STATED MEETING, HELD MARCH 4, 1912

The President, Dr. Gwilym G. Davis, in the Chair.

GENERAL INFECTION FOLLOWING ACUTE TONSILLITIS.

BY WILLIAM J. TAYLOR, M.D.,
OF PHILADELPHIA.

It has been my fortune to have seen during the past few years a number of instances of profound constitutional and localized infection following acute tonsillitis. These have covered wide areas in the body and have involved various tissues and organs.

The first was that of a gentleman of forty-six years of age, who had a violent tonsillitis, evidently streptococcic and distinctly not diphtheritic in character, which was followed by arthritis of both elbows. This was presumed to be rheumatic and resulted ultimately in complete ankylosis of both joints.

After various methods of treatment had been tried by his physicians in a neighboring city, including repeated etherization and attempts to secure motion in the joints (fourteen attempts in as many weeks), he was finally referred to me for surgical treatment.

An examination by the X-ray showed complete and firm ankylosis of each elbow and almost total destruction of the joints. The elbows were fixed at such an angle that he was helpless, he could not dress nor feed himself and, what annoyed him almost more than anything else, he could not even use his handkerchief.

I resected his left elbow, removing the disorganized joint and being careful to take away an ample amount from the humerus as well as from the ulna.

The result from a practical stand-point has been most satisfactory in that he has perfect freedom of motion and a thoroughly serviceable arm.

I declined to resect both elbows at that time, preferring to

try what could be accomplished with the left one, leaving to a subsequent occasion operation upon the right.

He has been so much improved in every way and can carry on his business as draughtsman, that nothing further has been attempted.

The second case was that of a small child five years of age, who had an acute tonsillitis, presumably streptococcic, for there was no diphtheria, followed shortly by an epiphysitis of the left femur, and for months she was ill. Finally recovery took place, but with a permanently damaged hip-joint.

The third was that of a lady of twenty-nine years, the mother of three children, who was apparently in perfect health with the exception of a uvula which was somewhat long and annoying. The end of the uvula was clipped off in the office of a throat specialist and by the next day she had an acute tonsillitis followed by very high temperature and evidence of profound constitutional infection. At the end of 48 hours she complained of abdominal pain (she was menstruating at the time) over both ovaries, and this progressed until her symptoms were so urgent that the abdomen was opened by another surgeon. An abscess of the right ovary and tube was discovered with general septic peritonitis.

Death followed in less than a week from the onset of her symptoms and was clearly due to a streptococcic infection with the primary seat of invasion in the tonsil and uvula.

The fourth case was that of a lady of forty, who had an acute tonsillitis directly traceable to an infected telephone through which she had been speaking. Her butler had tonsillitis and used the telephone, then a member of the family developed tonsillitis shortly after speaking through this same telephone, and soon my patient was attacked. All of them were probably streptococcic in origin.

She was a frail and delicate woman and before her throat was entirely well she went to the opera, from which she returned with a chill and very violent headache, and marked increase in her throat discomfort.

A hypodermic injection of morphia was given to her in her left leg by her physician, who used every possible precaution against contamination by the needle. Soon there was another chill followed by fever and a violent cellular inflammation of the whole of the left leg.

When I saw her some days later, she was in a desperate condition. I opened the leg from the knee to the ankle and gave vent to much pus and broken-down fatty tissue. A smear from this pus showed pure streptococci, but a culture taken at the same time could not be depended upon through an unfortunate mishap in the laboratory.

I have never seen an instance of more profound sepsis; her blood was not red but of a chocolate color, and for a long time I feared she could not possibly live. She recovered only after weeks of illness.

I have seen several other instances of general sepsis following acute tonsillitis, but these four cases will amply illustrate the extreme danger which may result from the very common affection, and which I do not think has been fully appreciated by the general practitioner of medicine.

Enlargement of the cervical lymph-nodes following tonsillar infection is of course very common to all of us, and I have purposely not taken up that phase of the subject. Neither have I considered the infection of the mastoid cells and cerebral complications, of which we all see a few instances.

The masterly article by the late Dr. Frederick A. Packard, the Wesley Carpenter lecturer for 1899, "On Infection Through the Tonsil Especially Connected with Acute Articular Rheumatism," has drawn attention to the importance of this subject, and covered very thoroughly the literature up to that time.

Various observers have shown the relation between angina and rheumatism, and have shown that a large number of staphylococci and streptococci are present in the scrapings from the tongue and mouth, as well as many other forms of bacteria. As the tonsil belongs to the lymphadenoid tissue and is covered by plicated and involuted mucous membrane and is a collection of recesses and glands, it can readily be seen how general infection can follow an acute tonsillitis.

The question of absorption through the tonsils of various materials has been carefully studied, and their power of filtering bacteria is found to be somewhat similar to the lymph-nodes, and to this extent they are of great benefit.

We all know that endocarditis is not an unusual result of tonsillitis.

Packard mentions a case (B. Auche, *Annales de la Policlinique de Bordeaux,* 1892) of synovitis of the knee and ankle requiring operation, which was followed later by a pleural effusion, and also two cases of peritonitis occurring in the course of tonsillitis as recorded by Groedel and Froelich.

