrates her. There is much tenderness over the lower abdomen at this time, with a slight increase of temperature.

There is, in addition to the foregoing, a flatulent dyspepsia which is always aggravated at the menstrual period. She suffers a great deal from pain which begins in the back of the neck and extends up to the temples through the head. During the last year there has been almost constant pain in the small of the back. Leucorrhea is not marked.

The bimanual revealed an unusually large vagina for a woman who had never had children. There was an ill-defined thickening on the right side, and on the left there was evidently a distention of the tube. Physical examination caused much pain.

The abdomen was opened October 13, 1891. The uterus was found drawn to the right by the inflammatory exudates of that side. The left tube was distended with serum, and the right was greatly thickened as a result of interstitial salpingitis. The right ovary was enlarged and cystically degenerated. The left had undergone atrophy and was not larger than a Lima-bean. Both appendages were removed without serious difficulty and the abdomen closed in the usual way.

The convalescence was interrupted on the seventh day by the patient eating freely of honey which was surreptitiously conveyed to her. This gave rise to severe enteritis with peritonitis, which nearly terminated fatally. She recovered from this attack, however, and was permitted to sit up on November 1st. On November 3d she walked across the room, and a week later left the hospital for her home. She is now quite well.

CASE IV.—*Oöphoritis of Twenty Years' Standing; Complete Prostration from Neurasthenia; Salpingo-Oöphorectomy; Recovery.*—Patient æt. 32; unmarried; referred to me by Dr. A. B. Spinney, of Detroit, Michigan. Her mother died of gastric fever. Father is well, aged 68. One brother living; strong and well. One sister living, not in good

health. When she was fourteen years old she fell and struck the small of her back. When sixteen, had sharp neuralgic pain in the left ovarian region, made worse by being on her feet. Was compelled to leave school at seventeen. Began to menstruate at fourteen; has always suffered greatly from dysmenorrhea, the flow being too long and too profuse. The pain comes on a day or two before the flow and continues during it.

Her mother died ten years ago, after six weeks' illness, during which the patient had practically the entire care of her, especially at night. After her mother's death she was bedridden for two years, during which time the ovarian pain was greatly aggravated. She placed herself under the care of a physician who resorted to local treatment, which consisted largely of applications of nitrate of silver to the cervix. At the end of two years she was able to get up and about, though the pain in the ovarian region was still more or less persistent. Two years ago she fell on the ice, again injuring her back. To use her own expression, "the backbone felt as though it were driven through the head." A week later the ovarian distress became intensified and there was swelling and tenderness of the corresponding side. The temperature was increased and nausea and vomiting were marked symptoms. She was confined to her bed for five months. Spinal irritation has been a marked symptom for the last two years, during which time she has been bedridden. A physical examination showed enlargement of the right ovary with great tenderness. There is endometritis with a small mucous polypus projecting from the cervical canal. Neurasthenia is most profound.

Local galvanism was applied to the ovary and to the spine. The only additional local treatment consisted of hot douches administered twice a day. Cimicifuga and bryonia were given internally and every means taken to improve the patient's nutrition. She, however, made but little progress under this treatment and celiotomy was decided upon.

The abdomen was opened on December 4, 1888. The right ovary was at least four times its normal size and the tube greatly thickened. The fimbriated extremity of the tube was adhered to the ovary. The left tube and ovary were likewise implicated in the inflammatory process, though to a less extent. It was deemed best to remove the appendages of both sides. The abdomen was closed in the usual way.

A slight attack of peritonitis followed the operation, the temperature rising on the following day to 102° F. This subsided and the sutures were removed on the seventh day. She regained her health somewhat slowly, but was able to leave the hospital on February 9th.

Three years later, while coming from Detroit to Ann Arbor, I was approached by a lady who introduced herself as this patient. The change was so great that I did not recognize her. She had taken on flesh and was, indeed, the picture of health. She steadily gained after returning home, is now supporting herself by teaching school, and is in every way perfectly well.

CASE V.—*Salpingo-Oöphorectomy for Intractable Dysmenorrhea.*—Mrs. C., æt. 38, one child; referred to me by Dr. H. L. Warren, of Jonesville, Michigan. One year ago I dilated the cervix, curetted and performed trachelorraphy, perineorraphy, and removed hemorrhoids from the rectum. For years she has been confined to bed for one week out of four with dysmenorrhea. After the minor work she improved most decidedly, but the dysmenorrheal pains returned as bad as ever. Hystero-epileptic convulsions at periods. In March, 1896, I opened the abdomen; found that both of the ovaries were cirrhotic, the left containing a hematoma. Patient very thin, and the abdominal incision was only an inch and a half long. Stump secured with silk. Abdomen closed with three continuous catgut sutures. Time of operation ten minutes.

CASE VI.—*Large Double Pyosalpinx; Operation; Recovery.*—Mrs. W., æt. 34; referred to me by Dr. W. E. Sawyer, of Marion, O. Lower abdomen distended with two irregular tumors, each as large as a fetal head, which seem firmly attached to the uterus. No history of gonorrhea. Cysts proved to be pus tubes. Had much pain, and her temperature ranged before operation from 99° to 103° F.

Both cysts were enucleated, and tied off with silk; hemorrhage very profuse and could only be controlled by gauze packing. Wound closed with silk.

Convalescence slow, but uninterrupted. On her return home, however, a discharge of pus took place from the lower angle of the wound, and a fistulous tract remains, undoubtedly due to an infected ligature. Otherwise she is very well. She is to return soon to have the fistula cared for.

CASE VII.—*Abscess of the Left Ovary, Resulting from Abortion; Probable Gonorrheal Infection.*—G. L., referred to me by Dr. D. G. Wilder, of Oberlin, O.; mulatto, æt. 16. One year ago was seduced, and became pregnant and had an abortion. This was followed by extensive pelvic inflammation, from which she came very near dying. Has had almost continuous pelvic pain since. Examination showed adhesions of appendages and a mass in the right side.

Operation on March 1st, 1896, in the Trendelenberg posture. In-

testines much distended with gas. Right ovary the size of a small orange and distended with pus; left ovary was imbedded in inflammatory exudates. Adhesions very firm. Catgut for pedicles. Abdomen closed with three continuous rows of catgut. No drainage. Pulse fast for seventy-two hours, and shock very marked. Bowels moved on the third day by means of a cathartic enema (p. 801). Convalescence uninterrupted.

CASE VIII.—*Gonorrheal Pyosalpinx; Salpingo-Oöphorectomy; Recovery.*—Mrs. S., æt. 30; C. M. C. Clinic. Has suffered a great deal from pelvic pain and distress during the last five years. Vagino-abdominal examination revealed a mass in the region of the right tube as large as the fist.

Abdomen opened on February 4th, 1896. Trendelenberg posture. Intestines packed away with gauze sponges; right tube ruptured while removing. Tube and ovaries tied off with catgut; uterus buried in inflammatory exudates, and could not at first locate fundus. Left appendages dug from inflammatory exudates, and pelvis perfectly cleaned. I never met with firmer adhesions. Abdominal incision six inches long. Wound closed with interrupted silk and catgut sutures; irrigation and drainage. Operation one hour and thirty minutes. Shock was profound, but the patient rallied and convalesced uninterruptedly.

CASE IX.—*Vagino-Abdominal Hysterectomy for Subinvolution and Fixation of the Uterus, with Cystic Degeneration of the Ovaries.*—Mrs. W., æt. 32; referred to me by Dr. Raymer, of Beaver Falls, Pa. One child. Cervix lacerated, uterus retroverted and fixed, with prolapse of the ovary. Patient much emaciated, very nervous, and could endure almost nothing.

Vagino-abdominal hysterectomy on June 15th, 1896.

Patient was walking about her room on the seventeenth day, and the temperature was never above 100° F. She has now recovered perfectly.

CASE X.—*Salpingo-Oöphorectomy for Gonorrheal Pyosalpinx.*—Mrs. W., æt. 40. Referred to me by Dr. J. H. King, of Ashland, O. Husband admits having had gonorrhea before marriage, and has a stricture at the present time. She has been an invalid for years, which dates back to an attack of pelvic inflammation. There is constant nausea and inability to eat anything except the most delicate food. Patient is much emaciated. Uterus retroverted and fixed, and left ovary under fundus.

Salpingo-oöphorectomy and ventral fixation on June 5th, 1896.

With the exception of an attack of cystitis induced by an unclean

catheter, convalescence was uninterrupted, and the patient is now fully recovered.

CASE XI.—*Small Cyst of Right Ovary with Secondary Involvement of the Appendix Vermiformis, Giving Rise to Complete Obstruction of the Bowel; Operation; Recovery.*—Patient æt. 28, married three months. I was called to see her by Dr. W. E. Sawyer, of Marion, on December 11, 1896. Thirty-six hours before I was called she was taken with symptoms of complete obstruction of the bowel, with great pain in the region of the stomach and persistent retching. Laparotomy was made the night of the above date in Dr. Sawyer's sanitarium. Short incision in median line. The appendix vermiformis was four inches long, the size of the little finger in thickness, and completely encircled the cecum, to which it was adhered in such a way as to cause complete obstruction of the bowel. The bowel was completely collapsed below the cecum, and greatly distended above it. The uterus was retro-displaced. The right ovary had undergone cystic degeneration, was the size of a hen's egg, and was prolapsed into the cul-de-sac of Douglas. The appendix was transfixed and amputated, and the stump covered with peritoneum. The right ovary and tube were removed, and the wound closed with catgut.

Patient never vomited after operation, and convalesced uninterruptedly.

CASE XII.—*Salpingo-Oöphorectomy for Tubo-Ovarian Abscess; Tuberculosis of Ovary and Tube; Removal of a Small Fibroid from Fundus; Fixation of Uterus in Front; Recovery.*—Mrs. C., æt. 40. Referred to me by Prof. Eliza J. Merrick, Cleveland. Has been an invalid for years; much pain in pelvis, and great pressure and distress in bladder at times. Married for seventeen years, and no children (conception prevented). Six or seven years ago was threatened with phthisis. One brother had both testicles removed for tuberculosis. Consumption on maternal side. Dysmenorrhea; the menses not excessive. Able to do housework, but is wretched most of the time. Examination made under chloroform on September 25th. Uterus had a mass projecting from it on right side; indefinite mass on left side, exquisitely sensitive without an anesthetic. Vomited for forty-eight hours continuously after this examination, and was very sore through abdomen.

Operation on September 29, 1896, under ether. Mass on left side was much less distinct than it was on making first examination. Divulsed, curetted and packed uterus with gauze; rectum also divulsed. Patient was then placed in the Trendelenberg posture, and a long central incision made. The mass on left side proved to be an abscess

of the ovary the size of an orange, which had ruptured (probably at first examination). The hips were lowered, the pelvis cleaned of pus, and the intestines protected with gauze pads. Left tube and ovary removed close to uterus, being tied off with catgut. A fibroid the size of a hen's egg removed from side of right uterine cornu, and the wound closed with successive layers of buried catgut. The uterus was fixed to anterior abdominal wall with two chromicized catgut sutures. There was much oozing from suture tracts in uterus, in order to control which it was necessary to encircle them with another ligature. Abdomen washed with normal salt solution. Wound closed with interrupted silk. Time of operation one hour and thirty minutes.

Patient convalesced uninterruptedly, and has quite regained her health.

CASE XIII.—*Salpingo-Oöphorectomy and Ventral Fixation of Uterus for Retroflexion; Prolapse of Ovary and Intractable Dysmenorrhœa.*—Patient æt. 35, unmarried. Referred to me by Dr. Eicher, of Norwalk, O. Had been an invalid for fourteen years. First menstruated at thirteen, and suffered a great deal of pain at that time; period lasted seven days. The next period occurred eight weeks later, at which time the suffering was so great that she was confined to her bed for the entire week. Menstruation has always been irregular, occurring every seven, eight or nine weeks, and once she went for four months. Blood is dark and clotted. At the present time she suffers severe pain in the right ovarian and lumbar regions, back and top of head, and through eyes.

On September 24, 1896, the abdomen was opened at the clinic of the Cleveland Medical College. The right ovary was prolapsed and partially calcified. The left ovary was cirrhotically degenerated. Both ovaries and tubes were removed, the pedicles being tied with silk. The fundus was fixed to the anterior abdominal wound with two chromicized catgut sutures, which were passed through the fascia and peritoneum on either side of the wound.

Convalescence uninterrupted and complete, and the patient is now earning her living (March, 1897) by doing housework.

CASE XIV.—*Polypus of Uterus Associated with Abscess of Right Ovary; Celiotomy; Recovery.*—Patient æt. 40, professional nurse. Has suffered more or less pelvic distress for some years, but has been able to attend to her duties. She consulted me for a mucous polypus, the size of a walnut, projecting from the cervix. On examination I found a mass in the posterior fornix which was exquisitely tender.

Operation on January 22, 1897. Polypus removed; uterus curetted

and packed; abdomen opened in the Trendelenberg posture. Mass proved to be left ovary distended with pus, which ruptured in removal. The ovary was the size of a hen's egg, and was a mere shell. The right ovary was the size of a walnut, distended with blood, and adhesions were very firm. Normal salt solution irrigation with gauze drainage. Pedicles secured with catgut. Wound closed with silk. Convalescence uninterrupted and complete.

CASE XV.—*Celiotomy for a Large Pus Tube with Tumor of Corresponding Ovary; Papillomatous Degeneration of Opposite Ovary.*—Patient æt. 46. Referred to me by Dr. Dixon, of Akron, O. Invalid for four years. Tumor in hypogastric region, which has gradually increased during the last four months; much tenderness and pain. Examination without anesthetic revealed uterus and tumor solidly fixed in pelvis, no fluctuation. Tumor surface rough and indurated, and has the characteristics of a fibroid.

Abdomen opened on January 27, 1897. Tumor proved to be a pyosalpinx of left side; the corresponding ovary was as large as an adult head; tube firmly adherent to uterus and surrounding organs. Tumor packed away from intestines with gauze and towels, and cyst tapped with ovariotomy trocar, with the patient on her side. The sac was then freed from adhesions and tied off; one portion of the sac contained more or less watery fluid. The sac was filled with papillomatous masses. The right ovary had undergone complete papillomatous degeneration (Plate XXIV). The ovarian artery of the right side was calcareously degenerated. The abdomen was washed with sterile salt water; glass drainage. Catgut throughout for both pedicles, arteries and abdomen. Tube was removed at the end of twenty-four hours. Very little oozing. Recovery complete.

CHAPTER XLIX.

DISEASES OF THE UTERINE APPENDAGES (Continued).

Congestion of the Ovary.

Pain in one or in both ovarian regions is frequently met with, especially just before and during menstruation. This pain may be stinging or burning in character; or the patient will describe it as a dull, cutting or sickening sensation. It is oftener met with on the left side, and frequently radiates down the inner part of the thigh, or to the small of the back. It is usually worse some days previously to and during menstruation, and gives rise to that type of dysmenorrhea known as "ovarian." Menorrhagia is likewise a frequent symptom, though in time the menses may become scant rather than excessive. The condition is often associated with neurasthenia and nervous manifestations of various kinds. There is tenderness upon pressure over the side affected. Other symptoms are: headache limited to the vertex, pain under the breast of the corresponding side, constipation, flatulence and nausea and vomiting. In the worst cases there may be hysterical outbreaks and even hystero-epilepsy.

The lesion of the ovary giving rise to this group of symptoms is described by some authors as chronic ovaritis, and, probably, the congestion many times results in inflammation. However, the symptoms characteristic of true inflammation are often wanting. There is, to be sure, more or less enlargement of the organ, but the subjective symptoms come and go, and, if the ovary is removed, the evidences of actual inflammation are not found.

Pain of the character described is oftener due to simple congestion. When the ovary becomes surcharged with blood, its unyielding fibrous investing membrane prevents its expansion, and there is pain not unlike that resulting from orchitis. In severe cases hemorrhage into the Graafian follicles takes place, constituting so-called *hematoma of the ovary*. The pain is brought on and is made worse by any cause giving rise to pelvic congestion. Immoderate coitus, the various expedients resorted to for preventing conception, constipation, ungratified sexual

desire, irritation of the uterus or of the cervix—any or all of these causes may result in simple congestion of the ovary, which stops short of actual inflammation.

In the *treatment* of ovarian congestion it is necessary, first of all, to remove the cause or causes which tend to perpetuate the mischief. Rest is important. Long continued standing or walking should be avoided; running the sewing-machine is responsible for many cases of ovarian congestion and inflammation. It is better for the patient while undergoing treatment to live *absque marito*, though nothing more fortunate could befall her than pregnancy, for utero-gestation followed by lactation is the nearest approach to physiological rest which can be given the ovary. Unfortunately, most women thus affected are sterile. Constipation should be overcome and the hot douche administered once or twice a day. Two or three times a week a galvanic current of from fifteen to twenty milliampères should be passed through the parts, with the positive pole within the vagina. This should be followed by the introduction of a boro-glycerid tampon medicated with the fluid extract of belladonna or ichthyol. External applications of chloroform liniment or a liniment composed of equal parts of aconite, arnica and ether, are often useful. Internally, belladonna, apis, cimicifuga, lilium tig., lachesis, collinsonia and bryonia are the remedies oftenest indicated.

Prolapse of the Ovary.

Non-adherent prolapse of the ovary is due, in nearly all instances, to chronic ovarian congestion or inflammation. Displacement of the ovary frequently results from pelvic adhesions and contractions. One or both ovaries may be prolapsed, though the left, for obvious reasons, is the one oftener displaced. The symptoms of this accident are sufficiently urgent to call for special consideration.

Symptoms.—Ovarian prolapse is, as a rule, associated with retrodisplacement of the uterus. There are few complications more difficult to contend against, without resorting to radical measures, than a retroflexed fundus under which is a prolapsed ovary. The condition gives rise to pain upon walking which is of a sickening, throbbing character, and is especially aggravated by stool. It is located in the inguinal or sacral region and extends down the thighs. The paroxysm is frequently precipitated by some unusual effort, as jumping from a carriage. Dyspareunia of a most distressing character is likewise caused by the displacement. The mental and nervous symptoms do not differ from those described under the head of chronic congestion of the ovary.

Diagnosis.—The peculiar sickening character of the pain, aggra-

vated as it is by walking, stool, and sexual intercourse, will suggest the cause of the difficulty. Upon making a digital examination a small almond-shaped tumor will be found in the posterior fornix which, when pressed upon, is exquisitely tender, and gives rise to a sickening sensation in the epigastric region, and sometimes to actual vomiting. If not adhered, it can be pushed out of the cul-de-sac. The excessive tenderness will serve to differentiate a displaced ovary from a small pedunculated fibroid. It can be distinguished from a retroflexed uterus by passing the sound. Fecal masses felt through the posterior fornix pit upon pressure.

Treatment.—The various measures having for their object the relief of pelvic congestion should be applied. If the uterus is retro-displaced, this should be reposited and a suitable pessary fitted. Unfortunately, the position of the ovary will not often permit the use of a Hodge pessary. Sometimes an air pessary (Fig. 174) will be tolerated when no other form can be worn. The knee-chest posture frequently resorted to is of much value, as are also hot douches and properly applied tampons. A soft lambs-wool tampon placed in the posterior fornix while in the knee-chest posture, medicated with ichthyol or belladonna, is often the only form of support which the patient can endure.

The general measures recommended for ovarian congestion may be tried. Unfortunately, after the organ has been prolapsed for some time, it is exceedingly difficult to effect a cure without permanently fixing the uterus in front. The condition gives rise to so much distress and suffering that, after all ordinary measures have been exhausted, the physician is justified in performing laparotomy, removing the offending organ, and, if the uterus is retro-displaced, holding the fundus in front by some one of the operative procedures recommended for that purpose (*v.* Chapter XXXVI). Laparotomy is almost always necessary when the displaced ovary is buried in inflammatory exudates.

Ovarian Neuralgia (Ovaralgia).

Ovarian neuralgia, or ovaralgia, may be due to a number of causes. Of these the so-called neuralgic diathesis is first to be mentioned. This means, in most instances, some depravity of the system, the result either of improper food, excessive tea-drinking, or undue exposure. Ludlam is of the opinion that daughters of rheumatic fathers inherit a special tendency to ovaralgia. Undue sexual excitement, disease of the uterus, and traumatism are other causes worthy of consideration. The affection is a frequent manifestation of hysteria.

Symptoms.—The patient is suddenly seized with an acute paroxysm of pain of a most intense character. It is oftener limited to one ovary, though it may implicate both. Like all ovarian pain, it frequently extends down the corresponding thigh. There is no chill, no fever, and no constitutional disturbance. The paroxysms come on without premonition, and ordinarily leave quite as suddenly. This is characteristic of neuralgias in general. The left ovary, because of its close proximity to the rectum, and because also of the disposition of the ovarian vein on this side, is oftener affected than the right. The attacks of pain may be followed by hemi-anesthesia of the corresponding side, or they may be associated with hystero-epileptic seizures.

Diagnosis.—The absence of constitutional disturbance, the erratic character of the pain, the diathesis of the patient, and the absence of sequelæ will differentiate the condition from ovaritis.

It may be mistaken for *hysteralgia* or neuralgia of the uterus. The latter affection is due, in at least ninety-five per cent. of all cases, to fluid finding its way into the uterine cavity through the cervix. The pain resulting from hysteralgia is more central, and is not of the peculiar sickening nature which characterizes all ovarian lesions.

Treatment.—The curative treatment must be directed to the diathesis. If there is anemia, chlorosis or malaria, these should receive attention. Nutritious food and proper exercise are important. Any sexual irregularities should be corrected. Nearly all neuralgic patients are exceedingly sensitive to sudden temperature changes, and, therefore, should go warmly clad. Ludlam recommends that the lower part of the abdomen be protected by an extra layer of flannel.

During the paroxysm the pain is to be relieved by the hot douche or sitz-bath. Hot external applications are extremely gratifying. If the rectum is distended with fecal matter it should be emptied. During the interval between the paroxysms a galvanic current of from fifteen to twenty milliampères, used twice or three times a week, will often put a stop to the attacks. It relieves the congestion of the ovary, which is so frequently present, and acts as a local sedative. If the galvanic current fail faradization with a high tension secondary current should be tried; or both may be used at the same sitting.

Therapeutics of Ovarian Congestion and Neuralgia.

Apis mel.—*Stinging pains in ovaries;* enlargement of the right ovary, with cough; aggravation after sexual intercourse.

Bryonia.—Soreness of right ovary, causing irritation and dragging pains, extending down the thighs; ovaritis with rheumatic affections;

shooting pains extending toward the hips; *all symptoms aggravated by motion.*

Belladonna.—Enlargement of the right ovary, *with pressure downward, as if everything would drop out of the vulva;* pains come and go suddenly, and are circumscribed, stabbing or darting in character; CEREBRAL DISTURBANCE AND SPASMS.

Naja.—Ovarian neuralgia, with violent palpitation of the heart; cramp-like pain in left ovary; thin, whitish leucorrhea; languor and fatigue; *organs seem to be drawn together, especially the ovaries and heart.*

Colocynth.—Stitches in ovaries; diarrhea; colic; pressure in abdomen; *intense boring pain in ovary, causing her to draw up double.**

Cimicifuga.—*Ovarian irritation with irritable uterus;* hysterical symptoms; *rheumatism;* dysmenorrhea or amenorrhea.

Bromide of ammonium.—Ovarian neuralgia; uterine hemorrhage from ovarian irritation or inflammation; dull, constant pain and hard swelling in left ovary.

Hamamelis.—*Ovaritis following traumatism;* soreness of ovaries extending all over abdomen; ovarian affections, with swelling and tenderness, worse at time of menses.

Lilium tig.—Stinging, darting, cutting pains in left ovary, with sensation of swelling and tenderness on firm pressure; *sympathetic cardiac disturbance;* pain extends down corresponding thigh.

Ustilago.—Pain in right ovary, with metrorrhagia; burning pain in the ovaries shooting down the limbs, especially left; neuralgic pains.

Iodium.—*Chronic congestion, with induration and enlargement of ovary;* pressing, dull, wedge-like pain from right ovary to uterus and through sexual organs; great sensitiveness in right ovarian region during or after menses; *atrophy with sterility.*

Consult:—Gelsemium, cactus grand., cantharis., *graphites*, lachesis, ferrum, *platina, mercurius*, and mag. phos.

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* "The characteristic pain in the colic of *Colocynth* may be transferred elsewhere. I remember once of curing a lady of ovarian colic, from which she had suffered for three years, with colocynth. The pains were griping, and were relieved by bending double. There were no organic changes. Two cases of ovarian tumor have been reported as cured by colocynth administered on this symptom."—*Farrington.*

CHAPTER L.

ECTOPIC PREGNANCY.

Definition.—Dr. Robert Barnes originated the term, ectopic pregnancy, to signify the development of the impregnated ovum at some point without the uterine cavity. I adhere to this term because, as suggested by Tait, "it gives a convenient and very complete definition without expressing any theoretical explanation of the condition." Other terms which have been put forth to signify the accident are, extra-uterine pregnancy and extra-uterine gestation.

A careful review of modern medical literature will clearly indicate the importance of the subject. I know of no trustworthy statistics showing the relative frequency of ectopic pregnancy as compared with normal gestation.* Of course, data of the kind, were they accessible, would indicate a very small proportion of ectopic pregnancies as compared with normal intra-uterine gestation; nevertheless, the accident is not an infrequent one, as every specialist who has to do with abdominal surgery well knows.

In reviewing the literature of ectopic pregnancy one is almost overwhelmed with its vastness. The last ten years, and especially the last five, have been most prolific ones in the creation of a special literature treating of the accident. Indeed, it seems almost useless to undertake, in a short chapter, to present even a résumé of it; and by some it may even be urged that the subject does not belong to gynecology at all. I cannot share this view. It belongs most decidedly and emphatically to the abdominal surgeon whether his line of work is chiefly in the direction of gynecology or of obstetrics. I think that most obstetricians will admit that gynecology has done much more toward the development of abdominal surgery than has obstetrics. I therefore deem no extended apology necessary for including in this work a chapter devoted to ectopic pregnancy.

Varieties.—Much confusion has been created by the innumerable

* Dr. Joseph Price (*American Journal of Obstetrics*, December, 1892) presents statistics bearing upon this point, but he himself admits that they are valueless. Formad found 35 ectopic pregnancies in 3,500 general autopsies.

subdivisions and varieties presented by various authors. Tait, with his usual clearness of conception and love for simplicity of classification, presents the following:—

SCHEME OF ECTOPIC GESTATIONS (IN TUBO-OVARIAN TRACT).

I.—Ovarian, possible but not yet proved.

II.—Tubal, in free part of tube, is (*a*) contained in tube up to fourteenth week, at or before which time primary rupture occurs, and then the progress of the gestation is directed into either—

(*b*) Abdominal or intra-peritoneal gestation, uniformly fatal (unless removed by abdominal section), primarily by hemorrhage, secondarily by suppuration of the sac and peritonitis; or,

(*c*) Broad ligament or extra-peritoneal gestation. This may—

(*a*) Develop in the broad ligament to full time, and be removed at viable period as living child;

(*b*) Die and be absorbed as an extra-peritoneal hematocele;

(*c*) Die and suppurating ovum may be discharged at or near umbilicus, or through bladder, vagina or intestinal tract;

(*d*) Remain quiescent as lithopedion;

(*e*) Become abdominal or intra-peritoneal gestation by secondary rupture;

III.—Tubo-uterine or interstitial is contained in part of tube embraced by uterine tissue, and, so far as is known, is uniformly fatal by primary intra-peritoneal rupture (as *b*) before fifth month.

While the foregoing classification possesses the merits of simplicity, it is necessary to state that it is not in harmony with the teachings of most modern authorities. Tait admits the possibility of ovarian pregnancy, but claims that its existence has not yet been proved. On the other hand, the majority of writers accept the recorded testimony of Parry, Kammerer,* Porter,† Larsen ‡ and others, as proving conclusively that ectopic pregnancy may be located within the ovary. Again, the scheme implies the inevitable rupture of the tube before the fourteenth week of gestation; that it is impossible for pregnancy within the tube to progress to term without rupture in one of the directions indicated. In refutation of this statement many cases are recorded showing that it is entirely possible for gestation to continue to full term without such rupture. Pozzi states that at least twelve cases of tubal pregnancy at term are known. Finally, the teaching that all cases of abdominal pregnancy are secondary (*i. e.*, result either from rupture of the Fallopian tube directly into the abdominal cavity, or rupture of

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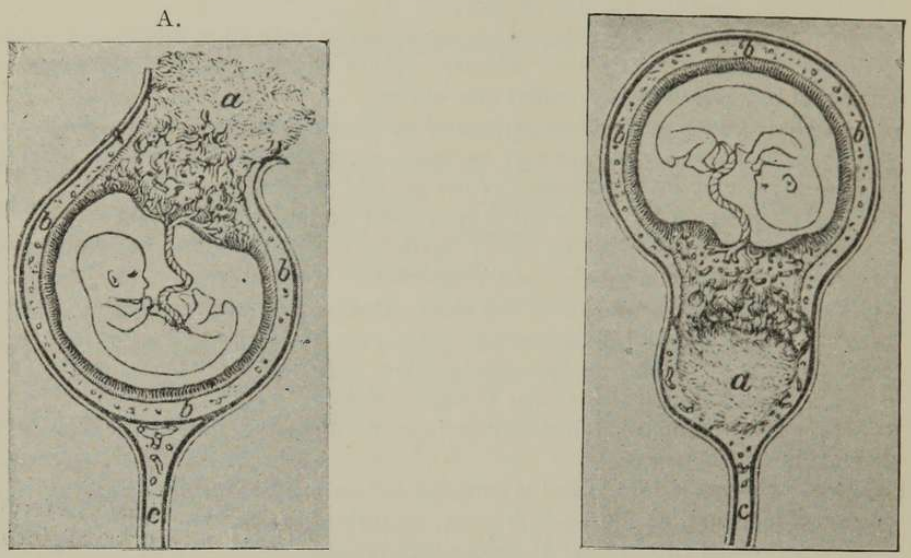
* *v.* "Illustrative Cases."

