

limits, and with a fair degree of usefulness. It is believed that its normal limit is about 100 years. Instead of about 40 years under the most favorable conditions, as at present, it is quite probable that 60 or more years should be attained by the best use of the means now known; that is, the average should be 60 or more years. With a better understanding and more faithful observance of health laws 40 additional years should be reached. This obedience to law, this adjustment of our surroundings and regulation of our whole being, mind and body, in accord with the conditions of physical health, will prove to be the only true elixir of life. . . .

The future is full of hope. Everywhere science with the microscope and the crucible is following the germs of disease and the agencies of death. Politicians even are beginning to think it is worth while to preserve the lives of their constituents. The great public is beginning to believe that something more potent than fasting and sackcloth can be devised for their protection from pestilence and the grave. Let us all work together and we can do much even now, and in doing what we know how to do we shall find out other ways to do still greater things. So shall we lengthen the cords and strengthen the stakes of the great tent of life, under which the cry of distress and wail of bereavement shall become ever less and less; while in swelling chorus shall be heard, through the ages, the laughing of children, the sweet voices of young men and maidens, and the strong words of old men and matrons.

4 Sixteenth street, Chicago.

ORIGINAL ARTICLES.

THE CURE OF HERNIA BY THE USE OF THE BURIED ANIMAL SUTURE.

Read in the Section of Surgery and Anatomy at the Fortieth Annual Meeting of the American Medical Association held at Newport, R. I., June 25, 1889.

BY HENRY O. MARCY, A.M., M.D., LL.D.,
OF BOSTON.

This paper is offered as a clinical study of operative measures for the cure of hernia. The cases reported represent all the usual varieties and were operated on during the eight months ending with April, 1889.

Case 1.—J. R., aged 45, an invalid for years from a large scrotal tumor. I had twice aspirated a few ounces of bloody fluid. There was also disease of the testicle. From the external ring there was a firm mass the size of the fist, continuous with the scrotal tumor. He had consulted several physicians, including members of the surgical staff of the Massachusetts General Hospital. Diagnosis uncertain, perhaps a malignant tumor; operative measures inadvisable. I operated

August 29, 1888, assisted by Dr. S. N. Nelson, of Boston. Removed the diseased testis; opened the hernial sac, which was found to contain only compressed omentum. Its folds were adherent, but were separated into the specimen here shown, which measures 6x8 inches. It was sutured across at its base, freed from adhesions to the internal ring, and divided. The stump was returned within the abdominal cavity. The large peritoneal sac was everywhere closely blended with the external tissues and was dissected with difficulty. It was freed to within the internal ring, well drawn down, and sewed evenly across at its base with five or six continuous sutures. This was excised and the closed peritoneum replaced within the ring. The internal ring was closed with a deep layer of double continuous tendinous sutures. A second layer of sutures was continued in the same manner, approximating the structures external to the pillars of the ring. The scrotal tissues were also closed by layers of buried continuous animal sutures. The skin was approximated subcutaneously by a blind stitch and the wound sealed with iodoform collodion. The operation, as were all of the entire series, was performed under strict antiseptic precautions, including continuous irrigation with a 2.5% sublimate solution. The wound healed without suppuration or even in any degree scrotal œdema. The patient was free from pain almost from the first.

At the discussion upon the subject of the cure of hernia in the Surgical Section of the Suffolk District Medical Society, January, 1889, Mr. R. kindly consented to be present and let the result be seen. The wound remains firm to date, the patient has resumed his ordinary occupation, suffers no inconvenience, and has not worn a truss. The sac in the specimen presented is stuffed with cotton and exhibits the peritoneal surface, in order to show the extraordinary changes that occurred in the development of its fibres.

Case 2.—M. H., aged 30, patient of Dr. C. W. Stevens, of Charlestown; is of exceptional physical development, fond of athletics. A large scrotal hernia of the right side, which for a considerable period has been irreducible and painful; incapacitated him at times for any labor. Had previously worn a variety of strong trusses with inability of retention. I operated September 29, 1888; opened sac, which contained an easily reducible loop of intestine and a large mass of compressed adherent omentum. The ring admitted two fingers. The operation was conducted as in case 1, except that, in the closure of the ring, the cord was gently lifted to one side and the internal ring closed from below upward, closely upon the cord at its entrance within the abdominal cavity. This was done in order to restore the obliquity of the canal. The cord was then replaced, and with the same suture the pillars of the ring were closed

down externally upon the cord, quite to the level of the external ring of the opposite side. The patient made a rapid recovery, the tissues uniting by first intention without œdema and almost without pain. Recent examination showed a slight bulging of the right inguinal region, but without opening of the canal. On account of a feeling of weakness and to prevent further yielding of the parts, he has been fitted by Dr. Codman with a light truss, which he wears with comfort.