It has been proposed that in acute articular rheumatism (Vosanyi and Lenare, Sixteenth International Congress) the tonsils be immediately and completely removed, and in certain cases where this has been done, it has been followed by a prompt subsidence of joint symptoms and rapid convalescence of the patient.

This is such a radical procedure that it takes our breath away, and only in view of profound constitutional complications can it be considered.

The tonsils as points of entrance for tubercular infection have been well known for a long time. George B. Wood (*Jour. A. M. A.,* May 6, 1905, p. 1425) has demonstrated that in pigs the course of tuberculosis is through the pharyngeal and tonsillar structure, through the glands in the neck into the thorax, and finally to the lung itself. He proves that the tonsillar tissue is more resistive to the action of the tubercle bacilli than the adjacent lymph-glands.

David J. Davis (*Jour. A. M. A.,* July 2, 1910), in an experimental study of the bacteria isolated from the tonsils, found in nearly every instance a pure growth of *Streptococcus pyogenes* from the crypts, and an intravenous injection in rabbits was followed by acute arthritis in nearly every instance.

In a discussion at the last meeting of the American Surgical Association (*Transactions Amer. Surgical Assoc.,* vol. xxix, p. 148) Dr. Maurice H. Richardson mentions a series of cases of constitutional infection all preceded by a simple tonsillitis. Among these were three cases of fatal peritonitis, a phlegmon of the neck, a phlegmon of the fascia lata and all the muscles, a sepsis around the left hip, and total gangrene of the lower extremity.

Dr. John H. Jopson reported the case of a boy of 18 who during the past winter had been the subject of repeated attacks of acute tonsillitis, two or more of these attacks being succeeded by attacks of pyelitis or, as his physician, Dr. Geisler, diagnosed them, ureteritis. The connection between the two conditions was apparently very definite, and the kidney condition was exceedingly acute and disabling. Finally his tonsils, which were badly infected, were removed by Dr. Stout, and since then he has remained well.

Dr. Walter G. Elmer recalled a case which came under his own care. This was a lady 73 years of age in which the infection travelled from her throat through the Eustachian tube to the middle ear, her temperature reaching 105.5°. This was followed the next day by diffuse abdominal tenderness, marked distention, and marked tenderness over the appendix, so that in a younger subject a diagnosis of acute appendicitis would have been made and operation advised. She being 73, and the fact that the ear was relieved by drainage and the symptoms subsiding, of course operation was not considered. This case, however, shows the similar relationship between throat infection and the abdominal cavity of which Dr. Taylor spoke.

Dr. Charles F. Nassau said that some four weeks after a total hysterectomy, the patient being perfectly well and at her home, she developed an acute tonsillitis. This was treated by a physician who evidently cleaned out some tonsillar crypts. The patient said it had caused her great pain. About 48 hours after that she developed a thrombophlebitis of the right femoral vein and since then she has had a periurethral abscess. At no time was there any trouble with the hysterectomy wound, although that is necessarily under suspicion; but she had been so well prior to her tonsillitis that he could not think her later trouble had anything whatever to do with her abdominal operation, but was a spread of infection from the tonsils.

Dr. John B. Roberts said that he wished that Dr. Taylor's paper could be read by all laryngologists, who are so earnest and anxious to radically remove the tonsils of many children, between five and fifteen years of age. Dr. Taylor says that it was suggested, at the meeting in Budapest, that the tonsils be taken out in cases of acute rheumatism, because of the connection between tonsillar infections and this infection of the joints. His own feeling had been that nature puts the faucial tonsils, the

pharyngeal tonsil, and the lingual tonsil at the opening of the gastro-intestinal canal as a protection against general infections. When infection gets into our mouths the tonsils probably act as a filter plant, in a manner similar to the action of the inguinal and axillary glands, which catch the micro-organisms which come from the lower and upper extremities respectively. Therefore it is a very unwise thing to take out radically either moderately diseased or occasionally diseased tonsils of a child until we have more authoritative knowledge of the functions of these juvenile organs. These cases of Dr. Taylor's show apparently that the first place the infection stopped was at the tonsil. Of course if the infection gets beyond the tonsils, either because the tonsils have been removed or because their filter function is not in good working order, general infection occurs and may show arthritic, abdominal, or other symptoms.

Dr. Roberts related a case in which the tonsils and adenoids in the pharynx were extirpated for a young child, in whom it had been advised that the pharyngeal adenoid tissue be removed, because of earache. To his surprise the operator also removed the slightly enlarged tonsils. A few months later the child died of a very acute cerebrospinal infection, proved by autopsy and monkey inoculation. It is asserted that that disease, the so-called anterior poliomyelitis, comes usually through infection of the pharynx. Does it not seem possible that the acuteness and severity of the general infection in that particular patient were greater because one of the safeguards of the system, the tonsils, had been removed a few weeks prior to the time the bacterial cause of the disease happened to reach the mucous membrane of the child's throat?

