STATED MEETING, HELD DECEMBER 6, 1915

The President, Dr. John H. Gibbon, in the Chair

OSTEOCHONDRITIS DEFORMANS JUVENILIS, OR PERTHES'S DISEASE

Dr. James K. Young presented two cases of this disease, one of these, aged five years, was suffering from Perthes's disease of one hip, and the second one, aged five years, was suffering from Perthes's disease of both hip-joints.

The first boy came under observation, July, 1913, at the Polyclinic Hospital, complaining of lameness in the left hip. There is no history of injury and his mother knew of no cause for this condition. There is no history of tuberculosis in the family. The X-ray showed a typical atrophy of the epiphysis of the femur, with some roughening of the cavity of the acetabulum. There was no limitation of motion except in abduction; and the disease, after remaining stationary for a time, has gradually recovered, there being an increased deposit of lime salts. He wore an apparatus to relieve weight bearing, and he was given calcium phosphate in large doses.

The second boy came under observation at the Polyclinic Hospital, November 22, 1914, complaining of knock-knee on the right side. He walked with his toes turned in and his mother noticed this condition for nine months, there was at this time no limitation of motion and the X-ray showed Perthes's disease of the left side. Subsequently, the same condition developed on the other side, in five months. He was treated similarly to the first case and he has now good functional use of the thigh.

Perthes's disease is characterized by atrophy of the upper epiphyses of the femur, due to a subchondral area obstruction, which eventually becomes complete; there is no temperature; there is slight limp, prominence of the great trochanter, some atrophy of the muscles and limitation of abduction, with slight pain from time to time. The patient does not respond to the tests for tuberculosis. After remaining active for a year or more there is a tendency to recovery with slight functional changes.

The X-rays in the second case are characteristic, and show a flattening and broadening of the head, with a moderate degree of coxa vara. The etiology is obscure, but Legg believes in a traumatic

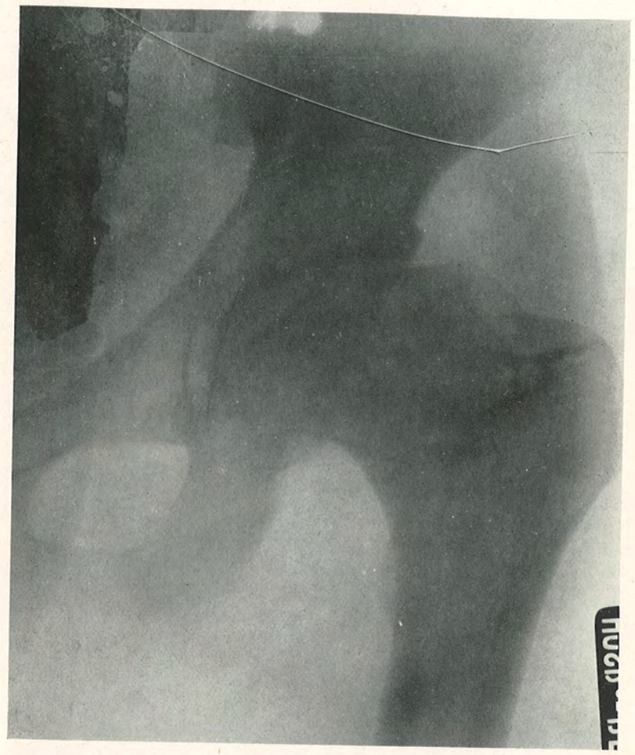

Fig. 1.—Coxa vara (flat head) in a patient aged eighteen years, following arthritis at five years of age.

etiology, with "blocking of the blood supply to the epiphysis, due to trauma of the epiphysial line."

DR. GWILYM G. DAVIS said that it is easy enough to diagnose in various affections the well-advanced typical cases, but the trouble comes in atypical ones, such as when we see a child running around with perhaps just a slight or no pain and perhaps a rather marked limp who does not progress apparently beyond that stage. It is possible to conceive of there being a number of possible conditions; for instance, the symptoms may be the result of a rhachitic state, such as bone softening. In arthritis deformans we find in some cases very similar conditions. It is perfectly well known also that in the adult it is not uncommon to find cases of atrophy, especially of the neck of the femur, from injury. Without doubt, following an injury there sometimes follows disturbance of nutrition in the head and in the neck of the femur, which gives rise to local changes. One might call this an osteitis or osteochondritis, but it is hard to determine the exact pathology of the affection. In some of the reported cases changes have been observed in other joints. That would argue a rhachitic condition or one of more or less general disturbance.

Examination from a pathological stand-point shows the absence of any specific taint, the Wassermann and von Pirquet tests being negative. An X-ray plate may be made and if the disease has progressed far enough certain changes may be evident in the head of the bone. To tell, however, the exact character of these cases is very difficult because of the changes being so slight. That which is to be especially guarded against is that we do not mistake an early case of tuberculosis for this condition and permit too great activity. Many of these cases are found to have been preceded by traumatism. One marked case of his appeared almost like a separation of the epiphyses of the head of the femur. The boy presented an appearance of retarted development, almost infantilism. The question arose whether or not he had a more or less general bone softening, with lack of development, in which the local conditions were caused by an accident. If an accident is the sole cause in such a condition in a healthy individual, spontaneous recovery ought to occur; but, if the accident is only an incident in a constitutional disturbance, the case requires entirely different handling, and the proper management of these cases is by no means established, nor have we decided upon any distinct line of treatment to pursue. It would be wise to protect the joint as much as possible and then endeavor to improve the general condition.

DR. ASTLEY P. C. ASHHURST presented an X-ray picture (Fig. 1) of

a patient, now eighteen years of age, showing a flat head of the femur. This young man says that when five years old he had a multiple arthritis, which laid him up for about a year. When he got about he was lame in the right hip, and has been lame ever since, but has never been laid up. There is shortening of 1.5 cm., and the thigh is 5 cm. less in circumference than the left. Flexion of the hip is slightly limited, internal rotation is lost, and there is almost complete loss of abduction. The question is, is every case of flat-headed femur an example of so-called Perthes's disease?

Dr. Davis has reminded us that Perthes was not the first to describe the condition. One of the studies of this affection which caught his own attention first was by Calvé, in the *Revue de Chirurgie* for 1910; he called it a "particular form of pseudocoxalgia." A case of coxa vara at the Episcopal Hospital in 1913 was thought to be an example of this affection (Klauder: *Medical and Surgical Reports of the Episcopal Hospital,* 1914, ii, 269).

It must be remembered that for very many years all forms of hip disease were undifferentiated. Then the tuberculous nature of many of them became recognized, and for a time many surgeons considered all cases of hip disease tuberculous. It is only within a comparatively few years that it has been possible to disprove the tuberculous nature of some cases, and among these non-tuberculous cases of hip disease we must place instances of Calvé's or Perthes's disease; but of their true pathogenesis we are still in doubt.

Dr. Young, in closing, said that there has been too much confusion in regard to the nomenclature of diseases of the hip. The term hip disease should be used exclusively for tuberculosis of the hip-joint and then there would be less confusion. The term osteochondritis deformans infantilis is a good one, but the term Perthes's disease has been commonly used by orthopædic surgeons, and as his description was the first systematic and complete one, it is not improper to designate this condition as Perthes's disease.

UNUNITED FRACTURE OF THE LUMBAR VERTEBRÆ

Dr. James K. Young presented a man, aged thirty years, who sustained an injury to his lumbar region by falling from a height and striking his spine upon a track of the railroad, ten years ago, and in whom a diagnosis had only been reached one year ago. There was great difficulty in getting satisfactory X-rays on account of the large size of the patient. The symptoms during this interval resembled, somewhat, the so-called "railway spine," such as usually accompanies

ligamentous injuries. The more recent improvement in the Röntgen technic enabled Dr. Pancoast, of the University of Pennsylvania, to take a picture which shows a fracture on the right side of the transverse processes of the third and fourth lumbar vertebræ, both of which are ununited. It is possible by surgical means to remove both of these, but the condition has so greatly improved, the patient is advised not to submit at the present time to operation.

RECURRENT DISLOCATION OF THE SHOULDER-JOINT

Dr. James K. Young presented a man who had been operated upon by a new method for recurrent dislocation of the shoulder-joint. The patient was an athletic mulatto, aged twenty years. The shoulder was injured by an overhand throw while playing base-ball, at a western university, in Kansas. The dislocation was subcoracoid, and recurred frequently during the day, interfering with his occupation, which was that of a dentist's helper. The operation which was performed was suggested by Dr. Oscar H. Allis, and consists in dividing the lower half of the insertion of the tendons of the pectoralis major and the latissimus dorsi, and keeping the shoulder in an elevated position until union has occurred. The incision is made between the deltoid and the pectoralis major in front, the cephalic vein is displaced outward, and the attachment of the pectoralis major tendon is found and divided in its lower half. In thin subjects the tendon of the latissimus dorsi can be hooked up from the same incision, but in muscular subjects a second incision must be made along the posterior border of the axilla, until the tendon of the latissimus dorsi is found and its lower half divided. The shoulder is kept elevated for ten days. The patient has had no recurrence of the dislocation since the operation. He also has full strength in the muscles about the shoulder-joint.