Case 3.—J. M., age 55, coachman. He had been troubled with a right inguinal hernia for a long time, complicated with hydrocele, for the relief of which he has been frequently tapped; fluid withdrawn at the Massachusetts General Hospital a few days previous to operation, October 4, 1888. He was unable to reduce the hernia, and after two days of severe vomiting, the latter part of which was stercoraceous, he sought surgical aid. Taxis under ether proved unavailing. Assisted by Dr. H. D. Didama, of Syracuse, N. Y., I divided the constricting ring, restored the hernial contents and completed the operation for radical cure. After rallying from the ether the patient was taken in a carriage to his home, where he remained in bed two weeks, almost without attendance, but he made a rapid and painless recovery. He was also exhibited at the meeting of the Suffolk District Society above referred to. Although the hydrocele has twice refilled to inconvenient size, he remains entirely without discomfort from the hernia, has not worn a truss, and is actively at work.

Case 4.—S. N., physician, age 31, upon whom I operated for the cure of an inguinal hernia of the left side in the autumn of 1886, which has remained firm up to the present time. During the summer of 1888 he first noticed a slight bulging of the right side, for the support of which he applied a light truss. Notwithstanding, the hernia rapidly became scrotal and irreducible. I operated October 12, 1888, assisted by Dr. H. D. Didama. The sac was thickened, everywhere adherent, and dissected with difficulty. The loop of the intestine was easily reduced, but a considerable amount of omentum was adherent, and so changed that it was removed. The specimen here presented is interesting because of its rapidity of formation. The patient suffered extremely from pain in the back on account of confinement to the bed. For this reason he was allowed to sit in a reclining chair each day after the first, and in two weeks from the operation walked a quarter of a mile without inconvenience. The side feels perfectly firm at date. He has not worn a truss.

Case 5.—Mrs. J., age 40, entered private hospital on account of ruptured cervix and perineum. She had suffered also for years from a femoral hernia of the right side, easily reducible, but

which was imperfectly retained with a truss. In addition to the operations for repair of cervix and the perineum, I removed the hernial sac December 3, 1888, which is here exhibited. The recovery was rapid without any unfavorable symptoms and the patient remains cured at date.

Case 6.—G. S., age 40. The general health of the patient excellent, but for years he has been incapacitated for active labor because of a large left inguinal hernia, complicated with a varicocele. The scrotal tumor is so large as to extend at times quite one-third to the knee. The hernial tumor is imperfectly retained by a truss, the pressure of which causes pain by impeding the venous outflow. Assisted by Dr. H. D. Didama, of Syracuse, N. Y., I operated December 4, 1888. In addition to the operation for the radical cure of the hernia I dissected and tied the veins of the scrotum in three different places, some of which were varicosed to the size of the little finger. The wounds healed without œdema or suppuration, but the scrotum remained somewhat tender to pressure, and the patient still wears a suspensory bandage. The patient remained in the hospital three weeks and was discharged cured. No return of or inconvenience from the hernia, and no truss has been worn. Is actively at work.

Case 7.—Mrs. J. S., age 43. For many years has suffered from a right femoral hernia, for which she had worn a truss. For the last year she had noticed a tumor in the groin, something larger than a hen's egg. At times it is painful and always a source of discomfort, is slightly tender to the touch, and does not diminish under pressure. Femoral canal admits the tip of the little finger. Operation performed January 2, 1889. Sac contained clear serum and was continuous above through the femoral canal with the peritoneum, but its cavity had been obliterated under the pressure of the truss, thus reducing it to the characteristics of a simple cyst. This I removed and closed the ring. Rapid primary union followed, and the cure remains complete without support. Specimen exhibited shows the intimate adhesion of the sac to the surrounding tissues.

Case 8.—Mrs. B., age 34. Has for a long time been a semi-invalid from a right femoral hernia, for which she has worn a truss. In preparation for moving she lifted more than usual, causing the descent of the hernial tumor, which immediately produced great suffering, with faintness and vomiting. The physician summoned to her relief attempted the reduction of the tumor by taxis, which he continued more than an hour. His efforts proved unavailing and he left the patient with directions to use opiates and hot fomentations. I was summoned twenty-four hours later, January 31, 1889. At once I removed her to hospital, etherized and operated. The ring was divided with difficulty and several inches of congested

intestine liberated and returned. The patient made an excellent recovery, although between three and four months pregnant at the time of operation. She remains cured at date, although nearing her delivery. She has not worn a truss. The sac here exhibited shows the constriction of the neck, through which a piece of rubber tubing has been passed.