† Am. Journal of Med. Sciences, January, 1853.

‡ *v.* "Illustrative Cases."

the tube first into the folds of the broad ligament and then into the abdominal cavity) is contended against by some of the best and most original investigators. Tait bases his assertion upon his large experience as an operator, which, it will be admitted by all, is most val-

FIG. 257.



DIAGRAMMATIC SECTION OF FALLOPIAN TUBE, REPRESENTING THE TWO DIRECTIONS OF RUPTURE.

A. Into the peritoneal cavity. B. Into cavity of the broad ligament. *a*. Clot at point of rupture. *b*. Wall of Fallopian tube. *c*. Cavity of the broad ligament, with folds separated by hemic effusion, *a*. (*Tait.*)

uable evidence. He maintains that the peritoneal cavity is inimical to the life of an ovule, whether impregnated or not; that the serous membrane will quickly digest and absorb an early ovum which comes in contact with its surface. It is, then, according to Tait, both physiologically and pathologically impossible for an abdominal pregnancy to have its origin in this way. Other observers, on the contrary, teach that it is not only entirely possible, but altogether probable, that the spermatozoa and ovules may remain in the peritoneal cavity for a long time without losing their vitality. Lecluyse records a case of abdominal pregnancy which occurred through an unclosed opening in the uterus after Cæsarean section; and Koeberlé one which occurred through a patulous cervical canal which remained after hysterectomy for myoma. Keller met with a case of abdominal pregnancy two years after an almost complete hysterectomy (Greig Smith).

Tubal abortion is a term applied to that condition where the ectopic

ovum is extruded through an unclosed abdominal ostium of the Fallopian tube without rupture. Tait's classification does not include this termination. Tubal abortion usually occurs early and the ovum frequently escapes detection. The resulting intra-peritoneal bleeding is, as a rule, profuse and often fatal.

This much in the way of introduction and to guard the reader against accepting *in toto* the teachings of Tait. Although Tait speaks dogmatically, he has the right to do so. His experience as an abdominal surgeon is both unique and remarkable. He does not reason from the standpoint of a theorist, but rather from that of one who is thoroughly familiar with his premises.

If, then, we accept the classification given, we have to do with but three primary varieties of ectopic pregnancy—ovarian, tubal, and tubo-uterine or interstitial. The secondary varieties are, abdominal and intra-ligamentary.

For all practical purposes this classification is sufficient, though not absolutely correct. The exceptions noted are practically pathological curiosities. In dealing with suspected ectopic pregnancy, it is quite enough, during the early period of gestation, for the clinician to locate the fetus without the uterine cavity. Nicety of diagnosis, as regards its exact location, is insisted upon by the "arm-chair" theorist rather than by the practical surgeon.

Etiology.—The greatest confusion prevails regarding the causes of ectopic pregnancy. This is not strange, inasmuch as many points pertaining to the physiology of normal menstruation and conception are as yet unsettled. Tait teaches that the uterus alone is the seat of normal menstruation and conception; that the ciliated lining of the Fallopian tubes prevents spermatozoa from entering them and facilitates the progress of the ovule into the uterus; and that the chief object of the plications and crypts of the uterine mucous membrane is to lodge and retain the ovule until it is impregnated, dies, or is discharged. Anything, therefore, which interferes with the function of the cilia of the tube may not only interfere with the passage of the ovule into the uterine cavity, but may permit spermatozoa to enter the tube and impregnate the retained ovule.

Bland Sutton* holds this view to be mere speculation, though admitting that it contains some elements of truth. Sutton, however, maintains that it does not explain all cases. He contends also that the usually accepted doctrine that the tubes are normally the meeting place

*London Lancet, February, 1891.

of the ova and the spermatozoa in the human family is pure conjecture. He has devoted much thought and research to the subject. "In the first place," he says, "salpingitis so severe as to promote destruction of the tubal epithelium causes such profound changes in the tubes as to lead to stricture and complete occlusion of the abdominal ostia. It is exceedingly rare to meet in tubes denuded of their epithelium patent abdominal ostia." He further affirms that a careful microscopic examination of several specimens of very early tubal pregnancy failed to disclose any evidence of loss of epithelium, or of old salpingitis.

While in the light of the present conflict of opinion, due modesty of opinion regarding the causes of the accident is most becoming, the probability of preëxisting tubal disease acting as a causative factor, in at least a goodly number of cases, must be admitted. Ectopic pregnancy occurs oftener in women who have never had children, or who, after having had one or more, have gone for a long time without again becoming pregnant. There is, in the language of Tait, a seeming "inaptitude" for conception, and a careful inquiry into the history of these cases will often elicit preëxisting symptoms of more or less pelvic distress, which are at least suggestive of tubal disease.

To make ectopic pregnancy possible, the spermatozoa must find their way beyond the uterine cavity into the Fallopian tube, for of course it is most improbable that an ovule after impregnation will pass from the uterine cavity again into the tube. This much is certain, and from a practical standpoint it matters but little whether the point of contact of the spermatozoa and the ovule is within the tube, the ovary, or the abdominal cavity. Any disease interfering with the passage of the ovule into the uterine cavity will, therefore, predispose to ectopic pregnancy. Of the various affections, preëxisting inflammation, especially salpingitis, with destruction of the ciliated epithelium, is undoubtedly the one most frequently responsible for the accident. Adhesions and malpositions of the tubes, obstructions from polypi, erosion, etc., must also be noted as probable mechanical causes. It is not difficult to comprehend an occlusion of the tube sufficiently great to prevent the passage of the ovule into the uterine cavity, thus causing it to lodge at some point within the tube, while permitting the passage of spermatozoa upward. The mucous membrane of the tube is very like that of the uterus, and since the ovule cannot find its way into the uterine cavity, it accommodates itself to the unnatural site, the Fallopian tube making a vicarious effort to care for it.

To conceive of other causes than inflammation as giving rise to the accident, requires no great stretch of the imagination. The effect of

moral and mental emotions in arresting the downward progress of the ovule is at least worthy of consideration. When it is remembered that excessive joy, grief or fright may arrest or bring on menstruation, may arrest labor pains or precipitate labor, it is not difficult to comprehend that such emotions may arrest the ovule at any point within the genital tract, or, indeed, may so reverse the action of the cilia as to convey spermatozoa entirely through the Fallopian tube into the abdominal cavity. Nor must we ignore the part played by traumatism, by uterine displacements, by tumors of various kinds, and, indeed, by those blood changes which so often exert a potent influence for evil upon all of the pelvic organs.

Ectopic pregnancy may complicate normal pregnancy. Two interesting instances of this kind have recently been recorded. Hertzfeld* delivered a woman, aged thirty-three, of her third child. The unusual size of the abdomen after labor led to the detection of a second living fetus without the uterine cavity. Laparotomy was performed, and the child, which died before the operation was commenced, extracted. Hertzfeld considered this to be a case of true ovarian pregnancy, basing his belief upon the fact that the right tube presented no evidences of solution of continuity. The funis was attached to the uterine adnexa, and the appendages of the opposite side were in every respect normal.

Byford† has removed a small lithopedion from each tube at one operation. Worrall‡ removed, at the Sydney Hospital (N. S. W.), a fetus weighing nearly five pounds from a woman whose uterus contained a living child. The operation precipitated a miscarriage, both children perishing, though the mother recovered.

Pathology.—Pathological changes will vary according to the location of the fetus. The uterus in all cases takes on an increased vascularity, and its mucous membrane, in anticipation of normal pregnancy, forms an imperfect decidua. The inner surface of the decidua shows no evidences of the attachment of the ovum, though its outer surface has chorionic villi. These will serve to distinguish the decidua of ectopic pregnancy from the membrane characterizing membraneous dysmenorrhea.

The nearer the ectopic pregnancy is located to the uterus the more marked will be the changes within this organ. The tube takes on hypertrophic changes because of its increased turgescence and vascularity. In *interstitial pregnancy* the walls of the corresponding

* Le Bulletin Médical, Paris, April, 1891.

† Manual of Gynecology, 1895, p. 463.

‡ Medical Press and Circular, London, March, 1891.

side become decidedly thickened, and the whole organ is markedly increased in size. In *Fallopian pregnancy*, on the other hand, and especially if the ovum is lodged near the fimbriated extremity of the tube, the increase in the size of the uterus is not so great. Admitting the possibility of *ovarian pregnancy*, it is probable that, were it to occur, the vascularity of the uterus would be even less than in Fallopian pregnancy proper. In all forms of ectopic pregnancy the size of the uterus never corresponds to the period of gestation, although it always undergoes certain hypertrophic changes. In the early months of gestation a corpus luteum is usually present. Strangely enough, it is sometimes located in the opposite ovary.

In *abdominal pregnancy* the sac may be composed either of the ovular membranes alone, or in addition to these an adventitious membrane, the result of peritoneal irritation. The *modus operandi* of the formation of this adventitious membrane does not differ materially from that enclosing an intra-peritoneal hematocele due to any cause.

In abdominal pregnancy, whether primary or secondary, the fetus is sometimes found without any encysting membrane of any sort. It is claimed by Tait, as has been shown, that this form of pregnancy (abdominal) is of exceedingly rare occurrence; that a rupture into the free peritoneal cavity, whether primary from the tube or secondary from the folds of the broad ligament, is almost invariably fatal unless an operation is at once resorted to. As an exception to this rule he cites the now famous Jessop case, in which the fetus was not encapsulated, but was absolutely free in the peritoneal cavity. In Jessop's case, Tait believes that the ovum was primarily within the Fallopian tube; that a rupture occurred at the tenth week, the ovum escaping into the right broad ligament; and that a secondary rupture took place at the seventh or eighth month, the fetus then escaping into the peritoneal cavity, where it continued its life amongst the intestines. The placenta was found "plastered over the pelvic contents." Instances where the fetus is found in the free peritoneal cavity with absolutely no investing membrane are not of common occurrence. I think, however, that the case of my own, (Plate XXXI) can be placed side by side with Jessop's case.

The placenta may be attached to any, or, indeed, to all of the pelvic and abdominal organs. In broad ligament cysts it is often attached to all of the pelvic contents; at other times it may be found in intimate contact with some portion of the abdominal walls, the intestines, or the omentum. In my own case of intra-peritoneal pregnancy, it was utterly impossible to define its attachments.

The position of the uterus will depend upon the location of the ectopic cyst. When within the folds of the broad ligament it is pushed to the opposite side and upwards; when in the cul-de-sac of Douglas it is carried forward and above the pubes; and in the rare instances in which the cyst is located in front of the uterus, the organ is pushed backward.

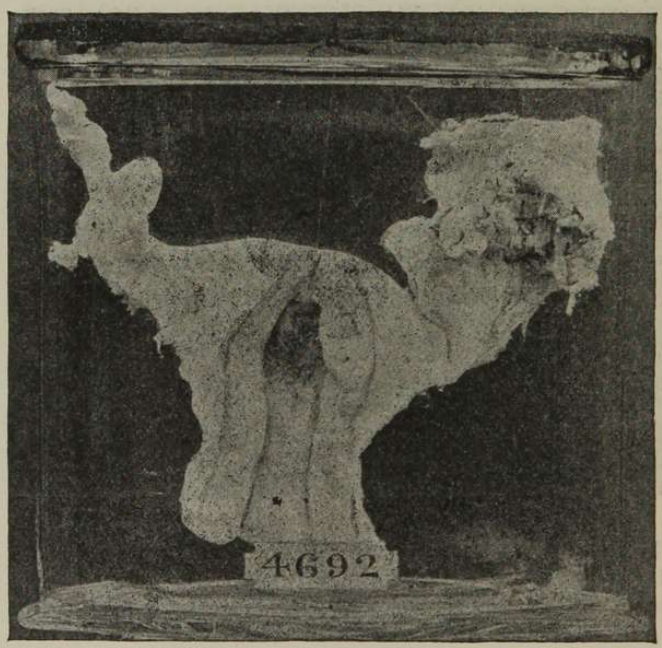
FIG. 258.

A UTERUS AND ITS APPENDAGES, SHOWING GREAT DILATATION OF THE RIGHT FALLOPIAN TUBE, WHICH CONTAINS A FETUS OF ABOUT THE THIRD MONTH. (*Museum R. C. S. Photographed by the Author.*)*

* "From a woman, aged 22, admitted into hospital with severe pains in the hypogastrium, of a month's duration. Had menstruated regularly. A hypogastric tumor was discovered; it appeared to contain fluid and to be surrounded by large pulsating vessels. Because of the peculiar discoloration of the inner aspect of the vulva, pregnancy was suspected. The tumor was tapped *per rectum* with an aspirator, and a pint of bloody fluid was thus removed. A styptic solution was injected to control hemorrhage and at once drawn off. The patient died suddenly four days later, having passed a decidua on the third day. Blood was found diffused over the peritoneum and issuing from an aperture in the upper part of the back of the tubal cyst."—*Dr. C. H. F. Routh.*

After the death of the fetus the cyst and its contents take on marked changes. In the vast majority of cases the fetus undergoes decomposition and suppuration. Occasionally, however, the liquor amnii is absorbed and the cyst shrinks. The fetus may also undergo calcareous degeneration and become converted into a lithopedion (Plates XXXIII and XXXIV); it may be transformed into a peculiar matter termed adipocere (a union of fatty acid with ammonia); or it may become mummified and indurated from absorption of its fluids. In rare instances it remains for an almost indefinite period unchanged. When the cyst undergoes degeneration it usually becomes attached to some of the surrounding organs; if to the vagina or bladder or the intestinal canal, its contents may be discharged through one of these channels after disintegration, or they may escape externally through the abdominal wall.

FIG. 259.



A UTERUS WITH THE FALLOPIAN TUBES AND OVARIES.

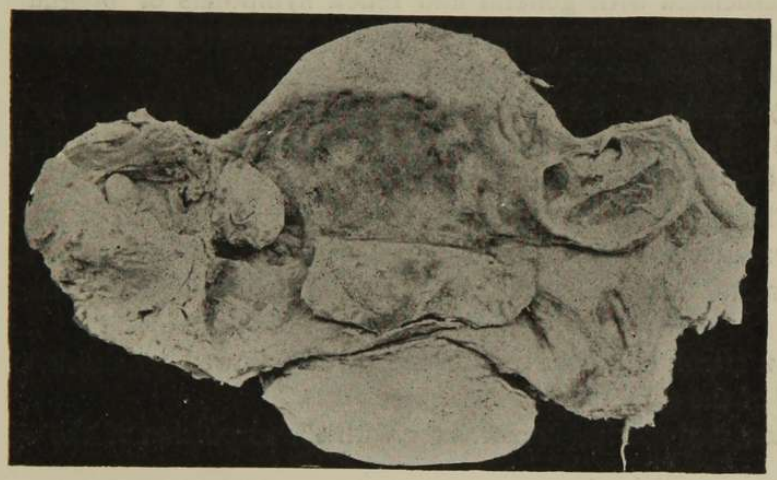
The right tube is laid open and contains a fetus about an inch in length, with the extremities just budding. There is a large corpus luteum in the right ovary which is not shown in the illustration. (*Museum R. C. S. Photographed by the Author.*)

Tait asserts that in tubo-interstitial pregnancy rupture invariably occurs into the peritoneal cavity. The case coming under my own observation, whose record I append to this chapter, is, I believe, one of

interstitial pregnancy in which the rupture occurred into the uterine cavity. Similar cases are recorded by Parkes, Monteil, Hodge, Mundé, Thomas, and others.

Symptoms.—In by far the larger number of instances the existence of ectopic gestation is not suspected until the symptoms of rupture present themselves. Very pretty clinical pictures of the early symptoms are put forth in most of the text-books, which, if in harmony with the facts, would enable the physician to diagnose ectopic gestation with but little difficulty. Unfortunately, clinical manifestations often occur with an obstinate disregard for set rules. This is preëminently

FIG. 260.



A UTERUS WITH ITS APPENDAGES.

The fimbriated extremity of the left Fallopian tube is dilated into a thick-walled cyst two inches in diameter, which contains a fetus three-quarters of an inch long, with its membranes and placenta. The right ovary is cystically degenerated. Covering the peritoneum which invests the back of the uterus is a thick layer of decolorized fibrin which is partially turned down. (*Museum R. C. S. Photographed by the Author.*)*

* "From a lady aged 31, the mother of three children. Four months before her death she ceased to menstruate; two months later an attack of severe hypogastric pain and collapse occurred, and in eight days a perfect decidua was discharged. This was followed in a few days by a second attack of pain in the hypogastrium, and a swelling above and to the left of the vagina was detected. She died within ten minutes of a third attack. Three thin layers of coagula were found in Douglas' pouch: the deepest, displayed in this specimen, most probably represents the first attack of hemorrhage; the middle layer was decolorized, but soft, and may have been the result of the second attack; the third was soft and dark red, evidently quite recent." (See "Trans. Obstet. Soc.," Vol. XXI., p. 169.)—*Albert Doran.*

true with the accident under consideration. A careful review of the clinical history, after rupture, will usually disclose the preëxistence of more or less pelvic distress, associated, possibly, with amenorrhea or irregular hemorrhages from the uterus; yet how many women suffer from quite as much distress and quite as decided irregularity of the menstrual function because of other causes than ectopic gestation. It must, therefore, be understood that what is said regarding the symptomatology during the early months, and up to the period of rupture, is subject to innumerable exceptions. The symptoms may, however, be looked for in something like the following order:—

1. Very often a considerable period of sterility followed by general and reflex symptoms of pregnancy.

2. Associated with general and reflex symptoms of pregnancy are those of disordered menstruation—usually irregular uterine hemorrhage attended by severe pelvic pain.

3. Symptoms of pelvic inflammation, especially marked by tenderness in one or the other iliac region. The tender area is frequently the seat of irregular spasmodic pains.

4. The presence of a pulsating tumor in the region of one or the other broad ligament, which is dense, sensitive and continues to grow.

5. Lateral displacement of the uterus, which is slightly enlarged but empty.

6. An attack ot severe pain in the pelvis followed by shock, collapse and all of the symptoms of hematocele.

7. Renewed uterine hemorrhage with the expulsion of the decidua, wholly or in part.

A clinical history such as the foregoing would, if presented entire, make the diagnosis very certain. I know of no means, however, whereby the average woman, otherwise healthy, can be made to consult her physician previously to the period of rupture, much less to subject herself to a careful physical examination. If she be wise enough to adopt such a course, and there should be found at one side of the uterus a gradually growing tumor, possessing the characteristics given and attended by the symptoms enumerated, the patient should at least be carefully watched.

The condition most liable to be confounded with early ectopic gestation is a *retroflexed pregnant uterus*. Jaggard* reports a case of this kind in which the vaginal portion of the cervix was so much elongated, and the lower uterine segment so thin and compressible, as to occasion

*Journal Am. Med. Ass., January, 1891.

great doubt. To add to the confusion there were pain, hemorrhage, and the expulsion of a supposed decidua. The genu-pectoral posture cleared up the diagnosis. Had the fundus been adhered the confusion would have been still greater.

If the life of the fetus is not destroyed by the rupture, or if it continues to grow in the region where primarily located without rupture, the symptoms will become more marked as time progresses. After the heart sounds are heard there is, of course, no longer any doubt as to the existence of pregnancy; it then remains only to determine its variety.

As gestation advances the usual signs of pregnancy become more distinct. Irregular uterine hemorrhage may continue, especially if the decidua has not been entirely thrown off, for an indefinite period. The fetal heart sounds are often intensified because of the thinness of the intervening tissue. For the same reason the fetal movements are felt with greater distinctness than in normal pregnancy. After rupture, the spasmodic pains usually disappear for the time being, to recur, if the ovum survive, at a later period. They become unusually severe as gestation approaches term.

Physical exploration will reveal the uterus enlarged, but the increase in size does not correspond to the period of gestation. The cervical changes, although marked, are not as decided as in normal pregnancy. The entire organ is usually displaced laterally, upward, and forward. A tumor will be found in the posterior cul-de-sac, or in the region of one or the other broad ligament, and it is often possible to outline distinctly the fetal parts through the posterior vaginal wall.

Upon *inspection* the absence of symmetry of the abdomen is very noticeable—the enlargement being greater upon one side. The increase in the transverse diameter is especially prominent.

Palpation will indicate the superficial location of the fetus, though a reliance upon this sign is sometimes misleading. There is in this connection one source of error, alluded to by Parry and Tait, which may make the diagnosis very uncertain. I refer to extreme thinness of the abdominal and uterine walls in otherwise normal pregnancies. Such a case recently passed under my observation. The patient, æt. 27, was unmarried and had a kyphotic pelvis. The tissue intervening between the examining hand and the fetal parts did not seem much thicker than parchment. The distorted pelvis caused an irregularity in the abdominal enlargement which added greatly to the confusion. I first saw the case at the beginning of the eighth month of gestation, and remained in doubt as to the actual location of the fetus for four weeks, though making repeated examinations. At the beginning of

the ninth month the uterine tissues began to increase in thickness, and I succeeded in reaching the presenting part through the cervix, which, of course, determined beyond all doubt the presence of the child within the uterus. During the past year another similar case was brought to me for the purpose of having an operation, a diagnosis of ectopic pregnancy having been made by a surgeon of extended experience. Examination under ether revealed the fetus within the uterus, the uterine walls being so thin and distended as to make it impossible to locate the fetus without anesthesia.

In order to emphasize the importance of this point I cannot do better than quote in detail from Lawson Tait.* He says:—

"This condition of extreme thinness of the uterine walls, in a pregnancy perfectly normal in every other respect, is a point which has not yet received the notice it deserves. It is, however, of sufficiently common occurrence to be a source of difficulty and danger, and, therefore, I propose to say here what I have noticed about it, in the hope that it may draw the attention of some one engaged in obstetric practice who may be able to investigate it more fully. I can now recall eight cases in which I have been consulted concerning a supposed extra-uterine pregnancy, yet in which there was only an extreme thinness of the uterine walls. I have no record of three of the cases, but of the others I have more accurate data than mere recollection. The features of all of them have much in common, and the known histories of four quite established this. The ordinary symptoms of pregnancy were present in all of them, and in only one was there any doubt as to its existence. The question generally was: Is the child in the abdominal cavity? and sometimes I had great difficulty in persuading the gentlemen who brought the patients to me that the position of the child was normal. Save in one case—that seen by me with Dr. Whitwell, at Shrewsbury—there was a marked absence of the liquor amnii, so that the movements of the child could be seen and felt in a most striking manner. In the pelvis the finger came upon the presenting part of the fetus, as if it lay immediately under the mucous membrane; and it was only on very careful investigation that the attenuated cervix uteri could be made out, spread over the body of the child."

At the end of the normal period of gestation in ectopic pregnancy a *spurious labor* usually sets in. The pains are so much like those of natural labor that nothing wrong may be suspected until a physical examination reveals the unnatural state of affairs. They are intermittent

* "Diseases of Women and Abdominal Surgery."

and periodical in character. This spurious labor varies in duration from a few hours to two or three weeks. Occasionally it does not occur, but in most instances a careful inquiry into the history will reveal the fact that pains not unlike those of labor were present at or about the time fetal movements ceased to be felt. The pains vary greatly in severity, and it is their occasional trivial and fugitive character that causes the patient to forget ever having had them unless her memory is especially jogged. In most instances, however, they are sufficiently severe to cause most excruciating suffering.

A hemorrhage from the uterus usually accompanies the spurious labor. It is followed by a discharge much like that of the lochia.

It is probable that the fetus lives but for a short time after the occurrence of the false labor, and its death is to be accounted for by the changes which occur in the utero-placental circulation. Nature, even when working under great disadvantages, makes an effort to observe certain fixed laws. The time has come for fetal expulsion and cessation of the utero-placental circulation. The fetus, of course, cannot be expelled spontaneously, but the placental circulation can be cut off, and is, though gradually. How long after the full period of development the child can live is a mooted question; it is possible that, in certain cases, life may be maintained for some time after the end of normal gestation is reached.

After the death of the fetus it may undergo any of the changes which have been indicated under the head of pathology, though rarely does the system tolerate its existence for any length of time. An effort is usually made, sooner or later, to expel it through inflammation and suppuration. It is true that an encysted fetus is not incompatible with life, and, indeed, with a fair degree of health and comfort. The condition is, however, one never devoid of danger, for with the slightest provocation the cyst is liable to become inflamed and to undergo suppuration. In those rare instances where the fetus has been carried for years it is transformed into a lithopedion, or undergoes calcareous degeneration. (*v.* Plates XXXIII, XXXIV.)

Diagnosis.—Ectopic gestation is to be differentiated from—

Acute pelvic cellulitis and peritonitis;

Pelvic hematocele due to other causes than ectopic pregnancy;

Conception in a rudimentary horn of a double uterus;

Pelvic abscess;

Pyosalpinx;

Uterine myofibromata.

In *acute pelvic cellulitis and peritonitis* no history of pregnancy will

be elicited. There will be a history of inflammation, with the sudden formation of a tumor within the pelvis (within the space of a few days). The peculiar, spasmodic, colicky pains so characteristic of ectopic pregnancy are wanting; there are no mammary changes and the uterus is but slightly enlarged.

In *pelvic hematocele* due to causes other than ectopic pregnancy, it will many times be utterly impossible to make an absolute diagnosis. The absence of all preëxisting signs of pregnancy will at least lead the examiner to suspect that the source of the effused blood is some other than a ruptured extra-uterine pregnancy cyst, but, as I have already endeavored to show, these signs and symptoms are so often wanting in ectopic gestation as to make their absence of little value in determining the actual cause of the hematocele.

As a rule when rupture takes place into the free peritoneal cavity the pain is less severe, though the constitutional symptoms are more marked, than when the blood escapes into the folds of the broad ligament. Then, too, in the latter condition (pelvic hematoma) the tumor is circumscribed, it is fixed laterally, and frequently causes stricture of the rectum.

When conception occurs in one side of a *double uterus* certainty of diagnosis is oftentimes utterly impossible. The changes in the uterus are very much greater than is the case in ectopic pregnancy proper, and our chief reliance will have to be placed upon these changes.

In *pelvic abscess*, due to causes other than suppuration of an ectopic pregnancy cyst, there will be a clinical history of the primary lesion—inflammation, pyosalpinx, etc.

Pyosalpinx is, perhaps, oftener confounded with ectopic pregnancy than any other condition. None of the symptoms of pregnancy will, however, be elicited. Should the pyosalpinx rupture, the symptoms of shock and peritonitis are much the same, though the collapse is not as a rule nearly so profound as that which follows upon rupture of an ectopic pregnancy cyst. The early symptoms of sepsis are, however, more pronounced.

In *uterine myofibromata* there is no history of pregnancy. The tumors are painless. Their presence does not ordinarily give rise to spasmodic, colicky pains, and they do not grow with the same rapidity as does a cyst due to ectopic pregnancy. Should fibroids complicate intra-uterine pregnancy the confusion may be very great (p. 657). In none of the foregoing conditions is there a mass expelled from the uterus whose surface is covered with chorionic villi.

It is not often possible to determine the *variety* of ectopic gestation.

There are certain peculiarities, however, pertaining to each variety which are worthy of consideration. In *abdominal pregnancy*, for instance, the uterus will be found but slightly enlarged. Its size will not be increased as markedly as in the other two forms, and the child can be moved about in the abdominal cavity very much more readily than is the case when enveloped either by the tube or the folds of the broad ligament. In *tubal pregnancy* the enlargement will be more unilateral and the tumor somewhat separated from the uterus. Ballottement is much more distinct than in the abdominal variety. *Interstitial pregnancy* is the rarest of all forms. It gives rise to an irregular enlargement of the uterus and is intimately connected with it, though the organ will be found empty.

