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GRADUATION
PAPERS,

PULTE MEDICAL COLLEGE.
CINCINNATI,

CLASS, 1882.

MARY WOLFE.

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Examination Papers

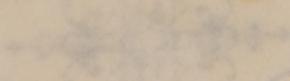
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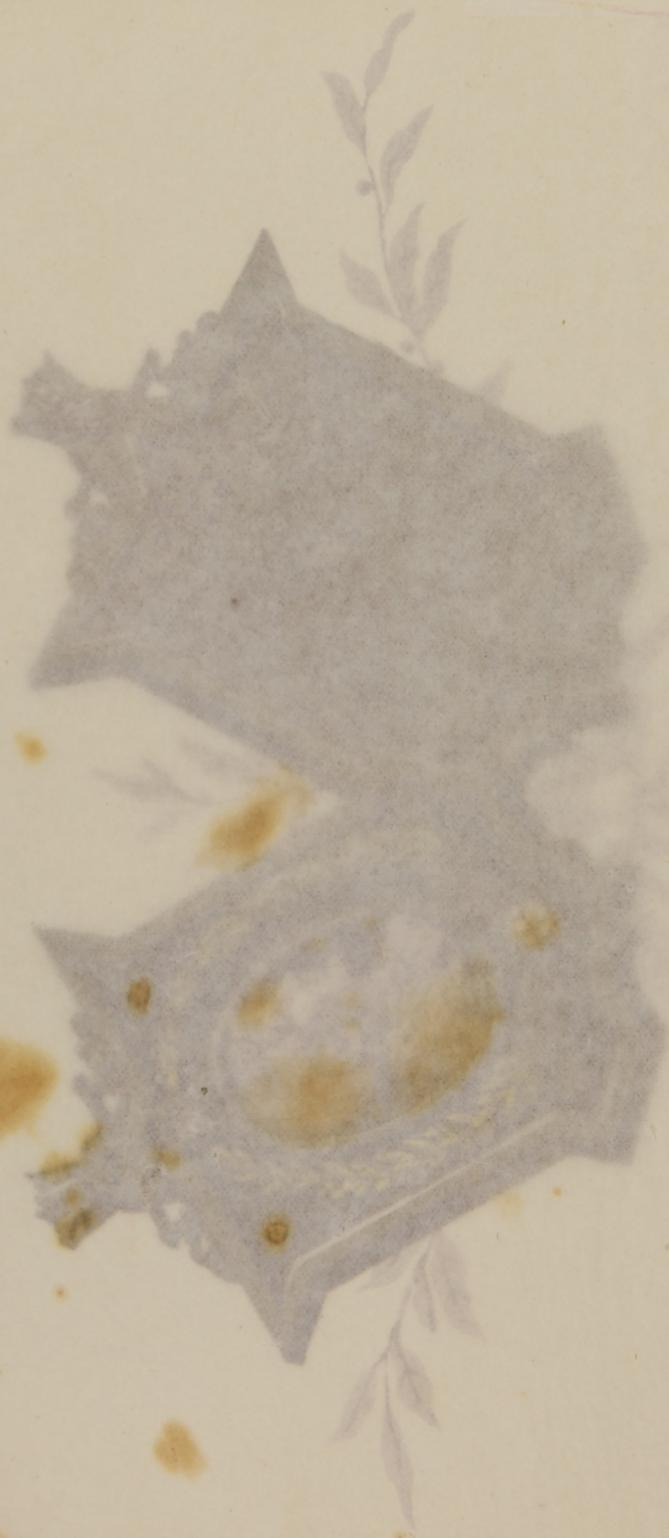
Mary Wolfe.

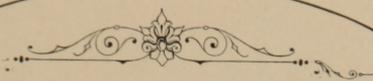
PULTE MEDICAL COLLEGE,

Class 1855.

1855







Examination · Papers

OF

Mary Wolfe,

DULTE MEDICAL COLLEGE,

Class · 1883,

CINCINNATI, OHIO,

1886.



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Correspondence.

146 SMITH STREET, CINCINNATI, O.,
March 10, 1882.

Professor J. M. CRAWFORD,

DEAR SIR:

The complimentary terms in which you spoke of MARY WOLFE'S written examination in Physiology and Histology in your public speech, at the Commencement Exercises of Pulte Medical College, at College Hall in the Mercantile Literary Building in this city, March 1st, 1882, and to memorialize which was awarded an elegant gold medal, have caused many personal friends to express a desire to read it.

Will you be kind enough to allow me a *verbatim* copy of her paper?

Yours truly,

N. B. WOLFE.

COR. SEVENTH AND MOUND, CINCINNATI, O.,
March 11, 1882.

Dr. N. B. WOLFE,

DEAR SIR:

Your note of yesterday is before me, asking for a *verbatim copy* of your daughter's examination paper, and I cheerfully comply with your request.

The committee that awarded the medal to Miss MARY WOLFE did so with entire unanimity. Her paper was *best* in that comprehensive sense which includes general scholarship, as well as physiological knowledge. The reading of it, I trust, will show to yourself and friends, as it did to the members of the committee, that the medal was worthily bestowed.

I am sincerely yours,

J. M. CRAWFORD.

INTRODUCTION.

It will be a matter of interest to our friends to learn the circumstances under which the following paper on Physiology and Histology was written, and how the award of the gold medal was made.

Professor J. M. Crawford announced to the members of the class that he desired them to assemble in the amphitheater of the college, on Wednesday, at ten o'clock A. M. of examination week. When they came together, he handed each student a paper containing the following examination decalogue :

- I. *Name the Contents of the Respective Regions of the Anterior Portions of the Chest, and give the Signs of Normal Functions of the Organs in each Region.*
- II. *Give the Divisions of Proximate Principles of the Blood, and the important Peculiarities of each.*
- III. *Describe fully the Process of Mastication, and give the Mechanism of Deglutition.*
- IV. *Describe Saliva, Gastric Juice, Pancreatic Juice, and give the Mechanism of their Secretion and the Function of each.*
- V. *In the Digestive Process, give the Successive Steps by which the Food finally enters the Blood,*
- VI. *Give the Relations of the Nervous System to the Glycogenic Function of the Liver.*
- VII. *Give the Physiological Anatomy of the Kidney, and Mechanism of the Secretion and excretion of Urine.*

- VIII. *Give the Mechanism of Respiration, and the Means by which Oxygen is conveyed to the Tissues.*
- IX. *Give the Mechanism of the Continuous Flow of Blood in the Veins, and the Cause of a Systemic Venous Pulse.*
- X. *Describe fully a Nerve, and give its Physiological Properties.*

The Professor supplemented these problems by stating that during the examination the students were expected not to converse with each other, nor to ask questions or refer to memoranda. In short, the class was given to understand that every student was expected to do *square work*. As each paper was finished it was delivered to Professor Crawford, who was present during the entire examination.

At the commencement exercises of Pulte Medical College, in College Hall of the Mercantile Library Building, March 1, 1882, after the addresses and valedictory had been delivered, the Dean of the College, Professor J. D. Buck, announced that "the next thing on the printed programme is the delivery of the diplomas to the graduating class; but, before doing this, one of the exercises of the evening, not set down, as it should have been, will now take place." Hereupon Professor J. M. Crawford came to the front of the rostrum, and said substantially:

"A friend to education and to Pulte Medical College, who does not wish his name made public, but who entertains a high appreciation of the study of Physiology and Histology, as constituting the foundation of a reliable medical education, in order to encourage application and reward success, placed in my hands, early in the term, funds to provide an annual prize, to be presented to the student who gives the *best examination paper* in this department of medical study. This award will be called 'THE UNKNOWN PRIZE,' and, like the Protean body, will take any shape

that may seem at the time best calculated to reward the victorious competitor. This year it takes the form of a gold medal. Whence it comes you will never know ; but whither it goes, each succeeding commencement, during my connection with the college, will reveal.

“The duty of selecting the one entitled to receive this award has been scrupulously performed by the Professor of Physiology, assisted by the Dean and other members of the Faculty. Among the papers of merit which they have examined and indorsed as worthy of honorable mention, there was one that attracted special attention, and commanded the admiration of the examining committee. This paper was found not only to be unusually comprehensive and exact in its grasp and arrangement of physiological and histological facts, but its statements were clear, concise, and in classic English.

“The prize I hold in my hand. You perceive it has the shape of a Greek cross, the base modified to resemble the human heart. On the face of the top section of the cross is engraved the symbol of the astral lights, a dual triangle forming a star, in the center of which is the radiant face of the sun. On the right section appears Mercury, with winged feet, walking upon a troubled sea, himself resplendent in the ambient air, bringing his appropriate message. On the left is ornately engraved a representation of Hygeia, the daughter of Esculapius, in the attitude of receiving light for her lamp from the emblem of wisdom, the serpent. The lower part of the cross is heart-shaped, on which is engraved the mundane egg, the mother source of natural life. Thus are symbolized in this beautiful jewel, the four elements, Fire, Water, Air, and Earth, associated with Wisdom, all contributing to Health. The circle in the center of the cross contains a beautiful enameled monogram, surrounded, in engraved Greek char-

acters, with the well-known motto, *Γνωθί Ζεαυτόν*, 'Know Thyself.' On the reverse of this medal is inscribed this personal legend:

AWARDED

TO

Miss Mary Wolfe,

FOR THE

Best Written Examination

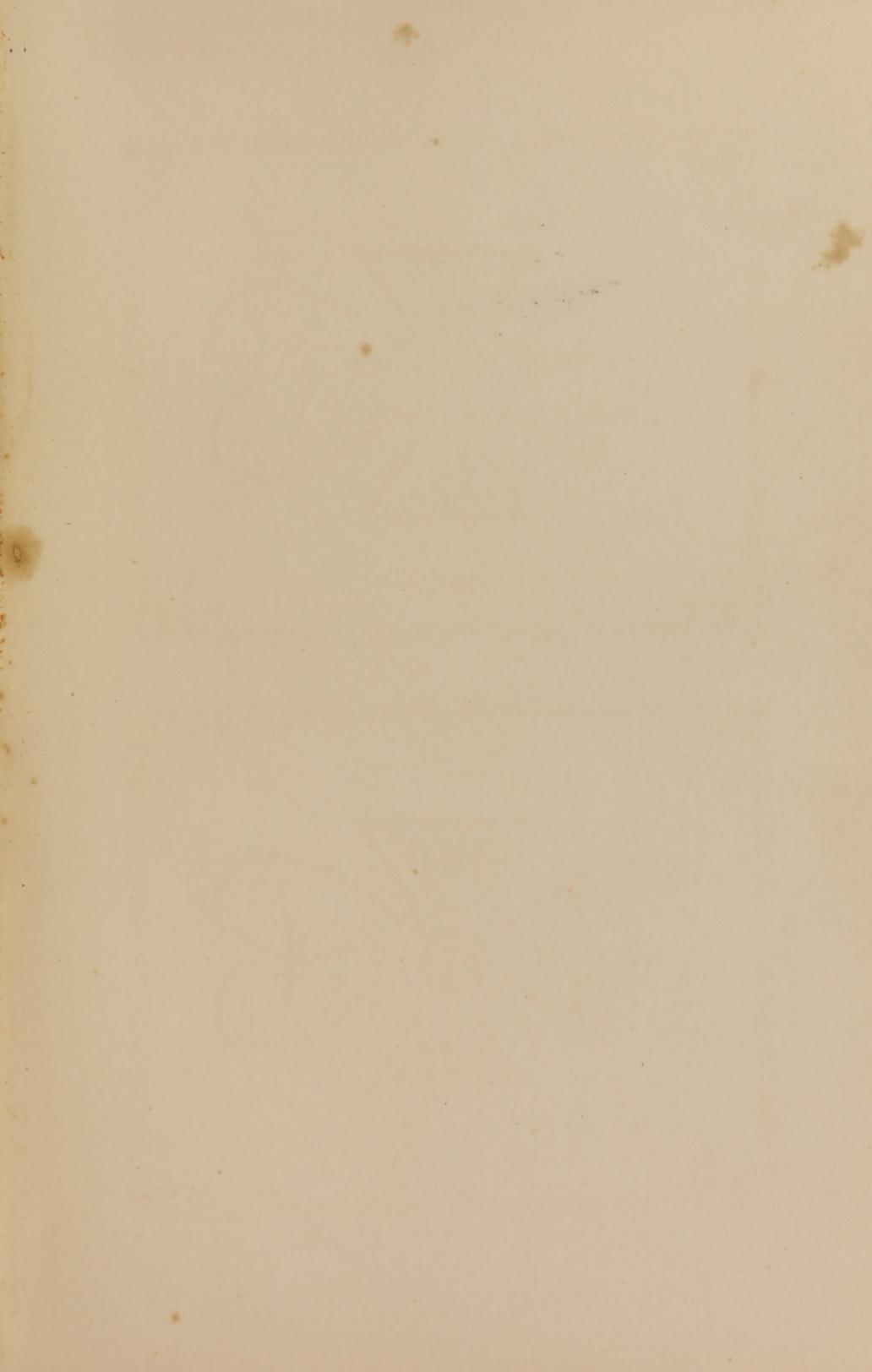
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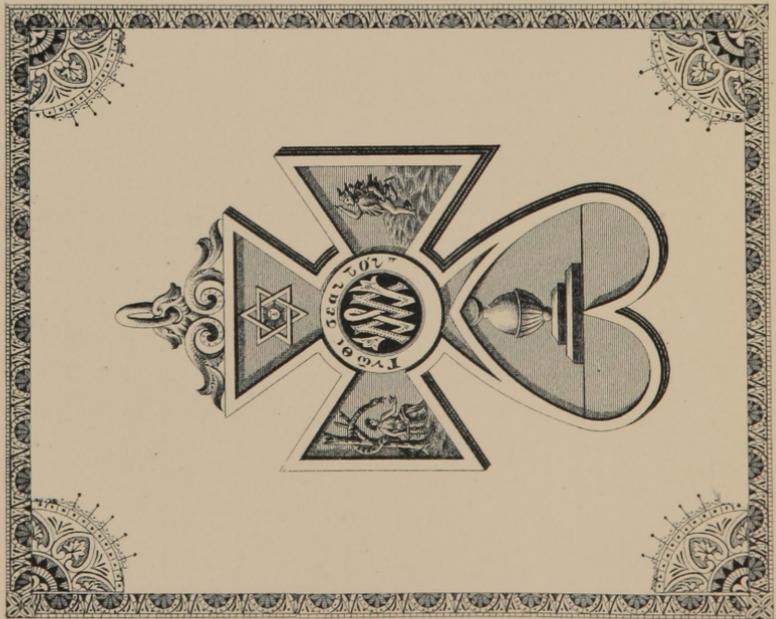
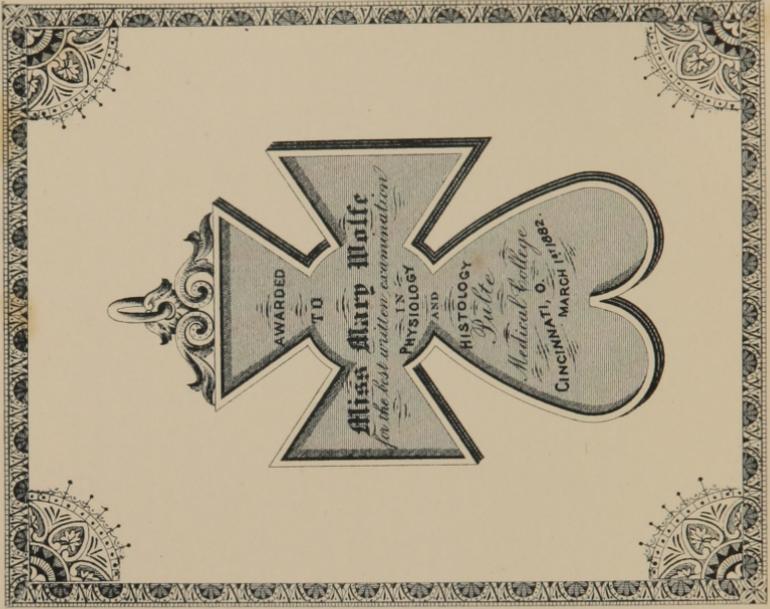
PHYSIOLOGY AND HISTOLOGY,

Pulte Medical College,

Cincinnati, March 1st, 1882.

"My duty is now done. Miss Wolfe, receive your medal. I trust the success which this symbolizes will stimulate you to still greater efforts in the pursuit of knowledge."







Physiology and Histology.

Written Wednesday, February 15, 1832, from 1½ to 5½ P. M.

I

Name the Contents of the Respective Regions in the Anterior Portion of the Chest, and give the Signs of Normal Function in each Region.

A. SUPRA-CLAVICULAR REGION.

Contents. On both sides it contains the apices of the lungs, the common carotid arteries and jugular veins, and the subclavian arteries and veins.

Signs of Normal Function. On palpation is found the pulsation of the carotid arteries; on percussion, pulmonary resonance; on auscultation, pure vesicular murmur, and scarcely audible voice.

B. CLAVICULAR REGION.

Contents. On both sides is found vesicular lung structure. On the right side are the innominate and subclavian arteries and their accompanying veins. On the left side are the common carotid and subclavian arteries, with their veins.

Signs of Normal Function. On palpation, the clavicle is felt; on percussion, dullness, and high-pitched resonance result; on auscultation, pure vesicular murmur, and scarcely audible voice are heard, except at the sternal end, where are found bronchial breathing and bronchophony.

C. INFRA-CLAVICULAR REGION.

Contents. On both sides are found the vesicular structure of the lungs, and the main branches of the bronchial tubes. On the right side, the vena cava and aorta are found, the right bronchus, the bronchial artery and vein. On the left side is a portion of the pulmonary artery, the bronchial artery, the left bronchus, and the vein.

Signs of Normal Function. On palpation, vocal fremitus is felt, more on the right side; on percussion, pulmonary resonance results; on auscultation, scarcely audible voice, and pure vesicular murmur, mixed with bronchial breathing, blended throughout the whole region, are heard, the vesicular murmur being more distinct toward the axillary region, the bronchial breathing toward the sternal; the heart sounds are found on the left side, at the lower border of this region.

D. MAMMARY REGION.

Contents. On both sides are lung structure and bronchial bifurcations. On the right side the heart's border is found behind the lung; also, on deep inspiration, the liver, when it rises to a level with the fifth rib. On the left side the lung is moved aside for the heart; beginning at the fourth sterno-costal articulation, extending down to the fifth intercostal space, and returning again at the sixth.

Signs of Normal Function. On palpation, there is slight vocal fremitus; on percussion, there is resonance on both sides, except on the left, over the region of the heart, where there is dullness and higher pitch; on auscultation, there is feeble vesicular murmur on the right side below, on both sides above; on the left side, at the junction of the third rib with the sternum, is heard the second sound of the heart; at the junction of the fourth rib with the sternum is heard the first sound of the heart. These are the points

of greatest intensity; the sounds are propagated into the surrounding area, and diffused throughout the chest. The voice is hardly audible.

E. INFRA-MAMMARY REGION.

Contents. On the right side is found the liver; in the superior portion of the region the lung is in front of it. On the left side are the anterior portion of the base of the lung, a small part of the left lobe of the liver, the anterior border of the spleen and the cardiac end of the stomach.

Signs of Normal Function. On palpation, resistance from the presence of the liver, and the apex beat of the heart are found; on percussion, dullness and high pitch over the region of the liver and spleen, and tympanitic resonance over the stomach, result; on auscultation, vesicular murmur is heard on both sides.

F. SUPRA-STERNAL REGION.

Contents. The trachea, and sometimes the tip of the transverse portion of the arch of the aorta, are found; also the arteria innominata at its lower border.

Signs of Normal Function. Palpation and percussion are of little value here; on auscultation, tracheal breathing is heard.

G. SUPERIOR OR UPPER STERNAL REGION.

Contents. The division of the trachea, the aorta, and great vessels are found here. The heart lies partly in this region. The pulmonary valves are on a level with the third rib, the aortic valves below.

Signs of Normal Function. Palpation reveals the presence of the sternum; on percussion there is clear resonance of high pitch; on auscultation, bronchial breathing, bronchophony, and reflected heart-sounds are heard.

H. INFERIOR OR LOWER STERNAL REGION.

Contents. The anterior mediastinum above, the stomach below, a part of the heart and a small portion of the lung on its right border are found; also the attachment of the pericardium to the diaphragm. The mitral valves are situated near the left side at the sterno-costal articulation of the fourth rib; the tricuspid valves are nearer the median line, below the aortic valves.

Signs of Normal Function. On percussion, resonance is clear in the upper part of the region, and tympanitic in the lower part; on auscultation, the heart-sounds are heard. The first sound is synchronous with the closing of the auriculo-ventricular openings; the second, with that of the pulmonary and aortic. The normal heart-beat may be divided into four periods: the first sound occupying four-tenths of the time; the first rest, one-tenth; the second sound, three-tenths; the second rest, two-tenths. Pure vesicular murmur is heard above, and but feebly below. The voice is hardly audible in this region.

II.

Give the Divisions of the Proximate Principles of the Blood, and the Important Peculiarities of Each.

THE proximate principles of the blood are found in the plasma. They may be divided into five classes, as below :

A. ORGANIC NITROGENIZED.

These are intimately connected with the vital principles, and enter directly into the nourishment of the tissues. They are all in a state of continual change in the body, constantly wearing out and becoming effete, when they take the form of excrementitious substances. This class of proximate principles is of organic origin exclusively; they are not crystallizable, and are of indefinite chemical composition. Plasma is largely made up of them; fibrin, plasmin, paraglobulin, and metalbumin are examples.

