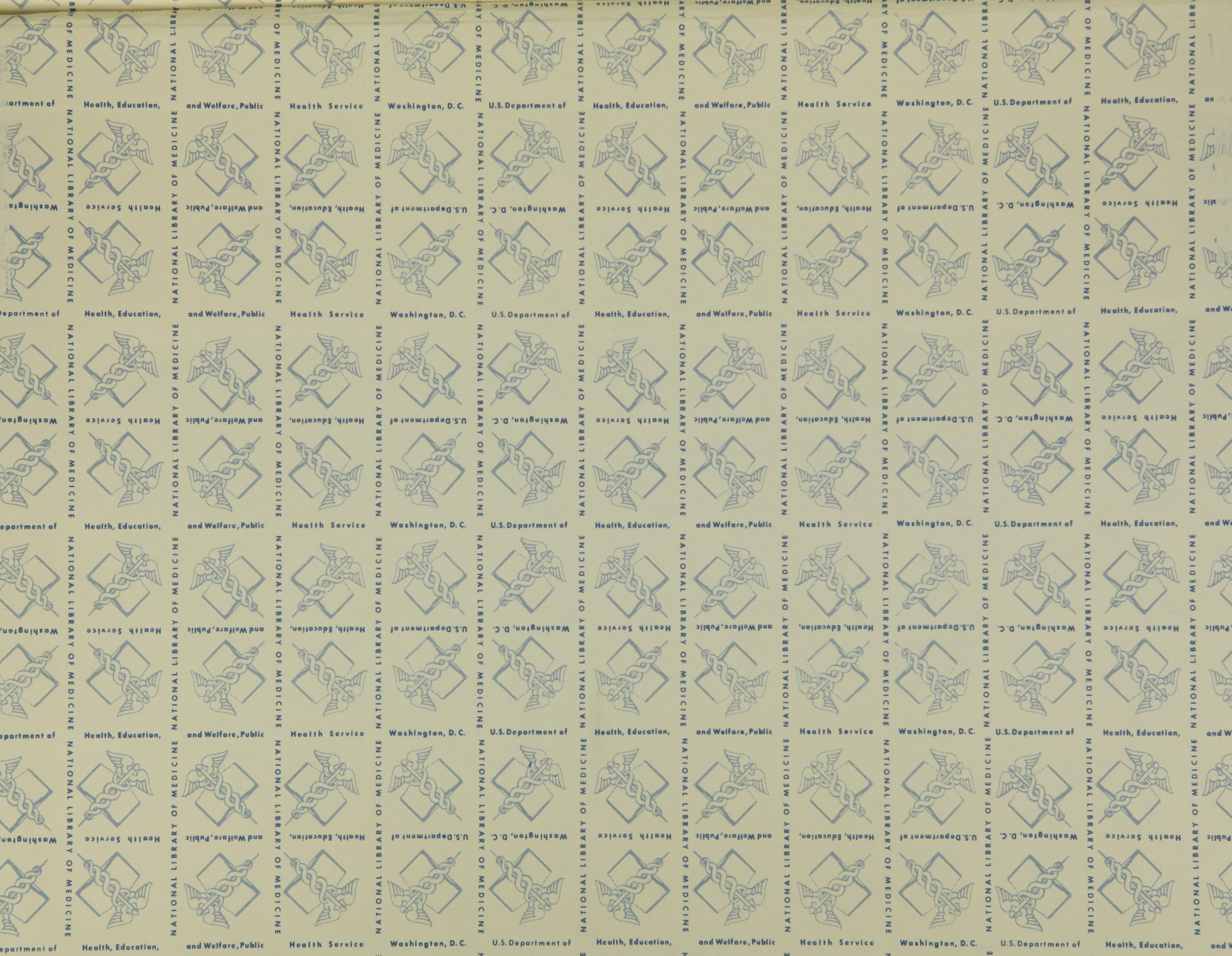
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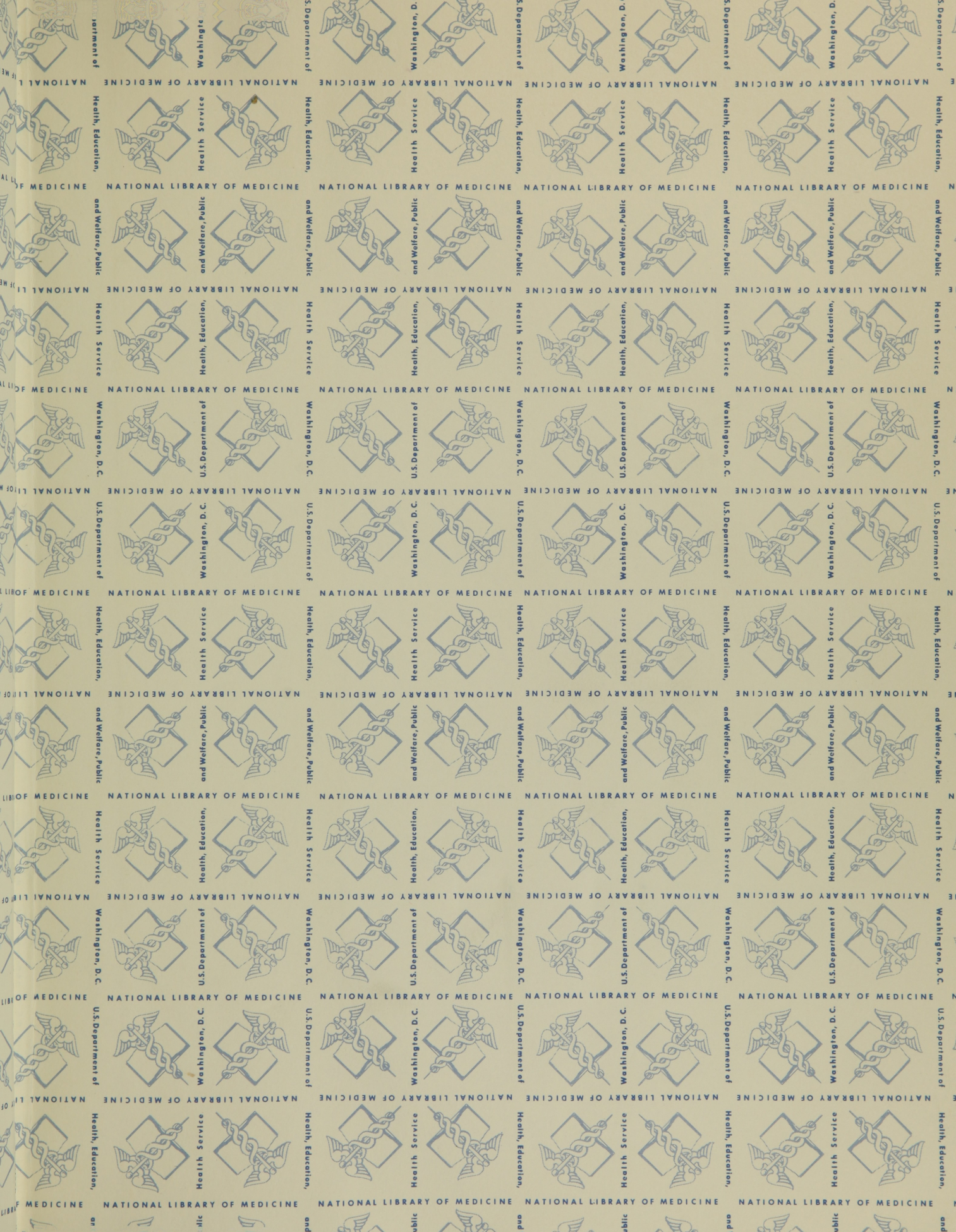
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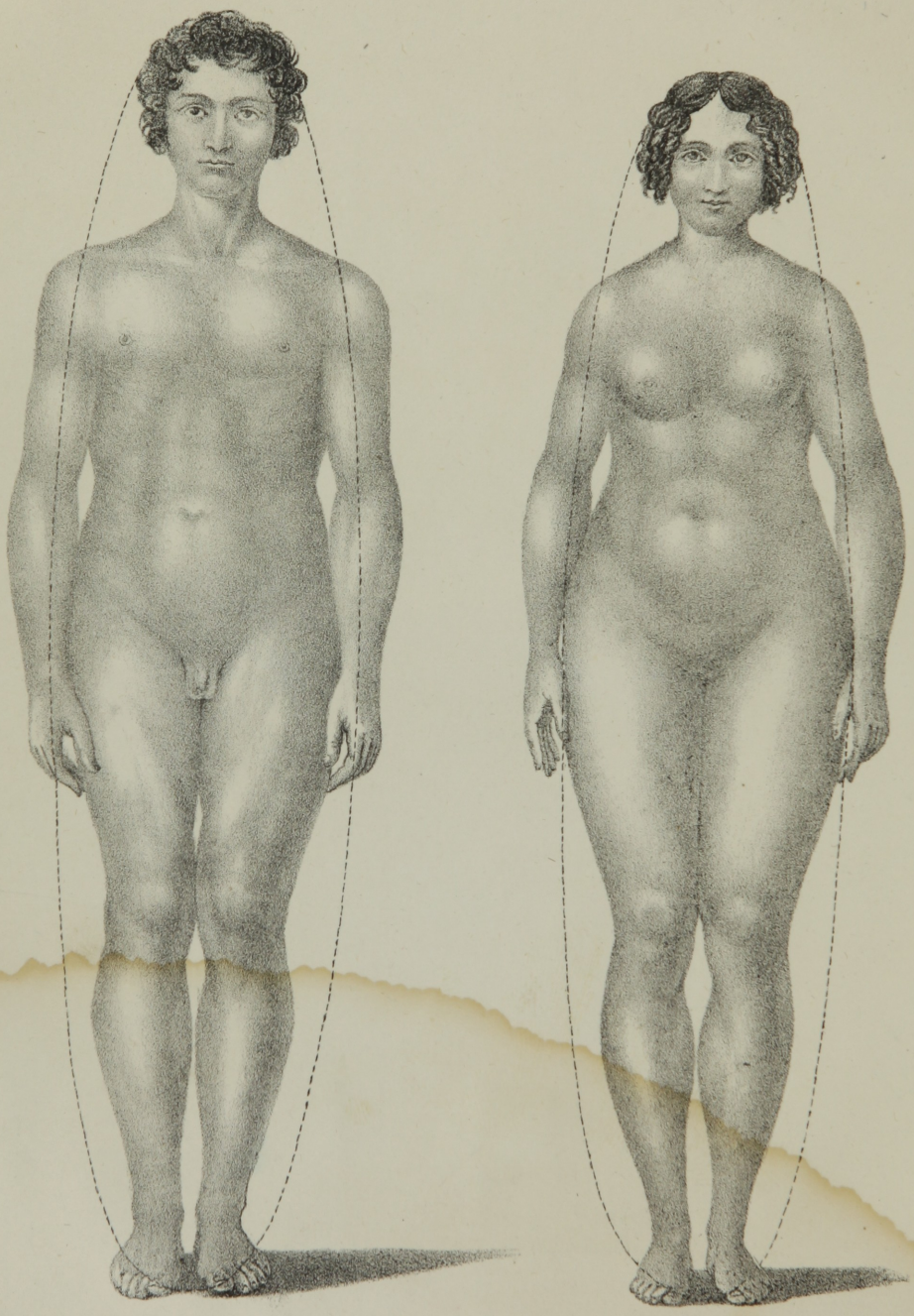

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OBSTETRIC TABLES:

COMPRISING

GRAPHIC ILLUSTRATIONS,

WITH

DESCRIPTIONS AND PRACTICAL REMARKS;

EXHIBITING ON DISSECTED PLATES

MANY IMPORTANT SUBJECTS

IN

MIDWIFERY.

BY G. SPRATT,

SURGEON-ACCOUCHEUR.

FIRST AMERICAN EDITION, FROM THE FOURTH AND GREATLY IMPROVED LONDON EDITION,

CAREFULLY REVISED, AND WITH ADDITIONAL NOTES AND PLATES.

1876

PHILADELPHIA:
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PREFACE TO THE FIRST AMERICAN EDITION.

The superiority of the present work over any other series of Obstetrical illustrations, is universally admitted. It is a happy combination of the *Picture* and the *Model;* combining the convenience of one, with the completeness of the other. To the busy practitioner, who wants something to refresh his memory, it obviates the necessity for continual *post mortem* examination, by supplying every point of reference he can possibly require. To the student it is equivalent to a whole series of practical demonstrations, with the advantage that it can be carried about with him and studied wherever he may desire. This is particularly the case with the plates explaining the use of the instruments. No *single* pictures could ever convey the same ideas, and enable the student to understand the descriptions; but these dissected plates are almost equal to the Mannikin itself. The newly added representation of the Cesarian operation, is another instance. The *best* views of that operation, when standing alone, are almost as likely to mislead as to guide correctly. This plate, however, exhibits the whole process in so complete and connected a manner, that nothing can be misunderstood.

The European reputation of this work is perhaps greater than that of any other of the kind. Numerous copies have been imported, at different times, at a high price, and a general wish has been expressed for its republication here. It was, however, so *novel* and so *difficult* a piece of work, that no lithographers liked to undertake it; they were afraid it would cost too much, and perhaps be inferior to the original. The Editor, however, having some similar work done by Messrs. *Wagner & McGuigan*, was convinced, from what he saw of their skill, that it could be done by them fully equal to the original, and much cheaper. He accordingly proposed it to them, and undertook the necessary supervision. The result has been its issue to the American public, after immense labor and expense, at a much cheaper rate than it can be imported, and, in many respects, in a much superior style. * The additional *Plates* and *Notes* have been specially designed to supply all deficiencies in the original, and to bring the work up to the present state of Obstetrical Science.

It is now put forward, confidently, as the *best*, in fact the *only* work of the kind in this country, and the attention of medical men is respectfully directed to its peculiar merits.

AMERICAN EDITOR.

* The Editor here deems it is a duty to say, that the manner in which Messrs. Wagner & McGuigan have executed their part of the task, reflects upon them the highest praise. It could scarcely have been better performed, and proves that their establishment is eminently calculated for the proper performance of this kind of work.—Ed. Am. Ed.

FRONTISPIECE.

This plate has been carefully compiled from other works, and corrected by an attentive study, both of *nature* and the *best works of art*, ancient and modern. Every effort has been used to make it, as nearly as possible, a correct representation of the perfect human figure, in both sexes, so that the peculiarities of each may be seen, and a correct comparison made between them.

This comparison is highly interesting in an *artistic* point of view, and is also, in many instances, of great *practical* value to the anatomist and physician.

DEDICATION.

TO

SIR CHARLES MANSFIELD CLARKE, BART.,

PHYSICIAN TO THE QUEEN.

Sir,

The high professional pre-eminence which your great talents as an Obstetrician, and your unwearied zeal in the alleviation of disease incidental to the female sex, have obtained for you, induced me to solicit the honor of placing this volume under your auspices. Encouraged by the flattering kindness which you have shown me, in condescending to examine and suggest many improvements in these Tables, and honored by your permission to dedicate them to you, I respectfully do so, feeling assured that a work (especially intended to promote the relief of female suffering) could not be so well placed as under your protection. That you may long continue to enjoy the exalted station in your profession which you now hold, is the sincere wish of,

Sir Charles,

Your very much obliged,

And very obedient, humble Servant,

THE AUTHOR.

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TABLES I. AND II.

ILLUSTRATING THE DEVELOPMENT OF THE OVUM AND FŒTUS.

PRELIMINARY OBSERVATIONS AND REMARKS.

To investigate the subject of conception would be foreign to a purely practical work on obstetrics; but the subject of reproduction of the human species is so deeply interesting, that we think a *brief outline* of the modern physiological theory of impregnation, and the progressive growth of the fœtus to maturity, will not be misplaced, nor prove uninteresting to many of our readers. The works of Blumenbach, Ryan, Velpeau, Spallanzani, and many others, may be consulted by those who wish to investigate minutely this interesting subject. That conception should follow sexual congress, it appears essential on the part of the female that the ovaria contain some of their vesicles in a healthy condition; on the part of the male, that the testes be in a healthy state. The male semen being transmitted through the uterus, and by the tubæ Fallopianæ to the ovaries, stimulates one of the vesiculæ Graafianæ which contains the ovum or germ.*

When fecundation takes place, the fimbriated extremity of one of the tubes expands and embraces the ovary, the impregnated ovulum bursts and escapes, with its external envelope, together with a small portion of the liquid peculiar to the Graafian vesicle, and thus it passes into the Fallopian tube, along which it is conveyed into the uterus. The precise time at which the ovulum enters the womb after fecundation is not known. Although it is generally supposed to be about a week or two in its journey from the ovaria to the cavity of the uterus, it appears probable that the time may be much shorter. It is said to have been detected in the uterus so early as the eighth day, by Home, Walker, and others. Dr. Granville states that he saw a perfect ovulum ejected from the womb fourteen days after a single sexual congress, which had taken place the day after the cessation of the menses.†

The ovulum contains the primordial parts of the fœtus, though on its first entrance into the uterus they can scarcely be detected, on account of their minuteness and transparency. It has two membranous coverings, having a gelatinous substance interposed between them, the chorion and amnion‡, the former being the outer, the latter the inner covering: these, with a fluid (liquor amnii) secreted by the amnion, constitute the ovum.

* An ovulum exists in each of the vesicles of Graaf, which the ovarium contains in women who have reached maturity.

† Granville's Graphic Illustrations of Abortions, &c.

‡ Velpeau says this membrane does not exist before the twelfth day.

From the moment of conception, the internal surface of the uterus acquires an increased action, and secretes a delicate, lacerable, and cribri-form membrane (decidua) which may be divided into two laminæ, the one in contact with the uterus, the other with the ovum.

According to Prevost, Baer, and Dumas, the blood is formed independently of the heart. The arteries, veins, and heart, are formed successively. The development of the nervous system commences from the circumference of the embryo, proceeding towards the centre; hence the lateral nerves of the head, trunk, and pelvis, are developed, whilst the cerebro-spinal system is yet in a liquid state.

Of the digestive organs the intestinal canal is the first to appear: it consists, during the first days of its formation, of a curved open tube, extending the whole length of the embryo, placed before the vertebral column. It communicates with the vesicula umbilicalis.* It extends and expands, and its superior extremity, the mouth, opens about the fourth or fifth week; the inferior extremity, the anus, opens about the seventh; the outlines of the stomach are visible about the ninth week.† Before the seventh day we cannot perceive any thing in the uterus which indicates the presence of a new being. On the tenth day a semi-transparent, greyish flake may be perceived, of an indeterminate form.‡ From the twelfth to the thirteenth day, the presence of a vesicle, the size of a pea, containing a thick fluid, in the middle of which swims an opaque spot, presents the first lineaments of the new being that bears the name of *embryo:* it is enveloped by the membranes *chorion* and *amnion;* the weight is equal to one grain.

The embryo may be perceived with the naked eye at the fourteenth day after conception (vide fig. 1, 2, and 3, Table 1). On the twenty-first day, it resembles, in form, a large ant or lettuce seed (Burton), its length is from 4 to 5 lines, and weight from three to four grains: at this period the different parts of the fœtus present a little more consistence, and those which are to form bones pass into a cartilaginous state (vide fig. 4 and 5). On the thirtieth day it is about the size of a horse fly, and resembles a worm bent together; at this period we may perceive, although faintly, some traits of the principal organs; the head appears as large as the rest of the body; there is also, in the former, black dots marking the spots for the eyes; its weight is from nine to ten grains, and its length from ten to twelve lines (vide fig. 6 and 7). At the period of forty-five days, the development of the fœtus in various parts becomes well determined, the superior and inferior extremities appear under the form of globular tubercles, the former preceding the latter by a short period of time; the body lengthens, but keeps the ovoid figure; blackish spots indicate the presence of the eyes, the mouth, and the nose; weight one drachm, length one inch.§ At from sixty to seventy days, the various parts of the fœtus become progressively developed, the black spots which represent the eyes enlarge, the eylids are visible, the nose becomes a little prominent, the mouth enlarges, the external concha of the ear becomes distinctly delineated, the brain is soft and pulpy, the neck is defined, and the heart is fully developed. At ninety days, three months, the development of all the essential parts of the fœtus becomes perfectly defined; the eyelids are distinctly delineated, but closely shut: the lips are very distinct and drawn together, the organs of generation are exceedingly prominent in the male as well as in the female, the penis in the former and the clitoris in the

* Meckel, Wolf, Oken. † Velpeau.

‡ The precise time at which the ovulum enters the womb is not exactly known.

§ The measure and weight vary more or less during every period of pregnancy.

latter are remarkably elongated.* The heart beats with force, and the larger vessels carry red blood; the fingers and toes are defined, the muscular system begins to characterise itself; weight, about two ounces and a half; length, from four to five inches.

At one hundred and twenty days, or four months, the development of the fœtus in all its parts is remarkably increased, the brain and spinal marrow acquire more consistence, the muscular system is distinct, and here and there we meet with some cellular tissue. The abdomen is fully covered in, and the intestines are no longer visible; in the latter, a little meconium collects; weight, seven to eight ounces.

At one hundred and fifty days, or five months, the development of every part of the fœtus is very considerably increased; the lungs enlarge, and are susceptible of experiencing a certain dilatation. The cutaneous envelope acquires at this period much consistence, the epidermis is stronger and thicker, the situation of the nails is determined, and the meconium is more abundant and lower in the intestines; length, eight or ten inches; weight, fourteen or sixteen ounces; intellectual faculties void.

At one hundred and eighty days, six months, the fœtus is increased in its shape and formation, the nails are marked, a little down appears on the head, the first indication of hair; the cellular tissue is abundant, and a little adipose substance is deposited in its cells: length, from nine to ten or twelve inches; weight, from one and a half to two pounds; intellectual functions void.

At two hundred and ten days, seven months, every part of the fœtus has progressively increased in volume, size, and weight; the nails are formed, the hair appears, the testicles descend, the meconium increases in the large intestines, and the bony system is nearly complete: length, from twelve to fourteen inches; weight, two and a half to three pounds; intellectual functions void.

From the seventh to the ninth month, the successive development of the fœtus is limited to mere weight and size.† At the period of nine months, the cutaneous, arterial, and capillary systems become very active, the skin appears colored, and the perspiration is established. The intellectual functions void; but the animal functions are well developed, especially that of taste; the child is sensible of pain, of hunger, and of heat and cold: weight, from five to eight pounds; length, from eighteen to twenty-two inches.

* The difference of sexes may be known from other circumstances besides the sexual organs, such as the particular formation of the head, extremities, thorax, abdomen, and dorsal spine.

† Although the growth of the various parts of the fœtus bears a proportion to the general development of its body, that part of the body which is below the navel measures in length less than the part above it, until the full period of gestation, when the navel marks the precise centre of the fœtus. This circumstance will assist us in forming an opinion respecting the age of any fœtus. (Foderé, Chaussier.)

DESCRIPTION OF TABLES I. AND II.

Fig. 1.—An ovum from eight to twelve days, of the natural size. The flocculent surface of the chorion is readily distinguished, and occupies the whole of the circumference.

Fig. 2.—An ovum of about twelve days, laid open.

Fig. 3.—A magnified view of the same ovum.

a.a.a.—The villous surface of the chorion.

b.b.—Reticulated magma or the allantois,* placed between the chorion, *c.c.c.* and the amnion *g.*

d. The embryo. *e.* The umbilical or intestinal vesicle.†

f. The umbilical cord.‡

Fig. 4.—An ovum of about twenty-one days, laid open.

a.a.a. The chorion spread open and retained by the pins.

b. The amnion open, leaving the embryo to be seen completely bare.

Fig. 5.—The same ovum (fig. 4) magnified.

a. The head of the embryo. B. The eyes. *c.* The mouth.

* The allantois is a vessel or sac which projects from the lower end of the anal intestines; it appears about the fourth week, and by the sixth it has nearly disappeared; it communicates with the bladder by the urachus, (a canal,) which is found impervious after the first three or four months of gestation. (Meckel, Dutrochet, Baer, and others.)

† The umbilical vesicle measures about half an inch in length; it is situated immediately against the anterior surface of the embryo, but gets further from it at the end of the first month, when it is found on the outside of the sheath of the cord. It is composed of a granular membrane; it contains a whitish liquid, which gradually becomes thicker, and ultimately hardened. The vesicle withers and becomes opaque; it receives the omphalo-mesenteric vessels. It disappears about the third month.

‡ The umbilical cord appears about the end of the third week, and then consists of a vein and two arteries, the urachus, a species of gelatine of a ropy nature, a portion of the intestinal canal, (larger in proportion as the embryo is younger,) the vesicula umbilicalis in part, and the omphalo-mesenteric vessels. The three last disappear after the third or fourth month of gestation.

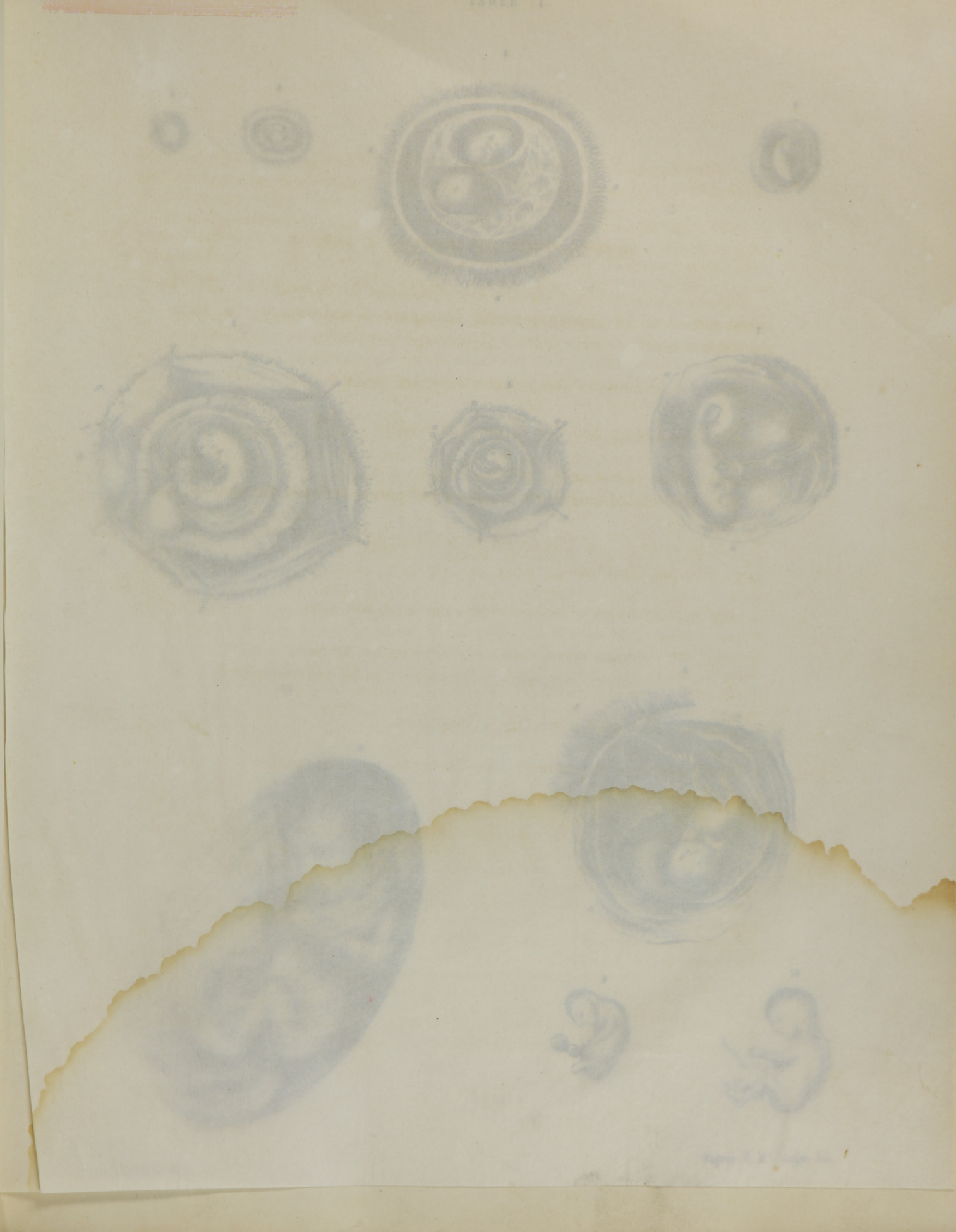


TABLE I.

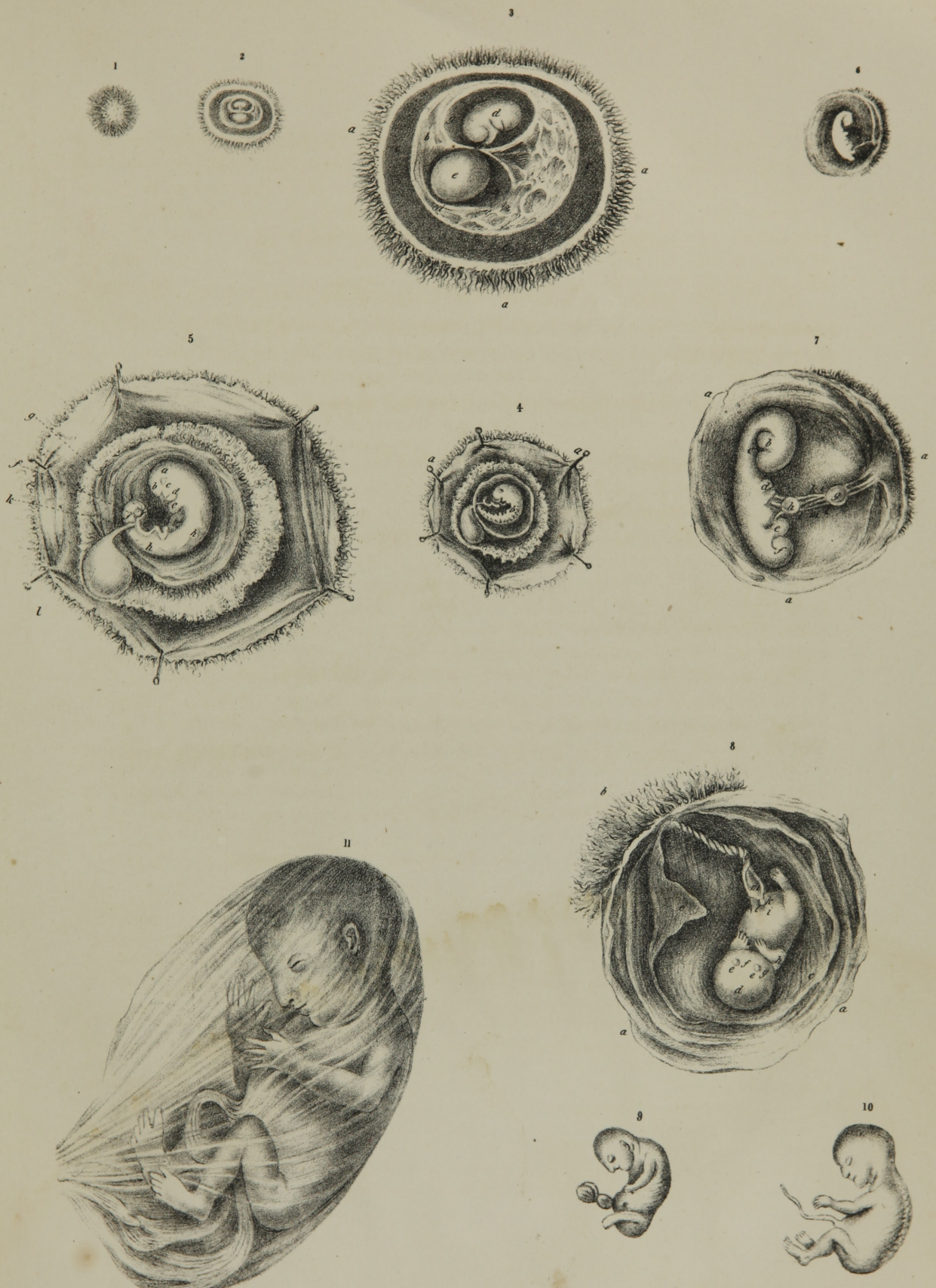


TABLE II.