This operation appears to be suitable in forward upward dislocations of the shoulder-joint; division of the lower half only of the tendon changes the direction of the action of these two powerful muscles, but does not apparently weaken the action of the muscles about the joint. It will be noticed that the capsule was not sutured, and that the joint was not opened, which obviates one possible source of infection.

RUPTURE OF THE SIGMOID BY INFLATION THROUGH THE RECTUM

Dr. A. D. Whiting reported the following case:

J. W., Pole, male, aged twenty-five, was admitted to the Germantown Hospital, November 11, 1915, at 2.30 P.M. While at

work, at 1.20 P.M., in a steel mill, in a stooping position, some of his fellow workmen, in a spirit of fun, placed the nozzle of a compressed air pipe within a few inches of his buttock and directed the compressed air, under eighty pounds pressure, through a three-eighths-inch nozzle toward the anus. The patient staggered and then leaned against a wall, but did not fall. With the assistance of a fellow workman, he walked to the Infirmary of the works, where the attending surgeon found the abdomen markedly distended and very tense. A rectal tube was passed, but no gas escaped through it. A small amount of blood was recovered. He was then sent to the hospital.

When first seen by Dr. Whiting, at about 3.15 P.M., his temperature was 97°, pulse 66, respirations 24. Breathing was difficult. The abdomen was distended and tense, and very tympanitic, with marked rigidity throughout but more pronounced in the upper right quadrant. Owing to the inability of the patient to understand English, a history could not be obtained until an interpreter was summoned. Then the patient denied the inflation of the colon, but stated that he had been seized with sudden upper abdominal pain. A diagnosis of rupture of the stomach or intestine was made and immediate operation advised. Before consent to operation could be obtained, the true history was given by the patient to a priest.

Operation (at 6.15 P.M.).—During the interval of five hours between the accident and operation, the patient became very much worse, the respirations were more difficult and the pulse much weaker and more rapid. Incision was made through the lower right rectus. As the peritoneum was opened, there was a gush of air, with blood and fecal matter, followed by immediate improvement in respiratory and heart action, which, however, did not last long. Inspection revealed an opening in the sigmoid, about 3.5 cm. in length, opposite the attachment of the mesosigmoid. This was closed with through-and-through catgut sutures. Further search showed that there had been a tearing of the serous coat of the sigmoid for about 15 cm. The descending colon and rectum were intact. Owing to the poor condition of the patient, it was deemed inadvisable to do a resection. A rapid closure of the rent in the peritoneum was performed, the abdominal cavity was flushed with hot saline, saline solution was administered intravenously, and the wound was closed without drainage. The patient reacted fairly well from the operation, but the improvement was not prolonged; his temperature rose, without remission, to 109°, just before his death, 28 hours after operation.

A post-mortem examination showed complete closure of all the tears of the bowels and the absence of peritonitis. A study

of the ruptured bowel shows absence of the usual rugations and irregularities of the mucosa, it being perfectly smooth from the stretching. The mucosa shows two tears, one perforating through the peritoneum, and numerous small ones longitudinal in direction. There are one longitudinal and two transverse tears of the peritoneum. There is evidence of hemorrhage between the bowel coats, and a few areas of punctate hemorrhage.

E. Wyllys Andrews (*Surg., Gyn. and Obs.*, xii, 1911, p. 63) has reported a similar case of his own and the histories of 15 others obtained through correspondence and law reports. In 13 of them the inflation of the bowel was the result of practical jokes; in three no mention is made of this feature of the accident.

In all of Andrews's collected cases, as in the present one, the nozzle of the apparatus was not introduced into the rectum, but simply directed toward the anus, the sides of the funnel formed by the buttocks directing the air into the bowel.

In all of the reported cases the intestinal injury was confined to the colon, and usually to the sigmoid, because, as suggested by Andrews, it "traps the air momentarily by its somewhat bent or kinked junction to the descending colon. It thus sustains the first shock of the pressure and, unable to pass the mass of air onward, it yields to the pressure, dilates, and bursts into the free peritoneal cavity."

The mortality of the condition is 100 per cent. without operation. Immediate cœliotomy with resection or repair of the bowel should reduce the mortality about 75 per cent. In Andrews's collected cases, seven were operated upon with a mortality of 57.2 per cent.

LUMBAR HERNIA*

By Edward H. Goodman, M.D.
and
John Speese, M.D.
of Philadelphia

Hernia in the lumbar region is one of the rare varieties and may occur as a congenital affection, as a spontaneous or acquired form, or as the result of severe local injuries or diminished local resistance following infectious processes. In reporting an instance of spontaneous or acquired hernia, we have thought it desirable to review the literature on the subject, as there is considerable uncertainty as to what constitutes a true lumbar hernia. We have studied, therefore, the instances of congenital and acquired hernia and have excluded from our statistics those hernias following direct traumatism of any type, and those the result of local inflammatory processes, both of which have been instrumental in causing a fairly large number of the cases on record. We have found reports of 33 cases of acquired lumbar hernia, 11 of congenital lumbar hernia, and about 40 cases following local injury and disease.

The entire subject of lumbar hernia is attended with much interest from the historical stand-point. We have consulted Jeannel's article freely for the descriptions of the cases reported by the first writers on this subject.

In Pierre Franco's *Traité des Hernies*, published in 1561, nothing is said of hernia other than inguinal, and it is not until a century later (1672 or 1687) that we find what seems to be the first description of lumbar hernia. Paul Barbette at this time states that, "Experience has taught me that the peritoneum may rupture in its posterior aspect toward the back, thus forming a hernia." Stephen Blancard, in 1701, states only, "Peritoneum prope spinam dorsi ruptum dat herniam"; a laconism which suggests the possibility of a lumbar hernia but does not permit of the supposition that the author had seen a case.

Dolée (1703) knew of lumbar hernia, but he, like his predecessors, took no pains to study its anatomy or its mechanism, although later writers without quoting Dolée correctly have interpreted him as describing lumbar hernia. Jeannel emphatically states that there occurs no passage in Dolée's writings to warrant this, and he reproduces verbatim the Latin text, which is without any special interest. Budgeon, in 1728,

* Read before the Philadelphia Academy of Surgery, December 6, 1915.

described a case of congenital hernia, but it is apparent that he had no idea of the true nature of the condition.

The first trustworthy observation on record is that of Garangeot (1731), who mentions a case of strangulated hernia, reducible after death, perhaps at the expense of a ruptured intestine. Although Garangeot made no autopsy, there can be little doubt about the true nature of the case. The report made by Garangeot failed to stimulate the interest of his contemporaries, for Arnaud (1749), although knowing that hernias may present themselves in the back, forbears to say more, as such hernias, "far from instructing those for whom I write, may prevent one from comprehending ordinary hernias." "*Étrange prétexte ou plutôt mauvaise excuse de l'ignorance de l'auteur,*" is the comment of Jeannel.

Ravaton, in 1750, published the first case of strangulated lumbar hernia which was cured by operation, but details are lacking as to the exact location of the tumor. A decade later Hermann (1767) described a case of strangulated hernia which was cured spontaneously by the formation of an artificial anus. In 1768, Balin writes, "Lumbar hernia may arise unexpectedly between the false ribs and the crest of the ilium, at the point where the external oblique is attached only by a cellular tissue." Although this is brief, terribly laconic, according to Jeannel, the latter claims that Petit, to whom is given the credit for describing the triangle which bears his name, has written no more fully. Jeannel discredits Petit (1774), and claims that in his article he has not described the triangle in question, has not furnished us with any anatomical data concerning his case, and Jeannel confesses he is at a loss to know why this region is called "Petit's triangle" any more than by the name of Dolée, Garangeot, Ravaton or Balin, who wrote as fully about it as did Petit. This view, it may be mentioned, is shared by Larrey also.

Since Petit's time no one until the advent of Grynfeltt attempted any serious study on the subject, and the term lumbar hernia was used so loosely that ventral hernias were continually being confused with the lumbar variety (Plenck, Chopart and Desault, Callison).

Grynfeltt (1866) was the first to give the subject deep thought, and described the space which bears his name. "The aponeurotic fibres of the transversalis in dividing form a passage for the lower intercostal artery, just as the spermatic cord enters the two pillars of the external ring. There is at this site a natural point of lessened resistance. If the lower border of the internal oblique inclines more anteriorly than normally, the last intercostal artery perforates the aponeurosis of the transversalis above the border. In other words, if the point of re-

sistance of this artery is in the lumbo-costo-abdominal triangle all the conditions favoring a hernia are realized." The space of Grynfeltt is bounded above by the twelfth rib, internally by the quadratus lumborum, externally by the external oblique and below by the internal oblique muscle.

