TRANSACTIONS OF THE PHILADELPHIA ACADEMY OF SURGERY.

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The President, De Forest Willard, M.D., in the Chair.

LEFT CÆCAL HERNIA, WITH A REPORT OF TWO CASES.

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That the presence of the cæcum in the sac of right inguinal herniæ is not uncommon has been shown by the number of cases reported since the more recent methods of operation have been in such universal use. When, three years ago, I made some investigation as to the frequency of cæcal hernia and classified sixty-three cases (*Journal of the American Medical Association,* June 11, 1898), I was surprised to find that a number of surgeons of long and extensive experience had never found the cæcum in the sac of a hernia. This, I believe, can only be accounted for by the fact that until within the past eight or ten years it was not the custom, in many operations for the radical cure of hernia, to open the sac and examine its contents before reduction. Since the publication of my paper, I have myself met with cæcal hernia on two occasions, and have seen it in the operations of others a number of times. The condition upon the right side, even in femoral herniæ, cannot longer be considered a rare occurrence, although oftentimes representing unusual and interesting pathological features. When the appendix occupies the sac for any length of time, it nearly always becomes adherent, and sometimes is the seat of inflammation rendering operation imperative, and occasionally it perforates and produces abscess formation within the sac.

The two cases here reported show a rarer form of cæcal hernia, for in each this portion of the bowel was found in the sac of a left inguinal hernia. Of the sixty-three cases above referred to, seven were of the left side, and six of these were irreducible, the condition of the seventh not being mentioned.

Case I.—S. J., aged seventy years; occupation, engineer. This patient was admitted to the Jefferson Hospital on the night of February 7, 1900, with an enormous left scrotal hernia. The patient said he had suffered from a very large irreducible hernia for several years, and that at twelve o'clock on the day of admission it had suddenly become much larger upon a violent coughing attack, and had given him great pain. The milder methods of reduction had been tried by his doctor without success. On admission, the symptoms of strangulation had set in, and immediate operation was advised. The patient was very stout and had a large and pendulous abdomen. Ether was given, and the usual incision of the Bassini or Halsted operation was made. When the sac was opened, there flowed out about a pint of dark serum. There was a large portion of the small bowel which occupied the anterior portion of the sac. It was very much congested, and in several places was adherent to the sac by old adhesions, showing a long residence in this position. At the posterior part of the sac and tightly constricted in the abdominal ring was the cæcum. The junction between the ileum and the cæcum could be plainly demonstrated, but the appendix occupied a position behind the cæcum and had not made its way into the sac. The condition of the contents greatly improved when the constriction was divided and the whole was returned to the abdominal cavity. The sac was removed, the method of Halsted being employed in the obliteration of the inguinal canal, silver wire being used as a suture. As there was considerable inflammation and an abundance of fat about the sac, I employed superficial drainage. The patient reacted very well from the operation, and, excepting for some superficial suppuration, the wound did well. On the nineteenth day after the operation, when the patient was apparently doing well, he died suddenly in the night from what was apparently heart failure. No post-mortem examination was allowed.

Case II.—W. W., aged fifty-five years; laborer. This patient was admitted to the Jefferson Hospital, September 18, 1900. He gave the history of having had a hernia since 1877. On admission, the patient had an extremely large left scrotal hernia extending nearly to the knee. Nearly

all of its contents could be returned to the abdomen, but when this was done the patient's respiration was greatly interfered with. The patient's urine contained some albumen, numerous leucocytes, and a few blood-corpuscles. Professor Keen, assisted by the writer, operated upon this patient in his clinic on October 1, employing spinal analgesia produced by Eucaine B. The sac was found to contain a number of feet of small intestine, the cæcum and appendix, and quite a large portion of the ascending colon. The whole was reduced to the abdominal cavity, producing some discomfort to the patient, and the operation of Bassini was then carried out. The patient reacted very well from the operation, but on the second day it was found that he suffered from a tight stricture of the urethra. For twelve days his temperature remained below 100° F., and his wound healed nicely without suppuration. After this, however, the patient developed symptoms of sepsis, and died of what was supposed to be involvement of his kidneys. (For the privilege of recording this case with my own, I am indebted to Professor Keen, who reported it, under the title of Spinal Anæsthesia, in the *Philadelphia Medical Journal*, November 3, 1900.)

The most interesting feature about these cases is the cause of the condition. Many of the theories regarding cæcal hernia have been revised during the past few years. It was formerly supposed that when the cæcum appeared in the sac of a hernia, it was with only a partial peritoneal covering; but a study of the cases reported has shown that it is extremely rare that a complete peritoneal investment of this portion of the bowel is not found. When the condition appears in children, it is practically always congenital, and due to an attachment between the testis and the cæcum or appendix; occurring in the adult, it is most usually acquired. Of the sixty-three cases which I classified there was not a single case of inguinal hernia, either congenital or acquired, which occurred in the female. Of the nine cases of left cæcal hernia with which I am familiar, but one occurred in a female, and it was of the femoral variety. I think from these facts we can conclude that cæcal hernia is rare in women and that left cæcal hernia is rarer still. The cause of acquired cæcal hernia would seem to be due to two conditions: first, a small but freely movable cæcum; second, a pre-existing hernia of the small intestine. The first of the two cases recorded gives a history which corresponds to that of a number of the cases which have been

reported, viz., that the patient has had for a long time an irreducible hernia, that he has had this suddenly increase in size as the result of strain, with the development of the symptoms of strangulation. If the ileum occupies the hernial sac, it can readily be understood that with a large ring, a movable cæcum, and muscular strain the large bowel could easily be drawn into the sac of the hernia. Transposition of the viscera would be an easy way of accounting for left cæcal hernia, but it is very rare that this condition has existed in the cases reported. It is my own opinion that the most frequent cause of cæcal hernia of the acquired variety, either right or left, is due to a long mesocolon and a pre-existing uncontrolled hernia of the ileum. Treves has shown us that the attachment of the cæcum to the right side of the abdomen is not nearly so firm as was formerly supposed. In an examination of 100 bodies, he was able to carry this portion of the bowel in most instances to the opposite side of the abdomen, and as high up as the liver. It is beyond question that the presence of the cæcum in a hernial sac is frequently the cause of both inflammation and strangulation. Of the sixty-three cases which I collected, twenty-eight were strangulated, two incarcerated, eleven irreducible, ten not stated, and only eleven reducible. These figures, I think, go to show that cæcal hernia is a condition which in all instances requires operation, unless it be in the congenital reducible variety found in children.

CÆCAL HERNIA, WITH VOLVULUS OF ILEUM.

Dr. Francis T. Stewart said that he was indebted to Dr. Martin for the privilege of operating on the following case, which he reported with a view to swelling the statistics of cæcal hernia collected by Klein, Brieger, Bacardi, and Gibbon; as a contribution to the study of volvulus associated with hernia recently made by Knaggs; and to establish a third class, that of cæcal hernia with volvulus, two other cases having been recorded, one by Da Costa (Annals of Surgery, Vol. xxix, p. 280), a right inguinal hernia consisting of cæcum, most of the ascending colon, and a twisted ileum, and one by Catellani (Annals of Surgery, Vol. xxviii,

p. 708) in which, besides the small intestine, the cæcum, ascending, and transverse colon descended through the left femoral ring, the whole mass being circumgyrated, the neck of the twist lying within the abdomen.

A. B., aged fifty years, laborer, entered the Pennsylvania Hospital, December 25, 1900. For eight years he had been harassed with a right-sided inguinal hernia, at first small but gradually attaining a large size. Two days before admission, the rupture became irreducible and exceedingly painful. There were retching, vomiting, and absolute constipation. The patient was thin but muscular; the face anxious, drawn, and covered with sweat; the abdomen rigid and tympanitic; the temperature normal; the pulse 140 and thready, and the respirations 40 and entirely thoracic. In the right inguinoscrotal region was a markedly tender, tense, and tympanitic tumor about the size of two fists, irregularly ovoid in shape, and extending from midway between the anterior superior iliac spine and the pubes to the bottom of the scrotum. After but a feeble attempt at reduction, operation was immediately undertaken. The sac was thick, vascular, contained no fluid, and was easily separated from the spermatic cord; a constriction in its neck was responsible for the strangulation. The scrotal portion contained about one foot of ileum, twisted 130 degrees from right to left; just without the external ring lay the caput coli and appendix completely surrounded by sac. Both large and small bowel were deeply congested, but the endothelium was intact, and moist heat with relief of the constriction quickly restored them. The internal ring readily admitted three fingers. The appendix was not excised. The operation was completed after the method of Bassini. Strychnine and digitalis were administered hypodermatically, and one quart of salt solution was injected into the left median cephalic vein. The bowels moved within twenty-four hours, the stitches were removed on the sixth and ninth days, and the patient left the hospital on the twenty-seventh day with a firm scar.

The salient points in this case are that the small bowel descended first, and by its twisting and traction pulled down the large bowel, tending to corroborate Gibbon's view that cæcal hernia is due to the traction of a pre-existing hernia of the ileum, that the patient presented evidences of a peritonism out of all proportion to the condition found at operation, that the sac was

complete and contained no fluid, although not adherent to the bowel, and that the hernia was exquisitely tender, which might be explained by the presence of the appendix.

EXCISION OF INTESTINE FOR ACUTE OBSTRUCTION OF BOWELS FOLLOWING STRANGULATED FEMORAL HERNIA. OPERATION.