Fig. 1.

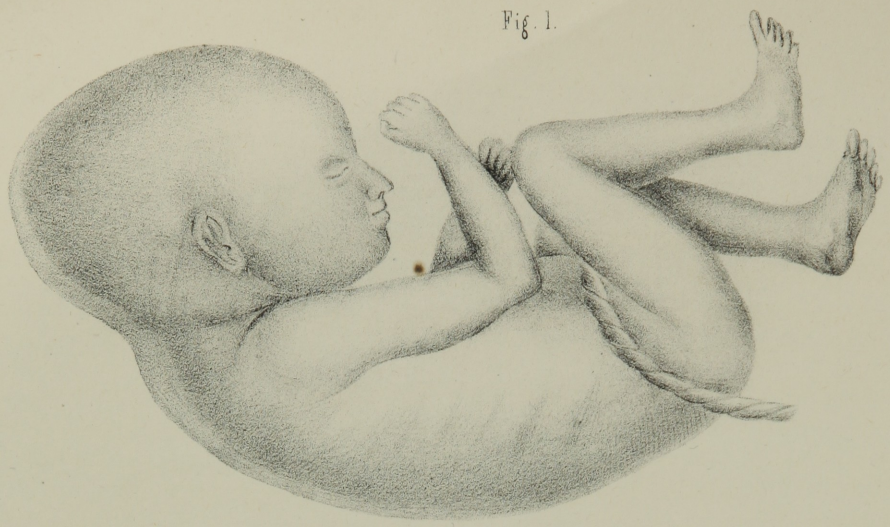
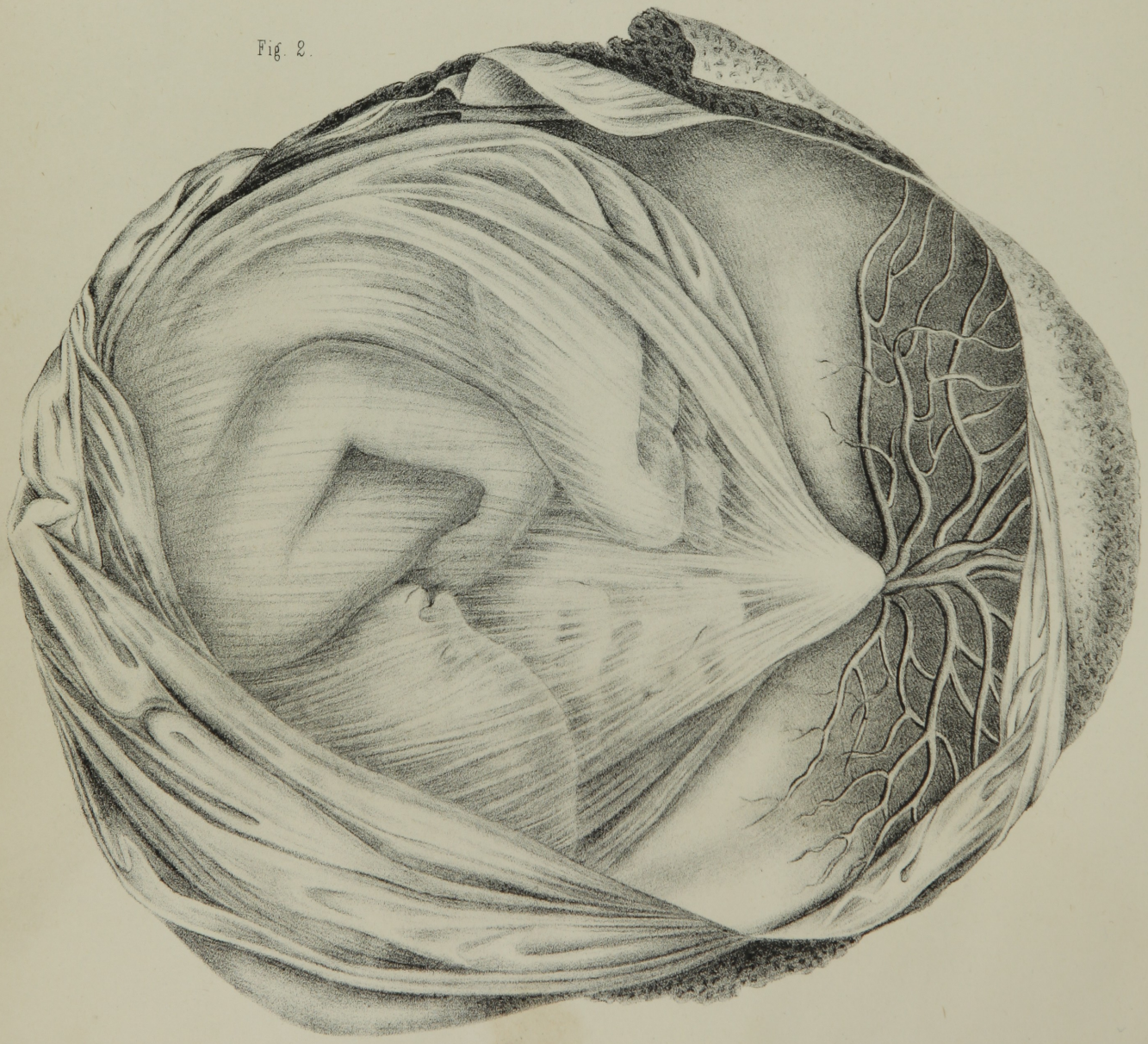


Fig. 2.



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d. The neck. *e.* The superior or thoracic extremities.
f. The abdominal, or inferior extremities.
g. The extremity of the coccyx. *h.h.* The arch of the spine.
i. The region of the liver.
k. The pedicle of the umbilical vesicle. *l.* The vesicle.

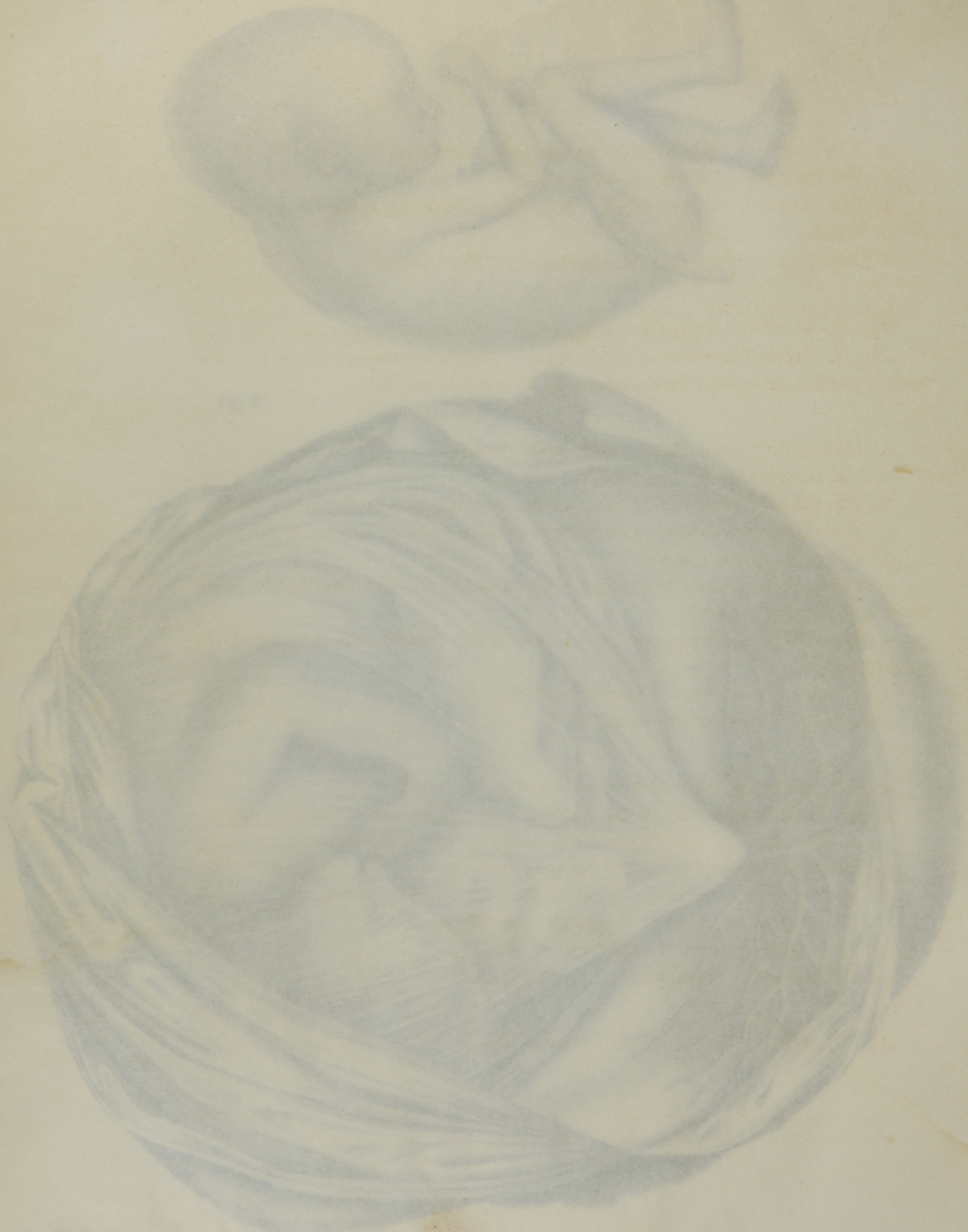
Fig. 6. An ovum of the natural size, laid open, about twenty days old.
Fig. 7. A magnified view of fig. 6, *a.a.a.* The circumference of the chorion, with a portion of its flocculent surface, to be seen on one side.

b. The head of the embryo greatly bent forward.
c. The mouth already very visible.
d. The thoracic tubercles, or rudiments of the superior extremities.
e. The abdominal tubercles, or rudiments of the inferior extremities.
f. The point of the coccyx.
g. The remains of the vitelline liquor, contained in the umbilical vesicle, hardened and forming a tumor.
h. Remains of another small vesicle which was formed near the ring of the umbilicus.
i. Umbilical vein. *e.e.* Umbilical arteries.
m.m. Omphalo-mesenteric vessels.*

Fig. 8. An ovum, of from five to six weeks, laid open.
a.a.a. The circumference of the chorion. *b.b.* Villosities of the placenta.
c.c.c. The amnion. *d.* Head of the embryo. *e.e.* The temples.
f. Root of the nose, or interval between the eyes. *g.* The right ear.
h. The superior extremities. *j.* The inferior or pelvic extremities.
i. The abdomen. *k.* Sexual organs.
b.b. The umbilical cord, already turned spiral.
m. The swelling containing the intestinal portion.

Fig. 9. A fœtus of the age of forty-five days.

* These vessels consist of an artery and vein, they accompany the cord as far as the navel, through which they pass into the abdomen. These vessels disappear as the vesicula umbilicalis becomes obliterated.



d. The neck. *e.* The superior or thoracic extremities.
f. The abdominal, or inferior extremities.
g. The extremity of the coccyx. *h.h.* The arch of the spine.
i. The region of the liver.
k. The pedicle of the umbilical vesicle. *l.* The vesicle.

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ii. Umbilical vein. *e.e.* Umbilical arteries.
m.m. Omphalo-mesenteric vessels.*

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a.a.a. The circumference of the chorion. *b.b.* Villosities of the placenta.
c.c.c. The amnion. *d.* Head of the embryo. *e.e.* The temples.
f. Root of the nose, or interval between the eyes. *g.* The right ear.
h. The superior extremities. *j.* The inferior or pelvic extremities.
i. The abdomen. *k.* Sexual organs.
b.b. The umbilical cord, already turned spiral.
m. The swelling containing the intestinal portion.

Fig. 9. A fœtus of the age of forty-five days.

* These vessels consist of an artery and vein, they accompany the cord as far as the navel, through which they pass into the abdomen. These vessels disappear as the vesicula umbilicalis becomes obliterated.

Fig. 10. A fœtus of the age of two months or sixty days.

Fig. 11. A fœtus of the age of three months, enclosed in the amnion.

Fig. 1. (Table II.) A fœtus of the age of four months.

Fig. 2. (Table II.) A fœtus of the age of five months, with the placenta and membranes. The chorion is laid open to exhibit the fœtus enveloped in the amnion. The amnion is seen attached to the centre of the internal surface of the placenta, through which the navel chord passes. The external surface of the placenta is seen covered by the chorion and decidua.

TABLE III.

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TABLE III.

ILLUSTRATING THE FEMALE ORGANS OF GENERATION.

A. The Mons Veneris.

B.B. The Labia externa, majora, vel pudendi.

C. The Perineum anticus.

The Mons Veneris is a prominence situated on the Symphysis Pubis, arising from each side of the groin, composed of common integuments, fat, fibrous and cellular substance, and numerous sebaceous follicles. Its breadth is about two inches, and covered with hair after puberty. The inferior part bifurcates to form the Labia externa.

The Labia externa take their rise from the termination of the mons veneris, and descend to the perineum anticus, where they unite and form the fourchette or frenum (marked D in the drawing). The points at which the Labia unite above and below are called *superior* and *inferior* commissures, and the fissure formed by the Labia is called the genital fissure, or sinus pudoris, vulva or pudendum. The Labia are composed of common integuments, cellular substance and fat, and are covered with hair after puberty. Their internal surfaces are smooth, of a pink color, and supplied with numerous sebaceous and mucous follicles.*

The Labia are dense and in opposition before puberty; but become elongated, less dense, and bluish, after marriage.

The Labia are sometimes found united at birth. The surfaces of the Labia very frequently cohere, so as to close up the genital fissure, leaving only a small opening for the passage of the urine. This cohesion is not unfrequently caused by uncleanliness when the parts are attacked with excoriation or ulceration.

On separating the *Labia externa*, the *Clitoris*, &c., are brought into view.

A. The *Clitoris*. B.B. The *Nymphæ*, or *Labiæ minora*. C. The *Hymen*. D. *Meatus urinarius*. E. The orifice of the Vagina.

The Clitoris is an elongated substance, about two inches in length, formed of two cavernous, spongy, vascular bodies. It has a round, free extremity,

* These follicles sometimes give rise to an acrid discharge, not unfrequently mistaken for gonorrhœa.

TABLE III.

ILLUSTRATING THE FEMALE ORGANS OF GENERATION.

A. The Mons Veneris.

B.B. The Labia externa, majora, vel pudendi.

C. The Perineum anticus.

The Mons Veneris is a prominence situated on the Symphysis Pubis, arising from each side of the groin, composed of common integuments, fat, fibrous and cellular substance, and numerous sebaceous follicles. Its breadth is about two inches, and covered with hair after puberty. The inferior part bifurcates to form the Labia externa.

The Labia externa take their rise from the termination of the mons veneris, and descend to the perineum anticus, where they unite and form the fourchette or frænum (marked D in the drawing). The points at which the Labia unite above and below are called *superior* and *inferior* commissures, and the fissure formed by the Labia is called the genital fissure, or sinus pudoris, vulva or pudendum. The Labia are composed of common integuments, cellular substance and fat, and are covered with hair after puberty. Their internal surfaces are smooth, of a pink color, and supplied with numerous sebaceous and mucous follicles.*

The Labia are dense and in opposition before puberty; but become elongated, less dense, and bluish, after marriage.

The Labia are sometimes found united at birth. The surfaces of the Labia very frequently cohere, so as to close up the genital fissure, leaving only a small opening for the passage of the urine. This cohesion is not unfrequently caused by uncleanliness in those who are attacked with excoriation or ulceration.

On separating the *Labia externa*, the *Clitoris*, *&c.*, are brought into view.

A. The *Clitoris*. B.B. The *Nymphæ*, or *Labia minora*. C. The *Hymen*. D. *Meatus urinarius*. E. The orifice of the Vagina.

The Clitoris is an elongated substance, about two inches in length, formed of two cavernous, spongy, vascular bodies. It has a round, free extremity,

* These follicles sometimes give rise to an acrid discharge, not unfrequently mistaken for gonorrhœa.

called its glans, which is enveloped by skin or prepuce, which terminates in the Labia minora. It resembles the male penis; it becomes erect during coition, and is the principal seat of voluptuousness. The Clitoris arises from the ischia-pubic branches, and is attached to the pubis by a suspensory ligament.

The Clitoris sometimes increases to the length of four or five inches. The Clitoris is sometimes the seat of cancer and cauliflower excrescence.

The *Nymphæ*, or *labia minora*, are two continuations from the prepuce of the clitoris and *labia externa;* they diverge and descend on either side to about the middle of the *labia externa*, where they terminate insensibly on the internal surface. They are formed of fine thin vascular and spongy tissue, and consist internally of adipose and cellular tissue; they are firm, and of a reddish color.

The nymphæ in some persons are naturally elongated, and in some countries, as Hindostan, Persia, and Turkey, they produce so much inconvenience as to require extirpation. In the fœtus, and at birth, the *nymphæ* pass the *external labia;* in virgins, they are hidden within the *vulva;* but in women who have had children they become elongated, less firm, and lose their rosaceous color.

Meatus urinarius, or orifice of the urethra, is a small round aperture situated about an inch below the *clitoris*, and about one-third of an inch above the entrance into the vagina; it is surrounded by small depressions, called lacunæ.

The situation of the orifice of the urethra demands particular attention, on account of the introduction of the catheter. The best position for introducing the catheter, is for the patient to lie on her back with her knees separated and elevated. The operation will be best performed by the operator standing on the patient's right side, with the catheter, previously oiled, in his right hand, then to carry his left hand over the right thigh of the patient, and with the index finger to separate the labia and nymphæ, the finger must then be passed downward about an inch below the clitoris, till it arrives at the orifice of the urethra. The right hand, with the catheter, is to be carried under the patient's thigh, and the point of the instrument directed to the extremity of the index finger, when, with a little dexterity, it readily slips into the urethra. The relative positions of the parts are so much altered in cases of procidentia and inversio uteri, " that, although the catheter must be introduced and carried forwards to the pubes, with the point directed in the usual course, yet, when it has reached the symphysis, its handle must be so elevated towards the abdomen that the extremity of the instrument should be directed towards the knees. Under other circumstances, such as the bladder being over the pubes, when the abdomen is pendulous, the handle must be as much depressed,

immediately after the point has cleared the symphysis pubis."* Previous to introducing the catheter, the stilette should be withdrawn, and a moistened bladder tied on the extremity of its handle, into which the urine may flow. This plan prevents the bed being wetted, which is an almost unavoidable circumstance, as the operation is commonly performed.

The *vagina* is the canal which extends from the genital fissure to the uterus, passing between the *bladder* and *rectum*. In the virgin state, it is about one inch in diameter, but much more capacious in married women, and those who have had children: it is capable of great contraction and dilatation. It is from three to five inches in length; the superior or upper part encircles the cervix uteri.

The vagina is lined by a mucous membrane, which affords a secretion which prevents adhesion of its surfaces. This secretion is increased in leucorrhœa.

Fig. 2.—On folding down the part marked D, the uterus, &c. are brought into view.

A. The fundus of the uterus. B.B. The round ligament, the left of which is seen passing through the ring of the external oblique muscle C, and terminating on the mons veneris. E. A portion of the small intestines. C. A portion of the external oblique muscle turned aside, to shew the uterus in its situation.

D.D. The iliac arteries, veins, and nerves.

The *uterus*.† This organ is situated between the bladder and rectum, it is destined for the reception of the fœtus. The form of the unimpregnated uterus is somewhat pyreform; when impregnated, its shape is oval. The uterus is divided into fundus, corpus, and cervix; the fundus is that portion which is above the insertion of the fallopian tubes; the corpus is the portion between the fundus and cervix, and the latter is the narrow portion below the corpus or body. The unimpregnated uterus‡ is about three inches in length, two inches in breadth at the fundus, and one inch at the cervix. The cavity of the uterus is somewhat triangular, and is lined by a continuation of the villous covering of the vagina. The substance of the uterus is composed of muscular fibres, nerves, arteries, veins, and absorbents, connected by dense cellular structure. Its nerves

* Conquest's Outlines.

† Fig. 1. Table IV, in the Obstetric Tables, represents the unimpregnated uterus and its appendages.

‡ See fig. 1. Table IV, Obstetric Tables.

are supplied from the meso-colic plexus, the sacral and great sciatic. Its arteries are four, two spermatic and two hypogastric: these vessels freely anastomose.

The *ovaries* or seminal glands of the woman, the secreting organs of the germ, are situated near the sides of the uterus, enclosed in the posterior fold of the broad ligament, are oblong, oval, about the size of a bean or almond, and of a yellow grey color, and contain the ova, in number from eight to twenty. At puberty, the ovaries become developed and active, and, by sympathy, produce a series of changes in the uterus, mammæ, larynx, &c.

The uterine tubes, (Tubæ Fallopianæ), are two small canals, arising from the lateral angles of the fundus of the uterus, four or five inches long, and about the size of a goose-quill; they pass through the middle fold of the broad ligament.

Fig. 3.—On turning down fig. 2, the uterus is represented in situ. A. The uterus. *b.b.* The fallopian tubes, fimbriæ, and ovaries. C. The bladder. *d.* The rectum passing down behind the uterus. *e.e.* The round ligaments. *f.f.* The broad ligaments.

We must observe, that, to have this and the former view of the contents of the pelvis, (fig. 2), it is necessary that the pelvis be placed horizontally; otherwise, the uterus, &c., would appear to be placed somewhat too high.

TABLE IV.

ILLUSTRATING THE SIGNS OF THE DIFFERENT EPOCHS OF PREGNANCY.

Signs.—Pregnancy may be distinguished by presumptive or rational signs, and positive or sensible signs. The signs presumptive or rational, are those which cause a belief or supposition that pregnancy exists. Although numerous, these signs are very uncertain, and we can only form conjectures by their presence. Among these signs, are those which affect the entire economy: these are the general presumptive signs. There are others which manifest their presence on a point far removed from the economy: these are the particular or local signs. The first are drawn from all the changes that a woman experiences in the regular and natural functions, in her habits, her longings, and her particular fancies, the effects of which are marked by the paleness of the face and a certain alteration in the features which belongs alone to pregnant women, but which the most experienced eye cannot always recognise.

The particular or local signs are of a more positive nature: alone, they do not indicate to a certainty the reality of pregnancy; but they deserve all the attention of the practitioner. These signs are, first, the suppression of the menses; 2d, the enlargement and expanding of the abdomen; 3d, the discoloration and brownish appearance of the areola, the swelling of the breasts, and the moisture from the nipple.

There are two remarkable circumstances in the life of women, during the time the monthly courses are suppressed without the health being sensibly affected: these two circumstances are pregnancy and suckling; but far from the suppression of the menses being a positive sign of pregnancy, it is not always even a rational sign—nothing being so variable or so subject to derangement as this evacuation; any more than its constant and regular appearance is a formal proof that the woman is not pregnant, since there are numerous examples which demonstrate that, although pregnant, some women have not ceased to menstruate, at least during the first months of gestation.

So soon as a woman perceives that her abdomen enlarges and expands, she thinks herself pregnant; above all, if these signs are accompanied by the suppression of the menses.

It is true that pregnancy causes the enlargement and expanding of the abdomen; but causes foreign to pregnancy, which may produce this appearance, are too numerous to allow us to accord to this sign all the value which it merits in the case of a true pregnancy.

Besides, the abdomen does not visibly enlarge until after the third month; and as the feeling at this short period of pregnancy can only furnish vague data, we must only pronounce with much reserve upon the enlargement of the abdomen, even as a rational sign of pregnancy.

Later, and when pregnancy is far advanced, the size of the abdomen adds little to its certainty; other signs, more positive, leave no doubt about its presence.

The sympathy which exists between the uterus and the breasts explains sufficiently the influence that pregnancy exercises upon the latter. In general, this influence is not felt till towards the fourth month, nor is it discontinued until the accouchement, a period when the functions are established in these organs. However, it is not uncommon to see the breasts swell from the beginning of pregnancy, and even furnish by the nipple a secretion sufficiently distinguished. It is these anomalies which throw such uncertainty upon the swelling of the breasts as presumptive signs of pregnancy; although it is certain that it is one of the least equivocal, because it is uncommon, in false pregnancy, that the causes which occasion them produce upon the breast the same effects as true pregnancy. Alone, however, the swelling of the breasts and the secretion from the nipple would be far from being sufficient motives for believing in the presence of pregnancy; since we have examples in women who were really not pregnant, and with very young girls, where these phenomena were present.

4th. The dark brownish color which encircles the *areola* and the nipple is generally enough looked upon as a sign of pregnancy; because it is demonstrated that the dropsy, and all other circumstances which may produce the enlargement of the abdomen, have no action upon the breasts, and do not give place to any change of form or color in these organs. However, this sign will not always suffice to ensure the presence of pregnancy.

There are some women having the *areola* dark, and others who, even having had several children, have not experienced any change in this part, it always having remained of a pale pink color, even after many pregnancies.

The sensible signs, positive or demonstrative, of pregnancy, are of two species. The former, which are drawn from the sight and feeling, form its experimental or practical history. They make known the changes that the womb experiences, during pregnancy, in its form, its figure, and its situation: this is what may be called the physical phenomena of pregnancy.

The second are not accessible to our senses; they result from the changes that the womb undergoes in its organization during the course of pregnancy, changes which operate in virtue of common functions of which it is already possessed, and which form the physiological phenomena of pregnancy; these are its true rational signs.

Experimental detail of pregnancy.—At the end of the first month, nothing indicates to the accoucheur, at least in a perceptible manner, not even that pregnancy exists, nor even that the womb may be in a state of plenitude or action: any, that is to say rational, signs, not being yet manifest; and the general accounts given by some authors are too vague to allow us to place much faith in them.

It is not the same at the end of the second month (60 days accomplished). The practice of feeling may, by attention, enable us to distinguish the state of the fulness of the womb, as well as that the slight change made in its form and size make us presume on the existence of pregnancy.

During the whole course of the first month, the womb does not appear to experience any sensible change in its form or size; it is even probable that, far from acquiring any increase, it, on the contrary, contracts, as if it would embrace more closely the new production enclosed in its bosom.

At the end of the second month, its size is sensibly increased, its form is become rounded, it fills up the greater part of the pelvis; but the abdomen, far from enlarging, becomes more contracted, more tender, and sometimes a little painful.

After the third month, its size increases, as also its length, the fundus rises to the height of the region of the pubis and superior aperture or brim of the pelvis.*

The finger, introduced into the interior of the vagina, will perceive its form rounded, globular, and equal; it can be raised without making the woman feel any perceptible pain; the abdomen is slightly tumefied by the rising of the intestines, (see fig. 2.); but the neck of the uterus has not experienced any change, and consequently cannot furnish any perceptible sign of pregnancy.

The use of the stethescope, if it were possible to apply it in the interior of the vagina, could furnish, at this period, valuable results to confirm the existence of an organised body in the uterus.

At the end of the fourth month, the uterus emerges from out of the pelvis; its fundus rises to two or three fingers' breadth above the region of the pubis. The abdomen is sensibly enlarged; but it is at the side of the vagina, by the touch, that we can perceive with certainty the presence of pregnancy. It is not impossible to derive certain information by the ballottement;† the head of the fœtus having acquired at this period sufficient size and weight to obey, in a perceptible manner, the motion impressed upon it. It is not even uncommon that, at the same period, the woman should feel the first motion of her child.

At the end of the fifth month, there no longer remains any doubt as to the presence of pregnancy; all the signs, be they sensible or be they rational, unite in crowds to confirm it. We find the fundus of the uterus on a level with the umbilicus.

Feeling makes manifest the presence of the child, and the touch, executed by a careful and experienced hand, shews it with the greatest facility.

At the end of the sixth month, the rapidity with which the expanding of the uterus operates is such, that the extremity of the organ is raised two fingers' breadth above the *umbilicus;* its usual form is that of an *ellipsis*, greatly lengthened from fundus to cervix. We can easily perceive, by feeling, the head of the child through its distended coats. One particularity characterises the end of the sixth month: the neck, which up to this period had not taken any part in the development of the body and of the fundus of the uterus, begins to experience a little enlargement towards its base, its inferior orifice begins slightly to open, the neck itself, a little tumefied, becomes softer, and every thing announces that it is at length disposed to participate in the general dilatation of the womb.

In the course of the seventh month, the fundus of the womb, which still rises a little, begins to enter into the epigastric region; but its elevation no longer presents the same activity: on the contrary, it keeps decreasing, and from the elliptical, the womb tends more and more to take a spherical form, which contributes to the widening of the cervix uteri.

The cervix, in fact, loses more and more of its hardness,‡ its inferior orifice widens in a very perceptible manner, and we could easily introduce the extremity of the finger into it. It is also at this period that the body of the uterus enlarges, which increases the size of the woman, and adds much to her bulk; the touch or ballottement begins to lose its elasticity, the size of the head of the child no longer permitting it to be displaced with the same facility: but this circumstance only tends to render still more evident the pregnancy of which it serves to determine the advanced state.

During the whole eight months, and, above all, towards the end, the fundus of the uterus

* See fig. 2, Table IV.

† See our Remarks, Plate IV, fig. 2.

‡ Vide Table V, fig. 2.

occupies the greater part of the epigastric region, its bulk is considerably enlarged, and its shape becomes more and more rounded and spherical.

The umbilicus is distended and swollen, the neck loses more and more of its length and of its hardness, it is become soft, swollen above all towards the anterior lip.*

The head of the child is large and heavy, the finger raises it with difficulty, and the ballottement can be no longer executed.

At the end of the ninth month, and consequently of pregnancy, the fundus of the uterus, far from rising more and more, as we might suppose, falls lower than it was at the end of the eighth month; we find it near the umbilical region. The cervix uteri is totally effaced, and it no longer presents itself but under the shape of a soft roll or cushion.

The head of the child becomes still larger and heavier, and, as it rests above the superior aperture of the pelvis, it is almost impossible to raise it by the touch or ballottement.

Such is the short sketch of the changes which operate in the form, figure, and size of the uterus, during the whole course of pregnancy.

Although we derive very considerable advantage from attending to the signs of the epochs of pregnancy which are afforded by the development of the uterus, yet none of them are *infallible* before the fifth or sixth month.

An accurate knowledge of the changes which take place in the neck and body of the uterus will, with a careful history of the symptoms, unable us to distinguish pregnancy from ovarian dropsy, tympanitis, moles, polypi, &c.

DESCRIPTION OF PLATE IV.

Fig. 1—Represents a profile view of the virgin female, to shew the form of the abdomen, breasts, &c. The chief points to be observed in this drawing are the form of the abdomen and breasts, and also the relative size and situation of the uterus. The line enclosing the letter A denotes the size and situation of the uterus, and the colored space marked B the course of the vagina.

The uterus is situated in the cavity of the pelvis, betwixt the bladder and rectum, below the small intestines, and above the vagina, in the direction of the axis of the superior strait of the pelvis, and forms nearly a right angle with the axis of the vagina. The os uteri points backwards and downwards, and its anterior lip is lower than the posterior; the direction however will vary a little, as the bladder or rectum may be full or empty.