Four years later Lesshaft (1870), without mentioning Grynfeltt's work, came to the same conclusions and the space is known in Germany as Lesshaft's triangle, but its proper name should be the Grynfeltt-Lesshaft space. Lesshaft studied 108 adult cadavers, and found Petit's triangle present in 84. In 34 cadavers of embryos or new-born the structure was present 9 times. In other words, the triangle is generally present in adults and only occasionally in embryos or the new-born. When the triangle was not present it was noted that the edge of the latissimus dorsi muscle was in direct apposition with or overlapped the margin of the external oblique. The importance of the triangle was emphasized by these studies, as it is more constantly present and is larger than the inferior triangle of Petit.

V. Baracz and Bursynski have in turn made anatomical studies with the following results: After the first layer of the back muscles is turned aside (latissimus dorsi) one sees the second layer, consisting of the posterior inferior serratus muscle and the internal oblique. Between these two may be seen the third layer, the aponeurotic portion of the transversalis. This muscle with the lower border of the serratus posticus inferior, together with the inner edge of the twelfth rib above, the erector spinalis, the internal oblique and the external oblique laterally, and the base composed of the transversalis, make up the triangle lumbo-costo-abdominal of Grynfeltt and Lesshaft.

The authors have made numerous dissections, having reference to Petit's triangle and to the triangle of Grynfeltt, and of 76 examinations, Petit's triangle was missing 12 times on both sides and 4 times on one side only. It existed, then, in 63.13 per cent. of the cases. The size of the triangle varies a great deal, often merely a slit and again having a base 5 or 6 cm. wide. The base may be muscle alone (internal oblique) or muscle and tendon where the internal oblique extends to the lateral base of the erector spinalis. To pierce this layer great force was necessary, and as there are no openings for the vessels or nerves, the authors consider it improbable that a hernia can rise through Petit's triangle.

The Grynfeltt-Lesshaft triangle was present in 93.5 per cent. of the dissections, and the authors regard it as an almost constantly occurring weakness in the lumbar region. The space is not always that of a triangle or rhombus, it may be deltoid, trapezoid or polyhedral. The

shape and size of the triangle depend on several factors: the length of the twelfth rib, whether the internal oblique with its muscle bundles reaches to the lateral border of the erector spinæ, or is in varying distance therefrom forming a tendinous aponeurosis; upon the development of the serratus posticus inferior; upon whether the fibres of the median border of the external oblique insert on the tip of the twelfth rib or above or below the rib; upon the existence of a tendinous arc in the aponeurosis of the transversalis muscle; furthermore, upon whether the median portion of the latissimus dorsi inserts in the eleventh or twelfth ribs or whether it unites with the posterior fibres of the external oblique, and finally the size and shape depend on the development of the quadratus lumborum.

The most common form is an acute angled quadrilateral, or a triangle. The thickness of the aponeurosis varies in this space but at the uppermost limit the thinnest portion of the lumbar region is seen. In this thin area vessels and nerves are found, usually the twelfth intercostal, and it is in this region that hernias most often occur.

Etiology.—In the etiology of the cases quoted in this paper, indirect traumatism alone is accepted as a cause, and all the cases are excluded in which the hernia followed direct injury, or was secondary to infectious processes, sinus formation, or visceral protrusions due to muscle paralysis. By indirect traumatism is meant conditions demanding habitual or sudden strain, lifting of heavy weights, coughing, and the strain following falls. In 14 of 33 cases, such a history is mentioned, the hernia appearing soon after the injury was sustained. Whether there has been a congenital predisposition in these cases is a matter of debate; there is little evidence to support such a view. It must be mentioned, however, that emaciation, old age, repeated pregnancies, by lowering muscle tone, predispose to the development of lumbar hernia. In those cases in which the age is given we find but 5 instances occurring before the fortieth year of life, 4 in each of the three succeeding decades, and in quite a large number of cases, the histories state that the hernia occurred in an elderly person.

There is a marked predisposition toward the development of hernia on the left side, 19 cases being noted here, 10 on the right side and 2 were bilateral. The hernias occurred 22 times in males and 9 times in females.

The hernia is generally subcutaneous but may be separated from the skin by a layer of fat or muscle. There is considerable doubt concerning the formation of a sac, for it has been distinctly noted at operation and at postmortem that a sac composed of peritoneum often is lacking. This

seems to be particularly the case in the hernias composed of fat protruding from the subperitoneal or perinephritic tissues.

The hernia is composed of fat, mesentery, large or small intestine or, in rare instances, the kidney, and as a rule the hernia is reducible without difficulty, even when symptoms of strangulation have developed. As to the site of the orifice it is impossible to determine this with accuracy in most cases unless an operation has been performed. Jeannel claims that hernias due to effort or to trophic changes in the muscles present themselves in Petit's triangle or in the Grynfeltt-Lesshaft space, while traumatic hernias and those due to disease may occur anywhere. In many cases the site of the hernia is distinctly stated, and where accurately described we have found that 6 cases occurred in the Grynfeltt-Lesshaft space and 9 in Petit's triangle. When all the cases are grouped together one triangle is involved about as frequently as the other.

The symptoms depend largely on the cause of the hernia. In our case the onset was insidious, the hernia entirely escaped the patient's notice until it was pointed out to him twenty years after the first symptom following strain. During these years he was convinced that the only inconvenience he experienced was a feeling of weariness in his back after a day of hard work. In this case as in a typical example of any type of hernia, the signs characteristic of a hernia were so well marked that there could be no question of the correct diagnosis. It should be mentioned, however, that errors in diagnosis have been made, and hernias have been incised in the belief that the condition was an abscess. In one instance the bowel was opened and a fecal fistula resulted.

Most authors speak of the serious nature of lumbar hernia because of the tendency toward strangulation. Jeannel in his analysis found strangulation in 18 per cent. of the cases; this collection including hernias due to all causes. In the 33 cases of spontaneous hernia we have collected, symptoms of intestinal obstruction or strangulation, either mild or severe, were mentioned 8 times, or 24 per cent. In many, the symptoms were mild and disappeared when the hernia was reduced. Reduction was accomplished easily, even when the symptoms indicated a severe form of strangulation, a feature probably due to the absence of a sac, removing the danger of constriction exerted at its neck.

Operative measures have been uniformly successful in the treatment of lumbar hernia, although the number of operations reported is comparatively small. Despite the fact that symptoms of strangulation are so frequently encountered, but one operative death is recorded. In

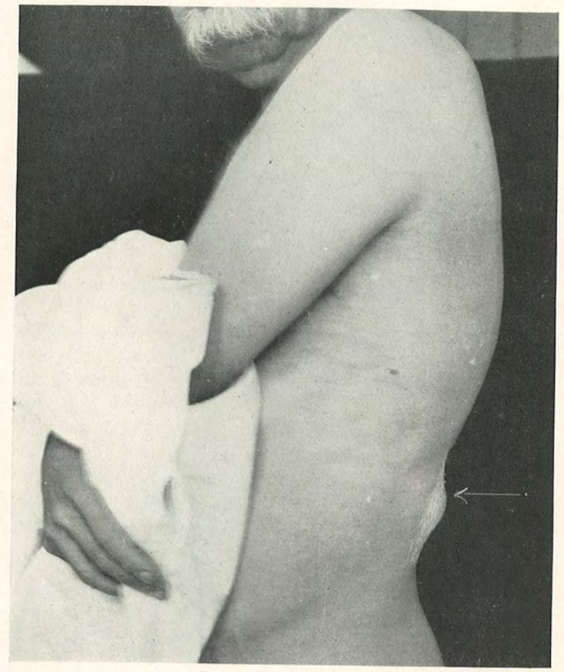

FIG. 1.—Lumbar hernia.

many instances comfort is secured by the use of a truss or belt and the hernia is thus retained within the abdominal cavity with a considerable degree of comfort. As so many of the patients are advanced in years, and in a debilitated condition, operation should be advocated with some degree of caution. Of course a radical cure should be undertaken when symptoms of strangulation arise, or when the general condition of the patient becomes a matter of concern from the pain and inconvenience of the hernia.

Patient, John C., aged fifty-eight, was admitted to the medical wards of the Presbyterian Hospital, service of Dr. James E. Talley, October, 1915, on account of nephritis. On examination of the patient, a swelling in the left lumbar region was noted. The patient said that until our discovery of this tumor he had been unaware of its existence. Just how long it had been present it is impossible to state, but the following history obtained from the patient leads us to suppose that it must have existed for many years.

The patient is a stone mason by occupation and is accustomed to very hard work. About eighteen or twenty years ago, while attempting to lift an unusually heavy piece of stone, he was seized with a sharp pain in the left side of his back, which persisted for about a week and which prevented him from working. He does not know if any swelling appeared at that time, and, as we have stated, has been unaware of any tumor existing in his side, until this autumn. This pain he was told was due to a strain, and since then he has often had attacks of "weak back," particularly when his work was unusually heavy. At times when he has attempted to lift a weight he has felt something tighten in his back, as if something were pinching him, but this sensation would pass off on assuming the upright position, and after resting a few minutes. He has never had any signs of strangulation, nor has there been any permanent interference with his work on account of his back.