Dr. Thomas S. K. Morton reported the following case. M. W., a single woman, aged thirty-one years, was seen December 10, 1900. She presented symptoms of strangulated femoral hernia on the right side. It had been present for several years, but had never become irreducible until some twelve hours previously. Then she lifted a heavy weight and experienced much pain in her rupture. Two vigorous efforts had been made to effect reduction, —one under ether. Operation was performed. About six inches of dark, small intestine were found in the sac, as well as a considerable amount of omentum and prune-juice-colored serum. The intestine was œdematous and, in spots, had lost its lustre. Warm applications having markedly improved its circulation as evidenced by brightening color, it was returned to the abdomen. The omentum was bruised and infiltrated with small spread-out clots, so it was excised. Bassini's radical closure of the canal was then employed. She made an ideal recovery, the bowels moving spontaneously on the second day. But two weeks afterwards she suffered from severe pains about the umbilicus for several hours. This was repeated once or twice at intervals of two days and then disappeared. She went to her home at the end of the third week, and continued in apparently perfect health for some ten days. Then she was seized with violent symptoms of obstruction of small intestine which lasted for twelve hours. Upon the third day following another attack almost as violent came on, and the woman was returned to hospital for abdominal section.

This second operation discovered the portion of bowel that had been strangulated condensed into a very hard, fibrous mass about two inches long and firmly adherent just below the femoral ring in the pelvis. It was dissected and torn off with extreme difficulty. The lumen of the bowel at the site of constriction was torn open during this procedure. The calibre of the gut through the cicatricial mass was not greater than one eighth of an inch. The whole diseased portion of gut as well as one inch of healthy

bowel on each side were excised. Downes's forceps were employed in this case and gave satisfaction. Recovery from the operation was again ideal, save for a saprophytic abscess in a portion of the wound, which probably arose from contamination by the torn portion of bowel. She has remained in perfect health up to the present time, seven weeks after.

SARCOMA OF SUPERIOR MAXILLA.

Dr. Richard H. Harte presented again a man whom he had presented about a year before to show the result following an operation for the removal of the superior maxillary bone in which he had to place a large skin-flap to cover up a defect in the anterior part of the cheek. Since the operation the man has gradually improved in health, and has had nothing done to the persistent disease except the removal of a small mass which appeared a few months ago in the region of the angle of the jaw. This was done by Dr. Le Conte. The man has gained steadily in strength, looks perfectly well, and is able to do the ordinary work of a day-laborer. There is an opening leading from the roof of the mouth, and posterior to that there is a small cystic mass corresponding to a portion of the soft palate, which Dr. Harte expected to remove in a short time.

Dr. Le Conte said that he could thoroughly bear out Dr. Harte in his statement that this case was a most unfavorable one for operation. The growth was not only in the antrum, but had extended to the skin surface and had ulcerated, a fungoid mass appearing, possibly the size of a quarter of a dollar, over the cheek, which necessitated not only the removal of the upper jaw, but likewise the removal of the larger portion of the skin which covers the upper jaw, and necessitating plastic operation to cover in the defect.

FRACTURES OF THE SKULL.

Dr. Richard H. Harte read a paper with the above title, for which see page 73.

SOME OBSERVATIONS ON FRACTURES OF THE SKULL, BASED ON ONE HUNDRED AND FORTY-SIX CASES.

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It is not my object in this paper to go into all the numerous theories which have existed from time immemorial in regard to fractures of the skull. These theories, and the controversies they have engendered, have arisen largely from the way in which different observers have looked at the same injury, and have unduly emphasized one or another feature which to their minds has been the salient element in injury.

The skull, it shall be remembered, is a bony spheroidal case, of curious architectural construction, which varies in some detail in every case and at different times of life. Furthermore, no two injuries are produced in exactly the same manner. Even the varying muscular rigidity of the individual will influence the character of the injury. This is, of course, influenced, too, by the cause which has produced it. For example, the head may have been caught between heavy falling beams and crushed; or we may have a small punctured or stellate fracture, such as is caused by the point of a pick entering the skull, causing no injury except at the point of entrance, and not even wounding the membranes. A fissured fracture may be the result of the blow from a sand-bag, producing a simple fissure of very short extent, which closes so accurately that it can only be discovered with the greatest difficulty. Again, a fissure may radiate from the point of impact to the base of the skull, or, as has been frequently noticed, appear only on the opposite side of the skull from the point where the blow has been received, producing the variety known as

contre-coup. (This variety of injury is easily demonstrated by physical experiments on definitely shaped bodies.) Still other varieties are explained by what is known as the bursting theory, in which the opposite sides of the skull are brought nearer to each other, with the result that the intermediate portion gives way.

It is impossible to say what the result will be after a definite blow has been delivered upon the vault of the skull. A fracture at the base, or a fracture at the point of impact, or simply a jarring of the cerebral mass, may occur, depending upon the strength and resistance of the bony parts involved. It will be obvious that it will be hardly necessary here to go into a minute description of the different varieties of fracture of the skull. They may be conveniently divided into simple, compound, comminuted, fissured, or depressed, according to the position and the part of the skull involved, and all of them may exist with or without noticeable injury to the skull contents. Other general divisions frequently made by hospital surgeons, and made with regard to location, are fracture of the vault and fracture of the base. Not unfrequently we find the former running or extending into the latter, and both vault and base involved. (The writer is inclined to lay much stress upon these two varieties.) A fracture of the skull may be a most trifling injury, whereas injury of the base should always be considered one of the gravest of head injuries.

Fractures of the base of the skull are not produced by the same character of force that we find causing similar injuries to the vault, for the weight of the body is in this case more often a factor, driving the vertebra up against the skull and resulting in a fracture of the posterior and middle fossæ, for the reason that a concentrated force will, in all probability, produce a fracture at the point of impact, whereas diffused force is likely to cause a fracture of the base,—a result to be accounted for by the vibratory theory of *contre-coup*. Aran's "radiation" theory is that fractures of the base occur because of the radiation of fissures from the point of application of the force. He conceived that the fissures passed

by the nearest route to the base and involved it in the fracture. He furthermore discovered, as the result of experiments, that the part of the vault which was first struck would give the key to the fracture which would take place at the base. Thus, injuries produced in the front part of the vault indicate fractures of the anterior fossa, those of the middle part of the vault to fractures of the middle fossa, and those of the back of the head to fractures of the posterior fossa. In 1880, Meserer expressed the opinion that fractures of the base always occur in the direction of the force applied, or, at any rate, parallel to it, and considered these not as the result of radiation, but of bursting forces. His theory may be illustrated by subjecting a hollow sphere to pressure. The breakage will occur either at the point of immediate pressure or by bursting at the most distended part. This theory was accepted by the late Professor Ashhurst, and, from a physical stand-point, must undoubtedly carry much weight.

To sum up practically the results of diffused blows upon the skull, we find that their chief effect is at a distance from the point of their application. Blows struck on the vault produce fissured fracture in the corresponding segment of the base. Those struck on the periphery of the base produce fissured fractures on the base of the skull parallel to the direction of the force applied. It is only by the careful consideration of the initial force that an intelligent idea of the character and direction of the fracture can be obtained.

The term fracture is used generally to express any break in the continuity of the skull, and may mean the simplest fissure of the vault without any cerebral symptoms, or be employed to express a complete crushing of the skull and its contents. It is, however, usual to distinguish such fractures into fractures of the vault and fractures of the base. A fracture that is confined to the vertex is not necessarily a more serious injury than a corresponding fracture of any of the flat bones elsewhere. The danger depends on injury to the underlying structures, such as wounds to the vessels, sinuses, or brain substances. The prognosis should depend upon the accuracy of the diag-

nosis, which in its turn must depend largely on the ability to explore or determine the exact amount of destruction to the bone and to the underlying parts, which latter is by far the more serious factor in the injury. We know that in simple fissuring the bony margins, after often having injured the parts beneath, immediately return to their natural positions. Consequently inspection of a superficial wound is no index of the harm that may have occurred in the tissues below. Another variety of injury is caused by the splintering of fragments from the area of the fracture, causing wounds of the brain or membranes. A large fragment may have been separated and driven deep into the brain substance. Any of these conditions are liable to produce pressure either from a fragment of bone pressing on the brain, or from effused blood escaping either from the diploe or from a wounded meningeal vessel. It seems, to-day, to be the consensus of opinion that the latter is much the more serious condition of the two,—a condition which, if not soon relieved, is bound to be followed by fatal results.

Diagnosis of fracture of the vault is very simple if the wound leads down to the seat of injury, or if by slight enlargement the fracture may be brought into view. The cases which require the greatest amount of skill are injuries in which there is no external wound, for then much uncertainty often arises in determining whether depression in the soft parts really corresponds to a distinct depression in the bone. Frequently the only way in which such an uncertainty can be made a certainty is by making an incision; and when made for this purpose, such an incision is perfectly justifiable, provided proper aseptic precautions are observed. Sometimes the suspected margin of bone can be felt with a needle by puncturing the skin and exploring the surface of the bone. When the patient is conscious, he may be able to give information as to the character of pain when pressure is made over the injured part, especially if a fragment is loose. Still, there is no doubt that, with all aids to diagnosis, many cases of fracture of the skull go unrecognized, and are not detected until a post-mortem is made.

The writer feels that many children recover from unrecognized fracture. So long as a fracture is simple and uncomplicated, its determination is not a clinical necessity, but rather of scientific interest.

It is worth while to mention two errors that are often made in the diagnosis of fractures of the vertex,—one, the mistaking of normal fissures for fracture, especially unobliterated frontal fissure, over which a trephine has been applied on more than one occasion; and, second, simple incised wounds of the skull are frequently mistaken for fissured fractures. In cases of doubt in either of these conditions a small piece of the skull removed with a gouge at right angles to the fissure will determine the exact character of the injury.