The diagnosis, *after the death of the child*, may present many difficulties unless, indeed, suppuration has already occurred and pieces of the fetus have been expelled through the bowel, vagina, abdominal wall, or bladder. The history of the case will ordinarily afford much valuable information. Patients believe themselves to have been pregnant, and, if they also relate a history of spurious labor followed by cessation of the fetal movements, the diagnosis is pretty certain. After the death of the fetus the abdomen decreases in size and the cause of the enlargement may be attributed to some other condition—ovarian cyst, fibroid tumor, cancer, etc. While the examiner should rely much more upon physical signs than upon the history given by the patient, the most careful physical exploration may fail to reveal the actual condition. If the symptoms of suppuration present themselves, the pus should be evacuated as soon as expedient and the remains of the fetus removed. This will, of course, clear up the diagnosis, and in most instances promote a cure as well.

Prognosis.—Ectopic pregnancy is always a serious condition. It is said that the abdominal variety is the most favorable of all, but even here the prognosis is quite bad enough. If rupture does not occur before the fourth month, there is strong probability that gestation will continue until term, at which time there is again the greatest liability to rupture. In the event of rupture, if it occurs into the free peritoneal cavity, the larger proportion of cases die as a result of the hemorrhage unless operative interference is immediately resorted to. Rupture into the folds of the broad ligament, as we have seen in dealing with extra-peritoneal hematocele, is a much less fatal accident.

After the death of the fetus, suppuration and blood-poisoning usually terminate life. It is true that a patient may carry an extra-uterine fetu for an indefinite length of time without serious inconvenience or dis-

tress, but this is a rare exception to the general rule, and she is never free from danger while so doing; a slight accident of any kind may excite suppuration.

It is true also that spontaneous recoveries are reported after suppuration had set in, the fetus being expelled piecemeal through some of the avenues already mentioned. That a few recoveries under these circumstances should have taken place only proves the physical endurance of some women; it certainly does not justify an expectant plan of treatment after the diagnosis has been made.

Treatment.—With the frightful mortality attending unmolested ectopic gestation confronting us, there is little need of argument in favor of some form of operative treatment. Death from hemorrhage, peritonitis, septicemia or exhaustion, is the termination in such a very large proportion of cases as to have caused a general acceptance of the proposition laid down by Werth to the effect that "Extra-uterine pregnancy is a malignant neoplasm and should be treated as such." A woman's life is in jeopardy as long as she carries an ectopic cyst, and the danger begins from almost the very inception of pregnancy. Even after the fetus has been transformed by degenerative changes into an "inert mass," the danger is very great. The treatment, therefore, is simply reduced to a question of *method* and *time* for operative interference.

The conflict of opinion that exists among modern authorities has to do largely with the management of the gestation when the patient's life is not immediately threatened by rupture or hemorrhage. In the treatment of ruptured cyst with active hemorrhage into the free peritoneal cavity the dictum of Stephen Rogers, enunciated as long ago as 1867, to the effect that "*The peritoneal cavity must be opened; the bleeding vessels must be ligated*,"* has become the guiding principle of all surgeons.

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* I desire again to call attention to the fact that the credit of this dictum belongs to the late Stephen Rogers, an American surgeon. The quotation given is taken from the "Transactions of the American Medical Association" for 1867, the essay (which fairly teems with suggestions which have now become recognized surgical principles) being reprinted in pamphlet form. In reviewing Lawson Tait's "Lectures on Diseases of the Ovaries," in 1888, I called his attention to Rogers' essay. A copy of the review falling into Mr. Tait's hands led him to write me thanking me for calling his attention to the essay of Rogers, of which he had never previously heard. I sent him my only copy, but he does not allude to it in his "Diseases of Women and Abdominal Surgery," which was given to the profession early in 1889, except in a quotation taken from Parry. Parry gives Dr. Herbert (also an American surgeon) the credit for first suggesting celiotomy to save a woman dying from

Previously to the period of primary rupture the questions, then, which confront the surgeon are: Shall the abdomen be opened and the cyst removed as soon as discovered? Shall measures be resorted to, having for their object the destruction of the ovum? Or shall the pregnancy be permitted to continue to term with the hope of delivering a living child through the abdomen?

1. *Shall the abdomen be opened and the cyst removed as soon as discovered?* As has already been intimated, ectopic pregnancy is not suspected in by far the larger number of cases until rupture occurs. If a fairly certain diagnosis can be made of an ovum within the Fallopian tube, or if the patient present symptoms which in themselves give rise to suffering sufficiently great to justify an exploratory operation, I think that the indications are clearly to open the abdomen, and, if an ectopic pregnancy cyst be found, to remove it at once. This I did in one of my recent cases and have no cause to regret the course pursued. The possibility of ectopic gestation continuing to term without interruption is so remote, and the maternal dangers are so great, as to make this course almost imperative. But let the uncertainties of diagnosis at this period be borne in mind. The surgeon who is governed in all cases by dogmatic rules will probably more than once open the abdomen to find that the tumor is not due to ectopic pregnancy, but to some other pathological condition. Since an exploratory incision in the hands of a skilled laparotomist under modern antiseptic methods is not a dangerous procedure, the mistaken diagnosis will ordinarily be followed by no bad results; and if the local symptoms are such as to simulate ectopic pregnancy, the disease, usually a pyosalpinx, can be removed. After the fifth month, if the fetus is dead, I think that an abdominal section should undoubtedly be made. There may be some question as to the advisability of celiotomy immediately after death occurs, *i. e.*, before the cessation of the utero-placental circulation. The majority of authors advise against the immediate operation because of the increased danger from hemorrhage. In its favor there is to be said that there is much less danger from peritonitis and septicemia, and since we have learned to control hemorrhage by gauze packing the danger from

early rupture of the cyst. Whether Mr. Tait has elsewhere acknowledged the bold teaching of Rogers (and it was indeed bold at that early date) I do not know. Parvin, and Thomas (the last edition of Thomas & Mundé) also mention the teachings of Rogers only in an incidental way. This rather surprises me, for, in the light of 1867, Rogers' radical arguments show him to have been a man of clear conception and great originality. Greig Smith in the last edition of his work on Abdominal Surgery (1896) refers to the essay of Rogers.

bleeding is reduced to a minimum. As soon as sepsis manifests itself, an operation is not only indicated but imperative.

I think, too, that even in those instances where the fetus has been transformed into a lithopedion, and tolerance of it is practically established, the danger of non-interference is much greater than is an operation for its removal. A "quiescent lithopedion," as shown by Tait, Campbell, Parry, and others, is of decidedly rare occurrence, and a woman is never for a moment safe while carrying within her abdomen any of the products of an ectopic gestation.

Other considerations calling for immediate operative interference are: suppurating fetal cysts, and pregnancy in a rudimentary uterine cornu. In the first instance, even though the cyst abscess is already discharging, the processes of nature must be hastened. In the majority of cases it is not necessary to open into the abdomen, the fistula indicating the preferable point for incision. When the fetus is within a rudimentary cornu the mortality in unmolested cases, according to the statistics of Bandl, is over seventy-seven per cent. Owing to the difficulty of obtaining a suitable pedicle, it is best to remove the entire fundus, as in Porro's operation.

2. *Shall measures be resorted to, having for their object the destruction of the ovum before laparotomy is performed?* It is a well-known fact that if the ovum perish during the early weeks of gestation it ordinarily gives rise to no further trouble. We have seen that it is altogether probable that when Fallopian pregnancy ruptures into the broad ligament, ovular death with absorption is the rule rather than the exception. This, at least, is the teaching of Tait and others of extended observation. We have seen, too, that it is utterly impossible, in by far the larger number of cases, to distinguish a broad ligament hematocele due to ruptured ectopic pregnancy from one due to other causes. Since this is the case it seems to me eminently proper, when the rupture has evidently taken place into the broad ligament, to resort to measures which tend to destroy the life of an early ovum. From present data it is difficult to estimate the value of electricity for this purpose. The accuracy of diagnosis is ever to be questioned, even in the hands of men whose reputation is established; yet I think that the utility of electricity can hardly be denied in properly selected cases. I would not use it if I thought that the ovum were still within the Fallopian tube, for fear of inducing rupture; nor should I use it in large ectopic cysts. I should limit its use to broad ligament hematoceles, whether due to ectopic pregnancy or to other causes, with a view, first, of destroying the vitality of the ovum should it be alive, and, secondly, of promoting

absorption of the hematocele. We have in galvanism an invaluable agent for the latter purpose, and it is reasonably certain that a strong galvanic current passed through the tumor will also kill an early ovum. Since this is so I cannot conceive of galvanism doing harm, and it may do much good. It is at least worthy of trial.

On the other hand, I cannot conceive of anything more unsurgical than the destruction of the fetus by galvanism, or by any of the methods presently to be mentioned, after the fourth month. After this period the changes following the death of the fetus are such as to make its destruction, to my mind at least, a most unwise procedure.

Electro-puncture and faradization have also been used with alleged success. Electro-puncture strikes me as a more dangerous expedient than is exploratory laparotomy, and infinitely less satisfactory. The faradic current, restricted to the class of cases which I have described, would probably be harmless, though the recent experiments of A. Martin go to prove the greater destructive properties of the galvanic current. Martin passed a strong faradic current, and a galvanic current of fifty milliampères, through a large number of eggs in different periods of incubation. Eighty per cent. of those acted upon by faradism hatched, while none treated by galvanism did so.

The injection of morphin, strychnia, ergotin, etc., and the internal administration of iodid of potassium, mercury, and other similar agents for the purpose of killing the ovum, have been resorted to in the past, and are still mentioned by a few writers as justifiable procedures. Attention is called to them under this head only for the purpose of condemning their use. They are all inferior to electricity and infinitely more dangerous.

In those rare instances where maternal death does not immediately result from intra-peritoneal rupture and hemorrhage, the blood becoming encysted, I do not think it wise to operate if the patient rallies and does not show symptoms of sepsis or serious peritonitis. Nature will sometimes take care of a large hematocele of this kind and the patient regain her health perfectly. I have in mind, of course, those instances where the surgeon does not see the case until some days after the hemorrhage has occurred and the blood has already become encysted. The surgeon should, however, hold himself in readiness to operate at once should symptoms of sepsis or renewed hemorrhage supervene.

3. *Shall the case be permitted to continue to term with the hope of delivering a living child through the abdomen?* In considering this question we are again confronted with the most diverse opinions of men whose authority is established beyond peradventure. It seems to me

that the rights of the fetus have been in the past too much ignored. After the fifth month there is certainly a fair prospect of gestation continuing to term without rupture, and, should rupture occur, the danger attending celiotomy is not much greater than is the operation previously to the accident—providing, of course, the patient is easily accessible. This is especially true if we can convince ourselves that in all probability the pregnancy is abdominal. Jessop, Eastman, Braum, Breisky, Tait,* and Koeberle† have all succeeded in delivering living children through the abdomen. In my case of intra-peritoneal pregnancy I believe that the child could have been saved had the operation been performed earlier. At any rate the results already obtained force the claims of the fetus upon us after the fifth month. During the early period of ectopic gestation the maternal dangers are so great, and the chances of the ovum surviving the period of rupture so slight, that we are compelled to ignore these claims. After the fifth month, however, we can only look upon any operation having for its object the inevitable death of the fetus *as a stigma upon the obstetric art.* The brilliant results obtained by Tait and others justify the hope that during the coming ten years feticide, even in ectopic gestation, will be practised much less often than formerly. Nevertheless, here, as in all branches of abdominal surgery, fixed rules and dogmatic teaching will ever be set aside by the surgeon whose skill and ingenuity make him equal to any exigency or emergency. Such a one will look upon the delivery of a living child at term through the abdominal wall, from a living mother, as "the crowning triumph of obstetric surgery." He will not, however, when the odds are greatly against the mother, hesitate to sacrifice the fetal life for the sake of saving hers.

The general principles to be observed in the management of ectopic pregnancy may be summed up as follows:—

1. When life is threatened by hemorrhage from a ruptured cyst, no matter what the period of gestation may be, *the abdomen should be immediately opened, the bleeding point secured, and the products of the conception removed.* Immediate laparotomy should also be resorted to if a fairly certain diagnosis can be made previously to the fifth month; if symptoms of septicemia present themselves at any period of gestation; if suppuration occurs; and, finally, if the products of ectopic pregnancy are found in the form of a lithopedion, even though apparent tolerance has been established.

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* Tait has saved three children and two mothers.

† Koeberle saved four mothers and seven children out of nine operations.

2. We are not justified in resorting to measures for destroying the life of the fetus except when rupture occurs into the broad ligament folds previously to the fourth month, when galvanism may be used.

3. After the fifth month if the fetus is living we are justified, if the conditions are favorable, in temporizing, with the hope of delivering at term a living child through the abdomen. This with a full consciousness that many cases will present elements of danger demanding *immediate operative interference.*

Technique of the Application of Electricity.—One pole is applied as closely to the tumor as possible, either through the vagina or the rectum. If the galvanic current is used, the negative pole should be the direct one. A large dispersing electrode is placed over the abdomen. The strength of the current should range from twenty-five to seventy-five milliampères. The sittings should continue for from ten to fifteen minutes, and should be repeated every other day until the tumor ceases to grow and diminishes in size. A sharp faradic current may be passed for a short time after the galvanic.

Technique of Laparotomy for Ectopic Gestation.—The general principles of abdominal section, applicable to all cases of laparotomy, are, of course, to be observed. These have been elsewhere discussed (Chapter XLVI), and I shall at this time refer to a few special points only.

Before and soon after the death of the fetus the great element of danger is hemorrhage. In early tubal pregnancy there is no difficulty in obtaining a pedicle, and the entire mass should be ligatured and cut off, either before or after rupture. The abdominal wound may then be closed either with or without drainage, as the case may require.

From the fifth month on, such a course as this is rarely ever practicable, for it is usually extremely difficult to remove the entire mass. If the sac can be more easily reached by making a lateral abdominal incision, this should be done. Indeed, the lateral incision made parallel to Poupart's ligament, when the pregnancy is intraligamentary, is ordinarily preferable to the central, for there is less danger of opening into the peritoneal cavity. If it is possible to reach the sac without invading the peritoneal cavity, Tait recommends the following procedure:* "When the sac is opened the fetus is to be carefully lifted out by the feet, using great care not to lacerate the sac or abdominal wall. If the child is living some one disengaged should take immediate charge of it. The umbilical cord should be cut off quite close to the placenta,

* "Extra-uterine Pregnancy," Strahan, 1889, p. 111.

the placenta squeezed as empty of blood as possible, the sac cleansed of all blood, loose membranes, etc., and then washed with warm water, the sutures carefully placed, the sac again washed out with clean water by means of a siphon trocar, and the stitches drawn tight, with a small trocar still in the wound. The sac should then be emptied of all the water possible, the trocar taken out with precautions against the admission of air, and the *wound totally closed.*"

Tait thinks that this is the best method of dealing with the placenta, and he has tried all, though most American surgeons prefer to leave the cavity open and pack it with gauze. He has twice removed it entire, in each case saving both the mother and child. The hemorrhage was controlled by perchlorid of iron. Occasionally it is possible to secure the main vessels of the pedicle, when the placenta should always be removed; or it may be possible, in certain instances, to create a pedicle and remove the entire sac. Oftener the attachments are extensive, and the placenta should be left unmolested.

When the peritoneal cavity is opened into, care should be taken not to injure the placenta in opening the sac. If it is clear that the removal of the sac will be attended with great difficulty it should be stitched to the abdominal wound. No traction should be made upon the placenta and cord. The sac may now be treated as recommended by Tait, or it may be washed out with a 1:4000 bichlorid solution and packed with iodoform gauze. The gauze can be safely left in the cavity for three or four days. After the removal of the gauze the cavity is kept thoroughly clean by frequent irrigation. The placenta is detached piecemeal and the cavity gradually closes by granulation. A glass tube may be introduced instead of the gauze.

If the vagina can be easily penetrated without injuring the placenta, a drainage-tube may be passed into it through the bottom of the sac, and if the cavity is not too large the abdominal wound may be closed. As the sac fills in the tube can be gradually withdrawn. Should decomposition supervene when the placenta is hermetically sealed by the method of Tait the sac can be reopened and the decomposed placenta removed with but little danger from hemorrhage.

If the fetus has been dead for some time, matters are much simplified. It is now no longer advisable to close the wound hermetically. If placental decomposition is already established the organ can be removed at once and hemorrhage controlled by gauze packing or by ligatures. An effort should be made to remove the entire sac. Drainage is here a *sine qua non.*

In those rare instances where the fetus is intra-peritoneal and with-

out any investing membrane, as in Jessop's case and my own, there is no sac other than the entire abdominal cavity to deal with. In Jessop's case the child was living and the placenta "covered the inlet of the pelvis like the lid of a pot, and extended some distance posteriorly above the brim, where it apparently had an attachment to the large bowel and posterior abdominal wall" (Strahan). Jessop did the only possible thing to do under the circumstances, and left it entirely untouched. In my case, the placental attachment was quite as extensive, involving the uterus and adnexa as well as the omentum. I had to do with a large putrid mass within the free abdominal cavity of a patient whose system was already surcharged with septic poison. To have left it behind would have been criminal. I therefore took away all removable sources of hemorrhage and septic infection. In so doing, although observing a broad surgical principle, I had to create a precedent, for I had not, up to the time of operating, been able to find a recorded instance of ectopic pregnancy other than interstitial in which the entire uterus and adnexa were removed with the fetus and placenta.

In ruptured interstitial pregnancies it is as a rule necessary to perform the Porro operation. If it is possible to control the hemorrhage without sacrificing the uterus, this should be done.

Elytrotomy or Vaginal Extraction.—Elytrotomy in ectopic pregnancy still has its advocates. I can imagine that with one inexperienced in abdominal surgery the temptation to extract a fetus easily felt projecting into the vagina, by elytrotomy, would be very great. When rupture has taken place into the broad ligament and suppuration has set in vaginal puncture and drainage can be easily made. Kelly* reports ten cases thus treated. In one case an active hemorrhage occurred which he was unable to control through the vagina. The abdomen was opened and the sac extirpated. "For this reason," Kelly remarks, "any one who undertakes the vaginal puncture must be prepared to make an abdominal section."

Kelly's method of operating is as follows:—

"I do not consider it necessary any more to make the abdominal incision. After an accurate diagnosis of the case, outlining the sac and its relations by abdominal and rectal palpation, and after careful vaginal palpation, to determine the proximity of the sac to the upper vaginal wall, a point is located behind the cervix in the vaginal fornix close to the sac and a sharp scissors plunged upward in the direction of the axis of the pelvis. The scissors is then opened and some of

*Johns Hopkins Hospital Bulletin, November and December, 1896.

the fluid blood usually trickles out at once. A large scissors is then introduced, if need be, and the opening widened by withdrawing it with blades open. It is important to have a large opening, both for the purpose of getting two fingers in to clean out the sac and for good drainage afterward. The torn edges of the wound never bleed excessively. The sac must be delicately cleaned out, and everything be brought away down to the shell of the sac and surrounding adhesions. In one of these cases I brought out a well-defined Fallopian tube cast, due to hemorrhage in the tube. The cleaning out is followed by irrigation, after which the sac is plugged with gauze, which is left in for several days, and sometimes longer, and then the wound is washed out daily until it closes. I know of no instance of more than moderate suppuration following this plan of treatment."

Illustrative Cases.

CASE I.—*Non-Encysted Intra-Peritoneal Pregnancy; Operation; Recovery.*—Mrs. E. C., actress, aged 23 years, dark hair and eyes, petite and very intelligent. Patient of Dr. Sara J. Allen, of Charlotte, Michigan. Married, June, 1888, just thirteen months previously to the operation, at which time she was menstruating regularly, but the flow never appeared after marriage. The following November, fearing pregnancy, she for the first time consulted a physician, who made an ineffectual effort to produce an abortion. After a rest of four or five days she returned to the stage.

While engaged in her work as an actress, she sustained three bad falls, suffering as a result much and continuous pain. In February of this year (1889) she had a severe attack of peritonitis, preceded by collapse and syncope. She was confident of feeling motion and life previously to and during this attack, notwithstanding the assurance of several physicians who at the time examined her that no pregnancy existed. Going from town to town, numerous medical men were appealed to, and not in vain, to undertake an abortion. The repeated criminal efforts were unavailing, and she, too, became dissuaded, believing her condition to be due to other causes than pregnancy.

On the morning of July 23, Dr. Allen sent for me. I found the patient in a precarious condition, with a pulse 145, and a temperature 104° F. Sepsis was marked, as was shown by the pulse, temperature, color of skin and profuse perspiration. The abdomen was the size of a full-term pregnancy and very sensitive; the enlargement was uniform and symmetrical. The vagina was equally sensitive, and the patient could not tolerate an examination which was in the least satis-

PLATE XXXI.

Intra-Peritoneal Pregnancy. Fetus and Placenta, Together with Uterus and Adnexa. Fetus in Free Peritoneal, Cavity. (*Wood.*)

factory. I could, however, feel a large fetal head low down between the vagina and the rectum, the cranial sutures being felt with distinctness and the plasticity of the head easily observed. The intervening tissues did not seem to be thicker than heavy parchment. This examination made me mistrust an extra-uterine pregnancy, a condition which Dr. Allen strongly suspected before my arrival, and I requested that another assistant be secured, so that, if our suspicions were confirmed by an examination under ether, an operation might be proceeded with. We accordingly got everything in readiness to meet any emergency.

At 1:30 P. M. the patient was placed on the table under the influence of ether. The head was found in the position described, evidently occupying the Douglas pouch. The cervix was high up above the pubes, and could be dragged down but a short distance by the volsella. The finger could be passed through the canal only to the internal os. A probe penetrated the uterine cavity three inches. The fetal parts could be easily detected through the thin abdominal walls, and I imagined that I could hear the placental bruit, though I fully appreciate the deceptive nature of this sound, especially under the circumstances with which I had to contend. Feeling confident that the child was not within the uterine cavity, and with the concurrence and assistance of the attending physician and Dr. J. W. Siegfried, now of Ashtabula, I prepared to open the abdomen.

Operation.—Observing antiseptic precautions as thoroughly as possible, an incision was made midway between the pubes and the umbilicus, in the median line. I did not make a lateral incision because the perfect symmetry of the abdomen gave no clue as to the side upon which the sac was located—if it were upon either side. The first stroke of the knife brought me to a membrane resembling the peritoneum as found over adherent ovarian tumors. Catching this between two forceps and nicking it, a stream of fluid, either amniotic or ascitic, gushed out. The abdominal walls were quite vascular, and several catch-forceps had to be applied to spurting arteries. It now became necessary to enlarge the abdominal incision so that it extended at least two inches above the umbilicus. The feet of the child were then grasped by the left hand and an effort made to deliver it through the wound. This could not be done until the head was peeled out, as it were, from the cul-de-sac of Douglas, after which a five-pound putrid fetus, thickly covered with *vernix caseosa* and with the skin broken in many places owing to the high state of putrefaction, was delivered through the abdomen. The hemorrhage at this stage became frightful, the patient exsanguinated, and it was evident that something had to be done, and that quickly.

Instructing Dr. Siegfried to throw some brandy under the skin, I threw an elastic ligature around the entire mass and packed sponges about the pedicle. This controlled the hemorrhage very effectually and gave me an opportunity to wash the clots from the abdominal cavity by pouring hot water into it from a pitcher. The next point to contend with was the management of the placenta. It was very evident that the peritoneal cavity could not be excluded from the cyst cavity, for the only cyst cavity that I could detect was the peritoneum, unless, indeed, the cul-de-sac occupied by the head could be called such.

I found no traces of a gestation sac other than the attachment of the omentum to the mass which I had included in the elastic ligature, and several bands of inflammatory tissue springing from the pelvis and attaching themselves to the transverse colon. A more careful examination showed that my ligature had embraced the broad ligament, between whose folds the placenta was attached, the entire fundus of the uterus and both tubes. The inclusion of the uterus could only be determined by the failure to find it in any other locality, for it was utterly impossible to distinguish or separate the various structures of the mass; indeed, in my opinion, it would have been the most reckless folly to have undertaken it. To detach the placenta was entirely out of the question; to leave it within the abdominal cavity, the peritoneum being more or less destroyed at the lower border of the broad ligament and the system already saturated with septic material, seemed equally unsafe. I therefore transfixed the pedicle above the ligature with a couple of Wilcox pins and cut away the entire mass—placenta, uterus and appendages—permitting the stump to rest at the lower angle of the wound, as in supra-vaginal hysterectomy. The omentum seemed unhealthy, very much thickened and even gangrenous, and this too was tied and cut away. The bands of inflammatory tissue were secured in the same way. In short, both the abdominal and pelvic cavities were completely emptied of any tissue or substance that could slough or decompose. The abdomen was again thoroughly washed with hot water and sponged dry, but owing to the continued oozing of blood from the Douglas cul-de-sac a glass drain was passed into the bottom of the cavity. The patient's condition would not permit of longer delay in contending with the hemorrhage, so the pelvis was packed with iodoform gauze, one end of which was left projecting from the abdominal wound. The abdomen was then closed and the stump dressed in the usual manner, when the patient was placed in bed, very weak, but soon rallying under the influence of warmth and hypodermic stimulation.

The pulse dropped in nine hours after the operation to 116, and the temperature to 101° F., without any evidences of profound shock. The temperature for a short time fluctuated between 101° and 102° F., one day reaching 104° F., approaching the normal about the sixteenth day. Nourishment was freely taken and retained from the first. The gauze was removed at the end of the second day, blood-stained but sweet. Smaller drainage tubes were substituted from time to time, but drainage was entirely discarded on the twenty-sixth day. The cavity was kept thoroughly clean by suction and frequent washing. The pedicle and ligature were removed on the sixteenth day, the entire cervix coming away through the vagina on the seventeenth day. This seemed to me most unusual, and, to make sure that it was the cervix and not a decidua, I had the mass sent to me for examination. I also had Dr. Allen make a vaginal examination before completing my record, and she reported an entire absence of the cervix. It is probable that the elastic ligature fell below the utero-vaginal mucous membrane, thus severing the cervix and permitting it to fall into the vagina, the fundal end of the stump adhering to the lower end of the abdominal wound for several days longer.

The patient was able to take a drive just one month from the day of the operation and ultimately recovered perfectly.

Case II. (Plate XXXII.)—*Ectopic Pregnancy; Fetus in Free Peritoneal Cavity; Operation; Recovery.*—Patient æt. 31. Had one child seven years ago, since which time she has never been pregnant; has done nothing to prevent conception. Menstruated last on May 3, 1897. Very soon after this period she complained of sharp pains in the abdomen; more severe on the right than on the left side. Prof. George H. Quay, of Cleveland, examined her on July 4, 1897, and found the womb pushed to the right. She was seized with hard pains in the abdomen in the early part of June, with symptoms of shock, but had no hemorrhage from the uterus. She first felt motion in September; motion seemed more marked from the first than it should have been and caused much distress. After the middle of November the motion ceased. No history of false labor at that time, but she began to flow, which continued more or less profusely up to the time of the operation. An examination three weeks ago revealed a dilated cervix, with a soft spongy mass at the internal os, which led me to believe that the case was one of placenta previa. She says that the abdomen was unnaturally flat from the first, and that she felt the child was located higher than it should have been. Believing the condition to be that of placenta previa, she was removed to the Huron Street Hospital two weeks ago,

and placed under the care of Prof. Harlan Pomeroy. However, an examination under anesthesia, made January 4, 1898, revealed the uterus empty, and I accordingly opened the abdomen at once.

Operation.—Cervical canal first dilated and uterus packed with gauze; patient placed in Trendelenberg posture and abdomen opened in median line. A large mass presented itself when the abdomen was opened, which was intimately attached to the pelvic floor and base of left broad ligament. This proved to be the remains of the sac and the placenta, together with a large organized blood clot. An elastic ligature was thrown around the base and the entire mass was amputated above the ligature. The umbilical cord was traced to the upper part of the abdomen, where an eight months' fetus was found in intimate contact with the stomach and diaphragm. After the fetus was delivered and the upper part of the sac cut away the remaining portions of the sac, placenta, and left broad ligament were entirely enucleated. In doing this two or three arteries, the size of a goose quill, were cut and secured in a running catgut suture, which covered all the raw surfaces of the peritoneum. The sac was attached to the posterior uterine wall, and there was free oozing from the raw surfaces left behind, which necessitated the use of the cautery to control the hemorrhage. The abdomen was washed with a normal salt solution, three quarts of which was left behind. A glass drain was inserted. Abdominal wound closed with interrupted silk sutures. Patient was extremely shocked at the termination of operation, and after being placed in bed thirty ounces of normal salt solution was infused into the subaxillary regions. Active heart stimulation was necessary. In three hours she rallied, though her pulse remained rapid (120–140) for seventy-two hours and her temperature somewhat high (101–102° F.) for four days, in spite of free purging with the salines.

On the second day thirty ounces of the normal salt solution was again infused in the subaxillary regions with marked benefit. Energetic heart stimulation was required for four days. At this writing (January 20, 1898) her pulse and temperature are normal, she eats and sleeps well, and bids fair to recover perfectly.