Dr. Damon B. Pfeiffer related the history of a medical student who had fractured the external malleolus of the right fibula. While in the hospital he had a severe attack of tonsillitis, bilateral; he previously had had tonsillitis many times when a child, and claimed that the tonsils had been removed by cauterization, but there evidently was some submerged tissue which was not removed. He was given the ordinary treatment, in spite of which a tonsillar abscess formed, which was incised and considerable pus evacuated. He left the hospital in a few days and went home to recuperate. A few days later he noticed blood in the urine, which, upon standing, was sufficient to form a clot in the sedimented portion and he is now suffering from a very severe hemorrhagic nephritis.

OBSERVATIONS ON THE RADICAL CURE OF HERNIA.

BY CHARLES F. NASSAU, M.D.,

OF PHILADELPHIA.

Few subjects are of such perennial interest as hernia. In these days when most surgeons and even the occasional operator feel that they are protected by an indefinite fetish, by some termed aseptic by others antiseptic surgery, many patients are subjected to a so-called radical operation for the cure of hernia. Often operations seem to be performed with the idea that if the wound does not suppurate the hernia will be cured. Fortunately this is true in many cases. To operate upon a condition sometimes maiming but seldom mortal is to me a solemn procedure. How lightheartedly and carelessly many cases of hernia are subjected to operation by men who do not have even a hazy understanding of anatomy many of us know.

It is not the intention of this paper to magnify or to look upon as marvellous a properly performed operation. The mere technical and mechanical considerations entering into the surgical cleanliness and the plastic disposition of the tissues are simple. Like many simple things complications are often made artificially.

We shall confine our remarks to a consideration of inguinal hernia. Of the many operative procedures in vogue previous to the papers by Halsted and by Bassini, radical cure was a dubious outcome. To Halsted more than to any other man, we owe our knowledge of the causes of recurrence. In the exhaustive paper by Bloodgood (vol. vii of *The Johns Hopkins Hospital Report*) can be found the most careful analysis of the causes of failure and reasons for success ever published in any paper on hernia.

As you know, Bassini transplanted the whole spermatic cord so that it made its exit at an outer and higher level, and lay between the internal oblique muscle and the aponeurosis of the external oblique muscle. It is obvious that in direct hernia and in indirect hernia with atrophy of the conjoined tendon Bassini's operation is deficient. In Halsted's early operations he laid special emphasis upon reducing the size of the spermatic cord by excision of most of the veins. The vas deferens with its artery and a few veins was left as a thin structure, and was transplanted into the upper angle of a short incision through the lower border of the internal oblique muscle; one suture was placed above the cord, including in its grasp the aponeurosis of the external oblique muscle and the internal oblique. The next suture was placed below the cord, including the internal and external oblique, a special attempt being made to draw down the internal oblique muscle in such a way that in the continuation of the suturing the so-called new canal was lined by muscle tissue. After the introduction of a single row of deep mattress sutures the thinned spermatic cord lay beneath the skin. This was the fundamental Halsted operation; it has since been much modified. The edge of the internal oblique muscle is no longer cut, and the reason is obvious when one studies the distribution of the nerve supply. As a further advance Halsted has called attention to the fact that if the veins of the cord are excised it must be done only when the vas deferens is not torn from its bed and not transplanted. The utilization of the fibres of the cremaster muscle and the overlapping of the aponeurosis of the external oblique are later developments of Halsted's method.

The operation of Ferguson of Chicago is but a wider application of the principle, that in certain cases it is not wise nor necessary to transplant or even to disturb the spermatic cord.

For the past seven and a half years, except in direct hernias and not always then, we have not transplanted the spermatic cord, unless demonstrating the typical Bassini operation to students.

It will, we think, be granted that the higher the sac is obliterated, the better. In congenital and in sliding hernia of the sigmoid the surgeon is confronted with difficulties. For more than seven years, however, in all ordinary hernias, where there has been a well-defined sac that was not too thick, and when no adhesions were present in the sac or around its internal orifice, the inversion transposition method of Kocher has always been our choice. We have called attention to these few points with a definite purpose. We have now arrived at the point where Bloodgood's transplantation of the rectus muscle can be described, and emphasis placed upon the fact that, of all improvements introduced into the operation for hernia, this, indeed, is the most valuable.

It is true that Wölfler had described a so-called transplantation of the rectus muscle at the same time or perhaps previous to Bloodgood's publication.

Wölfler opens the anterior sheath of the rectus muscle and attempts to pull the side belly of the muscle over to Poupart's ligament, with the hope of course of supplying the deficiency in the conjoined tendon. It is apparent to any one versed in the anatomy of hernia that it would be necessary to drag the muscle over the front of the remaining outer portion of its sheath and over the inner portion of the internal oblique —a process almost impossible without devitalizing tension.

Bloodgood, in his transplantation, utilizes the outer border of the rectus muscle behind the internal oblique and just in front of the peritoneum, or, as a matter of fact, the bladder. In this way the outer edge of the rectus is available for the introduction of sutures, from the point of its insertion below to a point two or three inches above. The strong, thick muscle is easily brought over the site of the direct hernia, and always three and sometimes five interrupted sutures can be used to fasten it along the inner shelf of Poupart's ligament. Any remnants of conjoined tendon can be sutured on the anterior surface of the muscle, and farther out the internal oblique and cremaster muscles can then usually be sutured to the outer half or two-thirds of Poupart's ligament without tension.