On theoretical grounds, fracture of the inner or *vitreous* table should be much more common than we are led to believe it is, owing to the direction of the force and the character of the bone involved. It has been stated that it is impossible to sustain a fracture of the inner table without a corresponding injury of the external. This statement will hold good for delicate skulls with little or almost no diploic structure; but in skulls with thick diploic layer and thin outer table, a fracture of the latter may easily occur without injury to the inner table.

I will now pass to the consideration of fracture of the base of the skull, and speak of the treatment of the two varieties together. I have already referred to some of the causes of, and the theories that are entertained in regard to, fracture of the base of the skull. Any of the fossæ may be involved. or the fracture may extend from one into the other. Fractures involving the middle and posterior fossæ are frequently seen.

Fractures of the posterior fossa occur, for the most part, by violence applied posteriorly and from below. There is often a ring form of fracture produced by the impact of the spinal column on the base of the skull, as when an individual falls on his head, producing a fissuring of the base away from the jugular fossa, or towards the foramen spinosum,—the most

common site of fracture of the petrous portion of the temporal bone. Probably the most frequent site of fracture of the petrous bone is through its weakest part, which corresponds to the position of the middle ear; and a fracture here is often accompanied by bleeding from the ear, or with escape of cerebrospinal fluid.

Fracture of the anterior fossa may involve the central portion of the orbital plates, or may extend to the optic foramen, or to the sphenoidal fissure, or may pass transversely and involve the cribriform plate. The study of the mechanism of basal fracture is of the greatest importance, as we may thus explain how forces are distributed to certain portions of the base of the skull, and show how frequently effect follows the cause, and that blows on the side of the skull usually result in fissures of the base of the middle fossa.

During the preparation of this paper, the case of a child who had fallen from a window, striking the side of its head, causing a large hæmatoma with hæmorrhage from the external ear, came under the writer's care. The diagnosis of fracture at the point of impact, with fissuring involving the middle fossa, was made. This was verified by incising the scalp and raising a large displaced fragment, and a long fissure extending towards the middle fossa, which in all probability involved a part of the petrous bone.

A large percentage of fractures of the base of the skull are mere fissures, which are often very firm, and which close almost instantly after their production, so quickly, in fact, that blood is not found between them. Sometimes rare forms of fracture will be found, as breaking of either of the clinoid processes of the sphenoid.

Prognosis of fracture of the base of the skull depends largely upon the violence which has caused it; and the majority of fatal cases are due to contusion of the brain or the large nerve trunks, or hæmorrhage from other intracranial lesions resulting from the same violence. The longer the fissure the greater the danger, especially when it takes its origin in the vertex, thus being more likely to invade some of the air cavities and produce a compound fracture. Fissures which are definitely confined to the base are not exempt from the danger of air infection from any of the air sinuses, as the ear, frontal, sphenoid, and ethmoid, making the fracture compound in character, although no external wound is evident. Another important factor which must be carefully considered is the amount of injury to the brain substance. Any positive evidence of such injury having taken place should always be regarded as most unfavorable; although the writer recalls a case in which a drachm of brain substance escaped from the internal ear in a bad basilic fracture, and yet the patient recovered, though with impaired brain function. This shows that recovery often follows undoubted fracture of the base of the skull, sometimes of the severest character. There is no doubt that a large percentage of the cases of basilar fracture that recover do so with some impairment of sight or hearing, or some special sense disturbance due to pressure or exudate along the nerve trunks. The impairment of brain function, whether temporary or permanent, depends upon the amount of concussion received by the brain at the time of the injury.

The diagnosis of fracture of the base of the skull depends largely upon the careful consideration of three distinct phenomena:

(1) The escape of blood from the seat of fracture until it is detected at certain points beneath the skin.

(2) The escape of brain substance, blood, and serous fluid from the skull, through the nose, pharynx, or external ear.

(3) The impairment of the nerves of special senses, or functional disturbance of any of the cranial nerves. The spread of blood may be beneath the skin, or mucous membrane of the pharynx, or conjunctiva, all of which are points where ecchymosis is likely to appear when an injury has occurred; though these conditions are by no means infallible signs that fracture of the skull exists.

Ecchymosis about the eye is a most common condition following trifling injuries in the region of the eye, and appears almost immediately after the reception of the injury. Those

ecchymoses which appear two or three days after the injury are much more significant. Fractures which extend into the orbit give rise to hæmorrhage into that cavity and cause protrusion of the eye. I do not recall a case where this was the only symptom present; but when it does exist, it is significant of serious trouble, and probably indicates the rupture of a large vessel. Escape of brain substance means, of course, a break somewhere in the base of the skull. When coming from the external ear, it means some break in the wall of the upper part of the ear apparatus. It has been stated that this condition is much more liable to happen in persons advanced in years, owing to the rarefaction of the bones about the tympanum. The writer recalls a case, however, where a considerable amount of brain substance escaped from the ear of a child who had sustained a fracture of the base of the skull.

The escape of blood from the ear, nose, and pharynx are common occurrences in basal fractures. The ear is the most frequent point of exit, owing to the tunnelling of the petrous bone by canals which connect with the ear in such a way that blood is liable to escape in considerable quantities if the petrosal sinuses, or any large meningeal vessel, have been injured. Blood may, however, find its way through the external ear as the result of a slight contusion rupturing the tympanum. The origin of the hæmorrhage can often be determined by the careful use of the otoscope.

The escape of serous fluid, either mixed with blood or by itself, is a pathognomonic sign, and where it escapes there must be some tear in the dura or arachnoid, as well as a fissure in the same portion of the petrous bone. Where the two fluids—that is, blood and serum—are mixed, the latter, in doubtful cases, can be detected by rubbing the effused material between the thumb and finger, when the peculiar quality of serum will manifest itself; whereas blood alone would soon become dry and sticky. The amount of fluid that may escape varies. If the hæmorrhage only comes from the vessels in the ruptured tympanum, it will be of short duration, as the vessels are very small and will soon cease to bleed. If, however, it arises from a torn sinus or vessels of the dura, it may

be very persistent, lasting for several days. As a rule, the escape of serous fluid is not so profuse as the escape of blood, but often lasts for a much longer period, sometimes as much as from one to two ounces escaping in twenty-four hours. A case is cited where sixty-three ounces escaped in 106 hours. Some abnormal condition of the brain may have existed in this instance, however. At other times, hardly enough will escape to be recognized.

Hewitt states that nearly 50 per cent. of fractures involving the middle fossa were accompanied by distinct bleeding from the ear. In 70 per cent. of the cases which did not bleed, the tip of the petrous bone was involved, as shown by post-mortem examination. My own experience would lead me to believe that bleeding is a much more frequent occurrence, but I regret that I have no exact data on this important symptom.

The paralysis of certain cranial nerves, or groups of nerves, as before mentioned, is significant of basilar injury, as these nerves are frequently impinged in their exit where involved by the fracture; or they may be injured by a spicule of bone dividing, pressing, or bruising them, and thus result in loss of function to the parts supplied by them. Similar conditions may result from injury to the origin of the nerves in the brain. The seventh and eighth pairs of nerves are those most frequently involved; although in one of the writer's recent cases there was paralysis of the fifth, sixth, seventh, and eighth pairs of nerves; yet practical recovery ultimately resulted.

Emphysema of the tissues about the orbit and nasal passages is significant of some break in the continuity of the air passage, and may possibly exist in the region of the mastoid. It is, however, so common in other injuries, as in fracture of the nose, that its presence must be carefully considered with other symptoms before a positive diagnosis is made.

Coma is in nowise diagnostic of fracture of the skull. It may be present in a number of traumatic conditions involving the brain in which the skull is intact. It is present, however,

to a greater or less extent, in all severe fractures, especially those of the base of the skull. This condition is frequently confused with coma produced by alcohol. The value of its proper recognition cannot be overestimated, not only because it is the condition with which traumatic coma is most liable to be confounded, but because error in diagnosis may inflict so much unnecessary suffering and possible disgrace to the patient, and involve additional danger. Such an error places the most serious responsibility upon the surgeon. Many head injuries have been mistaken for alcoholism and the patient left to die in a police station. Coma should not be ascribed to alcohol except after the strictest process of exclusion, after every symptom of head injury has been considered seriatim. In discriminating between the two forms of coma,—alcoholic and traumatic,—the temperature is our best guide. In the former the temperature is subnormal, whereas in the latter it is slightly above normal, except shortly after the receipt of the injury, when considerable shock may be present. As reaction begins, however, it soon rises until it reaches a point several degrees above normal.

The prognosis in fractures of the base of the skull depends mainly upon the extent of the violence which has produced the injury. The danger arises from contusion of the brain or large nerve trunks, or other intracranial lesions, which may have resulted from the same violence. The longer the fissure the greater the danger, especially when the fissure radiates from the vertex, as there is then more danger of some of the air cavities of the skull having been opened, and thus the fracture rendered compound,—a contingency which should always be carefully considered because of the ease with which such an opening of the air-cells may have occurred, and the difficulty of detection. The fatal element in such cases, as before stated, is injury to the skull contents. Rarely is an average fracture of the base of the skull beyond repair; almost everything depends upon how much the brain has been injured, and whether septic infection can be prevented. The recovery from basilar fracture is seldom ideal; some lesion, or impairment of the

special senses, or cranial nerves, is apt to remain to a greater or less extent.