The fetus weighed five pounds and seemed perfectly developed. Putrefaction had set in and the skin was broken in many places. The placenta and sac weighed two and one-half pounds. The sac was ruptured at one point, but the opening into it was not large enough to have permitted a fetus the size of this one to pass through. As there was no history of secondary rupture it seems probable that the fetus passed

PLATE XXXII.

Ectopic Pregnancy with Placenta and Sac. (*Wood.*)

into the peritoneal cavity when the first rupture took place in June and continued to grow. The fetus had been dead at least three weeks.

CASE III.—*Interstitial Pregnancy Rupturing into Uterus; Recovery.*—Mrs. S., aged 40; brunette. Commenced menstruating at 15. Her only child is ten years old, and twelve months after the birth of this child she had a miscarriage at the second month. The miscarriage was not followed by any serious sequelæ, menstruation recurring at regular intervals, being normal in quantity and duration the following seven years. Three years before I saw her she had an attack of pelvic peritonitis, caused by undue exposure of some sort, which came very near proving fatal; an inflammatory deposit was left behind which caused considerable pain and inconvenience. From that time on she suffered from menorrhagia, which at times was alarming. One year before I saw her this became so bad that she was compelled to take to her bed and place herself under the daily attendance of Dr. James M. Long, of Coldwater, whose patient she was. The examination then made revealed, besides the inflammatory deposit, a fibroid involving the posterior wall and fundus of the uterus. She was very much emaciated and very anemic from the loss of blood, but by the properly selected remedies, in conjunction with daily local treatment, she so far recovered as to be able to spend a season at the Northern Lakes, which added to the improvement already begun at home. The menorrhagia, however, remained more or less severe.

About the middle of the following January she was again taken with unusual symptoms, which for the second time necessitated almost daily attendance. She suffered from dull, heavy bearing-down pains in the pelvis extending to the back and down the thighs; great lassitude, with an obstinate hacking cough; anemia from the long-continued drain upon the system; leucorrhea, with at times clots of matter and blood in the discharges. There was no nausea or vomiting.

On the 29th of March, 1885, Dr. Long requested me to examine the case with him. Besides the facts given above I elicited the following: The usual menstrual flow made its appearance in January. In February she was unwell but one day, and in March, just four weeks from the day she was unwell in February, menstruation again appeared, and so far as quantity and duration were concerned this was the most natural period she had had for three years. She had ceased flowing three days before I was called as counsel. I found her very much in the condition described above. The uterus could be plainly outlined through the lax abdominal walls, extending as high up as the umbilicus, the fundus tipping backward and to the left. There was, in the region of

the left Fallopian tube, a distinct tumor about as large as a small fetal head, with a broad base continuous with the left uterine wall. It seemed hard and gave a perfectly resonant sound on percussion. Upon making an examination per vaginam the cervix was found hypertrophied, elongated, and directed forward; the os was dilated so as almost to admit the index finger, and from it there oozed a thick, sanious discharge. As far as could be discerned with the finger through the posterior cul-de-sac, the uterus was indurated and irregular. The uterine cavity measured five inches. I could discover nothing in the interior of the womb, though the whole cavity was explored as thoroughly as possible with the sound. The history of the case, as well as the physical signs, seemed to point unmistakably either to a sub-peritoneal or an interstitial fibroid.

For the purpose of curing the hemorrhage the curette was thoroughly applied and brought away the usual débris found in fungoid endometritis. An application of pure carbolic acid followed the use of the curette.

On the morning of April 28, she began to have peculiar bearing-down pains, but no more severe than had often preceded the advent of the menstrual period. The pain increased in severity until the first of May—thirty days after the use of the sound and fifteen days after the curetting—when a somewhat distorted but *well preserved* fetus of three months was expelled. The flooding was alarming, but by the timely arrival of Dr. Long this was controlled, and the patient, under the influence of stimulants, soon rallied from her syncope. The following four or five days she was very low from a condition simulating shock, with much tenderness and pain in the region of the left Fallopian tube; there was retention of urine and evidences of circumscribed peritonitis. Under the influence of china, veratrum, and bryonia, with antiseptic vaginal injections, she rapidly improved, and, I believe, regained her health perfectly. A subsequent examination revealed no evidences of a double uterus and I believe that the case was one of interstitial pregnancy which ruptured into the uterine cavity.

CASE IV. — *Laparotomy for Ruptured Ectopic Pregnancy; Death From Uremia.*—Mrs. M., aet. 24; referred to me by Prof. G. J. Jones, of Cleveland. One child five years ago; sterile since. Ten days ago she was suddenly taken with the characteristic symptoms of ruptured ectopic pregnancy. She rallied from the primary rupture and shock, but in the course of five or six days symptoms of sepsis set in.

Operation on February 13th, 1897. The abdomen was found full of clotted blood, the left tube was ruptured, and a blighted ovum of ten

weeks was adhered to the left broad ligament. The abdomen was emptied of all clots and irrigated and a drainage tube inserted. The tube, ovum and sac were all removed. The patient did well for the first twenty-four hours, when suddenly the urine became completely suppressed and she died twelve hours later from uremia. I had not up to that time used intravenous infusions of the normal salt solution for uremia. Chloroform was used for an anesthetic.

CASE V.—*Abscess of Left Broad Ligament Resulting from Ectopic Pregnancy.*—Patient aet. 22; referred to me by Prof. P. A. Cole, of Cleveland; prostitute. Some two months previously patient believed herself to be pregnant, and one day while on the street was suddenly taken with a severe pain in left side, which was followed by loss of consciousness and collapse. Patient was removed to her home in an ambulance. She rallied in a few hours, but soon noticed an enlargement immediately above the left Poupart ligament the size of a fetal head, which was hard and tender. Symptoms of sepsis supervened, which profoundly impressed the system. The temperature ranged from 99° to 104° F., and the pulse was feeble and rapid.

On August 21st, 1895, I made an exploration through the vagina with an aspirator, but could not locate the abscess. An incision was then made above and parallel to Poupart's ligament and the tumor entered. It was filled with a soft broken down mass which contained the products of an ectopic pregnancy. The cavity contained at least a teacupful of pus. It was washed out and a drainage tube passed into the vagina. The cavity was then packed with gauze and left open from above. A catheter passed into the bladder drew off a large quantity of pus, which she had been passing per urethram for some time. The vaginal tube was gradually withdrawn as the cavity closed in from above, and while the convalescence was tedious, perfect recovery ultimately occurred.

CASE VI.—*Ovarian Pregnancy.*—The following case, reported by Larsen, is one of such rarity as to merit full mention:*—

"The patient was thirty-three years old and previously healthy. Her menses began at twenty, and were regular except on one occasion, when one or two months were missed. A profuse flow was exceptional. She last menstruated in the beginning of August, 1891. Immediately after this she was seized with cramps, vomiting and some pelvic pain. Three months later she had retention of urine, at which time, on examination, a uterine pregnancy at three months and enlargement of the

* Am. Year Book of Med. Sciences, 1897.

right ovary were diagnosed. During the remainder of her pregnancy the patient's condition was good. Motion was felt by the middle of December, and on the 10th of the following April there were severe shooting pains accompanied by some hemorrhage and the passing of a firm lump the size of a hen's egg. Motion ceased at the same time. A thin, light, sanguineous discharge continued from the vagina, and at every return of the menstrual epoch this discharge acquired the appearance of the menstrual flow; otherwise the patient's general condition was good. On the 22d of September the diagnosis was made, under anesthesia, of a dead fetus retained in the uterus. Upon dilatation of the cervical canal, however, the body of the uterus, which on palpation could not be differentiated from the tumor, was found to be empty. On September 27th abdominal section was performed, with extirpation of the tumor, which was attached by a single rectal adhesion, but otherwise freely movable in the abdominal cavity, and united to the uterus by the right tube and broad ligament, which were also tied off. The right ovary could not be seen and the left tube and ovary were normal.

"Convalescence was uneventful. Upon opening the fetal sac a quart of chocolate-colored, thin and very flocculent fluid, with a macerated, flattened and apparently fully-developed fetus, placenta and cord, was found. The placenta was attached to the posterior wall of the sac, while the anterior wall was adherent to the broad ligament, though this was easily separable except at the upper and outer part. At this place it was immediately continuous with the fetal sac, and this in turn was firmly attached, for a distance of 4½ cm., especially thick at the under part, to the posterior surface of the tube. The inner and upper part of the sac, near the uterine end of the tube, was also firmly united to the posterior surface of the ligament by a small adhesion. The portion of the tube that was removed measured 10 cm., and was much dilated. In the broad ligament could be seen three branches of the internal spermatic artery, the middle branch going to the fetal sac, which was also supplied with branches from the outer ones. The posterior surface of the sac was as thin as paper, while the anterior was fibrous in character and studded with the open mouths of the torn vessels; it was about 8 mm. in thickness. The microscopic examination of the anterior wall showed here and there small groups of follicles with a distinct membrana granulosa, and in several of these appeared more or less well-preserved ovules with germinal vesicle and germinal spot."

CASE VII.—*Extra-Uterine Gravidity.*—"Dr. Kammerer presented a specimen of extra-uterine gravidity from a woman 30 years of age, who died last year. She had been under treatment for chronic metritis, and

had passed from under his care, with the exception of the introduction of a large sound once a month to keep the cervix open. Seven or eight years previously she had had a child. She became again pregnant, and a little time subsequently was taken suddenly ill with symptoms of internal hemorrhage and peritonitis, and in the course of a few hours died. Upon post-mortem examination several quarts of blood were found within the peritoneal cavity, and on the left ovary a rent revealing the source of the hemorrhage. Opening the ovary an embryo was discovered about four weeks old. Dr. Kammerer replied to a question of Dr. Peaslee that he could see no decidua within the uterine cavity."—*New York Medical Journal*, 1865, p. 161.

CASE VIII.—*Lithopedion in the Free Peritoneal Cavity; Carried for Nineteen Years; Operation; Recovery.*—Mrs. S., æt. 52. Was first married in 1865, and had one child by this husband, who died two years after marriage. Was married again in 1876, the second husband living for ten years. She never supposed herself pregnant before or after the birth of her first and only child. She has no recollection of a sudden acute pain in the abdomen with symptoms of shock and collapse. However, nineteen years ago she was treated for a severe attack of "inflammation of the bowels," which attack was associated with, and followed by, profuse uterine hemorrhages and suppurative mastitis. She did not recover from this attack for a year, and has never been free from pain since, though at no time has she been confined to her bed. Has never been able to stoop over without severe abdominal pain. This pain is also excited by ascending the slightest incline, sweeping, etc. Has been anxious to have children and has never done anything to prevent conception. Has flowed excessively at her periods since the attack of severe illness nineteen years ago, and has suffered from occasional attacks of metrorrhagia, which were attended with much pain. For three months previous to operation she flowed almost continuously, and it was this fact which led her to consult her physician, Dr. Edward F. Gifford, of Erie, who at once recognized some unusual condition within the pelvis and called me in council.

Examination revealed a hard irregular mass the size of the double fist, which was intimately attached to the uterus. The sound showed the uterus of normal depth with fundus crowded backward. The uterus was curetted and packed with gauze. The abdomen was then opened in the Trendelenberg posture, and the lithopedion shown in Plates XXXIII. and XXXIV. discovered. The head was crowded into the posterior cul-de-sac, while the body was attached to the right side of the fundus. An effort was made to grasp the mass in volsella forceps,

but owing to its extreme hardness this was impossible. The abdominal incision was enlarged sufficiently to admit the left hand, when the mass, which I then supposed was a calcified fibroid, was lifted into the wound with much difficulty. Several loops of intestine were intimately adherent to it and had to be dissected off with care. The lithopedion was then delivered. There were no evidences of a sac of any kind around the lithopedion. Deep down and firmly fixed in the pelvic cavity of the right side there was a calcareous mass the size of a silver dollar, which might have been the placenta, or possibly the remains of the fetal sac. The fundus of the uterus was crowded into the hollow of the sacrum. The left ovary was bound down by adhesions and not larger than a Lima bean. The tube was distended with water and sausage-like in shape and size. Both the ovary and the tube were tied off with catgut. No traces of the right ovary or tube could be found. The abdomen was drained with a glass drain and closed with catgut. The operation was done on January 28, 1897, and the patient made an uneventful recovery. The hemorrhage from the uterus ceased at once. For the first two months following the operation there was a slight bloody discharge from the uterus at the menstrual periods. This has now entirely ceased and she is free from the old abdominal pain and perfectly well.

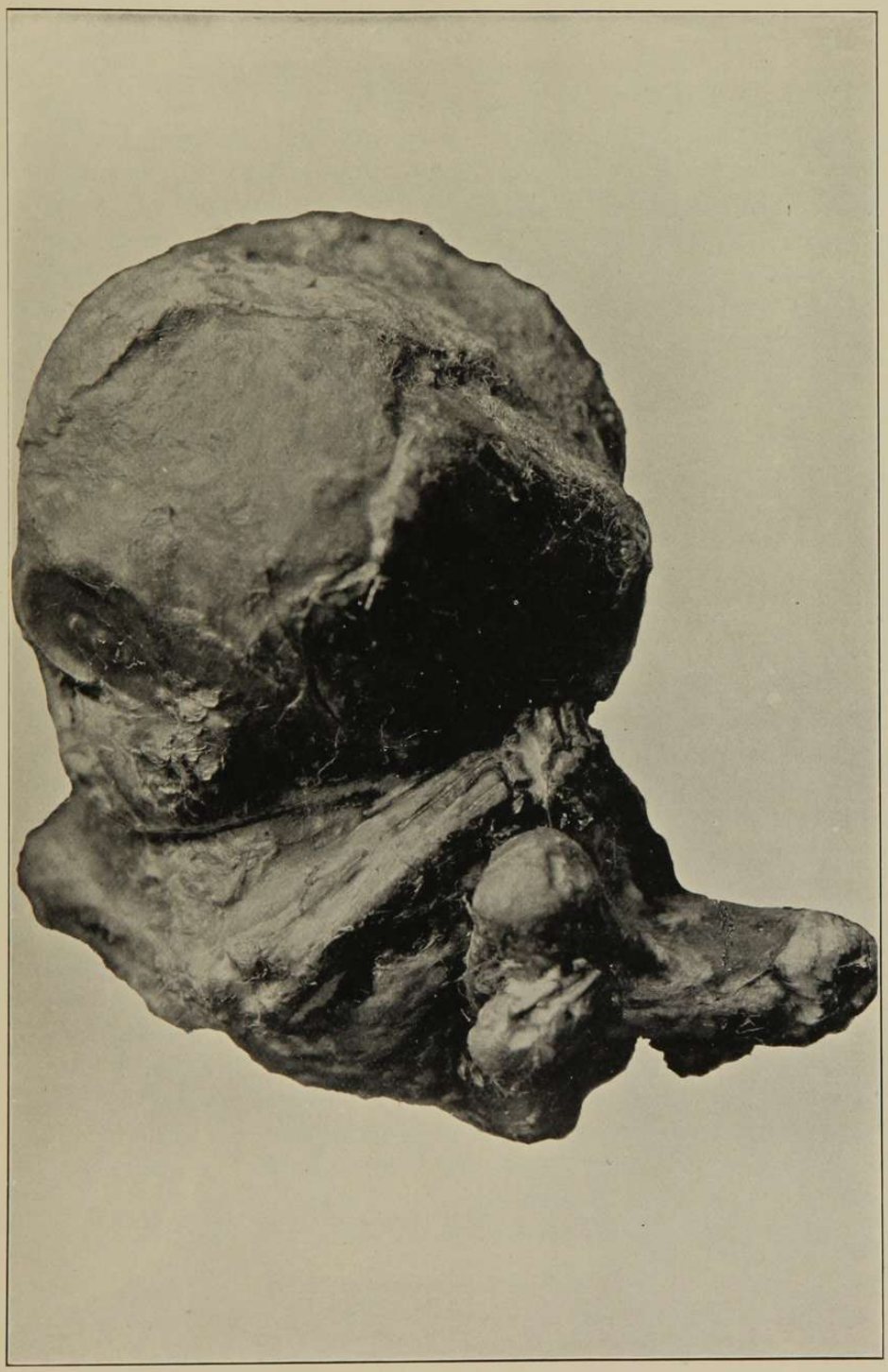
Description of Lithopedion.—Length, six inches; circumference of head, nine inches; weight, one pound. General appearance, front view, not unlike "skull and crossbones." Solid throughout, except a small spot at vertex. Head contained a purulent fluid. Humeri, bones of forearms, carpal and metacarpal bones distinct. Femora, tibiæ, fibulæ, tarsal and metatarsal bones distinct. Eyes and nose distinct. Outlines of cranial sutures distinct. No trace of skin or muscles. Portions of body covered with a thin membrane resembling periosteum. The whole mass solidly moulded together and covered with a phosphatic deposit.

From the history of the case I am inclined to think that rupture occurred when the patient had the attack of "inflammation of the bowels" nineteen years ago, though she is very sure that there were no symptoms of shock or collapse. It is possible that the case was one of primary abdominal or ovarian pregnancy. She denies the possibility of pregnancy since the death of her last husband, and there is every reason to believe her statement regarding this point.

True lithopedions are rarely met with. Tait * publishes the twelve cases recorded by Fales, of Boston, in the *Annals of Gynecology*, and

* Diseases of Women and Abdominal Surgery, Vol. I., p. 634.

PLATE XXXIII.



LITHOPEDION. ANTERIOR VIEW. (*Wood.*)

says that he himself has seen but one case where it was "suspected to have occurred."

A case is recorded by Lusk* very similar to mine. Dr. A. Martin,† of Berlin, has also placed on record two cases.

Appel‡ has recorded an interesting case of lithopedion, and has tabulated fourteen additional cases. The length of time during which the tumors were carried varied from seven to fifty-seven years.

Dr. J. G. Clark records a still more interesting case in the November, 1897, number of *The Johns Hopkins Hospital Bulletin*. The patient was a colored woman, aged 45. He publishes Kuchenmeister's table of forty-seven cases, all that were recorded between the years 1582 and 1880. I am unable to find described in any of the recorded cases so typical and perfect a specimen of lithopedion as the one shown in Plates XXXIII and XXXIV.

Dr. Robert Barnes, at the October, 1881, meeting of the London Obstetrical Society, referred to several cases of alleged lithopedions which, in his opinion, were not true lithopedions. In commenting upon Dr. Barnes' paper, Dr. Mansell-Moullin, the president, said: "The paper impressed him with the necessity of greater care than he and other authors had used in applying the word 'lithopedion.' The observation confirmed the remark which he made on the reading of Dr. Barnes' original paper, that there was never a stone child really, but only petrifaction of the membranes and adjacent fetal parts."

I quote the above to show the skepticism which is extant regarding the existence of true lithopedions.

The following case I present as one fairly illustrating the outcome of ruptured extra-uterine pregnancy cysts if not interfered with. The older literature abounds with numerous illustrations of the kind.

CASE VIII.—"*Extra-Uterine Pregnancy; Rupture; Death.*—Mrs. M., married, aged twenty-nine years; has had two children at term; no miscarriages. She called at my office February 6, 1884, complaining of dull pain in the right iliac region, back and rectum. There seemed to be a tendency to hysteria. She had only a slight flow at her last menstrual period, and was afraid she might be pregnant. Great difficulty attended a vaginal examination, the mucous membrane being hyperesthetic. The uterus was in its normal position. On its right side a round, soft body could be felt, apparently of about the size of a walnut. Conjoined manipulation was rendered impossible by the rigidity

* Am. Journal of Obstetrics, Oct., 1892.

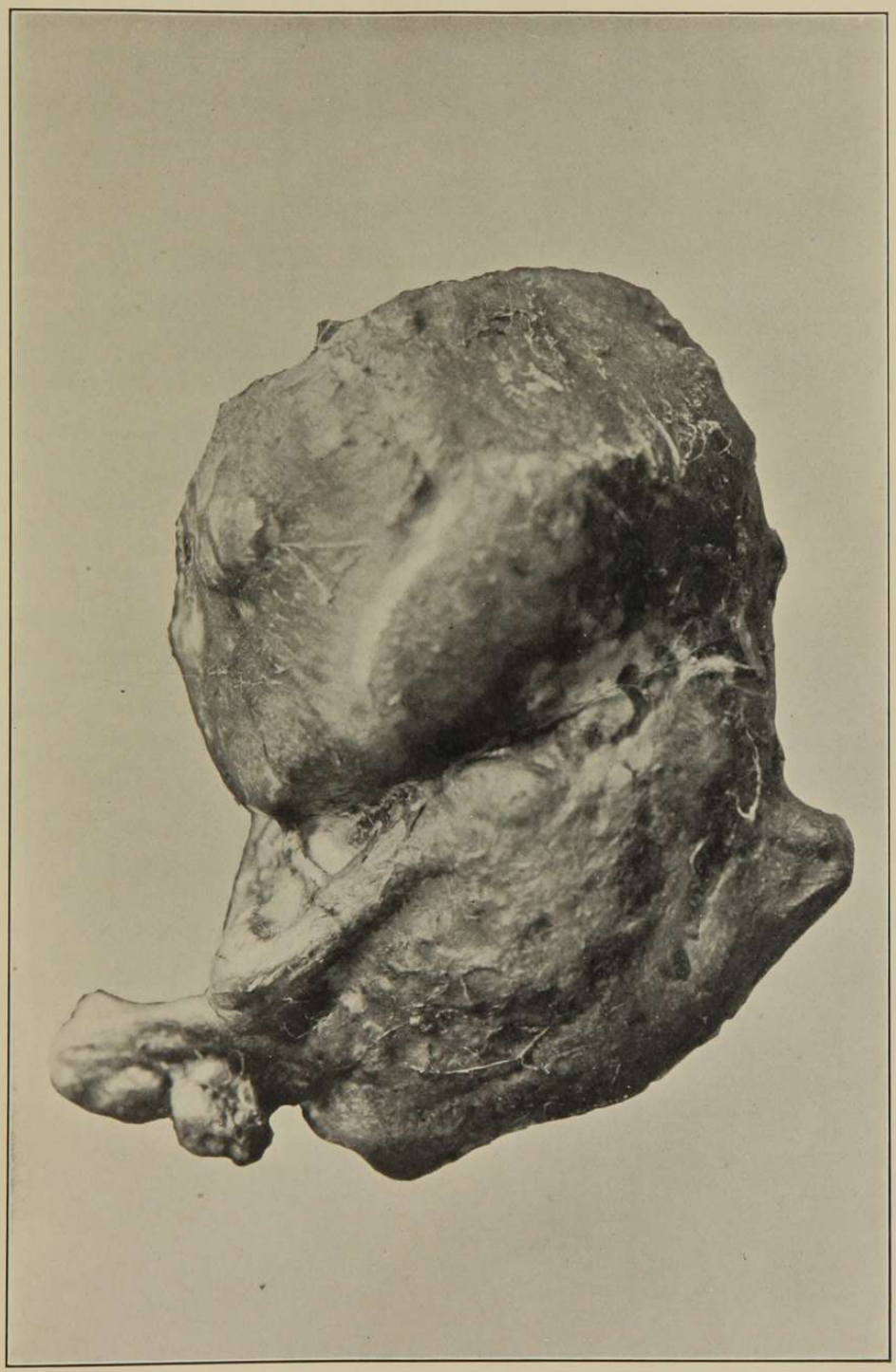
† Zeitschr. f. Geburtsh. v. Gynaek. III. Bd., 2 Hft.

‡ Annual of Universal Medical Science, Vol. II., 1889.

of the abdominal muscles. The patient had not had connection with her husband since the completion of her last menstrual period. I did not think she was pregnant, and considered her case one of chronic oöphoritis. I was called again on the night of the 24th of February. After having been up most of the day, the patient was taken with very severe neuralgic-like pains referred to the region of the heart, and suffered from globus hystericus. It was learned from her attendant that the symptoms developed while she was having some dispute with her husband.

"The following week I attended her husband for alcoholism, and at that time Mrs. M. was not complaining much, but worried a good deal about her husband, and had one or two hysterical attacks, with pain in the abdomen and rectum. On March 7th she had another attack similar to the first, and from that time the attacks became more frequent, some pain over the abdomen and in the rectum existing in the intervals. The patient was confined to her bed most of the time. On one or two occasions there was some nausea and vomiting, which I attributed to morphia. I had now gained the confidence of the patient, and learned that she was troubled a great deal, mentally, on account of domestic difficulties, and that the acute attacks were always preceded by mental strain and excitement. At no time was there an increase of temperature. It was almost impossible to make a satisfactory examination of the genital organs, which was attempted on several occasions. On the 16th she had another severe attack, one of her children having had a fall in her presence. She described the location of the pain as being 'in front and back passages;' also over the abdomen and heart. There was nausea, with pallor, and coldness of the extremities. A vaginal examination could not be made, but I thought I could feel a tumor, by external palpation, situated directly over the symphysis pubis. The patient soon felt quite well again, and I left the house with my mind fully made up to call Dr. George T. Harris in consultation the next day, give ether, and make a thorough examination; but, finding the patient well the next morning, and being busy, I neglected to do as I intended. The patient passed a good night, and was feeling well. Shortly afterward she called for the chamber, but had some trouble in passing her water, immediately followed by cries of distress and 'Go for the doctor; I am dying.' When I arrived I found her in a condition of collapse, with hardly perceptible radial pulse, pale and exsanguinated. I at once suspected internal hemorrhage, ordered external heat, gave hypodermic injections of brandy, ether, etc., and sent for Dr. Harris, who confirmed my fears of hemorrhage, and, from the

PLATE XXXIV.



LITHOPEDION. POSTERIOR VIEW. (*Wood.*)

history, suspected extra-uterine gestation with rupture of the sac. The patient gradually sank, and died at 3 P. M.''—*American Journal of Obstetrics*, Vol. XVIII., p. 406.

CHAPTER LI.

INJURIES RESULTING FROM CHILDBIRTH.

Lacerations of the Cervix Uteri.

History and General Considerations.—Lacerations of the cervix are produced in nearly all instances by parturition. Sir James Y. Simpson first called attention to the frequency of the accident, and, later, Dr. Gardner, in his work on "Sterility," described somewhat in detail cervical lacerations and their results. Dr. Gardner's work was published in 1856. Five years later Professor Rose, of Marburg, drew attention to ectropium of the cervix, especially dwelling upon the condition as a cause of cervical ulceration. He, however, like Simpson and Gardner, did not appreciate the full importance of the subject and its frequent association with lacerations. The true significance of cervical lacerations was first recognized by Dr. T. A. Emmet, who published his first paper upon the subject in 1869. This paper was unquestionably one of the most important contributions ever made to the literature of gynecology. Nevertheless, it was not until the publication of his second paper, five years later, that its full importance was appreciated. Since 1874 trachelorrhaphy, by which name the operation for the closure of cervical rents is known, has steadily grown in favor, though, like most innovations in medicine, it has met with bitter opposition.

Not a few men have undertaken to build up a special uterine pathology based upon cervical lacerations. Dr. Emmet called attention to the various symptoms liable to arise from the deposition of cicatricial tissue within the cervix, and from the resulting ectropium, not the least important of which being certain reflex neuroses. He, however, never claimed that trachelorrhaphy is a "cure-all." Indeed, he has been most earnest in his efforts to impress upon the profession the fact that operative cases must be selected with care and discrimination, especially when the operation is performed for neurotic troubles. Notwithstanding his protests a certain class of men do not look beyond the cervix for the origin of reflex phenomena. If a cervical rent, no matter how slight, is found, further investigation ceases. Trachelorrhaphy is ad-

vised and performed, but the promised relief does not follow, because the operation was not indicated. It is not strange that indiscriminate work of this kind should have induced the more conservative specialists to call a halt. Fortunately, the operation has now reached its proper level, and the indications for it are pretty clearly defined. As a result slight tears are repaired by men of experience much less often than formerly for reflex nervous symptoms. When the operation is indicated, however, there are few gynecological procedures more beneficent, and the profession owes to Dr. Emmet unstinted gratitude for his labors in this direction. The connection existing between cervical lacerations and carcinoma of the uterus is discussed on p. 679.

Frequency.—The accident is of frequent occurrence. There are few women who have given birth to children at term whose cervices are not more or less torn. As a general rule the rents heal spontaneously, though some trace of them is usually left behind. It is evident, therefore, that if all women having cervical lacerations were operated upon, nearly every woman who gave birth to a child would have to subject herself to the surgeon's knife. Clearly defined lacerations are met with in only about thirty-three per cent. of parous women.

Etiology.—Under this head it will be necessary to consider only those causes connected with parturition. One of the most prominent of these is early rupture of the membranes, followed by uterine pains sufficiently strong to force the head through the undilated canal; the cervix not being sufficiently dilated, and more or less hard and unyielding, a tear is almost inevitable. An abortion as early as the third or fourth month may give rise to such an accident, for, in early abortion, the cervical tissues have not undergone marked changes and the unyielding cervix is very liable to give way.

Cervical hyperplasia and endometritis, by their degenerative influence, predispose to lacerations, especially if associated with cystic disease.