The aponeurosis of the external oblique may be closed with a continuous suture, or the aponeurosis may be overlapped by one row of mattress and one row of ordinary interrupted sutures.

Widely divergent methods of skin suture are used according to the fancy of the individual operator.

The Cause of Failure.—Primary healing is an absolute essential in the perfect cure of a hernia, although a slight degree of skin infection may cause no actual harm if the deeper structures are not involved.

We believe, however, that wound infection is probably the most frequent cause of failure. Probably the most frequent cause of wound infection is that type described by Kocher as lesion infection. Given an operating room technic of a perfection that lowers the introduction of organisms into the wound to a harmless minimum, with careful handling of the wound and clean dissection, one attains the ideal result. If, however, fingers are introduced too frequently into the wound, parts are violently retracted and tissues torn apart by rough dissection; if there is carelessness, in hæmostasis, the tissues becoming blood stained; if there is too much tension in the sutures, then we shall have the lesion infection of Kocher and Tavel, and, undoubtedly, contribute in a very marked degree toward unfavorable healing. An extremely common cause of failure is the neglect on the part of the operator to properly appreciate the best way to distribute the structures at his command.

In many individuals the arching fibres of the internal oblique and transversalis muscles are frequently deficient even where the hernia is not of the direct type. In these cases and in all direct hernias Bloodgood's transplantation of the rectus muscle must be performed, not as a matter of choice but as a matter of necessity, if the hernia is to remain cured.

Method of Rectus Transplantation.—After the ligation of the neck of the sac, a small retractor is placed under the remnants of the conjoined tendon, the pull being upward and slightly toward the median line. With the finger-tip or long

dissecting forceps, any anterior bulging of the bladder is prevented, and a longitudinal incision is made along the outer border of the rectus muscle, exposing it to a distance of from two to three inches. A traction suture is then placed so as to grasp a large part of the belly of the muscle so that it can be drawn out from its sheath over toward Poupart's ligament. Suturing is begun from below upward. Usually from three to five sutures are introduced so that the entire area occupied by a direct hernia is covered by thick muscle. Care should be taken not to introduce these sutures in the same plane along the muscle to avoid splitting it.

The next step is to bring down the internal oblique muscle to Poupart's ligament, certainly along its outer half, and if possible so as to overlap the rectus; all that remains is the suturing of the aponeurosis of the external oblique and the skin.

Choice of an Anæsthetic.—In children up to the age of sixteen or seventeen and in neurotic individuals some form of general anæsthesia is as yet the necessary evil. In young adults, in the aged, and in all strangulated hernia, except in children, we believe that general anæsthesia should be avoided as far as possible. We strongly believe that a general anæsthetic given to a case of long-standing strangulation frequently turns the scale toward death. At the present time, methods of operating under local anæsthesia, as laid down by Dr. Mitchell of Washington, are so exact and so painless, that one who has given any study to the method will no longer use ether.

A study of the article by Cushing on "The Nerve Distribution of the Inguinal Region," a little practice in infiltration and nerve blocking, together with gentleness in handling tissues, render the method one easily learned after some experience.

The infiltrating solution that has given the best results in our hands is that recommended by Mitchell. The solution is made in two strengths. The strong solution is made by dissolving a hypodermic tablet containing ¾ grain of cocaine

and 1/400 grain of adrenalin in 50 c.c. of normal salt solution. The weak solution contains the same strength tablet in 100 c.c. of salt solution. These tablets should be sterilized in very small cotton stoppered vials with dry heat, raising the temperature gradually during one hour to 100° C. Only two tablets are sterilized in each vial and they should be placed in cotton to avoid contact with glass. After experimenting with various syringes the best has been found to be the Record of 2 c.c. capacity.

The first thing to accomplish in operating under local anæsthesia is to prevent the patient from believing that anything unusual is about to take place. In fact the best way is to say very little in way of explanation. If any question is raised, let it be known that the operator is not using ether as a mark of special favor to the patient.

A few quiet words to the effect that: "We are going to operate together, and if by any chance you feel any pain let me know," will create a proper mental attitude.

The patient's general nervous sensibilities are usually less on edge if a hypodermic injection of ¼ grain of morphine is administered a few moments before operation is begun.

Space is too limited to enter into a minute description of operation under local anæsthesia, but the points essential are: (1) Careful skin infiltration (strong solution); (2) perfect blocking of the iliohypogastric and ilio-inguinal nerves (strong solution); (3) avoiding unnecessary handling of tissues; (4) absolute prohibition as to gauze dissection; (5) forewarning patient that at this or that point some discomfort may be felt for a moment until a fresh infiltration with the weaker solution can be made.

The post-operative course of a patient operated upon under infiltration anæsthesia is so much more comfortable than with the use of ether that it is hard to institute comparisons.

The cases now reported comprise those operated upon in St. Joseph's Hospital up to May 1, 1909, at Frankford Hospital up to May 1, 1910, and at Jefferson Hospital to October 1,

1911; three operations on two patients at the Presbyterian Hospital, the last one in June, 1907.