Little dependence can, however, be placed on statistics of fracture of the base of the skull. Out of forty-six cases of this variety of fracture which occurred in my own practice, 69.5 per cent. terminated fatally, and 30.5 per cent. recovered so that they were able to leave the hospital in fair condition. Possibly, in some of the cases cited as having recovered, fracture may not have existed, as post-mortem verification was impossible, but all doubtful cases were carefully excluded. I find that these percentages are almost identical in both hospitals from which I have collected my data.

The *treatment* of fractures of the base of the skull is largely expectant, the part involved being practically beyond the field of surgical intervention. There is little left for the surgeon to do except to assist the tendency of nature to repair the injured parts. The salient features of the treatment might be mentioned, in brief, as: absolute rest in bed with ice-bags or cold compresses to the head; thorough sterilization of the auditory canal if blood or serous fluid is escaping, and protection of it with some aseptic dressing; the administration of small quantities of calomel and opium by the mouth, preferably in the form of Dover's powders, two grains of pulv. Doveri and one-quarter grain of calomel every three hours, and an ice-bag to the head. Such is the routine treatment usually pursued. On theoretical grounds opium should be contraindicated in head affections; but practical experience has led me to believe that it is one of the most useful remedies that we have at our command. Figuratively speaking, it puts the brain in splints, and thus places it in the most favorable condition for the repair of its injuries. Of course, it must be used with discretion, especially if there arise any signs of coma. Calomel is an old remedy in these conditions, and is valuable for, as the old writers say, its "anticipatory antiplastic effect." All those careful hygienic attentions should be paid which the thoughtful attendant's good sense will naturally suggest, but which are beyond the scope of this paper.

In the treatment of fractures of the vault of the skull,

especially from an operative point of view, the surgeon should resort to every means in his power to restore the continuity of the skull, even if no signs of compression appear. The treatment of a simple fracture of the vertex, so long as no operation to relieve depression is called for, should be of the simplest possible character, corresponding to the general principles laid down for governing injuries of the base of the skull. When depression does exist, even though the external parts are not injured, the treatment, contrary to the teachings of many distinguished surgeons, should at once become operative. The consensus of opinion of the more advanced surgeons of to-day is, that it is not only justifiable, but the best practice, to cut down and elevate the depressed fragment of bone. This opinion seems correct for many reasons, aside from those immediately apparent, when we consider the secondary and remote consequences of the lesions, if dealt with in the manner advised by the less advanced surgical teachers. If properly performed, the operation is not nearly so dangerous as failure to relieve the presence of so plain an indication. I may go even farther, and say that I think it advisable in doubtful cases to incise the scalp over the questionable point and be positive whether a depression exists or not. By following this procedure, fractures have been recognized which would otherwise have been overlooked.

In dealing with compound injuries, the course to pursue is, in the majority of cases, much plainer. The fact of the existence of an open wound makes the diagnosis easier. Here it is imperative, aside from the relief of points of pressure, to remove all loose splinters and spicules of bone which are liable to wound or irritate the dura or cortex; and, in fact, to get rid of all tissue, soft or bony, whose vascular supply is such as to make its nutrition doubtful. The wound in many cases may be closed with the view of procuring immediate union; but if there is a disposition to bleed, either from the dura or diploæ, it is much wiser to pack the wound with gauze and depend upon closing it later. If the wound be infected at the time of operation, a drainage tube may be inserted; but it is rarely necessary to carry this tube beneath the edge of the bones,

carrying it out of the most dependent part of the scalp being all that is necessary. Early and frequent dressing of the wound is imperative, especially in septic cases, as the slightest retention of pus or other product of inflammation is liable to set up meningitis, which is frequently and rapidly fatal.

A few words with regard to stellate or punctured fractures. These are invariably depressed, with ragged, irregular edges, and unquestionably call for the use of the trephine or the rongeur forceps, until the edges are smooth, and all sources of irritation to the dura or cortex are removed.

The operation of trephining *per se* in careful hands is practically without risk, and where cases of fracture of the skull terminate fatally, it was not the operation, but the condition which demanded it, that caused death. In the writer's tables this operation was performed in twenty-six cases, all but three of which recovered, making a mortality of about 11.5 per cent., compared with a mortality of over 51 per cent. in the pre-aseptic era.

The appended table is the result of the deductions made from cases which occurred in the writer's service at the Episcopal and Pennsylvania Hospitals during a period of ten years in the former and seven years in the latter.

Total number of cases treated	146	
Number of recoveries	84	57.5 per cent.
Number of functions impaired	11	15.06 " "
Number of deaths	62	42.5 " "
Number of deaths within twenty-four hours	54	87.1 " "
Number of trephine operations	26	
Number of trephine operations recovered	23	88.5 " "
Number of trephine operations died	3	11.5 " "
Average number of days in hospital, those recovered (not within twenty-four hours)		18.8
Average number of days in hospital, those died (not within twenty-four hours)		3.64
Average number of days in hospital, those trephined; recovered		22.28
Average number of days in hospital, those trephined; died		3.66

NEUROPATHIC AFFECTION OF THE BONES.

Dr. Charles H. Frazier presented a man, sixty years of age, by occupation a freight conductor; a moderate user of tobacco and alcohol; never contracted syphilis. At the age of twenty-five he began to complain of occasional shooting pains in the left tibia, at first referred to a portion, now to the entire, shaft. Associated with the shooting pains, which have increased in severity and frequency, is a hypertrophy of the bone throughout its entire length. Five years ago the patient began to notice some disturbance of function in the right knee; at present he can neither fully extend nor fully flex the joint.

Examining the skiagraphs that were made of the left and right knee-joints and of the left and right shafts of the tibia, one notes that the breadth of the articular ends of the bones entering into the conformation of the right knee-joint is considerably greater than that of those bones entering into the conformation of the left knee; that, furthermore, there are sprouting from the articular surfaces of the joint bony outgrowths, osteophytes, or exostoses which spring probably from the edges of the articular cartilage. The skiagraphs of the shafts of the right and left tibia differ from one another in that the shaft of the left or affected bone is broader, denser, and more irregular in outline. The medullary cavity is demonstrable in the skiagraph of right tibia, not of the left. Further than this no information can be gathered from the skiagraphs.

The conspicuous features of the case worthy of attention are these, to wit:

(1) An affection of the osseous system bilateral and asymmetrical in its distribution.

(2) Beginning at the age of twenty-five and extending over a period of thirty-five years.

(3) Not affecting in the slightest degree the patient's general health.

(4) Running an afebrile course.

(5) In which pain is the most conspicuous, in fact the only, subjective symptom.

(6) With no apparent tendency to progressive involvement of other bones or other joints.

(7) With no concomitant lesion in the bones of the face or cranium, or the bones of the trunk, vertebra included.

(8) The pathologic process being essentially a formative one, that is, one attended with generation, and not with destruction, of bone, a process which from the apparently increased density of the left tibia, as demonstrated by the skiagraph, is one akin to osteosclerosis rather than osteoporosis.

(9) An affection of obscure origin, in so far as it is not traceable to infection, to traumatism, or to any demonstrable lesion of cord or brain.

Dr. Frazier said that he (1) could conceive of an osteoperiostitis of a syphilitic nature, slow but progressive, gradually involving the entire shaft of tibia; a bone which might be said to be the seat of predilection for syphilitic lesions, an osteoperiostitis attended with generation of bone by ossification of the inflammatory exudate, which would account for the present condition of the left tibia.

(2) Knowing how many years the typhoid bacillus lies dormant in the system without setting up any inflammatory reaction, one might be tempted to hold this organism responsible for the condition of the left tibia, were it not for the fact that the patient has never had typhoid fever.

(3) Disregarding for the time the left tibia, one might say that the presence of the osteophytes or exostoses along the margin of the articular surfaces were suggestive of the condition met with in the early stages of osteoarthritis.

(4) Again, the enlargement, especially of the articular ends of the long bones, calls to one's mind Marie's disease, the so-called hypertrophic osteoarthropathy, which is for the most part a pulmonary affection accompanied by enlargement of the extremities.

No one will take exception to the statement that this case presents an unusual and an atypical manifestation of one or another of the bone-affecting diseases. That it is not of infectious origin, inflammatory in nature, Dr. Frazier was convinced. Reasoning by the process of exclusion, there remains for consideration that class of bone diseases which, for want of a better name, is called neuropathic or trophoneurotic, a class including such affections as Marie's disease, as acromegaly, as leontiasis ossea, as Paget's disease (osteitis deformans), a class having many features in common: beginning at or after middle age, *i.e.*, in the decline of life; of duration unlimited, the affected indi-

vidual dying of some intercurrent affection; the process primarily an osteoporosis, secondarily an osteosclerosis, and essentially formative and associated with hypertrophy of the bones involved; the symptoms almost wholly objective; the prognosis favorable as to life, but absolutely unfavorable as to recovery, occasionally the process being arrested; the treatment purely symptomatic.

As to the characteristic features of each of these affections: in acromegaly they are enlargement of the inferior maxilla, the supraorbital ridge of the hands and feet; in Marie's disease they are the enlargement of the articular ends of the bones, especially those entering into the elbow, shoulder, knee, wrist, and fingers. There is no lesion in cranial or facial bones; in osteitis deformans there are enlargement of the bones of the skull and of the tibias and femora together with a kyphosis in the cervicodorsal region, a symptom common to both acromegaly and Marie's disease. The lesions of leontiasis ossea are confined to the bones of the face, of which the superior maxilla is the first to be attacked.

Were it necessary to classify the affection as exhibited with any one of these classes the reporter would be disposed to select osteitis deformans, realizing that one is but an incomplete picture of the other; that instead of the lesions being widely distributed, the process is confined to but one bone of the left leg and to one articulation of the right.