Case 9.—Strangulated umbilical hernia, five days' duration; patient of Dr. J. H. Parks, of East Boston. Case came under his observation only a few hours prior to his sending for me in consultation. Stout Irish woman, aged about 50. For some years had suffered from an umbilical hernia, double fist's size, a portion of which for a considerable period had been irreducible. Stercoraceous vomiting had continued for two days. Operation considered permissible, although the result would be doubtful. The thin-walled integuments covering the tumor were sphacelated. The hernial contents were found to consist of a large mass of adherent omentum, within which a considerable loop of small intestine was incarcerated. The constriction was easily divided, but the intestine was gangrenous and tore asunder under gentle traction. The ends were brought out from the wound, resected, and coaptation affected by means of a double row of continuous Lembert sutures. These were easily and rapidly applied and the divided mesentery united in continuous suture. The parts were well washed with hot sublimate and returned within the abdomen. The hernial sac was resected and the abdominal wall closed in layers by continuous tendon suturing, as after an ordinary laparotomy. When partially recovered from ether regurgitating vomiting occurred, several pints of dirty fluid, which was so continuous as to impede respiration and, despite all efforts, proved the cause of death. In order to anticipate such a possible accident it had been the intention to wash out the stomach prior to etherization, but in the hasty preparation the stomach tube had been unfortunately forgotten.

Case 10.—I. J., aged 75. Strangulated left inguinal hernia. Retired sea captain; general health good. Has for years suffered with double inguinal hernia, imperfectly retained by a truss. About four weeks prior to operation the left hernia became strangulated and, under ether, was reduced with difficulty. I was summoned shortly after the strangulation occurred. Failing in taxis I operated at once, March 7, 1889, assisted by Drs. Nelson and Cook. The tumor was double fist size and reduction was effected only after a wide division upward of the constricting ring. The sac contained about fifteen inches of small intestine, closely adherent by lymph exudation, probably dating from the strangulation of four weeks previous. Adhesions broken down prior to the return of the intestine into the ab-

domen. Vomiting ensued soon after the close of the operation, and insufflation of a portion of the liquid contents into the bronchi well nigh caused death. Acute pneumonia supervened, which caused the greatest anxiety for the two subsequent weeks. Although the strain from coughing was severe, the sutures did not yield, and yet, ten days after the operation, a considerable portion of devitalized, broken-down tissue was exfoliated. Repair went on satisfactorily by granulation, although the recovery was necessarily protracted. A considerable depression marks the site of the wound, but the abdominal wall is firm and unyielding. The patient is actively about, wearing a truss to support the opposite side. The accompanying specimen shows the everted sac stuffed with cotton and nearly fills a quart jar. The peritoneum affords an interesting study.

Case 11.—Mrs. P. Right femoral hernia. I operated upon the lacerated cervix and restored the perineum at the same sitting, April 17, 1889. Recovery rapidly followed, the patient apparently suffering little or nothing more from multiplicity of operations. Union in each primary. Specimen exhibits an interesting condition of the changed peritoneum. The patient returned home, several hundred miles distant, at the expiration of three weeks, and reports condition satisfactory.

Case 12.—Right scrotal hernia. Patient aged about 60, inmate of the Soldiers' Home at Chelsea because of this disability. Operated upon by Dr. Nelson and myself April 10, 1889. Sac everywhere adherent. Dissected with difficulty. Obliquity of canal restored. Recovery slow, but result reported as satisfactory. The accompanying specimen exhibits the peritoneal sac most remarkably reinforced by interlacing bands of hypertrophied connective tissue.

Case 13.—Right femoral hernia. Female aged 27; seamstress. Hernia retained imperfectly by a truss. Disability and suffering very pronounced. Operation April 27, 1889. Recovery rapid; discharged from the hospital at the close of the second week, and she has resumed her ordinary occupation.

Case 14.—Miss N. C., aged 28. Large ventral hernia. In August, 1886, I removed a multiple ovarian cystoma weighing about 30 pounds. Incision was 3 inches in length. Wound closed by interrupted sutures taken through the entire thickness of the abdominal wall. Following the recovery the patient rapidly gained 40 pounds in weight. Ventral tumor at time of operation, May 10, 1889, nearly the size of an adult head. Resected the sac and closed the abdominal wall by continuous tendon sutures in four layers, the skin with blind stitch. Sealed the wound with iodoform collodion, as in all the previous cases. Patient made rapid recovery and was discharged from the hospital in two weeks, wearing an abdominal support. The specimen of the cyst

shown, exhibits remarkable diverticuli. The lower portion of the sac was filled with a mass of adherent omentum.