Examination reveals the presence of a tumor in the left lumbar region just under the last rib. The tumor is about 3 cm. in diameter, is rounded and painless. On palpation the swelling is soft and may be easily reduced with gurgling, gives an impulse on coughing which makes the swelling more prominent as does any straining effort. On percussion the tumor is resonant and asculta-tion reveals peristaltic sounds. When the patient bends forward, the tumor becomes more prominent; when he lies on his abdomen, the tumor disappears spontaneously, and there may be felt a small opening in the dorsal muscles admitting the tip of the middle finger, against which is felt an impulse when the patient coughs. These

findings at once led to the certain diagnosis of lumbar hernia, presumably in the Grynfeltt-Lesshaft space, not in Petit's triangle.

We were interested in learning just what part of the intestine formed the hernia, and as far as we are able to decide by means of the X-ray, it is the small intestine which protrudes. Although recognizing that strangulation occurs in a larger proportion of cases than in inguinal hernia we advised against operation on account of the patient's age, the renal condition (nephritis) and on account of the benignity of the hernia, no symptoms developing during the eighteen or twenty years of its existence.

The accompanying photograph shows fairly well the site and the appearance of the hernia.

CONGENITAL LUMBAR HERNIA

Etiology.—The etiology of this form of hernia is unknown, unless it be due to congenital malformation.

For our knowledge of the anatomy we are dependent on the cases of Jeannel and of Coley, and it would seem that the sac is composed sometimes of parietal peritoneum itself, sometimes by the parietal peritoneum and large intestine, the descending colon when on the left side, the ascending colon when on the right. The sac is never adherent to the skin as far as is known.

The contents of the hernial sac may consist of any of the following—large bowel, small intestine, kidney. The site of the hernia may be either in the so-called triangle of Petit or in the space described by Grynfeltt, or in an anatomic region imperfectly described, along the external oblique at the level of the twelfth rib. As to the pathogenicity of this hernia, it may be said that the rupture falls in two categories, the one in which there has been a malformation, and the other not due to a malformation, but more in the nature of a paretic state of the muscles of the lumbar region.

From the diagnostic stand-point the recognition of a hernia should be easy, though there is a case on record in which the intestine was cut, under the impression that the swelling was an abscess (Dolbeau). It would seem that such a mistake should be impossible, as with a little care the diagnosis should be easily made.

Congenital lumbar hernia is an incurable infirmity. The course of the trouble is uncertain; there may be increasing discomfort or there may be progressive improvement with a support. There has been no record of strangulation having occurred, but one should always have before him the possibility of this accident.

Congenital lumbar hernia as well as the spontaneous type is never

cured by means of a bandage or truss, and it would seem that operative measures are to be urged.

CASES OF CONGENITAL LUMBAR HERNIA

Case I.—Budgeon, 1728. Much contested and much discussed case. Tumor at birth, ruptured at seventeen years of age. Thought by some to have been lumbar hernia, by others, spina bifida, and by Jeannel to have been hydronephrosis.

Case II.—Plenck, 1774. Hernia of kidney and not of bowel.

Case III.—Monro, 1811. Hernia of kidney.

Case IV.—Colles, 1829. Three years old. Tumor observed at time of birth. Tumor now size of a moderate-sized watch, at birth much smaller. Situated posteriorly immediately above skin of ilium, left side. Easily reducible.

Case V.—Macready: "In 1882, a youth, aged sixteen, presented himself at the Truss Society, and has often been seen since then up to the present time (1890). Soon after birth a swelling was observed on the right side, for which a belt was worn during six months. The lump then disappeared, but was again noticed when he began his apprenticeship as a plate worker, some months before his appearance at the Society. He then had a hernia of the size of half an orange; it was easily reducible, and escaped by an opening immediately below and anterior to the tip of the twelfth rib."

Case VI.—Mastin, 1890. Male. When six years of age, hernia measured eight and a half by nine inches, contents of sac were small bowel and descending colon. Apparent defect of latissimus dorsi and quadratus.

Case VII.—Wyss, 1892. Boy, nine months old. Many other congenital defects. Right sided hernia through Grynfeltt's triangle.

Cases VIII and IX.—Berger, 1895. Simply says he has seen two cases, one in a sclerotic, the other in a little child, probably due to congenital defect of the muscles in the lumbar region.

Case X.—Coley, 1895. Eleven months old child, with a hernia protrusion about the size of a goose egg in the left lumbar region. Noticed since birth and was probably due to a congenital malformation of the abdominal parietes, allowing this mass to protrude through the triangular space between the latissimus dorsi.

Case XI.—Russell, 1898. Child. Doubt whether congenital or due to congenital absence of a portion of abdominal wall. Hernia is visible except when muscles were stretched. Was inclined to treat by transplant of muscle.

Case XII.—Jeannel, 1902. Boy, four months old. Shortly after birth, tumor in right flank, size of hen's egg, situated between last rib and iliac crest. Tympanitic on percussion, reducible, increased by exertion, decreased by rest. Operation. Cure.

ABSTRACT OF CASES OF SPONTANEOUS LUMBAR HERNIA

1. Ravaton: Female, age not given, tumor of three weeks' duration, situated in the left lumbar region. Symptoms of strangulation developed. Operation. Cure.

2. Petit: Patient was an adult female, hernia on left side in Petit's triangle, size of a child's head. Strangulation relieved by taxis. Recovery.

3. Monro: Bilateral hernia in a child six months old, covered by skin only, immediately under the false rib. Each tumor contained kidney, easily reduced through an oval ring of a considerable size.

4. CLOQUET: Male, aged seventy-five, pain in lumbar region following strain; pain disappeared; recurred in two months with an attack of nausea and vomiting. Round tumor found in right lumbar region, 1 cm. from last rib. Tumor painful on palpation, gurgling, impulse on coughing. Symptoms relieved after reduction. Application of a truss gave considerable relief.

5. KINGDON: Male, aged fifty-four, for several years had asthma and cough. Eight days before he tried to lift a fire engine which he was cleaning and felt something give way in his back. At night when he undressed a swelling was felt which grew larger as he coughed. The hernia was the size of a fist and was situated between the lower ribs and the iliac crest on the left side. It was reducible, and the hole through which it came was small and above the iliac crest, about three inches from the spine at Petit's triangle. It felt crepitant, not gurgling, on reduction. The integuments over it were thin. On exhibiting the patient it was generally and unhesitatingly admitted that the swelling was a hernia through the foramen of Petit. (Quoted by Macready.)

6. BASSET: Young man with a swelling in the left lumbar region, size of an apple and ovoid in shape; had had this tumor since childhood. It was soft, elastic without fluctuation and resembled a lipoma. Coughing increased the size, gave impulse, expansible in character, reducible. There was a family predisposition to hernia in this case.

7. HARDY: Woman, thirty years old, admitted to the hospital for syphilitic paraplegia. While straining at stool noticed a tumor eight centimetres in diameter, just above the iliac bone, subcutaneous, large base, hemispherical, about the size of a fist, soft, no change in color of skin, no fluctuation, resonant on percussion. Reducible with gurgling, reappears on coughing and on effort, impulse. Patient perfectly well.

8. MARQUEZ: Old woman; while attempting to lift a heavy load of grass, felt a sudden pain in the side, becoming more and more painful and being accompanied by nausea, colic and extreme anxiety. Swelling in left flank, tender, gurgling, and spontaneously reduced. This hernia had been present five or six years.

9. TRIPONEL: In the discussion of Marquez's paper, Triponel said he was reminded of a strangulated right-sided lumbar hernia; operation. A year later another strangulation and a new reduction. Patient advised to wear a truss and to avoid violent muscular effort.

10. LEVY: Old country woman, swelling in left flank at side of Petit's triangle. Never had any serious inconvenience. Patient thought the tumor gave her lumbago on that side.

11. TURENNE: Case of elderly male with tumor in left flank of three years' standing, and arising without any apparent cause. It was the size of a nut, uneven, and rounded, and seemed to consist of a portion of the omentum. It was reduced easily, was kept in place by means of a bandage. It had never caused any inconvenience.

12. DOLBEAU: Old woman, no mention of the side. Opened for abscess. Recovery.

13. APPERSON: Female, aged sixty-three, tumor on right side, size of a teacup, now and then presented signs of strangulation but was easily reduced and retained by bandage and compress. Woman feeble and relaxed as the result of child-bearing.

14. COZE: Male, no ascribable cause. Hernia right side, toward the top of Petit's triangle, size of a hen's egg; soft, reducible. Few months later patient, a soldier, being no longer able to keep up his occupation, was brought to hospital. At this time a large hemispherical tumor 12 to 14 cm. in diameter was noted, soft, no skin changes, readily reducible with gurgling, contents probably ascending colon.

15. COZE: Soldier, right side, toward top of Petit's triangle, 6 by 4 cm. in extent; reducible small tumor; gurgling. Previously operated on for this swelling, scar of operation on skin. The following month tumor had enlarged, was reducible, impulse, no gurgling.

16. GOSSELIN: Male, aged fifty-five. When fifteen years old had lateral curvature of spine, to the right. Since five or six months some pain in left renal region, colicky in character. When he coughs or exerts himself, side pains him, obliged to stop and press it with his hand. In the left lumbar region a hernia, the size of a mandarin; reducible.