A very large proportion of the Jefferson Hospital cases I owe to the courtesy of Dr. J. Chalmers DaCosta.

Statistical Summary.—Total number of operations, 133 on 119 patients.

Age varied from 35 days to 75 years.

There were 28 cases of strangulated hernia with 5 deaths.

One case of partial suppuration requiring removal of silk suture, result is perfect cure.

One case recurred in six months at site of transplanted cord.

Edward C., right inguinal hernia. Operation, St. Joseph's Hospital, Jan. 29, 1904. Kangaroo tendon sutures. Healing p. p. Re-operated at another hospital during my absence and was seen in September, 1904, with a second recurrence and a stitch sinus.

Dr. Richard H. Harte said that there is one important feature that is often overlooked in the question of operation for hernia, and that is the importance of having the wound thoroughly dried before closing. This is often responsible for the failure to get absolutely clean, healthy wounds. He firmly believed that this is the reason why so many men whose technic cannot be questioned get suppuration, from hemorrhage setting in after the reaction of the patient.

Dr. John H. Jopson could not agree with Dr. Nassau as to what he says of the lack of value of the rectus transplantation by the Wölfler method. He had nearly always incised the anterior covering of the rectus muscle when transplanting it, which he has done many times, in hernias, where the conjoined tendon was poorly developed, and he included in his stitches the conjoined tendon, and if the incision in the sheath is made of a fair length, one can bring the rectus muscle down to the desired point on Poupart's ligament without undue tension.

Dr. William L. Rodman believed that transplantation of the anterior sheath of the rectus is one of the most important steps that has been made in operations for hernia. It seemed to him that the transplantation of the sheath itself is more important than the fibres of the muscle, because the latter would

atrophy soon after transplantation and be of no real resistance to the future descent of a hernia. Another very important point is whether or not the cord shall be transplanted in the average case. Formerly he believed that the technic of Bassini was much the best, and he was prepared to believe so yet in a majority of cases; still he did not feel at the present time that it was absolutely necessary to transplant the cord in every case. Certainly it is a distinct disadvantage in some; as, for instance, if we have associated an undescended testis where the cord is already too short. It also seems an unnecessary step in the average case, in children, because almost any operation in them will be followed by cure. He had been omitting this step increasingly in the last five years, and although it was impossible for him to say that all these cases had done as well as where the cord was transplanted, as he had not reviewed them, yet that was his impression. Transplantation is necessary in direct hernia particularly, but in oblique hernias it may be an unnecessary step.

Most important in hernia operations is the choice of suture materials. Bassini used silk in his operations, and many others also until a number of fistulæ or sinuses caused them to abandon silk. He formerly used silk a great deal because he had not sufficient confidence in catgut or kangaroo tendon; but for the last 10 or 15 years he had very generally preferred the absorbable suture, and the best is small kangaroo tendon. Kangaroo sutures as generally used are much larger than is necessary and the knots have been the cause of trouble in the majority of instances; to this he attributed his late infections years ago. Small kangaroo tendon can be as completely sterilized as anything else and is sufficiently abiding. A suture should abide for three or four weeks to insure safety. The use of rubber gloves also has done more to make the results in hernias good than anything else except the absorbable suture materials. The use of gauze dissection is not disadvantageous if done carefully.

As to the use of cocaine, while it is undoubtedly a valuable advance, yet it is for the exceptional rather than the ordinary case. Where there are distinct contraindications to ether, cocaine should be used exactly in the way Dr. Nassau has shown. He had witnessed failures in the hands of those most familiar with cocaine.

Dr. Charles F. Nassau, in closing, remarked that he had

stated that Bloodgood in his transplantation utilizes the outer border of the rectus muscle behind the internal oblique and in front of the peritoneum. Dr. Halsted has in certain isolated cases utilized the whole sheath to cover the defect, but in the Wölfler method it is pulled out through the anterior sheath, and in Bloodgood's method the retractor is introduced beneath the internal oblique and transversalis and by pushing back the bladder the incision is made (along the outer border of the rectus), and the whole strength of the anterior sheath is then left to cover over and it may even spread out after the edge of it is freed. These are the advantages and differences between Wölfler's and Bloodgood's transplantations, it being the transplantation of the rectus muscle, not of the sheath, in any sense whatever, in every method.

He did not go into the question of suture material as he considered it unimportant. His own preference is for silk when the work is being done where he knew the silk stays in. In the Frankford Hospital where he had control of the technic and had had the same operating room nurse for years, he used silk almost exclusively as a buried suture until the last three years, when he had been using catgut, although also using silk in selected cases. He had taken out but one silk stitch from an inguinal hernia; he had taken out two buried silk sutures in seven years, and both of these he put in himself, the second time being in an epigastric hernia. Chromicized catgut, if the best brand is used, is all right.