CÆCAL HERNIA.

Dr. Francis T. Stewart and Dr. John H. Gibbon read papers on cæcal hernia, for which see pages 66 and 69.

Dr. William J. Taylor said that Dr. Gibbon attributes the formation of this hernia to the mesentery or long mesocolon. The speaker, however, thought that Mr. Jonathan Hutchinson, Jr.'s, dissection of monkeys to be rather against such a conclusion. Hutchinson has shown, in a very large number of monkeys, that the mesocolon and mesentery are unusually long and free in monkeys, and yet hernia is almost unknown among them. The mesentery is very much longer than in the human being, and one would suppose that would have a tendency to the production of hernia in monkeys, if that was a factor.

Dr. Ross reported the case of a man operated on by him

for right inguinal hernia. The cæcum occupied the sac in this case, due to the fact that the arching fibres of the transversalis and internal oblique, instead of arising from the outer half of Poupart's ligament, started not more than one inch below the anterior superior spine, so that the external ring was approximately three and a half to four inches long. This man had an undescended testicle, which was removed.

Dr. Richard H. Harte said that he had seen a number of cases of cæcal hernia in his hospital practice, and in every instance in which he had operated he had found a portion of the ileum also in the hernial sac. He was convinced that the ileum was the first portion of the bowel to make its descent, and then it gradually dragged the cæcum down later. This seems undoubtedly to be the most rational cause for the cæcum's appearance as a hernial protrusion. This doubtless, on the whole, is due to a relaxation of the mesentery. In regard to Dr. Taylor's remarks in reference to the infrequency of hernia in monkeys, he would say that can be ascribed largely to the position which they maintain in walking, usually going on all fours rather than in the erect posture. If a similar position was maintained in human beings, doubtless hernia would be much less frequent than it now is.

MORTALITY OF OPERATION FOR OBSTRUCTIVE JAUNDICE.

Dr. John B. Deaver read a paper entitled as above, for which see page 90.

THE MORTALITY OF OPERATION FOR OBSTRUCTIVE JAUNDICE.

By JOHN B. DEAVER, M.D.,

SURGEON TO THE GERMAN HOSPITAL.

The following is the classification of causes of obstructive jaundice by Murchison, "Osler": (1) by foreign bodies within the ducts, as gall-stones and parasites; (2) by inflammatory tumefaction of the duodenum or of the lining membrane of the duct; (3) by stricture or obliteration of the duct; (4) by tumors closing the orifice of the duct or growing into its interior; by pressure of the duct from without, as by tumors of the liver itself, of the stomach, pancreas, kidney, or omentum; (5) by pressure of enlarged glands in the fissure of the liver, more rarely by abdominal aneurism, a fæcal accumulation or the pregnant uterus; (6) to these may be added lowering of the blood-pressure in the liver, so that the tension in the smaller bile-duct is greater than in the blood-vessels. In this class very probably may be placed the cases resulting from mental shock or depressing emotions.

Of the above causes of obstructive jaundice, I have only met with those caused by calculous obstruction of the hepatic and common or of the cystic ducts, where the stone was located at the junction of the cystic and hepatic ducts with obstruction of the latter; stricture and angulation of the common duct caused by adhesions which were making either pressure or traction; pressure on the common duct from carcinoma of the head of the pancreas, either alone or in connection with cancer of the duodenum. A condition to which my attention has been drawn, upon more than one occasion, is the association of attacks of jaundice with very movable kidney, and I have been inclined to attribute this in part, at least,

to traction upon the peritoneum, and consequent angulation of the common duct.

The cause of death in the cases which I have lost were consecutive and secondary hæmorrhage, exhaustion, and cholæmia. I have, with one exception, been fortunate enough to have had autopsies in these cases, and therefore have been able to rule out peritonitis as the cause of death.

Mayo Robson (Disease of the Gall-Bladder and Bile-Ducts, Second Edition, 1900) reports twenty-two deaths following operation for the relief of obstructive jaundice. Of these, seven died as the result of hæmorrhage either consecutive or secondary; five of exhaustion; four of shock; three of heart failure, one of which was complicated by nephritis; one of an abscess between the liver and diaphragm, which was not discovered at the operation; two of peritonitis, in one of these a small hole was torn in the colon by the breaking up of dense adhesions, and in the other a ligature, which had been used to tie off the cystic duct in amputation of the gall-bladder, slipped and caused extravasation and peritonitis. It would seem therefore that his experience coincides with my own, and that peritonitis is not a common factor in the mortality. It is a question with me if most of the cases which die of exhaustion or heart failure are not in reality cases of cholæmia. Shock cannot be separated from hæmorrhage as a cause of death, for it is the loss of blood, either at the time of operation or following it, that causes the shock.

From the present status of surgical interference for obstructive jaundice, it should not have the mortality credited to it from either of the causes mentioned, as I will try and show later on.

Neither consecutive nor secondary hæmorrhage should occur, and particularly consecutive hæmorrhage. The latter is due, pure and simple, to the blood changes consequent upon the prolonged jaundice. The exact changes which take place in the blood, I believe, have not been definitely determined. It is probable, however, that there is some chemical change which inhibits the fibrin-forming element, and thus prevents

rapid coagulation. The ordinary blood-counts indicating anæmia, hæmoglobinuria, leucocytosis, etc., do not account for the tendency to hæmorrhage in obstructive jaundice. The effects of the bile salts on the blood-vessels must also be taken into account. There seems to be a relaxed condition of the arteries which interferes with their proper contraction, thus encouraging free bleeding.

I have met with but two cases of secondary hæmorrhage, and in each of these there was a period of consecutive bleeding preceding the onset of secondary hæmorrhage, and which was controlled only after the wound had been packed with gauze. In both of these cases the gauze packing introduced to control the consecutive bleeding was removed on the seventh day, the removal being effected without difficulty and with practically no pain. In one case, three days after the removal of the gauze, secondary bleeding occurred, costing the patient her life. The same may be said of the second case, except that it was only by the most heroic efforts that her life was saved. Intravenous saline transfusion given by my house surgeon, Dr. Moore, upon two different occasions, full doses of opium, absolute rest of the stomach, nutritious enemata, etc., were the means to which we can ascribe her recovery.

I have seen but one death from consecutive hæmorrhage alone. This patient died within twenty-four hours following the operation. The control of primary hæmorrhage by means of the ligature is certain. I have never been unfortunate enough to wound the portal vein or any large vessel. To guard against consecutive bleeding, chloride of calcium in thirty-grain doses for three or four days before as well as after operation, as recommended by Robson, I believe good practice; yet, I am sorry to confess, I have not been able, in my comparatively limited experience, to attribute much good to it. A wider experience and greater familiarity with its use may perhaps convince me of its utility and benefits. Suprarenal extract has lately taken a place as a hæmostatic, and in one of the cases herein reported it was tried with seeming success.

Obstructive jaundice due to gall-stones is usually due to obstruction of the common or hepatic ducts; it may, however, and in fact frequently does, occur when the gall-stones are confined to the cystic duct or gall-bladder. Here the obstruction to the flow of bile is due to the associated cholangitis. This is a rather favorable condition of affairs for operation, as the removal of the gall-stones from the cystic duct or gall-bladder will be followed by a rapid subsidence of the inflammatory swelling of the common duct. Reidel (Gumprecht, *Deutsche Med. Work,* 1895, No. 15) says that two-fifths of the cases of jaundice in cholelithiasis arise in this way.

Drainage plays an important part in the above result; this is probably accounted for by the fact that the valve-like action of the reduplication of the mucous membrane lining the cystic duct is overcome by the obstruction to the flow of bile, and the slow regurgitation becomes a steady flow of bile into the gall-bladder, and the drainage provides for the escape of the excess.

There is a class of cases where the inflammation in and about the gall-bladder is so intense that the surrounding tissues and organs become gangrenous, and the patient succumbs to the exhausting effects of local and constitutional sepsis. The following case is an illustration:

C. P., aged fifty-three years; for several years prior to present attack has had "bilious attacks" without jaundice or pain. Present attack began five weeks before admission to German Hospital, December 4, 1900. He had pain in the region of the gall-bladder radiating to shoulder; he was tender over the gall-bladder, but was not jaundiced. He continued his occupation for two weeks. Three weeks prior to admission, the pain and tenderness became more aggravated, and jaundice made its appearance for the first time. The jaundice has gradually increased until the present time; bowels constipated; the gall-bladder was enlarged, and upon deep pressure tenderness could be demonstrated.

Operation.—The gall-bladder was enlarged and tied to the liver by dense adhesions. It contained many large stones, pus, and bile, and its walls were ulcerated and friable. The common and cystic ducts presented the same condition as the gall-bladder and contained many stones; there was one stone in the hepatic duct. The stones were all removed and the cavity packed with gauze and drained. On the sixth day the gauze

packing was removed, liberating a considerable amount of pus; the tissue about region of the gall-bladder was necrosed, and a large pus cavity led down behind the liver. He died of exhaustion due to local and constitutional sepsis.

Post-mortem.—Localized fibrous peritonitis, no involvement of general peritoneum.

A careful study of the causes of the mortality of obstructive jaundice leads us naturally to the consideration of the best methods to adopt to combat the disease. Shall we treat them as medical cases, with the prospect of surgical help if medical measures fail, or shall we treat them as purely surgical cases? And if so, how and when? If we take the six causes for obstructive jaundice, we can see that two, namely, inflammatory tumefaction of the duodenum or bile-ducts and changes in blood-pressure, are purely medical cases, while in the other four the indications are distinctly and positively surgical.