The series of cases reported above, operated upon within eight months, include all the usual varieties of hernia. They complete a list of operations, now numbering nearly 100, which I have performed during the last eighteen years. The method followed, from the first, has been subject substantially to the same factorage, although varying somewhat in detail.

Since I have recently given to the profession my views upon the conditions, symptoms and treatment of hernia at length,¹ I shall limit myself in this paper to a brief discussion of what I deem to be the essentials of the operation for the cure of hernia. I do this with the greater interest and pleasure since the cure of hernia is confessedly an opprobrium of surgery, and it is not until a very recent date that surgeons in either Europe or America have been willing to discuss seriously the advantages to be derived from operation.

In 1878 I first reported to this Association my method, illustrated by a series of cases with specimens, which have been supplemented, from time to time, by further contributions until the present. The basic and fundamental factor consists in closing the divided and weakened structures by strong sewing with a carefully prepared animal suture after the removal of the sac. This is aseptically applied and approximates the refreshed tissues by layers of buried suturing, so as to avoid the necessity of drainage, and thus allows of the complete closure of the wound, hermetically sealed with iodoform collodion, a very simple, but germ-proof dressing. I first published it in the *Boston Med. and Surg. Jour.* in 1871. My first case thus operated upon was in 1870. In this case the use of the buried suture was accidental and applied to serve a temporary purpose, but a permanent cure resulted. After mature deliberation I judged it sound surgical practice thus to attempt the cure of hernia, and other equally successful cases thus treated soon followed, the first fruits of my personal instruction received from Prof. Lister in Edinburgh, in 1869. He had limited his studies at that time to the results of the ligation of arteries by catgut left buried in the wound. I extended the use of the catgut ligature to the approximation of tissues, and made a series of experimental studies in animals upon the changes in the tissues which ensued. I determined that, when properly prepared, if aseptically applied, they were slowly replaced by bands of living connective tissue, and thus served an important purpose in the reinforcement and strengthening of the parts involved. The use of

the suture thus applied to hernia, is naturally of very great value for the approximation and retention of all wounded surfaces. In aseptic wounds it now promises to do away entirely with drainage and the multiplicity of antiseptic surgical dressings.

Under the new régime of surgery, in competent hands, the claim for operative measures for the cure of hernia may be strongly made:

First.—It is eminently a safe operation. In my own experience, extending through all these years, in all cases operated upon where the integrity of the intestine was not involved, I have not had a fatal case, or one where it appeared that even the danger line was in any way approached. In my recent work upon hernia above referred to I have collated, as far as possible, all the reported cases of operation under aseptic precautions. From the reports of recent operators I find 779 cases of hernia which have been operated on for a variety of causes, with only five deaths, and these are explained as having resulted from conditions not referable to the operation. This contrasts so extraordinarily with the earlier experience of the profession, when, usually, all hernial operations were septic and peritoneal infection the rule, often followed with fatal issue, that the modern operation for hernia may be claimed as one of the greatest triumphs of aseptic surgery.

Secondly.—The results of the attempt at radical cure are almost equally surprising. I have found it quite impossible to trace the subsequent history of every patient, but recent investigation shows that of those of whose histories I have a knowledge fully 90 per cent. are permanently cured, and in no instance do I advise the subsequent wearing of a truss. The essentials of my operation are briefly as follows:

The hernial sac is opened, its contents restored to the abdomen, or removed, and it is freely dissected to its very base within the ring. The sac is then drawn down, sewed across with an even continuous double suture, resected and removed. The peritoneum is then carried quite within the ring. (Fig. 1.) In large direct inguinal hernia it is important to restore the obliquity of the canal, nature's wise provision for maintaining the closure of the canal by intra-abdominal pressure in health.

This is effected by commencing at the lower and inner border of the ring, the cord having been gently laid to one side, and closing by double suturing quite to the inner opening of the ring upon the cord, which is now replaced, and the external pillars of the ring are closed by similar suture downward and inward to the pubic tubercle. The inguinal rings are thus reformed and the canal is restored to its normal oblique position. (Fig. 2.) If the tissues are sufficiently thick to warrant it, a further layer of animal suturing completes the closure, and the skin is neatly and accurately approximated by a blind running

¹ "A Treatise on Hernia. The Radical Cure by the Use of the Buried Antiseptic Animal Suture." 1889. G. S. Davis, Detroit, Mich.