In the question of operation under local anæsthesia, if the patient squirms over the table, suffers pain, and the surgeon is worried and things are prolonged, then it is better not to operate in this manner. On the other hand, if the surgeon does not make a reasonably persistent effort to master that technic in a certain number of cases, when the time comes where he needs it he cannot do it except his patient suffers pain, and he therefore does an incomplete operation. In one patient of 75, the only one of the series in which he resected nine inches of bowel, this was done painlessly and the old man got well. Through the courtesy of Dr. DaCosta he had two men patients in the wards at the Jefferson Hospital at the present time, both of whom went through their operations well, and he would be very glad to have any who are interested go in and see them. They lay on the operating table in perfect comfort with the exception of slight

sensations at one or two spots where they warned him he was impinging on tender ground. The thing can be perfectly accomplished if one gives a little time to it.

TWO CASES OF CAVAL OCCLUSION: (1) VENA CAVA INFERIOR; (2) VENA CAVA SUPERIOR.

Dr. Penn G. Skillern, Jr., described these cases with remarks.

Case I.—A man, 20 years of age, in April, 1910, contracted enteric fever, for which he was treated in the Pennsylvania Hospital for three months. During the third month of the disease he noticed that both legs were slightly flexed, painful, tender, and beginning to swell. They have remained swollen since. Pain started in feet and extended upward to pelvis, and also to the right lumbar region, which latter was but temporary. About two months after discharge from the hospital he noticed for the first time enlargement of the superficial veins, first in the left inguinal region, from whence the veins "began coming out all over"; he did not notice the time or order of appearance of the veins after this. These veins have not decreased in size until one week previous to this report (Feb. 26, 1912), when he noticed for the first time that they were undoubtedly diminishing in size. He feels well in other respects: no gastro-intestinal disturbances, not even piles.

Examination reveals an ulcer over each shin, in the course of the internal saphena, both 2 cm. in diameter and both presenting the usual characteristics of varicose ulcer. Moderate œdema of legs and feet.

After elevation of the lower extremities against the wall for 15 minutes, to gravitate as much of the fluid as possible from the limbs, each limb was encased in an Unna's paste dressing from the roots of the toes to the tibial tubercles.

Examination also revealed the condition of the superficial veins shown in the accompanying photograph (Fig. 1).

Along the course of both saphena there were dilated venules, taking for their pattern the delicate tracery of fine seaweed. The course of dilated and tortuous veins on the respective sides was noted as follows:

Right side. Thigh: Superficial circumflex iliac between saphenous opening and anterior superior iliac spine, just below

which it was markedly tortuous and enlarged. Abdomen: A dilated and tortuous vein receives the column of blood from the superficial external circumflex iliac and conveys it to the right axilla, passing lateral to the nipple. The superficial epigastric runs upward near the outer border of the rectus to inosculate with the superior epigastric. The superficial external pudic joins with its fellow. Chest: Anterior perforating cutaneous branches of internal mammary are more prominent below than above the nipple.

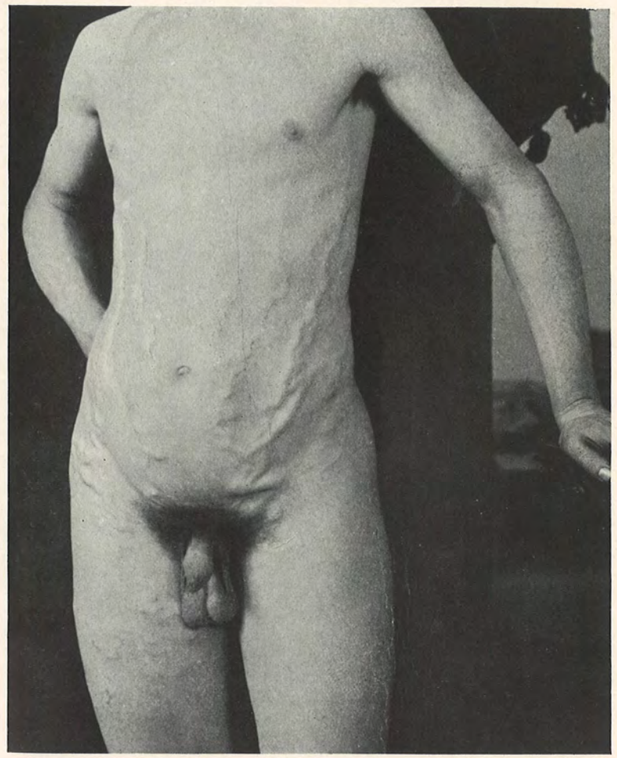
Left side: Thigh: Vascular mass over the saphenous opening, representing ampulla of saphena, and simulating femoral hernia. At the middle of Poupart's ligament there is the greatest dilation, the vessel here being 2 cm. in diameter as measured by the calipers. Abdomen: Superficial epigastric takes a prominent part. It sends a branch toward the navel which suggests the cœliotomy vein of Kelly, and which divides at the level of the navel, one branch inosculating with the superior epigastric, while the other makes almost a bee-line for the nipple, just short of which it disappears. Most of the current of the superficial epigastric, however, is diverted through a large tortuous vessel, which courses obliquely upward and outward to the middle of the axilla, and which corresponds to the vena thoracica epigastrica longa tegumentosa of Braune.

No noteworthy dilation immediately about navel. No piles. No varicocele. Area of hepatic and splenic dulness not increased. Examination of heart and lungs negative. Superficial cervical veins not enlarged.

