constriction of the small bowel and thus intestinal obstruction in a boy four and one-half years old. This case recovered. Of the two other cases a Meckel's diverticulum was seen during the course of an operation for another condition and one was found at autopsy. In discussing this paper, Doctor Gibbon cited three cases, one of which was causing intestinal obstruction, and Dr. W. J. Taylor referred to the case already cited, and mentioned one other upon which he had operated. No other instance occurs until 1914, when A. B. Gill reported a case of perforated Meckel's diverticulum with recovery. Seven years elapse until the next instance is recorded in January, 1921, by E. J. Klopp, his case being one of acute inflammation of Meckel's diverticulum. At the next meeting, February, 1921, E. T. Crossan and Don Lew, the latter by invitation, reported a case of acute intestinal obstruction from Meckel's diverticulum complicating acute appendicitis. At the last meeting, December, 1922, Dr. Damon Pfeiffer reported a case of perforated Meckel's diverticulum requiring resection of the intestine. In all, therefore, including my own case, there have been thirteen instances of Meckel's diverticulum reported to the Academy of which five caused acute intestinal obstruction.

DR. WM. J. TAYLOR stated that he had had one case of obstruction in relation to Meckel's diverticulum, which he reported at Johns Hopkins Medical Society meeting. He operated on a child four years of age for what he thought was acute appendicitis. On opening the abdomen a large mass was found, which he opened up, and found to be a Meckel's diverticulum twisted on itself three times, and strangulated. It was black and gangrenous and contained a number of grains of corn. It was cut off and the child made a good recovery.

PLEURAL EPILEPSY

DR. HUBLEY R. OWEN and DR. A. GONZALEZ (by invitation) read a paper with the above title, for which see page 6.

Stated Meeting Held February 5, 1923

The President, DR. JOHN H. JOPSON, in the Chair

BULLET WOUND OF PREGNANT UTERUS

DR. J. W. BRANSFIELD reported the case of Mrs. L. T., age eighteen years, who twenty minutes before admission to St. Agnes' Hospital, April 28, 1922, accidentally discharged a revolver, the bullet striking her in the abdomen. She complained of a burning sensation with occasional cramp-like pains in her abdomen; no other discomfort. She stated she was about eight and a half months pregnant.

Examination showed bullet wound of entrance in abdomen 2 cm. below the umbilicus in midline. Uterus could be palpated and the fundus extended about 1 cm. above the umbilicus. The size of the uterus led me to believe that the patient was about at term and further questioning brought forth the information that she had been suffering from severe

pains of cramp-like character for the past twelve hours. He suspected she was in labor when injured. The point of exit of the bullet could not be found. Heart and lungs were negative. The patient was sent directly from the receiving ward to the operating room, and under ether anæsthesia, the abdomen was opened by a midline incision. The bullet tract through the abdominal wall was excised. The uterus was delivered into the wound. The intestines had escaped injury, being pushed upward by the pregnant uterus. The bullet wound in the uterus was found about 3 cm. from the crest. No wound of exit was seen. A Cæsarean section was performed and a living female child delivered. The placenta was practically detached from the uterus. The membranes had been ruptured.

The child was uninjured and normal in every respect. The bullet could not be found either in the placenta or in the uterus. The uterus was closed in the usual manner and the abdomen closed without drainage. Vaginal examination made with a view of dilating the cervix for drainage revealed the cervix to be practically obliterated. The bullet was lying free in the vagina. No injury occurred either to the cervix or vaginal wall. Both patients did well following the operation and were discharged from the hospital, May 23, 1922.

TRAUMATIC LESIONS OF THE HEAD

DR. THOMAS A. SHALLOW read a paper with the above title, for which see page 26.