17. MACREADY: A man aged fifty-four came to the Truss Society in 1884 with a swelling over the left triangle of Petit, about the size of a walnut. It increased somewhat on coughing, but was not reducible, and therefore, as this aperture could not be examined, some doubt exists whether the tumor was a hernia or a lipoma. He had also a left inguinal hernia.

18. MACREADY: A man aged thirty came to the Truss Society in 1889, who stated that usually after a hard day's work he had pain in the right side in the position of Petit's triangle. An impulse and a bulge on cough were found there, but no complete protrusion.

19. HUTCHINSON described an autopsy on an elderly emaciated man with a hernia the size of a fist, in the left lumbar region, extending from the last rib to crest of ilium; several years in duration; diminished on pressure, resonant on percussion, impulse on coughing, gurgling; no pain, no inconvenience. Thought it was in Petit's triangle, but on dissection found an opening above and to the inner side of Petit's triangle, was outside of the quadratus lumborum, through the transversalis and the latissimus dorsi. No sac of peritoneum found, but one formed from local hypertrophy of subperitoneal fat.

20. HUME: Male, aged sixty-eight, tumor in the left lumbar region for fifteen years, size of a fist, but became larger at intervals, when it was painful and symptoms of intestinal obstruction developed. When admitted for treatment, symptoms of strangulation had been present for two days, operation disclosed gangrenous small intestine caused by pressure of two fibrous bands, and a twisted sigmoid. Hernia did not seem to be in Petit's triangle. Death in twenty-four hours.

21. RUPPANER: Male, aged forty-eight, history of strain and fall followed by pain in left lumbar region. Operation eleven days after injury disclosed a rent in lumbocostal fascia, 1 cm. in length, through which protruded a nodule of fat, size of a cherry. No sac present, tumor reduced, rent and muscles sutured. Hernia was in trigonum lumbale superior.

22. STARR: Male, age not given; eighteen years ago fell while carrying a sack of grain on shoulder, and hurt his side. He thinks lump did not appear at that time. Twelve months ago while stooping down preparing to lift a weight he was seized with pain in the side, which for a few minutes prevented him from assuming the erect position. After the severe pain had ceased, he noticed a lump in his back which has persisted ever since, always a steady pain in the side,

which sometimes becomes sharp and shoots into the backbone. The swelling is about the size of a duck's egg, its long axis being directed from above, downward and outward, and is situated in the right lumbar region, between the lower border of the ribs and the crest of the ilium. Slightly tender on pressure, elastic, reducible; crackling sensation on reduction, on straining tumor gives tympanitic note.

23. GALLOWAY: Male, after being in the army for four years, developed hernia which was the size of a partridge's egg, and has gradually grown to present dimensions, five inches in length by two inches in width, left side.

24. DUMESNIL AND BRUMON: Male, sixty-one years old, complained of shortness of breath and sometimes dyspnœa. During the examination, patient strained and immediately there appeared a tumor in left lumbar region. He says he noticed this fourteen years before. At this time it was about the size of a walnut and painless. In 1891, it was the size of a mandarin orange, but had not increased in size since then. When the patient rested, no tumor, but on exertion it became quite large. It is painless, gurgling and reducible. Never prevented patient from pursuing his occupation as collier. Since 1885 a bandage has sufficed to hold the tumor in position.

25. ZENTNER: Female, aged six years; following whooping cough, developed a walnut-sized tumor in the left lumbar region, also history of violent strain in falling, followed by pain the same day and tumor a few days later. Bandage applied but tumor enlarged in spite of constant pressure. Now tumor is size of hen's egg, is soft, tympanitic and is reduced easily, no gurgle. Situated in Lesshaft's triangle. Operation disclosed sac of peritoneum projecting through transversalis, omentum in sac, sac and muscle sutured. Cured.

26. DEMOULIN: Male, forty-seven years old, mason, who, as a result of a violent effort six months before, felt a severe pain in the lumbar region, followed by an egg-sized tumor. No serious accident has resulted from tumor. Diagnosed lipoma, not completely reducible. This was a hernia developing from the fat capsule of the kidney.

27. JONES: Male, aged forty-five; tumor present for four or five years, lately producing local pain and tenderness, constipation and dyspnœa. Hernia on right side, extended from the ribs to iliac crest; reducible with gurgle; impulse on coughing. Operation. Fat found in hernia; no sac, cure.

28. BARACZ: Male, aged thirteen. Tumor left-sided, below twelfth rib, size of a billiard ball, also small one in left flank. Straining causes prominence, tympany over hernia, reducible, in Grynfeltt's triangle.

29. GAILLAC: Soldier jumped from height; immediately felt severe pain in the lumbar region and swelling—egg-sized tumor, soft, painful, reducible.

30. LEJARS: A man sixty-five years old developed symptoms of strangulation in left lumbar region; large tumor, painful, reducible. Patient stated that he had had it twenty-five years and during this time it was the size of a walnut. In the first three weeks it had been growing in size, painful and colicky. During the last six days obstinate constipation; for past three days not even gas came from the rectum; extreme nausea, distention of abdomen, and pain, particularly in the left flank. Tumor is spherical, little flattened, 7 cm. in diameter, about 3 cm. long, extending to iliac crest, skin reddened. Operation; no peritoneal sac but large intestine found. Recovery. Believes it came out through Petit's triangle.

31. FRIEDENTHAL: Female, aged forty-five. Injury to the spine by fall, and six years later strangulation in lumbar region appeared. Patient could not give any history of hernia. Cherry-sized hernia in left side, under twelfth rib, attributed to weakening of the muscles following frequent pregnancies and the indirect traumatism of the fall.

32. SECOUSSE AND LASSERE: Male, age not given, carried heavy weight upstairs, three days later noticed a small tumor in left lumbar region about the size of a nut. Ten days later it was the size of a pigeon's egg. This was three years ago and now it has increased very much in size. Round, about the size of two closed fists, becomes larger when patient coughs, and spreads widely over the lumbar region. Reducible and gurgling, non-painful.

33. GOODMAN AND SPEESE: See above.

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DR. WALTER G. ELMER said that a case similar to this is in the University Hospital now. It is that of a little boy treated for infantile paralysis of the leg. There is paralysis of the muscles in the flank so that when he coughs there is a hernia about the size of his fist which bulges out just below his ribs on the right side. There appears to be no urgent need for treatment of this condition at present.

CONGENITAL ABSENCE OF THE FIBULA[1]

DR. ASTLEY P. C. ASHHURST reported the following case:

In May, 1912, Edgar A., a boy of seven years, came to Dr. Harte's service at the Orthopædic Hospital. He walked on his knees (Fig. 2), owing to congenital absence of the right foot and lower leg, and a congenital malformation of the left foot. The right tibia terminated as a conical stump below what should have been the middle of a normal leg. On the outer side of the right leg was a tab of tissue which could be moved voluntarily, independently of the leg. The right knee-joint was normal, but no fibula was present on this side. On the left side the knee also was normal, but there was no fibula, and the outer two toes and corresponding portions of the foot were absent. The foot was in a position of marked equinovalgus.

Operative correction of the deformities of the left foot was advised, with use of an artificial limb on the right. The parents refused operation, and the child was not seen again until the autumn of 1915, when he was ten years of age. In the meantime his father had made for him a crude artificial limb which he wore on the right leg, and with which he was able to walk moderate distances. The left foot, however, was becoming more and more deformed, and the parents were now willing for operation. The equinovalgus was now much more marked than at his first visit in 1912—the heel was very high, the inner border of the foot was convex, and the outer border was raised until the sole lay at an angle of 45 degrees with the ground. Skiagraphs (Figs. 4 and 5) showed no astragalus, a deformed calcaneum (perhaps an amalgamation of astragalus, calcis and cuboid) in marked outward displacement, and two tarsal bones, perhaps the scaphoid and one

[1] One of the most complete discussions of the interesting subject of congenital deformities of the limbs is that by G. Potel, running through the *Revue de Chirurgie* for 1914, vol. xlix. According to his classification the present case is one of hemimelia. Very evidently it is not a case of intrauterine amputation; witness the deformities of the left lower extremity, and the tab of tissue adherent to the right leg, and representing an abortive attempt to produce foot or toes.

of the cuneiforms. The three inner metatarsals with their corresponding phalanges were present. The operation planned was an arthrodesis to hold the calcis under the tibia in the midline, and a transplant from the tibia to form an external malleolus.