* See fig. 4.

Fig. 1.

G. Spratt del.

Wagner & Mc Guigan li

Fig. 2—Represents the female in the third month of pregnancy. We are here to observe the increased size of the abdomen, breasts, and uterus, compared with fig. 1. A. The situation and dimensions of the uterus. B. The course of the vagina.

At the end of the third month, the fundus uteri is on a level with the superior margin of the pubis. About the end of the 4th month, the uterus rises to the hypogastrium, and the spontaneous motions of the fœtus are felt by the mother; but some women never perceive them during the whole period of pregnancy, and others imagine they feel the movements of the child when there is no conception.

At the end of the fifth month, the uterus touches the inferior boundary of the umbilical region, and the cervix uteri will, on examination, be found to be considerably shortened. (See fig. 2, Table V. in the Obstetric Tables.)

At this period, the most certain sign of pregnancy is afforded by the touch or ballottement and auscultation; the touch consists of the introduction of the finger into the vagina, and the application of the other hand above the pubis; the uterus will be felt enlarged, and, if a gentle percussion be applied above the pubis, the fœtus will be made to strike the finger, which cannot take place unless there be a fœtus and fluid in the uterus.

Fig. 3.—This figure represents the female at the full period of six months; the enlarged size of the abdomen and uterus, (marked A.) are very conspicuous; the breast is also more prominent, and the nipple elongated.

At this period of gestation, we may call to our assistance auscultation, to enable us to decide if our patient be pregnant. The application of the stethoscope to the abdomen has been considered by some* as one of the most infallible proofs. M. Le Jumeau de Kergaradic has applied the ear and stethoscope to the abdomen, and discovered the double motion of the fœtal heart, and also the pulsation of the placenta, which was synchronous with the maternal pulse.

Morgagni proposes the following plan for discovering the motion of the fœtus:—In warm weather, let the hand be immersed in cold water, and suddenly applied to the abdomen of the female; and, in cold weather, let the hand be immersed in warm water and applied, when the motions of the child will be distinctly felt. Dr. Ryan says, "I have often acted on these suggestions with success."†

At seven months, the abdomen affords a dull fluctuation, which differs

* Dr. Kennedy, of the Dublin Lying-in Hospital, has written in favor of it. Dr. Ferguson, of Dublin, thinks it an unequivocal proof: see Dub. Med. Trans. vol. i, 1830. Dr. Elliotson is in favor of it. M. Velpeau has tried it in a number of cases without success; and Dr. Negle, of Dublin, thinks it equivocal.

† Ryan's Manual of Midwifery, 3d edition, 1831.

from ascites; percussion affords a dull sound, which is distinguishable from tympanitis or meteorism. At the end of eight months, the uterus has risen to the epigastrium, the cervix nearly obliterated, round, gaping, thickened, and pointing to the cavity of the sacrum. The limbs of the child may generally be felt through the parietes of the abdomen.

Fig. 4.—Represents the female at the full period of gestation, (9 months). The uterus is now fully developed, the abdomen greatly distended, the cuticle, from the great distension, appears smooth and polished; the breast firm and full, and the nipple elongated; the umbilicus projecting, the cervix uteri is obliterated, and the orifice directed towards the sacrum.

Fig. 5.—On raising fig. 5, the full-grown fœtus is seen in utero, presenting in the natural position.

Fig. 1

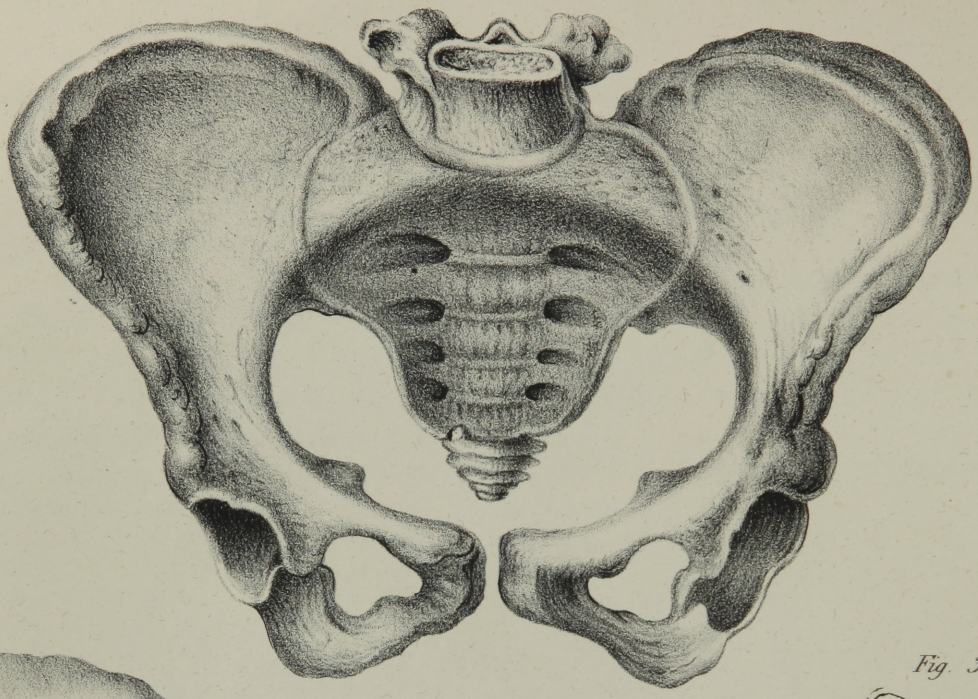

Fig. 2.

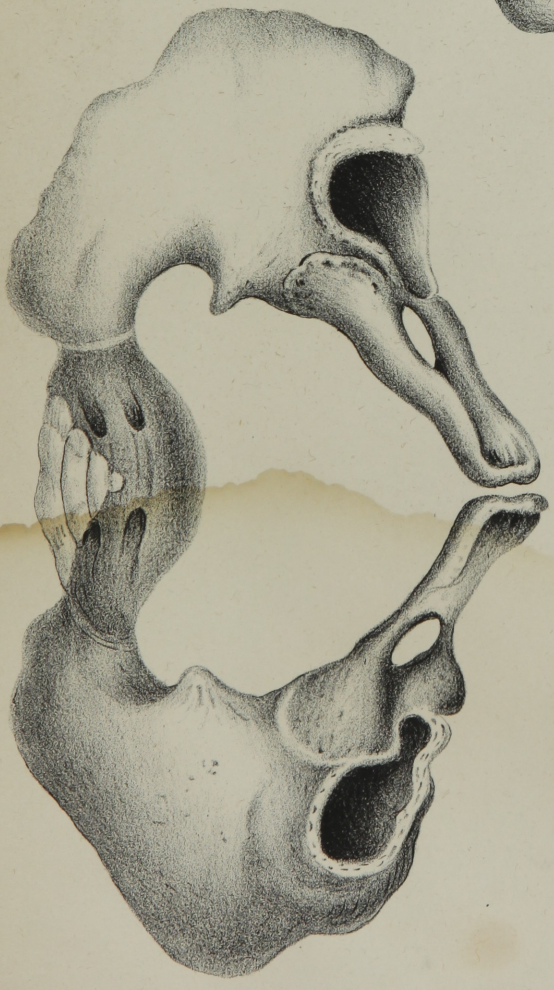

Fig. 3.

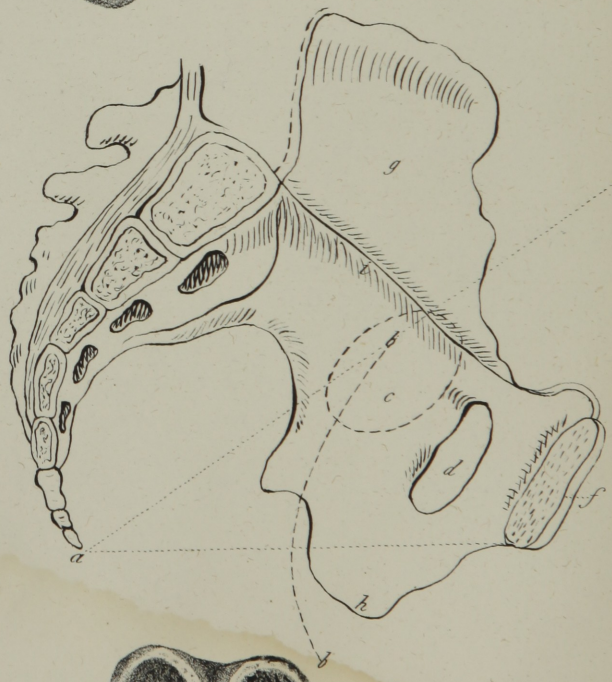

Fig. 4.

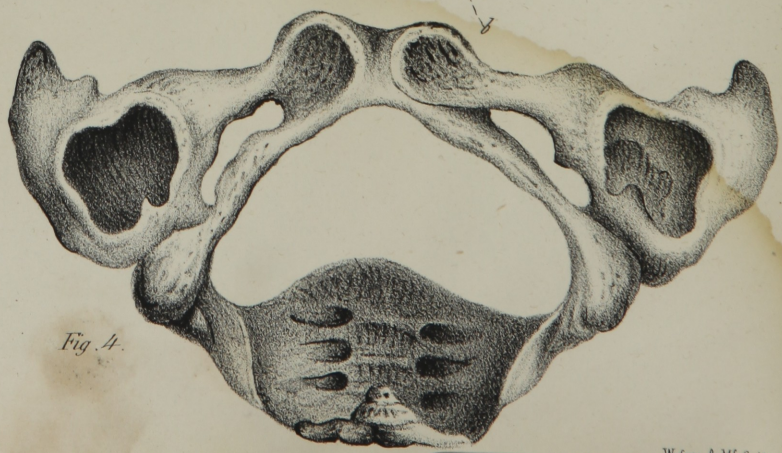

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TABLE I. B.

Fig. 1.—Front view of a perfect and well-formed female pelvis, the ligaments being *removed.*

The adult pelvis consists of four bones; viz. the two *ossa innominata*, the *os sacrum*, and the *os coccygis*. The *ossa innominata* forms the sides and front of the pelvis. The *os sacrum* the posterior part (the upper and projecting part of which is called its promontory). The *os coccygis* is the small bone at the apex or extremity of the sacrum, consisting of three or four irregularly shaped pieces, united to the *sacrum* by an intervening fibro-cartilage, admitting of considerable motion during parturition. This union of the os coccygis to the os sacrum allows the former to recede, in most women, nearly one inch, as the head of the child passes the outlet. The other bones of the pelvis are united by various ligaments and cartilages; and, there being no motion, the union is termed synarthrosis.

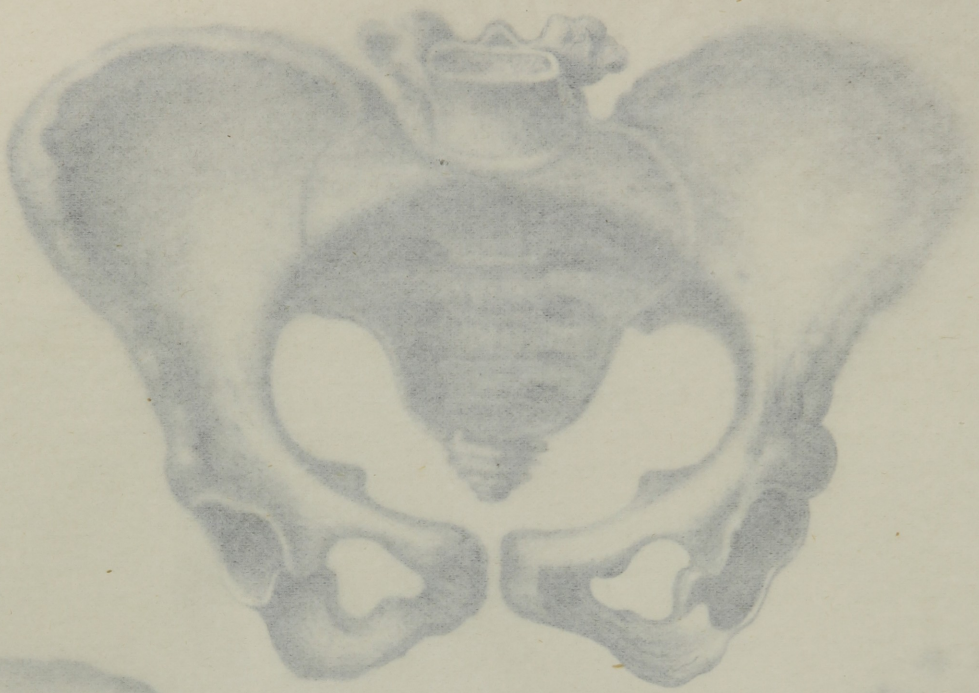
Fig. 2.—View of the same pelvis resting on the left ilium. (This view is intended to give a correct idea of the position of the pelvis, when a woman is lying in a recumbent posture on her left side.)

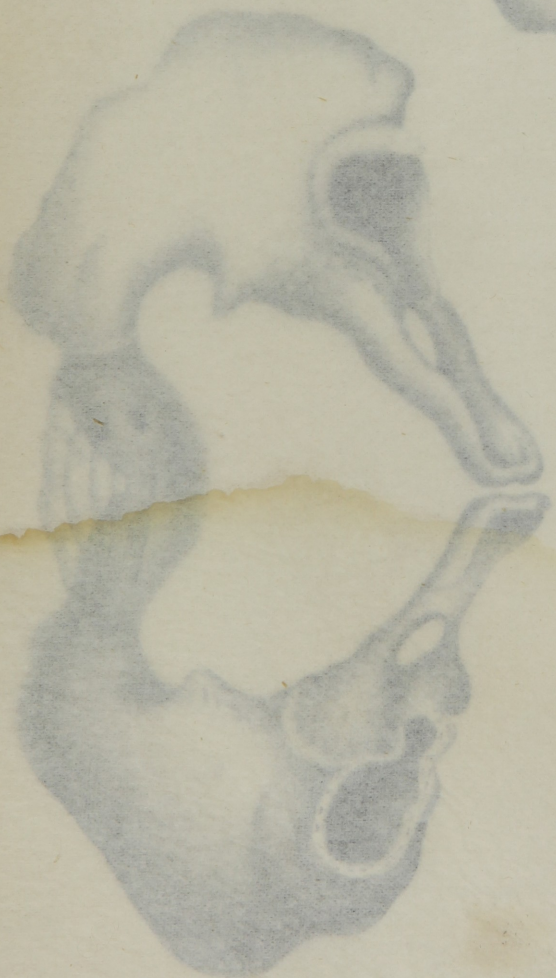
Fig. 3—Represents a section of the bones of the pelvis (the left side.) The dotted line from *a* to *a* shows the axis of the brim of the pelvis, the centre of which is where the dotted line crosses the line marked *i*. The curved dotted line, marked *b b*, denotes, at the point where it crosses the dotted line *c k*, the centre of the lower aperture. The dotted circle round the letter *c* shews the situation of the acetabulum; *d*, the foramen magnum; *e*, the bones of the sacrum and coccyx; *f*, the pubis; *g*, the ilium; *h*, the ischium.

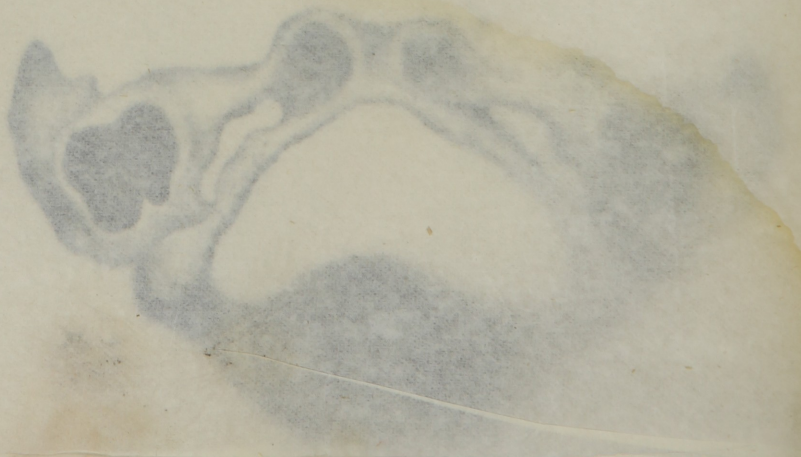
Fig. 4.—Horizontal view of the same pelvis. (This is intended to represent the position of the pelvis, when the female, in the act of parturition, is about to be delivered, when lying on her back.)

The above figures are about half the size of the natural pelvis, the drawings being made on the scale of four-eighths of an inch.

The bones of the pelvis claim the particular attention of the accoucheur, as, without a proper knowledge of them, no one can be a competent judge how to act in difficult cases, or







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The bones of the pelvis claim the particular attention of the accoucheur, as, without a proper knowledge of them, no one can be a competent judge how to act in difficult cases, or

under particular circumstances. The perfect pelvis varies in size in different women: from the rim, the depth varies in some of its parts. It is from four and a half to five or six inches behind, from the top of the sacrum down to the coccyx; from two and a half to three inches at the sides to the lower edge of the ischium; and one and a half to two inches deep at the symphysis pubis.

Three parts of the pelvis demand particular notice. The *brim* or superior aperture; the *outlet* or inferior aperture; and the *cavity*.

Each aperture of the pelvis has two diameters, a long and a short one: in the upper aperture, the long diameter is from side to side (about five inches and a half); the short diameter is from sacrum to pubis (about four and a quarter, or four and a half), but occasionally much wider. The lower aperture differs from the upper, in having the long diameter from the apex of the os coccygis to the pubis; the short diameter is from ischium to ischium.

The pelvis may be properly divided into two cavities or chambers, the upper and the lower. The axis of the upper chamber differs from the lower. The dotted line *a a*, *Fig.* 3, from the coccyx to the scrobiculus cordis (the part between the navel and pit of the stomach), represents the axis of the upper chamber, and shews the direction the forceps ought to take, when it becomes necessary to apply them, when only half the head of the child has entered the brim, and to draw downward and *backward*. But when the head gets lower down, so as to be chiefly in the lower chamber, the axis varies; the forceps will then take a different direction, and continue changing as the head of the child advances in the direction of the central curved dotted line *b b*, *Fig.* 3, when the action of the forceps will be downward and *forward*. In all manual operations, the direction of the axis of the pelvis at its different parts must be accurately observed. "Even in bringing the fœtal body through the pelvis, the course of the axis must not be forgotten, more especially if the pelvis be contracted."*

It must be remembered, however, that the cavity of the pelvis is considerably diminished by its teguments and contents. Correspondent, however, to this diminution of the cavity of the pelvis, the head of the full-grown fœtus measures but three inches and a half from ear to ear (the short diameter of the fœtal head), and four and a quarter from the fore to the hind head (the long diameter). These dimensions, however, it must be recollected, differ both with regard to the pelvis and the fœtal head, and are frequently the cause of lingering labors.

* Dr. Blundell's Lectures.

Fig. 1 & 2.

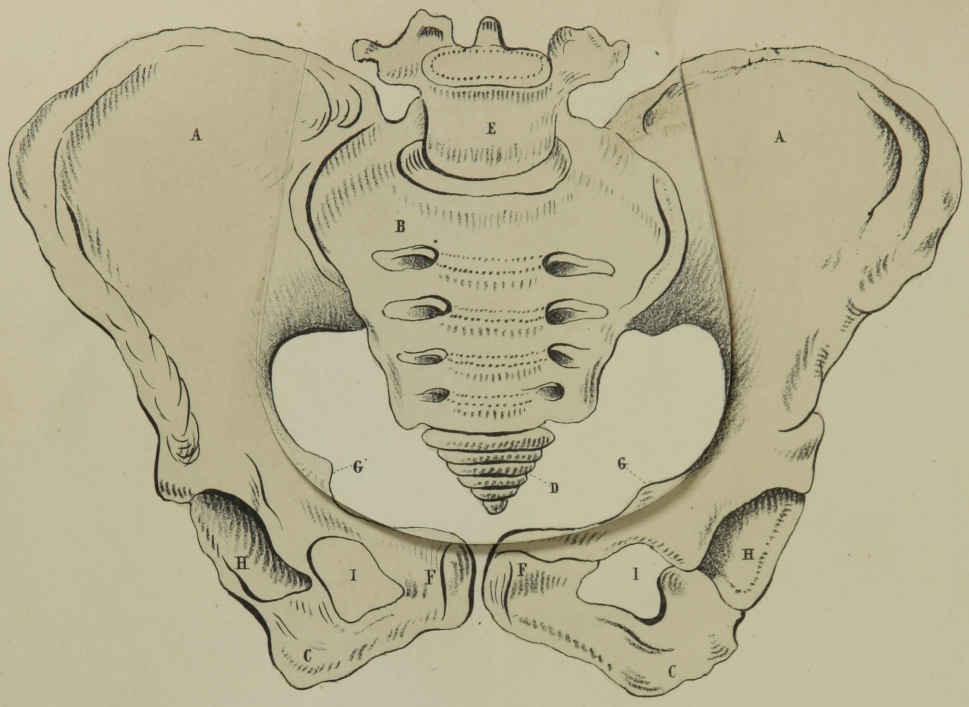


Fig. 5.

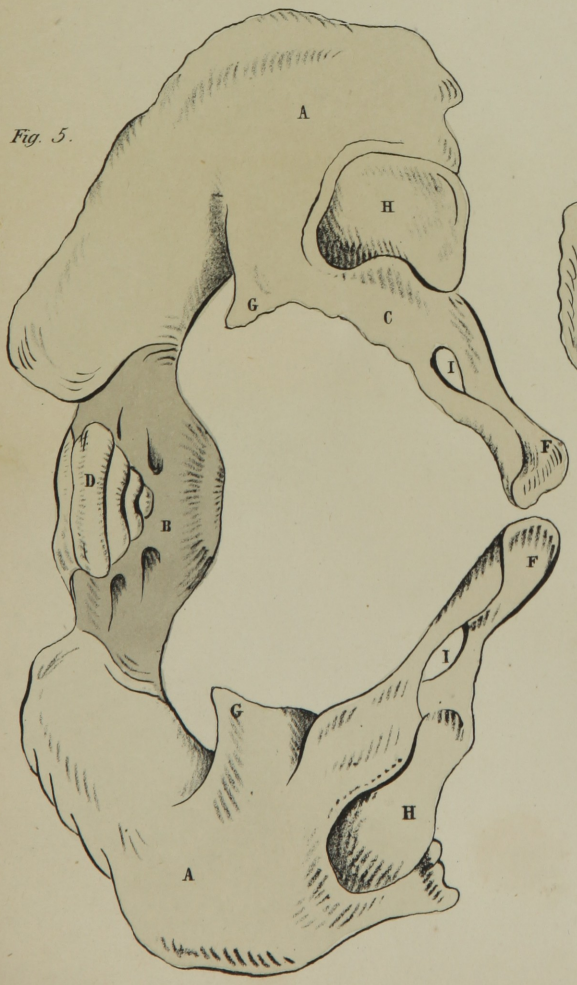
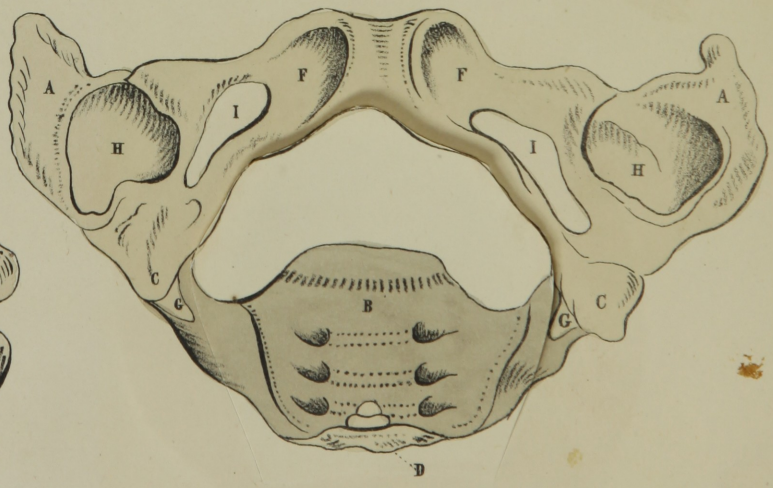


Fig. 3 & 4



G. Spratt del.

Wagner & M.c Guigan lith.

TABLE II. B.

Fig. 1—Represents lines of *Fig.* 1 in the preceding Tables; *a a*, ossa ilii; *b*, os sacrum; *c c*, ossa ischii; *d*, os coccygis; *e*, the lowermost vertebræ lumborum; *f f*, ossa pubes; *g g*, spinous processes of the ossa ischii; *h h*, acetabula; *i i*, foramen magnum.

Fig. 2—Represents the head of the fœtus, in the first position, passing diagonally through the brim of the pelvis. On raising *Fig.* 2, the fœtal head is seen presenting in the third position.*

In an ordinary labor, the head of the child presenting, the vertex lies over the centre of the pelvis; in the commencement of the process the face lies to one side of the pelvis, and the occiput to the other side; hence the long diameter of the head corresponds with the long diameter of the pelvis (Fig. 1.); in this position, should there be no disproportion betwixt the head and the brim of the pelvis, the head very readily descends; sometimes, however, the head of the child is placed with the *face* towards the *pubes*, and then the *long diameter* of the head is opposed to the *short diameter* of the brim or superior aperture (Fig. 2), and consequently the head passes with great difficulty. If the head be large and the pelvis small, it cannot pass, and it may be required to open the head. (See Tab. VII. B.)

The head of the infant commonly passes into the cavity of the pelvis before the position is correctly ascertained; the obstetricians who are well acquainted with the anatomy of the parts, and the divisions of the infant's head (sutures and fontanelles), will often be able to distinguish the direction of the head early in labor. When the head has passed through the rim of the pelvis, there is more space between the forehead and the pelvis than between the occiput and the pelvis; the occiput being so prominent, a finger cannot pass between it and the pelvis. Should the head enter the pelvis with the forehead to one side, and the occiput to the other, instead of coming diagonally (see the third position of the head in this drawing), it may lodge before the spines of the ischia: there will then be considerable space between the side of the head and the symphysis pubis. By feeling the ear nearly opposite the symphysis pubis, and observing on which side the cartilage of the ear is, it will be known where the occiput lies. This mal-position may sometimes be changed to the diagonal direction, by the application of two fingers on the temples, pressing the head a little upwards, and the face round towards the sacrum†: should this not succeed, it may be requisite to employ the forceps.

* Mayrgnac, D. Davis, &c. &c. † Smellie, Clark, Conquest, Hughes, and others.

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† Smellie, Clark, Conquest, Hogben, and others.

Fig. 3.—Outline of *Fig.* 4 in Table I.; *a a*, ossa ilii; *b*, os sacrum; *c c*, ossa ischii; *d*, os coccygis; *e*, the lowermost vertebræ lumborum; *f f*, ossa pubes; *g g*, spinous processes of the ossa ischii; *h h*, acetabula; *i i*, foramen magnum.

Fig. 4—Represents the head of the fœtus passing through the lower aperture or outlet of the pelvis. The vertex towards the pubes and the face lying towards the hollow of the sacrum.

Towards the end of the second stage of labor, and when the occiput is about to emerge from under the arch of the pubis, and begins to protrude through the *os externum*, the accoucheur should place his hand, covered by a soft napkin, in such a manner as to afford a regular and equal support to the perinæum, and guard it from laceration. The head must be prevented from passing over the perinæum until it has acquired sufficient dilatability; nor must it be allowed to pass *suddenly* over it, even when it is considerably relaxed, or laceration may take place.

Fig. 5.—Outlines of *Fig.* 2, Table I.; *a a*, ossa ilii; *b*, os sacrum; *c c*, ossa ischii; *d*, os coccygis; *e*, the lowermost vertebræ lumborum; *f f*, ossa pubes; *g g*, spinous processes of the ossa ischii; *h h*, acetabula; *i i*, foramen magnum.

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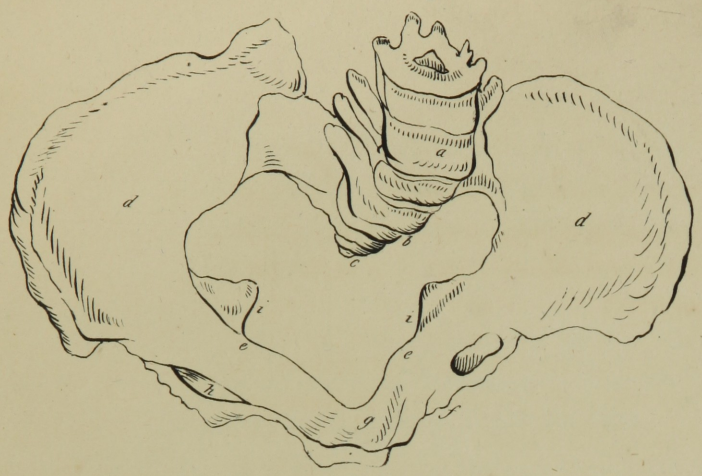

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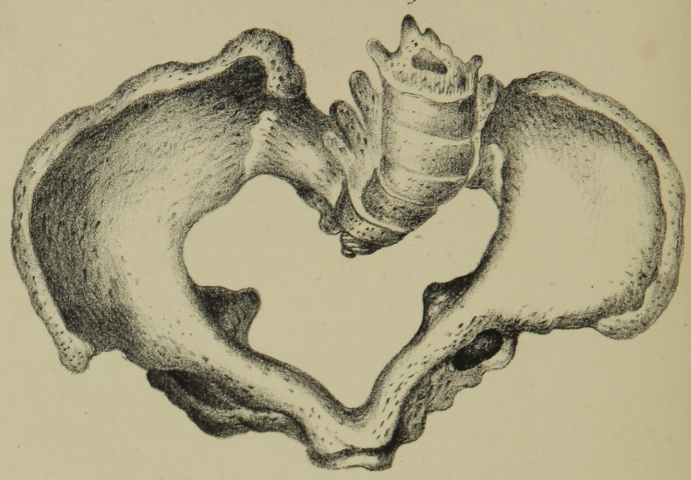


Fig. 4.

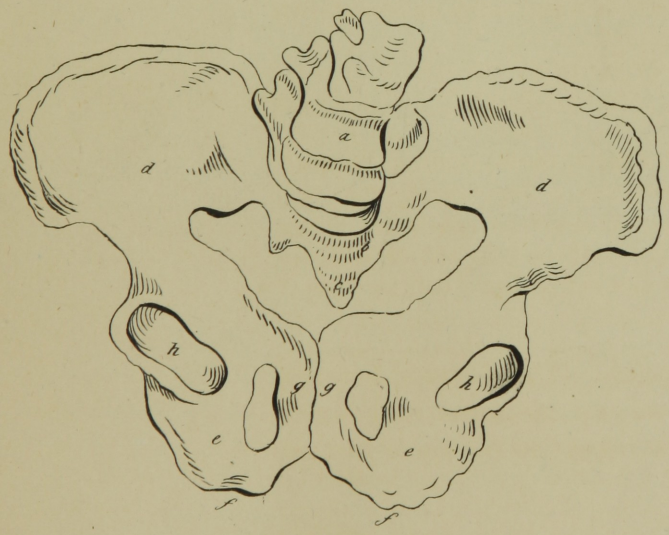


Fig. 3.