B. ORGANIC NON-NITROGENIZED.

These principles are essential to development and nourishment. They are deposited in the tissues, and are seemingly stored there for emergencies. They usually exist in the blood in but small quantities, and are derived from the food; the glycogenic matter comes partly from the food and partly from the liver. They are of definite chemical composition. The fats, sugars, and starches are examples.

C. ORGANIC SALINE.

These principles are formed in the body by true chemical union. Pneumates and lactates are examples.

D. INORGANIC.

These are principles not formed in the organism, and that remain unchanged while in the body. They are of definite chemical composition, and are crystallizable. The substances forming these are introduced from without the body, and are discharged from it in the same chemical form in which they entered the organism. In the body, however, they behave as organic principles, and are necessary for nutrition. The carbonates, phosphates, sulphates, water, and sodium-chloride are examples.

E. EXCREMENTITIOUS.

These are the waste principles and poisonous matter from the system, and result from the breaking down of tissues. Urea, carbonic acid, and cholesterin are examples. Cholesterin is a principle separated from the blood, in all probability, as shown by Flint and Müller, through the excrementitious function of the liver, and is discharged in the form of stercorin with the fæces. Urea is mainly discharged in the urine and sweat, the excrementitious fluids of the organism.

III.

Describe fully the Process of Mastication, and
give the Mechanism of Deglutition.

A. MASTICATION.

Mastication is the process of dividing the food by the teeth, assisted by the tongue, cheeks, and lips, to prepare it for deglutition.

Mechanism. The movements in mastication are those of the lower jaw, the tongue, cheeks, and lips.

The lower jaw has three movements, a vertical, a lateral, and an antero-posterior. The vertical movement is an upward and downward motion. The upward motion, or closing the jaws, is caused by the contraction of the temporal, masseter, and internal pterygoid muscles. The downward motion, or opening the jaws, is caused by the action of the digastric, the mylo-hyoid, the genio-hyoid, and the platysma myoides muscles. The lateral and the antero-posterior movements are caused, the former by the contraction of the muscles that elevate the lower jaw, acting uni-laterally; the latter by the anterior and posterior portions of the pterygoid muscles contracting separately.

The tongue is in active and eccentric motion, the intrinsic fibers and extrinsic muscles both being engaged.

The muscles of the cheeks and lips act, also, in helping to keep the food between the teeth.

After the bolus is thoroughly masticated and insalivated it is ready for deglutition.

B. DEGLUTITION.

Deglutition may be divided into three stages. The first stage is voluntary, and extends from the time the food is pushed back, after being masticated, collected into a bolus, and insalivated, until it enters the isthmus faucium. The second stage extends from the time the food enters the isthmus faucium until the constrictors of the pharynx grasp it. The third stage extends from the time it enters the grasp of the constrictors until it reaches the œsophagus.

The First Stage. After the thoroughly masticated and insalivated bolus of food is forced back by the tongue, it rests on the posterior portion of that organ, which presses against it, and which is also applied to the roof of the mouth to prevent the return of the bolus. By this pressure of the tongue it enters the isthmus faucium.

The Second Stage. After the bolus has been pressed into the isthmus of the fauces, the tensor palati renders the soft palate tense; the levator palati draws it upward; at the same time the posterior pillars of the isthmus faucium contract, the chink between them being filled by the azygos uvulæ; the stylo-pharyngeus acts in concert now, and pulls the pharynx back, like the finger of a glove. This brings the roof in apposition to the superior constrictors, and excites just enough action in them to grasp it, thus closing the opening into the posterior nares. At this time the larynx is being raised by its five levators, the digastric, the stylo-hyoid, the mylo-hyoid, the genio-hyoid, and a few fibers of the hyo-glossus. The epiglottis is now covering the glottis, the floor of the pharynx is now an inclined plane, and the anterior pillars, the palato-glossus muscles, now contracting, force the bolus along this plane into the grasp of the superior constrictors.

The Third Stage. The constrictors, the superior, middle, and inferior, contract upon the bolus from above downward, and thus it is forced into the upper opening of the œsophagus, to be conveyed thence to the stomach by the peristaltic action of the œsophageal muscles.

IV.

Describe Saliva, Gastric Juice, Pancreatic Juice,
and give the Mechanism of their Secretion
and the Function of each.

A. SALIVA.

Description. Saliva is a fluid which is secreted by glands situated around the cavity of the mouth. It is rather turbid, somewhat viscid, almost tasteless, and its reaction is alkaline. The turbidity is caused by the presence of epithelial cells, which are mixed with the salivary secretion. These cells come from the mucous glands of the mouth, and from the ducts of the salivary glands.

Mechanism of Secretion. The salivary glands are racemose glands, situated in the buccal cavities, in the fossæ of the lower jaw, and under the posterior portion of the tongue. They are lined with mucous membrane, and the investing epithelium differs in the ducts and in the glands. The glands proper, or terminations of the ducts, are lined with spheroidal or true glandular epithelium. The ducts are lined with columnar epithelium. In the body of the gland the proper secretion is separated from the blood. This is the function of the true gland cell wherever found. The epithelium lining the ducts secretes mucus. The glands and their ducts are :

The parotid, with Steno's duct.

The submaxillary, with Wharton's duct.

The sublingual, with the small ducts of Rivière.

The secretion from the parotid is least viscid ; that from the submaxillary next ; and that from the sublingual most of all.

Function. The principal office of the saliva is, mechanically, to moisten the food and thereby assist deglutition ; and, chemically, to thoroughly change the starches into dextrin, and then into sugar, either in the mouth or afterwards in the stomach.

The active principle is ptyalin.

B. GASTRIC JUICE.

Description. Gastric juice is a fluid clear and amber-colored, with an acid reaction. It contains hydrochloric acid and mucus. It is secreted by the peptic glands, situated in the mucous coat of the stomach, by the glands that secrete hydrochloric acid, and by mucous follicles. The different glands secrete the different constituents, all being mixed together to form gastric juice.

Mechanism of Secretion. The peptic and the hydrochloric acid glands are very similar in their microscopic anatomy. They are racemose glands, and in the cellular or lobular portion are lined with spheroidal epithelium. The ducts are lined with columnar epithelium. The mucous follicles are lined throughout with columnar epithelium, and are mostly situated about the pyloric end of the stomach.

Function. The action of the gastric juice is upon the proteids. The product of its digestion is peptone. There is a small by-product which is called para-peptone. The gastric juice dissolves the envelope in which is held the fats, and it acts upon the fibrins, albumins, and gelatins by a disintegrating process. The substances swell up and are reduced to a thin, pultaceous mass. Hydrochloric acid is necessary to its proper function, and to the presence of this

principle is due the fact that gastric juice is normally acid in its reaction.

The active principle is pepsin.

C. PANCREATIC JUICE.

Description. Pancreatic juice is *the* digestive factor. It is similar to the salivary secretion in that its reaction is alkaline. It is viscid and translucent.

Mechanism of Secretion. The pancreatic juice is secreted by the pancreas. This is a long, narrow organ, situated below and behind the stomach. It extends from the right to the left hypochondriac region, completely across the epigastric. It is composed of lobes. The secreting sacs, or terminations of the divisions of the ducts, are lined at the base with demilune cells; on these are the true gland cells. The ducts are lined with columnar epithelium. The small ducts join together and form two: one that is large and opens into the duodenum, in company with the bile duct; and one that is smaller, and opens a little above this, which Bernard alone has found.

Function The pancreatic fluid acts on all the food that has not been digested by either the saliva or gastric juice. It emulsifies the fats.

The active principle is trypsin.

V.

In the Digestive Process, describe the Successive Stages by which the Food finally enters the Blood.

THE food, after being properly digested, enters the blood by some process of absorption.

In the stomach the water and more fluid portions of the food are taken up by the capillaries, and enter directly into the venous circulation.

In the intestines are found the villi. These contain lacteals and capillary blood-vessels. The chief office of the lacteals is to absorb the fats; but during active digestion they are found to contain other substances. The lacteals convey their contents to the receptaculum chyli, and thence the thoracic duct carries it to the venous blood. The capillary blood-vessels in the villi take up the fluid, which, after absorption, is known as chyle. These capillaries pour this into the portal vein.

Absorption takes place from the mouth to the anus, the *degree* being different in different parts of the alimentary canal, the *process* always the same.

VI.

**Give the Relation of the Nervous System to the
Glycogenic Function of the Liver.**

THE relation of the nervous system to the glycogenic function of the liver is not clearly known. It is intimate, however. The controlling influence seems to be centered in the floor of the fourth ventricle; for if this is punctured, artificial diabetes will result. The impulse is sent to the liver by other nerves than the pneumogastric; for even if these are severed the glycogenic function, though suspended for a time, again becomes normal. The connection of the sympathetic system is not known.

VII.

**Give the Physiological Anatomy of the Kidney,
and the Mechanism of the Secretion and Ex-
cretion of Urine.**

A. PHYSIOLOGICAL ANATOMY.

The kidneys are situated in the lumbar region, and are oblong, symmetrical bodies. They are inclosed in a coat of adipose tissue, inside of which is their proper covering, the fibrous capsule.

The fibrous capsule surrounds the kidney, and is continuous with the fibrous covering of the pelvis and ureters. It sends trabeculæ into the cortical substance of the kidney. The kidney is composed of a cortical and a medullary substance.

The cortical substance is granular. It occupies the exterior portion of the organ to the general depth of one-sixth of an inch, and sends down prolongations into the medullary substance. The cortical substance contains granular matter, Malpighian bodies, capillary plexuses of blood-vessels, convoluted uriniferous tubules, and the columns of Bertin.

The medullary substance is found interior to this cortical layer, and is sometimes called the pyramidal substance, being composed of the pyramids of Malpighi.

Blood Supply. The renal artery enters at the hilum, and, after dividing, passes forward toward the cortical substance. The divided arteries continue to follow the same

direction until they reach the bases of the pyramids, on which they form an anastomosing plexus. From this plexus branches are given off; those on the convex side extend out into the cortical substance, and each ramification becomes the afferent vessel of a Malpighian body, and after entering the body breaks up into minute branches, which form a dense convolution known as the glomerulus. The branches toward the concavity of the base of the pyramid pass backward toward the hilum, and terminate in the capillaries of the pyramidal substance. These are called the arteriolæ rectæ.

The veins originate in three ways,—from stellated radicles near the external surface of the cortical substance; from the capillary plexus about the convoluted tubes; and from the capillary plexus, in which the arteriolæ rectæ terminate.

Malpighian Body. This is composed of an afferent and an efferent vessel, forming a capillary plexus, without anastomosis, within the terminal expansion of a uriniferous tubule, the capsule of Müller.

Tubuli Uriniferi. These are tubes beginning in the capsule of Müller, and extending to the calices. They are convoluted in the cortical substance; on reaching the border of the medullary substance they become less so, and much narrower, and dip down into the pyramids, returning again to the cortical substance. Throughout this part of their course they are called the looped tubes of Henle. They again enter the pyramids of Malpighi, and their course is now more directly toward the pelvis. Several of them join together, forming larger tubes. In this part of their course they are called tubuli recti uriniferi, or the strait tubes of Bellini.

Pyramids of Malpighi. These are the large pyramids of the medullary substance, and are composed of lesser pyramids, called pyramids of Ferrein.

Pyramids of Ferrein. These are collections of uriniferous strait tubes, about a hundred in each.

Calices. These are little openings into which the apices of the pyramids are received.

Infundibula. These are the short, funnel-shaped tubes into which the calices open.

Pelvis. This is the expansion of the ureter, and into it the infundibula open.

Hilus. This is the gateway of the kidney.

Epithelium. The cells lining the strait tubes are polygonal in shape. It is supposed that those in the convoluted portion of the tubules are true gland cells, and that the capsule of Müller is lined with pavement epithelium.

B. MECHANISM OF SECRETION.

The secretion of urine takes place in the Malpighian body and convoluted uriniferous tubes. The watery elements are principally separated in the glomerulus; the other constituents in the tubes, from the blood in the capillaries that surround them. The separation in the Malpighian body is effected mainly by pressure; that in the tubes, by the action of the true gland cell. The efferent vessel, after leaving the Malpighian body, is about one-half the size of the afferent. It still contains matter that is excrementitious; so its course is directed toward the convoluted tubes, and it forms a plexus about them to allow this waste matter to be extracted from the blood. When the renal vein is finally formed, it contains the purest blood in the body.

VIII.

Give the Mechanism of Respiration, and the Means by which Oxygen is conveyed to the Tissues.

RESPIRATION is of three kinds—pulmonary, cutaneous, and muscular.

A. MECHANISM OF PULMONARY RESPIRATION.

Inspiration. The act of inspiration is performed by the muscles of inspiration, working in concert with those muscles that open the rima glottidis. In inspiration the rima glottidis is opened, and the walls of the thorax are extended. This extension of the walls causes a tendency to a vacuum, and the air rushes in to fill it. The muscles of inspiration are the diaphragm, the scaleni, the external intercostals, and the levators of the ribs, with accessory muscles, which are the serratus posticus superior, the sterno-cleido-mastoides, the pectoralis major and minor, the serratus magnus, and the levator anguli scapulæ.

Expiration. The act of expiration is performed by the muscles of expiration and by the contraction of the tracheales muscles and of the elastic fibers found in the walls of the air-cells. The expiratory act is more passive than the inspiratory, and occupies about one-fourth the time of respiration. The muscles of expiration are the triangularis sterni, the sacro-lumbalis, the external and internal abdominal oblique, the transversalis, the infra-costales, and the internal intercostals.

B. MEANS BY WHICH OXYGEN IS CONVEYED TO THE
TISSUES.

Oxygen rushes in with the air when the lungs are filled. By the law of diffusion of gases, it rapidly passes through the air already in the lungs, and is brought in apposition with the membrane which lies between it, and the blood charged with carbonic acid gas.

The interposition of the membrane favors diffusion. The oxygen passes in, and the carbon di-oxide out, still by the law of diffusion. The oxygen now enters into chemical union with the hemaglobin of the red corpuscle, forming oxy-hemaglobin, and then this servant of the cells, the red corpuscle, carries the oxygen to the capillaries; here, the tissues having a greater affinity for the oxygen than has the hemaglobin, it enters their structure, and leaves the corpuscle, the carbon di-oxide being taken back to the lungs in exchange for the oxygen left with the tissues.

IX.

Give the Mechanism of a Continuous Flow of Blood in the Veins, and the Causes of a Systemic Venous Pulse.

THE three factors of a continuous flow of blood in the veins are the *vis a tergo*, or action of the heart, the over-distension of the arteries, and the peripheral resistance of the capillaries. When these three factors bear a normal relation to each other, the stream of blood flows continuously in the veins. When any one of them is disturbed without a proper compensation in another, a venous pulse is the result.

* *The First Factor.* If the defect is either in the valves of the heart or in the stroke, there will not be sufficient force to *over-distend the arteries*. The impulse will be transmitted on through the capillaries into the veins, for the arteries are then, practically, inelastic tubes, and exert no modifying influence.

The Second Factor. If the weakness is in the coats of the artery, even though there be a sufficient heart-impulse, the elasticity of the arteries not being great enough to modulate it, it will *still* propagate itself through the capillaries into the veins.

The Third Factor. If the peripheral resistance of the capillaries is lessened sufficiently, as when their walls are dilated from any nervous cause, the arteries will not be over-distended, and the impulse will continue on through the whole circulation.

X.

Describe fully a Nerve, and give its Physiological Properties.

A. DESCRIPTION.

A nerve is a conductor of impulses and impressions.

It is composed of one or more bundles of nerve fibers, held together by an investing sheath.

Nerve fibers are of three kinds,—the medullated, the non-medullated, and the gelatinous.

The Medullated Fibers are those which contain, in addition to the axis-cylinder, a surrounding envelope of medullary substance, called the white substance of Schwann. This is in turn surrounded by the sheath of Schwann, a homogeneous membrane containing oval nuclei longitudinally arranged. In this sheath are contractions, the striæ of Frommann, but they do not extend to the axis-cylinder.

The Non-medullated Fibers are those which are of the same structure as the foregoing, except they do not contain medullated substance. They are found at the origin and at the peripheral extremities of the nerves generally.

The Gelatinous Fibers, or fibers of Remak, are gray in color, of a flattened shape, and contain oval nuclei. They are not abundantly found. More are present in the sympathetic than in the cerebro-spinal system. They are most numerous in foetal life, and are present in regenerating

nerve tissue. They have been denied a classification as nerve fiber by some authors, and have been called simply connective tissue. Others have not regarded them as distinctive nerve fibers, but have considered them to be undeveloped or rudimentary fibers of the medullated or non-medullated variety.

The axis-cylinder seems to be the part of the nerve essential to its proper function, as it is constant from the origin to the termination. It is marked by longitudinal striations, which are thought, by some writers, to indicate a fibrillated structure.

The nerve fibers are bound together by the *périnèvre* into primitive bundles or funiculi. These bundles are again gathered together, and held by the perineurium. This constitutes a nerve, although the smaller nerves contain sometimes but one funiculus. Besides the nerve fibers and sheaths, each nerve contains accessory anatomical elements; as, blood-vessels, probably lymphatics, connective tissue, and *nervi nervorum*.

Nerve fibers neither branch nor divide, but continue uninterruptedly from center to periphery. A fiber from one nerve will cross to another, thus assisting in co-ordination.

The nerves of the cerebro-spinal system originate in the brain from different parts of its structure; in the spinal column by the anterior and posterior roots, the motor, and co-ordinating and sensory, from the spinal cord. The sympathetic system is a chain of nerves and ganglia connected with the cerebro-spinal system, and dependent upon it.

Nerves terminate, *generally*, by gradually becoming less in diameter, until they are lost to the microscopic eye. They terminate *especially* in the terminal plates of the muscles, the taste bulbs, the tactile corpuscles, and the corpuscles of Krause.

B. PHYSIOLOGICAL PROPERTIES.

The axis-cylinder *conducts*, the other parts are accessory. The nerves are carriers, both from the center to the periphery and in the opposite direction. The efferent fibers bear motor impulses from the brain. The afferent fibers convey sensory impressions to the brain. There is no known difference between the afferent and efferent nerves in anatomical structure.

Nerves possess the property of irritability to a marked degree. They can be stimulated by electricity, which resembles nerve force. They are capable of being regenerated. They are conductors of nerve force or vitality. That they are the connecting link between the brain and the outside world is known; but how the brain and the governing mind are united, neither the physiologist nor the microscopist has revealed.

NERVOUS DISEASES.

PROFESSOR A. C. RICKEY requested the members of the Senior Class to meet in the hall of the college February 28, 1882, to be examined in Nervous Diseases. He gave permission to any member of the Junior Class who desired the examination to meet with the Seniors. Mary Wolfe, of the Juniors, accepted the privilege.

When the students were assembled, Professor Rickey wrote on the blackboard the following problems, and requested they should be answered in writing then and there in his presence, viz:

NERVOUS DISEASES.

- I. *Give the Pathology, General Symptoms, and Treatment of Neurasthenia.*
- II. *What Tissue Changes usually result in Inflammation of the Nervous Tissue and its Coverings?*
- III. *Define Paralysis, Hemiplegia, Paraplegia, Hyperaesthesia, Anesthesia, Paresis.*
- IV. *Give the Pathology of the Epileptic Seizure.*
- V. *Give the Pathology and Nature of Locomotor Ataxia.*
- VI. *Give the Pathology and Symptoms of Cerebral Hemorrhage.*
- VII. *Name and Describe Three Leading Pathological Conditions in Insanity.*
- VIII. *State the Symptoms and Prognosis in the Different Forms of Tubercular Meningitis.*
- IX. *State in General Terms the Use of Electricity in Nervous Diseases.*

To the above problems Mary Wolfe wrote the following answers:

Nervous Diseases.

Written Tuesday, February 28, 1882, from 10½ A. M. to 12½ P. M.

I.

Give the Pathology, General Symptoms, and Treatment of Neurasthenia.

A. PATHOLOGY.

Neurasthenia is a lack of nerve force and action. It may arise in two ways:

1. FROM INSUFFICIENT DEVELOPMENT OF NERVE FORCE.
2. FROM AN INORDINATE EXPENDITURE OF THIS FORCE.

There are two sets of nerve fibers in the vasomotor nerves: the vasomotor dilators, and the vasomotor constrictors. An increased flow of blood to a part may be produced either by an overaction of the dilator fibers, thus enlarging the capacity of the arteries, or by a paralysis of the constrictor fibers, which will produce the same effect. It will readily be seen that any disturbance in the proper supply of nerve force, which will produce these effects, will give rise to the chain of symptoms and their sequelæ which we find in neurasthenia.

1. *The insufficient supply of nerve force.* This is generally found in illy developed people, in those that are poorly nourished, and in the children of over-taxed parents.

2. *The inordinate expenditure of nerve force.* This is found in those people who are *over-worked*, either mentally or physically—for the nervous system is the source of all the phenomena of life. Under this head are professional men who are zealous in their work, overtaxed shop-girls, mothers who have too many cares, those who dissipate, fast livers, and those who disregard the laws of health by overstrain of any kind. The use of tobacco also will cause it.