The most common of all causes, and more common than all the others put together, is obstruction from gall-stones. Parasites are so rare that they can be passed by with the mention, although the indication here is distinctly surgical. Every case of cholelithiasis that I have operated upon has given a history of repeated attacks treated medically, yet have not been cured of the disease or freed from its dangers. Each succeeding attack is accompanied by local and systemic changes which detract from a favorable surgical prognosis. We have seen that the most common cause of death is hæmorrhage caused by changes in the blood; that the next most common was exhaustion, or what we believe to be cholæmia, and third, most common, shock which is a result of hæmorrhage, and that these three causes are undoubtedly enhanced by delay or long continuance of the pathological factors of the disease.

It would seem, then, that operation, and early operation, offers the best safeguard to the destructive possibilities of obstructive jaundice due to cholelithiasis. Strictures or obliteration of the duct; tumors closing the orifice of the duct or growing into its interior; pressure from without by tumors of contiguous organs, or by enlarged glands in fissure of the

liver, present indications so unmistakably surgical that it is hardly necessary to argue the point.

Marked jaundice, and especially if of long duration, offers a serious obstacle to operative interference, and yet in some cases we must assume the increased risks. The class of cases in mind is the fulminating type of the disease; they run a course similar in onset, duration, and termination of the attack to the fulminating form of acute appendicitis. A differential diagnosis is oftentimes difficult to establish; yet the one most important fact can be established as a rule, *i.e.*, general peritonitis, which is the usual accompaniment of fulminating appendicitis and unusual in the case of the biliary apparatus. In either case operation should be synchronous with the establishment of a diagnosis, or even with a strong suspicion of the trouble; under these circumstances it is better to open an abdomen and find little or nothing wrong, than to do so later on in the attack and find an irremediable condition of affairs.

The time which elapses between the onset of an attack of fulminating obstructive jaundice and its fatal termination is, at the most, a very few hours; and even in this short time it is usual to find gangrenous destruction of not only the gall-bladder and ducts, but of the contiguous organs and tissues, and especially the duodenum and liver. Here the only hope is prompt relief of the obstruction and adequate drainage.

The important fact to be learned by this paper, and which to me seems to be the only logical deduction, is that early operation not only in the acute exacerbation of the disease, but in the early days of the disease itself, not only offers the best and surest prognosis as to recovery, but as to the mortality as well.

The five cases reported in this paper are used as a text; they represent the mortality of this affection in the German Hospital during 1898, 1899, 1900, and for January and February, 1901.

A. W., operated in 1898. Obstructive jaundice. Stone in common duct; had consecutive hæmorrhage, which was controlled by packing;

four days after operation a secondary hæmorrhage occurred, and, in spite of packing, she died of shock due to hæmorrhage.

C. L., operated in 1899. Obstructive jaundice. Urine loaded with bile. Gall-bladder enlarged and filled with sanguineous pus; five stones removed from gall-bladder and one from cystic duct. Patient died of exhaustion two days after operation.

C. P., aged thirty-eight years; married. Diagnosis, cholelithiasis. Admitted May 22, 1899; discharged May 27, 1899; result, death. Father, mother, one brother, and three sisters living and well; uses alcohol very moderately; married thirteen years; two living children, two died in infancy. Had usual milder diseases of childhood, had enjoyed excellent health up until three years ago, when he had an attack of enteric fever. Present trouble began one year ago, although he had not been feeling well since his attack of enteric fever two years before. Has lost fifty pounds within the past two years. The present trouble began with severe cramplike pain in the hypochondriac region. These remained localized in the position, and did not radiate. At the same time he became nauseated, and for several days continued to vomit small quantities of biliary material. At this time he was confined to bed for a period of ten days, although his pains had greatly moderated after the fourth day of onset of the symptoms. During this period, and for an indefinite time thereafter, his stools, which were infrequent, were of various colors, varying from a light grayish clay color to dark brown. During this attack his skin became yellow, but gradually faded out until he became perfectly white again. Urine was at times of a deep brown color, staining his underwear. After a time he became better and finally resumed his work, and continued at it until last November (1898), when he again had a similar attack with pain, biliary vomiting, constipation, and jaundice, differing only from the former one in severity. This attack did not confine him to bed; but since then he has never been free from jaundice or pain and tenderness over the region of the gall-bladder. During the next four months he continued moderately jaundiced, but does not know whether his jaundice moderated or became more intense at times. His stools were of a variable color, at times clay colored, at others of a deep brown color.

His present condition began four weeks ago with severe pains in the left hypochondrium, followed by nausea and biliary vomiting. Fæcal passages and urine had the above mentioned characteristics. This attack, like the preceding one, did not confine him to bed, but prevented him from continuing at his occupation. His pain (although moderate) and soreness in the region of the gall-bladder have continued until his admission to the hospital. His jaundice was gradually becoming more intense.

Upon admission, temperature and pulse are normal. Has the above symptoms, with slight tenderness upon deep pressure just below the costal arch, three inches to the right of the median line. It seems that faint gall-stone crepitus can be felt in this position. Gall-bladder and area of liver dulness are not enlarged.

Operation, May 24, 1899. Patient prepared and etherized, using 480 cubic centimetres of ether. An incision through the rectus muscle. The

gall-bladder was partly visible and projected slightly below the inferior hepatic border; it was only slightly distended. The peritoneal cavity was packed off with wet, hot sterile gauze, and the region of the gall-bladder explored by the finger. The finger inserted in the foramen of Winslow disclosed a large stone about the size of a pigeon's egg, occupying a position in the common duct, behind which the cystic duct and gall-bladder were slightly distended with bile. An incision about one and one-half inches in length in the common duct released the stone and many smaller triangular ones which had collected in the duct. The duct was then mopped out with iodoform gauze and the incision closed with a row of continuous sutures. The area just behind the common duct was drained by rubber tubing and two pieces of gauze. The gall-bladder was opened by an incision barely large enough to admit a small rubber drainage tube; the latter was packed around with two strips of gauze, the tube emerging at the lower end of the abdominal incision. The tube draining the area behind the common duct came out just below it. The gauze packing was removed and abdominal wound closed by interrupted, through-and-through silkworm-gut sutures, silver foil, and iodoform gauze dressing.

May 25, 1899. Abdomen greatly distended, not tender. Distention diminished after turpentine enema. Pulse very feeble. Facies drawn and pinched.

May 26, 1899. Pulse has become more feeble and at times barely perceptible, skin cold and clammy. Patient has begun to vomit small quantities of greenish material. This has kept up without interruption during the day. Delirium in a mild form has set in, and altogether patient is in a very poor shape. Abdomen greatly distended and tympanitic; hepatic area of dulness not marked.

Partial Postmortem.—Localized fibrinous peritonitis; no pus in general peritoneal cavity. Death probably due to cholæmia.

W. J. P., aged fifty-four years. Diagnosis, gall-stones. Operation. Admitted January 26, 1901; discharged February 4, 1901. Result, death.

Mother living and well. One brother died of enteric fever; one brother living and well. One son and one daughter living. Wife living. No history of carcinoma or phthisis.

Patient was very weak when admitted. He was emaciated, exceedingly nervous, extremely jaundiced, no fever, and fair pulse. His illness began in February, 1900, with a diagnosis of catarrhal jaundice. Gall-stones were considered, but he never had pain in any way resembling biliary colic. In the following May he was improving from the attack, and had a slight attack of colicky pain lasting twelve hours, which suggested biliary colic. After this he began to fail; he lost flesh, had marked anæmia, leucocytosis, constant nausea, and appearance of cachexia. Malignant trouble was positively diagnosed.

In July he had a second attack of colicky pain of short duration, followed by rapid improvement. He gained weight, was free from jaundice, and he thought he was cured, when on his return to Philadelphia, in November, the jaundice, weakness, loss of flesh, and nausea returned.

Gall-stones were diagnosed. Operation was considered, but was deferred, hoping for improvement. He steadily lost ground until he was admitted on January 26 with above symptoms and leucocytosis of 15,400. Pruritus was marked and distressing.

Three days after admission he was operated under ether anæsthesia. Incision was made through the right rectus muscle into the peritoneal cavity. The gall-bladder was felt to be smooth, not markedly enlarged, and the seat of a large stone. The intestines were walled off with gauze. The gall-bladder was opened on the anterior surface and a large stone (of size of first joint of thumb) was removed. The stone was free. Another stone was felt in the common duct. This was also movable. It was removed by making an incision into the common duct. A rubber drainage tube was placed into the gall-bladder and through the opening in the duct, and was held in place by a chromicized catgut ligature.

A piece of iodoform gauze was placed under the gall-bladder and left in. The large pieces of gauze were removed, and the wound was closed by through-and-through silkworm-gut sutures, except at the upper part, where the two tubes and gauze were placed.

He did well for two days after the operation; his mind was clear and alert, pulse and temperature good. He slept fairly well, expelled flatus, and took nourishment. There was slight but continual oozing of blood from the wound and a free discharge of bile. He could not urinate voluntarily. The next two days he became nauseated, restless, passed scanty amounts of urine, pulse more rapid, mind not so clear. The slight oozing from the wound was not checked by packing; the gauze was removed on the third day after, but the oozing continued. It was checked at once with a 1 per cent. solution of suprarenal extract.

On the fourth day he became delirious, semicomatose; pulse was weak; was nauseated with occasional vomiting; abdomen was flat, and he passed flatus. He was transfused, with temporary improvement for twelve hours, at the end of which time he was again transfused. After repeated enemas he had a slight bowel movement on the fifth day. After this he gradually sank, and was unable to take food by mouth or rectum; pulse could not be felt; was semicomatose; extremely jaundiced; pruritus marked even in delirium, vomited, and unable to retain anything by rectum.