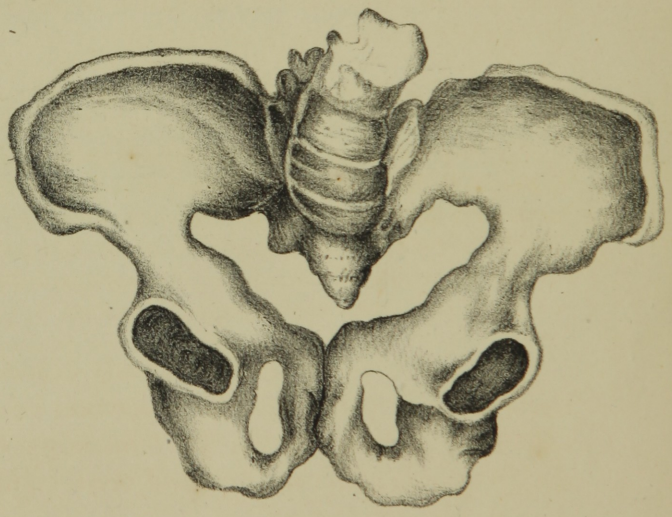
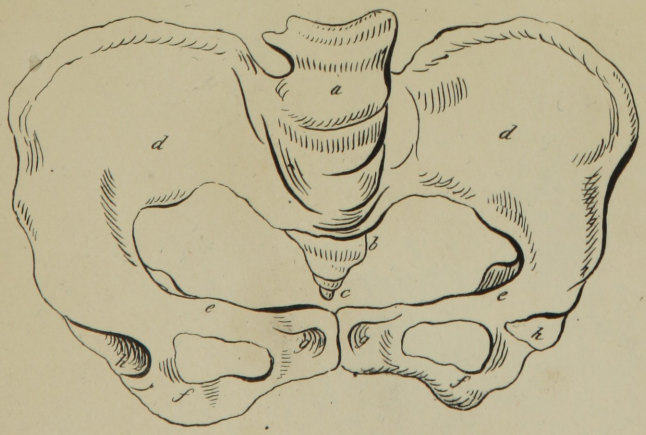


Fig. 6.



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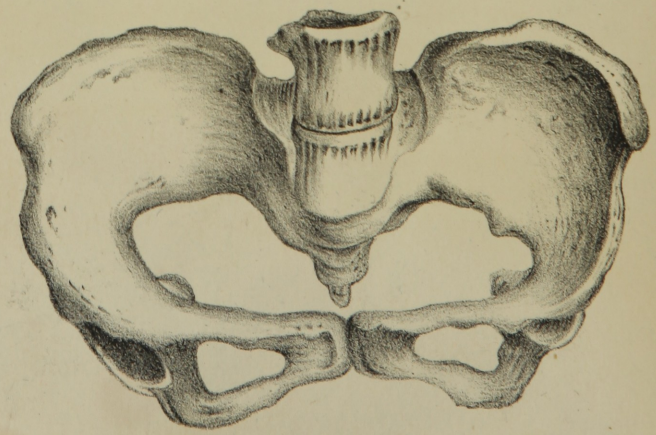


TABLE III. B.

Fig. 1.—Front view of the pelvis somewhat distorted. When the distortion of the bones is not more than in the pelvis here represented, and the head of the child of a moderate size, it may pass by the natural efforts; but if not, the forceps or vectis (if judiciously applied) may succeed.

Fig. 2.—Outlines of the same pelvis; *a a a a*, the lowermost vertebra; *b*, the sacrum; *c*, coccygis; *d d*, ilium; *e e*, ischium; *f f*, tuberosity of ischium; *g*, pubis; *h h*, acetabulum; *i i*, spinous process of ischium.

Fig. 3.—A very remarkable distorted pelvis, occasioned by the disease termed *mollities ossium*. The distance from the most projecting part of the spine to the part where the pubes and ilium unite, measured on the left side only one inch and three-eighths, on the right side one inch. From the internal point of the os pubis on the right side to the centre of the vertebræ one inch and three-eighths, on the left side one inch and a half.

Fig. 4.—Outlines of the same pelvis.

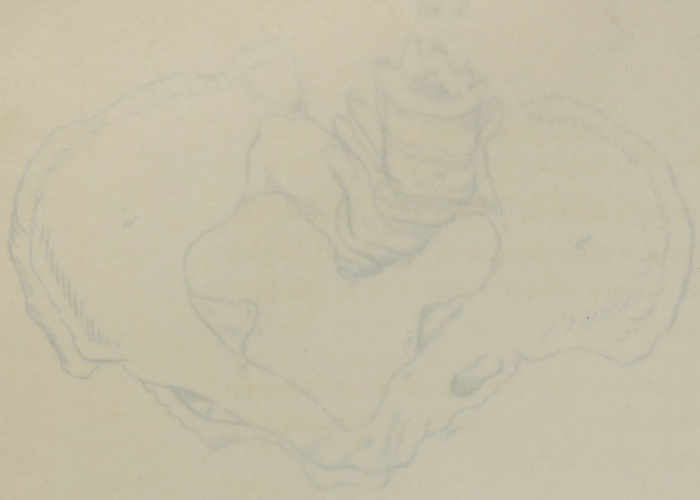
The Cæsarean section was performed by the late Mr. Hunter, on the body of Elizabeth Foster, aged thirty-six, from whose pelvis this drawing was taken. She expired twenty-six hours after the operation; the child was preserved alive. This woman had borne several children previous to her being affected with this disease (*mollities ossium*). At the time she married she was perfectly straight, and measured five feet four inches high; but, previous to her death, her stature was diminished one foot.

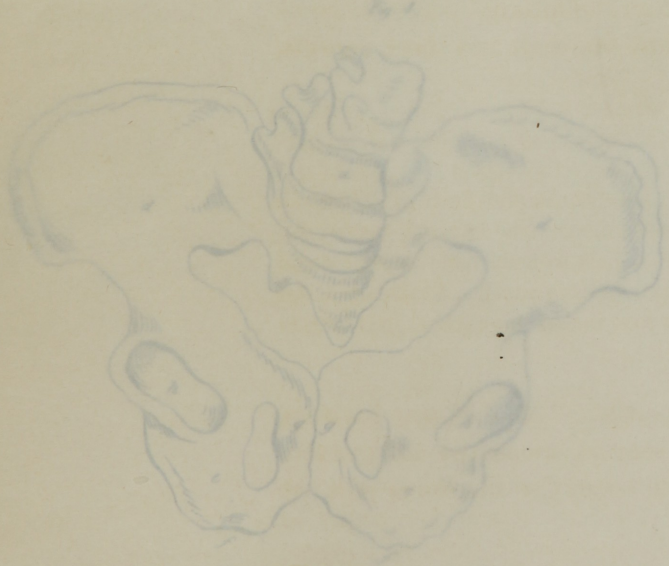
Fig. 5.—View of another greatly distorted pelvis. The distance between the symphysis pubis and the projection of the sacrum measured only seven-eighths of an inch. From the termination of the coccyx to the lower part of the symphysis pubis one inch and seven-eighths.

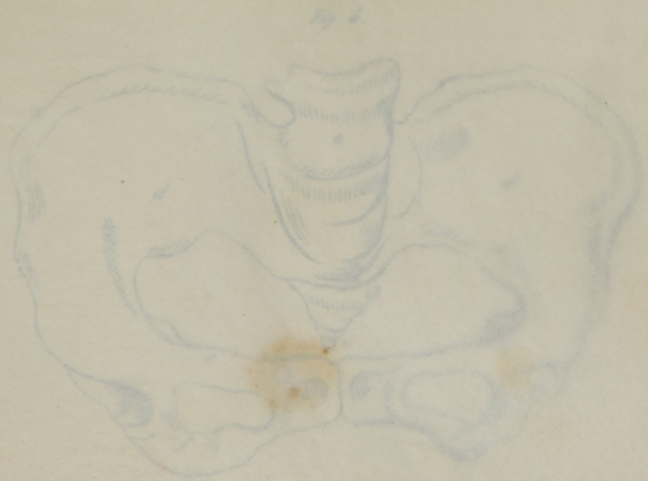
This drawing was from a model of the pelvis taken out of the body of Mary Rhodes, aged twenty-three years, on whom the Cæsarean operation had been performed by Mr. Thompson, of the London Hospital, October 21, 1769. She expired five hours after the operation. This pelvis is not deformed like that of Elizabeth Foster's, nor from the same cause; Mary Rhodes' was much deformed by rickets, being only four feet four inches high, her back very hollow, her hips narrow, and lower extremities crooked.

Fig. 6.—Outlines of the same pelvis.

Contraction or distortion of the pelvis occurs in every variety of degree; the slighter contractions not unfrequently occasion protracted labours of various duration; but the higher degree of contraction, requiring the use of the perforator, are fortunately rare.







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These drawings of distorted pelves were made from casts (from the original skeletons) on the scale of one-third. By comparing these with the perfect pelvis, Table I. (which is made on the scale of four-eighths to the inch), the degree and peculiarity of the distortion will be readily discerned.

The female pelvis is much more susceptible of injuries from pressures than the male; the former being wider and more shallow in its cavity, and the bones more slender, to render it conducive to the easy passage of the infant. A distorted female pelvis is liable to be attended with most alarming consequences. There are two general causes for diseased bones in children: the one, and to which children very early are liable, is *rachites* (or rickets); the other, termed *mollities ossium* (a softness of the bones), a malady which may occur at any period of life. From either of these causes the pelvis is liable to become deformed. If the vertebral column become deformed after a person attains the age of puberty, without any appearance of the disease, *mollities ossium*, that is no proof of the pelvis being deformed. But, where the lower extremities are deformed, the pelvis is ever to be suspected of being deformed also; and, in women whose stature does not much exceed three feet, there can be but little doubt that the pelvis is deformed.

There is no great difficulty in determining the dimensions of the pelvis by the fingers in the vagina; but not so readily the size of the child's head in the uterus.*

To ascertain the distortion between the front and the back of the pelvis, let the fore-finger be placed on the promontory of the sacrum, and the rest of the fingers at the arch of the pubes, which will give the distance. To measure the brim from side to side, introduce all the fingers close together, and then, spreading them from one side to the other, the degree of distortion may be ascertained; or all the fingers may be applied to the back of the symphysis pubis. If there be want of room behind the pubis, you will then feel something of an angle there. If the brim be of full measure from side to side, when all the fingers are introduced and placed behind the symphysis, they will all of them lie in the same place.

To measure the outlet of the pelvis from before backwards, place the fingers so that the root of the index one lies against the arch of the pubes, and the tip of it upon the coccyx. Thus ascertaining the measure between the front and back, and by laying all the four fingers into the arch of the pubes, the distance from side to side may be known.†

Those contractions which create the most frequent difficulties, and which at the bed-side, are found the most frequently to require the use of instruments, are almost invariably found at the brim of the pelvis; therefore, whenever it is suspected that there is such a degree of distortion as may require the use of the forceps, lever, or perforater, the brim is the part of that pelvis which should be first and most carefully examined. When contractions occur at the brim, they are found almost *invariably between* the pubis and sacrum. The contractions lying at the brim are sometimes placed between one and the other side, where they rarely require the use of instruments.

When the pelvis is known to be distorted to a considerable degree, so that an infant at its full time would endanger the life of the mother, and certainly could not be born alive, under such circumstances it may be advisable to attempt premature delivery at about the seventh or eighth month, as at that age it may be possible for the infant to pass, be born alive, and reared to maturity.

* Foreign practitioners have invented a variety of different instruments, called *pelvemiters* for measuring the dimensions of the pelvis; but British obstetricians consider them useless.

† Blundell's Lectures.

Fig. 1.

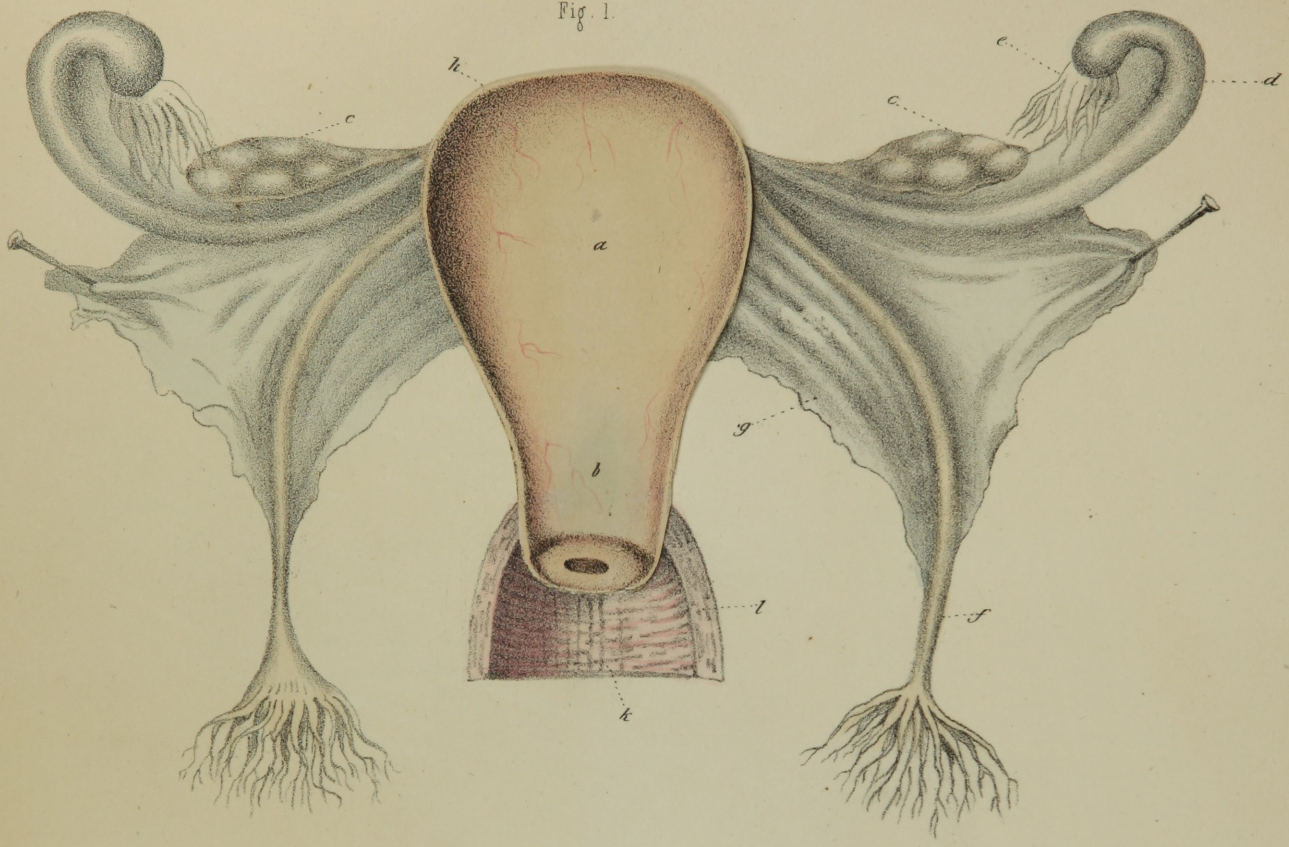
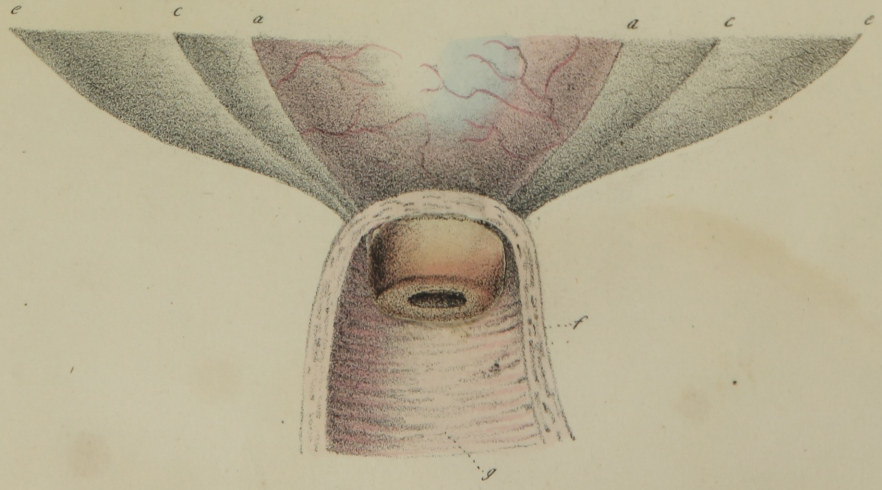


Fig. 2.



G. Spratt del.

Wagner & Mc Guigan lith.

TABLE IV. B.

Fig. 1—Represents (of the natural size) a front view of the unimpregnated uterus and its appendages, with a section of the upper part of the vagina, the anterior part of which is removed to shew the collum uteri suspended in it. *a*, the corpus (or body); *b*, the cervix (or neck); these being raised show the cavity of the uterus *i*; the dotted part *h* represents a section of the body, fundus, and neck of the uterus; *c*, the ovaries on each side; *d*, the Fallopian tubes; *e*, the fimbriæ; *f*, the round ligaments; *g*, the broad ligaments. The ovaries, Fallopian tubes, &c. are raised a little out of their natural situation in order to display them the better. *k*, the cavity of the vagina; *l*, the cut edge of the substance of the vagina.

Fig. 2.—This figure represents the upper portion of the vagina, and the lower part of the body of the uterus and cervix uteri, the anterior part of the vagina being removed to show the cervix uteri, as shortened by pregnancy, about the length it commonly appears at the third or fourth month of gestation. *a a* shows the lower part of the body of the uterus as it is stretched at the same period. By comparing this figure with the unimpregnated uterus, *Fig.* 1, the alteration in the form of the parts will be readily perceived. *Fig. b* shows the cervix uteri at about the sixth month of pregnancy; and *c c*, the body of the uterus at the same period; *Fig. d*, the cervix uteri at the full term of gestation; and *e e*, the uterus, stretched at the same period, which shows that the cervix uteri becomes nearly obliterated at the end of pregnancy.

Considerable allowance, however, must be made in our calculations for the difference in the length of the cervix uteri in different women. In general, if the neck of the uterus be only half its usual length (the cervix uteri in the unimpregnated uterus being somewhat more than an inch in length), we may judge the woman to be between five and six months advanced in her pregnancy; if three-quarters gone, between seven and eight months. At

* A Description of the Uterus and its Appendages is given in Table III, illustrating the female organs of generation.

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this period, the uterus leaning forward over the pubes, the neck is thrown back towards the sacrum, and renders it difficult to reach the os tincæ with the finger.

The mode of ascertaining pregnancy, by examination per vaginam, by those who have habituated themselves, may sometimes be pretty correct; but the prudent accoucheur will be cautious in giving his opinion until about the fourth or fifth month.*

To examine well, it is necessary to carry the fingers very far into the pelvis: to do this, the finger must be placed in the front of the pelvis where the bones are shallow, and not on the back and sides where the pelvis is deep.

It may happen that the uterus may become enlarged by disease, in which case, unless particular symptoms are attended to and minutely investigated, the accoucheur will be mistaken in his prognostic.

The os tincæ in the virgin state appears like a crevice or cleft going from side to side, and closed; but in those who have had children it is circular, somewhat like a funnel with the large end downwards, into which the point of the finger may be introduced a little way. When the uterus is unimpregnated, the division between the neck and fundus cannot be distinguished, because it forms so very obtuse an angle; but, if the womb be impregnated, the fundus will be enlarged to the size of an orange at the end of three months. (See *Fig.* 1, *a a.*) The best way of examining will therefore be, before you carry the finger to the os uteri, to pass it up the side of the vagina (to the upper part), and feel for the fundus.

* Vide Denman's Introduction, &c. p. 202.

Fig. 1.

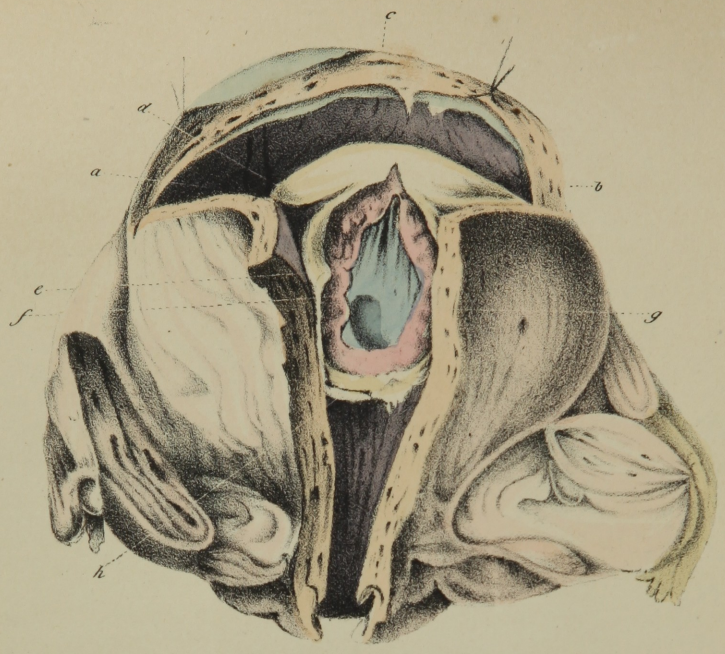

Fig. 3.

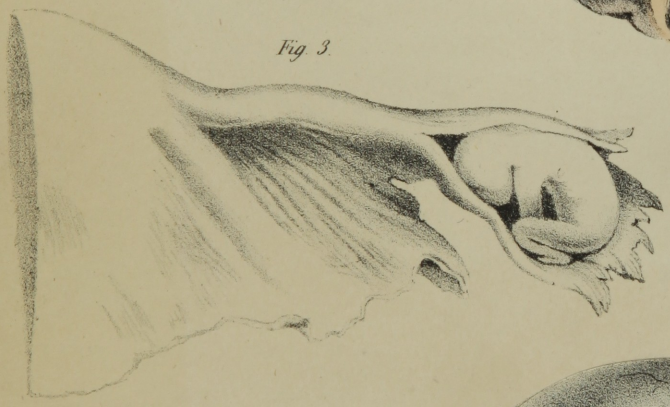

Fig. 4.

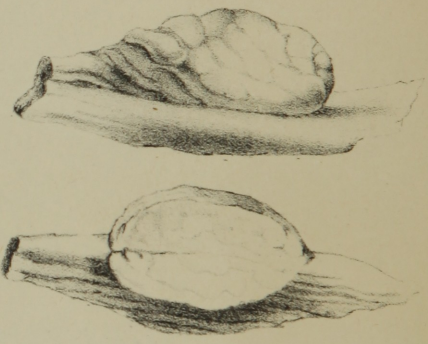

Fig. 5.

Fig. 2.

G. Spratt del.

Wagner & Mc Guigan lith.

TABLE V.

Fig. 1.—Represents the back of the uterus and its appendages in the second month of utero-gestation, with a longitudinal incision down the posterior surface, crossed by a transverse one parallel to the entry of the Fallopian tubes, to shew the ovum. *a*, the right Fallopian tube; *b*, the left ditto; *c*, the decidua uteri, or decidua vera; *d*, the decidua reflexa, or ovuli, covering the unattached part of the ovum; *e*, the decidua vera, or uteri, passing down between the ovum and uterus; *f*, the chorion; *g*, the amnion; *h*, the decidua lying between the chorion and decidua which crossed the cervix uteri. This drawing is half the size of nature; for which, and the following description, we are indebted to Dr. Robert Lee, who kindly permitted us to copy his drawing, illustrating his remarks on the structure and formation of the human ovum, published in the 17th vol. of the Medico-Chirurgical Transactions.

"Intervening between the superior and unattached surface of the ovum and fundus uteri was a broad but shallow cavity, measuring three inches in the lateral, and one inch and a half in the antero-posterior diameter, and from one to two lines in depth. The upper concave surface of the cavity, formed by the decidua lining the fundus uteri or decidua vera, was smooth and slightly convoluted. The inferior convex surface, formed by the decidua covering the ovum or decidua reflexa, was perfectly smooth, resembling the external serous surface of the uterus. Into this cavity the Fallopian tubes freely opened by patulous orifices; that on the left side, by which the ovum had entered the uterus, being rather more than a line in diameter, that in the right rather less. The cavity thus formed between the decidua lining the fundus uteri and the decidua covering the upper and unattached portion of the ovum was filled with a red-coloured serous fluid."

Fig. 2.—This figure is half the size of nature, and represents the back of an impregnated uterus, with a section of its body, to shew the fœtus between the third and fourth month of gestation.* The child is seen through the

* [illegible] the uterus is liable to that displacement called retroversio uteri, which is most frequently occasioned by over distention of the bladder. The treatment of this disease consists chiefly in the regular employment of the catheter; the bladder must be emptied twice or thrice every twelve hours, until the uterus by its growth rises above the pelvis.

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transparent membranes; the decidua reflexa, covering the transparent membrane, is represented by the opaque and white striæ. The blue vessels represent a convoluted vein, and the red convoluted arteries. *a*, the body of the uterus; *b*, the neck; *c*, the ovaries; *d*, the tubes; *e*, part of the broad ligaments; *f*, part of the round ligament. The vagina is represented cut open, to shew the neck of the womb, &c. *g*, the upper part of the vagina, which is smooth and less rugous than the fore part; *h*, the orifice of the urethra; *i i*, the nymphæ; *k*, the clitoris.

Fig. 3—Represents a section of the uterus and ligaments, with the right Fallopian tube containing an extra-uterine conception.

Extra-uterine conceptions are mysterious deviations from the ordinary course of nature: no rational cause has yet been assigned for these occasional deviations. In most of these cases, the woman has sunk from the constitutional disturbance; in others, after many years, an abscess has been formed, and bursting externally through some part of the abdomen, or internally into the large intestines, through which the various bones of the infant have been expelled. The uterus always becomes more or less developed, and secretes its decidua, during extra-uterine conception; and the usual evidences of pregnancy are present.

Fig. 4—Represents an isolated ovarium.

Fig. 5.—A section of an ovarium, in which is seen the vesiculæ Graafianæ, which contains the ovum or germ.

TABLE VI.

Fig. 1—Represents a section of the left side of the female pelvis, with its contents, the upper portion of the left thigh, nates, &c. The uterus at the full period of gestation before labor has commenced, the os tincæ not dilated, the finger in the vagina in the act of an examination. *a*, the left thigh; *b*, the cut edge of the uterus; *c*, the vagina; *d*, section of the abdominal muscles, &c.; *e*, the rectum; *f*, the perinæum; *g*, the bladder; *h*, section of the pubis; *i*, *k*, section of the lower lumbar vertebra, sacrum, and coccygis.

TABLE VI.

C. Spratt del.

Wagner & Mc Guigan lith.

When the finger is introduced through the os externum into the vagina, it should be passed upward and backward to feel for the os uteri, which, at the commencement of labor, will usually be found high up, and pointing backward (towards the sacrum); the touch of the finger will discover if the os tincæ be open, and how much, and if the membranes be pressing down and distending it. The os uteri will in some instances be somewhat relaxed and open for several days, or perhaps weeks, previous to the accession of labor; hence a slight dilatation of the os uteri is no proof that labor has commenced. If the os uteri be closed (as here represented), and some length of the cervix remain, labor cannot have commenced, although the woman may have pains periodical in their return. These are denominated false pains.* But if there should be *pressure* upon, or *dilatation* of the os uteri during the continuance of the pain, we may be persuaded labor has commenced. When the pain is off, carry the finger upwards and towards the symphysis pubis, when the head of the child, if presenting, may generally be perceived by the resistance made to the point of the fingers.

In some instances the os uteri is displaced and tilted backward towards the sacrum, so that it cannot be reached by the finger in the early part of labor. This situation of the os uteri occasions some embarrassment to young practitioners, who, upon a first examination, imagine the pelvis filled up by the head of the child, and hence anticipate a speedy delivery; but, after the lapse of many hours, another and more accurate examination discovers the os uteri scarcely within reach (projecting towards the sacrum), and very little dilated. Labor, rendered tedious by this circumstance, requires only time and patience.

Fig. 2—Represents the same parts, with the os uteri considerably dilated in the time of a pain, the membranes containing the waters protruding, with the index and middle finger of the left hand in the vagina.

When the os uteri lies very high up in the vagina, we have found it more readily reached by the middle finger of the left hand than by the index of the right.

When the os uteri is dilated to about one inch in diameter, the head presenting, the parts well formed, and the woman having had children, the labor may be considered in some forwardness, provided the pains be considerable. But should the membranes be ruptured at this period, either accidentally or intentionally, the labor would be protracted, and probably rendered very tedious, particularly if the os uteri should be disposed to be rigid. Hence, in making an examination, care should be taken not to press forcibly upon the membranes during the continuance of a pain.†

We are told by Dr. Merriman, "It may be safely laid down as a rule (which will admit of very few exceptions), that the membranes should *not* be artificially ruptured, 1, while the head of the *fœtus*, or a large portion of it, is above the brim of the pelvis; 2, while the *os uteri* is undilated, or in a state of rigidity; 3, while the *perinæum* is thick and firm, or rigid."‡

Fig. 3—Represents the same section of the parts, with a view of the os uteri fully dilated, the membranes (containing the waters) protruding.

* Denman's Introduction to Midwifery, sec. iv, p. 276. † Ibid. p. 282.

‡ Vide Synopsis of Difficult Parturition.

When the os uteri is fully dilated (as here represented), the membranes usually break spontaneously. Should the presenting part of the child not have been previously ascertained, it is no proof against its being a natural labor; but should not the head or other part of the child be discovered by the finger after a pain or two (the membranes being ruptured), it will be justifiable to introduce the hand into the uterus to ascertain the presentation, and then to act according to the circumstances of the case.

Fig. 4—Represents the same section of the parts, with the left side of the uterus removed to show the child in the act of parturition at the termination of nine months' gestation. The head is represented here as advanced into the brim of the pelvis diagonally, with one ear inclined towards the right groin, and the other towards the junction of the sacrum and ilium, the most favorable position for its passing through the upper chamber of the pelvis, the long axis of the head being in the direction of the long axis of the pelvis. On turning down the section of this figure, marked A, the farther advancement of the head towards delivery is delineated.

Fig. B, C, D, and E, illustrate the various turns of the fœtal head after its entrance into the lower chamber of the pelvis, to its complete liberation from the os externum; the dotted lines shewing the axis of the pelvis and vagina.

When the head presses on and distends the perinæum, as in *Fig.* C, then it will be necessary to apply the hand close over the perinæum, to support it, and to check the advancement of the head when the forcing is very great, until the perinæum is sufficiently stretched for the head to pass without its causing laceration. Laceration more frequently occurs from want of due caution in supporting the perinæum at this period of labor, than from any other cause. The head being liberated from the os externum (*Fig.* D), ought not to be hastily dragged farther, but suffered to remain for another pain or two, which will generally be sufficient to expel the shoulders and body. When the head only is delivered, and the action of the uterus returns, care must be taken to support the head as it advances, and to direct it upwards to the abdomen of the mother (*Fig.* E), so that it may have a curve, accommodating to the direction of the vagina, and illustrated by the dotted lines.

To ascertain, from the commencement of the natural labor, how long it may continue before the child is delivered (even in those who have had children, and the pelvis well-formed,) must in a great measure be uncertain, as much will depend upon the degree of ossification of the cranium and on the size of the child; perhaps, in the general run, it may be calculated that, from the time of the commencement of the pain till the membranes break, eight hours may elapse; after which, if the head pass immediately into the upper chamber of the pelvis, the pains being strong, the vagina and the os externum properly relaxed, the child will be delivered in one hour, or sooner; but if the head be very large, it may be two, three, four, or more hours; and when the child is small, it may be born two or three pains after the membranes rupture. In cases of a first child, it seldom happens that it is delivered in less than twelve hours, even if the child be small.