B. SYMPTOMS.

Tenderness of the scalp from irritation of the superficial nerves. Pains in the head. Floating specks before the eyes. Dimness of vision forms congested condition of the arterioles of the retina. Tinnitus aurium. Localized peripheral anæsthesia and hyperæsthesia. Insomnia, morbid fear, timidity in business, melancholy from physical inability. Gastric disorders (these are purely reflex, and can be easily distinguished from those troubles which originate in the stomach itself). Nervous twitching of the extremities. Coldness of the hands and feet. Mental irritability. Other symptoms which are the result of the disturbance of the equality of the blood pressure caused by the exhausted condition of the vital powers *primarily*.

C. TREATMENT.

1. *Remove the cause.* Do not entirely change the patient's occupation, but by good judgment so modify it that it will be best for him both mentally and physically. Have plenty of fresh air for him to breathe. The diet should be carefully selected. Attention should be given to bathing and proper clothing.

2. *The Remedies.* These should be selected according to the symptoms. Arsenicum calcaria phos. and car-Sulphur, gelsemium, natrium muriaticum, zincum, pla-

tina, alumina, the bromides, especially that of potassium (ergot in one to two grain doses is much urged).

3. *Electricity.* Both the constant and induced current have been used with success in relieving the symptoms of neurasthenia.

4. *Metalliscopy.* This consists in the application of metal disks to the surface in cases of hyperæsthesia and anæsthesia; is yet in its infancy of usefulness, as its good effect is not clearly established.

5. *Passive Motion.* Passive movements of the joints is tried with good effects.

6. *The Swedish Movement Cure.* Rational.

7. *The lomi-lomi of the Kanaka women.* Very good.

II.

What Tissue Changes usually result in Inflammation of the Nervous Tissue and its Coverings?

A. IN THE NERVE changes take place in the adventitia and in the nerve proper.

1. In the adventitia there is a proliferation of the connective tissue, and an increase of granular matter; there is also a pathological exudation from the membrane. These changes cause a thickening and opacity of the meninges.

2. The nerve proper breaks down by fatty, calcareous, amylaceous, or pigmentary degeneration, the morbid increase of these cells crowding out the normal nerve cells and replacing them. If the inflammation goes on, these changes will be followed by atrophy.

B. IN THE ENCEPHALON the adventitia and the brain substance are subject to the same conditions, and the inflammatory process may there continue until a detritus is the result, and abscess may even follow. The inflammation may be succeeded by a more slow destruction, and atrophy ensue. Or the inflammation may cease, the unhealthy exudations disappear, and a cicatrix result.

III.

Define Paralysis, Hemiplegia, Paraplegia, Hyperesthesia, Anesthesia, Paresis.

A. PARALYSIS is a partial or complete lack of either motor or sensory power, or of both, in one or more parts of the body.

B. HEMIPLEGIA is paralysis of one-half the body, the lines of division being vertical. "One side" is paralyzed.

C. PARAPLEGIA is paralysis of the lower half of the body, the lines of division being horizontal.

D. HYPERASTHESIA is over-sensitiveness or increased nervous irritability.

E. ANASTHESIA is under-sensitiveness or lack of nervous irritability.

F. PARESIS is partial paralysis of motion.

IV.

Give the Pathology of the Epileptic Seizure.

EPILEPSY, or "falling sickness," is a disease whose origin or cause is not clearly understood. No known cause can alone produce it. There are two theories of the conditions whose presence is essential to its appearance:

First, that arterial ænemia must exist, and

Second, that venous congestion must be present.

As these two conditions are complementary, both theories are equally plausible.

1. CLASSIFICATION.

Epilepsy has been divided into two principal classes:

A. Grand Mal.

B. Petit Mal.

To these have been added Masqued Epilepsy, and Status Epilepticus.

A. GRAND MAL. The stages of Grand Mal may be divided into this:

- | | |
|--|---|
| <ul style="list-style-type: none"> 1. Prodroma. 2. Aura. 3. Attack. 4. Passing Away. |) These stages are not always <i>all</i> present, but some of them, and the symptoms accompanying them are found in every case. |
|--|---|

1. *The prodromal symptoms* are nervousness, a slight degree of mental irritability. The change in the urine (the solid constituents being absent from disordered nerve supply) is diagnostic.

2. *The Aura* then appears. This is described as "a feeling as though a current of air were rushing from the extremities toward the body." (This symptom is generally constant. Some authorities say that if a string be tied around the extremity in which the Aura begins, at *its very commencement*, the attack can be prevented.) Following the Aura comes

3. *The Attack*. The muscle of the face, body, and limbs either twitch violently or tremble very much. The eyes are wide open, staring, and the pupils irregularly dilated; else they are rolled back in the head, and the pupils contracted. Foam issues from the mouth, the teeth are clinched, and the patient rolls on the floor in convulsions. A low moan or cry accompanies the Attack. The Attack occurs at moment of sudden ænemia.

4. *Sequel*. The twitching ceases, and the muscles which were in tonic spasm relax. Then comes the exhaustion, when the patient wants to sleep. The stupor and mental derangement that follow the Attack last for a long time, and it may be so long that the interval between the attacks will not admit of complete return to health.

B. PETIT MAL consists simply of a loss of consciousness and volitions for a moment, and it is generally accompanied by a slight convulsion. The patient may be talking, and for a moment cease, as the seizure takes place, and may then resume his conversation with no seeming bad results.

Masqued Epilepsy is similar to Petit Mal, but the convulsions do not occur.

Status Epilepticus is a form of epilepsy in which the spasm of the muscles remain present for some time, then comes a short interval of freedom, and then the recurrence of the spasm.

2. MORBID ANATOMY AND SEAT OF LESION.

There are but few tissue changes which are found in an autopsy. Prominent is the unsymmetrical development of the medulla and olivary bodies, and the hypertrophy of the jugular process of the occipital bone and of the atlas and axis. There is also a general tendency to exostosis at the base of the brain. The medulla is supposed to contain the respiratory, vasomotor, and convulsive centers in close proximity to each other, and it is the disturbance of the normal relations of these centers that causes, so far as we know, the trouble. (At the moment of attack there is a stoppage of the respiratory act, and sudden ænemia always.)

V.

Give the Pathology and Nature of Locomotor Ataxia.

LOCOMOTOR ATAXIA is sclerosis of the posterior columns of the spinal cord. (Some authors say that the lateral columns are also sometimes involved, and, as the disease extends, even the anterior columns are included, resulting in paralysis and death.)

The seat of the disease is generally the lumbar or the cervical region.

The attack is slow and insidious, and it mostly occurs between the ages of 30 and 50 years, and more frequently then in men than in women.

Morbid Anatomy. The sclerosis begins in the posterior root near the fissure, and extends through that to the cord itself; it may even attack the gray matter of the cord. The adventitia of the nerve takes on an "hypertrophied condition," and by proliferation of the connective fibrinous tissue their size is a little enlarged. The nerve proper is reduced in size by contraction, and a degeneration ensues that is soon changed to an atrophy—when a hardened condition exists. The posterior roots of the nerves now have a tendonous appearance.

Abnormal Function. The office of the posterior columns of the cord is to preside over co-ordinations, and partly to govern sensation. When disease attacks this part, the co-

ordination is necessarily disturbed. There is an accompanying loss of muscular and cutaneous sense, but it is the loss of co-ordination principally that causes the erratic movements in *Ataxia Locomotrice*. The function of the bladder and the rectum is disturbed; there is inability to write or work; the pupil is dilated, and paresis, and finally ptosis of the lid results. The voice is disturbed from muscular paralysis or lack of co-ordination there, and innumerable other symptoms are present, marked among them the pain from the back around the body, shooting and excruciating, and the tingling throughout the whole periphery.

VI.

Give the Pathology and Symptoms of Cerebral Hemorrhage.

PATHOLOGY.

Cerebral Hemorrhage may result from three causes:

1. From disease in the coats of the arteries.
2. From blood pressure (as in that anomaly of circulation caused by hypertrophy of the left ventricle, and in over-nutrition.)
3. From disease in the surrounding brain substance.

It may be either an arterial hemorrhage or a capillary one. The most frequent seat of hemorrhage is the corpus striatum, the optic thalamus, and the ganglia.

According to its seat, size, and cause, is its importance.

1. The apopleptic cyst is formed by the effused blood; this blood becomes decomposed, and the surrounding affected brain tissue, and the fibrin the blood deposits, may make a wall for the cyst. There is then a breaking down of the cyst, and little fibrous bands stretch across and fill it up; between these is the serum. On the disappearance of the serum, a cicatrix is formed, differing in anatomical appearance, in the different parts of the brain.
2. The apopleptic cyst may also break down in abscess.

SYMPTOMS.

In the earlier stages the symptoms are generally similar to those found in congestion.

1. When the hemorrhage is arterial and large, there is the "stroke," the whole system is disturbed, coma and, probably, death result. There are no pedromal symptoms. Temperature high.

2. When the hemorrhage is small and sudden, the above symptoms are similar, but less severe, the attack lasting but a few hours, and passing away. If it does not return, then we may safely say the cicatrix apoplectica has formed, and the danger is over.

3. If the hemorrhage is large, but slow in effusing, then there are slowly developing pedromal symptoms, and finally the apoplectic stroke.

VII.

Name and Describe the Three Leading Pathological Conditions in Insanity.

1. *Cerebral Irritation.* This may result from disturbance of the function of the organs of the system, as of the stomach, intestines, liver, or uterus. It is accompanied by hyperæmia, and this hyperæmia causes the irritability of the mental organization.

2. *Cerebral Excitement.* This succeeds often the former stage. Here the hyperæmia is more marked, and the symptoms of mania begin. The extent of this congestion is supposed to determine the kind of mania; as, if it be circumscribed, monomania results.

3. *Cerebral Depression.* In this stage the inflammatory condition gives place to that which tends to atrophy. It is then melancholy, and suicidal tendency is found in the patient.

VIII.

State the Symptoms and Prognosis in the Different Forms of Tubercular Meningitis.

There are two forms, called

- a. Basilar Tubercular Meningitis,
- b. Simple Tuberculosis of the Meninges.

A. IN BASILAR TUBERCULAR MENINGITIS there is an inflammatory condition. According to Niemeyer, it is the presence of this inflammation which is the distinguishing mark of this disease. The deposits are along the course of the vessels. There is a thickening and opacity of the meninges.

1. *The Symptoms* in the pedromal stage are the quietness and the lack of childlike ways in the patient. There may be but a slight difference from its ordinary manner. The attack is sudden; the child lies with flushed face and dilated pupils for, may be, several days before relaxation, that precedes death, comes.

2. *The Prognosis* is very unfavorable.

B. IN SIMPLE TUBERCULAR MENINGITIS the condition is not so grave. The acute inflammation is absent, and the deposits and changes in the meninges are not so marked. The extent of tissue involved is much less also.

1. *The Symptoms* of throwing the head back, the quietude, and all are present, some fever, slight dilation of pupils, and a more or less marked apathy.

2. *The Prognosis* is more favorable than in the other form; still the condition is grave.

IX.

State in General Terms the Use of Electricity in Nervous Diseases.

Electricity acts simply as a stimulus to the nervous system, in its beneficent use not generally producing tissue changes.

In the treatment of nervous diseases, both the Galvanic and the Faradic current are used. The Galvanic is mostly employed.

The response which a nerve makes under the stimulus of the electric current is called *Electrotonicity*.

The response or the effect produced on the nerve beyond the anodes is called *Anelectrotonicity*. The same effect upon the nerve under the influence of the current is called *Kat-electrotonicity*.

In the first response the nerve is less excited, but has more electro-motor power. In the second, it answers more freely, but has less electro-motor power.

The physiological effect of the Galvanic current is two-fold, according as the direct or inverse current is applied to the part in need of the stimulus.

The action of the Galvanic current is to cause a "peristaltic wave" to extend along the artery between the points at which the anodes are applied. This wave extends in the direction of the positive pole from the negative. In applying the direct current this wave carries the blood in the direction of the current. In the inverse the

flow of the blood is retarded, and the part is kept from being overcharged. Those congestions which are so difficult to remove by remedies often yield to properly applied Galvanism, and those nerves which are weak and unhealthy in their action, take on normal function under the influence of the current.

The Faradic or induced current causes a spasmodic contraction of the arterial walls, which reduces the supply of blood in the arteries, and in this way overcomes undue determination in a part. It is particularly adapted to neuralgia, and to all congested conditions.

There must be caution used in the employment of the Faradic current, to first pass it in one direction then in the other. A constant use of the current in one way will cause paralysis.

When the tissues have ceased to respond to one kind of electricity, the other can be used with good effect.

Those organs which can not be reached in their disturbed function by even the highest potencies, can be made amenable often to this, the most soulful remedy known.

Examination Papers.

CLASS 1883.

EXAMINATION WEEK in a medical college is always an event of deep interest to the average medical student. The time has come for him to give an account of himself—as to whether he has employed his opportunities profitably or been a spendthrift of his golden chances in the gay dissipations of city life. He must now stand face to face with his teachers, and in no doubtful sense answer the questions staring at him from the blackboard or handed him in writing by the exacting professor himself. He must answer at once, with no time for stuffing preparation, in the presence of the professor, and under the searching scrutiny of his eye. No “boy” ever passed through such an ordeal without feeling his heart beat quicker and stronger than is common to it in health. He has now to “toe the mark,” and win his grade for graduation. If he fails, he is disgraced, in his own estimation at least. If he succeeds, it is of the greatest interest, not only to himself but friends, to know by what per cent he has passed his examinations, and whether he has fairly won a rosette, a medal, or an honorable mention. To him a ribbon is not a gewgaw, but a badge of honor, when it signalizes a triumph for his industry or genius. It ennobles the wearer when he has won

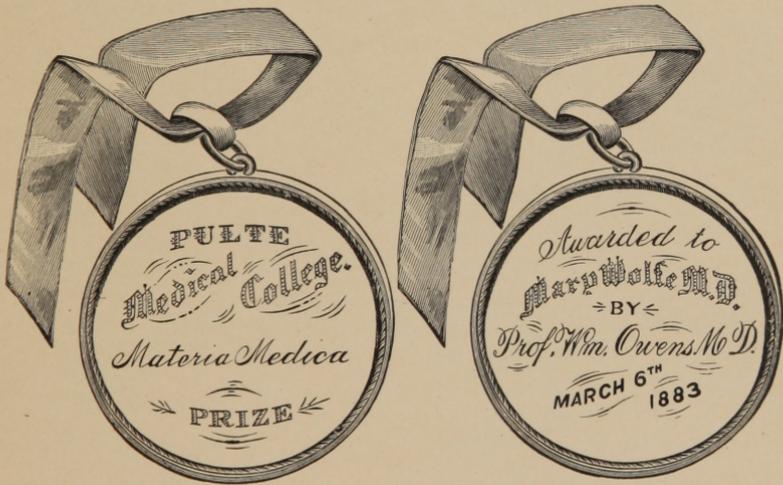
it for saying the right thing, in the right way, at the right time, and in the right place.

When Professor William Owens, Sen., M. D., announced to the class, on Monday, February 26, 1883, that he would on the following day examine the students of Pulte Medical College in *Materia Medica*, more than one heart fluttered in anticipating the trying ordeal through which "Old Pap" would put them. True to his announcement, on Tuesday morning he gave to every student in the amphitheater a list of Ten Drugs for general analysis, one of which only he indicated to each student, to be specially analyzed and classified with reference to its botanical and therapeutic character and qualities. To five members of the graduating class for 1883 he gave for special analysis printed slips containing the following:

NUX VOMICA.

- I. *Give Scientific and Common Names, the Natural Order to which it belongs, the Active Principles it contains, and the Part of the Plant used in Medicine.*
- II. *Describe the Paroxysms that Nux Vomica induces.*
- III. *Upon what Organ does it produce its Principal Action? State the Manner in which it is affected, and the Conditions which result.*
- IV. *Give its Sphere of Action.*
- V. *Describe its Effect upon the Heart.*
- VI. *Describe its Influence on the Brain and Cord.*
- VII. *Describe the Mental and Moral Disturbance it induces.*
- VIII. *Describe its Effects on the Alimentary Canal.*
- IX. *Describe the Effects of Nux Vomica upon the Mucous Membrane.*
- X. *Give Leading Indications and Therapeutic Use.*

On this Drug (*Nux Vomica*) and its special analysis, MARY WOLFE, of the graduating class of 1883, wrote a paper, of which the following is a transcription, and submitted it for inspection to the professor, who, on Commencement night, in College Hall, in Cincinnati, on the 6th of March, 1883, in a speech (says a city journalist) replete with personal compliment to the ability of the young woman, presented her with a gold medal, of which the following is a *fac-simile* :



Matéria Medica.

Written Tuesday, February 27, 1883, from 10 A. M. to 12½ P. M.

NUX VOMICA.

I.

Give Scientific and Common Names, the Natural Order to which it belongs, the Active Principle it contains, and the Part of the Plant used in Medicine.

Technical Name, STRYCHNOS NUX VOMICA.
Common Names, STRYCHNINE—VOMIC NUT.
Natural Order, APOCYNACEÆ.

ACTIVE PRINCIPLE.

The active principle resides in the alkaloids, which do not differ in the mode of their action, only in the degree of its intensity. They are,

STRYCHNIA.
BRUSIA.
IGASURIA.

Of these, strychnia is the most powerful, being twelve times stronger than the weakest.

QUALITIES OF THE ACTIVE PRINCIPLE.

Character. It exists in long crystals, four to eight sided.
Color. Grayish white.

Taste. Intensely bitter.

Reaction. Alkaline.

Solubility. It is slightly soluble in water, more soluble in alcohol or ether.

PORTION OF THE PLANT USED IN MEDICINE.

The germ is the part used. The fruit is about the size and shape of an orange. It has a smooth surface. The pulp of the fruit is innocuous; the seed is very poisonous. The seed is flat and round, about the size and shape of a silver quarter of a dollar. It is this seed that is improperly called the vomit nut. In the contents of this seed is found the active principle. It is extracted by maceration, warm water being generally used to render the process more easy, and a gray powder is the result. From this is obtained the active principle in crystals, as before stated.

II.

Describe the Paroxysms that Nux Vomica induces.

LARGE DOSE.

The injection of a large dose of nux vomica causes paroxysms. There is an afflux of blood to the spinal cord and medulla, affecting the anterior columns of the cord. The whole system of voluntary muscles is affected first, and the involuntary afterwards. The spasm begins by twitching of the extremities and limbs; then the muscles of the trunk, the face, and eyes; then the whole body becomes rigid, and so great is the contraction that opisthotonus results. The spasm is followed by relaxation gradually coming on; but on the application of the slightest irritation the convulsions will recur. The convulsions will continue, unless relieved, until death supervenes from one of two causes:

1ST. ASPHYXIATION.

2D. EXHAUSTION.

Besides the muscles mentioned, those of the throat are violently contracted. The mucous membranes are also congested, and the injection may become so intense that bloody or pinkish frothy secretions follow.

Appearances in the Paroxysm. The whole body is in a state of tetanus. The eyes protrude, and are staring; the

pupil is dilated, or just before death is contracted. The face is livid, or pale. The lips are blue; and saliva, ropy and viscid, oozes from the mouth. The teeth are firmly clenched; and often the tongue is wounded and bleeding, which causes the blood in the secretion. The muscles of the throat are firmly contracted. The internal viscera are congested. The mental faculties are generally not disturbed. The hands are clenched; and the whole body is bent upward like a bow, resting on the hands and feet.

III.

Upon what Organ does it produce its Principal Action? State the Manner in which it is affected, and the Conditions which result.

SPINAL CORD AND MEDULLA.

It produces its principal action on the spinal cord and medulla, causing disturbance of the motor functions of the cord, and also of the functions of those organs whose centers are in the medulla. The disturbance is caused by altered blood supply. The congestion in the medulla is principally along the pons. The respiratory function is disturbed. The special senses are exalted. The mucous surfaces have increased secretions. The muscles, the flexors principally, are contracted firmly. The extensors are affected, but the greater power of the flexors counteracts their contraction, and the influence of the drug upon the former is only seen in the rigid, stone-like condition of the body apparent to the sense of touch.

IV.

Give its Sphere of Action.

SPHERE OF ACTION.

The chief sphere of action is the solar plexus, and through this it produces its effects upon the various structures of the body.

The vaso-motors are also affected. It is by the influence of the drug upon them that the congestion that exists in the cord and medulla and various organs is caused.

Nux may be said to act in two ways:

1ST. TRAUMATICALLY.

2D. DYNAMICALLY.

1st. *Traumatically* by irritating the peripheral filaments of the pneumogastric nerves in the stomach, and by these nerves the influence is transmitted to their centers. Still there could be no disturbance of function without change in the blood supply, so the nerves of organic life which control the blood-supply must be affected even here. The action of the pneumogastric seems to be simply to convey the impression or stimulus, and then the other system receives it and acts. Until the organic system is impressed there can be no change in the function or state of an organ or tissue.

2d. *Dynamically* by its direct influence upon the organic nerves. The influence here is neither traumatic or chemical, but that of force to force, and is the true homœopathic relation of the drug to the system.

Nux acts as an irritant to these nerves, causing increased function, then decreased and exhaustion. Upon the structure of the tissue they supply it acts in the same way.

V.

Describe its Effects upon the Heart.

EFFECTS UPON THE HEART.

Upon the heart its influence is first to depress and then to increase its action, causing also violent spasmodic palpitation. The increased action of the heart accelerates the circulation, and it is through this quickening of the circulation that the effects on many organs of the body are produced. This action is through the cardiac ganglia of the organic system. The reaction of the system against the drug results in the stage of relaxation and depression.

VI.