He died while in this condition. Wound healed beautifully. Permission for an autopsy was refused. This was, I think, a death from cholæmia.

The cases of death reported by Mayo Robson are as follows:

No. 283. Obstructive jaundice. Several loose stones in common duct. Cause of death was violent and persistent hæmatemesis. Death on second day after operation.

No. 264. Obstructive jaundice for months. Pressure from cancer of pancreas. Died on fourth day of cardiac failure. No peritonitis.

No. 178. Obstructive jaundice. Common duct thickened and contained gall-stones. Death from exhaustion and shock on third day.

No. 149. Obstructive jaundice. Four months. Cancer of pancreas and common duct. Death from intraparietal and intraperitoneal hæmorrhage without peritonitis. Lived one week.

No. 141. Obstructive jaundice. Cholelithiasis; eighteen stones, dense adhesions. Gall-bladder removed. Ligature slipped on second day. Extravasative peritonitis.

No. 243. Obstructive jaundice. Stone in ampulla of Vater; removed through duodenum. Pus collection between liver and diaphragm. Not discovered until autopsy.

No. 255. Obstructive jaundice. Stone in common duct and one in ampulla. Well until fifteenth day; died on seventeenth day of heart failure. No peritonitis.

No. 277. Obstructive jaundice. Stone in common duct, which was immensely distended. Numerous adhesions; violent hæmatemesis twelve hours after operation.

No. 272. Obstructive jaundice. Stone in gall-bladder; two stones in common duct. Many adhesions. Persistent vomiting, and death from exhaustion on fourth day.

No. 236. Obstructive jaundice. Stones in common duct; hepatic duct and cystic duct removed. Patient died on sixth day of heart failure and exhaustion.

No. 177. Obstructive jaundice. Stone in common duct removed by incision and duct sutured. Died at end of five weeks from exhaustion.

No. 59. Obstructive jaundice. Stone in common duct; adhesions removed; incision and then suture. Death from peritonitis due to fæcal extravasation from a small hole in colon caused by adhesions.

No. 250. Obstructive jaundice. No stones or tumor felt; cirrhosis of liver and some swelling of head of pancreas. Disease probably cancer of papilla and subsequent cholangitis. Died of shock and exhaustion on third day. No autopsy.

No. 274. Obstructive jaundice. Cholelithiasis. Patient weak, and no attempt to remove stones. Bladder drained. Died on second day. Hæmorrhage, which was in the form of persistent oozing.

No. 143. Obstructive jaundice, with hæmorrhage from various localities. Stricture of common duct. Death from hæmorrhage and shock in twenty-four hours.

No. 51. Obstructive jaundice. Distended gall-bladder, no stones; head of pancreas hard. Died of shock on second day.

No. 33. Obstructive jaundice. Cancer of pancreas, with gall-stones. Hæmorrhage of nose, bowel, etc. Died of shock promptly.

No. 11. Obstructive jaundice. Cancer of pancreas, distended gall-bladder. Death on ninth day of hæmorrhage.

No. 235. Obstructive jaundice. No stones in gall-bladder or common duct. Death in seven days, of syncope. Kidneys granular and capsule adherent. No peritonitis.

No. 159. Obstructive jaundice. Adhesions, gall-stones, and infective cholangitis. Death from general oozing at site of torn adhesions.

No. 92. Obstructive jaundice. Eighteen stones from ducts; infective cholangitis, adhesions. Death on twelfth day; exhaustive, persistent vomiting. No peritonitis.

Richardson, in a paper read before the Surgical Section, meeting of American Medical Association, 1900, reports thirteen deaths in cases of biliary calculi and about 100 recoveries. He claims that early operation is not attended by any mortality, but the fatal cases were those operated late or after cholæmia had become a factor.

DISCUSSION.

Dr. John H. Gibbon asked whether Dr. Deaver had ever seen death from acute dilatation of the stomach after operation for gall-stones. He did not mean dilatation that results from constriction of the duodenum, from adhesions, but acute dilatation following operation.

Dr. Deaver replied that he had never seen acute dilatation of the stomach in the deaths following gall-bladder surgery. He had had five deaths, but had not seen a death result from that cause. He had seen what might have been diagnosed as acute dilatation of the stomach; but when he followed these cases to the autopsy table, sepsis was revealed. If there is no sepsis, there will be no acute dilatation of the stomach or alimentary canal.

ENTERORRHAPHY WITH AID OF THE O'HARA FORCEPS.

Dr. Gibbon said that in a case of strangulated hernia he had had an opportunity to use the O'Hara forceps, where it worked very well indeed, and it would seem to be particularly commendable in these cases. It does not require any of the methods, such as rubber bands, forceps, etc., for preventing the flow of fæces over the wound. In this case he was enabled to do an anastomosis a great deal quicker than if he had used the

hands only or the La Place or Downs forceps. The patient died very shortly after the operation from shock. There was every evidence of a perfect anastomosis post-mortem.

THE TREATMENT OF SUPPURATING HÆMATOCELE FOLLOWING EXTRA-UTERINE PREGNANCY.

Dr. George Erety Shoemaker read a paper with the above title, for which see page 102.

THE TREATMENT OF SUPPURATING HÆMATOCELE DUE TO EXTRA-UTERINE PREGNANCY.

By GEORGE ERETY SHOEMAKER, M.D.,

GYNÆCOLOGIST TO THE PRESBYTERIAN AND METHODIST HOSPITALS.

Extra-uterine pregnancy is encountered by the gynæcologist at widely different periods of development, ranging from the fifth week to the ninth month, or even to the condition of missed labor after term. The conditions to be met may differ as widely as the poles, ranging from the tiny, unruptured, non-adherent tube with a living ovum, to a formidable condition with a full-term child and a vascular placenta widely attached to intestine or other non-contractile site. The range is from a simple collection of fresh fluid blood free in the peritoneal cavity and easily washed away, to the enormous encapsulated blood and tumor mass walled in by adherent intestine, omentum, and thick inflammatory sac formation with suppurating contents.

The condition of the patient may be that of the young and vigorous woman in abounding health (one of my patients rode a bicycle the day before I operated and after the preliminary rupture). She may be going about as usual, with only a few cramp-like pains, considered trivial, or she may be, when first seen, in profound collapse, with general sepsis long after rupture and the death of the fœtus.

Quite recently the writer has operated on three of these various types, each requiring different management, and his previous experience covers other varieties of condition. No one can lay down a stereotyped treatment for extra-uterine pregnancy, so far as detail is concerned, for the various resources of the surgeon who is accustomed to dealing with

complicated abdominal conditions will be taxed to the utmost by some cases. It may, however, be stated that the treatment is distinctly operative. Granted that the conditions be recognized, the day of attempts to kill the fœtus by electricity or other means has probably passed forever.

If the mass found be considered residual, and Nature making an attempt to surround and absorb it, the risk of suppuration or peritonitis still demands immediate operative relief. As to the choice of route, whether vaginal or abdominal, there has been some discussion in recent years. As is well known, certain operators acquire great dexterity in dealing with intra-abdominal conditions through the vagina. A number of these have attempted and a few have advocated the vaginal route for the treatment of the ordinary, comparatively simple recent case. With this plan the writer cannot agree. A number of these operators have encountered difficulty in controlling hæmorrhage, and have had to resort to abdominal section in order to save the patient. There is much likelihood that vaginal hysterectomy might be forced upon the operator to gain room or to control a troublesome hæmorrhage.

Although the writer is accustomed to operating by the vagina for various conditions, and possesses the requisite familiarity with the technique, he would strongly advise the abdominal route only in all cases unruptured, or recently ruptured, as well, of course, as when the child has developed for some months, whether it be living or dead. Where the tube is unruptured, the anatomy is often disturbed and ligation is much surer from above. With free blood in the peritoneum, toilet and ligation are thus best accomplished. With a well developed child, living or dead, the question of vaginal treatment should not arise.

There remains, however, the condition of suppurating hæmatocele from early ruptured tubal pregnancy, or hæmatocele which Nature has thoroughly walled in and is trying to absorb. Here, with the diagnosis once clearly established and confirmed by abdominal section, instead of proceeding to break

up adhesions and deal with the condition from above, the writer believes that the abdomen should at once be closed and the collection be drained from the vagina. The convalescence will be smoother and safer, as it would be from the vaginal drainage of any pelvic collection with no sac except adhesions. An illustrative case is here given in which this method was successfully carried out.

Mrs. L. D. was admitted to the writer's service at the Presbyterian Hospital, January 19, 1901, with this history: Age, twenty-three years; white; Ireland. Married three years; one child two years old. No miscarriages. Menstruation every four weeks; lasts three to four days, not painful but profuse. No periods missed to date. Four months ago began to have leucorrhœa and obscure uterine discomfort, but periods continued normal. A flow lasting as usual about three days, stopped on December 6, but a few days later violent cramp-like pain in the left lower abdomen began. No fainting or collapse. The flow returned, and has continued daily since, that is about three or four weeks. Quantity, two napkins. Color, red or brown. Some nausea, not in morning. Loss of appetite, flesh, and strength. Patient on admission very pale, skin moist, lips blue, pulse somewhat rapid.