Generally, in fifteen or thirty minutes from the expulsion of the child, the woman complains of a slight pain in her back and abdomen; and this secondary contraction of the uterus detaches the placenta, and usually expels it through the passages.

Sometimes the placenta is retained beyond the usual period for its expulsion. 1st, from inaction or insufficient action of the uterus. 2dly, by the irregular action of the uterus. 3dly, by the adhesion of the placenta to the uterus. Though the placenta be retained after the birth of the child, if there be no hemorrhage or other untoward symptom to demand immediate interference, we are to wait in expectation of the uterus acting. Should the placenta be retained in utero, in consequence of insufficient power, on an external examination of the abdomen, instead of communicating to the hand the sensation of a hard ball, just above the symphysis pubis, it will be found large and loose, occupying a considerable part of the cavity of the abdomen; the management of this case is to produce uterine contraction; and it is to be accomplished by external and internal means; the former is by the steady employment of pressure on the abdomen with a bandage, or by grasping the uterus within the palm of the hand, briskly rubbing the uterine region and loins, or dashing the abdomen with cold water. The internal means to be employed are introducing the hand within the cavity, and gently moving the fingers until the contractile power of the uterus returns and expels the hand and placenta; cold water may also be injected. For the management of the placenta, when detained from irregular contraction or adhesion, see Table v. B.

Labors rendered difficult or protracted from defective parturient Power or preternatural Resistance.

Any circumstance debilitating the constitution or the uterus will produce feeble or irregular uterine action. When parturition is protracted from this cause, the powers of the system must be supported by nutritious diet; no voluntary exertion or forcible straining should be permitted. Uterine action may be increased, by friction of the abdomen and loins steadily employed, and moderate pressure on the abdomen, and a mild tepid enema. Opium is a very efficient remedy, and may be given either by the mouth or rectum, to the extent of twenty minims, so as to procure sleep and suppress the irregular action of the uterus, that on their recurrence it may act with greater energy. The ergot of rye has been given with great advantage in these and other cases dependent upon an enfeebled condition of the uterus.*

* The ergot may be advantageously given under the following circumstances. When the child has descended into the pelvis, the parts dilated are relaxed, the pains having ceased, or being too ineffectual to advance the labor, there is danger to be apprehended from delay, from hemorrhage, or other alarming symptoms:

When the pains are transferred from the uterus to other parts of the body, or to the whole muscular system, producing puerperal convulsions:

When the placenta is detained from a deficiency of contraction, when local discharges or hemorrhages are too profuse immediately after delivery, and the uterus continues dilated and relaxed without any ability to contract:

In patients liable to hemorrhage immediately after delivery, in such cases, the ergot may be given as a preventive, a few minutes before the termination of the labor. When, in the early stages of pregnancy, abortion becomes inevitable, accompanied with profuse hemorrhage and feeble uterine contractions:

When judiciously administered under the above circumstances, the ergot is very efficacious, being

If plethora, as indicated by the force or frequency of the circulation, produces this irregular and feeble action, the detraction of a few ounces of blood will accelerate the labor. Rigidity of the os and cervix utere is another cause of very lingering labor; time will usually terminate these; yet abstraction of blood, regulated by the powers of the constitution, freely opening the bowels by an aperient exhibited by the mouth, and an emollient glyster, will materially accelerate the dilatation. After which, one or two drachms of tincture of opium, with a few ounces of tepid water or gruel, may be thrown into the rectum. A drachm or two of the extract of belladonna gently rubbed on the os uteri will often speedily relax the rigid condition of it. All stimulants, exertion and fatigue, must be carefully avoided. When rigidity of the external parts retards the expulsion of the child, sufficient time must be given; fomentations, and lard liberally introduced within the vagina, will promote the desired effect. Another cause of protraction, and which sometimes proves very tedious, is œdema of the cervix uteri, and must be relieved by cautiously elevating the fundus uteri, and dilating and supporting the os uteri during the paroxysms of pain; artificial dilatation of the œdematous cervix uteri must not be persevered in, if it be acutely sensible. When this is the case, the abstraction of blood will be very beneficial.

Mal-position of the uterus, in which the os uteri is either thrown backward against the promontory of the sacrum, or forward against the symphysis pubis, protracts labor. In these cases, nothing but time and patience will effect a change. Anchylosis of the os coccygis to the sacrum is another cause for which no relief, but such as time affords, can be given.

Various other causes will produce lingering and protracted labor; as, want of room, the pelvis being encroached upon by tumors of various kinds, as the cysts of ovarian dropsy, hernia of the bladder, &c. or the head of the child may be enlarged by hydrocephalus Should the cause of impediment be compressible and not very formidable, time and powerful parturient efforts may overcome it. Some tumors may be elevated and kept above the brim of the pelvis until the presenting part occupies the superior aperture of the pelvis. Some may be safely punctured, and others may require the forceps, perforation, or the scalpel; but no invariable direction can be given for the management of these cases, as much must depend upon the size, consistence, and situation of the obstruction.

followed, in from five to twenty minutes after its exhibition, by uterine action, which gradually increases, and goes on without any intermission till the delivery be completed.

Twenty grains of ergot, given every ten minutes, answers better than a larger dose, as it is not so likely to affect the stomach with nausea or vomiting, which a larger dose is apt to do.

The ergot should never be administered until the rigidity of the os uteri has subsided, and a perfect relaxation induced; nor should it ever be administered in any case of preternatural presentation that will require the child to be turned.

Fig. 1 & 2.

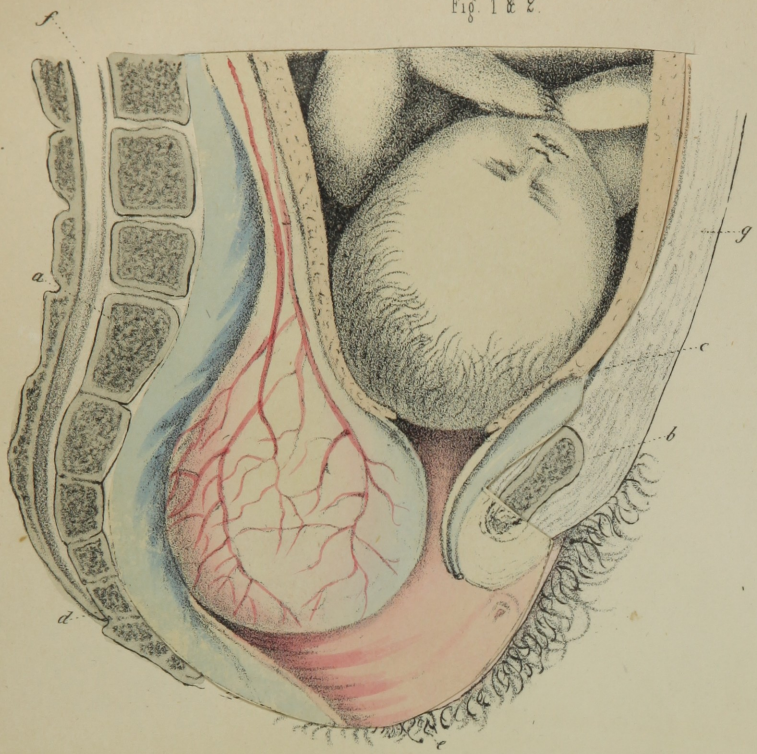


Fig. 3.

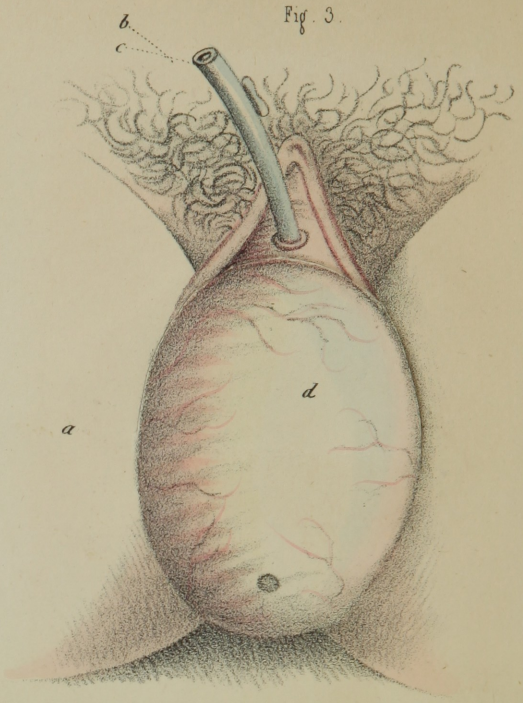
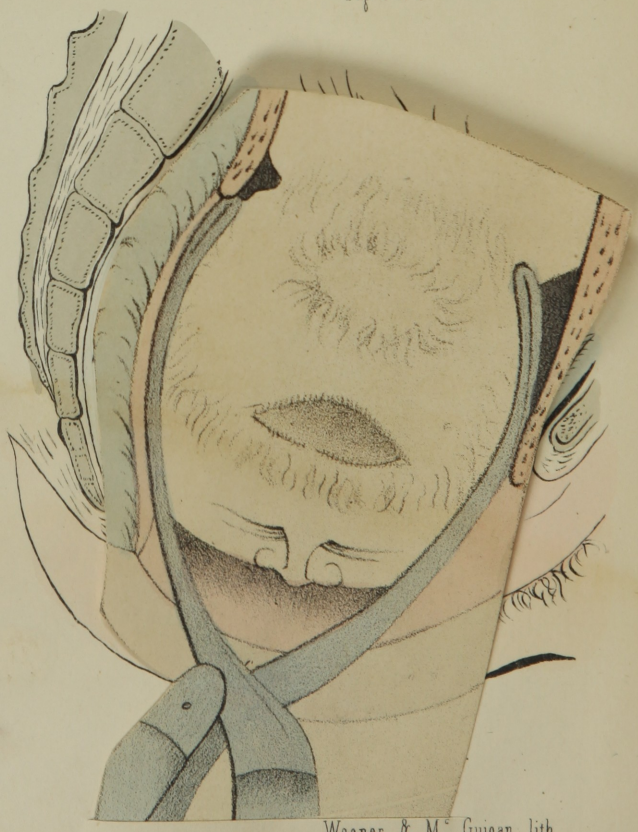


Fig. 4 & 5.

Fig. 6 & 7.



G. Spratt del.

Wagner & Mc. Guigan lith.

TABLE VII.

Fig. 1.—Represents a section of the pelvis, uterus, &c., to show a morbid enlargement of one of the ovaries, occupying nearly the whole cavity of the pelvis, and preventing the descent of the child's head. *a*, the bones of the lower part of the spine, sacrum, and coccyx; *b*, section of the ossa pubes; *c*, the bladder; *d*, the rectum; *e*, the vagina; *f*, medulla spinalis; *g*, muscles and aponeurosis of the abdomen; *i*, cut edge of the uterus; *k*, the enlarged ovary.

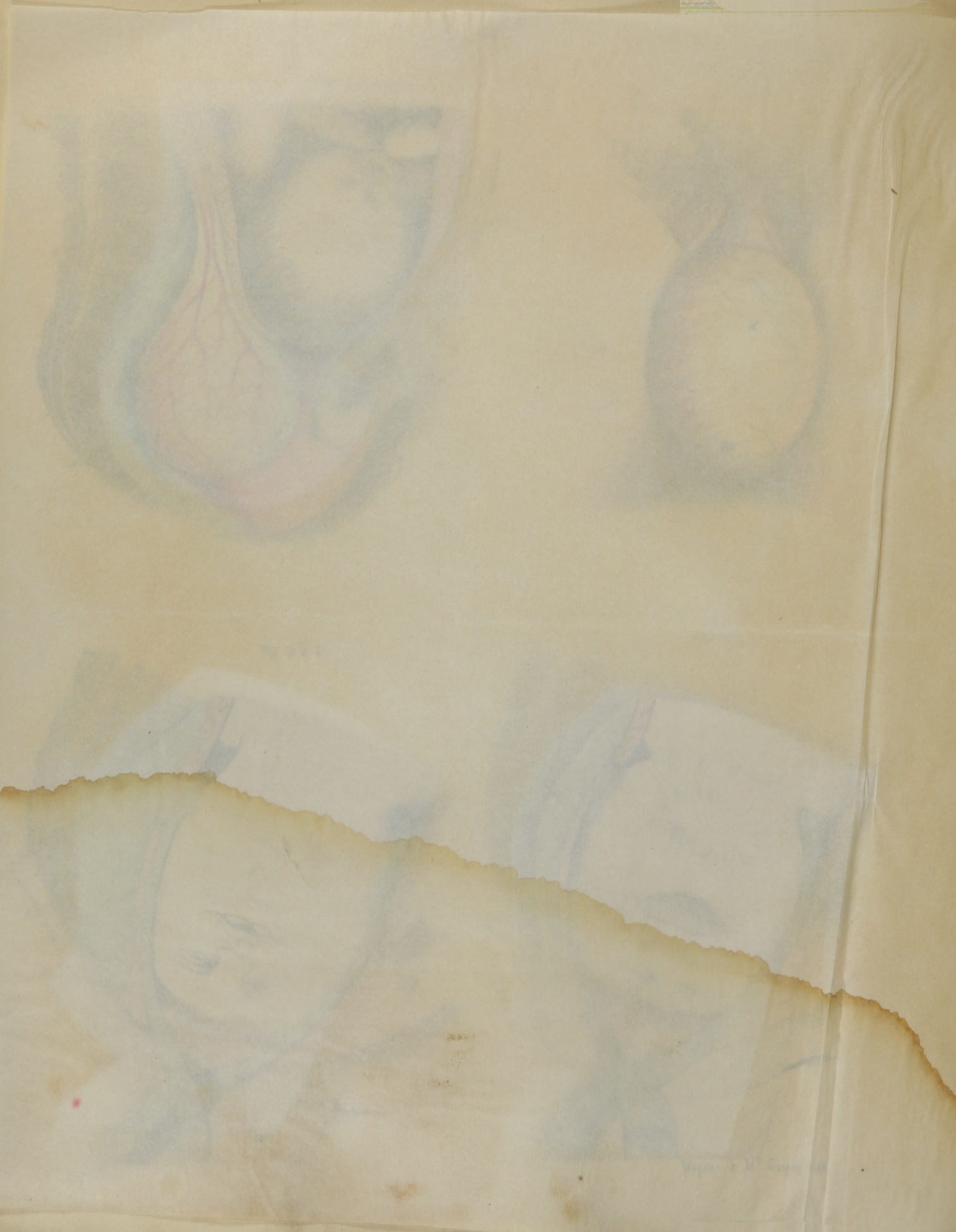
The most frequent cause of enlargement of the ovaries is the disease called encysted dropsy. References to eighteen cases may be found in the tenth volume of the "Medico-Chirurgical Transactions." These tumors have been found of various sizes and degrees of firmness; hence it is obvious that tumors so situated must prove an obstacle to parturition in proportion to their bulk and compressibleness. In cases of very moderate or partial confinement of the pelvis from this cause, it will be prudent to trust to the efforts of nature* to expel the child, and we are told by Dr. Merriman, that "where the tumor was not very large nor firm, this method has been successful. In the more formidable cases of obstruction from this cause, various methods have been recommended to preserve one or both lives. With a view of preserving the child, some have recommended the operation of turning, but this does not appear to have been successful. Others have taught, that in such cases the perforator should be resorted without delay. Sometimes the tumors have been opened, but in several instances it has been necessary subsequently to have recourse to embryotomy." In cases of moderate obstruction from this cause, the occasional use of the forceps may be expedient, to shorten the duration of labors, which might otherwise become dangerous to the mother or child.

Dr. Merriman, after enumerating the different methods adopted in eighteen cases, says: "Upon the whole, the evidence we at present possess is more in favor of opening the tumors when they contain a fluid, than of any other mode of procedure."

Fig. 2.—This figure represents a displacement or protrusion of the urinary bladder, occasionally met with during labor, and which proves an impediment to the birth of the child.

This displacement consists in a descent into the cavity of the pelvis, of a portion (more or less) of the parietes of the distended bladder, which form an elastic tumor (as represented at *b*), situated either under the arch of the pubes, occupying the anterior part of the vagina, or on

* See David's Operative Midwifery.



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* See Davis's Operative Midwifery.

one side.* The anterior protrusion is probably more frequently an obstacle to parturition than the lateral. We have met with one case of the former, and Dr. D. Davis says he has met with several, but not with one of the latter. We are told by Mr. Christian, "as the tumor is covered by the vagina, and its base diffused, there can be no danger of its being mistaken for the membranes enclosing the liquor amnii, nor does it, indeed, prevent the os uteri from being readily felt. If an error of this kind is at all to be apprehended, it is where the tumor is situated under the arch of the pubes." Dr. Merriman relates a case of the anterior protrusion, which was unfortunately mistaken for the head of a fœtus enlarged by hydrocephalus, and fatally punctured. Hence how much it behoves the inexperienced to pause and minutely examine every circumstance before they venture upon an operation. The remedial agent in these cases is the introduction of the catheter (to draw off the water), which will detect and cure this displacement.

Fig. 3—Represents a case of procidentia uteri, which forms a pendulous tumor, hanging between the thighs; the bladder occupies and forms the anterior part of it.

a a, the thighs; *b*, the mons veneris; *c*, the catheter; *d*, the anterior portion of the tumor formed by the bladder; on raising this part, the bladder is supposed to be laid open.

In cases of procidentia uteri, when it becomes necessary to introduce the catheter to draw off the urine, we must bear in mind the unnatural course of the urethra—the catheter being introduced in the usual course till its point has reached the symphysis; its handle must then be so elevated towards the abdomen, that the extremity of the instrument should be directed towards the knees, which is clearly shown at Fig. 2, representing the point of the catheter in the bladder.

Fig. 4, 5, 6, and 7—Represent sketches of face presentations. The letters refer to the same parts in all the four figures. *a a*, section of the lower part of the uterus; *b*, the rectum; *c*, the vagina; *d*, the left labia; *e*, the left nymphæ; *f*, part of the bladder; *g*, os pubis of the left side; *h*, section of the bones of the sacrum and coccygis; *i*, the perinæum; *k*, section of the muscles, &c., covering the bones of the sacrum, &c.

Fig. 4.—Face presenting with the occiput to the left side.

5.—Face presenting with the chin towards the pubis.

6.—Face presenting with the occiput to the right side.

7.—Face presenting with the chin towards the sacrum.

Remarks on these presentations follow our description of Table IX.

* See Dr. James Hamilton's Cases in Midwifery, p. 9; and Mr. Christian's paper in the Edinburgh Medical and Surgical Journal, vol. ix, p. 281.

PRELIMINARY OBSERVATIONS ON THE USE OF INSTRUMENTS.

It has long been established as a general rule, that instruments are never to be used in the practice of midwifery, but from positive necessity.

To determine the proper period for their employment, is one of the nicest points in the practice of obstetric art. The following *general* rules may be laid down.

The forceps are used to supply, with them, the insufficiency or want of labor pains; but so long as the pains continue, and we have reason to hope they will be effectual, we shall be justified in waiting.

The lower the head of the child has descended, the easier in general will their application be; the success of the operation more certain, and the hazard of doing mischief less.

The cessation or diminution of pain is either the consequence of original debility, or of an exhausted state of the uterus from long-continued exertions; and must be distinguished from that temporary suspension of uterine action, which is not accompanied with any other unfavorable symptom, and which may be often removed by repose and nourishment. But should the pains have been for many hours strong and expulsive, and cease altogether, the presenting part firmly wedged in the pulvis, interrupting the functions of the bladder and rectum, accompanied with fever, restlessness, headache, vomiting, mental inquietude, abdominal tenderness, with heat, dryness, and pain about the vagina and os uteri (the os uteri being fully dilated), timely assistance must be given; otherwise, exhaustion, sloughing, or other untoward symptoms terminating in death, will soon close the scene.

Before using instruments, the rectum and bladder should, if possible, be always emptied.

Instruments should always be introduced slowly and cautiously, and during the intervals of the pains; and the assistance given with them should be afforded during pain (should there be any), in order that the uterus may be gradually emptied.

The extracting power should be employed in the direction of the axis of that part of the pelvis at which the head is situated; if it be at the brim, the handle of the instrument must be directed backward against the coccyx; but as the child advances, that part of the instrument grasped by the operator's hand should gradually be directed towards the pubes.

The short forceps are used by most practitioners, and those constructed with reflecting or moveable handle are decidedly to be preferred. The long forceps may be substituted for the short ones in most cases; but the blades must be fixed on the sides of the face, if the head be in the cavity of the pelvis; but if the head be at the brim, over the occiput and forehead.

Particular rules for applying the forceps in every position of the head are given in Tables viii. and ix.

On the Application and Use of the Vectis.

We shall have a just idea of the vectis, by considering it as one blade of the forceps, a little lengthened and enlarged, without any lateral curvature. The general condition and circumstances of labors, as requiring and allowing the use of the forceps, will hold equally good when the *vectis* is intended to be used. The *vectis* may be employed, subject to very much the same regulations as the forceps; the advantages of the vectis are, that it may be used earlier, and can be applied to any part of the head. The vectis should be employed rather as a hook than a *lever*, and on that principle is a safe instrument; but, if used on the lever principle, acting upon the soft parts of the mother as the fulcrum, a dangerous instrument, and much mischief has been done by its use.

TABLE VIII.

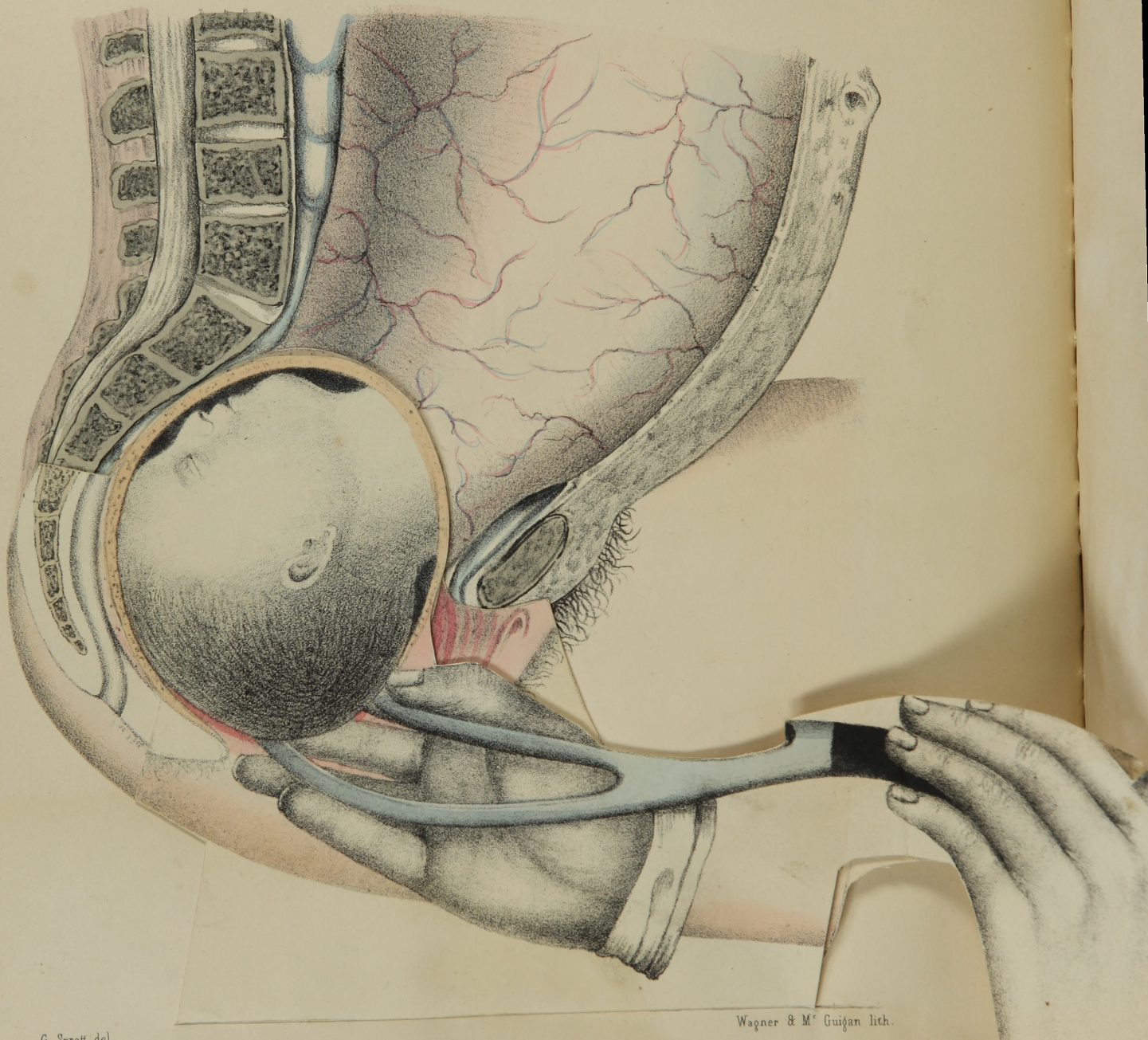

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TABLE IX.

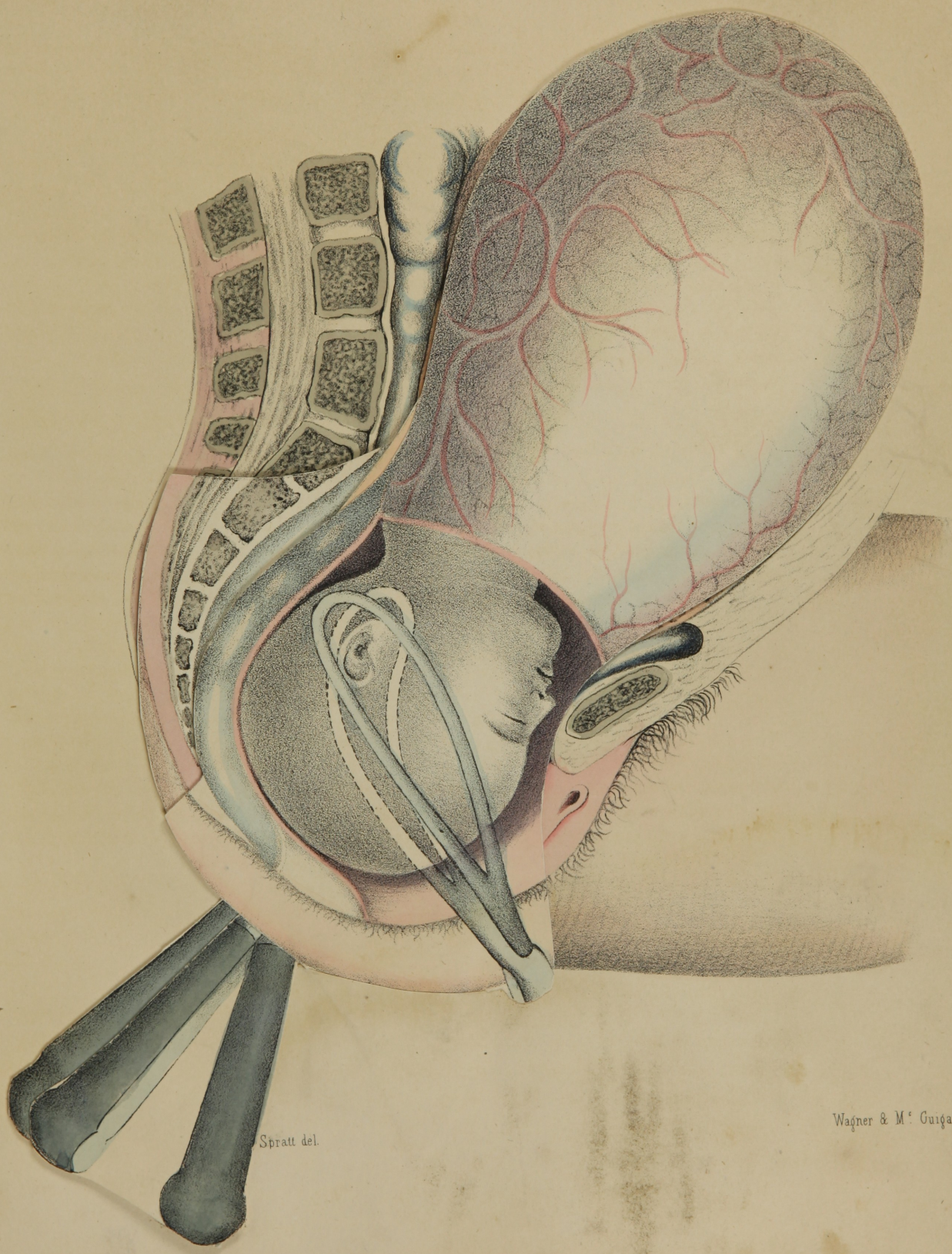
Fig. 1—Represents the same section of parts as in the preceding Tables, with a portion of the lower part of the uterus removed to shew the head of the child in the second position, viz., with the face towards the pubes. In this drawing the dotted lines are intended to represent the double curved forceps, and shew the different hold they have of the head compared with the common short forceps here represented as applied.

This is the most frequent of all the wrong presentations of the head. In this position the head is usually longer in passing through the pelvis than in the first position; but if the pelvis be well formed, and the action of the uterus strong, in the majority of cases the child will be expelled alive by the natural efforts. Should untoward symptoms arise, so as to demand artificial assistance, this position (when the head has descended low into the pelvis) may sometimes be rectified as proposed by Dr. Clarke, by laying two fingers on the cheek, and pressing gently during every pain, gradually turning the face into the hollow of the sacrum. Should this not succeed, the forceps or lever, or other means, must be resorted to, according to the exigencies of the case. In this presentation, if the lever be used, it may be applied over the mastoid process, in order to bring the chin below the pubes, when the case would be managed without much difficulty, and with little risk to the perinæum; or the lever may be passed behind the occiput, to assist the pains in advancing the occiput towards the os externum. The application of the forceps in this position of the head does not materially differ from the first position, described Table VIII. They are to be applied over the ears of the child; but when applied (as will be seen by the drawing) they have a different and less perfect hold; hence they are more apt to slip, and act with less advantage.

In this position, when the head is brought sufficiently low to distend the external parts, there will be great danger of laceration, unless the perinæum is cautiously guarded, and the head prevented from advancing too fast (if the pains be strong), until the os externum is gradually and sufficiently dilated.

Fig. 2.—In this drawing the right side of the uterus is removed to show the child in the act of parturition, with the face towards the right side of the pelvis (one ear to the sacrum, the other to the pubes); this may be denominated the third position of the fœtal head.

TABLE IX.



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In this unfavorable position, the head is (especially if large, or the pelvis somewhat small) liable to become arrested in its progress through the pelvis. Should there be occasion to use the forceps in this presentation, they must be applied over the ears of the child; but, to facilitate the expulsion of the head, it will be necessary to alter this position to the first or most natural position. This is to be effected by carrying the face into the hollow of the sacrum, by a gentle rotatory movement from left to right, to about one-fourth of a revolution, or what is called a quarter turn. The mal-position of the head being removed by this movement, it is probable the labor-pains (if there be any) may be sufficient to expel the fœtus without further assistance.

Fig. 3—Represents the forceps applied in the fourth position of the fœtal head, *i. e.* with the face to the left side of the pelvis.

In this presentation the left ear may be felt behind the symphysis of the pubes; the head being arrested in its progress by its untoward position, it becomes expedient to alter the position by turning the face into the hollow of the sacrum. This is to be effected by reversing the rotatory movement described in the preceding position of the head. In this case, the face being turned to the left side, the movement must be made from the right to the left. The head being in this manner placed in the most favorable position, nature will in the majority of cases accomplish the delivery without further assistance. Hence the forceps may be removed, unless hemorrhage or other untoward symptoms demand a more speedy delivery.