Describe its Influence on the Brain and Cord.

INFLUENCE ON THE BRAIN AND CORD.

The effects which it produces on the brain and spinal cord are the result of altered blood supply.

A. BRAIN.

1. *Upon the cerebrum.* There may be a momentary depression of the faculties. This is almost immediately followed by exaltation, even intoxication, and extreme clearness of ideas, and subsequently by stupor or dullness.

2. *Upon the sensorium.* The special senses are disturbed. The senses of smell and taste are perverted, and also that of hearing.

The general effects on the brain are to be attributed to the congestion and conditions following this. There is headache in the region of the temples over the eyes, and a sensation of fullness, as if the pains were pressing outward.

3. *Medulla.* The respiratory centers are disturbed, and the function of respiration is thus perverted. In the large dose asphyxiation may result even.

B. SPINAL CORD.

Here the congestion of the capillaries causes by lateral fluxion a disturbance of the functions of the motor columns of the cord. The muscles receiving nervous stimulus here are first thrown into a violent state of contraction, and then exhaustion results. The muscles of the throat, of the whole voluntary structure, are affected.

VII.

Mental and Moral Disturbances.

THE condition of the mind during the paroxysms induced by Nux is either undisturbed or exalted. The symptoms which may occur at the different stages of the action of the drug can all be traced to the altered blood supply. There may be confusion of ideas, affections of the sight, delirium, raving, and hallucinations. The congestion in the cerebro-spinal system induced by this drug is generally at the parts to which the irritation is first transmitted by the pneumogastric nerve from irritation of its peripheral filaments.

VIII.

Describe its Effects on the Alimentary Canal.

DIGESTIVE TRACT.

Tongue. The tongue is heavily coated, at the back part especially. The coating may be white, yellowish, or brown.

Taste. The taste is abnormal. There is a rancid taste as of old butter, or the taste may be acrid or sour, or even bitter from the condition of the organs of digestion.

Stomach. As the drug begins to act, the secretions are slightly increased; this improves the appetite. As the action of the drug becomes more intense, the greater increase of the secretions and their perversions destroy it. The food is undigested, and remains as a foreign body in the stomach, causing a sensation as if a stone were there. There are eructations of rancid, sour, and even bilious character. Catarrhal conditions in the stomach, with nausea and vomiting. Food passes into the intestine undigested. Sensation as of overloaded stomach, as if the result of too hurried eating, irritable condition of membrane lining the stomach, as in drunkards. Desire for stimulants early in the morning. Burning and discomfort in the epigastrium.

Intestinal Tract. Food passes undigested. May be pain in the abdomen and tympanitis. Diarrhea painless. Pain may occur before the stool. May be lenteric or catarrhal. Constipation follows from exhaustion, and is prolonged.

IX.

Describe the Effects of Nux Vomica upon the Mucous Membrane.

MUCOUS MEMBRANE.

Eyes. The conjunctiva is injected, and there is congestion in streaks, particularly at the inner canthus. The lachrymal secretion is increased. The vision is blurred. Sensation of heat and burning in the eyes.

Nose. Slight increase of secretion, with perverted sense of smell. Patient smells candle-wick and sulphur.

Mouth and Pharynx. The secretion is first increased in quantity, then its quality becomes changed. It is viscid and slimy, and the contraction in the throat causes it to be ejected in jerks.

Stomach. There is increased secretion. By this the digestive process is first favored, and then by the continued increase it is disturbed. The function of the gastric juice is rendered abnormal, and the process of absorption is disturbed.

Intestinal Tract. Here the secretion is increased, and a catarrhal condition results. Absorption is interfered with, and a diarrhea of a lienteric or papescent character results.

All these conditions in the digestive tract are followed by exhaustion, which is the reaction after the influence of the drug has passed away.

Respiratory Tract. The effect here is not marked, being but slight increase of function and consequent depression.

X.

Give Leading Indications, and its use therapeutically.

THERAPEUTIC RELATIONS.

HEAD.

Headaches, lateral headaches, pressing out over the eyes. Congestive headaches; headaches connected with gastric derangement when bilious. Sedentary "nux" habits; headaches in drinkers.

Conjunctivitis. When in conjunction with gastric trouble, and when the congestion is most at the inner canthus, with the conjunctivitis symptoms.

THROAT.

Tetanus. When the teeth are firmly locked, and when the spasm extends all over the body. Even if of traumatic origin. Type of effect of drug on motor nerves.

Spasm of Throat. Preventing swallowing. Increased secretions in the throat, ejected in jerks.

Hydrophobia. Spasmodic conditions about the throat. Dread of swallowing fluids. Slightest irritation, even a draft of air, will cause a spasm.

ALIMENTARY TRACT.

Gastric Catarrh. When increased secretion and digestion disturbed. When the result of intemperance or hurried

eating, accompanied by nausea. May or may not have thirst. Craves stimulants. Loss of appetite. Burning sensation in parts affected.

Gastralgia—Dyspepsia. When the foregoing symptoms, sensation as of a load in the stomach. Vomiting, eructations. Digestive function impaired. Headache accompanying, etc.

Diarrhea. Painless. May be pain before the stool, but not at the time of stool. May be flatus also. Worse in the early morning.

Constipation, obstinate, persistent, has been relieved by nux high. Tongue coated.

CATARRH OF THE DUCTS OF LIVER.

EPILEPSY AND CHOREA.

The tetanic spasms and twitchings of the muscles, the oozing saliva and rigid contractions, with other symptoms characteristic.

LEADING USES.

In all gastric affections, when the results of catarrhal conditions, intemperance, hurried eating, and sedentary habits. In fevers, when gastric derangements complicate. In disturbances of the brain which result from impaired digestion, as headaches, convulsions, vertigo. When thirst is present before and after, but not during fever. In spasmodic affections, when the convulsions are tetanic and characteristic.

SURGERY.

Written Wednesday, February 28, 1883, from 10 A. M. to 1 P. M.

ON Wednesday morning, February 28th, the day succeeding Dr. Owen's examination on materia medica, Dr. Hartshorn had the class assembled in the amphitheater to be examined in surgery. Lady members of this class had good reason to be a little nervous before this man. He had made them painfully conscious of the fact in his lectures during the Winter that he was not friendly to their co-education with men in the profession of medicine, and by his individual mannerisms had made their situation so unpleasant that, in the maintenance of self-respect, the continuity of their studies had been seriously interrupted. This petty persecution was reported to the other members of the faculty of the college, and was made a subject of discussion in their regular meeting, with Hartshorn present. At this meeting, a clause in the prospectus of the college was pointed out to Hartshorn, which, as an inducement to ladies to enter the *alumnæ*, required certain lectures to be given them in a class apart from the men. When he submitted the following list of surgical problems to the class the ladies knew they must do square work and ask no favors:

SURGERY

- I. *Give the Symptoms of Shock.*
- II. *Give the Treatment of Shock.*
- III. *Give the Different Forms of Hemorrhage.*
- IV. *Give the Kinds and Forms of Wounds.*
- V. *Give the Signs of Fracture.*

- VI. Give the Kinds of Fracture.
- VII. Give the Signs of Dislocation.
- VIII. Give the Differential Signs that Determine a Fracture of the neck of the Scapula from Subglenoid Dislocation of the Humerus.
- IX. What Muscles are on the Stretch in Subglenoid Dislocation of the Humerus.
- X. What are the Signs of Inguinal Hernia?
- XI. What are the Signs of Strangulated Hernia?
- XII. In what Position would you place the Patient to best enable you to Reduce Inguinal Hernia?
- XIII. In what Direction would you make Taxis?
- XIV. Give the Differential Diagnosis between Hydrocele, Hematocele, and Scrotal Hernia?
- XV. Name the Different Forms of Aneurism.
- XVI. What are the Signs of Aneurism?
- XVII. What is the Pathological Difference between True and False Aneurism.
- XVIII. In Dislocation of the Head of the Femur on the Dorsum Ilii, what Muscles are relaxed and what in a State of Tension?
- XIX. What are the Signs of Concussion of the Brain?
- XX. What Conditions call for and justify the Operation of Colotomy?

Answers to all of the above questions and propositions were written by Mary Wolfe in the presence of Professor Hartshorn in a closely compiled paper of about seventeen large pages, and submitted to him for inspection. The reason why it does not appear here, and the treatment Hartshorn gave this paper, and the final disposition he made of it is shown in the appendix. See Appendix.

PHYSICAL DIAGNOSIS.

Written Wednesday, February 28, 1883, from 1½ to 5½ P. M.

FOLLOWING the examination in surgery, in the afternoon, of the same day, February 28th, Professor Crawford examined the class in physical diagnosis. The questions and propositions submitted were as follows:

PHYSICAL DIAGNOSIS.

- I. *Differentiate between Functional Disturbance and Organic Heart Disease.*
- II. *Differentiate Mitral Insufficiency from Mitral Constriction, Aortic Insufficiency and Aortic Constriction.*
- III. *Give the Signs in Incipient Phthisis. Also those in the more advanced stage.*
- IV. *Give the Differential Diagnosis between Lobar and Lobular Pneumonia.*
- V. *Give Method of making Examination of the Liver, and Differentiate between Cirrhosis and Cancer of the Liver.*

To the foregoing Mary Wolfe wrote the following paper.

Physical Diagnosis.

I.

Differentiate between Functional Disturbance and Organic Heart Disease.

FUNCTIONAL DISTURBANCE.

1. *Rhythm.* The rhythm of the heart is not disturbed.

2. *The Pulse.* The pulse may intermit, but it will beat in time when the pulsation is resumed, as beat, rest, rest, beat, beat, rest, the time for each beat and rest being the same.

The character of the pulsation as regards force and quality is generally normal.

3. *Palpitation.* Palpitation occurs from external causes, as excitement, indigestion, and pressure, and passes away when the cause is removed.

ORGANIC DISEASE.

1. *Rhythm.* The rhythm is disturbed.

2. *The Pulse.* The disturbance is not a true intermission, but rather an irregular, unrhythmical beating; as there may be a few fast beats, then a few slow ones, and then several fast, then one slow, and all out of time.

The character of the pulsation as regards force and quality is generally less than normal, being weak and compressible, showing the lack of proper "vis a tergo" in the circulation.

3. *Palpitation.* Palpitation occurs from internal causes—the condition of the heart—and can only be overcome by the disappearance of the heart disease itself. It is the effort of the suffering organ to find rest, a struggle against the progress of the lesion.

4. *Character of Murmur.*
The murmurs are more blowing in sound.

The murmur is affected by exercise being diminished or obliterated.

5. *Mode of Appearance.*
The patient is made suddenly aware of the fact that the organ functions abnormally.

The causes might with propriety be called acute in functional disease.

6. *Symptomatic.*

7. *Pain.* Generally pre-cardial distress, dyspnoea, and fluttering.

8. *General Appearance.*
Does not indicate heart disease.

4. *Character of Murmur.*
The murmurs have a more substantial sound, a rushing or surging noise.

The murmur is affected by exercise, being increased in intensity.

5. *Mode of Appearance.*
The approach is more insidious. It may be a year before the patient has sufficiently severe symptoms to diagnose it subjectively.

The causes are generally chronic or long operating. Almost all organic disease is originally functional.

6. *Idiopathic.*

7. *Pain.* Pain is not marked; may extend down the left arm; is frequently absent.

8. *General Appearance.*
May be cyanotic look or anæmic expression.

II.

Differentiate—

Mitral Insufficiency from Mitral Constriction,

I. MITRAL INSUFFICIENCY.

1. *Synonym.* Mitral regurgitation.

2. *Time of Murmur.* The murmur is synchronous with the first sound of the heart.

3. *Cause of Murmur.* The regurgitation of blood through the left auriculo-ventricular opening, permitted by the insufficiency of the valves.

4. *Frequency of Occurrence.* First in frequency.

5. *Area of Greatest Intensity.* The area of greatest intensity is a circle about two inches in diameter, which has for its center a point a little to the left of the apex beat of the heart.

The murmur can also be heard in the dorsal region, from the fifth to the eighth vertebræ. Mitral murmurs are heard in the elbow (?)

II. MITRAL CONSTRICTION.

1. *Synonym.* Mitral obstruction. Mitral stenosis.

2. *Time of Murmur.* The murmur is with the second sound of the heart.

3. *Cause of Murmur.* The obstruction to the onward course of the blood through the left auriculo-ventricular opening, caused by a *constriction* or *stenosis* of the valves.

4. *Frequency of Occurrence.* Rarer than the two forms specially mentioned.

5. *Area of Greatest Intensity.* The area is similar to the foregoing, only the center of the circle of greatest intensity is at the apex beat or a little to the right of it.

The other conditions are the same. It can not be heard posteriorly.

NOTE. These differential points may be affected by abnormal surrounding conditions, and changes in the position and size of the heart itself. It would be impossible to even attempt to mention all these; but they are all to be deduced logically from the normal differential signs.

II.

Aortic Insufficiency and Aortic Constriction.

III. AORTIC INSUFFICIENCY.

1. *Synonym.* Aortic regurgitation.

2. *Time of Murmur.* The murmur is with the second sound of the heart.

3. *Cause of Murmur.* The regurgitation of blood through the left semi-lunar valves, caused by their incompetency.

4. *Frequency of Occurrence.* Rarer than the two forms specially mentioned.

5. *Area of Greatest Intensity.* The area of greatest intensity is a surface that corresponds to the sternum, in the projection to the right, just below the clavicle, over the junction of the third and fourth costal cartilages, extending out about an inch. The point or center of greatest intensity in this area is behind the sternum, a half-inch to the right of the junction of the fourth costal cartilage to the sternum. Aortic murmurs are also heard in the dorsal region the whole length of the thoracic cavity, especially at the lower angle of the scapula.

They are also heard in the general circulation, prominently in the carotids.

IV. AORTIC CONSTRICTION.

1. *Synonym.* Aortic obstruction. Aortic Stenosis.

2. *Time of Murmur.* The murmur is with the first sound of the heart.

3. *Cause of Murmur.* The obstruction to the onward course of the blood through the left semi-lunar valves, caused by constriction or stenosis.

4. *Frequency of Occurrence.* Second in frequency.

5. *Area of Greatest Intensity.* The area is similar to the foregoing.

The murmur is heard with greater facility when the rhythm of the heart is not disturbed, as it accompanies the first sound, and the time is longer. The murmur is also heard dorsally, and is propagated throughout the circulation, being heard in the carotids, above the clavicle.

N. B. Be careful to catch the murmur *in* the artery, because it may sometimes be confused with a mitral murmur, propagated through the tissues when in an abnormal state; as when a hepatized lung coexists, the law of sonorous vibration in solid bodies might propagate a mitral murmur widely.

III.

Give the Signs of Incipient Phthisis ; also those of the More Advanced Stage.

A. INCIPIENT PHTHISIS.

1. *Family History.* A permissible means of physical diagnosis.
2. *General Appearance.* If well nourished, or the reverse. If good circulation. If well-formed chest. Temperament.
3. *Contour of Bones.* They show a tendency to tubercular habit, if the shafts are slender and the extremities large.
4. *Emaciation.* Just beginning, noticeable about the neck, the larynx, and clavicle.
5. *Change of natural complexion.*
6. *Preternatural brightness of the eyes.*
7. *Twitching of the muscles of the face and chest.*
8. *Dilatation of the ala nasi on the affected side.*
9. *Hectic flush on the cheek.*
10. *Cyanosis seen in sclerotic.*
11. *Clubbing and curving of the finger nails,* from malnutrition caused by obstruction of the circulation through the subclavian veins by tubercular deposits.
12. *Œdema of the glottis.*
13. *Thickening, by infiltration, of the vocal cords.*
14. *Tubercles in larynx.*
15. *Voice of laryngeal Phthisis.*
16. "*Thermometric Wave.*" *Pathognomonic.* The tem-

perature is normal in the morning. It begins to rise about ten o'clock, and continues to ascend until two o'clock in the afternoon, when it reaches its greatest elevation. It remains high until ten o'clock in the evening, when it begins to decline, and is again (about) normal in the morning.

B. MORE ADVANCED STAGE.

1. *The signs in the incipient stage are all present.* The change in the general appearance, the progressive emaciation, the hectic flush and laryngial complications, becoming more marked.

2. *The apices of the lungs are the seat of the first deposits of tubercles.* These gradually extend downward until deposition takes place in the lower lobes. Auscultation and percussion reveal this, the region where they exist being marked by an absence of vesicular murmur and dullness on percussion—higher pitch. There is shortness of breath; at first only on exertion, afterwards at all times. There is increased frequency of respiration. As new and more extensive portions of the lung become involved in the deposit, constitutional disturbance increases. There is expectoration; this is the result of the inflammatory action set up by the true tubercles, acting by their presence as foreign bodies. The presence of the true tubercle in the sputum can be determined by the microscope. There may be abscess which can be diagnosed objectively. There may be hemorrhage, or expectoration streaked with blood. When the specific gravity of the expectoration is greater than water it is generally broken-down lung-tissue and pus, not the muco-purulent secretions of chronic bronchitis. As the disease advances, still more serious complications occur to disharmonize the system, such as disturbed gastric and intestinal function and œdema of the extremities. The whole appearance of the patient says phthisis, wasting away.

IV.

Give the Differential Diagnosis between Lobar and Lobular Pneumonia.

LOBAR PNEUMONIA.

1. SYNONYMS. *Croupous Pneumonia, Diffused Pneumonia* (diffused in the sense of being evenly or continuously extended over the lobe).

2. PHYSICAL SIGNS.

1st Stage or Engorgement. Vesicular murmur grows feeble until the beginning of the second stage, when it is lost in hepatization. As the vesicles fill with the exudation from the blood vessels, *rales* can be heard on inspiration. These are crepitant sounds and are pathognomonic.

2d Stage. Red Hepatization. When the lungs hepatize the vesicular murmur all sounds are absent excepting those abnormal in the bronchial tubes. Percussion reveals dullness over the whole lobe in this stage.

LOBULAR PNEUMONIA.

1. SYNONYMS. *Catarrhal Pneumonia, Interstitial Pneumonia, Parenchymatous Pneumonia, Disseminated Pneumonia* (disseminated in the sense of scattered through).

2. PHYSICAL SIGNS.

The stages are the same, but the manner in which the disease is located is different. There are patches of resonance and patches of dullness and other parts void of all sound. During the second stage crepitant rales are heard disseminated throughout the lungs, not continuously over them.

3d Stage. Resolution. The *rales* gradually return, until they become entirely restored in distinctness and volume.

3. LIMITATION.

The disease is generally limited in area by the inter-lobar fissures. One lobe or more of the lung being involved.

4. EXTENT.

Generally but one lung or part of one lung affected unilateral.

3. LIMITATION.

The disease is limited by the inter-lobular fissures. One lobule or very many being involved. The lobules being isolated each one, or each collection of a few.

4. EXTENT.

May extend throughout both lungs, being then bilateral.

V.

Give Methods of Making Examination of the Liver, and Differentiate between Cirrhosis and Cancer of the Liver.

A. IN MAKING AN EXAMINATION OF THE LIVER, the patient should be lying on his back with the abdominal muscles relaxed. The bowels should be evacuated prior to the examination. The physical means of diagnosis of most service are:

1. INSPECTION.
2. PALPATION.
3. PERCUSSION.
4. MENSURATION.
5. ASPIRATION.

1. *Inspection.* Notice if there is any circumscribed tumor. If there is general enlargement of the abdomen. If the superficial veins are prominent. Also, if there is a lessening of the proper size. Also, look for ascites.

2. *Palpation.* The general contour of the liver can be determined. If enlarged or atrophied or smooth or nodular. Tenderness can be discovered also by pressure. The general consistency of the organ may be determined.

3 and 4. *Percussion and Mensuration.* The area of the liver can be defined by these means, and they are of great value in determining the relation of the size to the normal standard.

5. **ASPIRATION.** This means is of service when there is reason to suspect an abscess has formed. When the constitutional and local symptoms point this way do not hesitate to use the aspirator, as it can do no possible harm and will determine the case at once.

B. DIFFERENTIAL DIAGNOSIS BETWEEN CIRRHOSIS AND CANCER, OBJECTIVELY.

CIRRHOSIS.

1. *Class of Patients.* Generally in drinkers and in those whose livers have been overworked.

2. *An Atrophy.* The liver is small and nodulated. "Hob-nail Liver."

3. *Superficial Veins* are prominent.