DR. CHARLES F. NASSAU in the discussion of it mentioned that in the Mutter Lecture a number of years ago, he had compared the results of fractures of the skull treated by operative and non-operative methods, and had looked up twenty-four cases of fractures of the skull that were not operated upon, to compare with the histories of twenty-four operated cases. At that time, following the advice of Cushing, some surgeons were doing subtemporal decompressions in cases of subdural hemorrhage. He modified this by turning down a flap over the temporal region and, if necessary, creating a large skull defect, which gave free access to all bleeding. This was closed secondarily in from three to five days. He used a large Turks' head dressing, which was not disturbed until the secondary closure. Comparison of the immediate results was startling. In the twenty-four cases treated conservatively, the mortality was 79 per cent.; the cases which had been operated upon carried a mortality of 38 per cent. In other words, the mortality was cut in half.

He did not take the standpoint that all fractures of the skull should be operated upon, and questioned very much whether any surgeon is able to save many patients with bad fractures of the posterior fossa. However, in compound fractures of the base in the middle or anterior fossa, he was of the opinion that we would obtain very much better results if more of them were operated upon. It is the one way in which all compression may be relieved, and with proper post-operative conditions chances of infection are slight, even when closure is delayed. This procedure entails no great risk, and if there is a subdural clot, it should be evacuated. This method of treating subdural hemorrhage has been practiced for many years, and he believed

that too large a percentage of cases not so treated become epileptic or have some grave changes in mentality. These cases all bleed copiously, especially when any of the large sinuses are ruptured, but he had seen only one or two complete decompressions with fatal hemorrhage. With pressure relieved, the hemorrhage is almost sure to stop.

Within the past few months he had seen a child with Doctor Jopson, and they considered very carefully whether they should operate that night. The child was not operated upon, and he now has a partial paralysis of the fourth nerve. He did not believe that the non-operative treatment was responsible for his present condition. The patient had probably a slight hemorrhage into the nerve unrelievable by surgery.

DR. J. S. RODMAN thought that one of the primary difficulties standing in the way of a clear conception of the indications for treatment, conservative or operative, was the various ideas of the underlying pathology and symptoms of these various traumatic brain lesions which differ so widely. What is concussion to one is not so to another, and there seems to be no uniformity of opinion in this regard. He had come to look upon simple, uncomplicated concussion as a relatively slight injury which will invariably clear up on the conservative plan of management. In fact, he believed there should be no particular difficulty in separating concussion, contusion and acute compression. In this differentiation an estimation of the pulse pressure is exceedingly important and he believed it a good working rule to consider an equality between the pulse-rate and pulse-pressure as an indication for operative relief of tension. In so far as eye symptoms are concerned, of much greater importance to him than inequalities of the pupil are the fundus findings, especially on the side of injury, of paling of the optic disk and congestion of the retinal veins. There can be no question, he thought, that intracranial tension can better be relieved by a large bilateral opening of the skull than by the smaller opening of a subtemporal decompression. But he had come to feel that many of these cases are going to get well without any operative procedure and that some are sure to die in spite of any operative procedure. In those suitable for operation, he preferred a subtemporal decompression, bilateral if need be, inasmuch as the defects thus caused are amply protected by the temporal muscle. He believed it is a serious matter to create cranial defects in the parietal regions, since most of them must be closed later because of the disabling symptoms they cause.

DR. BERNARD B. NEUBAUER stated that in diagnosing acute head injuries we consider the determination of intracranial pressure a very important factor. We base our treatment a great deal on what the intracranial pressure reads when taken with the spinal mercurial manometer. If the reading shows a pressure of 10 to 12 mm. or below we treat palliatively. If below 16 to 18 mm. and above 10 to 12 mm. we treat by therapeutic spinal puncture and repeat in twelve hours and daily thereafter until reading by spinal mercurial manometer is within physiological limit. If the reading by manometer is above 16 or 18 mm. we remove 5 c.c. of spinal fluid slowly for laboratory use only and

do a subtemporal decompression with drainage. We do not do a therapeutic spinal puncture for relief in these cases, as compression of the medulla in the ring of the foramen magnum is too serious a condition to take such chances as it may cause medullary œdema and death.