Fig. 4.—The face in this drawing is represented as being carried into the hollow of the sacrum, by the rotatory movement described in the two preceding positions of the head; the case now becomes similar to a natural presentation, and may be managed as such in every respect according to circumstances.

When the face presents, it may be known, by the inequality of the presenting part, and the distinction of the nose, chin, &c. The management of these cases must, in a great measure, be left to the efforts of nature, as the child may pass by the pains only, after a tedious labor. But the features of the face are often amazingly distorted, and it is well known that long and severe pressure on the head in such presentations often destroy the child in the birth. Therefore if assistance can be rendered either by the forceps or vectis to shorten the labor, so as to preserve the life of the child, the judicious use of such instruments must be acknowledged to be of real benefit.

Should symptoms require the use of the forceps, they must be applied over the ears of the child (as represented in fig. 4 and 6, Table VII.), and, in acting with them, extract from handle to handle, at the same time bringing the chin round to the symphysis pubis. Face presenting with the chin to the sacrum. (See fig. 7, Table VII.). Should the forceps be found necessary, from the size of the head, or from floodings, faintings, &c. they must be

applied over the ears, and the handles kept close against the perinæum. In this presentation the vectis may also be applied, as we have represented a blade of the curved forceps, *i. e.* over the ear and mastoid process. Face presenting with the chin towards the symphysis pubis. (See fig. 5, Table VII.). This is the most favorable of the face presentations.* In this case the vectis, if judiciously applied over the occiput,† will alter the position of the head; but should this not succeed, the forceps must be applied as in the former case. In general, when the face presents, it is more convenient to deliver with the vectis, or with one blade of the forceps, than with both blades.

* Denman's Introduction to Midwifery.

† Vide Hogben's Obstetric Studies.

TABLE X.

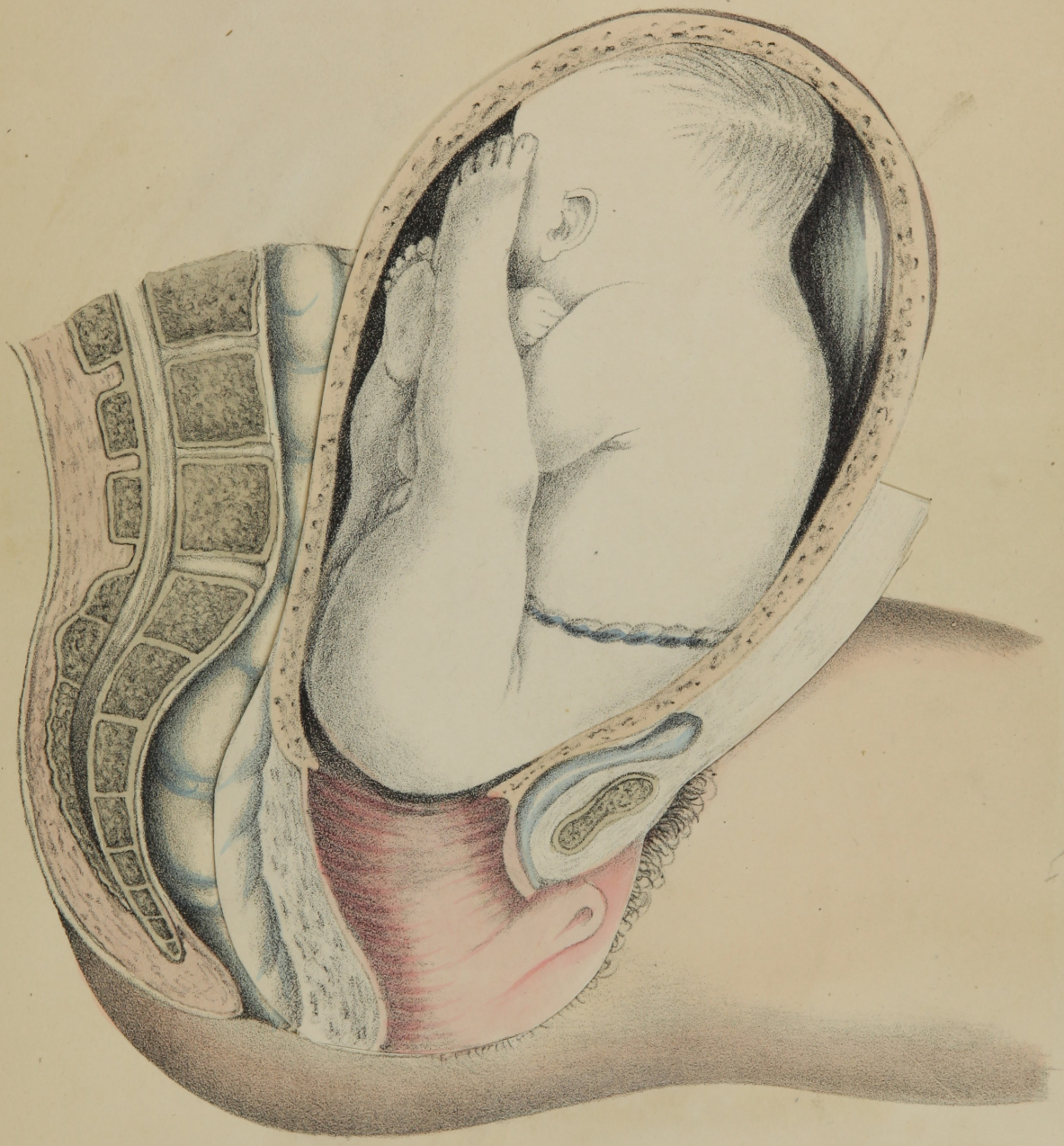
Fig. 1—Represents the same section of the parts as described in Table VI., with a section of the uterus, the right side being removed to show the fœtus in the act of parturition, the breech presenting with the back towards the fore part of the pelvis. The os uteri nearly dilated, the membranes broken, and the waters discharged, with the uterus contracted round the body of the child.

This presentation forms one of the first order of preternatural presentations, which include, also, the presentation of the hip, the knees, or one or both legs. This presentation may generally be known, by distinguishing the anus and organs of generation, and by the escape of the meconium. In the nates presentation, if the pelvis be well formed, and the child not particularly large, children are usually expelled by the action of the uterus. It has been recommended by some writers, to assist the delivery, when the buttocks do not pass readily through the pelvis, (there being urgent necessity for hastening the delivery,) by passing a finger on each side over the thighs to the groins, or, when the groins are beyond reach of the fingers, to introduce the blunt hook, by which to extract the child; or the descent of the nates may be assisted by the forceps, applied (one blade on each side) over the flank of the child.* There is yet another mode by which the nates may be extracted, which is by passing a fillet or silk handkerchief over the bend of the thighs, close to the belly; by this the necessary extracting force may be very advantageously and more safely employed, than by the blunt hook.† When the nates are brought through the os externum, the case becomes a

* Dr. Blundell's Lectures.

† Vide Merriman's Synopsis.

TABLE X.



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crural presentation; and the direction of the toes, and all other circumstances requiring attention in presentations of the feet, must be attended to.

Fig. 2—Represents the child presenting with one hand and foot.

This mixed presentation is very rarely met with, but we have introduced it to caution junior practitioners to avoid the error of mistaking a superior extremity for an inferior: this error has occurred. The crural or foot presentation is the most simple, and often the safest to the mother, of any of the preternatural presentations; but the life of the child is often placed in considerable danger from the compression of the naval cord, after the body of the child has passed through the pelvis. Hence, so soon as the body is born, the object of the accoucheur is to facilitate the head through the pelvis with all convenient speed. In order to accomplish this, it becomes necessary that the head of the child should occupy the hollow of the sacrum, after it has passed the superior aperture of the pelvis. To ascertain the position of the head, we must examine the feet; if the toes are turned towards either *sacro-iliac synchondrosis*, the fœtus is already in the proper position, but if the toes point to the *symphysis pubis*, the head is then in an untoward position, because it cannot adapt itself to the form of the pelvis. It will therefore be proper, if the head be in a wrong position, so soon as the nates have passed through the os externum, to grasp the nates and thighs (previously wrapped in warm cloth, to prevent the fingers from slipping), and during a pain to give such an inclination to the child as will incline the face towards the sacrum.* The arms should then be cautiously brought down, one after the other; the head is then to be extracted as expeditiously as the necessity of the case may need; if the pulsation in the string become weak or cease, the case becomes urgent, and without waiting for natural pains, the extraction must be made; but so long as a pulsation is felt there is no occasion for hurrying the delivery.

Fig. 3—Represents the presentation of the arm, which forms one of the second order of preternatural presentations, according to Denman and others. This order also includes the presentations of the shoulder, and the more rare presentations of the back, or belly, or sides.†

In either of these presentations it is necessary to turn the child and deliver footling, it being impossible for a full-grown fœtus to pass through the pelvis in either of the above positions. On the operation of turning, see Table VI. B. The necessity of turning in these presentations is universally admitted, and the

* Vide Dr. Blundell's Lectures.

† Madame Boivin, in her Memorial de l'Art des Accouchemens, has given delineations of those positions; but as, in 20,517 cases delivered at the Hospice de la Maternité at Paris, no instance of such presentation has occurred at the full period of gestation, we have not thought it necessary to swell the present work by delineating them.

more speedily this is accomplished, when the os uteri is sufficiently dilated (either naturally or artificially, as the case may require) to admit the hand into the uterus, the more easily and safely will the operation be performed.* Having obtained room to pass the hand through the os uteri, rupture the membranes (should they not have been previously broke) by pressing a finger firmly against them, the hand will then come in contact with the limbs or body of the fœtus. The hand is then to be carried forward till it reaches the feet, which should be carefully drawn down along the belly of the child, and as the feet are brought lower, the presenting arm will be retracted; when the feet are brought through the os externum, the case becomes similar to a crural presentation, and must be managed as such.

Fig. 4—Represents a shoulder presentation; the management of this case is by turning the child, as described in the preceding figure.

Fig. 5—Represents the fœtus in the natural position, seen through the amnion and waters; the funis presenting with the membranes unbroken.

When the funis presents, the most usual part of the fœtus beyond it will be found to be the head (as represented in the drawing), the nates or feet. Formerly it was supposed that, whenever the funis presented, the fœtus lay across the pelvis, with the umbilicus over the os uteri; and M. Magrier supposes the descent of the funis to indicate a presentation of the belly.† Smellie has also represented (in his plates) the descent of the funis as accompanied with the presentation of the abdomen; but the presentation of the abdomen is extremely rare; whereas presentations of the funis are by no means uncommon, and, when occurring, usually precede the head, nates, or foot. When the funis presents, the child's life is always in danger; for if much pressure be continued on the funis for the space of a few seconds, the child becomes languid; and if the circulation be suppressed for one minute, the child is in the utmost danger. Hence, attention must be paid to the pulsation of the funis. If, upon a first examination, no pulsation is to be felt in the funis, the child is already dead, and the case must be managed according to circumstances, without regard to the funis; but if there be a pulsation in the cord, we are assured that the child is yet living. Various modes have been proposed by different practitioners for replacing the protruded cord, but not one of which is likely to succeed in every, or even in the majority of cases; for the funis is generally forced down again on the pain returning.‡ When the head is low down in the pelvis, it may be

* In ordinary cases, if the os uteri be dilated to the size of a crown piece, and the soft parts in a state of relaxation, the sooner the operation is commenced the better.

† Vide Méthode pour manœuver les Accouchemens, 1804, p. 49.

‡ Mr. Hogben (vide Obstetric Studies) recommends, after the funis has been carried as far as possible above the brim of the pelvis by the fingers or some other contrivance, to introduce a piece of sponge, so as to keep the funis from sinking. Dr. Davis (see Elements of Operative Midwifery) recommends fixing

prudent sometimes to hasten the delivery (if the child be living) by means of the forceps. "If the breech present, it may be expedient to bring down one or both the inferior extremities at a proper time, taking care that the funis be not entangled between the legs of the infant." Should the upper extremities present with the funis, recourse must be had to turning, if the child be living or dead (the position of the child demanding the operation of turning independent of the funis). We would say, were we called to a case in which the os uteri was very considerably dilated, *as represented in the drawing*—the membranes unbroken—the *funis pulsating strongly*—the head beyond it—we would rupture the membranes, gently introduce the hand, and turn the fœtus; or should the membranes be broken, and our efforts to return the funis prove ineffectual, we would turn, provided the funis *pulsated*,* and circumstances peculiarly favorable to turning, viz. the passages so relaxed and dilated as to admit of the easy introduction of the hand, and the pelvis capacious—if, on the contrary, the pulsation in the cord should have ceased, the case should be left to the efforts of nature.

the funis by means of thread to the point of a thin, flat plate of elastic steel, fixed in a wooden handle, and carrying the point of the instrument above the head of the child, out of the way of pressure. Dr. Mackenzie succeeded by tying the prolapsed funis in a small leather bag, and carrying it beyond the head of the fœtus.

* Dr. Conquest very justly observes, "that all the advantage proposed to be gained (by turning) is on the part of the child, the mother's life not being endangered by a presentation of the funis; consequently, as the operation of turning is sometimes destructive to the mother, it ought never to be performed merely to save the life of the child."

TABLE XI.

Fig. 1.—The abdomen laid open to show a front view of the gravid uterus at the full period of pregnancy. *a a a a*, the peritoneum lining the parietes of the abdomen; *b*, a portion of the omentum covering the small intestines; *c*, part of the small intestines; *d d*, the round ligaments of the womb; *e e*, the fallopian tubes; on the left side little more than the beginning of the tube is seen, the rest running down behind the womb: on the right side, the middle part only is exposed, the beginning being concealed by the intestine which lies upon that part, and the end or fimbriæ being covered by the spermatic vessels.

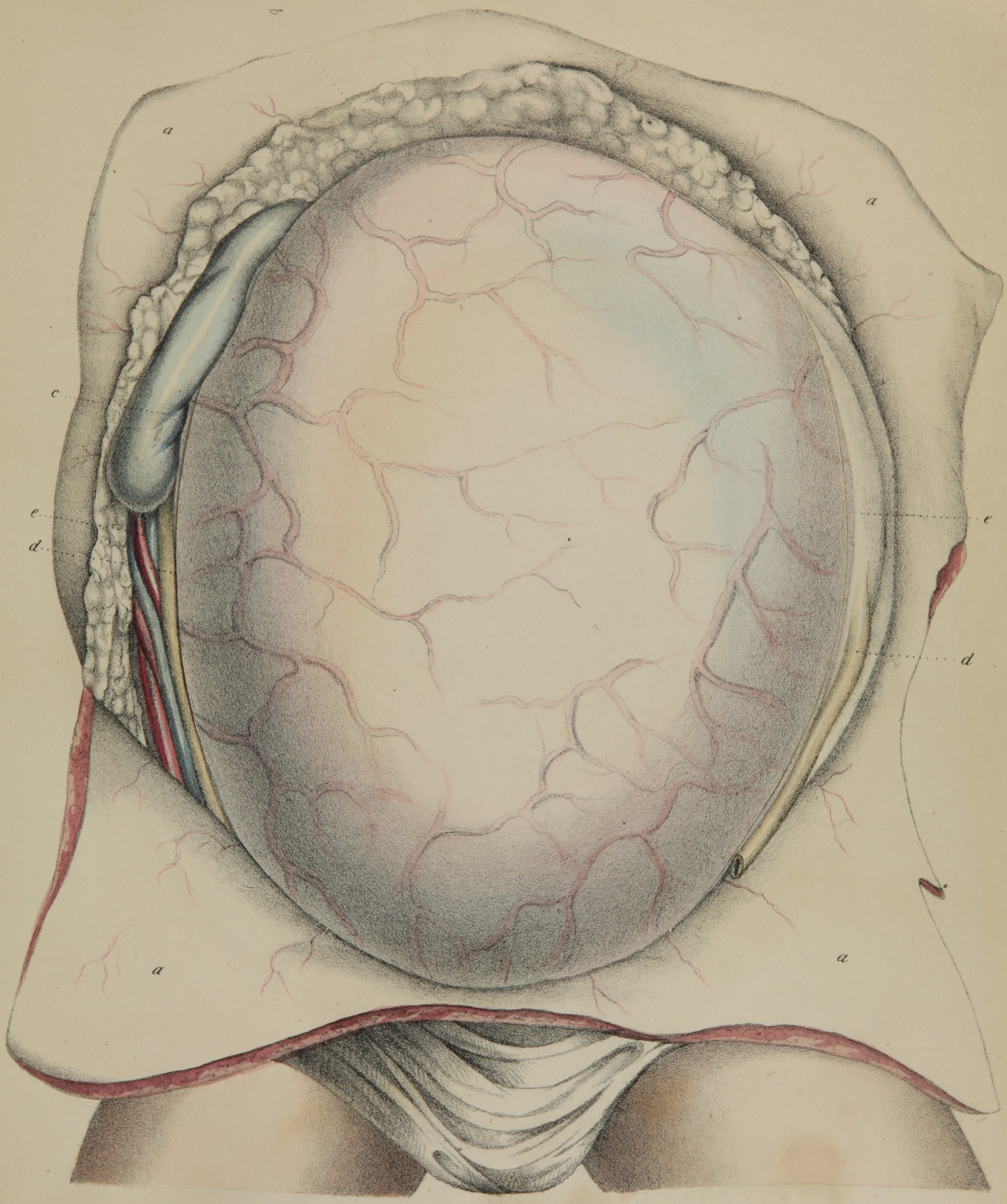
The fundus of the impregnated uterus at the period of between two and three months is even with the brim of the pelvis; about the latter end of the third or fourth, but sometimes a little later, the uterus advances above the brim, and is then readily perceived by the hand through the abdominal muscles, &c. Between the fourth and fifth month the fundus is between the pelvis and the navel; at the sixth, as high as the navel; at the seventh month, between the navel and scrobiculus cordis; in the eighth month, up to the scrobiculus cordis. The fœtus, at the full period of utero-gestation, weighs on an average from six to nine pounds, the placenta little more than one. The liquor amnii varies so considerably, that it is difficult to form an average quantity; but we may say that the quantity generally contained in the membrane is from eight ounces to sixteen. When it *exceeds* three or four pints, it may be considered excessive, and is then frequently the cause of lingering labors, from over distension of the uterus.* Cases are on record in which the liquor amnii has measured five and ten pints; and when the fœtus is diseased, the liquor amnii occasionally far exceeds the above quantity.

In the early stages of gestation, the quantity is larger in proportion to the size of the uterus than afterwards. The liquor amnii is sometimes of a greenish cast, often of a milky appearance, and at other times of a yellowish color. It contains water, albumen, carbonate and muriate of soda, and phosphate of lime.

The membranes of the ovum become of a firmer texture towards the end of pregnancy. Occasionally they are found, at the time of labor, unusually rigid and thick, and thus occa-

* Should this case be very obvious, the membranes may be punctured, but the necessity for this *very rarely* occurs; and certainly not until the membranes distended with fluid have fully performed their office of dilating the os uteri and the passage of the os externum. (Conquest.)

TABLE XI.



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sion a protracted delivery. Cases are on record in which the membranes have exceeded an eighth of an inch in thickness.* When the membranes have not been artificially ruptured, (and as a general rule of practice they never should be,) and have withstood the action of the uterus, the whole ovum has been expelled at once.

Fig. 2.—The tunica decidua, a tender lacerable substance or membrane, secreted by the uterus, and forming the outer layer or coat of the ovum. In the earlier months of utero-gestation, it may be easily separated into two laminæ: the one in contact with the uterus, named *tunica decidua uteri;* and the other, from being reflected on the first (and covering the chorion), the tunica decidua reflexa. After the fourth or fifth month, these two laminæ become, as it were, identified, and no longer separable.

Fig. 3.—The chorion, a dense, thin, smooth membrane, connected with the decidua as far as the edge of the placenta; it is then reflected over the surface of the placenta, which is opposed to the fœtus, and continued over the cord.

Fig. 4.—The amnion, a thin, transparent dense membrane, lining the chorion (through which the fœtuses are seen). The amnion is smooth and polished next the fœtus, and destitute of vessels; it encloses the fœtus and liquor amnii, and assists in dilating the mouth of the uterus at the period of labor.

Fig. 5—Represents a plural conception, each fœtus enveloped in separate membranes.

Twin cases usually terminate with safety both to the parent and children. It is the duty of the accoucheur invariably to ascertain if there be a second child before leaving his patient. After the birth of one child, the existence of one or more remaining in utero may be ascertained by external and internal examination. The external proof is the size and consistence of the abdomen, the parietes of which, if there be another child, remain nearly as tense as before the expulsion of the first; but this is not invariably conclusive, because the uterus may remain so uncontracted from other causes, as entirely to occupy the cavity of the abdomen. After applying the hand to the abdomen, or a finger or two in the vagina, should there remain any doubt, it will be prudent to pass the whole hand into the vagina, rather than leave his patient under any uncertainty. On the management of twins some diversity of opinion exists, as to whether the birth of the second should be purely artificial or left to nature. Several cases are on record where the second child has been retained many hours, or days, and even

* Vide Merriman's Synopsis.

weeks, without mischief.* Hence it has been supposed by some that the birth of the second child might be left to an indefinite period, provided no untoward circumstance should supervene to render artificial interference necessary. Others again, in anticipation of danger, proceed to deliver the second child immediately after the birth of the first. But the most experienced accoucheurs wait a certain time (from one to four hours), provided the first child was delivered by the natural efforts, and no untoward circumstance, as convulsions, hemorrhage, &c., should take place. But if the child should present in a wrong direction, it has generally been considered expedient to extract it by the feet with as little delay as possible. If also the first labor have been preternatural, dangerous, or difficult, it is, with some, an additional reason for delivering the second child as expeditiously as circumstances will permit.

In some cases it may be sufficient merely to rupture the membranes, in order to bring down the feet, or to render such assistance as the individual case may require.

* Vide Medical and Physical Journal for April, 1811.

TABLE XII.

Represents an injected uterus at the full period of gestation (about half its natural size), intended to illustrate the enlarged size of the vessels, their distribution and anastomosing with each other.

B.—The tube behind which the ovary lie concealed.
C.—The neck of the uterus.
D.—The spermatic artery.
E.—The spermatic vein.
F.—The hypogastric vein.
G.—The hypogastric artery.

TABLE XII.

TABLE XII.

TABLE XII

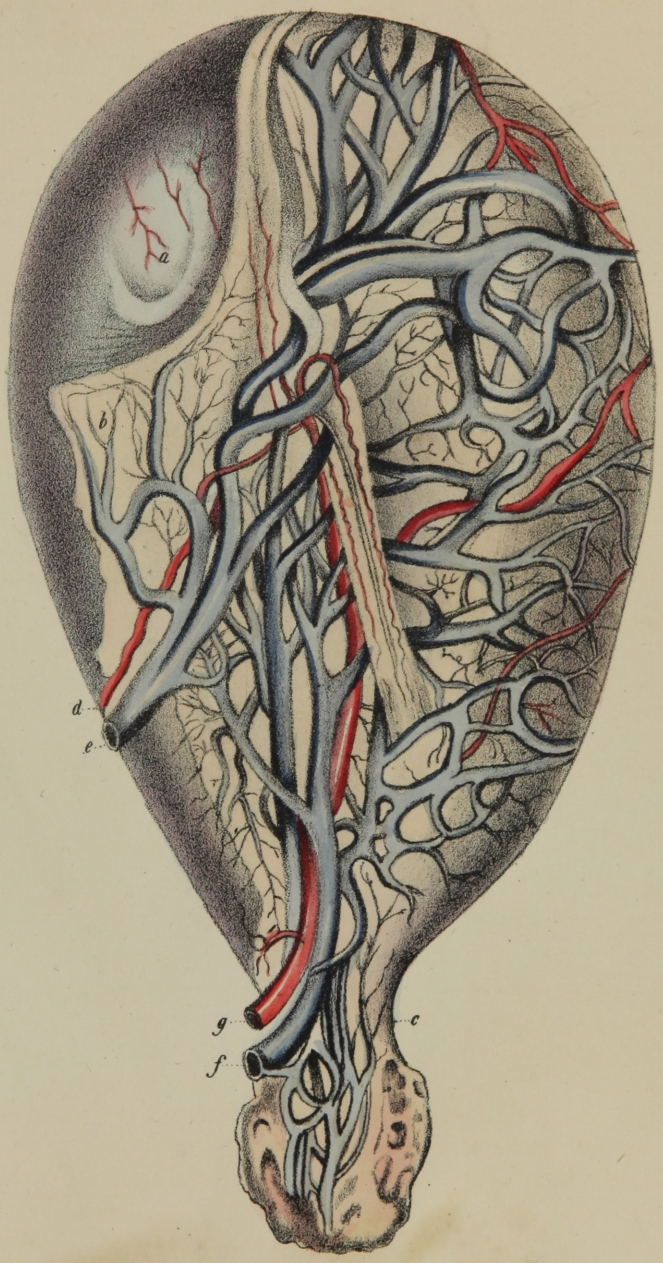

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TABLE V B

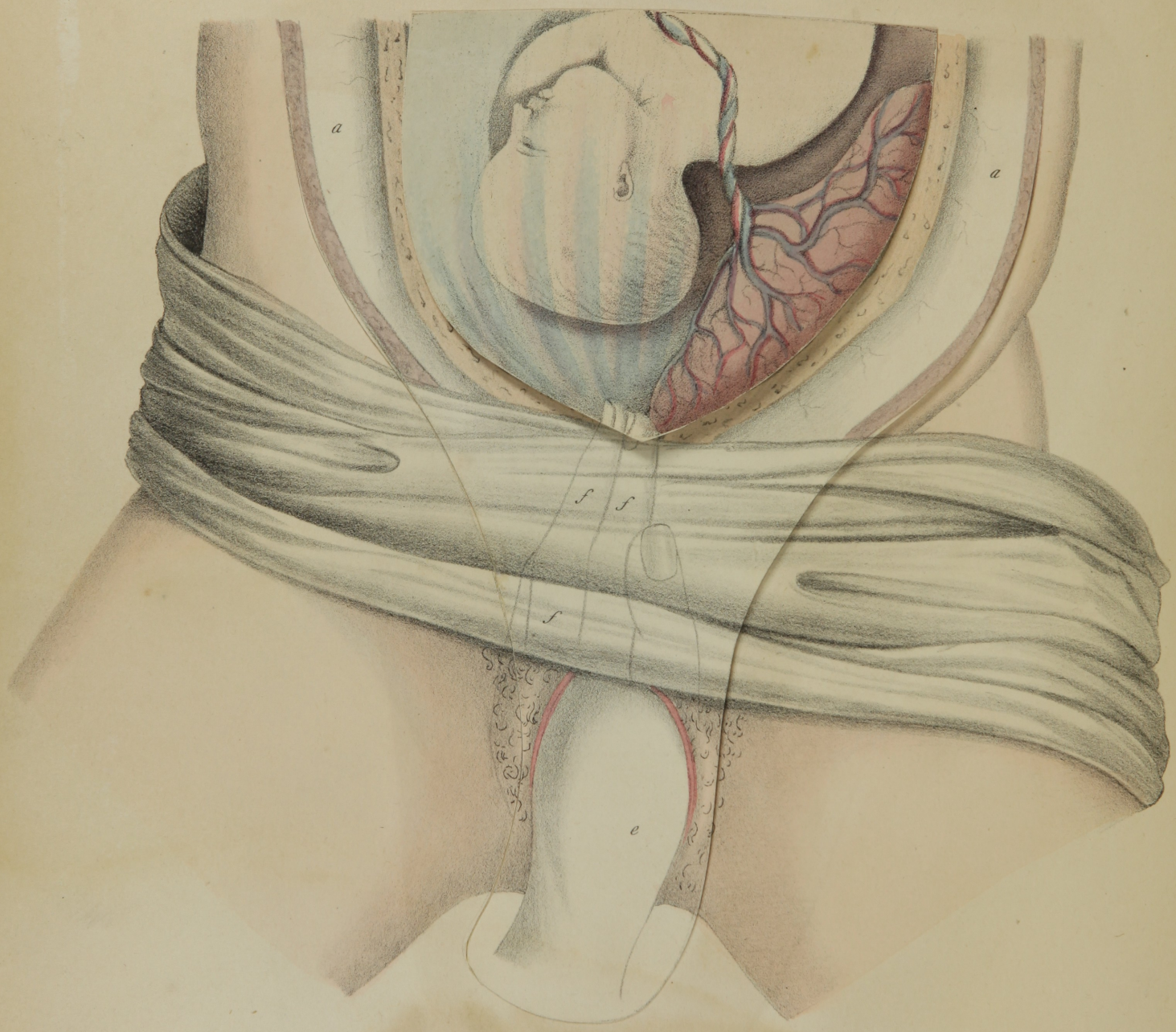

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TABLE V. B.

ILLUSTRATING PLACENTA PRESENTATIONS, ADHESION OF THE PLACENTA, &c. &c.

Fig. 1—Represents the abdomen and uterus laid open, (the anterior part of the uterus being removed, to shew the placenta, partially situated over the cervix uteri). The fœtus is seen through the amnion. The operator's hand is represented as introduced into the vagina, about to rupture the membranes; the direction of the fingers in the vagina are represented in outline.

A.A. The abdominal muscles, integuments, &c. turned back.

B.B. The cut edge of the uterus. C. The placenta.

D. The fœtus. E. The hand of the operator. F.F.F. The fingers in the vagina.

When the placenta is situated over the cervix uteri, very alarming and dangerous flooding commonly occurs, from about the sixth or seventh month to the full period of gestation; and no woman can be said to be free from danger until she be delivered: hence the interposition of art is demanded, and must be timely applied, or the woman will be lost: and we are told these cases ought never to be trusted to the powers of nature.*

The manual assistance required in these cases, is to deliver the woman as expeditiously as the urgency of the case may demand. The precise time when the patient ought to be delivered must depend in every individual case upon the *quantity* of blood lost and the *effects produced.* When the delivery is determined upon, (the usual means for suppressing hemorrhage having failed), the operation should always be performed with the utmost deliberation. When the fingers reach the placenta, it is of little consequence whether we perforate it, or insinuate the fingers on one side till we come to the edge; though the latter is generally to be preferred; and when the os uteri is only partially covered with the placenta, (as here delineated), the hand may be passed by its edge to the membranes without difficulty, which is preferable to boring through the substance of the placenta.† So soon as the hand has attained admission into the uterus, the operation of turning is to be performed, under the guidance of the direction given under the operation of turning, (see Table VI). In bringing down the child, (as in all preternatural cases), it should be done gradually; the pressure of its body, as it advances, will stop the flooding; and should there be pains, the obstetrician must extract at such times, resting between; but if there be no pains, it may be proper to rest at intervals; for, by hurrying the delivery, the woman may be so much fatigued as to be in danger of instant dissolution; the flooding being stopped by the child's body, the more immediate danger is

* See Conquest's Outlines, Denman's Aphorisms, &c.

† Ryan's Manual, &c. Blundell's Lectures, &c.

checked; the head of the child being suffered to remain a little time in the vagina, will give the uterus opportunity to contract on the placenta, by which means it will be sooner expelled, and the flooding stopped.

The placenta, when situated over the os uteri, is much thicker than in common, but less in circumference. When examination takes place, particular caution should be observed, that coagulated blood be not mistaken for the placenta.

Fig. 2—Represents the same section of the parts, with a delineation of the placenta, situated directly over the os uteri.