4. Pains dull.

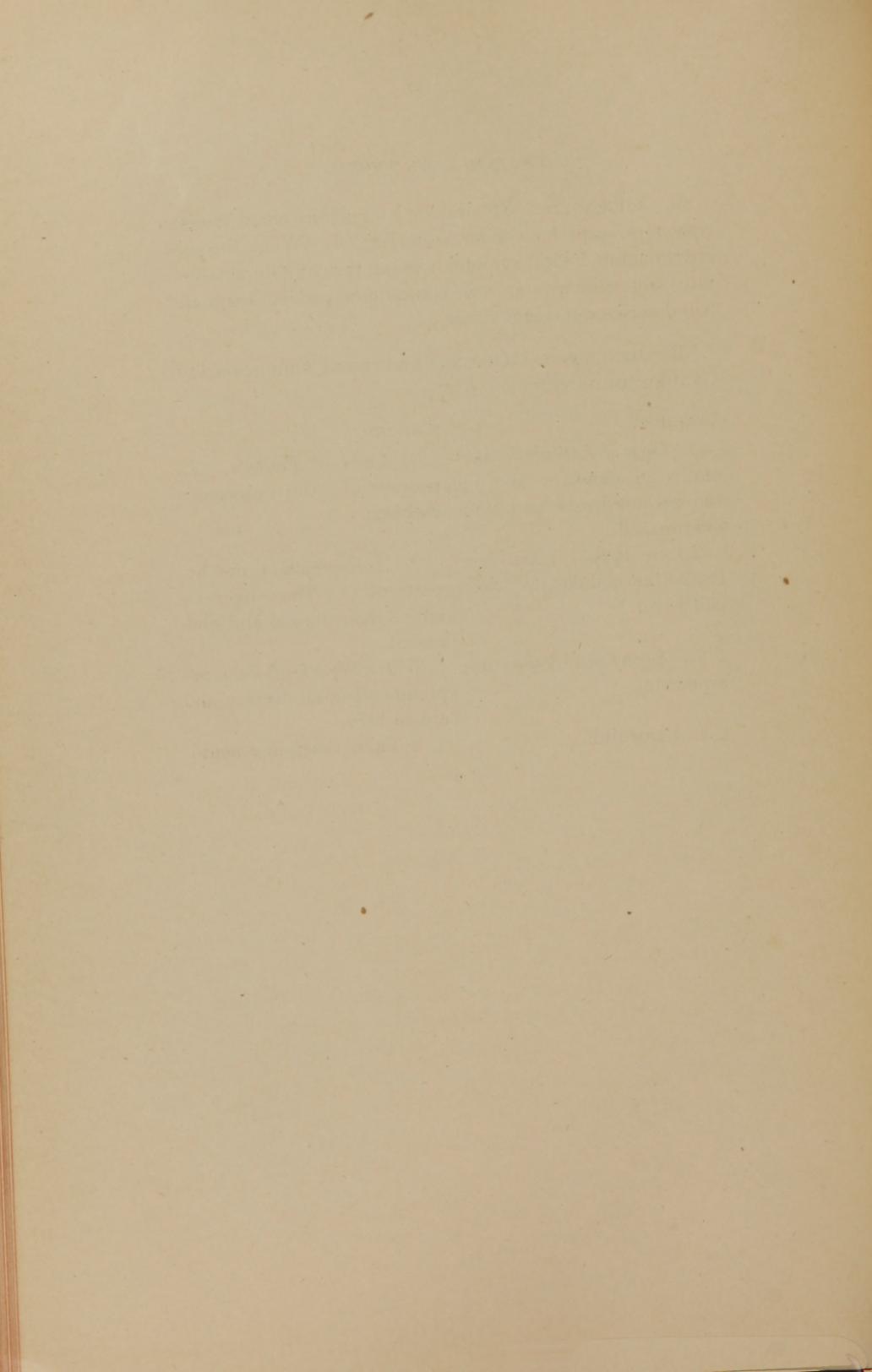
CANCER.

1. *Class of Patients.* In people of the cancerous cachexia.

2. *A Hyperplasia,* not hypertrophy. The liver is larger than normal and nodulated.

3. *The Superficial Veins* are prominent in all cancers, and are so here.

4. Pains sharp and acute.



OPHTHALMOLOGY AND OTOLOGY.

Written Thursday, March 1, 1883, from 9½ A. M. to 12½ P. M.

WRITING two papers on Wednesday, "Surgery" in the morning and "Physical Diagnosis" in the afternoon, had a perceptible effect on the spirits of the students. When they met in the amphitheater on Thursday morning they all looked *serious*, and some bore the evidence of having passed a sleepless night. Prepared or not, they were now expected to tell Professor McDermott, in the forenoon, what they knew about the "Eye and Ear;" and in the afternoon enlighten Professor Buck with their knowledge of "Theory and Practice."

On coming before the class, Professor McDermott, in his characteristically rapid way, said substantially that he was in quest of information on several subjects, but, to be definite in his desires, he wanted information on

OPHTHALMOLOGY.

- I. *Iritis, its Varieties, Symptoms and Pathology, Progress and Limitation, Local Treatment and Cure.*
- II. *Ophthalmia Neonatorum, Cause, Symptoms, Complications, and Local Treatment.*
- III. *Errors of Refractions, and Mode of correcting them.*

OTOLOGY.

- I. *Describe Sub-acute Catarrh of Middle Ear, and give Local Treatment.*
- II. *Describe Chronic Suppuration of the Middle Ear. Give Cause, Course, Termination, and Local Treatment.*

The following paper was written then and there by Mary Wolfe, and, without change or modification, handed to Professor McDermott.

Ophthalmology and Otology.

OPHTHALMOLOGY.

I.

Subject. Iritis, its Varieties, Symptoms and Pathology, Progress and Limitation, Local Treatment and Cure.

IRITIS is inflammation of the iris proper.

1. VARIETIES.

Iritis is generally divided into four classes, as regards the pathological conditions:

- a.* Simple.
- b.* Serous.
- c.* Parenchymatous.
- d.* Interstitial.

2. SYMPTOMS AND PATHOLOGY.

There is much vascular injection of both the sub-conjunctival tissue and the iris. A change of color in the iris occurs; it does not become red, but the red or amber of the blood mixes in an ocular sense with the pigment of the iris, and an abnormal color results; for instance, a blue iris with the blood superabundant takes on a greenish tinge. The congestion, by impinging on the terminal ends

of the ciliary nerve, induces marked "ciliary neuralgia." This is worse at night, before midnight, and follows the direction of the nerve tract, sometimes to the origin of the Trifacial. There is great photophobia, because the iris is inactive and sluggish. The pupil is contracted in all the varieties except the serous, where the pupil is dilated. The sympathetic nerve fibers govern the dilator fibers in the iris. The circular muscle or sphincter is controlled by filaments from the ophthalmic ganglion.

The vision is affected by the condition of the iris, the amount of light entering the posterior chamber not being regulated, and the exudate occluding the pupil. These symptoms are found in *simple* iritis. In each of the varieties besides, there are marked symptoms.

1. *b. In the serous* the pupil is dilated, and the pathological lesion is that condition of the iris where there has been an effusion of serum into the stroma of the iris.

2. *c. The parenchymatous* has the contracted pupil and the whole structure of the iris involved. The inflammatory effusion is thrown out, and the product of inflammation is diffused throughout the whole parenchyma of the organ. The amount of exudate into the chamber of the "anterior eye" is quite great; for instance, if there is a posterior synechia of the annular variety, the chamber that is behind the iris becomes so full of the effusion that the iris may be seen bulging forward, and an iridectomy be necessitated.

3. *d. The interstitial* is that form where the products of inflammation, instead of being throughout the whole parenchyma of the organ, are in the interstices between the stroma. These products are generally of a specific origin, and have the histological structure of gummata. They can be seen externally in the form of rounded projections, and must be differentiated from non-specific tumors of the iris.

3. PROGRESS AND TERMINATION.

The exudation being plastic and the pupil contracted, and the inner circumference of the iris being brought in contact with the lens capsule, the inflammatory action may cause adhesions to take place in these apposite structures. These adhesions are called posterior synechiæ, and are divided into complete and incomplete.

The complete are:

1. ANNULAR; or,
2. CIRCULAR; or,
3. SECLUSION OF THE PUPIL.

The incomplete are simply called posterior synechiæ.

During the course of this disease the pupillary space may be filled with exudate. This condition is called occlusion of the pupil. There may be even the formation of pus, when hypopyon would result. The danger of implication of the ciliary body is very great, when irido-cyclitis would result. The increased tension from the exudate would then bring on a glaucomatous condition.

4. LOCAL TREATMENT.

Always protect and rest the eyes. The indication first is to get the iris away from the lens capsule, except in the serous form. Atropine should be used for this. Paracentesis and iridectomy may be necessary in order to allow the effusion to escape. It may be necessary to form a new pupil by iridectomy if the pupil is destroyed.

5. CAUSES.

Generally supposed to be specific, but cases with no specific history are on record. Simple iritis may result from injuries, and is then classed as traumatic iritis.

II.

**Ophthalmia Neonatorum. Cause, Symptoms,
Complications, and Local Treatment.**

Ophthalmia neonatorum is the ophthalmia of new-born babes.

1. CAUSE.

The cause of this disease is the contact of the sensitive membrane of the eye with acrid or gonorrhœal discharges in the vagina of the mother during parturition.

2. SYMPTOMS.

The disease is very virulent in its course. If it is not watched carefully the deeper tissues will be speedily involved, and the eye will "slough right out bodily." There is a chemotic condition of the conjunctiva, with a purulent yellow profuse discharge. The lids will be bathed in this, and the tendency of the inflammation is to spread over and involve the cornea, and so backward into the deeper tissues. The subjective symptoms are, of course, absent; the objective are so plainly marked they can not be mistaken.

3. COMPLICATIONS.

The complications are very many. The case may be cured before much destruction is done, but any of the following conditions may result:

a. Madarosis or trichiasis or distichiasis from implication of the just formed hair follicles.

b. Destruction of the orifice of the Meibomian glands, causing xerophthalmia later.

c. Distortion of conjunctival reflexions from adhesions and inflammatory changes called symblepharon.

d. Perforation of the cornea by ulcers after keratitis. These may heal, however, and only maculæ be left.

e. Discharge of the humors of the eye.

f. Prolapse of iris, and if no further progress then anterior synechiæ, may be its destruction.

g. Prolapse of lens, and whole eye suppurating, rendering the organ useless.

h. Phthisis bulbi.

4. LOCAL TREATMENT.

Keep the eye clean as possible. If only one eye is affected, isolate the other, even hermetically sealing it. Use calendula or chlorine water, weak solution, to cleanse the eye of a tendency to involve the cornea. Then use a weak solution of atropine to dilate pupil. Nitrate of silver, a weak solution, and then salt water afterwards, may be used to change the character of the inflammatory action.

III.

Errors of Refractions, and Mode of Correcting Them.

REFRACTION, ITS ERRORS AND THE GLASSES TO CORRECT THEM.

Refraction in the eye is that adjustment of the different media through which the light passes by which the course of the rays is so diverted as to bring them to a focus at some point.

Normal Refraction is that adjustment by which the rays are brought to a focus just at the macula lutea or yellow spot of Sömmering.

Abnormal Refraction is that adjustment by which all the rays are brought to a focus, either anteriorly to this spot or posteriorly to it, or where the different rays from the same object are focused at different distances from the normal stand-point.

The Cornea is the medium having most influence in refraction.

SPECIAL ABNORMAL CONDITIONS OR ERRORS OF REFRACTION.

The commonest forms are :

1. Hypermetropia.
2. Myopia.
3. Astigmatism. $\left\{ \begin{array}{l} a. \text{ Regular.} \\ b. \text{ Irregular.} \end{array} \right.$

1. *Hypermetropia* is that error in a symmetrical cornea where the curvature is too slight, and the rays are deflected in such a degree only that the focal distance is lengthened and lies behind the macula lutea.

2. *Myopia* is that error in a symmetrical cornea where the curvature is so great that the focus is, by too much deflection of the rays, found in front of the macula lutea.

3. *Astigmatism* is the result of an asymmetry in the curvature of the cornea.

a. *Regular Astigmatism* is that form of asymmetry in which the curvature in each meridian is a perfect arc, but the different meridians are arcs of circles of different diameters. The varieties of regular astigmatism are :

1. Simple. 2. Compound. 3. Complex.

1. Simple astigmatism is that condition where the error of refraction is in but one meridian, the other meridians being normal. It may be either myopic or hypermetropic.

2. Compound astigmatism is that condition where different degrees of the same error exist in different meridians of the same eye. It may be compound myopic or compound hypermetropic.

3. Mixed astigmatism is that condition where the curvature of the cornea is both greater and less than normal in the different meridians of the same eye.

b. *Irregular Astigmatism* is that condition where the meridian itself is out of harmony in its own curve, not being a perfect arc.

GLASSES.

The glasses used are divided as to shape into,

- | | |
|-------------------|---------------|
| 1. Plano-concave. | 3. Biconcave. |
| 2. Plano-convex. | 4. Biconvex. |

Also,

- | | |
|-----------------|---------------|
| 1. Cylindrical. | 2. Spherical. |
|-----------------|---------------|

All glasses are from these forms. The refracting power of the glass is such, that when adjusted to the eye it will supply the power lacking there.

APPLICATION OF GLASSES.

1. *Hypermetropia*. To correct too slight curve of the cornea, a biconvex spherical glass is used, which lessens the focal distance.

2. *Myopia*. To correct the too great curvature of the cornea, biconcave spherical glass is used. This lengthens the focal distance. (Presbyopia is a secondary error, depending on the condition of the internal structures, but is corrected as hypermetropia.)

3. *Regular Astigmatism*.

a. *Simple Myopic Astigmatism* is corrected by a plano-concave cylindrical glass with the axis of the cylinder set at right angles to the meridian in which is the error.

b. *Simple Hypermetropic Astigmatism* is corrected by a plano-convex cylindrical glass with the axis at right angles to the meridian in which is the error.

c. *Compound Myopic Astigmatism* is corrected by a biconcave spherical glass, which corresponds in strength to the myopia of the whole eye, in combination with a plano-concave cylindrical glass, set as in simple astigmatism, of a strength which corresponds to the difference in refractive power between the astigmatic meridian and the myopic error of the whole eye. The different curvatures are ground in one glass, as prescribed, by the oculist.

d. *Compound Hypermetropic Astigmatism* is corrected on the same principle as the foregoing, only convex lenses are used, where in myopic they were concave.

e. *Mixed Astigmatism* is corrected by using cylindrical glasses with the axes set at right angles to the asymmetrical meridians, both plano-concave and plano-convex.

4. *Irregular Astigmatism* I don't know how to correct.

In prescribing glasses it is well to remember the amount of refractive error that is manifest is not the real. The ciliary muscle acts unconsciously, and the play of the lens overcomes the latent error. It is well to paralyze the action of the muscle and then use the tests.

1. *Manifest error* is that ordinarily presenting.
2. *Real error* is that due to the corneal implication.
3. *Latent error* is that hidden by the action of accommodation.

Myopic glass should be as "weak" as possible.

Hypermetropic glass should be as "strong" as possible.

OTOLOGY.

I.

Describe Sub-acute Catarrh of Middle Ear, and give Local Treatment.

SUB-ACUTE CATARRH of the middle ear is that condition which supervenes there after catarrh has made its way from the posterior nares through the Eustachian tube to the chamber of the tympanum.

The throat, on being examined, will be found to be congested and with but little secretion. The follicles may be enlarged, but there is not great redness or active engorgement. The Rhinoscope will reveal the same condition existing in the mucous membrane of the posterior nares, and by continuity it extends up the Eustachian tube and into the chamber.

The external surface of the drum membrane will have lost its bright luster, and it may even be slightly more concave. There will be a pinkish tinge and some congestion along the handle of the malleus. There will be dullness of hearing, dull pain in the head, chronic feeling of fullness in the ear, sensation as if something were in the ear. The symptoms of sub-acute catarrh in the throat will be marked dryness and fullness there. Every cold will aggravate into an acute attack, and the patient is especially liable to take cold. It occurs in people who are negative, and whose vital force does not seem to secure a return to health.

TREATMENT.

The treatment is directed principally to the catarrh. Locally to the throat, a wash of Iodide of Potash or of Chlorate of Potash may be applied; also other alterative or slightly stimulating washes. Nitrate of silver, a weak solution, may be applied to the posterior wall of the pharynx with a brush.

Inflation is of good service, and should be employed once every two or three days. Use the Politzer Bag. Have the patient get one and use it himself. Fill the external auditory canal from the meatus to the membrana tympani with boracic acid.

Constitutionally, such remedies should be given as have a relation to the pharyngeal catarrh, and also such as will give tonicity to the general system,—the Kalis and Iodides, Mercurius, Calcareo, Arsenicum, etc.

II.

Give the Cause, Course, Termination, and Treatment of Chronic Suppuration of the Middle Ear.

Cause. Chronic Suppuration of the middle ear is the result of acute suppuration. This is oftener of catarrhal origin than from any other cause.

Course. In acute suppuration, so soon as there is a bit of pus in the chamber of the tympanum, the pain becomes intense, and is only relieved by perforation. When the perforation has taken place the continued flow of pus through the opening into the external canal, which can be plainly seen through the Otoscope, will diagnose the trouble surely. The subjective symptoms are the loss of hearing, the roaring sensation in the head, the vibrant sound of metal, as of a ringing bell, the terrible pain with beating and throbbing before the perforation. If the cavity of the middle ear becomes full of pus there will be bulging of the drum membrane, and an obliteration of the "landmarks" upon it. When the membrane is perforated, on inflation, a whistling sound is elicited by the air passing through the opening.

The Termination is generally perforation. The mastoid cells, however, may become involved by the extension of the inflammation and suppurating process into them, causing mastoid abscess; or, worse still, by reason of the extreme thinness of the vault of the chamber, and the close proxim-

ity of the brain above, cerebral abscess may result, and thus the most serious of all consequences follow.

Local Treatment. As soon as the pus is formed evacuate the cavity by paracentesis through the umbo of the membrane. The external canal should be kept well cleansed and free from pus by thorough syringing. The mastoid cells, if implicated, should also be opened by an incision into the mastoid process behind the ear.

If there are other complications, treat them as indicated. The principal object is to keep the middle ear free from pus, to prevent extension to the mastoid cells or cerebrum and to control suppuration.

THEORY AND PRACTICE.

Written Thursday, March 1, 1883, from 2 to 4 O'clock, P. M.

As stated in the remarks preceding the paper submitted to Professor McDermott on the "Eye and Ear," Professor Buck met the class at two o'clock P. M. of the same day to examine the members on a half-dozen problems touching the Theory and Practice of the Homeopathic School of Medicine. The professor's line of thought was indicated under the following heads:

- I. *How does Homeopathy differ essentially from Other Systems of Practice?*
- II. *Give the Differential Diagnosis between Acute, Chronic, Functional, and Organic Disease.*
- III. *Give the Differential Diagnosis between Croupous and Catarrhal Pneumonia.*
- IV. *Give the Differential Diagnosis between Malarial and Typhoid Fever.*
- V. *With what Other Diseases of the Kidneys is Bright's Disease Confounded, and Give its Symptoms and Diagnostic Indications in the Acute and Chronic Forms.*
- VI. *Give the Essential Characteristics of Pulmonary Tuberculosis.*

In answer to the above, Mary Wolfe wrote as follows.

Theory and Practice.

I.

Subject. How does Homeopathy differ essentially from Other Systems of Practice?

I. Homeopathy is the infant *science* of medicine, and differs from all other systems of practice in general principles. It may be considered in its special sphere as holding the same relation to its fellows as the True does to the False in the Universal.

Before the scientific investigations of Hahnemann and his discoveries the whole system of practice in every school was empirical; and though there have been good results attained, it has been only when the law was in operation—often without the physician's knowledge. Other schools have not yet made the simple beginning of *starting with a basic truth*; hence they have not any logical or scientific records by which an understanding of their principles can be gained.

LAW OF HOMEOPATHY.

The law of Homeopathy is but a *special* expression of a general law, that "the universe exists in a state of polar tension."

a. The "law of similars" recognizes this, and in the provings of drugs and their clinical records are seen the disturbances in polarity that arise, and the restoration to homologous conditions which can be effected.

b. The "minimum dose" shows also the scientific application of a force to a force.

c. The "action and reaction," or "primary and secondary" effects of drugs, is in specific relation to the condition of the poles.

d. The "single remedy" shows a rational knowledge of the effect desired, if properly selected and prescribed.

II.

Subject. Give the Differential Diagnosis between Acute, Chronic, Functional, and Organic Diseases.

II. All disease being a unity in entity, varying only in its manifestation, it is almost impossible to more than touch upon the conditions which may exist to give rise to the disturbances of harmony classed under the above heads.

A. ACUTE DISEASE.

Any disturbance of the system which gives rise to immediate efforts to restore it to its normal state may be classed as an acute disease. An acute disease may be functional or organic. The character it assumes depends on the cause, the patient, the environment.

B. CHRONIC DISEASE.

Any disturbance of the system, either functional or organic, that is caused by a prolonged irritation, either psychical or physical, is a chronic disease. When a chronic disease is organic, there is generally some change of structure that acts as the prolonged irritation.

C. FUNCTIONAL DISEASE.

Functional disease is the effort which the system makes to restore harmony when it has been disturbed. It may be caused by direct irritation to the part functioning, or

may be the effort of one part to counterbalance a disturbed condition in another by taking upon itself abnormal activity.

D. ORGANIC DISEASE.

Organic disease is caused by that change in an organ which is the result either of prolonged irritation to itself, from functional disturbance, or that has arisen in "compensation" for inharmony in some other part. Each organ in the body is unselfish, and not only does its own work harmoniously, but has "a little something over" to give to every brother in distress.

III.

Subject. Give the Differential Diagnosis between Croupous and Catarrhal Pneumonia.

1. CROUPOUS PNEUMONIA.

a. PATHOLOGY.

Croupous pneumonia is lobar pneumonia, and the pathology is as follows:

1st Stage. The stage of engorgement and exudation. The engorgement is in the pulmonary capillaries. The increased amount of blood in them causes increased pressure, and the liquid portions ooze through into the air vesicles. The oxygen in the air is positive. The chief constituents of the blood make it negative when the normal quantity is present, but on engorgement there is an increase of positive elements, and thus, the membrane being neutral, the polar tension is changed, and the osmotic function, which was before with the positive pole exter-

1. CATARRHAL PNEUMONIA.

a. PATHOLOGY.