Usually shortly after the operation for subtemporal decompression with drainage, the readings as shown by the spinal mercurial manometer are reduced. He did not remember seeing any choked disks in acute head injuries. If the cases having a high increase in intracranial pressure are allowed to continue without relief, they usually develop medullary œdema and die. If they do recover they usually show post-traumatic symptoms both physical and mental, which are very distressing.

They do not base the diagnosis and treatment on whether or not a fracture of the skull exists except in fractures of the vault. They feel that the determination of intracranial pressure in acute head injuries is very important. Injuries to the posterior part of the vault are usually most serious as they involve the medulla with its associate serious syndrome. Should an operation be advisable they do a suboccipital decomposition with drainage.

Dr. John B. Roberts thought that "concussion" should be left out of the list of surgical conditions. Histologically, there is doubtless such a thing, but if a patient does not regain himself quickly one should look into the brain to see what is wrong by neurological or surgical means at once. He believed he had obtained good results, in obscure injuries to the head, by reducing intracranial tension by means of early venesection associated with purgation.

Doctor Shallow in closing said he did not mean to give the impression that he believed in operating in every case. Two of the cases reported were not operated on. In reference to Doctor Rodman's remarks about the size of the decompression, one can go in and stop the hemorrhage if there is any. He had seen subdural decompressions which were not sufficient and had done as many as four decompressions. One can determine the extent necessary at the time of operation. Whether pressure causes the epilepsy or not, he was doubtful, but it hardly seemed so, as in that event every case of brain tumor would have it.

These cases should be operated on within a number of hours, before they get their optic atrophy and choked discs. One might as well go on and follow the conservative treatment, if you wait for all these symptoms to develop. He thought that careful study with the ophthalmoscope was impossible in these cases. His observation is to determine at once what is the best thing to do if the patient does not come back to consciousness. If it is the quiet form of unconsciousness one can take some risk. If one does a lumbar puncture and finds hemorrhage it indicates a subdural hemorrhage.

TRANSPLEURAL ŒSOPHAGO-CUTANEOUS FISTULA

Dr. Alfred Hand and Dr. Walter E. Lee reported the case of L. L., two years of age, male, who was admitted to the Children's Hospital with the history of having caught cold July 4, 1922; who on examination

presented the typical physical signs of a consolidation of both left lobes of the lung. On July 16 changes in the physical findings led to the inference of fluid being present and on exploratory aspiration, cloudy fluid was withdrawn from left base in posterior axillary line. Patient was transferred to the surgical ward July 17.

Operation under local novocaine anæsthesia. Incision in eighth interspace, left chest, posterior axillary line. No rib resection. A foul-smelling, thin, purulent material was liberated on opening into the pleural cavity, to-and-fro suction through the wound very marked. Rubber tube inserted just to the inside of the pleural cavity and fixed by silk.

After operation child did well, not seeming to suffer from any shock; hourly dressing. Drainage continued profuse, but on July 20th a change was noted in its character, it having become more profuse, and white and

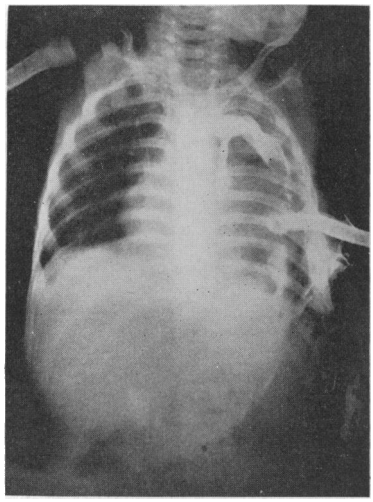

FIG. 1.—Showing œsophago-pleural fistula.