Unquestionably the unskilful use of obstetric instruments is responsible for cervical injuries in many instances; yet, as in perineal lacerations, the accident is oftener due to the tardy application of the obstetric forceps than to its skilful and timely use. However, cervical tears of the most serious character will occur in the hands of the best obstetricians; it is, therefore, unjust to censure the attending physician, as is often done, when the injury is discovered by another. It occurs oftener at the birth of the first child than at subsequent labors.

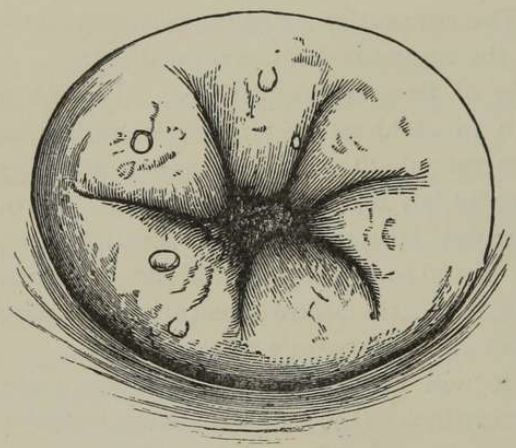
Varieties.—These are:—

1. Lateral; uni- and bi-lateral (Plates XXXV and XXXVI.);

2. Multiple or stellate (Fig. 261);
3. Antero-posterior, the posterior lip being the most frequent site;
4. Incomplete. Here the solution of continuity is limited to the mucous membrane and muscular wall of the cervix, and does not extend to the mucous membrane of the vagina. (Fig. 262.)

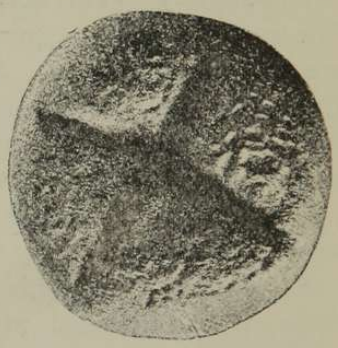
Lateral lacerations are oftener located on the left side of the cervix, probably because of the greater frequency of the left occipito-presentation.

FIG. 261.



STELLATE LACERATION OF THE CERVIX. (*Emmet.*)

FIG. 262.



MULTIPLE INCOMPLETE LACERATION. (*Skene.*)

Pathology.—Cervical lacerations are so intimately connected with subinvolution, endometritis (cervical and corporeal), areolar hyperplasia, cellulitis, inflammation of the uterine appendages, etc., as to make it impossible to discuss their pathology without frequently referring to these complicating lesions.

After the production of a laceration the wound may heal spontaneously without in any way interfering with the involution of the uterus. If, however, the healing process is interfered with because of septic or other influences, nature may make an effort to close the rent by the deposition of cicatricial tissue. This interferes with the uterine circulation, keeps the organ constantly congested, arrests involution, and, in time, gives rise to fungoid endometritis. The tubes, ovaries and broad ligaments likewise participate in the congestion. The uterus, as a result of the increased weight, frequently becomes displaced. There is besides more or less squeezing of the terminal nerves by the cicatricial plug, and as a consequence pain in the pelvis, thighs, and indeed in any part of the body may be produced. Emmet insists that

PLATE XXXV.

Uterus Removed for Complete Procidentia, Showing Extensive Bilateral Laceration of the Cervix, with Ulceration of Anterior Lip. (*Wood.*)

general anemia of a most profound character may result indirectly from the cicatricial deposit.

If the rent is not filled in by this unnatural tissue the os remains gaping and the whole cervical mucous membrane is more or less exposed. It is consequently subjected to constant friction against the vagina, which gives rise to congestion, hyperplasia, and cystic or papillary degeneration. The epithelium is destroyed by the resulting friction, and the underlying surface is left raw and exposed, which constitutes an erosion (Plate XXXVI). When the hyperemia and hyperplasia involve the fundus of the uterus, fungoid endometritis, with menorrhagia or metrorrhagia, results. If the rent is a lateral one, and has extended to the base of the corresponding broad ligament, cellulitis of that ligament is of frequent occurrence. This is due primarily to the absorption of septic matter through the rent, but it is perpetuated in a subacute or chronic form by the resulting cicatricial tissue, which interferes with the uterine and pelvic circulation.

It is necessary in studying the pathology of the accident to refer to the possibility of malignant degeneration following in its train. Emmet, Breisky and others have especially emphasized the importance of cervical lacerations and injuries as causative factors in the production of epithelioma. It seems to me not unreasonable to believe that cystic and papillary degeneration, which so frequently result, the presence of lowly organized cicatricial tissue, and the constant friction due to the ectropium, must necessarily favor malignant degeneration. At any rate, carcinoma uteri occurs much oftener in women who have borne children than in nulliparæ (p. 679).

Symptoms.—These are most variable in intensity and character. The average woman will go through life with a cervical laceration without suffering the least inconvenience from it. Even when the pathological changes referred to have taken place the symptoms are not necessarily distressing. The type of temperament asserts itself here as in all gynecological affections. In one patient a slight laceration, with comparatively insignificant complicating lesions, will produce the most intense distress. In another an extensive laceration, with erosion, eversion, subinvolution, and hyperplasia, will create little if any general disturbance. Usually, however, the endometritis, metritis, subinvolution, and other complicating factors, give rise to more or less local and general distress. Menstrual irregularities, particularly menorrhagia and dysmenorrhea, are common symptoms. There is likewise more or less leucorrhea due to the endometritis.

The most common *seat of pain* is the sacro-lumbar region. Ovarian

tenderness is frequently a marked symptom also. In short, any of the phenomena studied under the head of the various lesions enumerated as complicating factors may occur. As time goes on malnutrition due to disturbance of the gastro-intestinal tract, with consequent anemia, often becomes marked.

The *reflex symptoms* are most variable. Many of these have been studied in the chapters devoted to the hystero-neuroses, to which the reader is referred. Pain in the head and lower limbs, infra-costal and infra-mammary neuralgia, profuse salivation, hysterical joints, supra-orbital neuralgia—these and reflex phenomena without number may, and often do, result from cervical lacerations.

Upon *digital examination* the changed condition of the cervix will be noted. If there is eversion the external os will be gaping, and often the finger can be passed almost to the internal os. If hyperplasia exists the tissues will feel hard and resisting. There is increased sensitiveness at the angles of the rent where the deposit of cicatricial tissue is greatest. The cervix loses its normal shape, the degree of distortion depending upon the extent and character of the laceration. In cases of erosion there will be seen through the speculum a raw, vascular surface, which is sometimes partially concealed by the two lips of the cervix. Occasionally the external os is but little larger than normal, yet if the sound is passed through it into the cervical canal the latter may be found greatly distorted. This is the so-called "circular laceration" described by Emmet. It is easily overlooked by the inexperienced examiner, because of the absence of eversion. The erosion may be entirely wanting, even in the worst cases. I have many times found it absent in cervices markedly enlarged by the deposition of cicatricial tissue and hyperplasia. If the cervix is not indurated by hyperplasia, and the amount of cicatricial tissue in the angles of the rent is not great, the eroded surface may be entirely rolled in by temporarily coaptating the lips with two tenacula.

Differential Diagnosis.—It is sometimes difficult to differentiate simple erosion in nulliparæ from laceration. Care must, therefore, be observed to guard the reputation of virgins where such a condition exists (p. 458). It is impossible in nulliparæ to reinvert the lips of the cervix as can ordinarily be done when laceration is responsible for the eversion. In cases where papillary and cystic degeneration are marked the condition may be mistaken for epithelioma (p. 459). Here the microscope must be the final test. Should there be much hyperplasia the disease may be confounded with scirrhous cancer (p. 473).

Prognosis.—Eliminating the possibility of malignant degeneration,

PLATE XXXVI.

1

2

3

EROSION AND LACERATION OF THE CERVIX. (*Ruge and Veit.*)

1. Nulliparous os; 2. Bilateral laceration with erosion; 3. Section showing obstructed follicles with increase of connective tissue.

the prognosis, as regards life, is always favorable. Cervical lacerations alone never kill, and, as we have seen, may give rise to no inconvenience whatever. It is the complicating lesions which must be considered in determining the prognosis. The presence of the laceration is often first made known by some undue exposure, unusual strain upon the nervous system, or the onset of pelvic inflammation. In chronic pelvic inflammation and uterine congestion the presence of the cicatricial plug perpetuates the difficulty, and in order to cure these affections this must be removed. So, too, in cervical and corporeal endometritis, especially if eversion and erosion are marked. Much relief, and even a temporary cure of the more distressing symptoms, may be brought about by proper palliative treatment. But unless the parts are restored to their normal condition by a suitable operation the patient will usually relapse into her former state of ill health after the treatment is discontinued. Clearly, then, the significance of cervical lacerations depends rather upon the symptoms produced than upon the extent of the tears. This fact must be borne in mind in considering the prognosis.

Immediate improvement following trachelorrhaphy, except in the neuroses, is not the rule. This fact must be impressed upon the patient. The operation will place her in a condition so hat gradual improvement will continue until she is perfectly restored to health. This may require from three months to a year, depending upon the existing lesions, as well as upon the general symptoms which such lesions have induced.

Treatment.—The *palliative treatment* should be directed to any of the various complicating lesions, which have been enumerated, that may exist. Cervical catarrh and hyperplasia, sub-involution, cystic and papillary degeneration, periuterine inflammation, etc., can all be greatly benefited by the various measures which have been elsewhere recommended for these conditions when they present themselves as pathological entities. In all, the intelligent use of the hot douche is invaluable. It should be used for its thermic properties; hence, in very large quantities and very hot. The application of the compound tincture of iodin to the cervix and vaginal fornices, followed by boroglycerid tampons medicated with ichthyol, will do much good when the hyperplasia is marked. In cases of cystic and papillary degeneration local scarification will hasten the cure. The vaginal tampon, made of cotton-wool and properly medicated, will not only support the parts, but by the pressure produced will promote the absorption of existing inflammatory exudates. In the event of contraction of the utero-sacral ligaments this should be overcome by intelligently applied pelvic

massage. If there is relaxation of the vagina, with cystocele or rectocele, the saturated solution of alum may be advantageously used in connection with the boro-glycerid tampon. This treatment, repeated twice or three times a week, and persisted in from one to three months, will ordinarily afford the greatest relief; indeed, in the slighter forms of laceration this may be all that is necessary. In the worst cases, however, the only way to bring about a permanent cure is to resort to trachelorrhaphy. If the perineum and pelvic floor are injured, these should be repaired at the same sitting.

Indications for Trachelorrhaphy.—When called for, there is no operation more satisfactory than is trachelorrhaphy. The cases which, in many hands, have been most benefited by it are of two classes: subinvolution, with menorrhagia due to fungoid endometritis; and hyperplasia of the cervix with a large amount of cicatricial tissue. If reflex and nervous symptoms are particularly marked this is an additional indication for the operation, even though the laceration is not extensive. Should dysmenorrhea and menorrhagia attend the laceration it is necessary, ordinarily, to combine with trachelorrhaphy divulsion and curetting.

I shall first describe, in order to make this section complete, the ordinary surgical methods of dealing with the injuries of childbirth, giving in the succeeding chapter my own technique.

Operation.—The patient is prepared, as for all operations in or about the genital tract, in the following way: If possible on the night preceding or the morning of the operation she should take a bath. The bowels should be emptied the day before the operation by means of a cathartic, and, not later than two hours before coming to the operating room, with a large soap and water enema. A hot bichlorid douche (1:2000) is given on the morning of the operation, the mons veneris and external genitalia scrubbed and shaved, the vagina packed with iodoform gauze and a pad of the same placed over the genitalia. After being etherized the hips are brought to the edge of the table onto a Kelly pad, the gauze removed and the genitalia again washed with soap and water and then douched with a 1:1000 bichlorid solution. The nozzle of the irrigator is next carried into the vagina and this canal is thoroughly cleaned with the fingers. Finally, the rectum is thoroughly dilated by means of a large bivalve rectal speculum (Pratt's sigmoid), the blades of the instrument being carried well into the sigmoid so as to dislodge any scybalous masses that may be beyond the bend in the gut; during the divulsion a stream of sterile salt water is kept play-

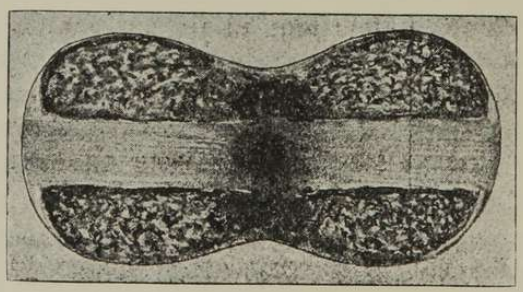
ing between the blades of the speculum so that there may be no subsequent embarrassment from the escape of fecal matter.

In order to expedite the operation there should be four assistants—one to give the anesthetic; one on either side of the patient to support the knees, hold the upper speculum, and make themselves generally useful during the operation; and a fourth to look after the sponges. There should be conveniently at hand two trays containing the following instruments: Two tenacula; one Mundé's counter-pressure hook; one Wood's wire twister (Fig. 138); one Sims' shield; one pair of Emmet's cervical scissors; one blunt-pointed uterine scalpel; one pair of wire scissors; six trocar-pointed cervix needles, straight and curved; four Wood's sponge holders (Fig. 137), containing sponges of suitable shape; one uterine sound; perforated shot; one needle holder; two coils of pure silver wire, Nos. 27 and 28; braided silk and catgut.

After the vagina and external genitalia are thoroughly cleansed the thighs and nates are covered with a perforated gauze apron. The upper blade of a Fritsch speculum is attached to an irrigating apparatus containing a 1:5000 bichlorid solution. The anterior lip of the cervix is first seized between the points of Skene's volsella and transfixed with a needle armed with a long braided silk. This is next passed through the posterior lip, then drawn from the cervical canal with a tenaculum, severed, and the separate loops tied. These "guy sutures" will give the operator perfect control of the cervix. Their introduction requires but a moment's time and the trouble is more than compensated for by the advantage gained. An applicator dipped in impure carbolic acid is now passed into the uterine cavity. If the nervous symptoms are at all marked, or if there is a history of obstructive dysmenorrhea, the cervix is forcibly divulsed. If there is subinvolution and menorrhagia, the sharp curette is next applied to the entire endometrium, the débris wiped away, and a second application of the impure carbolic acid made to the endometrium. This practice I consider very important and undoubtedly the good results obtained from trachelorrhaphy are enhanced by it. Should the case be one of gonorrheal endometritis the uterine cavity should be irrigated with a 1:1000 bichlorid solution, care being taken to remove all of the fluid with a strip of gauze. With the patient upon her back the mucous membrane covering the right border of the posterior lip is caught in a tenaculum, from which point it is removed to the corresponding apex. That of the anterior lip is dealt with in the same way, care being taken to make the dissection extensive enough to remove all of the cicatricial tissue, particularly at the angle of the rent. It will be found that this tissue is

much more abundant close to the cervical canal than immediately beneath the mucous surface of the cervix. While an undenuded strip should be left for the purpose of preventing occlusion of the canal, the scissors at the angle of the wound should, in removing the cervical plug which is usually found at this point, work a little distance from the cervico-vaginal mucous membrane in order to avoid cutting any of the branches of the uterine artery which may be imbedded in the submucous cellular tissue. A like denudation is made on the right side. The denudation of the right rent, in cases of bilateral tears, is done in exactly the same way. Ordinarily, a strip of mucous membrane a quarter of an inch wide is left between the two vivified surfaces, as shown in Fig. 263. This is for the creation of the new cervical canal. It is, however, of the greatest importance that *all* of the cicatricial tissue and diseased glands should be removed, even if the cervical canal must be invaded in order to accomplish this. I do not hesitate to sever the circular artery if necessary to do so in order to reach all of the cicatricial tissue. I once unwittingly penetrated the folds of the broad ligament on each side, so that the two fingers could be readily passed to the fundus uteri.* Under a stream of bichlorid the requisite number of sutures was inserted, and before the wound was closed the uterus was packed with iodoform gauze for the purpose of controlling the free

FIG. 263.



AREA OF DENUDATION IN TRACHELORRHAPHY. Patient on her side.

oozing of blood. The gauze was removed on the second day and the patient made an uninterrupted recovery. However, so extensive a dissection as this is unnecessary and not advised, but the danger attending injury to the circular artery has, I believe, been greatly exaggerated.

For the removal of the cicatricial tissue I use almost altogether the

* North American Journal of Homeopathy, June, 1891.

scissors shown in Fig. 264. By picking up with a tenaculum the hard deposits, which can be felt distinctly with the finger, they are easily removed with the scissors. Some operators prefer for this purpose the uterine scalpel shown in Fig. 265.

After the diseased tissue has been removed and the denudation completed, the parts are temporarily brought together by the aid of the guy sutures to determine whether or not approximation will be complete when the cervical sutures are introduced. If the hemorrhage is profuse and comes from the circular artery it can be controlled by passing deeply in the angle of the wound a wire suture, and temporarily twisting it; or the spurting arteries can be secured in a fine catgut ligature. In Sims' posture the upper row of sutures is first passed; in the

FIG. 264.

EMMET'S CERVICAL SCISSORS.

lithotomy posture it is a matter of indifference whether the right or the left side of the wound is first closed. Care must be taken to insert the sutures farthest from the operator as high up as possible to insure complete closure of the angles of the wound. A cervical needle armed with a silk leader, in the loop of which is placed a silver wire ten or twelve inches in length, is seized with the needle holder and carried from without inward (Fig. 266). The number of sutures will vary

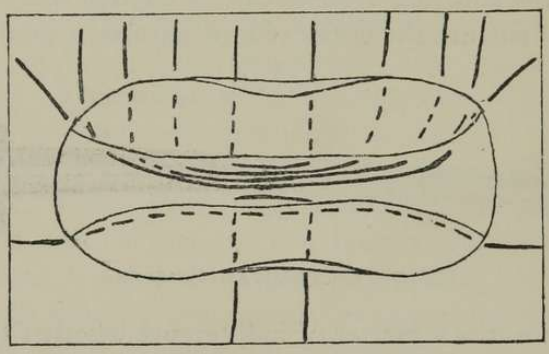
FIG. 265.

SCOTT'S UTERINE SCALPEL.

from two to six on each side, depending upon the extent of the tear. It is not wise to place them too close together—ordinarily about four to the inch. After a suture is passed, the ends are quickly twisted together and given to an assistant, or placed under the blade of the speculum. When all are passed, the operator approximates the two sides of the wound, securing first the sutures at the upper angles; this is done under a stream of bichlorid. Instead of twisting the sutures, perforated shot may be used for the purpose of securing them, because, if the twisted wire is used, no matter how cautiously the ends are bent

upon themselves, they are liable to become buried and lost. More than once have I left twisted sutures behind. That this experience is not peculiar to myself is proved by the writings of Mundé, Emmet and others. After the sutures have all been secured the vagina is again irrigated, wiped dry with sponges, and a strip of iodoform gauze packed about the cervix with one end left projecting from the ostium vaginæ. The gauze is introduced to support the parts should the patient vomit from the effects of the ether, and is removed as soon as the retching ceases.

FIG. 266.



INTRODUCTION OF SUTURES IN TRACHELORRHAPHY.

The *after-treatment* is very simple. The patient is placed in bed, where she is kept for two weeks. The sutures are removed on the tenth day, unless menstruation should make its appearance at or about that time, or unless the perineum was restored at the same sitting. She is permitted to urinate spontaneously from the first, if able to do so. After urinating, a small boric acid douche should be given. When the catheter is used the cleansing douches are not called for.

Lumbar pain from dragging upon the cervix is the most constant symptom, and is usually made better by a few doses of cimicifuga. If there is much tenderness or soreness over the abdomen an ice-bag may be applied. Mundé recommends that if there is retro-displacement a Hodge pessary be introduced before the patient is removed from the operating table. In retroversion the anterior lip should be well drawn down with the guy while the sutures are being passed (p. 599).

In order to remove the sutures the patient should be placed before a good light and the parts exposed with a Sims speculum. The first suture is caught in catch-forceps and severed with wire scissors. This is repeated until all are removed. The higher sutures can be located with the finger if they are not brought into view by the speculum. The

patient is permitted to get up and about at the end of the second week, although if there is marked subinvolution and pelvic congestion it is well to keep her quiet longer than this. In the meantime the various measures having for their object the relief of existing complications should be brought into requisition.

It cannot be said that trachelorrhaphy is entirely free from danger, but the danger, if counter-indications do not exist, is practically nil. The operation should not be done if acute inflammatory symptoms are present, or if the uterus is bound down by adhesions. The danger from sepsis, if antiseptic precautions are resorted to, is very slight. A few deaths have resulted from this and from pelvic inflammation; usually, however, serious pelvic inflammation is due either to uncleanliness or to the fact that the counter-indications have not been carefully observed. I have made at least four hundred trachelorrhaphies without a death. Except for two cases of cellulitis which resulted in my early experience from want of proper antiseptic precautions, I have not had to contend with serious complications of any kind.

If the operation is properly performed the parts rarely, if ever, fail to unite. When imperfect union takes place it can be attributed, in most instances, either to excessive suture tension, to sepsis, or to the depressed state of the general health.

Should *hypertrophic elongation of the cervix* complicate the laceration the redundant tissue must be amputated. In doing this care must be observed not to injure the bladder, rectum, or pouch of Douglas (Figs. 169 and 170). The hypertrophy may be limited to the vaginal portion, or it may implicate the supra-vaginal portion and body of the uterus. When met with in virgins, it is probably due to inflammation. The diagnosis is easily made by digital and conjoined examination. I prefer Simon's method of amputation. This is done by excising a wedge-shaped mass from the two lips, after which the vaginal and cervical mucous membranes of each lip are stitched together (p. 607). Hegar removes the tissues by a circular amputation, and then brings together the vaginal and cervical mucous membranes by a circular row of interrupted sutures.

In conclusion, it is necessary to allude to the probability of the recurrence of the laceration should the patient again become pregnant. The statistics of Wells show that a relaceration occurs only in about twenty per cent. of all cases in which the condition was noted after labor (Mundé). It is not probable that, unless conception occurs very soon after the operation, the patient is any more liable to sustain a subsequent laceration than are nulliparæ.

CHAPTER LII.

INJURIES RESULTING FROM CHILDBIRTH.

(Continued.)

Lacerations and Injuries of the Perineum and Pelvic Floor.

General Considerations and Anatomy.—There is no subject connected with gynecology more important than the one under consideration. The frequency of these injuries, the distressing symptoms resulting from them, and the numerous methods which have been devised, especially during the last ten years, for their correction, make them, I think, of unusual interest. By all odds the most valuable contribution to the literature of this subject accessible to the English reader is, in my opinion, the chapter by Dr. Howard A. Kelly in Vol. II. of the "American System of Gynecology." In the present chapter I have drawn liberally from Dr. Kelly's writings.

The almost countless operative procedures having for their object the restoration of the perineum and pelvic floor are the outcome of numerous and widely differing theories put forth by specialists and anatomists regarding the function of the structures involved. The student is earnestly advised to study carefully, before considering in detail the symptoms and treatment of these injuries, the chapter devoted to the anatomy of the pelvic organs. It is absolutely essential for him to comprehend the relationship of the several structures of the pelvic floor if he expects successfully to contend with the accidents and injuries following in the train of parturition.

The pelvic floor, considered as a whole, is made up of muscular and connective tissues which are so interlaced as to form a firm and resisting diaphragm. These extend from the pubic rami and ischia to the coccyx and sacro-sciatic ligaments, thus closing the pelvic outlet (Figs 2, 5, and 7). The pelvic floor is pierced in the female by the vagina and the rectum. The anus and lower extremity of the rectum are separated from the lower extremity of the vagina by a triangular body known as the *perineum* (Fig. 10). The importance of the perineal body as a supporting structure is variously estimated. Thus, Kelly maintains that its efficiency is inversely proportionate to

its depth—very deep perineums being weak, and shallow short ones strong. If the perineum is considered as a separate part of the pelvic floor, this view is unquestionably correct. If, on the other hand, we look upon it as intimately connected with the pelvic floor by the combination of muscles, fasciæ, vessels, nerves, fat, and areolar tissue, its importance as a supporting structure will be neither under-estimated nor unduly exaggerated. Being intimately blended with these structures, it helps to sustain the posterior vaginal and the anterior rectal wall, thus preventing their prolapse, at the same time furnishing a support upon which the anterior vaginal wall and bladder rest. Again, it directs the contents of the rectum during defecation backward, thus preventing the rectum from being forced into the vagina in the form of a rectocele, as it also prevents a cystocele by the support given to the bladder.

The levatores ani, which, together with their fascial coverings, are by all odds the most important structures of the pelvic floor, extend transversely across the pelvis at the upper portion of the median line of the perineum. These muscles, together with the transversus perinei and infra-vaginal portion of the triangular ligament, can be felt by carefully palpating the posterior vaginal wall just behind the hymen. They appear to the examiner as a band or sling of fibers, which is sufficiently under the control of the patient so that by it the vaginal orifice can be contracted or relaxed. The fibers of the levatores ani hug in their embrace both rectum and vagina, as is shown in Fig. 7. If these fibers are separated from their lateral attachments to the rectum, the pelvic floor is weakened and the vaginal outlet relaxed. The rectum will, as it were, fall away from the vagina, so that the space occupied by the perineal body is increased in its antero-posterior diameter, providing the fourchette has not been torn. It is this sort of a deep perineum which is weak, and which undoubtedly has given rise to the too sweeping assertion that all deep perineums are weak, whereas shallow short ones are strong. If the fibers of the levatores ani are neither separated nor relaxed the functional activity of the pelvic floor, as a whole, is preserved, whether the perineum be deep or shallow.

While, then, it is true that very deep perineums may be weak, they are weak not because of the large quantity of areolar tissue in them, but rather because the muscles and fasciæ are separated from their median attachments.

As the presenting part of the fetus impinges upon the pelvic floor during parturition, it forces the fibers downward and rolls them outward and forward from under the pubic arch. The pelvic floor, in

common with the entire parturient canal, is softened by the changes incident to gestation, and, as the head descends and recedes with each succeeding pain, the muscular fibers are gradually stretched and dilated until, in normal cases, the head is delivered without injury to the mother (Figs. 9 and 267). If there exist a disproportion between the

FIG. 267.

DIAGRAM OF VAGINAL OUTLET, SHOWING RELATIONS OF THE LEVATOR, RECTUM, AND VAGINA. (*Kelly.*)

size of the parturient canal and the fetus which has to pass through it, or if the pelvic floor is not thoroughly relaxed before the fetus is expelled, injuries are almost inevitable.

Forms of Injury.—Injuries to the pelvic floor resulting from childbirth may be divided into two classes:—

1. Visible tears, varying from a slight rent of the fourchette to a laceration extending into the rectum.

2. Invisible or subcutaneous tears. Here the muscular fibers and fasciæ are either lacerated or over-stretched. This condition permits of great relaxation of the outlet, the injury being frequently unrecognized because of the fact that it is concealed by the mucous membrane.

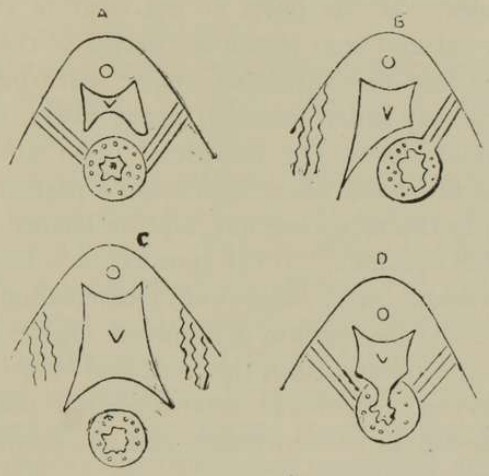
A slight rent involving only the mucous membrane at the fourchette is of frequent occurrence, especially in primiparæ, and, except as it furnishes an avenue for the entrance of germs, is of little consequence. If it does not extend beyond the sphincter the pelvic floor remains unweakened. When the recto-vaginal septum is involved it may extend as far up the vaginal canal as the cervix; usually it is confined to the lower inch of the septum. Central perforation of the perineum is a rare injury, though it occasionally occurs. It is the result of faulty position of the presenting part, or of deformity of the pelvis which drags the head backward instead of forcing it forward under the pubic arch.

Invisible or concealed tears often extend up one or both vaginal sulci, beginning at the posterior columna rugarum (Fig. 268).

One sulcus is usually more extensively involved than the other, the separation even extending as high as the cervix. The perineum may or may not be involved. These lateral injuries correspond to the axis

of the vagina and, extending in the direction of least resistance, separate the rectum from the levator ani muscle. The rectum itself is left uninjured. In those injuries extending through the recto-vaginal septum the muscular fibers of the pelvic floor are ordinarily not separated (Fig. 268, D).

FIG. 268.