Catarrhal pneumonia is lobular pneumonia, and the pathology is as follows:

1st Stage. The same.

The engorgement is in the bronchial capillaries, and the conditions are similar, the location of the exudation being different.

The same conditions of polar tension exist as did in the croupous variety, only the blood is not so negative in the bronchial capillaries, being arterialized and sent there for nutritive purposes only, while that in the pulmonary capillaries is strongly negative, being composed of the venous blood and the *chyle*, which is in the lungs for the purpose of becoming positive before it goes to the

CROUPOUS PNEUMONIA CONTINUED.

nal, and the chief current flowing inward, has now the positive pole internal in the capillaries, and the negative pole external. The stronger current is toward the negative pole when in health, the stronger flow in osmosis from without inward, the oxygen to the blood. In this condition it is from within outward; blood, or rather its more negative elements, and some positive, the red corpuscles—for the law works all the time—passing out into the air cells in the greater current.

2d Stage. The stage of red hepatization. This stage is the one in which all the vesicles in the diseased part are filled with the exudation.

As soon as the vessels are filled, equilibrium of the polar relation is restored, and a return to normal polarity (negative) in the relieved vessels outside of the air cells is brought about. Now an effort must be made to restore the positive tension in the cell. This gives rise to the

CATARRHAL PNEUMONIA CONTINUED.

capillaries of the general system, and in them loses its positive character with its oxygen and returns as negative fluid to the lungs. The exudation fills up the smaller bronchioles and seclude the air cells, which collapse, and are not filled.

The exudation is not so organizable as in croupous pneumonia; the difference being only in *degree*. It contains albumen and fibrin, but in less quantity.

2d Stage. In this stage, as the pneumonic condition is not continuous throughout a whole lobe, but disseminated, involving the lobules “in patches,” the red hepatization of the whole lobe does not take place, and the exudation only fills the parts involved.

The tendency of the exudation in this disease is to remain in the parts, and to go on to the condition where the leucocytes are transuded.

CROUPOUS PNEUMONIA CONTINUED.

condition known as the following:

3d Stage. Resolution. In this stage the filled vessel is relieved by the "rusty sputa" and by reabsorption.

As the osmotic function is resumed in the cell in this stage, the positive oxygen forces its way in, and the exudation is "crowded out," either through the bronchial tubes and trachea, or a small portion of it that has its exit prevented is carried by the eager oxygen into the vessel again.

b. PHYSICAL EXPLORATION.

1st Stage. The stethoscope reveals the presence of crepitant râles, vesicular murmur being gradually lost all over the *affected lobe*. Dullness and high pitch on percussion.

2d Stage. The stethoscope

CATARRHAL PNEUMONIA CONTINUED.

The polar relation will explain this, etc. [To fully carry out this change in tension, etc., would take too much time now. The principles governing the changes in this stage are the same as before explained.]

3d Stage. Resolution. In this stage the exudation is thrown off as in the other.

The air cells being secluded during the second stage, their sides are generally found to have been glued together with organizable exudate; and now, when the bronchioles are again free, the cells are obliterated.

In the croupous variety the air cells resume their normal function.

b. PHYSICAL EXPLORATION.

1st Stage. Auscultation reveals patches of crepitant râles, dullness in patches also.

2d Stage. The same as

CROUPOUS PNEUMONIA CONTINUED.

reveals the loss of vesicular murmur, the cessation of the crepitant râles, dullness increased.

3d Stage. Return of the crepitant râles and vesicular murmur and normal resonance. Finally râles are also lost and normal sounds return.

c. SPUTUM is red and frothy, and then becomes purulent, and finally ceases, or else, if polarity is not established, it becomes gangrenous. The purulent infiltration is between the second and third stage, etc.

d. SYMPTOMS. Chill and fever. The pulse accelerated, the temperature increased. Symptoms vary with the stages. At first a dry cough, then with expectoration. The effort of the other organs to assist the lungs causes abnormal conditions of the skin, and digestive tract; and disturbance of the circulation may cause the brain to be implicated functionally. The condition of the tongue and pulse and general system all depend on other causes, each being a marked case by itself.

CATARRHAL PNEUMONIA CONTINUED.

croupous, only the signs are not found continuously in the lobe's entire extent, but in "patches."

3d Stage. Same as croupous, only "patchy." Resolution is not so rapid or complete, and have signs of this physically.

c. SPUTUM is not so red, is frothy, and then purulent, generally continuing longer before cessation.

d. SYMPTOMS. Stage of engorgement has chill. Then reactionary fever, with the concomitant symptoms.

The tendency of the disease is to become chronic, and hence the symptoms are not so sthenic in type.

The recovery is slower, and the tendency to sequelæ is greater than in the croupous variety, the lungs being much oftener left in an unhealthy state.

IV.

subject. Give the Differential Diagnosis between Malarial and Typhoid Fever.

1ST. MALARIAL FEVER.

a. Cause. External generally. The poison gases of decaying vegetable matter.

The external causes operate on residents of the malarial district if they are in a state of negation.

b. Type. Intermittent, tertian, quotidian, etc.

c. Prognosis. Lasts a long time; but the patient lives, like a mummy in looks.

d. Lesion. The liver is disturbed in its effort to restore proper circulation, becoming congested. There may be "ague cake" also. The spleen, at work, is overtaxed from the same cause.

2D. TYPHOID FEVER.

a. Cause. External and internal both.

1. External. The poisonous gases liberated from decaying animal matter.

2. Internal. The constitutional tendency of the patient—predisposed to typhoid from excess, either mental or physical—negative.

b. Type. Remittent. Crisis every seventh, fourteenth, and twenty-first day.

c. Prognosis. Grave. May be favorable or otherwise.

d. Lesion. The system relieves itself and endeavors to restore harmony through Peyer's glands, which ulcerate and break down, sometimes irretrievably.

V.

Subject. With what Other Diseases of the Kidneys is Bright's Disease confounded? and give its Symptoms and Diagnostic Indications in the Acute and Chronic Forms.

1. BRIGHT'S DISEASE, may be confounded with
 2. Perinephritis.
 3. Nephritis Vera, $\left\{ \begin{array}{l} a. \text{ Parenchymatous.} \\ b. \text{ Interstitial.} \end{array} \right.$

1. BRIGHT'S DISEASE.

Acute. The tubules are affected first. The flow of urine is high-colored, and becomes scanty. There is lithic or uric *debris*. There is excess of phosphates and other salts. Albumen is present. There are also casts, tube, cell, and hyaline. Retinitis albuminuria. Pain or deep pressure in the region of the kidneys, extending to the tract of the ureters. The lesion is in the tubules.

Chronic. The pain becomes intense, albuminuria continues; also bloody urine. Constitutional disturbances become more marked. Other organs, in helping to relieve the overworked kidneys, also function abnormally. The circulation is disturbed, and oedema results. The parenchyma of the organ is finally involved. Pus may be present in the urine. The kidney is large and white; in the

last stages becomes small and granular, with destruction of the organ resulting from the progress of the disease.

2. PERINEPHRITIS.

The capsule of the kidney is involved. There is great tenderness on slight pressure. The serous membrane becomes very sensitive. There is no change in the character of the urine or its quantity, and no abnormal function of other organs.

3. NEPHRITIS VERA.

a. Parenchymatous Nephritis. In this lesion the tubules and the proper structure of the kidney are both involved. The symptoms would be similar to those in chronic Bright's disease.

b. Interstitial Nephritis. This is a disease of the interstitial structure, and not of the tubules. Generally traumatic in origin. The urine may be bloody—is generally normal in quantity—and may contain albumen. The characteristic appearances of Bright's disease urine are not found, however. The pain is not so great.

VI.

**Subject. Give the Essential Characteristics of
Pulmonary Tuberculosis.**

PULMONARY TUBERCULOSIS is a localized manifestation of malnutrition.

The general condition of the patient should be observed, if malnutrition is expressed. The family and individual also. Look for the signs of incipient phthisis. The cyanosis, bright eyes, twitching muscles, dilated *alæ nasi*, the white rim about the teeth, the infiltration about the glottis, infiltration and tubercles in larynx, the "thermometric wave," the increased pulse, short breath, lassitude, loss of appetite, progressive emaciation, dry, hacking cough, the configuration of the bones, etc.

The cough varies—may be dry, or moist and loose, with expectoration of purulent matter. Examine the sputum for tubercles. Detect the presence of the true tubercle if possible.

The deposits are most frequently in the apices of the lungs. It will be here the loss of vesicular murmur will be first noticed. With the physical means of diagnosis, mark whether the patient is in the

Incipient Stage,
Stage of Deposition, or
Stage of Ulceration.

The râles that are heard, the gurgles, the "cog-wheel" and amphoric breathing, all speak to the attent ear.

The diagnosis is simple after the signs are palpable. It is during the incipient stage that the physician finds one of his most successful missions as "a priest of the holy flame of life."

OBSTETRICS.

Written Friday, March 2, 1883, from 2 to 5 O'clock, P. M.

On Friday morning, March 2d, Professor Hunt met the class, and, in order to ascertain what they knew about Obstetrics, in good Socratic style submitted the following interrogations:

OBSTETRICS.

- I. *What is Douglas's Cul de Sac?*
- II. *What are the Symptoms of Abortion?*
- III. *What are the Dangers in Abortion?*
- IV. *What are the Chief Indications for Treatment?*
- V. *Into how many Stages is Labor divided?*
- VI. *How is the Dilatation of the Os affected?*
- VII. *How may it be known that Labor has begun?*
- VIII. *What is meant by the Mechanism of Labor?*
- IX. *What is the Presentation of the Child?*
- X. *How many Presentations are there?*
- XI. *Which is the most common Presentation?*
- XII. *Name the Diameters of the Fœtal Head?*
- XIII. *What is the Mechanism of Delivery in the left Occipito-anterior Presentation?*
- XIV. *What is Placenta Prævia?*
- XV. *What is the Cause of Postpartum Hemorrhage?*
- XVI. *What are the Symptoms of Postpartum Hemorrhage?*

- XVII. *What are the Indications of Treatment in Postpartum Hemorrhage?*
- XVIII. *What is Version?*
- XIX. *How many kinds of Version are there?*
- XX. *How is Podalic Version affected?*
- XXI. *What is the Object of Forceps?*
- XXII. *When should Forceps be applied?*
- XXIII. *What are the Indications for the Use of Forceps?*
- XXIV. *How soon after Labor is Milk secreted?*
- XXV. *What is Mastitis?*
- XXVI. *What is the Treatment of Mastitis?*

The following paper was written by Mary Wolfe in answer to the foregoing questions.

Obstetrics.

I.

What is Douglas's Cul de Sac?

It is the recto-vaginal fold of the peritoneum. The reflexion of the peritoneum between the uterus and the rectum, posterior to the uterus, extends down over the vagina part way before being returned over the anterior surface of the rectum. The "blind pouch" thus formed is called the "Cul de Sac" of Douglas.

II.

What are the Symptoms of Abortion?

1. *Pain.* The amount of pain varies with the time at which the abortion occurs. It simulates the first pain in actual labor at the beginning. If the abortion is permitted, the expulsive pain follows.
2. *Hemorrhage.* If the patient loses even four to six teaspoonsfuls of blood the abortion is almost sure to follow. The slight discharge of blood should make the physician watchful.

III.

What are the Dangers of Abortion?

1. *The Present.* The greatest danger is to the life of the product of conception. If the abortion is not arrested the fœtus, not being inherently viable, is lost. The next danger is to the life of the mother. The hemorrhage, and the conditions that may succeed the abortion, or accompany it, are to be feared here.

2. *The Remote.* Impaired health of the mother. The uterus may be left in such a condition that it can no longer perform its normal function, or there may be a state of debility permitting prolapse or malposition.

IV.

What are the Chief Indications for Treatment?

TREATMENT should be *first* employed to prevent the abortion; *second*, to favor it. The indications are as follows:

Preventive. When the case, on being examined, presents the following symptoms, preventive treatment should be used. The patient has pain simulating the contracting pains in labor. There may be a very slight hemorrhage. There is a history of a fall or fright, or it is about time for

the os to lose itself in the fundus, and the partial detachment of the placenta might occur if placenta prævia, or, in fact, there may be any cause that would even partially disturb the placental union (for abortion depends upon the breaking up of the placental attachment). The patient should be put to bed, given an opiate, perfect quiet should be enjoined. The hips should lie higher than normal, and by favoring perfect repose endeavor to have the parts themselves "tide over" the dangerous place.

Favoring. When the hemorrhage still continues and the pain, and also when there is no dilation of the os, and there is danger both to the mother and child from exsanguination, then the product of conception must be lost to save the mother. Always when but one life can be saved give the benefit of treatment to the mother.

The object of treatment now is to dilate the os and cause the expulsion of the contents of the womb. To dilate the os the best method is to introduce the "kite-tail" tampon into the vagina. This should be made of bunches of cotton joined to each other by a string. Soak the first bunch in a mixture of thymol (antiseptic) glycerine (dilating) and water, and introduce it well into the vagina through a Simms Speculum. Pack the bunches after dipping them in the above mixture about the os, not too tightly. Then pack the vagina. Retain the tampon in position by a T bandage if necessary. The patient will give warning when the os is dilating and the contents of the uterus are to be expelled. There is usually no trouble afterwards, the uterus contracting nicely, and the hemorrhage ceasing. Should the placenta not be expelled, then re-introduce the tampon, and it will effect this. Ergot should be given as in parturition, and it is necessary that the patient remain in bed even longer than the term following labor.

V.

Into how many Stages is Labor divided?

FIVE, as follows:

1. Contraction of the uterus.
2. Dilatation of the os.
3. Rupture of the bag of waters.
4. Expulsion of the foetus.
5. Expulsion of the placenta and adventitia.

VI.

How is the Dilatation of the Os affected?

As the womb contracts, the os begins to dilate with the expulsive pains. The pressure of the head of the child upon the os, as the contraction of the uterus forces it downward, may cause it by reflex action.

VII.

How may it be known that Labor has begun?

By the expulsive pains having commenced. The peculiar grunting or straining ejaculation of the lying-in woman shows this. Also the manner in which she makes traction on the hand of the physician if he grasps hers.

VIII.

What is meant by the Mechanism of Labor?

The mechanical changes which take place in the position of the child in relation to itself and surrounding structures in its progress from the uterus to delivery.

The stages in the mechanism of labor are :

1. Flexion.
2. Descent.
3. Descent and rotation.
4. Extension.
5. Partial restitution.
6. Complete restitution.

The factors are :

1. The "vis a tergo," or contraction of uterus.
2. The anatomical structure of the joint of the occiput with the vertebra.
3. The planes of the pelvis and spine of the ischium.
4. The structure of the external outlet at the lower strait.

IX.

What is the Presentation of the Child?

The presentation of the child is its appearance and position at the upper strait just before delivery.

X.

How many Presentations are there?

Presentations may be divided as follows:

1. AS TO PORTION OF BODY PRESENTING.

- a.* Head.
- b.* Breach.
- c.* Shoulder.
- d.* Knee.
- e.* Foot.
- f.* Hand.
- g.* Funis.

2. AS TO POSITION OF PORTION OF BODY PRESENTING.

As head, in

- 1. Occipital.
- 2. Facial.
- 3. Lateral.
- 4. Vertex.

3. AS TO DIAMETER IN WHICH THE HEAD PRESENTS.

- a.* Oblique, two.
- b.* Transverse or lateral.
- c.* Antero-posterior.



XI.

What are the Most Common Presentations ?



1. The child lies in the oblique diameter, extending from the left acetabulum to the right sacro-iliac symphysis, with the occiput looking to the acetabulum. This is the most common. The longitudinal suture follows the course of the diameter in which the child lies. The lamdoidal suture is at right angles to this. The head presents:
2. The next most common is when the occiput looks to the right acetabulum.
3. The next most common is when the occiput looks to the left sacro-iliac symphysis.
4. The next most common is when the occiput looks to the right sacro-iliac symphysis.
5. The presentations of other parts of the body are rarer than head presentations.

XII.

Name the Diameters of the Fœtal Head.

THE most commonly mentioned are :

1. The occipito-mental, $5\frac{1}{4}$ inches, generally.
2. The occipito-frontal, $4\frac{1}{4}$ " "
3. The biparietal, $3\frac{1}{2}$ " "

XIII.

What is the Mechanism of Delivery in the Left Occipitio-anterior Presentation?

THIS is the most natural position.

1. DILATATION OF OS AND RUPTURE OF THE BAG OF WATERS. The os is dilated, and the head presents in the oblique diameter, the longitudinal suture coursing from the acetabulum to the symphysis. The amnion, with its fluid, precedes the head, and is ruptured as the womb contracts behind it, forcing the head downward.

2. FLEXION. The head flexes at the upper strait from purely mechanical causes. The contractions of the uterus impart a downward motion to the child, and the body is pressed against the head. The arrangement of the condyles is such that, force being applied, the chin is forced upward

to the sternum, and the occiput is at the os. The pressure having no further change to make in the position of the child, as related to itself, transmits to it an onward motion.

3. DESCENT AND ROTATION. This onward motion causes descent of the fœtus. It has not, however, proceeded very far until, by the inclination of the planes of the pelvis, it is brought in contact with the spine of the ischium. These two factors cause rotation, and their adjustment is such that the occiput almost invariably rotates to the symphysis pubis, and the face to the hollow of the sacrum. Descent and rotation are continued until the head is under the pubic arch, in the just-mentioned position.

4. EXTENSION. Now, from purely mechanical reasons again, the pressure from behind changes the inclination of head to the body. The pubic arch holding the occiput, the forces imparted from above cause the head to extend, and in that way it is delivered.

5. RESTITUTION, PARTIAL AND COMPLETE. These motions take place just after the head has left the external outlet, and were so named because the supposed direction of the child in utero, just before delivery, was restored. The body follows the head, and delivers itself.

XIV.

What is Placenta Prævia?

IT is that condition where the attachment of the placenta is partially or completely over the os. The placenta forms at that portion of the uterus when the fecundated ovum is dropped. It is quite rare to find the os involved.

XV.

What is the Cause of Post-partum Hemorrhage?

THE principal cause of post-partum hemorrhage is inertia of the *ulvus*. This condition may result from many causes, as a protracted labor, a weakened patient, an abnormal labor, etc.

XVI.

What are the Symptoms of Post-partum Hemorrhage?

GENERALLY almost a state of coma, the pulse low, and the appearance of the patient such a characteristic one that, once seen, it is never forgotten.

LOCALLY there is hemorrhage, often very profuse. The womb will be found filling the cavity of the abdomen, relaxed and full of clots. The clots will not be mistaken for retained placenta, because they can be broken up by the hand, while the placenta can not be.

XVII.

What is the Indication for Treatment of Post-partum Hemorrhage?

THERE is but little time, and the object of treatment is to stop the hemorrhage and get contraction.

1. **TURN OUT THE CLOTS.** Introduce the hand into the uterus, and gently take away all the clotted blood that is there.

2. **MANIPULATION.** Do not remove the hand, but allow the blood to drain away along the wrist. Then, with the hand still in the womb to act as an irritant, try to induce contraction by forcible manipulation of the abdomen externally with the other hand.

3. **HOT AND COLD WATER.** If this does not succeed then inject first as hot water as can be borne into the organ, and then follow this with cold. Care should be taken in the application of these opposite temperatures, that the contraction and revulsion does not induce a spasm.

4. **ICE PACK.** If still unsuccessful, pack the vagina with snow or crushed ice, and make cold applications to the loins.

5. **ASTRINGENTS.** The mopping of the walls of the uterus with vinegar and water, or with a solution of iodine, has been recommended.

6. **STYPTICS.** Use them as a last resort, because of their danger. But if the case is almost hopeless then Mon-

schell's Solution of Perchlorate of Iron may be judiciously employed.

7. ERGOT should be given hypodermically in the hypochondriac region.

There is no time to wait for the action of remedies internally, but there are some that have been recommended. The whole treatment should be prompt, energetic and local.

XVIII.

What is Version?

VERSION is the turning of the child in the uterus to facilitate delivery.

XIX.

How Many Kinds of Version are there?

I ONLY know two :

1. *Cephalic*, turning so the head presents.
2. *Podalic*, turning the other way.

XX.

How is Podalic Version Effected?

THE obstetrician brings the patient to the edge of the bed and has the body lie crosswise on it. An assistant sits at each side of the patient, and the hips being brought to the edge of the bed, holds the knees firmly, the limbs resting on their laps. The physician then anoints the hand and arm with a lubricant, generally vaseline, has the fingers free of rings and the nails trimmed short. He inserts the hand, and, on reaching the head of the child, passes the palmar surface over the face. He then moves the head aside, and reaches for the foot along the anterior surface of the child. He grasps one or both feet, and then with the other hand manipulates the abdomen to assist in changing the child's position. He makes traction on the foot, and draws it through the os, and then nature assists him in the delivery. The head may not flex at the upper strait, when he can assist it to do so by inserting the finger into the mouth, drawing the chin downward, and thereby elevating the occiput. Sometimes flexion is accomplished by inserting a finger in the rectum, and pressing against the occiput as the other hand makes traction at the child's mouth. Before making version the rectum and bladder, if possible, should be evacuated.

XXI.

What is the Object of Forceps?

THE object of forceps is to assist in the delivery of the head of the child when from cause it is retarded.

XXII.

When should Forceps be applied?

AFTER the head has passed the upper strait, and delivery is retarded. They are sometimes used above the strait, but version is better.

XXIII.

What are the Indications for the Use of Forceps?