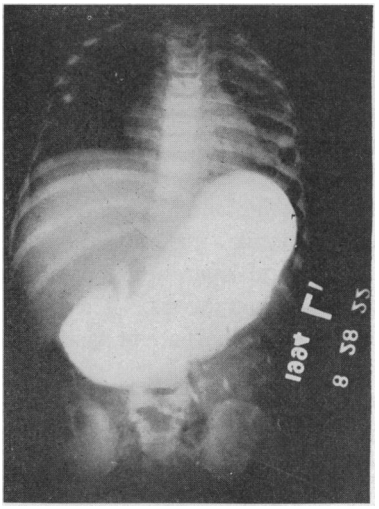

FIG. 2.—Showing fistula closed.

flaky in appearance, having an odor of sour milk. On the following day it was noticed that immediately after the ingestion of fluids there was a more active discharge from the chest opening, smelling like sour milk. An X-ray after a barium meal showed a communication between the œsophagus and abscess cavity (Fig. 1).

The Rehfuss tube passed into the stomach was not well tolerated, although the thoracic discharge lessened. On July 24, after forty-eight hours, the tube was withdrawn on account of extreme restlessness and passed through the nares. X-ray at this time showed the left lung almost completely expanded. On July 28, after tube feeding for six days, it was discontinued because of irritation to nares and ingestion of semi-solids, but little or no liquids allowed. No passage of food through the fistula was noticed. This impression was confirmed from X-ray examination on August 12. The child rapidly improved in strength and appearance, the discharge greatly decreased and became less foul. On August 20, drainage tube removed. On August 28, a confirma-

tory X-ray showed the fistula apparently closed (Fig. 2). On September 6, discharged from hospital; incision almost healed; very slight discharge; condition excellent.

Readmitted October 18, 1922 (about five weeks after discharge). With an abscess at the site of the old thoracotomy opening, incision of which liberated a large amount of foul-smelling pus. On October 25, two ribs (eighth and ninth) were resected, and a well walled-off pocket of pus about three inches in depth was found and evacuated, which after draining normally for eighteen days closed and patient was discharged cured.

Doctors Ballin and Saltzstein, Detroit, Mich., have published a thorough and comprehensive article on this subject. They report seven cases, including their own. Since that time reports of œsophageal perforation into the trachea have been made by Forster, Miginiac, Menne and Moore; two being of malignant origin and one of rupture, the latter being due to sudden internal pressure (violent vomiting of a solid curd of milk). There was no suggestion of a preceding inflammatory condition in this case. Of a transpleural œsophageal fistula, Fonte reports one, probably luetic. Necropsy showed perforation two cm. above the cardia into the pleura. This report includes a second case, that of a true transpleural œsophageal cutaneous fistula, male adult, recovery after two years three months suppuration; several operations were performed with negative results; cure was apparently spontaneous. The diagnosis was confirmed, late in the course of the disease, by the patient tasting the fluid that was injected into the pleural cavity—probably a gastric regurgitation having first passed into the stomach through the fistula and thence to the mouth. In this case there was a history of a contusion of the left thorax two months before the pleural focus was diagnosed. Whether this had any relation to the resultant condition we are unable to state.

If one takes the various possible causes or the etiology of this condition, only two seem possible in this case, namely, acute œsophagitis and ulceration, or a tuberculous condition resulting in ulceration, and second, a local pleural inflammation and ulceration into the œsophagus. Of the above two etiological possibilities one cannot state one or the other with positiveness, but owing to the relative short time necessary to effect a cure, they are rather of the opinion that it was not of a tubercular origin.

Considering the œsophagus anatomically and remembering its relations to the trachea, vertebræ, aorta and bronchus and examining the accompanying X-ray plates, we are led to believe that our perforation occurred at approximately its second anatomical constriction, or in other words, at the point where it is crossed by the left bronchus at the level of the fifth thoracic vertebra. Here it is deviating to the left and is in contact with the left pleura. An ulceration from the pleura might well perforate through into the œsophagus. That the ulcerative process did not occur primarily in the œsophagus may be deduced from the fact that it was not until several days after operation, and considerable time after thoracic symptoms developed, that food

material was seen or suspected in the discharge. That the fistula was not caused from irritation of the thoracotomy drainage tube, may be dismissed by the fact that the tube inserted was of sufficient length to penetrate into the pleura not over one cm. Also, if the ulceration and perforation had occurred previous to operation, the drainage would have been into the œsophagus and a resultant vomitus of a pus material would have ensued; therefore we are led to believe that a local suppurative pleurisy ulcerated into the œsophagus at its closest point to the pleura, the pleura being drained through a thoracotomy opening.