In this situation of the placenta, it may be required to perforate the substance of the mass with the fingers, and to pass the hand to the feet of the child, and bring them down through the aperture.

Fig. 3—Represents the hand introduced into the uterus to remove the placenta, the funis being separated.

This accident, (the separation of the funis), may arise from great force being used in extracting the placenta; but sometimes it takes place when very gentle force only has been used; the funis being small and of a flimsy texture, or not being firmly united. The separation of the funis may be attended with some inconvenience to the young practitioner, should the placenta not be expelled by the action of the uterus in due time, (or if attended by flooding), being deprived of his immediate guide by the loss of the funis. But no great difficulty will be found by the operator who has a proper knowledge of the anatomy of the parts; the hand being cautiously introduced into the uterus, the placenta is to be gently withdrawn in the direction of the axis of the pelvis.

Fig. 4—Illustrates the detention of the placenta, caused by *adhesion* between the uterus and placenta.

This adhesion arises in consequence of the deposition of coagulable lymph from inflammatory action, which may have existed during gestation, probably caused by some external injury.*

The adhesion is most frequently only partial, but sometimes unites the whole surface of the placenta to the uterus.

The unaided efforts of the uterus, as Dr. Conquest very justly observes, can never detach and expel the placenta under these circumstances; hence the interposition of art becomes necessary for its removal from the uterus. The hand of the obstetrician must be carefully introduced into the uterus, and, feeling for the edge of the placenta, cautiously and deliberately insinuating one, two, or more of his fingers between the placenta and uterus, slowly and tenderly separate the former from the latter. The hand should not be withdrawn until the separation is completely effected and uterine action excited.

* Vide Ramsbotham.

Fig. 5—Represents detention of the placenta, caused by irregular or spasmodic affections of the muscular fibres of the uterus, constituting the hour-glass contraction.

Spasmodic contraction of the muscular fibres of the uterus may occur either in the circular or longitudinal ones; when in the former, it produces either the hour-glass contraction, dividing the uterus into two cavities, (as represented in the drawing), or closes the cervix uteri, from which cause the placenta is detained. The management, in these cases, consists in allaying the spasmodic action, by the exhibition of an anodyne: from 40 to 60 minims of tincture of opium will generally have the desired effect; and, usually within half an hour, the constricted part becomes relaxed and dilatable, and the hand may be cautiously introduced into the uterus through the stricture.

TABLE VI. B.

THIS TABLE IS INTENDED TO ILLUSTRATE THE OPERATION OF TURNING.

Fig. 1—Represents a front view of the pelvis and uterus, the anterior portion of the uterus being removed to shew the situation of the fœtus, with left arm presenting, also the hand of the operator in the act of grasping the feet.

The position of the patient during the operation of turning is not very material, provided it is that which gives the operator the free use of his hand and arm. Some recommend that the patient should be placed on her hands and knees; and others, that she should lie on her back; but the usual position, *i. e.*, on the right side, is probably as convenient as any; and during the operation it may be found convenient to change one position for another, under particular circumstances. The operation may be performed either with the right hand or the left; when the feet of the child lie forward to the forepart of the mother, the right hand will be usually found most convenient; but if the feet lie to the back of the mother, they will be most readily come at by the operator using his left hand. Previous to commencing the operation, the arm should be laid bare, and, to facilitate its passage, the back of the hand and arm should be well smeared with some greasy substance, as pomatum, lard, sweet oil, or a lather of soap and water.

Fig. 2—Represents the same sections of the parts as the preceding drawing; in this, the hand of the operator is seen grasping both feet of the fœtus, and in the act of drawing them through the os externum, the presenting arm of the fœtus retracted, the back raised towards the fundus of the uterus, and the buttocks towards the right side.

It has been taught by most authors, to lay hold of both feet, as the turning is more readily and safely accomplished; but it will frequently happen, especially when the waters have been some time discharged, and the uterus strongly contracted round the body of the child, that we must be content to lay hold of one foot, rather than use any violence in our search for the other; a very intelligent teacher of midwifery, Mr. Radford, of Manchester, recommends in every case to turn with one foot only, believing that the extended extremity upwards secures the funis from compression during the passage of the body through the outlet.

Fig. 3—Illustrates the same section of the part, with the further advancement of the fœtus through the os externum, with the arms of the fœtus extended on each side of the head, the hand of the operator grasping the nates and thighs.

G. Spratt del.

Wagner & Mc Guigan. lith.

TABLE VI. B.

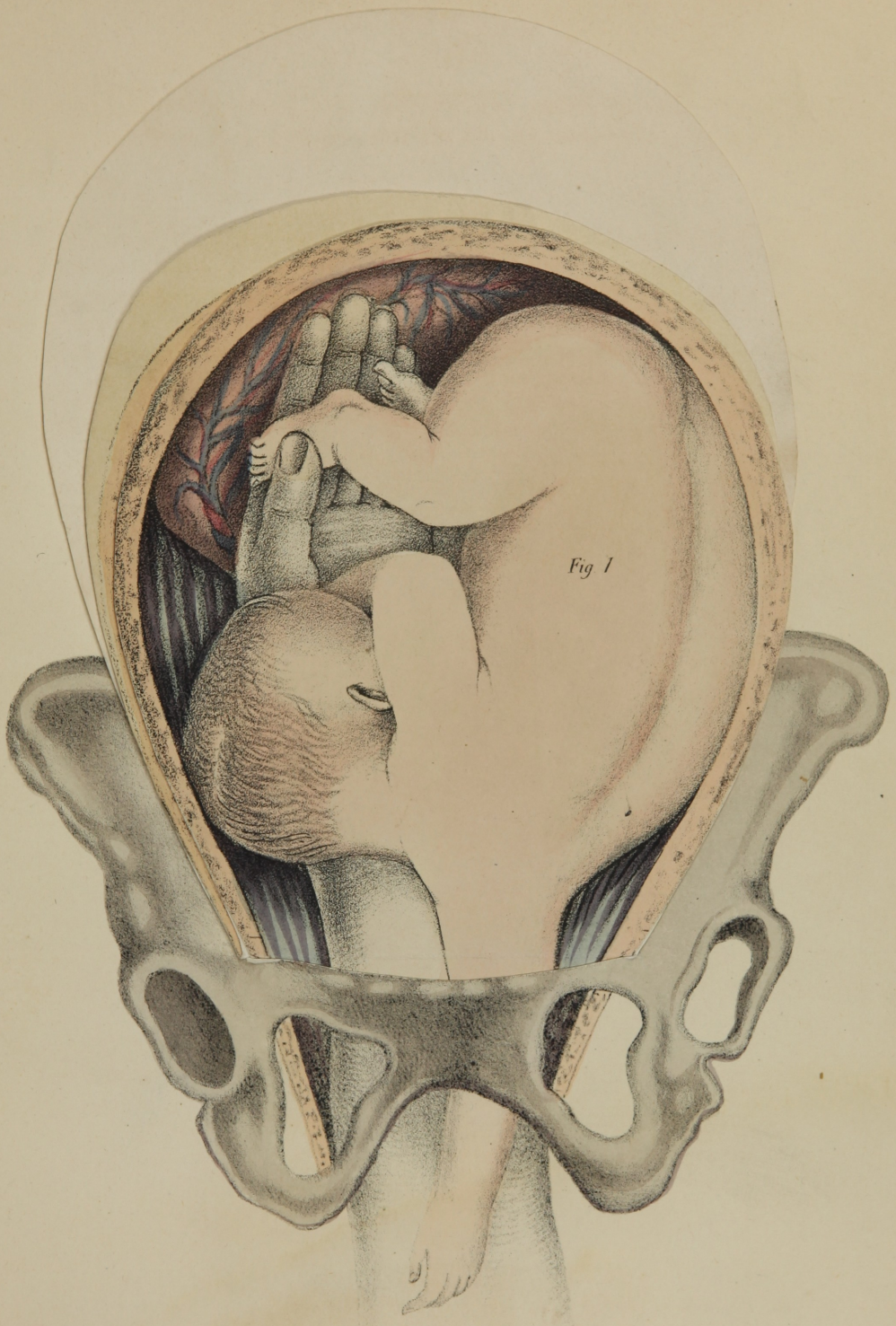


Fig 1

G. Spratt del

Wagner & M.c Guigan lith

So soon as the nates are brought within the hollow of the sacrum, the case becomes precisely similar to a foot presentation; the object of the operator will now be to give such an inclination to the body of the child as will direct the face towards the back of the mother, *the most desirable position for the passage of the head:* if the toes of the child are turned towards the belly of the mother, the head must come in an unfavorable position; but, if the toes point towards either sacro-iliac synchondrosis, the child is already advancing favorably.

In giving this inclination to the body, it is not necessary that the parts of the child should be completely turned, an inclination towards the mother's back being sufficient. The turn should be cautiously effected, without force, and during the time of a pain.

Fig. 4.—In this figure the further progress of the child towards delivery is seen; the head is represented in the cavity of the pelvis, the forehead turned to the hollow of the sacrum, and the occiput advancing from under the arch of the pubis, the right hand of the operator in the act of bringing down one of the arms.

In presentations of the lower extremities, and in those rendered so by the operation of turning, it is a question if it be best to deliver with the arms extended above the head, or to draw them down by manual assistance. We would say, in breech cases, where the labor has advanced slowly and without the interference of art, and in crural cases, where the os uteri has become perfectly relaxed and fully dilated, it may be attended with some advantages to bring down the arms, especially if there be any contractions of the pelvis, or the head of the child be large. But in presentations of the feet, or where the operation of turning has been performed, when from some untoward cause it has been thought expedient to hasten the passage of the body through the pelvis, it is often better not to attempt to bring the arms down, lest the os uteri should contract round the head; or, as some suppose, round the neck of the child,* and thus impede the passage of the head, or cause the death of the child.

To bring the arms down, we pass one or two fingers over the shoulder of the child as far as the bend of the elbow (see drawing), which is then to be gently depressed, when the forearm usually passes through the vagina with little difficulty.

Should the operator's fingers be unable to reach the head of the elbow, or not readily dislodge the arm, it would be prudent to give up the attempt, rather than risk an injury to the child.

In first pregnancies, it will require care, as the arm passes, to guard the perinæum from laceration.

"The head being brought into the cavity of the pelvis, and the face turned to the hollow of the sacrum," the body of the infant should be raised towards the abdomen of the mother, by placing it on the left arm of the operator, as represented in the sketch, fig. 5. The index and middle fingers of the right hand are to be placed on the neck of the child, and the index of the left in the mouth, to depress the chin; when gentle traction in the axis of the outlet, during uterine action, will usually accomplish delivery. Should there be no uterine action,

* Dr. Merriman "believes that it very rarely takes place round the neck of the child," and says "when it does happen, it is round the upper part of the child's head, girding it like a band in a line just above the nasal bones in front, and below the projection of the occipital bone behind."

we should excite it by friction on the abdomen, or by the ergot, or the child may be lost by pressure on the navel string.*

Sometimes considerable difficulty attends the passage of the head. Should the child be affected with hydrocephalus, the fluid must be let out by the trocar or perforator, either behind the ear or at the back of the neck.

The following caution should be attended to in performing the operation of turning:—

The hand should not be introduced during a pain, but in the interval.

The os uteri ought to be dilated to the size of a half-crown, and dilatable, to justify the introduction of the hand.

Care should be taken to ascertain correctly the position of the feet, before passing the hand.

The danger in turning arises from the contraction of the uterus round the body of the child: hence, when the uterus acts powerfully (the waters being discharged), we must overcome this resistance, by exhibiting fifty or eighty minims of the tincture of opium, or three grains of the gum; when anodynes fail, a copious bleeding may be tried. When these fail, it has been proposed to exhibit the tartarised antimony, so as to produce nausea.†

Turning ought never to be performed until the bladder and rectum have been evacuated.

The operation of turning is required when any part of the infant presents from the base of the skull to the breech; it is also required in floodings, when the placenta is attached over the os uteri, and in some other dangerous hæmorrhages, &c.; and also in some funis presentations.

* Ryan's Midwifery.

† Ryan's Manual, page 523.

TABLE VII. B.

ILLUSTRATING THE OPERATION OF CRANIOTOMY.

Preliminary Remarks.—The cases demanding this operation are those in which there is so much disproportion between the size of the head of the child, and space within the pelvis, as not to admit the passage of the former through the latter. This disproportion may arise either from the pelvis being contracted, or from the extraordinary bulk of the infant's head, or from tumor, &c. in the parturient passages: the former is the most frequent cause.

The precise diameter of the pelvis through which an infant at the full term of gestation can pass, without reducing the bulk of the head, has not been accurately nor satisfactorily determined. Dr. Clarke, of Dublin, says that $3\frac{1}{4}$ inches from pubes to sacrum is the least diameter through which he has known a full-grown fœtus to pass entire.* Dr. Osborn says $2\frac{3}{4}$ inches.† But the term *full-grown* fœtus is indefinite and unsatisfactory as regards the size of the fœtus; for one full-grown fœtus may readily pass through a diameter of $2\frac{3}{4}$ inches, whereas another would with difficulty pass a diameter of $3\frac{1}{4}$ inches; such is the disproportion between children born at full maturity: we can at all times more readily measure the diameter of the pelvis, than ascertain the dimensions of the fœtal head.‡ Dr. Ryan says (Manual of Midwifery), "If the sacro-pubic diameter is only $2\frac{1}{2}$ inches, and the transverse or bis-iliac 3 inches, craniotomy is justifiable; but if the short diameter is only $1\frac{1}{2}$ inch, the operation would be useless, and dangerous."

Dr. D. Davis (Vide Elements of Operative Midwifery) has invented an instrument, which he denominates the *osteotomist*, for breaking down the fœtal skull and bringing it away piecemeal. With this instrument he considers it practicable to deliver in cases of extreme distortion, when the diameter is less than two inches; and also recommends its use in breaking down the skull in preference to using much force, in cases less contracted.

Craniotomy may also be indicated if the fœtus be dead, and the parturient passages so contracted as to preclude the possibility of delivery either by the forceps, lever, or by turning, or when the head remains in the pelvis, and the hand, forceps, or blunt hook, is insufficient for its extraction. This operation may now and then be demanded in face presentations and preternatural labors, when the head is too large to pass the superior aperture of the pelvis.

The time when the operation of craniotomy should be performed, must depend, in every case, on the state of the patient. It has been frequently performed too late to save the life of the patient. In cases of distorted pelvis affording no possible chance of a natural delivery, we should have recourse to the perforator so soon as the orifice of the uterus is sufficiently dilated to admit of its convenient and safe employment; but in cases of doubtful sufficiency of space to admit of a living birth, we must delay the operation so long as any chance remains of a natural delivery, consistent with the safety of the mother.

* See Transactions of the Dublin Association, &c. vol. i. p. 374.

† Essays on Midwifery (1794), p. 194.

‡ On the mode of measuring the pelvis, see Tab. III. Obstetric Tables.

DESCRIPTION OF TABLE VII. B.

Fig. 1—Represents the lower part of the abdomen, &c. the female lying in the dorsal position, with the left hand of the operator in the vagina, guiding the point of the perforator.

The operation of craniotomy may be performed when the patient is lying in the usual position, "left lateral," or as here represented; the latter is the most convenient for the operation.

On commencing the operation, an assistant should make gentle pressure on the abdomen, so as to keep the uterus steady and the head of the fœtus fixed during the operation.

The first part of the operation consists in introducing two or more fingers of the left hand into the vagina, then to carry them forward and place them, if possible, on the sagittal suture or anterior fontanelle, then introduce the perforator, and pass it along the palm and fingers till it reaches the head, and, with a semi-rotary motion, penetrate the integuments and gently push forward the instrument, till it reaches the stops. (See C. fig. 2.)

On turning aside the parts of the drawing marked A, the relative positions of the *fœtus*, *pelvis*, *&c.* are brought into view, the anterior part of the uterus, &c. being removed to demonstrate the situation of the fœtal head and bones of the pelvis, &c.

Fig. 2.—B. The head of the *fœtus*. C. The *Symphysis pubis*.
D. The *Sacrum*. E. The upper part of the *Vagina*.
F.F.F.F. The cut edge of the *Uterus* and *Vagina*.

The perforator being passed to the stops, or rests, we are now to open the blades to the extent of an inch or two, close them, and open them again transversely, so as to make a crucial incision. (See fig. 3, on turning down fig. 2.) The cerebral mass is now to be broken up by moving the blades in various directions. The blades should now be closed, and the instrument gently withdrawn from the vagina. The brain now generally escapes, the bulk of the head becomes considerably reduced, and the child may be expelled by the uterine contractions, without further interference. Should this not take place, unless some untoward symptoms demand immediate delivery, we may wait for some hours without any further interference, during which time the contents of the head will be forced out by the contraction of the uterus, the bulk of the head reduced, and the child may be expelled by the parturient pains; should this desirable circumstance not follow, the crotchet or craniotomy forceps must be applied, to complete the delivery. (See fig. 4, on turning down fig. 3.)

Fig. 4—Represents the same section of the parts described in fig. 2, with the crotchet introduced into the perforation of the cranium, and the left hand of

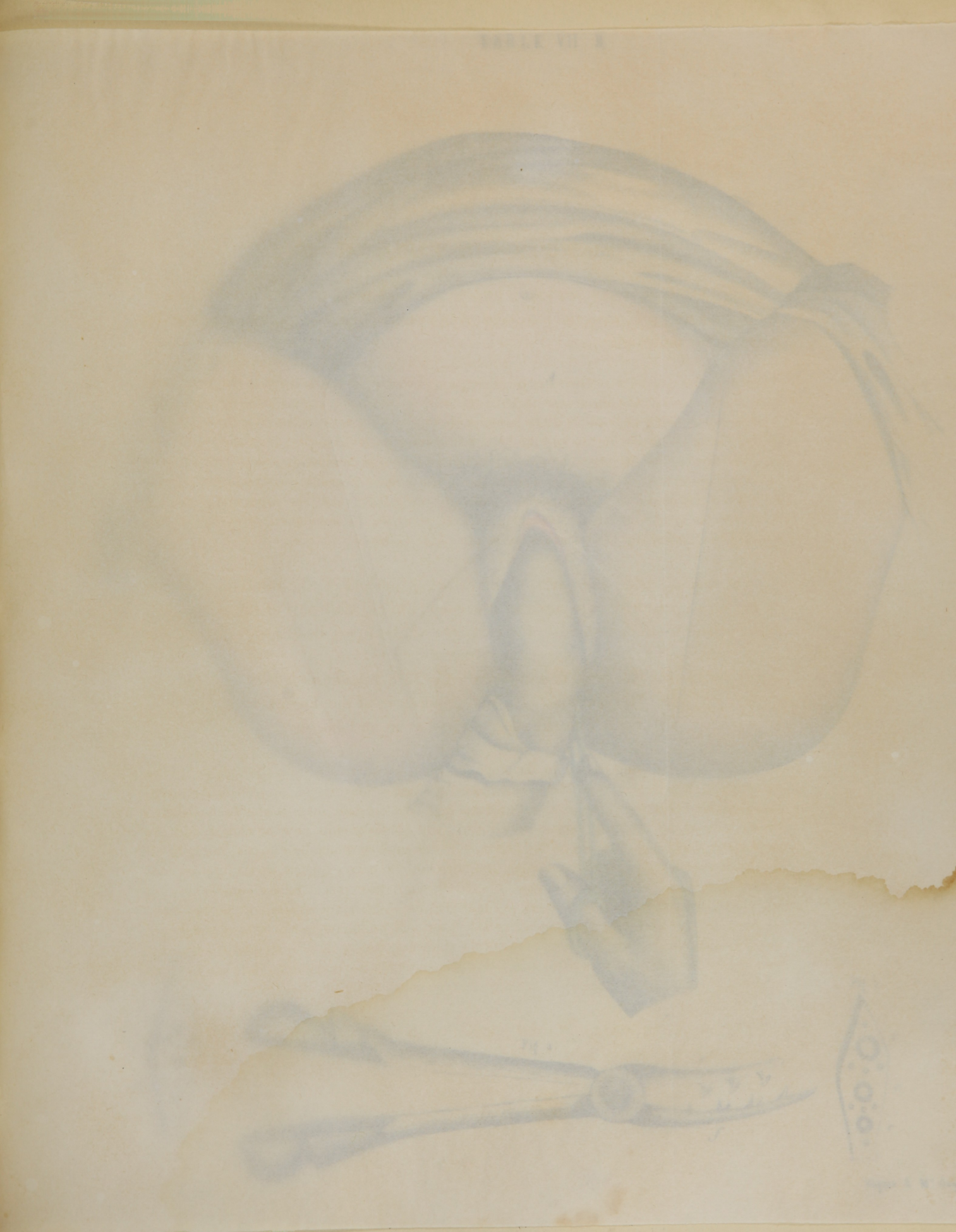


TABLE VII. B.

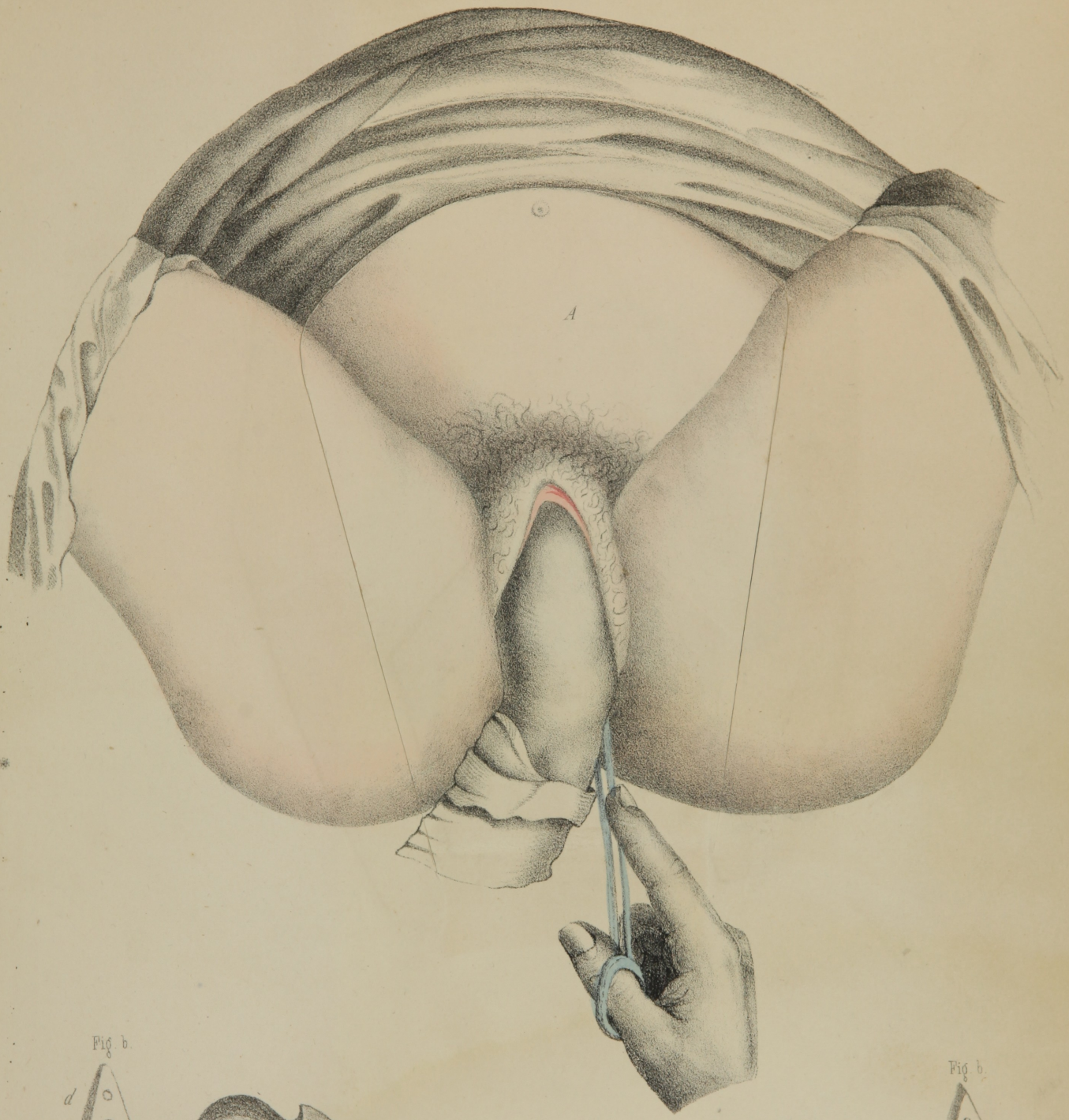


Fig. b.

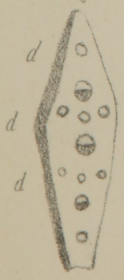


Fig. a.

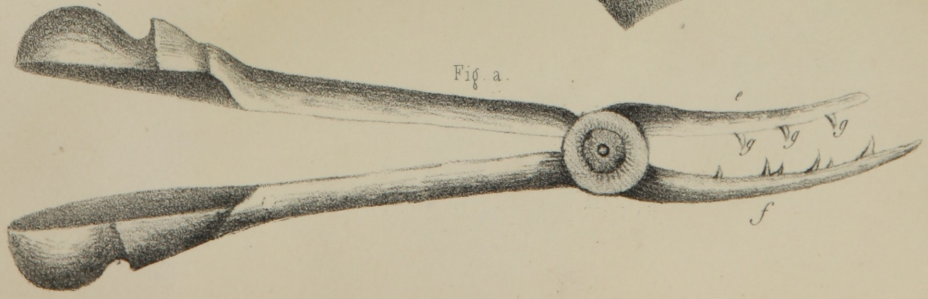
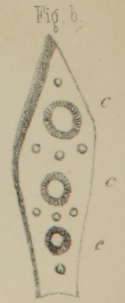


Fig. b.



G. Spratt del.

Wagner & M.c Guigan lith.

the operator in the vagina, to guard the passages against laceration, should the instrument slip from its hold, in drawing the infant through them.

The modern craniotomy forceps have now nearly superseded the crotchet,* as an extracting instrument; with the former we are enabled to use more power, with much less risk of doing violence to the parturient passages; and whichever instrument might be used, we must, in every stage of the extraction, draw down the head in the direction of the axis of the pelvis with great caution. The extracting force should be very moderate at first, but may be gradually augmented according to the exigency of the case. The operator should examine from time to time during the extraction if there be any pointed pieces of bone projecting beyond the integuments which might wound the passages; if so, they should be cautiously removed.

* There are many modifications of the craniotomy forceps recommended by obstetric teachers; of those we have seen, we give the preference to the forceps improved by Mr. Holmes. Fig. *a*, Table VII, is a sketch of that gentleman's forceps; he says, "they are to be introduced closed, till the point of the concave blade *h* reaches the perforation; it is purposely made longest, that it may slide over the outside, while the convex blade *i* begins to open and enter the perforation; this blade, *i*, is furnished with three chisel-shaped teeth, *f.f.f.*; they enter, while closed, three corresponding holes, *k.k.k.* in the opposite blade. Fig. 3 shews the inner faces of the blade *h* and *i*; smaller pointed teeth are also fixed in the blade *h*, with small corresponding holes in the blade *i*; these secure the integuments, while the three chisel-shaped teeth pass through the bones of the head, and enter the perforations in the blade *h*."

APPENDIX.

ON LABORS ATTENDED WITH CONVULSIONS.

The convulsions which occur during pregnancy and parturition very much resemble epilepsy; but to the symptoms these have in common, may be added, the peculiar hissing noise which women almost universally make with their lips during the convulsions.

Sometimes puerperal convulsions come on without any premonitory signs; but, in most cases, they are indicated by a piercing pain in the head, by giddiness, and other vertiginous complaints, by blindness, a sense of fulness and tightness about the head, by vacillation of the mind, or slight delirium, by violent cramp or pain at the stomach, by fulness or apparent strangulation of the neck and fauces. The pulse is usually full, hard, and very slow; but sometimes very rapid, and soon becomes small and feeble. The patient sighs often and deeply. When these symptons are not relieved by very active treatment, they are followed by a sudden deprivation of sense; the voluntary muscles first become rigid, and then violently agitated; the eyes roll, the teeth are fixed, and the whole countenance distorted, swollen, and livid; stupor follows, which continues from a few minutes to an hour, or longer; when the woman recovers, with sensations of extreme fatigue, and entire oblivion of the paroxysm. Sometimes the fit ends in apoplexy; or, after consciousness has been re-established for a short time, the convulsions return, and continue to recur for hours or days: and if the woman be in labor, they re-appear with the pains, and the stupor remains between the fits.

When convulsions happen to women with child, they are generally, but not constantly, accompanied or followed with symptoms of labor; but though the convulsions may be removed, the child is most frequently born dead.

Convulsions occur more frequently in first than in subsequent pregnancies or labors, and may appear at any time after the sixth month of utero-gestation.

It is of importance to distinguish genuine puerperal convulsions from hysterical paroxysms, which they sometimes resemble. They may be discriminated by bearing in mind that, in hysteria, the pulse is very rarely affected; the paroxysms come on without the usual premonitory symptoms of convulsions, and attack feeble, irritable women, rather than those who are robust, the usual subjects of convulsion.

Treatment.

The means to be used for the prevention or cure of convulsions, when threatened or existing, must be regulated according to the constitution of the patient and the violence of the

symptoms. It will always be necessary to take away blood; and it should be abstracted early, rapidly, and abundantly, that the vessels of the brain be unloaded: and it has been found particularly serviceable to open the jugular vein or temporal artery.

In this formidable disease, we are to regulate the depletion, not by the quantity drawn, but by the effects produced; and it will often be necessary to repeat the blood-letting more than once in the first few hours; after which more may be taken by cupping and applying leeches to the temples. Emetics, when they can be given, and nauseating doses of emetic tartar, will be conducive to the reduction of vascular action. From five to ten grains of the hydrargyri submurias, followed by a solution of magnesiæ sulphas, may be given. Croton oil has also been found useful. Clysters should also be given, to thoroughly evacuate the alimentary canal. The scalp must also be shaved, and cold evaporating lotions, or pounded ice in a bladder, should be constantly applied to it. It will also be prudent to empty the bladder.

Some practitioners have recommended the speedy delivery, as the most eligible and only effectual method of removing puerperal convulsions; but others have insisted that the labor should be uninterrupted. From the result of careful observation, made in numerous instances, it appears, that if the os uteri be rigid and undilated, any attempt to introduce the hand into the uterus, to expedite delivery, aggravates the convulsions; and, even when the os uteri is dilated, such an attempt will often bring back the paroxysms.

Should very urgent symptoms appear to justify delivery, before the head of the child has descended so low as to be within reach of the short forceps, either the long forceps or the perforator are to be preferred to the introduction of the hand into the uterus; excepting those case in which the parts may be well dilated, or in presentation of the arm, in which it is always necessary to change the position of the child by turning.

When puerperal convulsions continue after delivery, which in some instances they do, it will be necessary to persevere in the plan of treatment laid down, with the addition of counter-irritation by means of blisters applied to different parts of the body.

ON ABORTION, &c.

The predisposing causes of abortion are, general indisposition of the constitution, and an irritable and feeble condition of the uterus, not admitting of its distention beyond a certain extent, and premature development of the os uteri. Every action in common life has been assigned as the exciting cause of abortion; but it is to the excess of these actions that we are to attribute their effects. Plethoric women are more liable to abortion, from the peculiar disposition which the vessels of the uterus have, from structure and habit, to discharge their contents. Weakly women are liable to abortion, because they are susceptible of violent impressions from slight external causes.

Treatment.