1. IN locking of the head in the pelvis.
2. In long, tardy, and protracted labor.
3. When the patient is exhausted.
4. In any condition requiring immediate and rapid delivery, as when the placenta is delivered first, or cord is involved, etc.

XXIV.

How soon after Labor is Milk secreted?

By the third day. The first secretion of the breast is called colostrum, and has a purgative effect upon the child.

XXV.

What is Mastitis?

MASTITIS is inflammation of the breast, or milk fever in its mildest form. It may, however, go on to further inflammatory action, and cause abscess.

XXVI.

What is the Treatment of Mastitis?

DRY, cold applications. Ice applied in rubber bags all over the affected breast. The application should be intermittent. The old practice of poulticing favors abscess, which is not desired.



N. B. Wolfe

APPENDIX.

THE following legal proceedings, stenographically reported, will explain why Mary Wolfe's paper on Surgery does not appear in its proper place:

MARY WOLFE,
 vs.
D. W. HARTSHORN. } Before N. MARCHANT, Justice.

Suit in Replevin.

C. W. GERARD, *for Plaintiff.* C. D. ROBERTSON, *for Defendant.*

April 4, 1883.

MARY WOLFE, plaintiff, called in her own behalf, affirmed as follows:

DIRECT EXAMINATION.

By MR. GERARD.

Q. Where is your place of residence, Miss Wolfe?

A. 146 Smith Street, Cincinnati.

Q. Have you been a student at Pulte Medical College?

A. Yes, sir; I was a student for two terms, and was in the graduating class this year.

Q. Did you receive a degree as Doctor of Medicine in that class?

A. Yes, sir.

Q. What chairs were you examined in, in order to receive that degree?

MR. ROBERTSON. What is the purpose of this testimony?

MR. GERARD. We want to show exactly what this paper is, how it came to be made, and the value of it.

THE COURT. She now seeks to recover damages for the loss of the property, under the statute.

MR. ROBERTSON. There is no testimony that it is lost.

THE COURT. That is the return to the writ.

A. Shall I name all the chairs?

Q. As near as you can.

A. For both years?

Q. This year; those that determined your graduation.

MR. ROBERTSON. She has graduated, and has her degree and her diploma; and that ends the controversy, it seems to me.

THE COURT. There is no objection to her answering the question.

A. *Materia Medica*, Physical Diagnosis, Pedology, Operative Surgery, Descriptive Surgery, the chair of Eye and Ear, of Theory and Practice, and of Obstetrics.

Q. Were the examinations oral or written?

A. All that I passed this year were written examinations, and were conducted by the professor of each chair giving the class the questions, sometimes on the blackboard and sometimes on a slip of paper, the students writing the answers in his presence.

Q. Did each professor conduct the examination in his own department?

A. Yes, sir.

Q. Were the answers written in the presence of the professors and the students?

A. Yes, sir.

Q. At one sitting?

A. Yes, sir.

Q. Had you any knowledge of the questions that were to be asked, before the time of the examination?

A. No, sir.

Q. Was it your understanding that your grade would be determined by the character of the answers you wrote to these questions?

Counsel for defendant objects to the form of the question.

Q. Was it, or not, your understanding—

Counsel for defendant objects that the understanding of the witness is not competent.

THE COURT. What were the facts?

Q. By MR. GERARD. As to whether your grade depended upon this examination, or upon the marks you had received in the past.

A. That our grade was to be determined by the quality of the papers we handed in. That was my understanding.

Q. Do you know that you were graded according to the merits of your papers?

A. They kept the grades secret, but I think we all were graded according to our papers.

Q. According to these examinations?

A. The papers we handed in? Yes, sir.

MR. ROBERTSON. I ask that all that be ruled out. The witness's understanding, and what she thinks about a matter, is not proper evidence.

THE COURT. She states the fact as near as she possibly can.

WITNESS. The class understood that the examinations would determine our grades. Of course, I do n't know how the faculty graded my paper. That was a matter of secrecy.

Q. By MR. GERARD. After answering the questions and handing the papers to the professors, had you any opportunity to correct, or modify, or in any way amend them?

A. No, sir.

Q. Did you ever make any change whatever in the papers, or have any opportunity to do so, after they were handed to the professors?

A. No, sir.

Q. Did you prepare your papers with a view to a further use of them after the professors had fixed your grade?

Counsel for defendant objected to this question.

THE COURT. She has a right to answer that question. If she delivered up any property that was hers, it was her property.

MR. ROBERTSON. She has testified that the relation of teacher and student existed at that time; that it was necessary for her graduation that she should be examined, and was required to answer the questions in writing there and then. She says she did answer them there and then, and handed them to the professor. Now, any ulterior purpose that she may have had has nothing to do with this case. The relation of teacher and pupil is precisely that of parent and child, as long as they hold that relation, and any remote idea of the use of that work a pupil

can have, or any predicate of value upon it, is too vague and uncertain, and has no foundation in law.

MR. GERARD. I am trying to fix a value on a missing paper. It seems to me it is a competent question.

THE COURT. The question to be determined is whether, after submitting the paper for examination, she was entitled to receive it again or not.

MR. GERARD. If the paper belonged to Miss Wolfe and it was destroyed by Hartshorn, the question is, how much reward is she entitled to receive for her paper. I ask her whether, in the preparation of that paper, she put more work on it with the view of making further use of it.

THE COURT. She can answer the question whether she was entitled to the paper or not. That is a matter of proof.

MR. GERARD. Does your Honor rule that it is not a proper question as to whether she prepared it for further use? What I am trying to show is that she put more work upon that paper, because she expected to use it after the professor was through with it.

THE COURT. She can answer the question whether she put extra time on that paper or not; whether her labors were greater or less in preparing that paper.

WITNESS. Than simply to pass the grade?

Q. By MR. GERARD. Yes.

A. Yes, sir.

Q. You may go on and state why.

A. I took extra pains with all my papers, because my papa told me he wanted to see them, and that they would benefit me afterwards.

Counsel for defendant moved the Court to rule out so much of the answer as stated what the witness's father said.

Motion granted.

Q. You have already stated you were examined in surgery.

A. Yes, sir.

Q. Who conducted the examination on that subject?

A. On operative surgery, Professor Hartshorn.

Q. Have you a list of the questions that were propounded upon that subject and submitted to you?

A. Yes, sir; I gave it to papa.

Q. You may state to the Court whether those questions were handed to the students, or how?

A. Professor Hartshorn wrote them on the blackboard.

Q. Is that the list?

[Paper produced by Dr. Wolfe.]

A. Yes, sir.

Q. By MR. ROBERTSON. It is a correct list of the questions, is it?

A. I think it is; yes, sir.

Counsel for plaintiff offers list in evidence attached hereto and marked "Exhibit A."

Q. By MR. GERARD. Did you answer in full all the questions in that list?

A. Yes, sir, I answered them all.

Q. About how many pages of manuscript did it cover?

A. About seventeen pages.

Q. After answering all the questions, you submitted your paper to Dr. Hartshorn, as I understand it, for examination.

A. Yes, sir.

Q. Did you ever see the paper after that?

A. Yes, sir.

Q. Just state when and where.

A. I saw it at Professor Hartshorn's office two days after "commencement," on the 8th of March.

Q. What was the occasion of your going to Dr. Hartshorn's office?

MR. ROBERTSON. I object to that.

Q. What took place while you were there between yourself and Dr. Hartshorn, with reference to this paper?

A. My father sent me there for the paper, and when I went into Dr. Hartshorn's office he talked about several things. In regard to the paper I said, "Professor Hartshorn——." I do not know the exact words, but I will just tell it as near as I can.

Q. Give the substance of the conversation.

A. I have heard my paper on surgery well spoken of, and my papa would like to see it. Professor Hartshorn was very kind and said he had no objection personally to letting me have the paper or a copy of the paper, but he would like to consult with the faculty about it. I talked to him a little more, when he got a bundle of papers out of his desk and untied the string and looked them over. He took my paper out, and, after looking it over, smiled and asked me what I thought he

was looking over the paper for. I said I did n't know *He said he was looking through it to see if there were any marks on it before he would let me have it to look at.* I took the paper in my hands and looked at it, and I acted like I was going to keep it. Professor Hartshorn said, "You can not have it now, but after the faculty meeting." I talked to him a few minutes about other things and then went home. That was all.

Q. Did you call again at the doctor's office with reference to the paper after this time?

A. Yes, sir.

Q. When, and what took place upon that interview?

A. I went into his front office. He was sitting by the fire, and I said, "Professor Hartshorn, I heard there was a faculty meeting, and I came to see about the paper." He said very cold and slow, "Y-e-s, w-e h-a-v-e d-e-c-i-d-e-d t-h-a-t y-o-u c-a-n n-o-t h-a-v-e i-t." Then I did n't know what to do, but thought I had better say, "Well, Professor Hartshorn, I will take a copy of it." He looked at me and shook his head. I said, "Do you mean to say I can't have a copy of it?" And he says, "Y-e-s, that's it, that's it." I said, "Then my business is done," and went home.

Q. Did he at that time say that he had destroyed the paper or that he intended to destroy it?

A. *O, no, sir!*

Q. Did you at any time after that send for the paper?

A. I sent you, Mr. Gerard.

Q. Did you get it?

A. No, sir.

Q. Was this paper of special value to you?

MR. ROBERTSON. I object.

MR. GERARD. We are now trying to get at the value.

THE COURT. She can state if the paper was of any value to her.

Q. Was this paper of special value to you?

A. Yes, sir.

Q. You can go on and state the reason.

THE COURT. I don't care about that. She can state, if she attached a value to it, what that value was.

MR. GERARD. This paper was written under *test conditions*. You may say she is able to produce another paper like it; but she can not produce another paper in the presence of the pro-

fessor and the class, limited as to time, and at one sitting. This paper can not be reproduced, because it can not be produced again under the same conditions.

THE COURT. She can state right up and down what value that paper is to her.

MR. GERARD. I do n't know that she can give a money value.

THE COURT. Of course you have got to come to that, to entitle you to damages.

MR. GERARD. Certainly; I expect to do that.

Q. Miss Wolfe, did the other professors in the College give you your papers when you requested them to do so?

MR. ROBERTSON. I object to that.

THE COURT. That is all right. Answer the question.

A. All that I went to personally gave me the papers for which I asked. Two of the professors wished to keep my papers, which I permitted them to do, after taking a copy for my own use.

CROSS-EXAMINATION.

By MR. ROBERTSON.

Q. (Referring to Exhibit A.) Could you answer this first question now?

A. I think I could.

Q. As a doctor of medicine, can you give the answer to this question, "Give the symptoms of shock?"

A. Of course I can, but this is not the time or place to do it.

Q. Do n't be excited. Just answer that question.

A. I have answered it. You will find my answer in the paper I gave to Professor Hartshorn.

Q. Could n't you answer it now?

A. I presume I could.

Q. The symptoms of shock. You know what the symptoms of shock are, do n't you? As a doctor of medicine, you know what the symptoms of shock are, do you not?

MR. GERARD. I do n't see what that has got to do with the case. Having answered the questions under test conditions, even if she were to answer them again it would not bring back her lost paper.

THE COURT. I do n't think it is necessary to go into those examinations.

MR. ROBERTSON. Until they show some value.

THE COURT. Yes, sir. The plaintiff must show that the paper has a money value, and fix the amount.

MR. ROBERTSON. Very well; then I will omit this.

Q. When you gave the answers to these questions you were in the class-room, in the college, were you not?

A. In the amphitheater.

Q. With the other students?

A. Yes, sir.

Q. The other students answered the same questions?

A. Yes, sir.

Q. At the same time?

A. They seemed to be doing so.

Q. You occupied no more time than any of the others?

A. More than some, but not so much as others.

Q. Were you the middle of the students as they got through the work?

A. Hardly the middle; rather among those who occupied the most time.

Q. How long did this examination last?

A. I can not tell, exactly. I began at ten and wrote until about one o'clock.

Q. How long was it after that that you graduated?

A. About a week.

Q. Did you say the purpose of this examination was to get your diploma?

A. I presume it was to show our qualifications for receiving the medical degree.

Q. You had to answer a certain percentage of the questions accurately before you could graduate as a doctor of medicine?

A. Yes, sir.

Q. If you had failed, could you have graduated?

A. No, sir.

Q. You did graduate?

A. I did.

Q. And you got your diploma?

A. I did.

Q. Did you write these questions on your paper, preceding your answer?

A. Yes, sir; I am pretty sure I did.

Q. In estimating the worth of the paper as a whole, did you put any value on the questions?

A. I did, as exhibiting the *skill* of the professor in asking proper questions in the examination.

Q. Were they your property when you copied them from the blackboard?

A. The copy was my property; yes, sir.

Q. You mean that the paper and the labor that you put on it was your property.

A. The paper I handed Professor Hartshorn was my property.

Q. You were required to answer these questions in writing, were n't you?

A. Yes, sir.

Q. Could you answer them orally and graduate?

A. I think I could.

Q. I do n't mean your ability, but was n't it one of the rules of the college to answer in writing?

A. Yes, sir.

Q. And if you had disobeyed that rule you certainly would not have passed for graduation.

A. I know it.

Q. In other words, they would not take your examination excepting it was in compliance with the rule.

A. I suppose not.

Q. You say that paper had a special value to you. Had it any more value to you than your answer to any other question put to you by any of the other professors, this particular set of questions?

A. I think I wrote a little better paper for Professor Hartshorn than any other, and it would be a little more valuable on that account.

Q. Now, all through your college course, every week or two you had examinations, did n't you, or a quiz, or something of that sort?

A. Yes, sir; about every other lecture, I think.

Q. Sometimes oral?

A. Those were always oral; not in writing.

Q. You did n't regard those of any value or your property after you had answered them. After you had answered the questions of one of the professors, which you were bound to

answer as a student in the college, you did n't regard that you had any right to that answer, did you, or any special property in that answer?

A. The paper containing my answer was my property, yes, sir.

Q. It was your answer, of course, but do n't you think the professor had a right to ask it?

A. Certainly he had a right to ask the class questions. *It was his duty.*

Q. And are these written questions and answers any different than if you had answered them orally.

A. I do n't know exactly what you mean.

Q. In regard to your value of the paper, in regard to your mental strain in producing it, any thing upon which you predicate your value in these answers. You have these questions here, and you can certainly answer them; but you seem to predicate, or have got the idea here, and you want to convey to the Court, that because these were written and not oral there was some distinction.

A. I do n't have any such idea as that; no, sir, that was not the idea I intended to convey.

Q. Suppose that Dr. Hartshorn had said to the class, "I will examine you orally," and had put these same questions, and you had answered just as you did there, would they have been of any value to you? Had n't it gone out into the world as your answers and at once taken down, and that ended the whole controversy?

A. I do n't know whether it would be or not. *It did n't happen, as you suppose, and, of course, I could n't tell.*

Q. Is it your idea that, if my child goes to school and the teacher calls him up, and says, "Now, Robertson, you have got to answer these questions," that that boy has any right to his answers, whether it is in arithmetic or spelling or in any other matter.

A. Shall I answer you according to my experience in school?

Q. I am trying to get your view on that question.

A. *I think if they were answered with merit and his parents wished to see them he would certainly have a right to have the examination paper or a copy of it to show his people. I never heard of it being refused. That is only my view, of course. You asked me for my view.*

Q. I want to get at the basis of your action. Now, Professor Hartshorn was a professor in the college, was n't he?

A. Yes, sir.

Q. And was an officer of the college?

A. He was a professor; I suppose that is an officer.

Q. Occupying one of the chairs?

A. Yes, sir.

Q. He was a member of the faculty.

A. Yes, sir.

Q. And you left your paper in his hands to examine. After you had them in your hands you gave them back to Dr. Hartshorn that he might submit them to the faculty.

A. Yes, sir.

Q. And subsequently he refused to return them to you?

A. Yes, sir.

Q. Why did n't you see the faculty of the college about it?

A. *The paper was in Professor Hartshorn's hands. It was his individual action. The rest of the faculty gave me my papers; at least, all those I asked personally.*

Q. But he was simply the employe of the college. It was a college transaction or college business, was it not?

A. I think not, sir.

Q. You know that you answered the questions in the college?

A. Yes, sir.

Q. You know they were given for college purposes?

A. I do n't know that, sir.

Q. You know that every professor had to sign your diploma?

A. Yes, sir.

Q. You know that you had to answer the questions put by every professor before you could get your diploma?

A. Yes, sir.

Q. And that these answers were given in the course of your study?

A. Yes, sir.

Q. And then you single out Dr. Hartshorn, and want to make him responsible for every action of the faculty of the college?

A. I do n't do any such thing. *All of the faculty to whom I applied personally gave me my papers, excepting Professor Hartshorn, he did not.*

Q. You gave it back to him for the purpose of consulting the faculty in regard to it.

A. I did. He said he wanted it for that purpose, but I have been informed that *he never presented the paper to the faculty.*

Q. Just tell us what was said between you and Dr. Hartshorn?

A. In regard to the paper?

Q. Yes.

A. I think I said, "Very well," and that was about all. I certainly expected to get it if the faculty were consulted, so I made no objection to waiting.

Dr. N. B. Wolfe testified as follows:

DIRECT EXAMINATION.

By Mr. GERARD.

Q. What is your profession, and how long have you been engaged in it?

A. I am a physician, and have been treating diseases of the throat and lungs as a special practice in Cincinnati for twenty-six years.

Q. Is the plaintiff in this case your daughter?

A. She is.

Q. Did she graduate at Pulte Medical College in this city in the class of 1883?

A. She did.

Q. Did you examine her papers upon the different subjects she studied after her graduation?

A. I examined all she brought home.

Q. Did you examine her paper on surgery?

A. No, sir, I did not.

Q. Did you have any opportunity to do so?

MR. ROBERTSON. We admit that he had not.

Q. Doctor, please state what value you attach to the paper your daughter wrote on surgery under test conditions, and which she gave to Professor Hartshorn to examine.

MR. ROBERTSON. I object.

Q. A paper such as this has been described to be?

MR. ROBERTSON. There is no description of it.

MR. GERARD. Yes, sir, seventeen pages in answer to twenty questions.

Q. Now, what use could be made of that paper, and what value would it be to a beginner in the profession?

MR. ROBERTSON. I object. There is no description as to the character of the answers. She did not lay any foundation.

Q. Judging from the character of the examination papers that you saw, what value would her paper on surgery be to her?

MR. ROBERTSON. I object.

THE COURT. You said that she did n't lay any foundation. She said it was a valuable paper to her.

DR. WOLFE. I did not see the paper, and can not, therefore, fix a value on it. The papers I have seen will give her reputation for uncommon ability. She may have failed on surgery, but that is not the report.

MR. GERARD. The law presumes, when a paper has been destroyed or made away with, that the highest value shall be placed upon it. They could have produced this paper if they had wanted to. Having refused to produce it, the law presumes that it is a valuable paper.

MR. ROBERTSON. You have no right to say that this paper is destroyed, or any thing about it. First prove your premises.

MR. GERARD. If it is not destroyed, it is concealed.

THE COURT. The information we have is from the officer. He reported to me that the paper could not be found.

MR. GERARD. The paper is not found. If it is not destroyed you can produce it. The law presumes it to be a valuable paper because you refuse to produce it.

Q. By MR. GERARD. I will ask you, doctor, what use you intend to make of the papers the professors returned to your daughter?

Objected to by counsel for defendant.

Q. By THE COURT. Doctor, do you know the custom in medical colleges? Is a person graduating entitled to a return of the papers he presents to the faculty for examination?

A. When a request has been made for the return of a paper I have never known the original paper or a copy of it to be refused.

Q. Never knew one to be refused?

A. No, sir.

Q. Well, then, if the professor should not give up your daughter's paper, how can you estimate its value? We permit you to answer.

A. From my individual point of view no satisfactory estimate of the loss she has sustained can be made. While the paper is of much value to her as showing her skill in the science of surgery, others may fail to appreciate it at all.

THE COURT. You can't put it in that way.

Q. By MR. GERARD. State whether it was of any value to your daughter or not.

MR. ROBERTSON. How can the doctor state that a paper he never saw was of value?

THE COURT. He has heard the testimony of Miss Wolfe that she was examined in surgery by Dr. Hartshorn, and that her paper is now withheld by him. He has heard the statement of the witness; and if there is any value attached to that paper, or whether it would be of any practical use to her or any body else, it is for him to say.

A. Yes, sir; it would be of use to her if she ever wished to practice surgery.

Q. By THE COURT. Well, would there be any damages growing out of the non-delivery of that paper?

A. I do not think I understand you perfectly.

Q. By MR. GERARD. Will any loss accrue to her because of the destruction of that paper?

Q. By THE COURT. Any money damage? Is there a money value in that paper?

A. I intend to associate my daughter with me in business—

Q. That ain't the question, now, at all. You need not state, doctor, what you intend to do hereafter. The question is broad and plain. I want to get at the value of that paper. If you think there is any, say so; if not, answer the contrary.

Q. By MR. GERARD. The first question, doctor, is, Do you think it is of any money value? Just answer that question—yes or no.