Treatment.—Two main points are to be borne in mind, one, maintenance of sufficient nutrition for the patient, and second, the reinfection and constant irritation of the pleura by the traversing of the ingested food to the cutaneous surface. Of the two the maintaining of sufficient nutrition is probably the one to concern us most, providing sufficient facilities have been made to adequately drain the pleura of its infected material and food coming through the fistulous channel. The Rehfuss tube is the method of choice to overcome both conditions, but as in our case, the patient not bearing this treatment well, resort must be made to other means. Rectal alimentation or gastrostomy may be used, but the simple method of giving the more solid foods (junket, custards, etc.), providing the perforation is not large, is the least complicated and was apparently effectual. If the fistulous opening into the œsophagus is large or is at the base of a diverticulum having a wide opening, the method we used would be of little avail in overcoming the two points mentioned. The Rehfuss tube passed readily into the stomach and there was apparently no pouching or diverticulum present.

The return of the patient for drainage of the local abscess and treatment of the necrosed ribs at the site of the thoracotomy, we do not consider as part of the condition of perforation of the œsophagus, but rather a local sequela of the thoracotomy.

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BRONCHO-SUBPHRENIC-CUTANEOUS FISTULA

DR. ASTLEY P. C. ASHHURST reported the case of a man about thirty years of age, who came under his care in the Episcopal Hospital thirteen years ago, with a history that about three years before he had had some venereal disease, apparently chancroids. About six months before coming under observation, he began to have pains in his back. A few weeks before admission to the hospital he had developed a cold abscess in the left lumbar region; he was admitted to the ward, put on a Bradford frame, with extension; but as the abscess did not improve, and as he had fever and other evidences of secondary infection, and as

there was no evidence of vertebral disease, it was decided to open the abscess and drain it. When opened it was found that it surrounded the kidney which appeared to be normal. The cavity extended down toward the crest of the ilium. Doctor Ashhurst thought it came from infection of the retroperitoneal tissues ascending from the genitals. The patient convalesced but the sinus remained. He was under observation subsequently in the dispensary, but after two months, as the sinus remained unhealed, some bismuth paste was injected into it, whereupon the patient became blue in the face and the paste came out of his mouth. After a few days the bismuth injection was tried again, because it was desired to find out whether it came out of his stomach or his lungs. The second time the patient was sure it came from his lungs. He apparently had a subphrenic abscess communicating in some way with his bronchus. After several injections the amount of bismuth paste which passed through to his mouth gradually diminished and the sinus healed up. One year later he was seen again with the skin lesions of tertiary syphilis, which cleared up under treatment. He appeared to be well and had no sinus. Cases of long and tortuous fistulous communications of this kind are apparently comparatively rare, and it is remarkable how insidious the disease may be in its onset and yet the patients recover with so few complications.

IMMEDIATE PLASTIC OPERATIONS IN INJURIES INVOLVING TENDONS OR JOINTS

Drs. G. M. Dorrance and J. W. Bransfield discussed this subject by stating that in traumatic surgery, the object is to restore the injured workers to the same or some equally useful occupation. In other words, surgeons who fail to do constructive surgery are amiss in their duty towards the patient.

The experience gained in the war in debridement of wounds, primary suture, mechanical cleansing of wounds, and late plastic surgery have been of inestimable value in caring for traumatic cases.

The uniform success obtained with pedicle flaps in late cases where the infection had not entirely cleared up, led us to believe that the increase in blood supply brought to the parts, plus the pouring out of the blood spasm and lymph, might be a factor in the healing of these cases. In all events, the infection did not appear to prevent the flap from taking.

Exposed tendons or joints, especially in crushing injuries, do poorly. They are likely to become infected and later slough. Antiseptic dressings are prone to destroy the linings of joint cavities, tendon sheaths and tendons.