Operation (by Dr. Ashhurst, September 24, 1915).—Esmarch anæmia. An incision was made down the outer side of the leg, beginning 7 cm. above the ankle-joint, and continued forward parallel to the normal course of the peroneal tendons. A tendon was found inserting in the calcis and the base of the outermost metatarsal bone. This tendon was divided by Z-plasty, for subsequent reunion after lenghtening. The calcaneum was held by ligaments very tightly against the outer surface of the tibia, and a large upward projecting portion of the os calcis hindered access to the ankle-joint. A second incision was now made along the Achilles tendon, and this tendon was divided by Z-plasty for subsequent reunion with lengthening. This allowed the heel to be brought down, and made the ankle-joint more accessible. The projecting knob was then cut off the upper surface of the os calcis, and preserved to form an external malleolus; it measured about 4 by 2 by 2 cm. Its removal allowed ready access to the under surface of the tibia and upper surface of the calcis as far as the internal malleolus. The calcis was fully 5 cm. broad, and on account of an inward projection from it beneath the internal malleolus it was not possible to bring it plumb under the narrower tibia. A third incision was then made under the internal malleolus, opening the ankle-joint. After removal of the obstructing projection from the os calcis the latter bone could be brought around horizontally under the tibia in excellent position. Many small chips of bone were purposely left at the outer side of the ankle-joint to fill the slight dead space between tibia and calcaneum. Apart from this no further attempt was made to produce an arthrodesis at the ankle-joint. Next the outer surface of the tibia was removed by chisel, bearing cancellous bone, and the raw bony surface of the large mass first cut from the calcis was applied against this tibial surface, forming a very shapely external malleolus. It was fixed to the tibia by two self-boring Lambotte steel screws. This held the foot in admirable position with great stability. The new external malleolus overlapped the calcaneum, and there was not the slightest inclination to a recurrence of the valgus (Figs. 4, 6, and 7). The peroneal tendon and the tendo Achillis were reunited after suitable lengthening, the Esmarch band was removed, and the wounds closed. The foot was kept in plaster-of-Paris for about ten weeks, when a suitable ankle brace was applied. There is sufficient movement in the ankle-joint, the foot stays in perfect position, and with an artificial leg

FIG. 2.—Edgar A., seven years old (May 23, 1912). Congenital deformities.

FIG. 3.—Edgar A., ten years old (December 18, 1915). Three months after operation for congenital absence of fibula (equinovalgus).

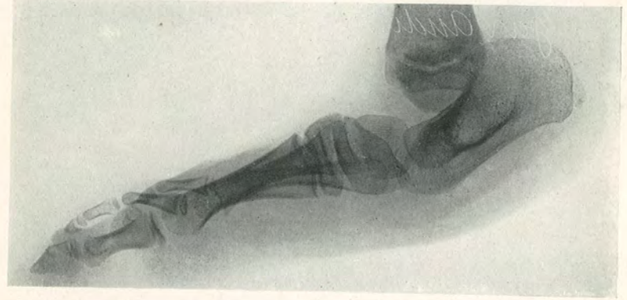

FIG. 4.—Lateral view of congenital deformity of foot, before operation.

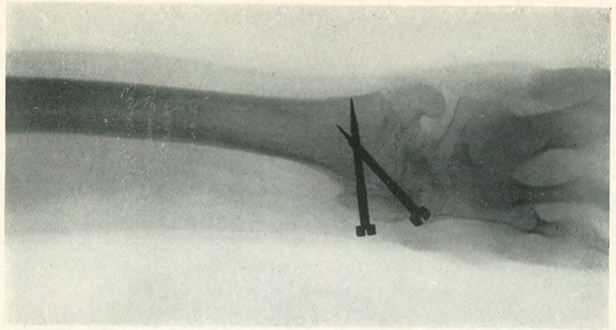

FIG. 7.—Anteroposterior view of foot after operation.

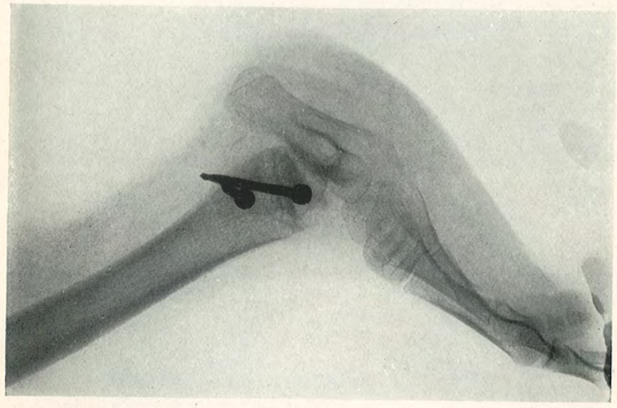

FIG. 6.—Lateral view of foot after operation.

FIG. 5.—Anteroposterior view of congenital absence of fibula and deformity of foot, before operation.

on the right side the boy is well equipped for locomotion. The ankle brace will be worn for about six months, or until the transplant from the calcaneum has become incorporated with the tibia.

DR. GWILYM G. DAVIS said that he had had a couple of cases similar to this one. In one the leg was considerably shorter than the opposite limb. In this case he bent the foot around until it came straight with the leg and resected at the ankle, putting the end up on the cut tibia so that it increased the length of the tibia and made a straight leg. By making an artificial foot the deformity was very much corrected. The other case was that of a young child and in it the tendency of the foot was to swing outward. In such a case when the child is very young, the best management is to correct the valgus by bringing the foot straight, holding it straight with braces with the foot persistently under the leg, so that the leg may accommodate itself to the foot at the ankle-joint. When the child has grown to approximately nine years of age some such operation as Dr. Ashhurst has done can be performed. Of course, the ease of the operation and its efficiency depend upon the amount of growth of bone at the time it is done. The foot can thus be held in its proper relation to the leg without the fibula, and all necessity of apparatus is dispensed with.

ENDOTHELIOMA OF LEFT FRONTAL LOBE

DR. CHARLES F. NASSAU and DR. GEORGE E. PRICE presented the following case:

Man aged thirty years, a native of Pennsylvania, white and a carpenter by occupation, who was admitted to the service of Dr. Nassau, at the Jefferson Hospital, February 12, 1915.

The family history was negative with the exception of the father's death from cancer of the thigh during the previous summer.

The patient himself gave a history of having had diphtheria, pneumonia and measles in childhood. He denied venereal infection, stated that he used but little alcohol and smoked in moderation. He had been married seven years and had two healthy children. His wife had one miscarriage. With the exception of a trivial accident affecting the left knee, there was no history of the patient having received any injury.

Twelve years ago, he had consulted an oculist because of headache, but after wearing glasses for six months the headache disappeared and he remained free from the trouble for ten years. Two years ago the headache returned, this time being unrelieved by correction of refraction.

In May of last year, he had an epileptiform attack, in which he was found unconscious and with his head turned strongly to the right. A second similar attack occurred one week later, but since this spell he has had no recurrence.

Following these attacks, the headache steadily increased in severity and would often last for days without intermission. The eye-grounds at this time were reported as being negative. Next, his eyesight failed rapidly, and, on December 11, 1914, the local surgeon removed a button of bone from the right temporal region without opening the dura. This operation, despite the failure to open the dura, was followed by rapid improvement of vision until about two weeks prior to his admission to the Jefferson Hospital, when it remained stationary. The headache had continued, but with lessened severity. There was no nausea nor vomiting at any time.

Upon examination, some tenderness was noted in the muscles of the left side of the neck near the occiput. There was no bulging at the site of the operation in the right temporal region. The lungs and heart were normal. Over the ninth and tenth dorsal vertebræ was observed a small tumor, not freely movable, but over which the skin could be readily moved.

Urine and blood examinations revealed nothing abnormal and a Wassermann test of the blood serum was reported negative.

An ophthalmological report, made by Dr. Sweet on February 13, 1915, was as follows: Pupils 3.5 mm.; reaction normal to light and convergence. Media clear, tension normal, ocular rotation unimpaired. Both optic nerves covered with exudation, extending several mm. beyond the normal edges; veins tortuous; retinal striations, particularly in R. E. No hemorrhages; swelling R. nerve about 5 D., swelling L. nerve 6 D. from a base of 2 D. Diagnosis: "Choke disk." Visual field shows slight concentric contractions of the right, but none in the left eye. There is enlargement of the blind spot in each eye.

Neurological Examination.—Gait and station normal. The pupils were slightly unequal, the right being the larger; both reacted to light and accommodation. There was no nystagmus, external ophthalmoplegia nor hemianopsia. No gross impairment of hearing. Musculature and sensation of face normal. No difficulty in articulation nor in swallowing. There was no aphasia. Grip with both hands fair and equal: no dysmetria; no diadocokinesis. The knee-jerks were normal. Upon testing for Babinski's sign, it was observed that the right great toe would sometimes flex, but at other times it would extend. Stroking under the outer malleolus on this side would usually cause extension. On the left side, there was always the normal reflex—flexion.

Sensation was everywhere normal. Astereognosis was not present. No mental symptoms were observed and the man's conduct in the ward was said to be that of the ordinary patient.