A. A simple "yes or no" is not a sufficient answer to the question. In fact, it is no answer at all. If I associate my daughter with me in business, I want first to examine her credentials as to ability in physiology, surgery, and medicine. This I have done carefully, so far as I have had opportunity. "Where is your paper on surgery?" I asked. "Dr. Hartshorn has destroyed it; it has been carted away to the ash dump," is the reply. Thus she is left without credentials as to her qualifications in surgery, excepting the common certificate signed

by Hartshorn, and given without discrimination to all graduates of the College. Such a certificate is not sufficient, and the public know it. "Grinding out doctors" has got to be a by-word and a reproach to medical colleges. The examination papers alone are proof of proficiency, and Mary's paper on surgery has been destroyed by unfriendly hands. All her other papers are graded high. She may have broken down on surgery; I don't know. All tangible proof on that point has been concealed or destroyed. I have no means of judging, and there is where I am lost. I have no means of knowing whether my child was competent in surgery or not, whether she has passed a fair examination or an indifferent one. For years I have been paying money to educate her that she might exhibit ability worthy of the outlay. The destruction of her paper on surgery, or its concealment, disables me from knowing. She can write another paper on surgery, I know; but she can't write it in the presence of Hartshorn, before the College; she can't have the public opportunity of answering without special preparation; she can only write an examination paper of such a character once in her lifetime. It should go to the world as evidence of her ability under test conditions. The opportunity to do this again is forever lost. How can you attach a money value to the loss of such an opportunity?

Q. Do you consider the destruction of this paper a damage to her professional prospects?

A. Certainly I do. Her papers are the only fair standards by which her ability can be judged. A diploma does not in every instance represent merit. It often signifies no more than does a surgeon's shingle nailed on the window-shutter of a slab shanty. One hundred per cent credit in graduation papers, the diploma does not distinguish with any more merit than a grade of seventy-five. I wanted my daughter to fetch me the evidence in her papers that she had been faithful in her studies, and that she had received her diploma, not as a matter of form and sufferance, but because she had won the certificate fairly by ability. If all college papers were published, as I have those of my daughter, it would be fair dealing all round; the graduate and the people would understand each other better. I would not lose that paper for a thousand dollars. Still I do not fix that amount as its value. I do not know that her surgery paper was any thing more than commonplace. But it is my right to

know; it is my child's wish that I should know, and nobody has a right to interpose obstacles to prevent me knowing. That is my grievance. After educating my child and spending thousands of dollars to qualify her for this very work, this man, without warrant or good will, destroys a paper which contains the only real evidence of her ability that can be given to the public.

Q. You say you intend to publish her examination papers, and circulate them among your patrons and friends. Will the loss of this paper damage her prospects?

A. Why not? Reputation is every thing to a physician. A name for ability is capital in trade. It is more than money. I do n't know how to put a money value on a good name; I do n't know how to do it.

Q. Is the paper worth one hundred dollars?

A. I said to my child, "If you bring home the faculty medal of the College, fairly won, I will put five thousand dollars to your credit in bank at once." She failed by a fraction of less than one per cent, and I wanted to see if the cause of her failure could not be traced to the unfair marking of that paper. You see, I attached some value to her examinations. The first honorable mention in a contest for the prize was not sufficient for one who has the genius and the courage to win the medal itself.

Q. By THE COURT. The only question before me, doctor, is whether your daughter is entitled to any damages for the destruction of her paper. If she is, what amount, in your judgment, ought she to have?

A. There has been no evidence produced here that the paper is destroyed, and I hope it is not; I hope the paper is not lost. *I don't want damages; I don't want money. I will give money for the paper.*

MR. GERARD. It may be necessary, before we go further, to introduce evidence showing what has become of the paper.

MR. ROBERTSON. Your suit should have been against the College.

MR. GERARD. No it should n't. The College did not destroy the paper we are after. Your client did it, and he alone is responsible.

THE COURT. I would say, right here, if this paper is of no value, why have all this trouble? If it is not destroyed, I have

no doubt the whole matter can be stopped right here by delivering it up. You see, there is a good deal of feeling about it, and it would be a great satisfaction to the doctor and his daughter both to get the paper. Now, if it is not destroyed, why not give it up, and have no further litigation about it?

MR. ROBERTSON. I can probably explain that on cross-examination of Dr. Wolfe. If the College is driven to the necessity, they will fight it to the Supreme Court.

MR. GERARD. The College will not be made a party to this outrage. Before we go any further, I will be sworn myself.

C. W. GERARD, called for plaintiff, being duly sworn, testified as follows:

My name is C. W. Gerard. I called upon Dr. Hartshorn, at the request of Dr. Wolfe and his daughter, and asked him very politely for her paper, telling him Miss Wolfe was very anxious to have it or a copy of it. He told me she had called at one time, and he told her that he thought there was no objection to giving her the paper, but he wanted to see the faculty; that afterwards he had seen the faculty, and he had concluded not to give it to her, or something to that effect; I do n't remember the exact words. He said, "You can't have the paper." Pointing to the fire he said, "The paper went right in there; I put it there myself." I said, "Why, doctor, you do n't intend to say you burned up that paper when she wanted it so badly?" He says, "I did burn it up." I said, "Can you give any reasons in the world for burning it up?" "I have my own reasons," he said. "Then I suppose she can neither get the paper or a copy," I said. He said, "No, sir." That was about the substance of the conversation between us. As to the custom, I do n't know what the custom is in medical colleges; but I know what it is in law colleges all over the country.

MR. ROBERTSON. I object.

MR. GERARD. I know the custom as to any other kind. They are all the same in that respect.

MR. ROBERTSON, I object.

MR. GERARD. Now as to the value of that paper.

MR. ROBERTSON. Did you see it?

MR. GERARD. I did not. Your client destroyed it. He burned it up.

MR. ROBERTSON. Then I object to your testifying.

MR. GERARD. By your logic it seems to me if a man wants to destroy the value of a horse, all he has got to do is to kill the horse.

MR. ROBERTSON. You can't testify to the value of a paper which you never saw.

MR. GERARD. I want to show some reasons why the paper had a special value.

MR. ROBERTSON. Do n't you preface it with the fact that you never saw the paper and do n't know what is in it.

MR. GERARD. How are we going to prove the value.

MR. ROBERTSON. Call the man that knows.

MR. GERARD. What! call that man, he who was by his own admission guilty of destroying it? No, sir! I do n't want his testimony! If you do, call him. The law presumes value to the paper when it has been destroyed by the party himself.

MR. ROBERTSON. Are you arguing or testifying.

MR. GERARD. I am arguing with you now; I have got to.

MR. ROBERTSON. You are not an expert in this matter, are you?

Q. In what matter?

MR. ROBERTSON. In the value of medical works?

MR. GERARD. No, sir.

MR. ROBERTSON. In the value of dissertations or papers on surgery?

MR. GERARD. No, sir! Neither are you!

MR. ROBERTSON. And yet you want to testify to the value of this paper that you never saw?

MR. GERARD. I would have seen it if your client had not filed it away in the ash-pan.

MR. ROBERTSON. And you do n't know a word that was in it.

MR. GERARD. No, sir, and you do n't.

MR. ROBERTSON. And yet you want to testify to the value of it.

MR. GERARD. I did n't say so. I do n't want to call Dr. Hartshorn, though; the man that burned it up.

MR. ROBERTSON. I protest against the testimony. He says that he has no experience, says that he is not competent, says that he never saw a word in it, that he do n't know the value of it.

MR. GERARD. The value of such a paper depends somewhat upon the ability of the writer.

MR. ROBERTSON. Is there any motion before the Court?

MR. GERARD. I have no motion, except to keep you still. In proving the value of this paper it is necessary to show who wrote it, how capable she is to write a paper on surgery or any subject connected with her profession. The value of a paper written by her would be very much greater than the value of a paper written by you or me. While I don't know any thing about this paper, I do know something about the ability of the writer and about papers that she has written, which have been very valuable.

MR. ROBERTSON. On other subjects.

MR. GERARD. On medical subjects, sir. I have heard leading physicians in this town say that her paper on physiology was something they had never seen equaled in an examination paper in this city.

MR. ROBERTSON. What those leading physicians told you would be testimony, would n't it?

MR. GERARD. I am not testifying now.

DR. N. B. WOLFE recalled for further examination.

Q. By MR. GERARD. Doctor, I would like you to put a money value on that paper.

MR. ROBERTSON. The doctor has testified that he can't do it.

MR. GERARD. He is at a loss to know just how to do it.

MR. ROBERTSON. Then do n't ask him to do impossibilities.

Q. Put a value of some amount on it.

THE COURT. The doctor can do that, if he wants to; if not, that ends it.

MR. ROBERTSON. He has ended it two or three times.

Q. By MR. GERARD. Doctor, can you name a money value on the surgery paper? We allege here that it is valuable, and the highest value this Court can adjudge is three hundred dollars.

A. I have not seen the paper.

Q. What damage has your daughter sustained because of the destruction of it?

A. That is very hard to say.

Q. That is what we have got to do. They have destroyed the paper.

A. I will give three hundred dollars to know the paper is not destroyed.

Q. You will give three hundred dollars for your daughter's paper on surgery, will you?

A. Yes; I will write my check for that amount this minute, to have the paper put in my hands.

Q. That is a good way to put a value upon it. You will give her three hundred dollars for the paper if she will give it to you, will you?

A. I will give Dr. Hartshorn three hundred dollars if he will return the paper to Mary. He got it from her under a promise to return it, or allow her to take a copy of it.

MR. GERARD. That is a good way to put a value upon it, Mr. Robertson. How do you like that? Turn over the paper, now, if you have got it. It is a bigger fee than you will get in any other way.

CROSS-EXAMINATION.

By MR. ROBERTSON.

Q. I think it is a matter of feeling with you, Dr. Wolfe.

A. No, it is not, Mr. Robertson; it is a matter of judgment, and dollars and cents. The paper is worth ten times that amount to my daughter, and I know what I am talking about.

Q. Well, put the value of it at three thousand dollars, then. Is that the value you fix?

A. It is worth more than that to her.

Q. Now, then, doctor, I noticed that you stated that some of her former papers were published.

A. I published her paper on physiology.

Q. What purpose had you in publishing it?

A. To let her friends know she had brains. Do you *object*?

Q. Did that paper state that she was a prospective partner?

A. No, sir; but she is, *if you do not "object."* It was simply an able paper, without any reference to business. When I send a paper from my child to a friend he will say, "She is clever." That is capital to her; that is building up reputation legitimately with brains, not *brass*. I have spent thousands of dollars cultivating her brains. I put her into a Medical College, against my feelings, but for a noble purpose. "Give good papers to all the chairs," I said, "and if you win the faculty prize I will put five thousand dollars to your credit in bank." All the papers of her examination I have seen were good enough to have won the reward, and why she did not get it is

the mystery I want explained. It was announced to the public, on Commencement night, that she was entitled to the *first honorable mention* in contesting for the prize, but that her grade was *one-half of one per cent less than the one who received it*. Not to put too fine a point on it, *I suspect foul play in the marking of my little girl's surgery paper, to conceal which may have been the motive for destroying it*.

MR. ROBERTSON. Never mind that. I want to ask you if it is not a fact that colleges object to papers being used, or colleges being used, to advertise specialties.

DR. WOLFE. I think not; for every professor who fills a chair in a college is a specialist. Your client is a surgeon specialist, and is so advertised by the College. Professor McDermott is a specialist for diseases and malformations of the eye and ear. If the faculty of any Medical College undertakes to make war on specialties, they will get more meat in their mouth than they can conveniently chew without the aid of dentistry (a specialty, by the way) to sharpen their teeth. But even if they were hostile to a scientific division of medical practice (which they are not), is the light of brains to be utterly extinguished because it is thrown athwart your client's prejudices. When you imply that I want to make use of Pulte College to advertise my business, you should remember the fact that *I had grown gray in a successful practice, and was ready to retire with a competence before the College that has honored your client with a professorship, was born*. Do n't forget it! Or do you mean to imply that the brains of graduates are only to be used as "College" property?

MR. ROBERTSON. O, no.

DR. WOLFE. It would seem so.

Q. The College was good enough for your daughter to go to, was it not?

A. Yes, sir; all but the lectures on surgery.

Q. You was satisfied?

A. No, sir; not with them.

Q. Why did n't you send her to another college, if you were not satisfied?

A. There are but few medical colleges in the country that favor the coeducation of ladies with men. There is none in this city but Pulte, I believe; that is not a *he college*.

Q. That was your reason?

A. Yes, sir; that was partly my reason.

Q. What I wanted to ask you is this: Is n't it a fact that the medical colleges object to men—this is not reflecting, mind you, on your skill—

A. Go on, sir. You are quite competent to *object*, but not to reflect on my skill, or that of my daughter.

Q. I understood you to say your daughter's paper was published to show her ability.

A. And do n't it? But does that justify the burning of it? I am in correspondence with many personal friends. I send Mary's paper on physiology to them. They write back, "I congratulate you on the success of your daughter," etc. Have you any right to "object?" If the paper had been thrown into the fire, perhaps your client would have been better pleased.

Q. She would still retain it in her mind.

A. In her mind? What can you tell of the quality of mind, until it shows itself? What is the value of a gem in the ocean until you fetch it to the surface? Why, that child, with all her ability, could not make her way in the world, unless there was some means of showing what kind of a mind she has. Your client throws the evidence of her mind, under test conditions, into the stove, and it comes out ashes. Is that a proper treatment of brains?

Q. Is n't it a fact that you have spent four or five thousand dollars advertising your daughter's paper?

A. You are badly informed, sir. *The father of lies* has played upon your client's credulity, and I think upon yours. But, if my daughter had brains enough to win two gold medals, and the first honorable mention in contesting for the faculty prize of the College, and only missed it by one-half of one per cent, and I incidentally received some credit for being her parent, guardian, and instructor, *would that justify the burning of a valuable paper on surgery?* You can answer that question with or without the aid of the Supreme Court, Mr. Robertson, just as you and your client may elect.

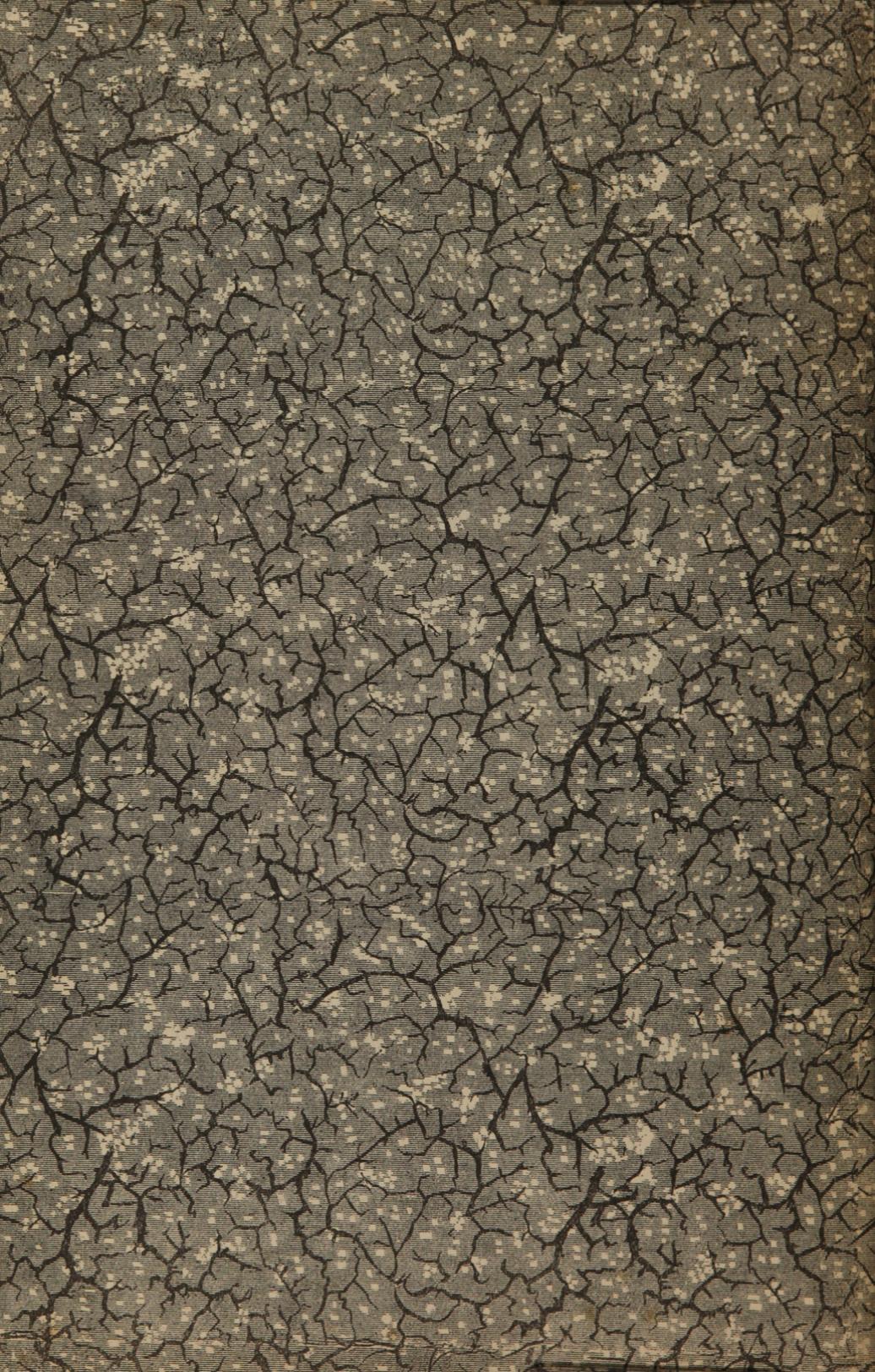
Plaintiff rested.

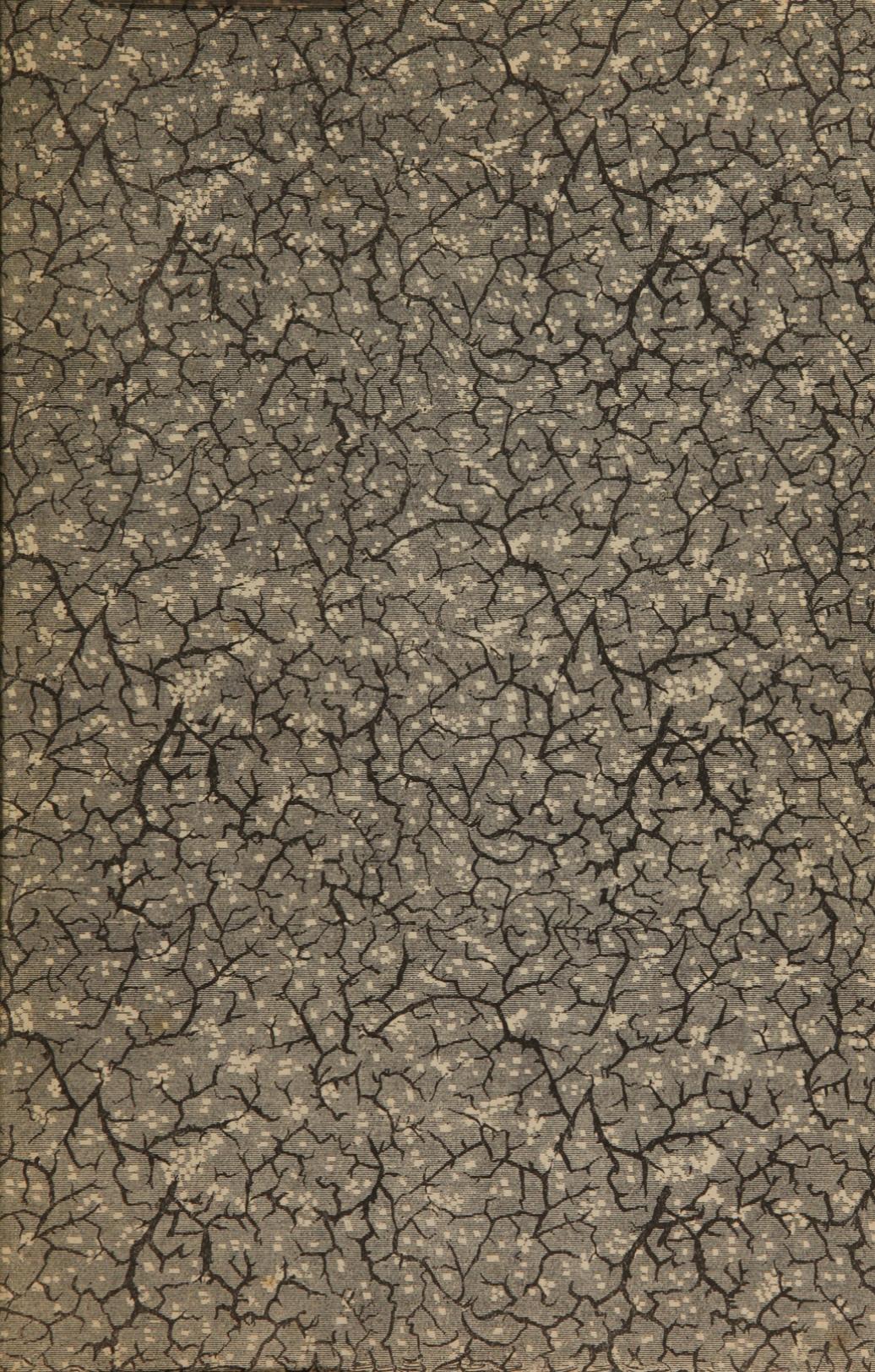
Counsel for defendant moved the Court to dismiss the action.

THE COURT. I shall not dismiss the action.

MR. ROBERTSON. I except. Proceed to judgment.

THE COURT. JUDGMENT, THREE HUNDRED DOLLARS FOR THE PLAINTIFF.





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