They are confident that they have found a means which helps, at least in part, to overcome the difficulties encountered, and have seven cases where pedicle flaps were used immediately to cover exposed tendons or joints. In all joint cases, the rules laid down by Willems were carefully observed.

The cases shown illustrated the three most common types encountered. 1. Exposed tendon and joint in a finger. 2. A palmar injury with superficial flexor tendons exposed. 3. Compound fracture with joint opened and superficial extensor tendons exposed. All of these cases, if treated by the usual

surgical procedures, would require plastic operations later, as there was a distinct loss of skin and superficial fascia. In the event an immediate flap had not been used, marked contracture and deformity would have occurred due to the contracting cicatricial tissue. In the third case cited above, amputation of the forearm was seriously considered, as the skin and superficial fascia had been torn off over an extensive area. Tendons were exposed and the wrist-joint opened, both bones of the forearm were broken and the fracture of the radius was compound.

The technic is the same as that employed in constructive plastic surgery of the hand. An abdominal flap is raised, using parallel incisions. The bed from which the flap is raised can usually be covered by undermining the surrounding skin. (Fig. 1.)

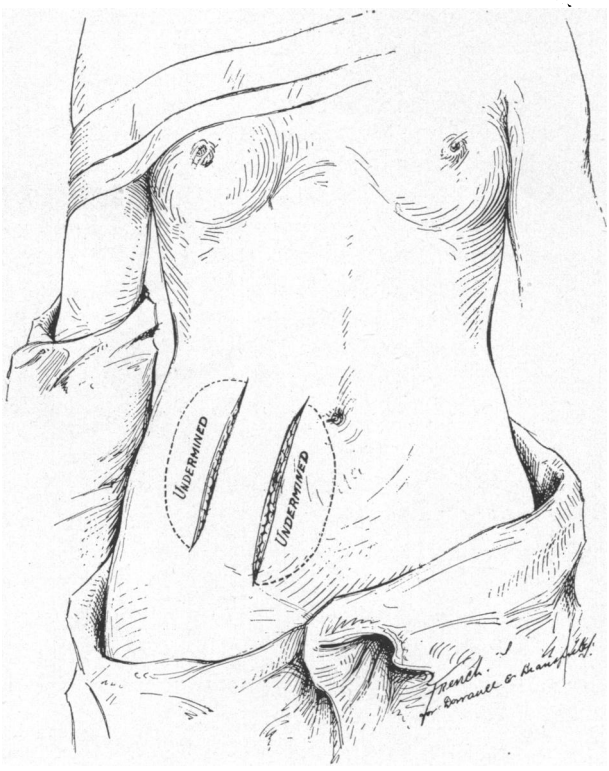

FIG. 1.—Showing preparation of abdominal flap.

The potentially infected hand or arm after careful mechanical cleansing, followed by the surgical removal of all devitalized tissue, is placed under the flap, the edges of which are sutured in place. (Fig. 2.)

While preparing the abdominal flaps, they have placed the injured hand or arm in 1 to 50 hypochlorite solution. Local suppuration may occur at the margin of the wound, but will respond to the usual treatment. They have not lost any tendons through infection. In none of their cases have the tendons been divided by the injury. If this had occurred, they would not do an immediate suture.

They feel confident that the method offers something worth while in preserving tendons and joints in these cases. They have not had a sufficient number of cases to recommend it as a universal procedure. Modifications of the technic may have to be made from time to time.

Conclusions.—1. In traumatic injuries with loss of skin and superficial fascia, with tendons or joints exposed, a pedicle flap used immediately appears to preserve the tendons and joints from infection and prevents loss of tissue.