While the absence of definite symptoms prevented a positive localization, it was felt that this same paucity of localizing symptoms favored a growth in the frontal region, while the turning of the head to the right side in the epileptiform attack and the occasional Babinski on the right side pointed toward a left-sided lesion. In accord with this conclusion was the fact that the swelling of the optic disk was most marked on the left side and it was further noted that most of the headache was on the left side, beginning in the temporal region. Accordingly, at operation Dr. Nassau began by turning down a flap on the right side, where the button of bone had been removed in Erie, thinking for safety's sake a decompression could be done on the right side. When the decompression opening was made on the left side, just appearing at the edge of the hole was seen a little bluish-gray appearance of the dura, which was extremely thick. A large portion of the lower inferior angle of the parietal bone was removed with the Rongeur forceps. Bleeding was very profuse, and was controlled with hot packs and Horsley's wax. After incising the dura, a large mass bulged up into the wound anterior to the fissure of Rolando. After starting the separation with the finger, the mass peeled out very well. It left an enormous cavity. Just here he emphasized the wisdom of performing such an operation in two stages when a severe hemorrhage is encountered. If he had finished this operation in one stage, he would have lost his patient. Iodoform gauze was gently packed into the cavity and the scalp brought over the gauze with just one silkworm-gut suture. An enormous Turk's head dressing was applied, using a Halsted gauze roll. Patient was sent to the ward in deep shock. The operation was done February 17, 1915. Five days later, without anæsthesia, he removed the packing from what was then not much of a hole. The wound was closed, with the exception of two small drains. By merely laying gauze in a brain cavity, one does not make injurious pressure, and unless the bleeding is from a large vessel, it will always stop. Of course there should be no visible bleeding point. In mere oozing, one gains nothing by a hard pack on the brain. When the pack was removed, some active bleeding occurred from a vein that was easily tied. March 7, 1915, eye report at this time choked disk, right eye, 1 D, and the left eye 2½ D. He was now turned over to the Radium Department, and he was treated by Dr. Newcomet for about 8 weeks. There is now absolutely no appearance of any growth whatever. He seems to be perfectly well.

The tumor was examined by Dr. E. D. Funk, who made the following report:

Specimen is an irregular, ovoidal mass of soft, grayish-red tissue, measuring 8 by 5 by 3 cm.; weight 93 gms. One surface is convex and shows slight fissure-like markings. This surface is covered by a thin, smooth, moist membrane. The remaining surface is a torn, rough, dark-red area measuring 1 cm. square, to which a small portion of dura is attached. The mass cuts easily and the incised surfaces exhibit a grayish color.

Accompanying the larger mass is a small grayish-white piece of dura measuring 1 cm. square and 0.2 cm. thick.

Specimen was fixed in absolute alcohol, embedded in paraffin, sectioned, and sections stained with hæmatoxylin, eosin and Van Gieson's mixture.

Histology.—The sections show many islands of closely arranged cells containing prominent nuclei. These lie in irregular spaces formed by the fibrous connective-tissue stroma.

Diagnosis.—Endothelioma.

Dr. Nassau remarked further that tumors of the posterior part of the frontal lobe usually give rise to Jacksonian convulsions by involving the motor area, and on the left side, if the foot of the third frontal convolution, or Broca's area, be invaded, motor aphasia develops.

In the prefrontal region, however, diagnosis is rarely made from any direct focal symptoms. According to Starr, "A decided change in character and disposition, a mental apathy and a tendency to somnolence must be regarded as a sign of frontal lobe disease." Oppenheim states that such psychic disorders as simple dementia and a peculiar facetiousness, to which he applied the term *witelsucht*, are of frequent occurrence in tumors of the frontal region. Unfortunately, mental symptoms may result from tumors located in other portions of the cerebrum, and, when present in frontal growths, they do not indicate the particular hemisphere in which the neoplasm may be found.

Bruns and Dercum have observed a cerebellar-like ataxia in cases of frontal lesion and Stewart has noted tremor of the extremities on the homolateral side, also loss of the superficial abdominal reflex. None of these findings are constant, however.

In this case, none of the symptoms described above were present. A symptom which had some localizing value was the occurrence of convulsions with turning of the head to the right side. It is well known that irritation of one part of the cerebral cortex may spread or radiate to adjacent parts, which Starr likens to the ripple on the surface of a lake into which a stone has been thrown.

The absence of mental symptoms in this patient may have been due to the character of the growth, as the endothelioma does not actually infiltrate and destroy the brain substance, but growing from the dura it pushes aside the cortex and embeds itself, or makes a nest for itself, in the brain. Moreover, the rate of growth of this variety of tumor is slow and would, therefore, permit of considerable adaptation on the part of the brain to the changed condition.

Probably no tumor of the brain offers a more favorable outcome to the surgeon than does the endothelioma. Well defined from the surrounding tissue, it is, as a rule, readily removed, and when completely removed the liability to recur is slight. The operator must see to it, however, that the growth is not broken, or if this occurs, great care should be taken to remove all of the tumor, as, should a piece of the growth be left, recurrence is probable.

A SIMPLIFIED PRE-OPERATIVE TREATMENT OF THE HANDS AND FIELD OF OPERATION*

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and
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A germ-free condition of the skin is not essential to the perfect healing of surgical wounds. The approach to sterility obtained by the various methods and agents that have been advocated from time to time is sufficient to afford rapid healing in a vast majority of cases. Many of the methods, however, are complicated and require considerable time for their execution; some of the agents are applicable to the field of operation alone, and only under certain conditions of the skin; some of them have deleterious effects upon the tissues.

The ideal method would be simple in application, efficient in action, free from deleterious effects, applicable to the wet or dry skin and to the hands as well as to the field of operation, and allow of rapid execution. To be efficient in action the agents used should dissolve or penetrate the débris composed of the secretions and excretions of the glands of the skin, countless broken-down cells and mechanical dirt which surround bacteria on the surface and in the most superficial layers of the skin; they should decompose and remove small particles of air that may be present in the cracks and crevices of the skin and thus penetrate more deeply; they should destroy all germ life with which they come in contact in a short space of time. To be free from deleterious effects, the methods and agents should not be harmful to the tissues, and above all should not interfere with their natural resistive and recuperative powers.

The approach to the ideal in methods or agents must be proved by both clinical and laboratory findings. The clinical results may be judged by the presence or absence of rapid and aseptic healing of the wounds, although it must be remembered that healing by first intention does not prove the absence of germ life. It simply shows that there is sufficient resistance in the tissues to overcome the activity of any bacteria that may be present. Probably the surest, the most positive prophylaxis against wound infection is conservation of the natural resistive and recuperative powers of the tissues.

*Read before the Philadelphia Academy of Surgery, December 6, 1915.

The laboratory should prove the value of the agents in destroying bacteria, preferably according to the Rideal-Walker coefficiency test, which takes carbolic acid or phenol as a standard and compares the efficiency of other agents with phenol in the ability to destroy the *B. typhosus*. The value of the agent as a germicide "can be expressed by a number called its coefficient which indicates how many times more, or in some cases less, the disinfectant can be diluted than phenol and retain an equal germicidal value." The laboratory should also show the value of the method and agents in either destroying all bacteria in the skin or in reducing them to a minimum, which may be shown, approximately, by imbedding scrapings from the skin in culture media and properly incubating them. We believe that the scraping instrument itself should be imbedded in the medium and that the method of testing which simply rinses the scraping instrument in the medium is faulty and unreliable. To obtain our scrapings both of the hands and the field of operation, we used a roughened strip of mother-of-pearl, this being used because it is readily sterilized in the autoclave, because it can be used repeatedly and because it can be imbedded in the culture medium. To avoid wrong conclusions, all chemical agents used must be neutralized or removed from the skin before the scrapings are taken, because an almost infinitesimal quantity of many antiseptics will be sufficient to prevent the development of bacteria. Scrapings should be taken thirty minutes after the supposed sterilization of the skin to prove that active bacteria have not been thrown onto the surface from the deeper layers of the epidermis. As demonstrated by Leedom-Greene and others, the skin must be moist when the scrapings are taken, because, in a dry condition, the cement substance of the epidermis holds the cells and bacteria in place to a much greater extent than it does when moist. A vigorous 24-hour culture of some easily recognized organism should be rubbed thoroughly into the skin and scrapings should be taken before and after the application of the agents being tested. Finally, a piece of the skin itself should be imbedded in culture medium and incubated for at least 48 hours.

In a former paper ("The local preparation of patients for operation," by A. D. Whiting, M.D., *J.A.M.A.*, August 8, 1914, vol. lxiii, p. 474) one of us reported several series of tests made to show the value of various methods and agents used in attempts to render the skin free from germ-life. These covered the dry method of sterilization; the wet method with the use of different chemical solutions; the combination of the wet and dry methods; and the method of freeing the skin of all bacteria by sweating. Those investigations seemed to

show that the skin could be made sterile by washing it from within outward by stimulating its natural activity, but that no other method of mechanical or chemical cleansing would render it sterile.

After studying an article by Hamilton (*American Journal of Pharmacy,* July, 1915) which grouped the various coal-tar disinfectants, and another by McDonald (*Surg. Gyn. and Obsts.,* July, 1915) which suggested the use of acetone as a solvent and alcohol as a vehicle with the incorporation into an acetone-alcohol solution of a germicide, we have experimented with several solutions in an endeavor to find one that would approach the ideal, or at least would more nearly sterilize the skin than the various methods and agents that one of us had previously investigated, be more simple in application, and allow of more rapid execution.