A. Relation of levator, rectum, and vagina (diagrammatic). B. Same, showing deep tear separating levator fibers from rectum in right sulcus. C. Same, showing relaxation of outlet, separation on both sides. D. Same, showing tear into rectum; levator fibers not injured. (*Kelly.*)

Causes.—The various causes tending to produce laceration and relaxation of the pelvic floor are:—

Occipito-posterior presentation and malpresentations in general;

Excessive uterine contractions;

Narrow and too acute pubic arch;

Weakening of the perineum from syphilis;

Excessive rigidity, especially in elderly primiparæ;

Obstetric operations, particularly forceps delivery.

The use of the obstetric forceps oftener produces superficial injuries than concealed. Even in the hands of the most skilled obstetrician, tears more or less extensive in character will every now and then result from its application. Nevertheless the concealed injuries are oftener due to long-continued distention of the pelvic floor by the presenting part of the fetus than to the intelligent use of instruments.

Spontaneous Reparation.—Nature, ever conservative, endeavors in her own way to repair injuries resulting from childbirth. Thus, in

relaxation from over-stretching of the fibers, the outlet is more or less completely closed by the levator fibers next beyond those which are injured. A constant spasmodic effort, when the patient is not at rest, is made by these fibers, though the contraction usually is insufficient to replace the natural support. In visible tears not extending into the rectum complete union may occur if the parts are kept clean and in apposition. Usually, however, such union is not possible without surgical interference. If the parts do not heal in this way, granulations are thrown out and scar tissue is created at the site of the tear which often gives rise to distressing reflex disturbance. This, in a measure, though it may pinch terminal nerve fibers, serves as a substitute for the original tissue, the cicatricial mass affording a point of attachment for the muscular fibers which are a part of the perineum.

In tears involving the recto vaginal septum nature is also able to do much to remedy the accident. If the rent extends into the anal border of the sphincter muscle only, subsequent cicatrization will prevent extensive separation. If the septum is involved higher up, the sphincter tends to contract at a point within the rent and more or less control of the bowel is preserved. However, after a certain point is reached the sphincter no longer works concentrically and the rectum is so separated as to destroy all retaining power.

Results of Relaxation and Laceration of the Pelvic Floor.—Immediately after labor, it is impossible to recognize mere relaxation. After the patient is up and about she will complain of indefinite bearing-down pains and a feeling of insufficient support at the vaginal outlet. As time goes on this distress becomes more and more marked. The symptoms are particularly aggravated by being on the feet, especially if the patient is compelled to lift and do manual labor. In due time there is often developed prolapse of the vagina, with cystocele, rectocele and even enterocele.

Uterine congestion and the various forms of displacement, especially prolapse, are not infrequently associated with relaxation and laceration. In complete laceration there is incontinence of feces and gas.

The formation of a *cystocele* in these instances is due to the intimate attachment of the bladder to the anterior vaginal wall. The bladder loses the support afforded by the pelvic floor and perineum, which causes it to descend in the form of a pouch into the vagina. At first this is small, but as time goes on it increases in size until the tumor becomes sufficiently large to protrude from the labia. Because of the inability to completely empty the bladder, cystitis, dysuria, etc., result. The

nature of the tumor can readily be determined by passing a sound into the bladder or by placing the patient in the genu-pectoral posture.

A *rectocele or recto-vaginal hernia* is produced by the same causes which, acting in front, give rise to cystocele. As the rectum pouches into the vagina, it becomes filled with fecal matter, which is evacuated with difficulty. This gives rise to tenesmus, hemorrhoids, obstinate constipation, and even serious inflammation. The tumor varies in size from a simple protrusion to one as large as an orange. The diagnosis is readily made by rectal exploration.

Enterocele or entero-vaginal hernia is caused by the descent of a portion of the small intestines in such a way as to encroach upon the vaginal canal. It is oftener located posteriorly. The intestines in Douglas' pouch may gradually stretch this serous prolongation, which, pushing before it the posterior wall of the vagina, may present at the vulva in the form of a tumor. This condition is sometimes associated with hypertrophic elongation of the cervix (Fig. 170 and Plate XII). The *symptoms* of enterocele are usually not distressing. The diagnosis is made by rectal exploration and by the tympanitic character of the sound elicited upon percussion. It is important to bear in mind the possibility of enterocele if the vaginal tumor is first discovered during labor. Strangulation at this time is not impossible and if the condition is mistaken for other forms of vaginal tumor, serious consequences may result from an incision. In all cases of doubt, capillary puncture and aspiration are wise precautions to observe before thrusting a knife into the tumor.

In cases of *relaxation* inspection will show that even though the perineum is actually deeper than normal the ostium vaginæ is not properly closed. The anal cleft, instead of presenting as a sharp, deep furrow, is flat and shallow, and the anus drops backward instead of being drawn up under the pubic arch. As the finger is carried into the vagina the distinct transverse ridge of fibers, extending from one pubic ramus to the other, cannot be felt. The only resistance met with upon pushing the posterior vaginal wall backward is the large open muscular loop which rises low down on the pubic ramus, and passes around the rectum and vagina just in front of the coccyx. If the patient is upon her back, and the perineum is retracted with a finger in either vaginal sulcus, the anterior and posterior vaginal walls will roll out (Fig. 269); in cystocele and rectocele the pouching is very marked. Or, if she is placed in Sims' posture, the ostium is not normally closed, but is sufficiently gaping to permit of the entrance of air. If the finger is now carried into the vaginal sulci the line of separation can be distinctly

felt. In the erect posture intra-abdominal pressure tends to force the pelvic contents from the weak outlet. There is usually more or less descent of the uterus connected with relaxation.

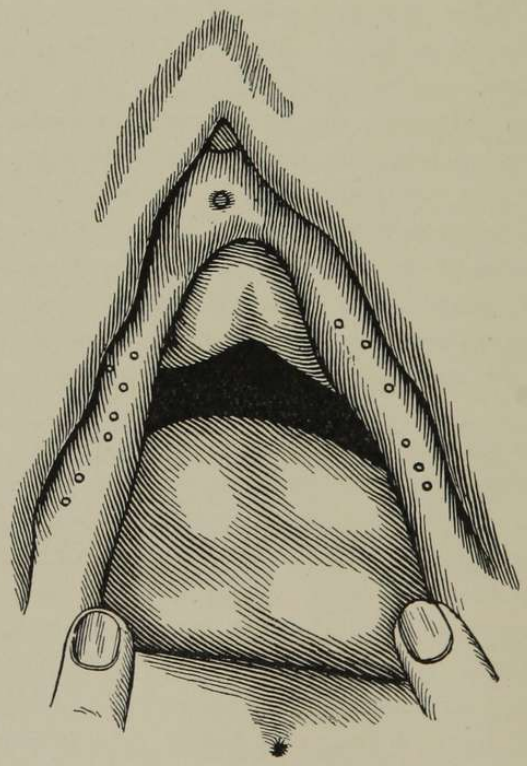
Treatment.

This resolves itself into—

(1) Palliative;
(2) Surgical.

Palliative Treatment.—The palliative treatment consists of those measures having for their object the relief of pelvic congestion and the temporary support of the uterus and vaginal walls—the hot douche, the

Fig. 269.



Showing Rectocele and Relaxation. (*Wood.*)

glycerin tampon, and a properly fitted pesssary, should there be uterine or vaginal displacement. Elderly women, especially, often decline to submit to operative interference, and it is possible to keep them fairly comfortable by the various palliative measures recommended in Chapter X.

Surgical Treatment—*Primary Operation.*—Recent superficial tears should be repaired at once. This will not only make a secondary operation unnecessary, but it closes one, and a very important, avenue for the transmission of septic matter. If the tear is a simple one, and does not extend into the sphincter, its closure is not in the least difficult, and any physician capable of assuming the responsibilities of an accoucheur ought to be able to repair it.

The patient should be placed across the bed with her hips projecting over its sides. After washing away the clots and débris with a 1:4000 bichlorid solution, the surfaces of the wound, if at all irregular, are trimmed with scissors so as to make coaptation perfect when they are brought together. I prefer wire for suture material in puerperal cases, because of the more or less septic character of the lochial discharge. This is threaded into an ordinary straight perineal needle, which is carried through the tissues by means of a needle holder. From one to four sutures will be necessary, according to the extent of the tear. The first two sutures are buried in the recto-vaginal septum, and are entirely concealed. The third and fourth, if used, are introduced in such a way as to make their appearance within the vagina. If, however, the tear is more extensive and involves the posterior vaginal wall, sutures must be passed within the vagina so as to approximate the torn surfaces. The sutures are secured by twisting or by perforated shot, care being taken not to cause too great tension. The external sutures are entered about a quarter of an inch from the margin of the wound and are made to reappear at the corresponding point on the opposite skin surface. After the sutures are secured the knees are tied together. The sutures are left in from seven to ten days. If the parts are kept scrupulously clean, union will result in nearly every instance. The patient is allowed to urinate spontaneously, if she can do so, after which a ten per cent. boric acid douche is given. If she cannot urinate spontaneously the catheter must be used.

If the tear extends through the sphincter, the technique of the operation for its immediate closure will have to be modified. Failures are here much more common than is the case in dealing with superficial injuries. The failure may be due to wound infection from fecal and lochial contamination; or to a bruised condition of the tissues which favors sloughing.

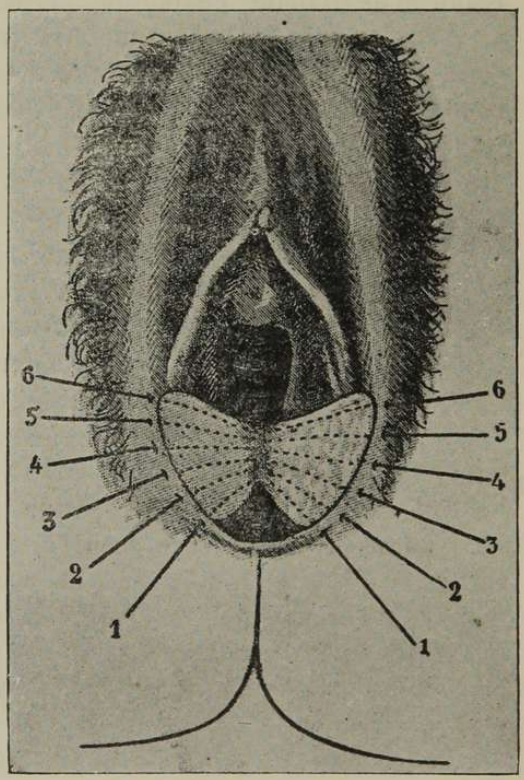
If the rent does not extend too far up the recto-vaginal septum, it may be closed by passing the sutures according to the method shown in Fig 270. It is best, however, when the tear extends any distance into the septum, to pass a sufficient number of interrupted sutures from

the vaginal and rectal sides of the wound to coaptate the surfaces nicely. Silver wire may be used for the vaginal surface, and silk or chromicized catgut for the rectal surface. These should be introduced about four to the inch.

In the after-treatment of complete tears great care is necessary to prevent hardened fecal matter from stretching the parts during defecation.

Secondary Operation.—By this is meant an operation upon the peri-

FIG. 270.



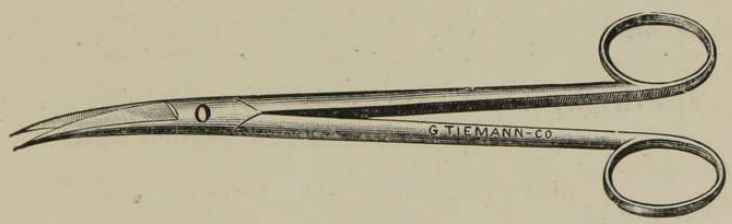
COMPLETE LACERATION. DENUDATION AND DISPOSITION OF THE SUTURES. (*Emmet.*)

neum and pelvic floor after the parts have cicatrized—from two months to several years following the injury. All granulations and inflammation at the site of the injury have disappeared, and in order to restore the parts to their normal condition, raw surfaces must be created, either by denudation or by flap-splitting.

There are certain general measures which should be attended to pre-

viously to any of the secondary operations upon the perineum and pelvic floor. It is not wise, especially in complete lacerations, to operate while the patient's health is greatly depreciated. Unless the indications for immediate reparation are imperative, sufficient time should be taken to build up the general system. In complete lacerations, the bowels should be thoroughly emptied by a cathartic twenty-four hours before the operation and the lower bowel washed out by an enema two or three hours before the patient is placed upon the operating table. She should be instructed to make a final effort to evacuate the bowels just previously to taking the anesthetic. Unless this last precaution is taken, water will be left behind which, together with the liquid contents of the lower bowel, will be expelled during the operation, much to the annoyance of the surgeon. When the recto-vaginal septum is involved, a longer time should be taken in order to insure complete emptying of the intestinal canal of all fecal and scybalous matter. A cathartic should be given every day for at least three days previously to the time set for the operation. The patient should, during this time, live almost entirely upon liquid food. The parts should be kept clean by antiseptic vaginal douches. For the enemata a boric acid solution should be used.

FIG. 271.



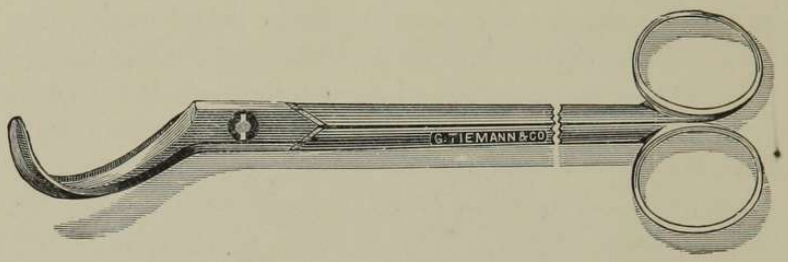
SIMS' SHARP CURVED SCISSORS.

General anesthesia is advisable in nearly all cases. Unless ether is counter-indicated because of some kidney or lung lesion, it is preferable to chloroform owing to its greater safety. In superficial rents, and particularly if the patient is not very nervous, it is entirely possible to operate with but little pain under the hypodermic use of cocaine. Occasionally patients are met with who dread the anesthetic more than the operation. As a rule, however, general anesthesia is advisable. Immediately before the anesthetic is administered, a large hot vaginal bichlorid douche is given, for its hemostatic as well as its antiseptic effect.

A large number of instruments is unnecessary. There should be a

pair of scissors curved on the flat (Fig. 271); a pair of angular scissors (Fig. 272); two tenacula; two or three straight round perineal needles (ordinary darning needles about two inches long); two short curved needles; three or four catch-forceps; a needle holder; chromicized cat-

FIG. 272.



EMMET'S DOUBLE-CURVED SCISSORS.

gut; an irrigator; and a Kelly pad. The crutch is, in my opinion, entirely unnecessary. Emmet's right and left scissors curved on the flat are a convenience rather than a necessity.

Assistants.—Four assistants are necessary: two to support the patient's limbs, hold the speculum and assist the operator in various ways; one to aid with the instruments and sponges; and one to give the anesthetic.

Position of the Patient.—For all operations upon the perineum and posterior vaginal wall the lithotomy posture is the preferable one. In anterior colporrhaphy it will be necessary to utilize the Sims or semi-prone posture in order to expose the anterior vaginal wall.

The character of the operation will depend upon the extent and nature of the injury.

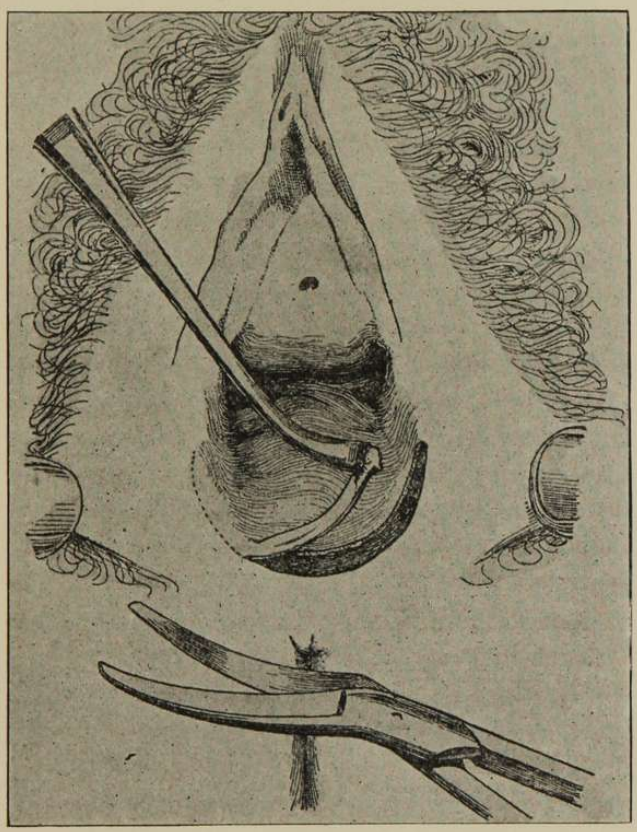
RESTORATION OF THE PERINEUM ONLY.

Simple Denudation and Coaptation.—The assistants, one on each side of the patient, support the limbs which are flexed upon the abdomen, and with the unoccupied hands separate the labia so as fully to expose the parts. The operator hooks a tenaculum into the muco-cutaneous surface of the left side at a point corresponding to the upper margin of the rent (this is indicated by the scar tissue), and with curved or straight scissors dissects up a strip of mucous membrane at its junction with the skin surface and extending from this point to a corresponding point on the opposite side (Fig. 273). The tenaculum is now discarded and the strip of mucous membrane is held in the left hand. With a pair of scissors curved in the opposite direc-

tion another strip is removed from right to left. This is repeated until the denudation is carried to the required height; usually an area corresponding to that shown in Fig. 274 is denuded.

The sutures (silkworm gut, silver wire or chromicized catgut) are now passed. I prefer for needles ordinary straight darning needles. They are inexpensive, readily penetrate the tissue, and, because of their shape, give rise to no hemorrhage. The lower suture is first introduced

FIG. 273.

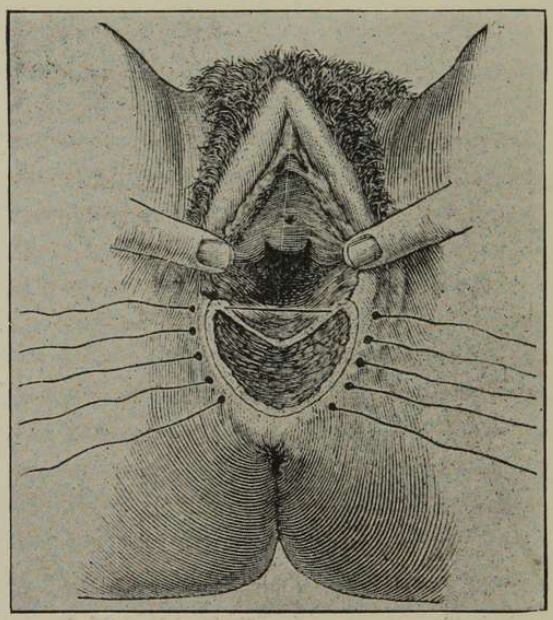


FIRST STEP; DENUDATION BEGUN. (*Skene.*)

a short distance from the skin surface and made to reappear at a corresponding point on the opposite side of the wound. From three to five sutures, depending on the size of the denuded area, are ordinarily required. The ends of each suture are secured in catch-forceps. All except the last are entirely concealed and should be passed with the finger in the rectum as a guide so that the rectum may not be penetrated. In inserting the last suture it is better, instead of introducing

it as is shown in the illustration, to pass it through the tissues at the upper angle of the wound on the left side, then carry it through the apex of the vaginal mucous membrane close to the point of denudation, causing it to reappear on the skin surface of the opposite side of the wound. When this suture is tightened it will elevate the vaginal mucous membrane to the highest point of the wound, thus preventing

FIG. 274.



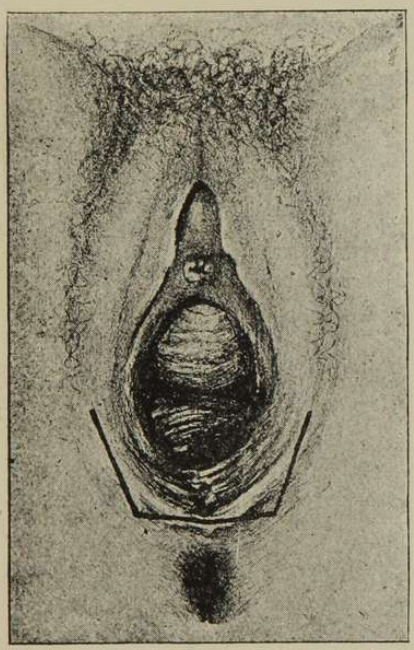
SURFACE DENUDED AND SUTURES IN POSITION. (*Thomas.*)

the formation of a sulcus just above the newly-made perineum, which, by the retention of secretions, may interfere with union (Emmet). During the entire operation constant irrigation is kept up with a 1:5000 bichlorid solution. It is rarely if ever necessary to do anything more than to temporarily compress spurting arteries in order to control the hemorrhage.

The lower suture is first tied (twisted or shotted if wire), and each succeeding suture from below upward is dealt with in the same way. There is danger of creating too much tension in securing the sutures. The tension should be only great enough to hold the parts in nice coaptation, making due allowance in all cases for more or less swelling. It is a good plan when wire is used, after the twisting, to shoulder the sutures with two tenacula. There should be but little pain after perineal operations, and when it occurs it is due to excessive suture tension.

After the wires are twisted the ends are cut about two inches from the skin surface. The several ends are then twisted into one coil and protected either with absorbent cotton or a piece of rubber tubing. The limbs are brought together before the sutures are twisted. When the operation is completed the parts are carefully cleansed, wiped dry (the vagina being cleansed with a sponge held in a holder), sprinkled with iodoform, and strips of iodoform gauze packed into the vagina. An antiseptic pad should also protect the newly-made perineum. The patient is then placed in bed with her limbs tied together until she recovers from the anesthetic.

FIG. 275.



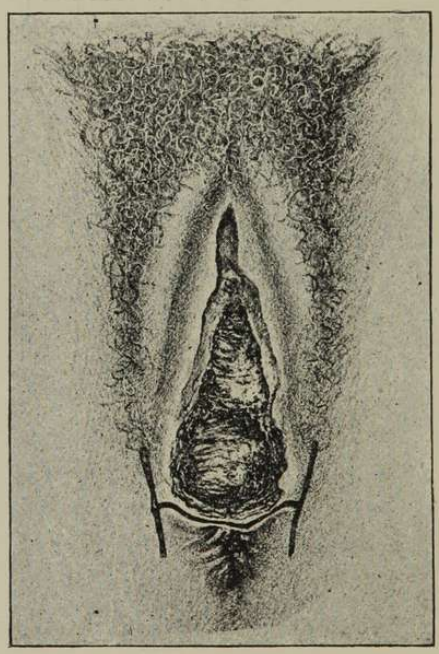
FLAP-SPLITTING OPERATION FOR INCOMPLETE LACERATION OF THE PERINEUM. (LINES OF INCISION.) (*Mundé.*)

The buried animal suture may be utilized for coaptating the denuded surfaces instead of the outside sutures. If used, great care must be observed to prevent suture infection. Catgut should be chromicized in order to prevent too rapid absorption. The suture should not be permitted to touch any part of the patient or the table during the operation. A long catgut is threaded in a suitable needle, passed at the apex of the wound and tied. It is then reintroduced, grasping only a portion of the denuded surface, and interlooped. The sutures are

passed about four to the inch until the lower angle or skin surface of the wound is reached. The catgut is pulled taut and held by an assistant as it is each time drawn through the tissues, until finally the wound is completely closed, the last row approximating the mucous and skin surfaces. The chief advantage of the animal suture is that it does not require removal. To prove successful, however, the strictest antiseptic precautions must be observed in its use.

Flap-Splitting Operation.—This operation, now so popular with the larger number of specialists, was reintroduced by Lawson Tait and has received the *imprimatur* of his name. It is admirably adapted to

FIG. 276



FLAP-SPLITTING OPERATION FOR COMPLETE LACERATION OF THE PERINEUM. (LINES OF INCISION.) (*Mundé.*)

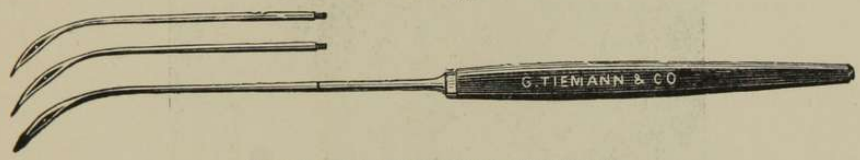
those cases of simple laceration uncomplicated with pelvic relaxations, and complete lacerations involving the inferior extremity of the recto-vaginal septum. It possesses the great advantage of being quickly and easily performed. In order to prevent confusion I will describe under the present head the operation for both complete and incomplete tears.

The patient is placed in the lithotomy posture, the index finger of the left hand is passed into the rectum for a guide, and with a pair of

angular scissors (Fig. 234) introduced into the left side of the recto-vaginal septum, the tissues are split from left to right (Fig. 275). Tait makes this median incision from a quarter of an inch to half an inch deep. If the laceration is an incomplete one the incision is carried up on either side to a point corresponding to the upper angle of the perineal rent. If the recto-vaginal septum is involved in the tear it is also extended downward and backward on both sides of the transverse incision to a point just beyond the edges of the sphincter ani muscle (Fig. 276).

The upper and lower flaps are now caught in tenacula or catch-forceps, the upper being drawn upward and the lower downward (Fig. 278). The sutures are passed from left to right and from below upward by means of a needle with a fixed handle (Fig. 277). The

FIG. 277.



PEASLEE'S PERINEAL NEEDLES.

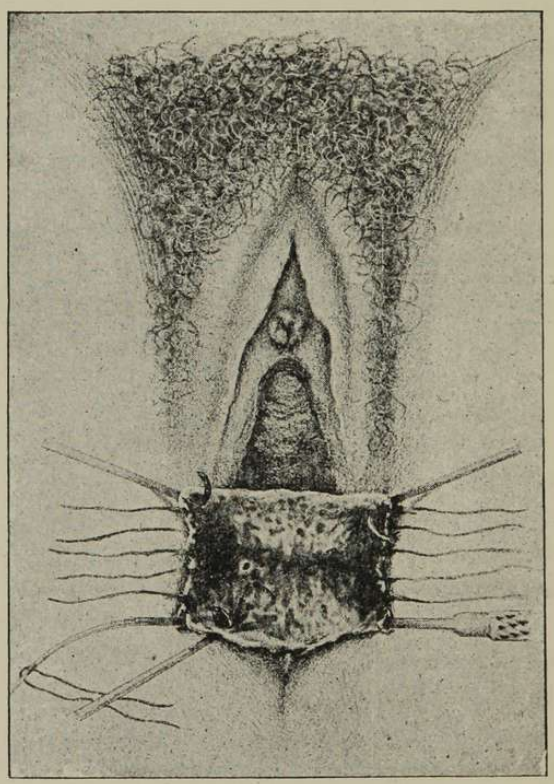
sutures should be passed very close to the edge of the wound, Lawson Tait even recommending that the skin surface be left untouched. I agree with Mundé, however, that it is better to include a small portion of the skin surface, for by so doing coaptation is made more complete. After all of the sutures have been introduced they are secured in the ordinary way. The puckering of the posterior commissure, which inevitably results, is closed by a continuous catgut suture. I shall speak of my modification of this operation in dealing with relaxations of the pelvic floor.

This is a most ingenious, and, ordinarily, a most successful operation. For complete tears I think that it is unexcelled. Its superiority over the older method was most forcibly impressed upon me by a case sent to me some years ago by Dr. Sutherland, of South Bend, Ind. The recto-vaginal rent extended for at least two inches above the lower border of the sphincter. The operation was done six weeks after confinement, while the parts were yet subinvoluted and exceedingly vascular. The hemorrhage was most profuse, and it became necessary to tie a good many arteries with catgut, which was evidently contaminated; at any rate, wound infection from some cause ensued. Sloughing occurred, but not until after the rectal and vaginal portions of the wound had united. The sloughing gave rise to an excavation

in shape not unlike that shown in Fig. 278. This, in time, entirely filled in by granulation, and the patient recovered with perfect control of the sphincter.

Other Methods of Closing Complete Tears.—Various other operations having for their object the reparation of complete tears are now, and have been for many years, in vogue. Of these Hegar's, Hildebrandt's, Simon's, Baker Brown's, Emmet's, Freund's and Good-

FIG. 278.