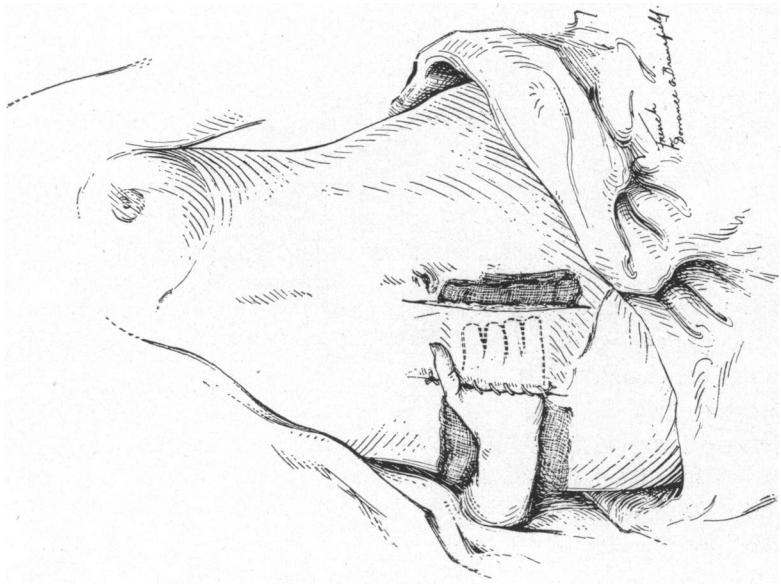

FIG. 3.—Showing injured hand sutured to flap of abdominal wall. Gauze dressing between forearm and abdominal wall.

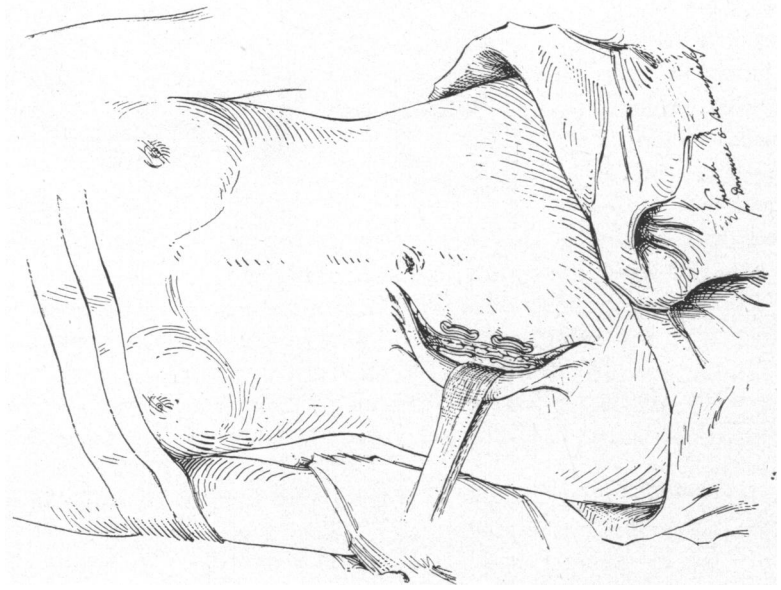

FIG. 2.—Showing position of parallel incisions and method of undermining in order to close skin beneath flap.

2. Deformities due to scar-tissue contractures are avoided and the length of time in the hospital is appreciably lessened.

3. Traumatic injuries of this type are given a better chance for a functional result.

4. Amputation may be avoided by early plastic operation.

DR. DEFOREST WILLARD thought this idea of putting the skin immediately over the joint wound a good one. This procedure should enable one to start early joint motion in those cases where there is a considerable amount of open wound. This probably applies also to the tendons. If the tendon sheaths are still good, he thought immediate skin graft was not so important, but if open, a graft with fat underneath will be a distinct addition to the surgery of traumatism.

DR. A. P. C. ASHHURST stated that for years surgeons had turned in flaps from the neighborhood of recent wounds, where the local conditions demanded; but taking pedicled flaps from another region of the body in such circumstances is not a recognized procedure. And certainly, in the case of the woman shown, he thought as good a result could have been secured by sacrificing the two outer metacarpals, which are of no use to her anyway, and then using the skin which covered them as a flap to cover in the denuded ends of the first and second metacarpals.