The patient cherished an ambition to enter the service, so that the possibility of subsidence of the veins was pointed out to him. In the meantime he was advised to wear a leathern girdle with pelvic straps to support the vessels as well as to protect them from injury, and under no circumstances to permit excision of the veins.

Dr. Skillern recalled the statement of Osler that "There is no more interesting subject of study than the way in which channels of collateral circulation are established in occlusion of large vessels." As a corollary to this, he thought an equally interesting subject of study was to diagnose the character and location of the occlusion as indicated by the topography of the enlarged veins. In this case it is clear that we have to deal with a pre-

FIG. 1.



Enlargement of superficial veins consequent upon occlusion of the vena cava inferior.

viously occluding but now canalized thrombus situate at the beginning of the vena cava inferior just above its great iliac tributaries. It could not be in one of the iliac veins, as in the case depicted by Ashhurst (*Jour. A. M. A.*, 1907, xlviii, 1840), and in that by Davis (Applied Anatomy, 1910, 380), because of the bilateral involvement. There might be a thrombus in each common iliac, but this is very improbable, and is not in accord with the history of *simultaneous* swelling of both lower extremities. For the same reason the thrombus did not start in one iliac vein (or tributary) and propagate itself to the cava, or into the other common iliac. The history states that enlarged veins were first seen in the left groin, whence they spread in various directions. We can still reconcile this with the pathology, for until the veins on the left side began to enlarge the cava was not yet completely occluded, but the thrombus propagated itself retrograde to the current and occluded the left common iliac first and later the right. There is present, then, a T-shaped thrombus.

Nor was the thrombus as high as the diaphragm, as in the case reported by Osler (*Jour. of Anat. and Physiol.*, 1879, xiii, 291), in which there was great stenosis of orifices of hepatic veins, for this patient exhibited no signs of portal obstruction, to wit: enlargement of liver and of spleen, gastro-intestinal catarrh, and piles. Nor was it as high as the renal, owing to the absence of albuminuria, nor even as the spermatic, since there was no evidence of right-sided varicocele.

Direction of circulation was from below upward.

Welch in 1909 (Allbutt and Rolleston, System of Medicine, 1909, 751) states that there are reports of at least 140 cases of this affection, so that it is relatively rare. In addition to the superficial veins returning the diverted blood, there is also doubtless a deep collateral circulation by way of the subperitoneal plexus described by Sir William Turner, as well as by dilated venæ azygos minor et major. Were the burden of returning the blood borne wholly by the deep veins, diagnosis would be rendered difficult on account of the negative results of inspection.

Case II.—Clinical Summary: Aneurism of aortic and popliteal arteries; compression of vena cava superior; extensive extracaval collateral circulation. Male, aged 46. No history could be elicited that bore any causal relationship to his vascular disease.

In July, 1907, he sought surgical advice for aneurism of the

right popliteal artery, and underwent the operation of ligation of the superficial femoral artery at the apex of Scarpa's triangle, right side.

In 1903, four years previous to this operation, he noticed the superficial abdominal veins beginning to enlarge. These veins shortly reached their present size, and have neither increased nor diminished in calibre.

Examination reveals a tall, fairly well-developed man, whose appearance is indicative of good health. Impact of heart against chest-wall greater than normal. Râles scattered throughout lungs. Liver enlarged, particularly in epigastrium. Area of splenic dulness increased. Hemorrhoids present. No inequality of pupils or of radial pulses noted; voice clear and resonant. No brassy, unproductive cough.

Regarding the dilated and tortuous superficial veins, these were noted as follows:

Lower extremities: No varicose veins, no varicose ulcers, not even legacies of these lesions nor scars about knees were observed.

Right side: Abdomen: Superficial epigastric ascends to 1 cm. below navel and deviates to the right to cross the level of the navel 3 cm. laterally. It then inosculates with the superior epigastric, which fuses with its fellow over the ensiform. Chest: A dilated vein runs from the middle of the axilla to the fifth intercostal space, where it disappears. Neck: Dilation of superficial veins, particularly about root of neck.

Left side: Abdomen: Superficial epigastric, smaller than its fellow, crosses level of navel 6 cm. from mid-line. In this portion of its course it loops over to join its fellow across pubic hair 3 cm. above root of penis and again just below navel. It then inosculates with the superior epigastric, which fuses with its fellow over the ensiform. From the ensiform a single vein courses upward in front of the sternum to join both external jugular veins. This single vein receives as tributaries the anterior perforating cutaneous branches of both internal mammary veins. As on the right side, a dilated vein runs from the middle of the axilla to the fifth intercostal space, where it disappears. Neck: Dilation of superficial veins, particularly about root of neck.