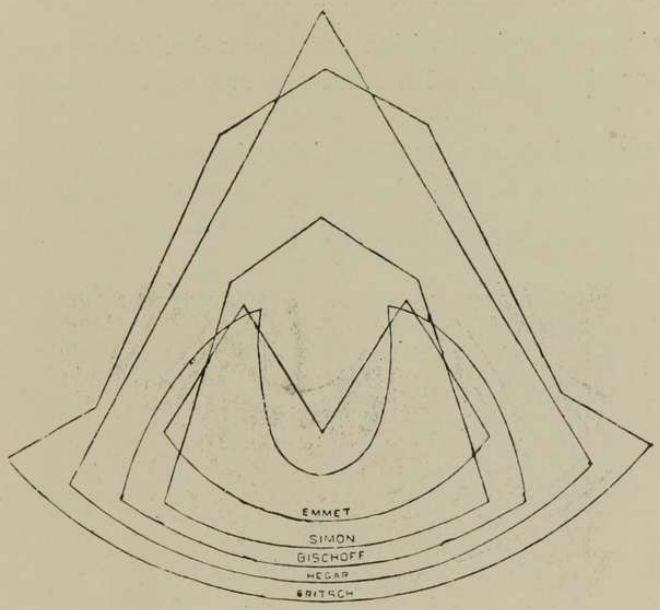
FLAP-SPLITTING OPERATION FOR LACERATED PERINEUM. APPEARANCE OF WOUND AND INTRODUCTION OF SUTURES FOR BOTH VARIETIES. (*Mundé.*)

ell's are best known. In the first four the vivification is confined to the posterior vaginal wall and is median; in the last three it is bilateral and is made in the vaginal sulci. Of these various operations Emmet's is the most popular in this country, although, in my opinion, infinitely more difficult and unsatisfactory than the flap-splitting method. I will, however, for the sake of completeness, briefly describe it.

Emmet's Operation.—The area of vivification is well shown in Fig. 270. It represents a triangle on either side of the lacerated perineum.

At the apex of the tear the two triangles are connected in the median line, the denudation being carried some three centimeters above the point of the laceration. It will be seen by studying the figure that the median denudation represents the body of a butterfly and the lateral portions its wings. The parts are closed with silver wire of medium size and the introduction of the sutures is of great importance. The point of the needle armed with the first suture is introduced one centimeter and a half behind and outside the anus, on the left side. This is carried through the inferior part of the recto-vaginal septum and is

FIG. 279.



SUPERIMPOSED DIAGRAMS OF FRITSCH'S, HEGAR'S, BISCHOFF'S, SIMON'S AND EMMET'S OPERATIONS.

made to appear on the right side of the anus at a corresponding point. The sutures must be guided by the left index finger in the rectum. Four or five sutures, one above the other, and all concealed within the vagina, are passed in this way. They are secured as in incomplete laceration. If perfect coaptation of either the mucous or the skin surface is not secured, superficial catgut sutures may be introduced. The first suture is by all odds the most important one and must catch the ends of the broken sphincter muscle in such a way as to bring them into perfect coaptation when the suture is secured. The vivification is carried only to the border of the rectal mucous membrane.

If the rent extends more than two inches upward it may be closed

by continuous or interrupted vaginal and rectal sutures. For the rectal suture chromicized catgut should be used; for the vaginal suture wire, silk, silkworm gut, or chromicized catgut, as the operator may elect.

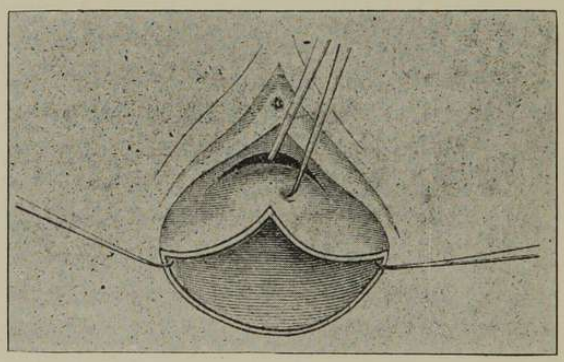
In all operations for complete tears the operator must keep in mind the three objects to be attained, viz., the restoration of the perineal body; the closure of the rectal opening; and, finally, the restoration of the sphincter ani muscle. Of these three objects the last is by all odds the most important; unless complete union of the two ends of the severed sphincter muscle is obtained, failure, either partial or complete, is inevitable.

Operations for Relaxation, with Rectocele and Cystocele.

The various operations which have been devised to overcome relaxation of the pelvic floor, with rectocele, are shown diagrammatically in Fig. 279.

These, embracing as they do various degrees and shapes of denudation, have all been devised for the purpose of picking up the relaxed

Fig. 280.

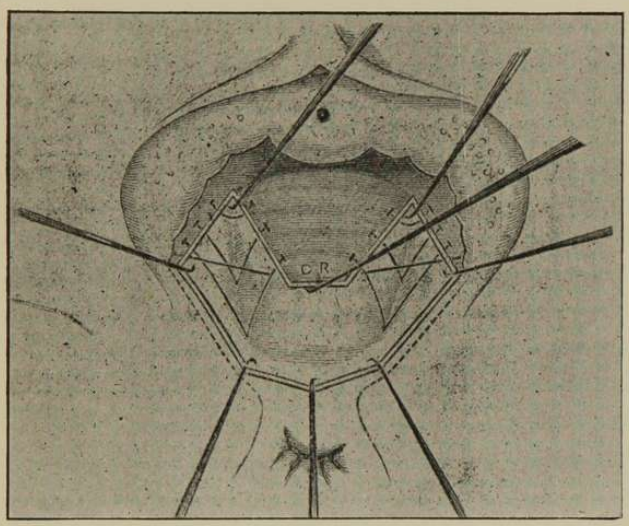


Hegar's Operation.

tissues underneath the vaginal mucous membrane, which condition is responsible for the rectocele and for the deficient pelvic support. They all, if properly performed, narrow the posterior vaginal wall. The breadth of denudation in all is greatest just within the vaginal outlet, which brings together at this point the lower border of the triangular ligament and the relaxed levatores ani muscles. Of the median operations I will describe Hegar's as being the one oftener performed. It is especially applicable to cases of complete procidentia in elderly women where the rectocele is very pronounced. When indicated it is usually necessary to make an anterior colporrhaphy at the same sitting.

Hegar's Operation.—The patient is placed upon her back with the thighs flexed upon the abdomen. The field of operation is fully exposed by a retractor passed underneath the pubes, when the cervix is caught by its posterior lip in a stout tenaculum or volsella and drawn downward (Fig. 280). Two tenacula are fixed at the highest point of the perineal tear, one on either side, and retracted. This procedure will nicely expose the area to be denuded. With a scalpel two lateral incisions are made, beginning at the crest of the rectocele, which is usually just below the cervix, and extending down the sides to a point

FIG. 281.



DENUDATION IN THE EMMET OPERATION. SUTURES PASSED. (*Kelly.*)

corresponding to the tenacula. The apex of the denuded area is caught in a third tenaculum and dissected from above downward. Or the dissection may be made from left to right and right to left with properly curved scissors (Fig. 272). After a flap large enough to be held by the fingers is dissected up, the tenaculum is discarded and the triangular section is removed to the skin surface. This is then incised either with the scissors or the scalpel. Bleeding surfaces are temporarily caught in snap forceps. Constant irrigation is maintained during the operation.

The wound is closed by continuous catgut, or by interrupted sutures. If the continuous buried suture is used it is carried from above downward in superimposed rows until the parts are perfectly approximated. It is sometimes best to introduce one or two rows of buried catgut,

bringing the mucous membrane together with interrupted silver wire sutures. After the vaginal surface is approximated the perineal wound is closed by silver wire sutures passed from without.

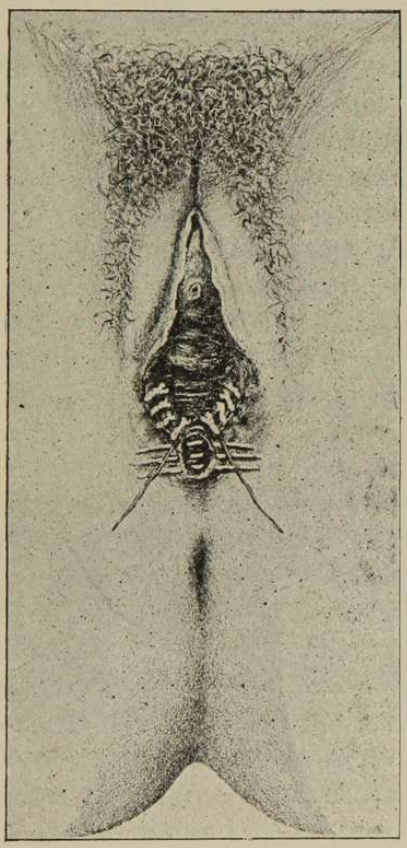
Emmet's Operation.—In Emmet's operation the denudation is "posterior median in front and bilateral on either side of the columna," extending into one or both sulci for a variable distance. In Fig. 268, the manner in which the fibers connecting the levator and rectum are separated is shown diagrammatically. The object of Emmet's operation is to utilize the vaginal sulci in such a way as more thoroughly to catch these fibers and bring them together. The operation is performed as follows:—

An elliptical surface in each lateral vaginal furrow is denuded (Fig. 281). This is accomplished by separating the labia and catching the crest of the rectocele in a tenaculum. Two other tenacula are hooked into the tissues near the caruncles on either side. If, now, the tenaculum which is hooked into the rectocele is pulled to the left, a triangle is formed which extends from this tenaculum to the tenaculum on the right side. A strip of tissue is removed between these two tenacula varying in width according to the extent of the denudation required. The crest of the rectocele is next drawn to the opposite side and a strip of tissue extending between this tenaculum and the one on the left side removed in the same way. This will leave an area of undenuded tissue between the crest of the rectocele and the skin surface, which is to be removed with a pair of curved scissors. As a result there will be created a denuded surface extending into the sulcus of both sides. If the relaxation is greater in one sulcus than in the other, the denudation may be carried higher on that side.

The manner of passing the sutures, devised by Dr. Emmet, is all-important, and is also shown in Fig. 281. Either silver wire, silkworm gut, or chromicized catgut may be used as suture material. In order to expedite the operation I use the continuous catgut suture, and cannot see but that the results are quite as good as with interrupted silver wire or silkworm gut. Beginning at the apices of the triangles they are passed transversely, the first not extending deeper than the mucous membrane. The subsequent stitches enter the vaginal mucous membrane close to the margin of denudation and are passed deeply toward the operator, brought out at the bottom of the sulcus lower down than the point of entrance, reëntered near the same point and made to appear on the lateral vaginal wall close to the margin of denudation. Care should, of course, be taken not to injure the rectum. If interrupted sutures are used they may be secured as soon as passed.

Usually from three to eight inside sutures will be sufficient to complete the operation. There will be left a small perineal surface unapproximated after the internal sutures are secured (Fig. 282). This is closed by two or three sutures passed from the outside just within the posterior commissure, not upon the skin surface.

FIG. 282.



INTRODUCTION OF THE SUTURES IN EMMET'S OPERATION. THE VAGINAL SUTURES ARE TIED. (*Thomas and Mundé.*)

The Author's Method of Dealing with All Lesions of the Lower Orifices of the Body at One Sitting.—I shall not at this time discuss the pathology or the symptoms of the several injuries and lesions to be dealt with. I have in Chapter VIII dwelt upon the unity of the pelvic organs and, indeed, of the entire organism. I desire, however, to again emphasize the fact that the operator who does not look beyond the cervix and the perineum in doing minor gyne-

cological work will be doomed to many disappointments. The pelvic floor as a whole, the urethra, the bladder, the clitoris, the hymen, the labia minora and the rectum are, from a pathological standpoint, equally important and should receive from the operator due attention at the same sitting at which the cervix is repaired, unless urgent counter-indications exist. I exclude, of course, the more serious affections and malformations of these organs, requiring for their correction prolonged operative work. But dilatation of the cervix and curetting, trachelorrhaphy, reparation of the pelvic floor and perineum, removal of irritable carunculæ from about the hymen and urethra, removal of clitoridean adhesions, amputation of hypertrophied nymphæ, divulsion of the urethra and rectum when called for, the removal of hemorrhoids, etc., can and should be done at one sitting in from thirty to sixty minutes, and in a thorough manner. A simple technique is, however, necessary for quick work, no matter how skilled the operator may otherwise be. I have gradually evolved a technique of my own which, I presume, is nothing more than a combination of the various methods given by various writers. This explanation I make for my own protection, for doubtless many operators have adopted practically the same methods which I am about to describe, though I am not aware that this is the case.

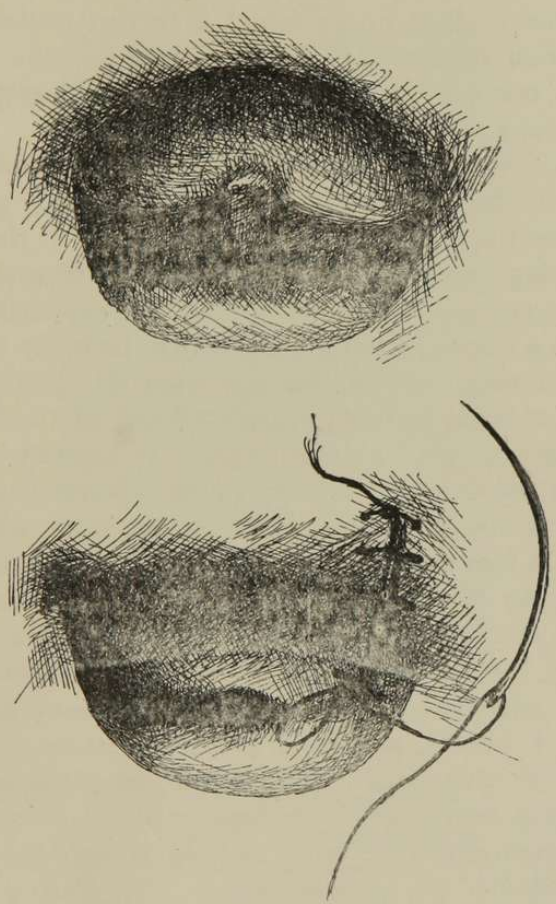
Trachelorrhaphy.—The patient is prepared and the parts vivified according to the methods described on page 895.

A Martin's curved needle (I have these needles made in smaller sizes than the original), armed with a No. 2 chromicized catgut suture, is now passed high up in the angle of the left wound in such a way as to bring together the opposing surfaces underneath the mucous membrane at this point. The suture is drawn through and tied. It is then carried downward as an interlooped continuous suture to the lower angle of the wound and tied (Fig. 283). The right side of the wound is closed in the same way, care being taken that too much tension is not made on the suture as it is being interlooped. Before securing it in the final knot the tension can be relieved, if necessary, by means of a tenaculum. Constant bichlorid irrigation is maintained during both the dissection and the suturing. The needle is passed from below upwards—a little point but an important one; by so doing, as it emerges from the tissues, it is not buried in the irrigating fluid and blood which naturally gravitate into the posterior fornix, and can be readily grasped by the needle-holder.

An ordinary trachelorrhaphy performed in this way is converted into a perfectly simple operation and can be done easily in ten minutes, and

even in five. I have now used the chromicized catgut suture in over one hundred trachelorrhaphies and without a single failure. In one case I used the carbolized gut and absorption took place before union was complete. No further attention need be given the cervix except to use a 1:5000 bichlorid douche after each urination. The patient is not haunted

FIG. 283.



METHOD OF SUTURING THE CERVIX. (*Wood.*)

with the idea of having the sutures removed, nor is the operator haunted with the possibility of having his operation spoiled by inexperienced attendants, to whom he often has to entrust the post-operative treatment.

Reparation of the Pelvic Floor and Perineum.—Tait's method of flap-splitting is, as I have endeavored to show, a most ingenious one when the perineal body alone is to be built up. I have, however, been led to modify somewhat the technique given by Tait,

Mundé and others. As ordinarily performed, there is left at the site of the newly created commissure a superfluous amount of tissue which is of no use whatever for supporting purposes; the vaginal mucous membrane, being drawn downward without the ostium vaginæ, is liable to become irritated upon walking and during sexual congress. To overcome this I remove a small triangular portion of tissue at the upper angle of the wound and bring the opposing surfaces together with a chromicized catgut suture, which is further utilized for the more perfect coaptation of the skin surfaces between the external wire sutures. This restores the fourchette to a virginal state as nearly as can be done by any operative procedure.

If relaxation of the pelvic floor, with rectocele, is associated with the perineal rent, the flap-splitting operation, as ordinarily performed, will overcome neither the relaxation nor the rectocele. If the recto-vaginal septum is split high enough to bring together the separated underlying muscles and fasciæ, and the wound is closed by external sutures alone, there will exist a degree of tension which will probably defeat the chief end of the operation; besides, the diaphragmatic pelvic muscles and fasciæ, instead of being restored to their normal relationship, are, when the external sutures are tightened, pursed in a most unnatural way underneath the pubic arch. Of course this operation can be supplemented by any of the forms of posterior colporrhaphy which have been described, and in this way the rectocele and relaxation overcome. But when colporrhaphy is performed according to the method of Emmet, Hegar, Fritsch and others, it is a somewhat tedious operation, involves an unnecessary loss of tissue, and leaves behind avenues for septic infection. To overcome these several objections I have devised a method which, I believe, will more perfectly restore a relaxed pelvic floor than any yet enunciated. It is, indeed, an extended flap-splitting operation and was suggested to me because of the conservative nature and extreme simplicity of the latter method of restoring the perineum. It is a combination of Lawson Tait's and Doleris' flap-splitting methods, of Schroeder's method of detaching the mucous membrane, and of Emmet's method of suturing. I proceed as follows:—

The patient is placed in the usual lithotomy posture, with an assistant on either side, who retract the labia with the fingers. The index finger of the left hand is carried into the rectum to serve as a guide. The character of the transverse incision will depend upon the perineal rent. If the body is not torn, and the condition is one of simple relaxation, it is made with a pair of angular scissors close to the fourchette, and is carried below the mucous membrane only (Fig. 284). At the

muco-cutaneous surface this need not be more than half an inch in length, the separation being carried laterally as far as is necessary underneath the mucous membrane. If the perineal body is to be restored it is made exactly as is shown in Fig. 275, with corresponding vertical incisions, except that the vertical incisions should not extend

FIG. 284.

FIRST STEP OF THE AUTHOR'S SUBCUTANEOUS OPERATION.
a, *b*, Line of Incision.

quite as high as in the original Tait operation, and, at their upper extremity, should extend into the muco-cutaneous border. In either event the dissection, instead of being extended into the recto-vaginal septum for half an inch only (which is the extreme limit of the Tait operation), is carried as high as the crest of the rectocele, even though this requires a separation of two inches or more in depth. This dissection, after the skin and deep layer of superficial fascia are severed, is best made with the finger and is carried well into the sulci so that the separated fibers are exposed. I think it best to use the finger only, for the tissues are easily separated, and by tearing them apart the hemorrhage is reduced to a minimum; there is also much less danger of penetrating the rectum or the vagina than when a cutting instrument is used. This step of the operation is facilitated by catching the two flaps

in catch-forceps and separating them (Fig. 285); it can be completed in thirty seconds. A stream of hot bichlorid solution should be kept playing upon the parts during the entire operation.

From one to three interrupted sutures of chromicized catgut are now introduced through the vagina. These sutures are best passed by means of a small curved needle which is made to penetrate the vaginal flap a little to the left of the median line at the apex of the rectocele, is

FIG. 285.

SEPARATING VAGINA FROM RECTUM WITH FINGER. (*Wood.*)

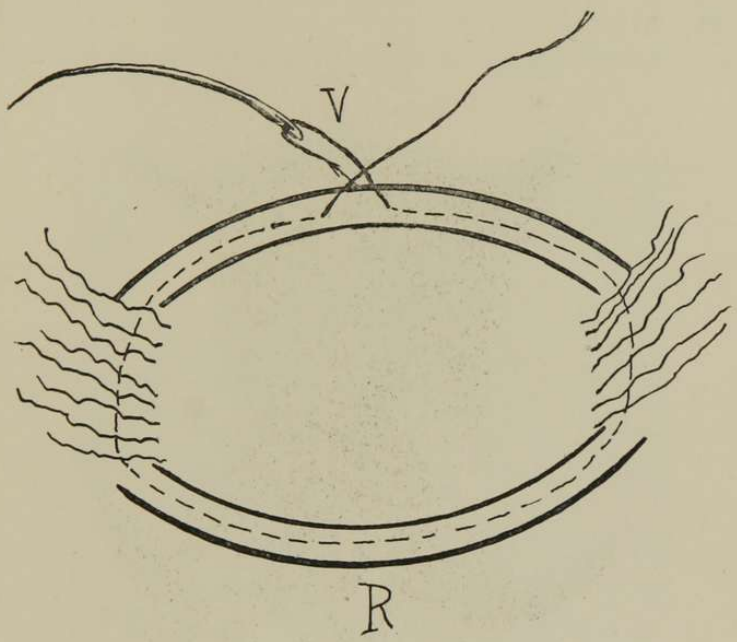
reintroduced into the lower border of the vaginal flap and carried around the left sulcus, again introduced into the rectal flap at the point of exit, buried in the rectal flap and carried around the right sulcus, reintroduced into the vaginal flap and made to again appear within the vagina near the point of entrance. Fig. 286 shows diagrammatically this suture introduced from left to right. I think that it is more conveniently introduced from right to left.

When the sutures thus introduced are tightened the separated muscles and fasciæ will be drawn together *underneath* the vaginal flap. Formerly I utilized the sulci alone in passing the sutures, but the sutures were not brought together in the *median line*, as they will be if the needle is made to entirely encircle the wound.

A triangular piece of tissue is removed from the lower angle of the

wound, to which is attached the lower forceps. Unless this is done the tissues will project at this point after the wound is closed. From three to five chromicized catgut sutures are now passed from the skin surface. For passing these sutures I have found nothing better than ordinary darning needles, such as can be secured in any dry goods store for a nickel a paper. They should be an inch and a half long and not too

FIG. 286.



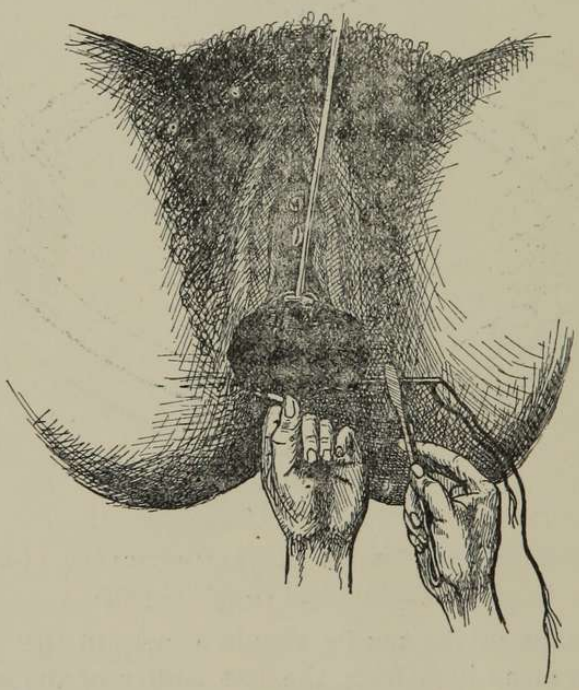
VAGINAL SUTURES SHOWN DIAGRAMMATICALLY. (*Wood.*)
V. Vaginal Flap; *R.* Rectal Flap.

light. The point of the needle should penetrate the skin not more than an eighth of an inch from the left border of the wound. With the forefinger of the left hand in the rectum as a guide, which also pulls down the recto-vaginal septum, the suture is made to completely encircle the wound from the skin aspect and to reappear at the corresponding point at the right margin of the wound. The vaginal sutures will have diminished the depth of the wedge-shaped excavation so that it will not be more than half an inch deep. All of the outer sutures are buried in the tissues, but care should be observed that they do not extend high enough to include the lower vaginal suture; in the latter event strangulation of tissue might result (Fig. 287).

This will create a firm, solid perineum, the width of which will depend upon the length of the vertical incisions, and the depth upon the dis-

section into the recto-vaginal septum. I next remove a small triangular portion of tissue at the point of the newly formed fourchette, as in operations for the restoration of the perineum only, bringing the edges of the triangle together with interrupted catgut sutures. This does away with the superfluous teat of tissue at this point and destroys the cicatrix, should one exist. If the skin borders are not perfectly coaptated they should be brought together with superficial sutures. All sutures will disappear by the twelfth day and no further attention need be given them.

FIG. 287.



PASSING EXTERNAL SUTURES. (*Wood.*)

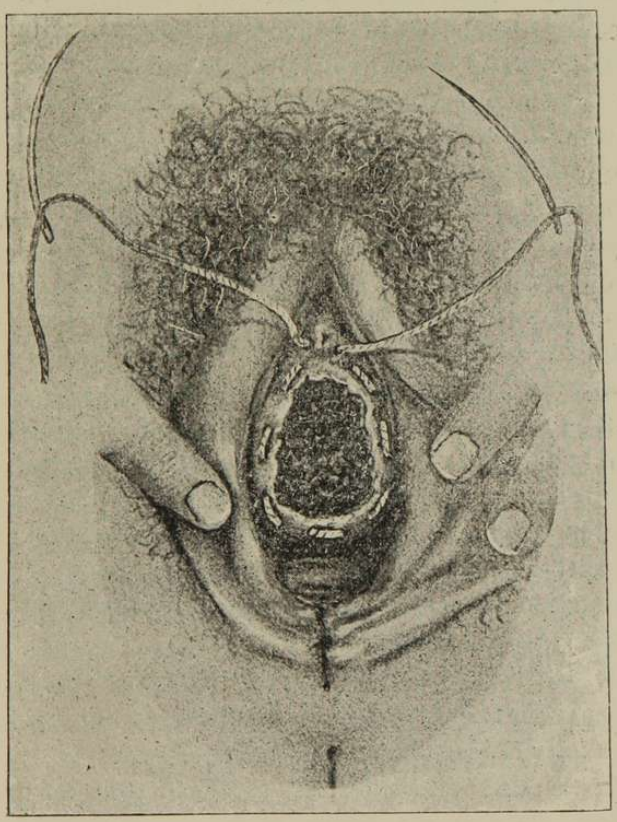
It should be borne in mind that this is essentially a *submucous operation*, *i. e.*, the separated muscles and fasciæ are drawn together *underneath the mucous membrane*, though the sutures are passed through the vaginal canal. By it the vagina is converted into a mere slit in the pelvic floor, and it therefore corrects any existing prolapse of the anterior vaginal wall. (Except in elderly women I now rarely perform anterior colporrhaphy.) It also restores the perineum and fourchette to nearly a virginal state, while it draws the anus and vaginal outlet toward the pubic arch more effectually than does any other operation

that I have performed or seen performed. Finally, it can be done more quickly than can any of the colporrhaphies which necessitate the denudation of the vaginal mucous membrane, especially if the denudation is made lateral. I have many times performed the entire operation in five minutes and do not hesitate, unless the capital operation is a particularly severe one, to repair the pelvic floor at the same sitting at which a laparotomy or a vaginal hysterectomy is done.

I claim for this *submucous* method of perineo-colporrhaphy the following advantages:—

1. It is more simple and can be more quickly performed than can any

FIG. 288.



STOLTZ'S OPERATION FOR CYSTOCELE. (*Thomas and Mundé.*)

of the colporrhaphies which necessitate the denudation of the vaginal mucous membrane, especially if the denudation is made lateral.

2. It unites the separated muscles and fasciæ at the *median line*, their normal relationship, which is not the case when the denudation is confined to the sulci.

3. The wound is entirely closed, except at the vaginal orifice, so that the possibility of septic infection is reduced to a minimum.

Anterior Colporrhaphy or Elytrorrhaphy.—In elderly women when prolapse of the anterior vaginal wall, with cystocele, is at all marked it will be necessary to perform an operation having for its object the relief of the cystocele. Innumerable operations have been devised for this particular purpose, all of which involve more or less denudation and destruction of tissue. Thus Hegar denudes a surface the shape of an ellipse, which is very blunt at the upper extremity. Emmet recommends giving the denuded surface the form of a mason's trowel. Stoltz makes a circular denudation. The fact is, the form of denudation is not of great importance. It is simply necessary to incise freely the exuberant portion of the vagina. Pozzi includes in the jaws of two or three forceps the folds of mucosa to be removed, which extend about three centimeters from the orifice of the urethra to about two centimeters from the cervix. The tissue seized is removed with scissors, and after the forceps are detached the wound is brought together either with the continuous suture in superimposed rows or with silver wire. Stoltz closes his circular denudation with a suture armed with a needle at each end, which he passes as shown in Fig. 288. This is a most satisfactory and expeditious way of closing the wound. During the dissection Stoltz depresses the anterior vaginal wall with a sound in the bladder. Catgut may be substituted for the silk.

Should there exist a urethrocele with prolapse, one of the operations recommended on page 539 may be made. If dilatation and prolapse of the urethra are marked I prefer, especially if more or less incontinence attend the condition, to close the incisions made parallel to the urethra, with sutures passed longitudinally instead of transversely. By doing this the urethrocele is not only overcome, but the patient is given perfect control of the bladder.