As every disease to which women are liable may dispose to abortion, the remedial means to prevent it must be accommodated to the disease, or to the state of the constitution. In the majority of cases, there is local congestion, which demands repeated bleeding in small quan-

tities, either general or topical, by leeches or by cupping; and the diet should chiefly consist of ripe, subacid, or dried fruit. If there be debility and irritability, recourse must be had to a nourishing and invigorating diet, and medicines, sea air and cold bathing, cold water injections per vaginam or per anum. In every case, it will be proper to avoid all violent exercise, to keep the mind composed, and to rest frequently in a horizontal position. Sexual separation should be enjoined.

If uterine action be established, abortion can be but rarely prevented; but it should be attempted, by general and local bleeding; by injecting, per anum, three or four grains of opium, previously rubbed down with cold water; by cool air, light covering, and by the exhibition of nitras potassæ.

Opium should not be given, unless with the intention of temporarily subduing the contractile efforts of the uterus; which may be arrested for a time; so that, when they recur, it may be with augmented power to expel the ovum. The secale cornutum may be given to advantage to assist the uterine efforts.

There is an endless variety in the manner in which abortion takes place; some women abort with sharp and long-continued pains, others with little or no pain; some with profuse and alarming hemorrhage. The hemorrhage in abortion is not always in proportion to the period of pregnancy.

The hemorrhage usually depends upon the difficulty with which the ovum may be expelled, and upon the state of the constitution naturally prone to hemorrhage. If the woman's life be endangered by hemorrhage, every medicine or application which has the power of slackening the circulation must be used; cold or astringent injections into the vagina, or even a piece of ice may be introduced within the vagina; dashing cold water on the abdomen; and the exhibition of lead internally, in combination with opium and acetic acid. Plugging up the vagina with a piece of lint or sponge has been sometimes used with advantage, by favoring the formation of coagula. Sometimes the hemorrhage is kept up by some portion of the ovum remaining partly within the uterus. Should circumstances seem to demand it, this may be removed by a careful application of the fingers. The ovum has been retained in the uterus for many months after the symptoms of abortion had appeared, and when it had lost the principle of increasing; but it is not thought proper to use manual or instrumental assistance for bringing the ovum away. Abortion occurs more frequently at the sixth, tenth, and twelfth weeks, and at the seventh month. The exciting causes of abortion, at those periods, should be carefully avoided.

ON HEMORRHAGE.

Hemorrhage, previous to or during the time of parturition, must be considered an occurrence of considerable danger, and as one demanding prompt and active interference. Uterine hemorrhage may occur before, during, or subsequent to the birth of the child; and is either accidental or unavoidable. Accidental, when occasioned by the separation of a part or the whole placenta over the os uteri. Hemorrhage arising from the first cause is not so dangerous as those from the second; nevertheless it sometimes proves fatal. The danger attending hemorrhages is to be estimated from a consideration of the general state of the patient, of their cause, of the quantity of blood discharged, and of the effects produced, which will vary in

different constitutions. Hemorrhages are infinitely more dangerous with sudden than with slow discharges of blood, even though the quantity lost be equal.

From whatever cause flooding may arise, the following general directions will be applicable, and should be rigidly observed. An horizontal position, cold applications of vinegar or salt water to the pubes and loins; vinegar and cold water may be injected into the rectum, and a piece of ice, if it can be obtained, introduced into the vagina; but very slight covering to the bed, and freely admitting as much cool air into the room as possible: as little food as possible should be given, avoiding all kinds of stimulating drinks and medicines. By these means the hemorrhage will frequently cease, or be so much diminished as to place the woman out of danger.

Should such measures not be successful to arrest the progress of accidental hemorrhage, two modes of proceeding have been proposed. First, to deliver the woman by turning the child and delivering by the feet; secondly, to merely rupture the membranes, that the liquor amnii may escape; the uterus, by contracting on its contents, may so far diminish the hemorrhage, that the woman may go on with safety until the child is expelled.

Of the propriety of this delivery there is no doubt, except as to the precise time when it should take place. On the first appearance of the hemorrhage, unless it be prodigious in quantity, or unusually untoward in its effects, it is seldom either requisite or proper to attempt to deliver by art; nor does it often happen that a second or a third return of the discharge compels us to do so.

The first method appears best adapted to those cases in which there is an absence of all uterine action, or in which the pains are extremely feeble and inefficient, with a relaxed condition of the cervix uteri. The second method is applicable to those cases in which there are labor pains, and almost always with success. Unavoidable hemorrhage is caused by the implantation of the placenta over the cervix uteri. Though the placenta be attached over the cervix uteri, the woman usually passes through the early part of pregnancy without any inconvenience; but flooding may occur, at any time after the fifth month, whenever the expansion of the cervix uteri lacerates those vessels which pass between it and the placenta.

But when the changes previous to labor come on, there must be hemorrhage; and the patient is never free from danger till she is delivered; and as the delivery is seldom completed by the natural efforts, we must be careful not to delay the delivery too long.

Sometimes the placenta is retained from torpor or irregular contractions of its fibres, and a profuse discharge of blood, when no action is exerted by the uterus to expel the placenta; and this is found to be by far the most common cause of hemorrhage at the time of delivery Whenever there is hemorrhage, the whole or a portion of the placenta must have been previously separated; and the hemorrhage usually continues, or returns, till the placenta is expelled, or extracted out of the cavity of the uterus. A loss of contractile power exists in various degrees; sometimes to such an extent, that the hand, introduced into the uterus, may be carried up to the scrobiculus cordis, without restoring its contractile powers: the extraction of the placenta is therefore to be considered as the only method by which an apprehended or present dangerous hemorrhage is to be prevented or avoided. Internal irritation of the uterus, by gently moving the fingers, and external pressure and friction, the application of cold, and the exhibition of the ergot of rye, are the principal means on which we must rely to re-excite the action of the uterus. When flooding occurs, with retention of the placenta from irregular

or spasmodic action of the uterus, the hemorrhage will be checked by such means as relax the spasms, *i.e.* a full dose of opium ; when the placenta may be removed, as illustrated at Tab. v. B.

The hand should never be withdrawn from the uterus until it begins to contract, except it be to empty the organ of coagula. Syncope or fainting is not an unfrequent consequence of flooding ; and although it is sometimes beneficial in staying flooding, it must be viewed as an evidence of danger, and as indicative of extreme loss of energy in the vascular system. Moderate fainting is beneficial, because, during its continuance, the mouths of the vessels often become so sealed by contraction and the formation of coagula, that hemorrhage ceases. Hence it ought never to be rashly interfered with, by the exhibition of brandy and other stimulants. As a general rule, stimulants are inadmissible in any case of uterine hemorrhage ; but when great prostration of the vital powers exists, with syncope, and the patient has continued faint so long as to give time for the vessels of the uterus to contract, then small and repeated doses of such stimuli as brandy or ammonia must be given ; as also nourishment in small quantities, very often repeated. Other means are also to be used ; and one of the most effectual is sprinkling the face and chest with cold water.

ADDENDA.

TABLE I. C.

CESAREAN OPERATION.

Fig. 1.—The different modes of making the incision. No. 1. Baudelocque's No. 2. Lauvergeat's.

Fig. 2.—The mode of the ancients. Commencement of the operation. 1. Section of the abdominal parieties, in the direction of the *Rectus Muscle.* 2. Section of the walls of the womb.

Fig. 3.—Extraction of the child.

Fig. 4.—Passage of the sound to convey the umbilical cord through the *os tincæ.* 1. The upper end of the sound with the ring fastening the cord. 2. The lower end of the sound protruding from the vulva.

Fig. 5.—The Cephalotribe.

TABLE I. C.

HYSTEROTOMY, OR THE CESAREAN OPERATION.

The artificial opening of the uterus, by an external incision, commonly termed the *Cesarean operation*, is one of the last resorts of science when nature fails, or when unforeseen impediments prevent delivery by the natural passages. This operation should of course never be performed, except when it is evident that delivery is *impossible* in any less objectionable form, or in other words when we have simply the choice of either doing this, with a *chance* of success, or leaving the patient to *certain death!* In any case, if the sacrifice of the *child* will obviate the necessity for such a dangerous operation, common sense and humanity evidently dictate that the sacrifice should be made. So that this operation should never be performed at the risk of the mother, merely with a view to saving the child.

This operation has met with great opposition and with great commendation. There is no doubt, however, but that it is frequently *the only resource*, though it has probably been performed in many cases when not imperatively needed. The necessity for it is not so great at present as it has been, owing to greater perfection in the structure and uses of various instruments for extracting the child, particularly the *Cephalotribe*, which will be described hereafter.

That this operation is a most serious one, as much so, probably, as almost any other, is undoubted. Some writers have asserted that *five-sixths* of those operated upon die! Others, however, assert that the proportion is not so great; and it is certain that cases have been known where the same person has been operated upon *several successive times*, and yet fully recovered. It is probable that the danger is much decreased by modern skill and science, and probably will be still more so. If the modern practice of *artificial delivery* was practised in every difficult case, at an early period, hysterotomy would never be needed, because the fœtus could then be removed while it was so small as to be passed by the vagina.

When it is fully ascertained that the child *cannot* pass through the pelvis, and that the artificial opening *must* be made, the inquiry comes, what way is the best of making it. There are three modes of operating in this extremity—that of the ancients—that of Baudelocque—and that of Lauvergeat,—each with its advantages and disadvantages. Excepting for the difference in making the *incision*, the process is much the same in all the modes. We need only describe it, therefore, in that most usually practised, the *Ancient*.

The Operation.—The most condensed, and yet detailed description of this important operation is given by Maygrier, in his "Midwifery Illustrated," which we therefore quote in full.

TABLE I C.

Fig. 5.

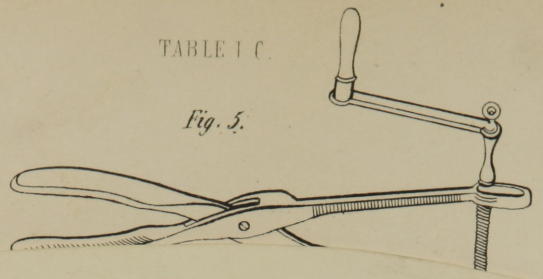


Fig. 1

Wagner & M.c Guigan lith.

"The female being placed on the edge of her bed, and slightly inclined towards the side opposite the operator, the latter, holding a common bistoury with a spring blade, makes a longitudinal incision from seven to eight inches in length, *in the direction of the rectus muscle*, and one inch from its outer edge, so that the lower angle of the wound is three or four fingers' breadth above the pubic region. This precaution is necessary in order that the instrument in its progress may not wound the membranous part of the abdominal muscles.

As soon as the integuments are divided, some portions of the intestine may project through the external wound; this must immediately be very carefully replaced, since if injured severe symptoms may follow. In order to avoid this accident, it has been recommended to introduce a probe-pointed bistoury, in one or the other direction, raising the integuments with the instrument, the blade of which is then directed from within outward.

When the integuments are divided and the edges of the wound are slightly separated, the body of the uterus appears, which can be recognised by its globular form, and its shining and glistening appearance. We must instantly open it by an incision from above downward, in the direction of that of the integuments, and four fingers' breadth in extent, large enough, of course, to extract the child. This incision should be made so that its lower angle comes at or near the centre of the incision in the integuments. (*See Table* I. C. *Figure* 2.) The operator then introduces one hand within the uterus, seeks for the child's feet, which he grasps and delivers with celerity and prudence. (*See Table* I. C. *Figure* 3.) Although the child is extracted through the soft parts, which oppose its delivery but slightly, it is not strictly necessary to proceed as methodically and with the same precautions as when the labor is terminated in the usual manner. Much caution must however be used. We must always remember that this severe operation has been performed to save the child, and that, with all our care, its life is endangered by weakness.

After the child is delivered, the thing most important to the success of the operation is the delivery of the placenta, which may be accomplished in two modes; either through the incision, or through the natural passages. The first mode demands no directions: in fact, we have only to remove the placenta through the external wound, by the aid of the cord, and to deliver it without any other precaution than that required by its passage through the wound in the uterus. But to obtain this result, the placenta must be completely detached after the delivery of the child: for if the least force is required, it is infinitely better to leave it within the uterus, and to wait until the uterine contractions bring it down towards the neck, and to extract it from the natural passages. This last process is highly advantageous, as it favors the flow of the fluids towards the vagina, and thus turns them from the wound in the uterus, through which it is always dangerous for them to pass.

But if the umbilical cord be left in the uterus after the child is delivered, it can pass through the neck but rarely, and as in this case we must wait until the whole placenta has come there, before we can deliver it, it is recommended immediately after the child is expelled, and the cord divided, to introduce its cut extremity into the tube of a long gum-elastic sound, the opposite extremity of which is directed through the wound in the uterus towards the inner opening of the os tincæ: in this manner, the cord is brought through the vagina out of the external organs of generation, and then the placenta can be extracted.

Although this mode is ingenious, something was still desirable, since the cord not being attached to the tube of the sound, might easily escape and frustrate this part of the operation.

To prevent this inconvenience, we have thought of fitting a moveable ring to the extremity of the sound which receives the end of the cord, by which we may tighten the extremity of the sound at pleasure, and thus fix firmly the portion of the cord within it. *(See Table* I. C. *Figure* 4.*)*

We ought not to omit mentioning a very serious circumstance which may occur at the moment the uterus is divided. Suppose, in fact, that the placenta is attached to the inner face of the uterus, in that part corresponding to the incision of this organ, we must necessarily make a large wound in it; this might occasion hemorrhage, which would be more dangerous, because most of the fluid would come into the cavity of the uterus, and some also might be effused into the abdomen.

However serious this accident might be, we must deliver the placenta, and even remove its divided portions through the wound in the uterus, as quickly as possible. This is the only mode of arresting the hemorrhage, and of preventing the danger which might attend the mother from the more or less prolonged continuance of the portions of the placenta in the uterus.

When the delivery of the placenta is happily terminated, the female must immediately be put to bed, in a slightly bent position, and the most perfect rest must be enjoined.

Some practitioners have proposed to apply sutures to the edges of the wound of the integuments, to keep them in contact, and to favor the formation of a cicatrix: but we prefer simply strips of adhesive plaster. Some compresses placed gently on the wound, and a loose body bandage, complete the dressing. In fact, if the operation be successful, the uterus in contracting soon effaces the incision made to remove the child: the cicatrization of the external wound not being prevented, the female may be perfectly well in a few days.

Such is the ancient mode of performing the Cesarean operation: it is generally employed, even by the moderns, but its severe inconveniences have induced practitioners to substitute others for it. In fact, it is evident that in this mode of performing the operation, the abdominal muscles are divided in different directions, and the transversalis abdominis muscle is not cut across, which might retard the cicatrization of the external wound. Farther, in performing the operation in this manner, we cannot always avoid the epigastric artery or some of its large branches, and even the uterine artery and the appendages of the uterus. The placenta, too, which is often attached to the sides of this organ, may also be interested in a greater or less extent, and thus give rise to the most alarming hemorrhages. Finally, the place in which the operation is performed, may not always be large enough, on account of the deformity of the person operated upon, which is sometimes very great. Such are the inconveniences, we might almost say the accidents, which attend the Cesarean operation performed after the manner of the ancients, which have led practitioners to make the incision of the abdomen along the linea alba. This mode of operating is termed Baudelocque's mode.

Baudelocque's Mode.—The division of the abdominal muscles in the Cesarean operation, has always been considered by practitioners as a serious circumstance. Violent inflammations, the length of time necessary to the cicatrization, and the risk of protrusions of the intestines, are in fact very common.

The last considerations led Baudelocque to propose to make the incision in the abdomen along the linea alba. In this mode of operating, the fleshy part of the abdominal muscles is

not concerned: we also avoid all the other inconveniences mentioned above; but it also presents remarkable disadvantages, which we shall mention after describing the operation. *Table* I. C. *Figure* 1. *No.* 1.

In this process, the parietes of the abdomen are divided along the linea alba, and the incision is equal in extent to that made on the side in the former mode. This incision commences at two or three fingers' breadths above the umbilicus, which must be avoided, passing on the side of it, and terminates three fingers' breadths above the pubis. In this manner nearly all the linea alba is divided, and exposes the uterus, in which an incision is made precisely like that mentioned in the former mode. The other steps of the operation are exactly like those mentioned above: we shall not repeat them here.

This process, as we have described it, is doubtless more simple than the preceding, since all the inconveniences mentioned in the operation, as performed by the ancients, are avoided; but it presents some others which we must mention, such as the length of the cicatrix, and the extreme difficulty of its healing: this exposes females to hernias, which are more difficult to reduce and to prevent, because the parietes of the abdomen present no resistance to their formation; on the other hand, if females who have been operated upon become pregnant again, they are exposed to new hernias, which may be extremely large, and also to all the bad symptoms which they cause.

We have now to say one word of Lauvergeat's mode, which, like the preceding, presents some advantages and disadvantages: but this differs very much in respect to the place and direction of the external incision.

Lauvergeat's Operation.—This scientific practitioner, struck with the great inconveniences attending the longitudinal division of the fibres of the transversalis muscle, and with the difficulty resulting from it in the cicatrization of the external wound after the Cesarean operation as performed by the ancients, proposed to make a transverse instead of a longitudinal incision of the abdominal muscles. In this mode of operating, in fact, the fibres of the transversalis muscle are scarcely touched; they are separated, rather than divided: and if the operation be successful, the cicatrization of the external wound, favored by the flexed position of the patient, is very easy. *See Table* I. C. *Figure* 1. *No.* 2.

But this mode, on the other hand, presents so great disadvantages, that it has been nearly abandoned by practitioners, who generally prefer one of the two preceding processes. It is, in fact, remarkable for this, that when the operation performed in this manner is about to succeed, it must perhaps be rejected: for then the incision of the uterus being suddenly brought below that of the integuments, by the quick contraction of this organ, one part of the lochiæ must inevitably escape into the belly, and cause there serious accidents.

It follows, from these remarks, that of the three modes of performing hysterotomy, the operation of the ancients is most inconvenient, although perhaps it is more easily practised; and it is also advantageous as allowing an easy issue to the lochiæ, which sometimes escape through the wound in the uterus: so that Baudelocque's mode seems preferable to the other two, although the only one which is attended with such fatal consequences: we allude to the difficulty of cicatrization, and the inevitable formation of hernias. As to Lauvergeat's mode, its advantages do not compensate for the inconveniences which often attend it, and we think it should never be performed.

M. Baudelocque, jun. has recently proposed a new process, which deserves the attention of practitioners."*

Our dissected plate will facilitate the understanding of all these descriptions very materially, and in fact makes them as intelligible as they can be made, by any kind of pictorial illustration.

* The following account of M. Baudelocque, jun.'s mode of performing the Cesarean operation, is from *Dr. Meigs' translation of Velpeau's Midwifery.*

"The incision is commenced near the spine of the pubis, and extends, parallel to Poupart's ligament, beyond the antero-superior spine of the ilium. He selects the left side, on account of the inclination of the cervix, when the womb is oblique to the right, and the right side where there is a left lateral obliquity. After having divided the abdominal parietes without touching the epigastric artery, he pushes away the peritoneum from the iliac fossa, quite down into the excavation, and detaches it from the upper part of the vagina, which he opens; through this opening, which ought to be sufficiently free, the finger is conducted into the os uteri, which is now to be drawn up towards the wound in the abdomen, while the fundis is at the same time pressed in an opposite direction, so as to make it turn over more readily. When the operator has succeeded in bringing the orifice of the womb opposite to the opening made in the abdominal parietes, the delivery is intrusted to the uterine contractions, or provided it should be absolutely necessary, the orifice might be dilated with the fingers, and the fœtus extracted either with the hand or the forceps."

THE CEPHALOTRIBE.

(*See Table* I. C. *Figure* 5.)

This instrument has done more than perhaps any other to obviate the necessity for the Cesarean operation. The following description of the instrument and its use, is taken from Chailly's *Practical Treatise on Midwifery*, a most excellent work.

"The cephalotribe, or compressing forceps of the head, invented by M. Baudelocque, nephew of the celebrated accoucheur, is a most precious instrument, which cannot be too positively defended against its traducers. It advantageously replaces all the sharp crotchets, and the entire arsenal of cutting instruments, armed with teeth, &c.; instruments almost as fatal to the mother as to the child, and which, I am happy to say, are completely banished from practice.

This instrument, composed of two branches, is applied, like the forceps, at the superior strait, on the two sides of the pelvis. In fact, even when it can be applied regularly to the head, it becomes altogether useless, if the size of the head must be reduced.

The important point in this operation is, carefully to guide the instrument into the uterus, and to be well assured that the organs of the mother have not been included within the grasp of the cephalotribe. Its weight, although much reduced since its invention, renders it much less manageable than the ordinary forceps.

The head being seized, the branches must be articulated, and then brought together by turning the manivelle. The firmest and most thoroughly ossified heads readily yield under the pressure of this instrument. As soon as the reduction is effected, the accoucheur should proceed to the extraction with all possible care; for spiculæ of bone frequently pass through the scalp, and may lacerate the maternal organs. To avoid these accidents, the accoucheur must give to the cephalotribe a proper direction; he should endeavor to place the largest diameter of the crushed head in apposition with the largest of the pelvis. For this purpose, he directs the concavity of the borders of the instrument either to the right or to the left, as he may experience more facility in bringing down the head in one or the other direction; he should also introduce the fingers of the left hand, in order to protect, as much as possible, the organs from the spiculæ of bone which may have protruded through the scalp.

Some authors have recommended always to perforate the cranium before applying the cephalotribe; but it seems to me that this precept should not be absolute. In my opinion, we should commence by perforating when we have reason to hope that this alone will suffice;

but when we know in advance that we must resort to the cephalotribe, notwithstanding the perforation, there can be no motive in performing two operations when one will be sufficient. In a word, the most solid heads cannot resist the cephalotribe; the scalp is perforated spontaneously, and the brain escapes of itself; this, at least, is what I have always observed in the living female, in the manikin, and in the dead infant. The operation is more rapid, less dangerous for the mother, and is not so repulsive to the assistants; and I believe that the opinion that perforation of the cranium should always of necessity precede the use of the cephalotribe, has been advanced with no other object than to make it appear that this instrument is incomplete."

NOTICES OF THE PRESS.

"Although we possess a number of excellent elementary works on the practice of midwifery, we are deficient in graphic illustrations, which convey to the mind of the student a knowledge of its principles. The works of Hunter and Smellie are too cumbrous, too expensive, and want all those points of information which the industry and skill of medical men have, since their time, clearly elucidated. The work of Mr. Spratt will supply this want. The plates are well executed and ingeniously contrived to exhibit, in a clear and comprehensive view, all the most important objects which belong to the obstetric department. By an admirable arrangement, similar to that which has been adopted by Tuson in the display of the different succession of muscular layers, the natural positions of the parts are judiciously shown. Besides the delineations and explanations of the figures, the author has given some very judicious practical remarks. We most strongly recommend this book to the student and to the profession. It is a volume alike interesting to both, for it instructs the former, and recalls to the recollection of the latter many most important circumstances, which it is impossible for the memory to retain in vivid and fresh colours."—*Med. and Surg. Journal.*

"The desire of pointing out to the attention of the student whatever is calculated to facilitate his acquisition of knowledge, has induced us to notice several works analogous to the present. Those which we have hitherto mentioned have related to difficult points of anatomy, such as hernia, &c.—subjects which are unquestionably much more easily mastered by the beginner, with the aid of plans, which he can, as it were, dissect and replace at will, than by any other contrivance with which we are acquainted. Some of the more important and obscure parts of midwifery have received this kind of elucidation from Mr. Spratt, whose ingenious and well-contrived plans we have examined with great satisfaction. They represent the impregnated uterus and its contents under various circumstances, and are excellently contrived to fulfil the design for which they are intended."—*Lond. Med. Gazette.*

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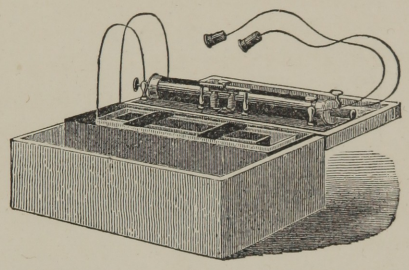

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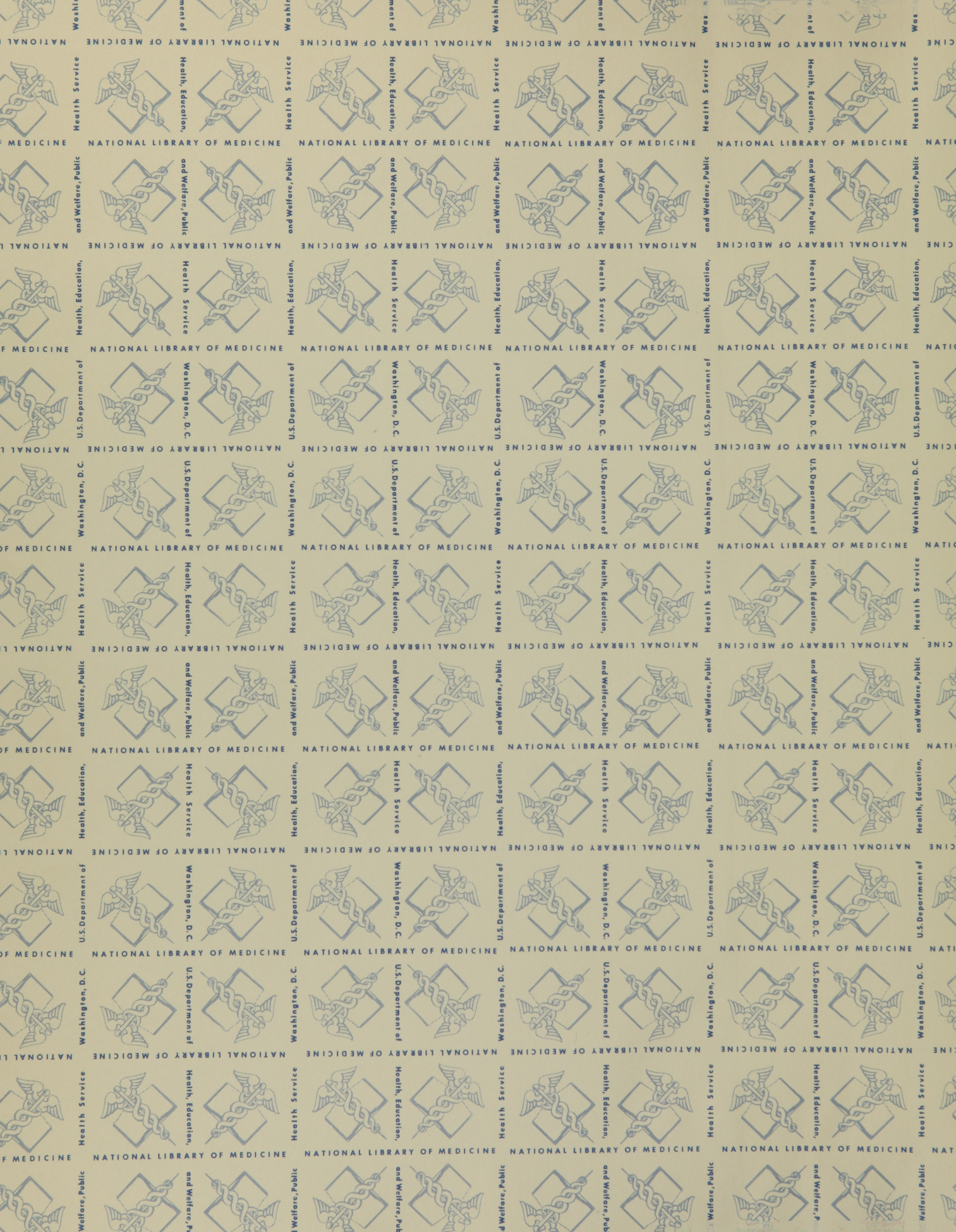
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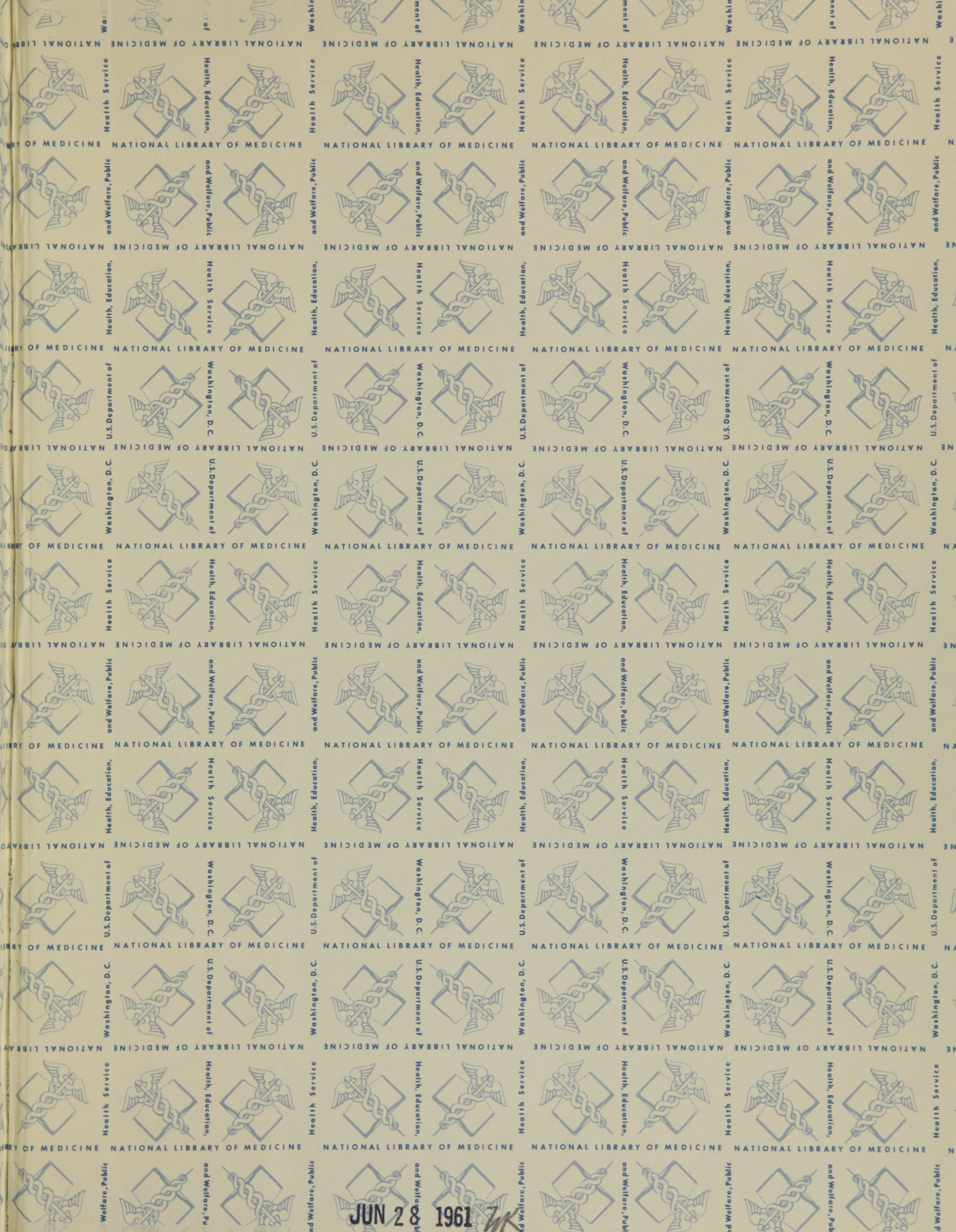
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