Hamilton states that since 1889 when the composition of creolin was made known to the scientific world, hundreds of the coal-tar disinfectants composed of creosote oil and soap and containing various proportions of the phenols have been exploited. These phenols are so called because they resemble carbolic acid or true phenol, in composition and action. They differ from carbolic, however, in being but slightly soluble in water, in being less corrosive and less poisonous, and in having greater germicidal power. They differ among themselves according to the coal-tar oil used in their manufacture and the different treatment to which they are subjected to make them soluble in water. Hamilton divides these disinfectants into three groups, according to their efficiency, the third group containing those of a high phenol coefficient. Unfortunately, many of these disinfectants, and especially those of Group 3, are proprietary preparations, the manufacturers keeping secret, for trade purposes, their method of manufacture and treatment, although making strong appeals for the use of a particular one in preference to all others. None of the preparations we have tested, according to our findings, has lived up to the reputation given to it by its proprietor. We wish to make it emphatic that we hold no brief for any manufacturer and that our sole object in mentioning any proprietary preparation is to stimulate interest in the surgical use of coal-tar disinfectants of a high coefficient in the hope that the proper authorities will provide the profession with at least one that is strictly ethical.

The following scheme of investigation was carried out at the German Hospital, service of Dr. Deaver, to whom we are indebted for the free use of surgical material.

Field of Operation.—When not contra-indicated, the field of operation was wet-shaved and the patient was given a warm tub bath the night before operation. During the day of operation, without further preparation, the field of operation was scraped with the mother-of-pearl strips, which were placed in bouillon and in liquefied agar which was plated. All culture tubes and Petri dishes were incubated at 37° C. for 48 hours.

Results.—All cultures showed a growth of staphylococci.

The field of operation was then surrounded by sterile sheets or towels and the part was rubbed for two minutes with gauze saturated with the solution being tested. The field was then washed off with sterile water or the solution was allowed to evaporate and scrapings were again taken with the pearl strips.

Result.—All cultures remained sterile.

A sterile dressing was then placed over the field and held in place by a sterile bandage. Thirty minutes later, the dressing was removed under aseptic precautions, the skin was moistened with sterile water and scrapings were again obtained with the pearl strips. These scrapings were taken to show whether or not bacteria had been brought to the surface of the skin from the deeper layers through the natural activity of the skin.

Results.—A total number of 446 of these various scrapings were obtained. With the exception of 38, all were returned sterile. Of the 38, one tube showed the presence of staphylococcus and 37 showed contamination. In the series of tests previously reported by one of us, but 2 out of 86 such scrapings remained sterile.

After the completion of an operation on a clean case, a small strip of the skin, including all layers, was removed just before the wound was closed, placed in bouillon and incubated at 37° C. for 72 hours.

Results.—Strips of skin from 117 patients cultured. Returned with no growth, 34; returned with growth, 83. Of the 83, 3 showed staphylococci, 1 streptococci, 58 large Gram positive cocci, 6 small Gram positive and negative cocci, 7 small Gram negative bacilli, 6 small positive and negative diplococci, and 2 sporulating bacteria. The laboratory reported that the majority of the growths were caused by contamination by non-pathogenic bacteria. The wounds of all but three of these cases healed aseptically. Of these three two were cases of acute appendicitis with some exudate and one was a myoma of the uterus in a patient with a very fat abdominal wall.

The Hands.—The hands and forearms were scrubbed with soap and hot running water, a bristle brush being used. The hands and forearms were then washed with the solution under consideration for

two minutes, a piece of sterile gauze being used to rub the skin. The hands were then thoroughly rinsed with sterile water and scrapings were taken with the pearl strip, the person being tested handling the strip himself, rolling it in the hands, scraping the skin, the nail-grooves and the under-surface of the free margin of the nails. The strips were imbedded in bouillon and incubated at 37° C. for hours.

Results.—All cultures were returned with no growth.

The hands were then incased in impervious, sterile rubber gloves. After the completion of an operation, the gloves were removed and similar scrapings were taken. The hands were again washed with soap and water, immersed in the solution, and again incased in rubber gloves. After each operation, scrapings were taken as before.

Results.—One hundred and forty-five scrapings were obtained, 96 were returned without growth, and 49 with growth. Of the 49, 5 showed staphylococci, in 3 and 2 successive cultures on different days. The laboratory reported that the growth in the other 44 cultures was due to contamination by non-pathogenic bacteria.

The hands were washed with soap and water for two minutes. Then 10 c.c. of a 24-hour culture of staphylococcus albus was thoroughly rubbed into the hands and allowed to dry. Scrapings were taken with the pearl strips and imbedded in bouillon and in liquefied agar which was plated.

Results.—All scrapings gave an abundant growth of the staphylococcus.

The hands were then treated with the solution under consideration, the solution was washed off with sterile water and scrapings were again taken and cultured.

Results.—Culture of sterile water before being used to remove solution, sterile. All culture of scrapings returned with no growth. Sterile water used in washing off the solution cultured and returned with no growth.

Same procedure on a different day, with immersion in the solution for 30 seconds, one minute, one and a half minutes, and two minutes. All cultures of scrapings returned with a growth of large Gram positive cocci, which the laboratory stated were positively not staphylococci.

Same tests repeated on third day, with same solution and technic throughout. All cultures returned with no growth.

Laboratory tests were made to show the germicidal properties of various agents and various solutions of them. This entailed an enormous amount of work and we wish to express our gratitude to Dr. Damon B. Pfeiffer, the Chief of the Laboratory, and to Dr. Carl

Becker, who so willingly and carefully made all of the laboratory tests for us. There were made 1174 cultures of the typhoid bacillus which had been subjected to the action of different strengths of 23 different agents or solutions for varying lengths of time. All were properly labelled and incubated at 37° C. for 48 or 72 hours.

Results.—Acetone has no germicidal power.

Alcohol in strengths varying from 40 per cent. to 95 per cent. destroyed the *B. typhosus* in less than 2½ minutes.

Acetone 40 parts and alcohol 60 parts destroyed the *B. typhosus* in less than 2½ minutes.

Acetone 40, alcohol 60, and liq. cresolis comp. 2 parts gave the same results.

Acetone 30, alcohol 65, liq. cresolis comp. 5 parts; acetone 40, alcohol 60, and crude carbolic acid 2 parts; acetone 40, alcohol 60, and pyxol 2 parts; acetone 35, alcohol 60, and creolin 5 parts; acetone 35, alcohol 63, and phenoco 2 parts, all destroyed the *B. typhosus* in less than 2½ minutes.

Liq. cresolis comp. gave a phenol coefficient of 2; creolin 1.5; pyxol, a proprietary disinfectant which the manufacturers claim to have a coefficient of 20, has a coefficient of 4, according to our laboratory reports.

Phenoco, another proprietary disinfectant with the manufacturer's claim of a coefficient of 15, has a coefficient of 9 according to our laboratory reports. Phenoco has been placed in New and Non-official Remedies, 1915, by the Council of Pharmacy of the American Medical Association.

As a result of these investigations, we would conclude that none of the various solutions used will destroy all germs of the skin in all instances, but that a solution consisting of acetone, alcohol, and one of the coal-tar disinfectants of a high phenol coefficient is more efficient than any other agent we have ever used for skin sterilization. In such a solution, the acetone (dimethylketone) acts as a solvent of the fatty or oily material of the skin and thus aids in exposing the bacteria to the germicides. The alcohol acts as a solvent; it has the power to penetrate into the cracks and crevices of the skin, as claimed by Braatz, through its ability to decompose and remove small particles of air that may be present; it is germicidal in solutions as weak as 30 per cent., according to Post and Nicoll, in solutions ranging from 40 per cent. to 95 per cent., according to our findings, with its strongest germicidal powers in solutions ranging from 60 per cent. to 70 per cent., according to Leedom-Greene; it also acts as a good vehicle. The coal-tar disin-

fectant that may be used acts simply as a powerful germicide, destroying all bacteria with which it comes in contact in a length of time varying with its coefficient and the degree of dilution.

The advantages of such a solution are many. Patients do not complain of any irritation following its use, although it causes a burning sensation when used on the scrotum. It does not stain the skin. It reduces to a minimum the time consumed in preparing the field of operation, and its method of application is the simplest. It may be used on a wet or dry skin, for emergencies or for cases where the consumption of time in preparing the patient is not of great moment. There is no exfoliation of the skin as is seen after the use of iodine, nor is there any blistering. It may replace all other solutions in sterilizing the hands, although its continuous use causes some irritation in some instances; in others, no effect is noticed; others say the application of the solution gives rise to a decided feeling of warmth. The solution may be used repeatedly, any collected detritus being removed by filtration.

To further hospital efficiency, to save time, to remove the danger of faulty technic in complicated methods, and to save expense, we would suggest that a solution consisting of 35 per cent. acetone, 1 or 2 per cent. of a coal-tar disinfectant of a high coefficient, preferably phenoco, with enough alcohol to make 100 per cent., would answer the purpose. The method of application consists in rubbing the field of operation for two minutes with a piece of gauze saturated with the solution after either a wet or dry shave. A warm, cleansing tub bath is, of course, always advisable when not contraindicated.

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