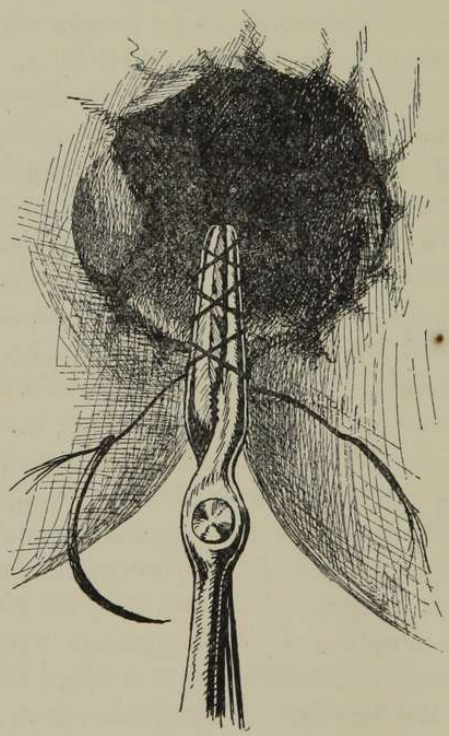
Adhesions of the Clitoris and Hypertrophy of the Nymphæ.—I have in another place discussed the importance of clitoridean adhesions (p. 348). I shall at this time simply affirm that in my opinion they are even more pernicious than are adhesions of the prepuce in the male, for the reason that the nervous system of women is more impressionable than that of men. Clitoridean adhesions are easily recognized and quite as easily removed. There is no better instrument for the latter purpose than an ordinary director. The prepuce should be separated from below upwards, care being observed not to unduly lacerate the tissues. While it is important thoroughly to free the organ, it is equally important not to go beyond the base of the clitoris. The whole operation, if indeed

the procedure can be so dignified, should not require for its completion more than two minutes. The separated surfaces should be subsequently dressed with sterile vaseline to prevent the adhesions from reforming.

Disease and hypertrophy of the nymphæ, unlike lesions of the clitoris, have not received the attention from specialists which their importance justifies. It is to be presumed that in all cases of pruritus vulvæ the operator will, before unnecessarily mutilating the parts, seek carefully for the *cause* of the itching and remove such cause if it is possible so to do. In the vast majority of instances it will be found to result from an unnatural discharge from the uterine cavity. However, after the nymphæ have undergone certain hypertrophic changes, so that they are an inch or more in length, amputation should be resorted to. They will be found upon examination to present a roughened osage orange-like appearance. According to H. Carrard, there is, in this form of hypertrophy, "an increase of the nerve fibers, in the form of Meissner's tactile bodies, also in the form of club-shaped terminations and peculiar tactile bodies having an aggregation of adenoid tissue" (Winckel). This condition is very frequently found in nervous affections, especially in epilepsy and hystero-epilepsy, and usually gives rise to intense itching —not infrequently to onanism. Indeed, my observation leads me to believe that the nymphæ are hypertrophied, and have undergone the changes just described, in nearly every case of abnormal sexual excitement and nymphomania. Of course the fact must not be lost sight of that lesions of the external genitalia may be the result rather than the cause of masturbation; but I am led to believe that in the larger number of cases of masturbation occurring in girls and women the vicious habit is secondary to actual disease of the external genital organs. Be this as it may, when the nymphæ are found in the condition described, it is best to reduce them by surgical measures to their normal size. The operation is a most simple one. One nympha is put upon the stretch with two catch-forceps, one above and the other below, and removed with one stroke of the scissors. The incision at its upper part should not approach the clitoris too closely. A small arterial branch will be cut, but the bleeding is easily controlled by temporary compression. By means of a curved needle, armed with a catgut suture, the opposing edges of the wound are neatly approximated from above downward, the stitch being continuous and interlooped. The nympha of the opposite side is dealt with in the same way, when the operation is completed. A bichlorid compress is placed over the vulva until the final dressings are applied, which consist of iodoform, iodoform gauze and sterile cotton, all of which are held in place by a T bandage.

The Removal of Hemorrhoids.—Various operations have from time to time been devised for the removal of hemorrhoids. Those of to-day which are best known are the clamp and cautery, the Whitehead, the slit, the ligature, and the American. The clamp and cautery are, theoretically, objectionable, first, because the more powerful clamps give rise to sloughing of tissue; and second, because the application of the cautery necessarily leaves a cicatrix behind. I am not sure but this objection is more theoretical than practical, and it is probable that the clamp and cautery will remain indefinitely a popular operation with many. The slit operation impresses me as being unsurgical, for

FIG. 289.



HEMORRHOID CLAMPED, SUTURED AND TIED. (*Wood.*)

the reason that the wound is left open. It is, too, decidedly more tedious than the one soon to be described. The use of the ligature is painful and is always attended with more or less sloughing. Both the Whitehead and the American operation necessitate unnecessary mutilation and are not infrequently followed by incontinence and stricture. In a paper read at the 1884 session of the American Institute of Homeopathy I dealt in detail with the evils attending the American opera-

tion. The discussion which followed the reading of this paper, even though most of the speakers were advocates of the American operation, emphasizes more than my own words that it should be reserved for the most desperate cases. One prominent surgeon analyzed his own series of fifty-two cases, and his results as given would kill, professionally, one of less reputation and skill in general surgery. I cannot believe that the American operation is justified except in very rare instances. In the paper referred to I described a method, infinitely more simple, which I have been following for the last seven years and which is shown in Fig. 289. Other operators have since described almost exactly the same method and I do not suppose that it is original with me, nor do I care whether it is or not. I never saw or heard of it until I did it myself. My chief object is to limit the number of American operations, which are becoming all too frequent.

The operation is done as follows: If the pile presents itself as an isolated tumor it is seized at its apex with a Pratt's T forceps and drawn downward. Its base is next clamped in an ordinary catch-forceps with a strong shank. The tumor is removed with scissors close to the forceps applied to its base. Next a curved needle, armed with a chromicized catgut suture, is carried from the shank of the forceps to its tip, the needle passing underneath the forceps and the suture over it, with about three interruptions to the inch. It is then carried downward toward the shank, the needle being inserted midway between the upward running sutures. The forceps is now unlocked and removed; the free ends of the suture are drawn sufficiently tight to overcome the slack caused by the instrument and tied. If there are other hemorrhoids they should be dealt with in the same way. When it can be done I think it best to apply the forceps which clamps the base of the pile parallel to the axis of the gut, for the reason that by so doing the action of the sphincter is in nowise disturbed. However, when the tumors completely encircle the rectum they can be removed in sections by the same method, the forceps being applied at right angles to the rectum. Care must be observed in passing the sutures that the needle hugs the lower surface of the forceps so that the sphincter may not be caught in them. Were this to happen, unnecessary and distressing sphincteric spasms would follow. Parsons & Son, of Cleveland, have devised for me a special clamp which is preferable to ordinary catch-forceps, though the latter will answer very well.

I claim for this operation the following advantages over the American:—

1. The time required for its completion is not one-quarter of that required for the American.

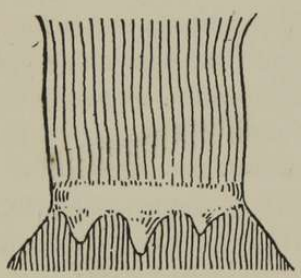
2. The shock is almost nil, for there is practically no blood lost.

3. There is no danger of slipping of tissue with resulting stricture or incontinence.

4. The suffering during convalescence is infinitely less than in any of the other methods enumerated, unless it be the slit operation, and it is free from any of the objectionable features of the latter.

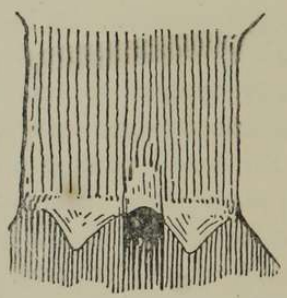
All minor lesions of the rectum, urethra, and genital tract, not specifically dealt with in the foregoing description, should be removed at the same sitting. These include carunculæ, fistulæ, and rectal pockets and papillæ. The manner of dealing with urethral caruncles is described on page 541. Rectal pockets and papillæ are shown in Figs. 290 and 291. While I am inclined to believe that their importance has been

FIG. 290.



RECTUM PRESENTING PAPILLÆ. SHARP-POINTED VARIETY. (*Pratt.*)

FIG. 291.



DOUBLE PAPILLÆ WITH POCKET BETWEEN. (*Pratt.*)

exaggerated by Dr. Pratt and his followers, their removal can do no harm and may do much good. Pockets should be carefully lifted up with Pratt's blunt hook and snipped off with curved scissors. Papillæ are elevated with a tenaculum and cut away. Nothing more than passing bleeding results. Should it persist a rectal plug of iodoform gauze may be introduced.

It is absolutely cruel, in my opinion, to compel a patient to undergo two, three, or even four, separate operations for the correction of the several lesions considered, unless insuperable obstacles exist in the way of marked systemic depression or heart complications. However, I do not believe in sacrificing *thoroughness* for rapidity. As a matter of fact, under favorable conditions, and with ether as an anesthetic, the patient can remain on the operating table for an hour or an hour and a half with perfect impunity. One who cannot do the

work which I have outlined in that length of time had better, for the good of the patient, assign her to some one who can. With strict antiseptic precautions no subsequent trouble will ensue. Animal sutures have been used throughout and the patient on regaining consciousness will look forward to an uninterrupted convalescence, her peace of mind being disturbed neither by the thought of a second or a third operation, nor the nightmare "that the stitches must be removed on the tenth day."

After-Treatment of Colpo-Perineorrhaphy and Operations upon the Lower Orifices.—The *post-operative* care of all plastic cases is very important, if union by first intention is to be obtained. The patient is placed in bed with her knees tied together. If she can urinate spontaneously she is permitted to do so from the very first, after which a small 1:5000 bichlorid douche is administered. If she cannot urinate spontaneously a catheter must be introduced every six hours; in this event the cleansing douche is not called for. In those cases involving the recto-vaginal septum the greatest possible care must be observed in the management of the bowels. I think it is better to keep them confined with small doses of opium for the first three days. A cathartic is then given which is supplemented by an enema of glycerin in order to insure complete liquefaction of the feces. During the evacuation of the bowels the nurse should watch the patient carefully and if any scybalous masses present themselves at the anus they should be dissolved by permitting a stream of warm sterile water to play upon them. In incomplete perineorrhaphies and rectal operations the bowels may be moved on the third day by a cathartic, supplemented by an enema of glycerin and water. Subsequent evacuations are secured in the same way upon alternate days. If wire sutures are used they are removed from the tenth to the twelfth day. Catgut sutures will care for themselves. Should the pain be very great in rectal operations, half grain opium suppositories may be introduced every hour until the patient is relieved. Fresh external dressings should be applied after each urination.

There should be no persistent rise of temperature following the several operations described if the case progresses normally. A persistent elevation usually indicates suppuration which, in the larger number of cases, is along the tract of some suture which is twisted or tied too tightly; or, if the buried suture has been used, is due to wound infection. The temperature will often temporarily rise a degree or a degree and a half soon after the operation, but this quickly subsides and is purely reactionary. Should it remain persistently elevated the wound should

be inspected, and if there is suppuration along the tract of one or more of the sutures, these should be removed or their tension relieved.

Mortality.—A few cases are on record where death has resulted from tetanus and septicemia following perineorrhaphies and rectal operations. As a rule none of the operations enumerated are dangerous, and the few deaths which have been recorded were due to causes which might have set up fatal complications in any cutting operation. The operator should, nevertheless, bear in mind that the perineal region is particularly rich in lymphatics—hence the importance of strict antiseptic precautions.

CHAPTER LIII.

OPERATIONS FOR MATERNAL AND FETAL DYSTOCIA.

I shall briefly consider the several operations upon the gravid uterus necessary to save the life of either the child or the mother. While the subjects included in this chapter are essentially obstetric in their nature, the gynecologist and abdominal surgeon is oftener called upon to perform them than is the obstetrician. In addition symphysiotomy will receive consideration. Laparo-elytrotomy has been so rarely performed that it cannot be said to be fully established.

Cæsarean Section.

This operation is very old, and it derives its name from the fact that Julius Cæsar was supposed to have been delivered through the abdomen. However this may be, it is well known that the Greeks were acquainted with the operation now known as Cæsarean section and called it "Hysterotomia." It received new impetus when abdominal surgery approached its present degree of perfection.

When Performed.—The majority of operators prefer to wait until labor pains set in, but before the liquor amnii escapes. Harris and Coe maintain that it should be made before labor is established. The advantages of the latter course as set forth are, that preparation for the operation can be deliberately made, and the patient placed under the most favorable conditions for capital work. These gentlemen also maintain that the uterus contracts even more thoroughly before labor sets in than after it is established. Unfortunately, the surgeon has to operate in the majority of instances at a time most unfavorable for the patient. As a rule, the necessity for the operation is not determined previously to labor. Many times it has to be performed in a room ill-fitted for surgical work of any kind, and often while the patient is *in extremis*.

Indications.—Cæsarean section is called for when the pelvic contraction or the dystocia is so great as to make any operation having for its object the delivery of the child through the natural passages impracticable. Pelvic tumors, either benign or malignant, incarceration of

a backwardly displaced fundus, or ventro-fixation of the uterus may necessitate the operation. The operation may also be justifiable in the impending death of the mother, when it is probable the child's life can be saved by speedily opening the abdomen. Indeed, in all instances of contraction of the pelvis, which makes it impossible to drag the presenting part through the parturient passage without serious or fatal injury to the child, the operation may be called for, unless symphysiotomy is indicated. When the uterus is septic the Porro operation, or total hysterectomy, is preferable to Cæsarean section. So, too, in malignant conditions of the uterus, where there is a prospect of eradicating the disease, the more destructive operations should be substituted for the Cæsarean.

Operation.—When possible the patient should be prepared as for all celiotomies, by having the bowels thoroughly emptied, the genital tract and abdomen disinfected, and the diet properly regulated. When the operation is immediately called for the abdomen should be thoroughly scrubbed with a 1:1000 bichlorid solution, the parts shaved and finally washed in ether; the vagina should be washed with a 1:1000 bichlorid solution. Full antiseptic precautions should be observed (*v.* Chapter XII).

The following instruments are necessary:

One elbowed scissors;
One scalpel;
Twelve hemostatic forceps;
Six needles (three full-curved and three straight);
One needle holder;
An elastic ligature;
A large fountain syringe for irrigation.

The abdominal incision is made in the median line, extending from two inches above the symphysis to an inch below the umbilicus. If it is determined to deliver the uterus before it is incised, the abdominal incision will have to extend above the umbilicus nearly to the sternum. I think it best to cut to the left of the umbilicus. Because of the elevation of the bladder, the incision should not approach the pubes closer than two inches.

If the uterus is incised inside the abdominal cavity, the first assistant is instructed to crowd it against the abdominal incision by pressure exerted on either flank. The uterus is incised longitudinally. An incision is first made an inch and a half in length corresponding to the abdominal incision. Care should be observed not to open the membranes if they are still intact. A finger is inserted into this incision, when it is ex-

tended upward and downward by means of the elbowed scissors. It should be at least six inches in length, and its lower border should not extend beyond the bladder reflexion of the peritoneum. Should it be possible to locate the placenta the incision should be made so as to avoid this organ. However, the placental attachment can rarely be determined, and should the incision be over the placenta it will have to extend through it. The membranes are now opened and the amniotic fluid permitted to escape. The hand is gently, but quickly, passed into the uterine cavity and the child is grasped by the neck if possible; if this is not possible, by the feet. If the body is delivered first the uterus may contract down upon the neck, so that it will be necessary to liberate it by enlarging the incision. The cord is cut between two catch forceps, and the child is turned over to a third assistant, whose special duty it is to care for it. At this stage of the operation a hypodermic injection of ergotin should be administered. Should the uterus fail to contract, and a faradic battery is conveniently at hand, it may be utilized for the purpose of exciting contractions. Unless the patient's condition is critical it is best to wait a few moments for the spontaneous detachment of the placenta. Should the hemorrhage be troublesome it may be controlled by gauze packing, or an elastic ligature may be thrown around the cervix. It is quite important that all of the secundines be delivered, and it is equally as important that drainage be secured through the cervical canal. Many operators insert a piece of gauze through the uterine incision into the vagina. Should the uterus fail to contract, after waiting a reasonable length of time, the Porro operation will have to be resorted to. If the placenta is not spontaneously detached the uterus should be emptied with the hand.

Personally, I prefer to deliver the uterus before it is incised. The chief objection to this procedure is the longer incision required. However, in my opinion this is more than offset by the greater accessibility of the parts. The fundus is carefully lifted out of the abdominal cavity, after which one or two temporary sutures may be passed to prevent the intestines from protruding from the abdominal opening. Warm sterile towels are now packed about the uterus and over the opening, so that the intestines may be kept warm and the amniotic fluid not find its way into the abdominal cavity. The operator can now proceed to open the uterus according to the method already described. Should the hemorrhage be troublesome, the first assistant can control it by compressing the cervix with the fingers.

Many methods have been devised for suturing the uterine wound, but all were more or less imperfect until Sänger and Leopold devised

the present technique. This is well shown in Fig. 292. The aim should be to hermetically seal the uterus by bringing together the peritoneal surfaces. This is accomplished by two layers of sutures, deep and superficial. The peritoneal covering should first be detached for a short distance from its underlying muscular layer along each border of the wound. Some surgeons remove a section of muscular tissue immediately underneath the peritoneum thus detached. This

FIG. 292.

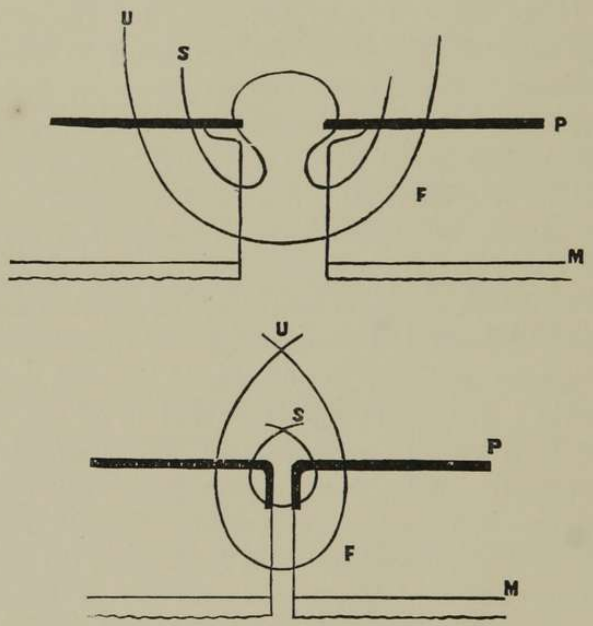


DIAGRAM TO SHOW THE PLACING OF SUTURES IN THE UTERINE WOUND AFTER CÆSAREAN SECTION. (*Sänger.*)

P, Peritoneum; F, Uterine wall; M, Mucous or decidual layer; U, Deep uterine suture; S, Superficial serous suture.

precaution is not considered necessary by the majority of modern operators. The deep sutures are first introduced, and are passed half an inch from the edge of the wound, and made to emerge at its bottom in such a way that no suture enters the uterine cavity. They should extend at least half an inch beyond the ends of the incision. Between each deep suture two superficial sutures are passed. The superficial sutures are even more important than the deep sutures. They are first passed through the peritoneum and muscle of one side, coming out a little below the left lip of the wound. Then they are made to catch the edge of the peritoneum of the corresponding side, reintroduced from above

through the edge of the peritoneum of the opposite side, made to describe a curve through the muscular tissue and peritoneum, so as to correspond with the opposite wound. When the sutures thus introduced are tightened the result will be that the peritoneal surfaces are turned in, and the wound perfectly closed. The deep sutures will approximate the muscular structures, and will relieve the tension of the superficial. Should it be found that apposition is not complete additional interrupted sutures may be passed; or perfect approximation may be secured by a running catgut suture.

Medium-sized silk should be used for the deep interrupted sutures, and fine silk for the superficial.

If the abdominal cavity has been soiled it should be flushed with a normal salt solution; if it has not, irrigation is unnecessary. The abdominal wound may be closed either with or without drainage as the case demands. As a rule I think it safer to introduce a drainage tube for twenty-four or forty-eight hours. The tube will at least give timely warning of internal hemorrhage should it occur. Greig-Smith uses, instead of the glass drain, a piece of rubber tubing which is cut obliquely and fixed in the lower angle of the abdominal wound.

The abdomen is to be closed according to one of the methods given on page 787. Personally I prefer to close it by three successive layers of chromicized catgut.

Prognosis.—In the hands of the best operators Cæsarean section has resulted in a mortality of but 10 per cent. for the mothers and with a saving of from 90 to 95 per cent. of the children. Nothing more need be said regarding the wisdom of the operation when it is indicated.

Porro's Operation.

The so-called Porro operation was first performed by Porro in the Maternity Hospital, of Pavia, in 1876, as a sequel to the Cæsarean operation. It was suggested to Porro by the extra-peritoneal treatment of the stump in hysterectomy. While other operators preceded Porro in the removal of the gravid uterus, it never became an established procedure until Porro performed it in 1876.

The operation is nothing more than a sequel to Cæsarean section. It is indicated when for various reasons the unmodified Cæsarean section is impracticable. Such indications are: failure of the uterus to contract, with bleeding from the site of the placenta; fibroid tumors of the uterus; septic conditions of the uterus; bleeding from the uterine

wound; difficulty in detaching the placenta; and malignant disease of the fundus of the uterus.

The same conditions which prevent the delivery of the child *per vias naturales*, and which call for the Cæsarean section, call for the Porro operation, when the various conditions suggested in the foregoing paragraph prevail. The statistics show that the mortality attending the Porro operation is rather higher than that attending the modern Cæsarean section.

Operation.—The parietal incision does not differ from that required for Cæsarean section, except that it must be sufficiently long to deliver the uterus at once from the abdominal cavity. Hemorrhage can be controlled either by an elastic ligature or by constriction of the cervix with the hand. The uterine incision is made in the usual way, and the child delivered. The placenta may or may not be removed before amputating the uterus, as the case may require. Ordinarily I think it wise to leave it unmolested. The stump is secured by transfixing it at the internal os with steel pins and passing a Koeberle serre-nœud around it underneath the pins; or, should the serre-nœud not be available, the elastic ligature may be left on permanently, exactly as in the extra-peritoneal method of dressing the stump in hysterectomy for fibroids (p. 650). The uterus is amputated three-quarters of an inch above the wire or ligature, when the abdomen is cleansed and the peritoneum carefully approximated to the lower border of the stump with a running catgut suture. The abdomen is now closed in the usual way. Unless the peritoneal cavity has been contaminated drainage is unnecessary. The stump is trimmed and dressed with iodoform and gauze. In subsequent dressings the tissues may be mummified by applying to the stump the dry perchlorid of iron. The parts can be kept sweet by frequent dressings and applications of boric powder. The serre-nœud is tightened from day to day; the stump will separate in from seven to fourteen days.

The after-treatment of Cæsarean section and Porro's operation differs in no wise from that given for celiotomies in general (p. 795).

Both intra-peritoneal treatment of the stump and total hysterectomy have been advocated and practiced in lieu of the Porro operation, but as yet the statistics are all on the side of the latter procedure.

Puerperal Celiotomy for Rupture of the Uterus.

Rupture of the puerperal uterus may be due:—

1. To some obstruction to labor;

2. To grinding or crushing of the tissues compressed between the pelvic wall and bony prominences of the fetus;

3. To abnormal thinness of the uterine walls; and

4. To external violence.

The uterus may be simply perforated, the opening may be irregular, or the fundus may be completely detached from the cervix or vagina.

The symptoms of rupture are, as a rule, sudden and pronounced, depending of course upon the size and nature of the opening. When the accident occurs during labor the patient will be seized with acute pain in the abdomen, which is speedily followed by shock and collapse. There will be vomiting, fainting, pallor, and almost extinction of the pulse. Uterine contractions cease, and if the child finds its way into the abdominal cavity the abdomen becomes flattened. The intestines may protrude through the cervix and even through the vulva. Usually the child dies quickly, but if it does not its movements will be felt in the free abdominal cavity. In the event of slight rupture the collapse is much more insidious and the lesion may not be suspected for some days. When the fetus escapes through the rent into the abdominal cavity the presenting part can no longer be felt per vaginam.

The statistics show that without surgical treatment at least six cases out of seven are fatal. Fifty per cent. of the cases operated upon were saved by celiotomy. At the 1897 meeting of the American Institute of Homeopathy Dr. J. M. Lee, of Rochester, exhibited two uteri removed per vaginam, for disease, which showed cicatrices of old ruptures.

Operative Treatment.—Should the head be in the pelvis and the body in the peritoneal cavity an attempt at delivery through the vagina should be made with forceps. After the abdomen is opened the surgeon should be governed in his operative work by the nature of the uterine rent and the condition of the patient. If collapse is not marked and the rent is not too irregular it should be closed by the method recommended for Cæsarean section. If the condition of the patient will not warrant an attempt to repair the uterus, it should be delivered, constricted and dealt with exactly as in the Porro operation. The abdomen should be flushed, and drainage, either through the abdominal wound or vagina, resorted to.

Every precaution should be taken to revive the patient. The timely use of the salt solution, introduced directly into the circulation or infused into the cellular tissue, will save many lives. From one to three quarts of it, in cases characterized by marked shock, should be left behind in the abdominal cavity.

Symphysiotomy.

Symphysiotomy is more than one hundred years old. It was revived by Prof. Morisani, of Naples, in 1891, and is speedily growing in popularity. It is indicated in those instances where labor is obstructed by the diminished diameters of the bony pelvis, and where the conjugate diameter is not below three inches. If below three inches, either the Cæsarean or the Porro operation is the preferable procedure. Morisani himself limits symphysiotomy to cases of impossible delivery at term where labor is well advanced, the head low and the cervix dilated. If the child is known to be dead, embryotomy should be substituted for symphysiotomy.

Operation.—The patient is placed on a good operating table with an assistant in charge of each limb. The pubes are shaved and disinfected and the vagina cleansed. The surgeon stands between the thighs. The bladder is emptied with a catheter and a sound introduced. The necessary instruments are:—

Fig. 293.

Harris' Galbiati Knife.

A strong scalpel;
A blunt pointed curved bistoury;
One fine Adams or a wire thread saw;
Six catch-forceps;
Obstetric forceps.

Galbiati and others have devised special knives (Fig. 293) for dividing the pubes, but they are superfluous. The operation has been made to appear especially difficult by men who have introduced into their descriptions a multiplicity of both words and instruments.

An incision is made through the mons veneris extending from the clitoris to an inch above the pubes. The prevesical space is entered between the recti immediately above the pubes, and the forefinger introduced. Should more room be necessary to permit the introduction of the finger the recti may be divided on each side of the middle line close to the pubes. The pubes are next freed from fat posteriorly, when they are ready for division.

With the forefinger of the left hand as a guide, division is made from

before backward with the scalpel. Great care is required at this step of the operation not to injure the urethra. Some operators use to protect the urethra a grooved guard (Lusk). With reasonable care, however, this is not necessary. The division should be made cautiously by separate cuts. It is well to keep the thighs together during this step of the operation, as after division the bones may suddenly spring apart and seriously lacerate the underlying structures. Harris recommends that the sub-pubic ligament (ligamentum arcuatum) be not divided. This ligament extends downward on the rami of the pubes and forms the upper boundary of the pubic arch. Harris maintains that its division exposes to injury the deep layer of perineal fascia, together with its underlying vascular tissues. Harris, by means of a blunt-pointed bistoury, guided by the forefinger from above, separates this ligament from the pubic rami. As this ligament is divided the pubic bones will gradually separate for a distance of from five to seven centimeters. Greig Smith says that the separation should not exceed six centimeters (two and one-third inches). The urethra can be kept out of the way by the sound in the bladder previously introduced.

The forceps is now applied and the child delivered. The placenta is immediately delivered.

Should the symphysis be ossified it will have to be sawed through.

Operators are not agreed as to the necessity of suturing the bone and periosteum. Pinard unites the bones with four deep and four superficial sutures. Lusk introduces strong silk sutures through the longitudinal bands. Farabœuf has invented a fixation forceps to bring the pubic bones in close contact while the sutures are being secured. A small tube or a strip of gauze is placed in the prevesical space, when the cutaneous wound is closed with a running catgut suture. Harris recommends that a broad strip of adhesive plaster be carried around the pelvis. In lieu of the plaster a many-tailed binder may be tightly applied. The wound is dressed in the usual antiseptic way.

It may be necessary to resort to acupressure or the Paquelin in order to control bleeding.

Should laceration of the urethra or bladder occur a catheter should be kept in situ until the rent is healed. The patient should be kept quiet in the dorsal posture for at least a month. Otherwise the after-treatment does not differ from that of the ordinary obstetric case.

Prognosis.—The maternal mortality attending symphysiotomy is still high—above 10 per cent.; the fetal mortality in the hands of the best operators ranges from ten to twenty per cent. Doubtless this rate will be reduced in the near future by a more careful selection of cases.

Symphysiotomy should be looked upon as a substitute for high forceps operations, the induction of premature labor, and version in slight degrees of pelvic deformity. It should make the performance of embryotomy much less common.

It is a much easier operation for the average general practitioner than either the Cæsarean or the Porro.

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