Examination.—Mass fills lower abdomen to umbilicus, highest to the right. Slightly tender. Resonance impaired, but not dull (adherent intestine partly made up its wall). Muscles not rigid. Spleen, heart, kidneys, liver negative. Vagina not blued, but some passive congestion. Cervix rather soft. Uterus appears forward, fundus just above pubis, and closely adherent to large mass below, behind, and above it. Rounded, tense, smooth, firm prominence in Douglas's cul-de-sac, apparently fluid though resistant. This mass could not be displaced, and slight movements of the uterus are independent of it. No mammary signs of pregnancy. Hæmoglobin, 55 per cent.; red corpuscles, 4,560,000; leucocytes, 13,600. The diagnosis gave rise to some speculation among those who examined the case, but as the semisolid, fixed mass, of recent formation, was outside the uterus, as there was constant recent brownish discharge, a rather soft cervix, and a history of recent pain attacks, extra-uterine pregnancy was considered not unlikely. The leucocyte count indicated inflammatory changes in the mass. On incising the abdominal wall, the parietal peritoneum, omentum, and underlying structures were inseparably matted. The incision was therefore extended upward, until in the umbilical region a point was found where the peritoneal cavity could be entered above the mass. A finger was passed around the side of the omental edge, when the fluid character of the walled-in collection was demonstrated by palpation.

Its upper wall was made up of intestine, the edges of the coils being adherent to one another by the peculiar hard, wooden, inflexible adhesions which betoken the existence of a false sac with inflammatory contents.

In front the collection was firmly walled in by omentum and bowel most solidly united to the abdominal wall and bladder. No sign of blood or blood-stain appeared free in the open upper peritoneal cavity, and all the surfaces were here smooth. The suspicions of incarcerated extra-uterine pregnancy were now confirmed.

An experience with a similar case several years before had demonstrated to conviction the extreme difficulty of safely separating omentum and bowel down to the contents of such a sac; the great rigidity of its walls and their inability to collapse when emptied; the ragged internal surface of the sac from adherent, partly organized clot; and the danger of late infection of the upper peritoneum after the sac had shrunk.

This experience occurred in a case admitted to the Methodist Hospital after various attempts had been made by dilating her cervix under ether to deliver her of a supposed full term pregnancy which she did not have. She had been treated by various physicians and was septic. I opened the abdomen above and found one of those incarcerated extra-uterine blood masses described above. I attempted to deal with it from above the pubis, but shall never repeat the effort. In the case now under discussion the abdominal wound was therefore provisionally closed with clamped sutures, without entering the sac, and the posterior prominent vaginal wall was incised. Some pints of decomposing, thin, brown blood with gray purulent streaks escaped, while large black clots of somewhat more recent formation were carefully dislodged. Gentle irrigation. No fresh bleeding. No evident large tubal mass remained. Vaginal drain of gauze and rubber tube. Returning now to the abdominal wound, the sutures were tied without drainage.

A culture made from the contents of the sac developed a pure growth of streptococcus.

The patient did splendidly from the first. The temperature never rose above 99.4° F., and the pulse showed little disturbance after the first day, when its highest rate was 128. The contrast in her condition would have been marked had I separated and stitched the bowel, and after great difficulty packed the cavity from above. As it was, the abdominal adhesion sac rapidly shrank; irrigation was cautiously continued every second day. After the first few days the discharge from the vaginal opening was slight, rather more opaque than mucus is, and never had any odor. The abdominal wound healed primarily. When discharged from the hospital, a small sinus about an inch in depth remained behind the cervix, but was rapidly closing. All that remained of the large abdominal mass was a little thickening behind the uterus, about as large as three fingers. The mobility of the uterus was still impaired. The patient was entirely without discomfort or symptoms, and her hæmoglobin had increased from 55 per cent. to 65 per cent.

While this is but a single case, it must be recalled that this form of incarcerated blood collection is not very frequently met. It is indeed remarkable how Nature proceeds to wall

in the blood, absorbing any which may have strayed, so that on opening the abdomen not a sign of blood or blood-stain appears until a very complete wall of intestine, omentum, and lymph is broken down. When the collection is not too great, it will be walled in entirely behind the uterus, as beautifully illustrated in a case operated upon at the Methodist Hospital. There the clot filled the pelvis as high as the fundus of the uterus, the edge of the adhesion wall being attached across the top of that organ, leaving the bladder free to dilate. The broad ligaments were stretched outward and then backward, exactly as though the tubes had been held out like arms. The fimbriated ends curved inward. Towards the diaphragm the colon was densely adherent, while in front of all the small intestine and omentum were attached. A strong sac had formed around the blood-clot, which was of the size of two fists. This sac could be peeled off the peritoneum at some points, but not all. Separation of adhesions was difficult, and some bowel stitching was required. As the emptied sac would not collapse and could not be entirely removed, a Mikulicz gauze-bag drain was packed into it and brought through the parietal wound. This case was not suitable for vaginal treatment, because the left tube was much distended by the pregnancy, apparently containing a mass which it would have been dangerous to leave.

This patient was thirty-three years old, had had seven children, and a miscarriage only five months before. She had had regular periods since the last, so called, two weeks before operation. The history of pain attacks and irregular bleeding lasted about four weeks. She is now in excellent condition, pulse 78, but will require careful draining for some time, owing to bowel-wall infiltration and ragged sac interior.[1] Another case of ruptured extra-uterine pregnancy I operated upon nine days ago, also at the Methodist Hospital. She may be mentioned here by way of contrast with the other cases. The diagnosis was easy and was made before operation. The patient was twenty-three years old, and had never before

[1] Patient made a complete recovery.

been pregnant. The blood-clot, about ten or twelve ounces, was free in the peritoneal cavity. It was readily removed, the adhesions separated; the left tube and ovary, shown in the specimen, tied off, and the abdomen closed without drainage. She also is doing finely, with a pulse about 76.[1]

Where suppuration is going on, as in the first case described, it is quite certain that the fœtus is dead, and that further hæmorrhage will not occur. In the early stages of ruptured extra-uterine pregnancy, of course, successive hæmorrhages are the rule, and for that reason the only good treatment includes thorough ligation of the affected area.

Vaginal incision and drainage I consider, therefore, only adapted to a very few cases, which have been thoroughly walled in, where there appears to be no undrained tube mass, and where previous abdominal exploration has demonstrated the strong incarceration of the clots. All other cases should be dealt with exclusively from above. The recognition of these suppurating incarcerated cases, and their distinction from tubal and ovarian abscess, or adherent retroversion with incarcerated intra-uterine pregnancy, will always present some difficulty. The leucocyte count will be high in the first two conditions and low in the last named. In the hæmorrhage cases, a low red-cell count and the physical appearance of anæmia suddenly established will be helpful.

It may be of interest to note that in the three recent cases referred to in this report, there was no instance of a missed period, all of the ruptures being probably in the early weeks. Not one of the patients had actual collapse. In two of the cases the walls of the tube had not ruptured, but the hæmorrhage had escaped from the fimbriated end of the distended tube.

DISCUSSION.

Dr. Deaver said that he regarded Dr. Shoemaker's discrimination between free blood and walled-off exudate as very logical indeed, and particularly so when he mentions in one of those cases that the culture showed streptococcus. If he had at-

[1] Patient made a complete recovery.

tempted to make that enucleation through the abdominal route, he would have disseminated sepsis; and if he had, he would have lost his case of peritonitis. He agreed with him in choosing the abdominal instead of the vaginal operation. When one opens the abdomen, one can say, "I am master of what I survey;" but in these cases of walled-off abscess, which they practically resolve themselves into, the surgeon is not master of all he surveys if he evacuates them through the abdominal route, notwithstanding he may be well reinforced with gauze. Infection can be transmitted through the gauze and communicated to a healthy peritoneum beyond. He gave the details of a case of pelvic hæmatocele in the true sense, one having no connection with an extra-uterine pregnancy. This girl was menstruating and dancing. Suddenly she was taken with abdominal pains. Dr. Ross diagnosed internal hæmorrhage. The abdomen was opened for the purpose of establishing the diagnosis, and there was found a hæmatoma occupying the interval between the two layers of the broad ligament. The abdomen was closed; the broad ligament space was opened through the vagina, drained, and the patient made an uneventful recovery. He had disposed of several cases of suppurating extra-uterine pregnancy in that wise. In this class of cases, where a doubt exists as to whether pus is present, in the absence of the usual constitutional evidence of pus, the blood count is of considerable avail; so that where there is a high grade of leucocytosis, and it is not possible to detect fluctuation by vagina or reach the mass by vaginal touch, it is indicated to open up the abdomen, locating the condition, and then deal with it from below.

Dr. Ross remarked with reference to the case which Dr. Deaver had referred to, where there was a true intraligamentary hæmatocele; this girl was twenty-one years old when the accident happened. At the age of twelve she had had an abdominal abscess, which the doctor diagnosed at the time as appendiceal abscess. As a result of the inflammation, she had very strongly adherent adnexas, which rendered the broad ligament very rigid. It was probably due to the rigidity of the broad ligament that the rupture of the vessel occurred. That was the explanation that seemed most rational to Dr. Deaver and himself in thinking the matter over. He added that there were no indications of pregnancy, either objective or subjective.

Dr. Shoemaker rejoined that it was not positive that the case mentioned by Dr. Deaver was not one of extra-uterine pregnancy. He did drainage only, and saw nothing to establish the diagnosis. The early rupture of the tube is very commonly downward, and therefore between the folds of the broad ligament, and the escape of blood into the peritoneal cavity is not uncommonly secondary.

AMPUTATION AT THE HIP-JOINT FOR SARCOMA; THE TENDENCY TO RECURRENCE.

Dr. John A. Wyeth read a paper with the above title, for which see page 110.