Remarks.—Unfortunately this patient became sensitive to a degree in regard to his condition, and it was only out of courtesy to Dr. Miller that he submitted to examination, which was rather

hastily conducted in a dressing-room of the clothing shop. He would not consent to be photographed, to have blood taken for a Wassermann test, nor to appear before a medical society. There is no doubt, however, that the site of the venous occlusion is the vena cava superior; this is attested by signs of portal obstruction, namely, enlarged liver, enlarged spleen, and presence of piles; by the venous dilation about the root of the neck; and by the great similarity of the collateral venous circulation to previously reported cases, particularly that of Osler (*Johns Hop. Hosp. Bull.*, 1903, xiv, 171), the photograph of whose patient shows a collateral venous circulation which is almost the exact counterpart of those in this patient. That the compression of the cava is aneurismal in cause seems justified by the presence of arterial degeneration as shown by the existence of the popliteal aneurism, and by the chronic cough, backache, and intercostal neuralgia from which he suffers. That the cause of the cardiovascular disease is obscure is admitted, but the probability of its luetic nature is suggested in the history. Whether the man's occupation as a salesman of clothing for 20 years up to the time the disease first appeared, during which time he was on his feet all day and constantly lifting more or less heavy wearing apparel, had any causal relationship with his vascular disease, is problematical. It is noteworthy that he attributed his trouble to worry, which may or may not have been a cloak to conceal the real origin of the malady.

Welch (*loc. cit.*, p. 755) in 1909 found records of 35 instances of obliteration of the superior vena cava. He states that one-third of the cases are due to thrombosis, but that most depend either upon pressure from without, as by aneurisms, or upon syphilis. Dilation of superficial veins is especially marked over the anterior wall of the thorax and upper part of the abdomen, as held in Dr. Skillern's case. After reviewing a train of head and arm symptoms and signs that might be produced by venous obstruction near the superior thoracic aperture, he says: "In the light of the whimsicalities of venous thrombosis, it is hardly necessary to add that the symptoms may be less marked, and may deviate from what might naturally be expected."

The essential differences between these two cases are, first, the direction of the current. In Case I, where the inferior cava was obstructed, the blood was conducted efferent from the femoral

veins afferent into the axillary veins, so far at least as the superficial circulation is concerned. The direction of the current was from below upward. In Case II, on the contrary, where the superior cava was blocked, the blood was conducted efferent from the innominate and axillary veins afferent into the femoral veins. The direction of the current was from above downward. Then in Case I the veins of the lower extremities were involved, and there were varicose ulcers, while in Case II these vessels were uninvolved, probably because compensation by way of the deep abdominal veins was sufficient to obviate too much positive pressure upon the saphena veins, while the femorals below the latter took care of themselves by means of their powerful valves. In Case I there was no portal obstruction, while in Case II this was marked. In Case I there were no dilated veins over the sternum or at the root of the neck, while such was the feature of Case II. In Case I the etiology was unmistakable, while in Case II it was most likely luetic. Finally, the difference in ages. The first patient was 20 years of age, far below the period of vascular decadence, while the second patient was 37 when his malady started—well within the period of vascular degeneration.

FRAGMENT OF FILIFORM BOUGIE NUCLEUS OF VESICAL CALCULUS.

Dr. Henry R. Wharton related the history of a man, 30 years of age, who was admitted to the Presbyterian Hospital June 15, 1911, on account of retention of urine due to a close stricture of the membranous portion of the urethra; notwithstanding adequate dilatation of the stricture he continued to suffer from intermittent attacks of retention. Upon exploration of the bladder by a searcher a stone was felt. Median perineal aplotomy was then done, and two calculi were removed, each of which had developed upon either end of a four inch long fragment of a filiform bougie. Upon inquiry it developed that the man had been treated for his stricture one year before at another hospital, and it was presumable that in the course of this treatment the fragment of bougie had been left in the bladder. The mechanism of the intermittent retention may be explained by the fact that at times one of the stones attached to the fragment of bougie was forced into the urethra during micturition and for the time occluded it.

Dr. Morris Booth Miller said that some three or four years ago he had almost an identical experience. While on duty at the Philadelphia General Hospital he had a patient under his care with a persistent perineal fistula following an external urethrotomy. Nothing that he could do would close the fistula, so finally under ether he explored and found an incrustated filiform which had been cut off. The larger portion of it was in the bladder but a portion was in the urethra. Upon consulting the colleague under whose care the patient had previously been, he recollected that he had introduced two filiforms and thought they had both come out intact, but what had happened was that one had been cut off in the operation and a piece about three inches long had been allowed to remain in the bladder.

Dr. Thomas C. Stellwagen said that he had in four or five instances detected in the bladder with the cystoscope portions of a filiform bougie. The Gouley catheter is dangerous, for after long use the tip gets sharpened and cuts the end of the filiform, and the surgeon does not realize it.

Each filiform should be most carefully tested through the Gouley or set of Gouleys before using it, because the filiforms sometimes do not allow the Gouley to slide freely over them, and too much force may be used, and in this manner the end is forced into the bladder and cut off.

Dr. A. P. C. Ashhurst said that it used to be taught by the late Prof. John H. Brinton that when the Gouley catheter has been passed down to the stricture over the filiform, it was safer to push both the filiform and Gouley catheter together, passing them both at the same time from this point on; because if one pushed the catheter onward over the filiform one surely would cut the end off the latter.

Dr. G. G. Davis said that some filiforms are made of whalebone, some of the French of silk, others of hardened catgut or silkworm gut; the whalebone ones are quite brittle and they not infrequently break, while the French ones are more apt to double on themselves.