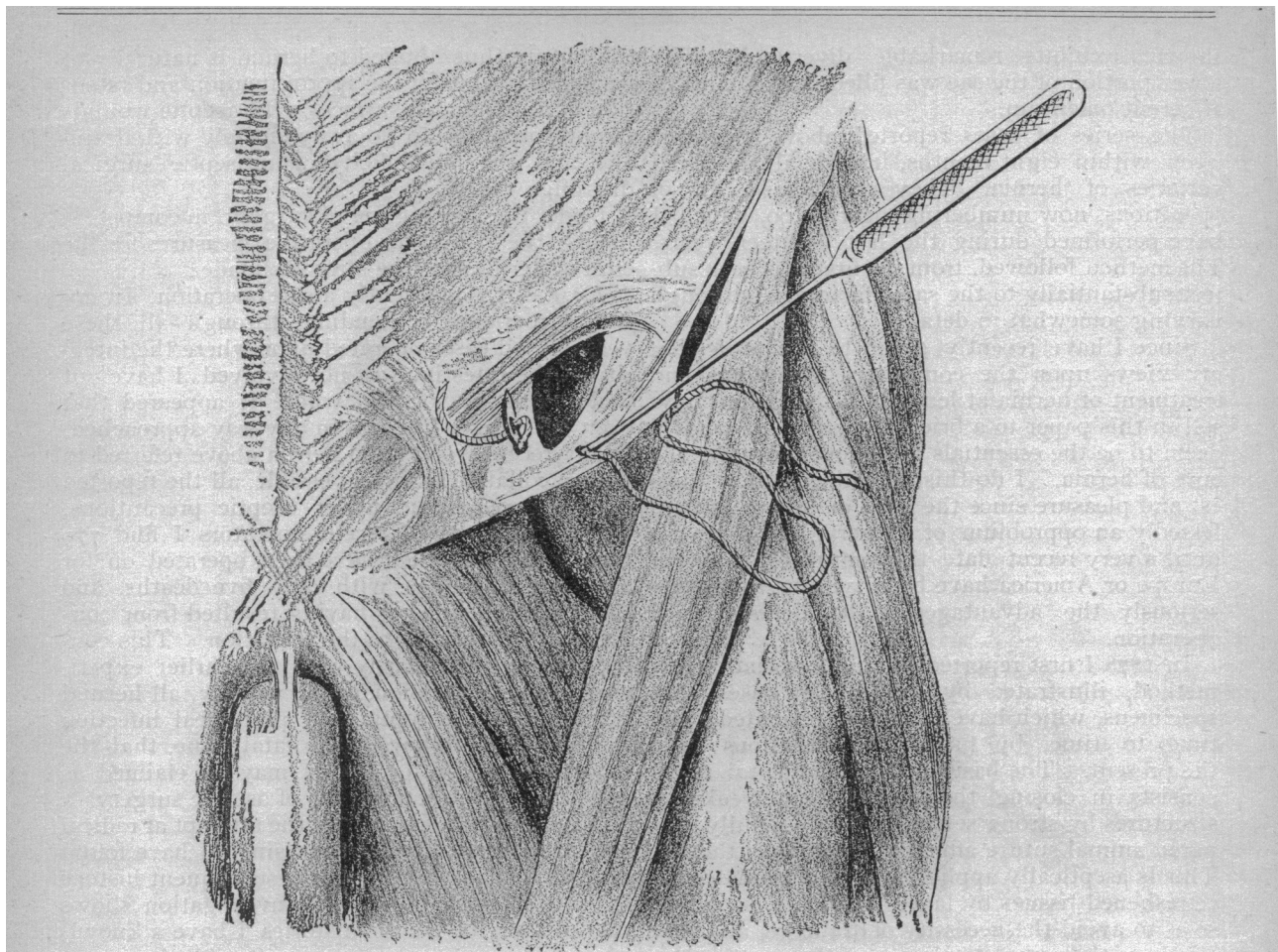


FIGURE 1.—Represents the introduction of the first stitch, taken to close the ring from below upwards in order to restore the obliquity of the canal.

stitch, perhaps best applied with a fine Hagerdorn needle, taken through from side to side, including only the deeper layer of the skin. This completes the closure of the wound, each step of which is done under irrigation with a weak sublimate solution, and without the vestige of a stitch in sight. The incision is now dried, dusted with iodoform and covered with iodoform collodion, into which a few fibres of cotton are incorporated. No further dressing is necessary.

Femoral hernia is treated essentially in the same manner. Here it is necessary, after the removal of the sac, to close the ring. Protect the femoral vessels in their sheath by pressing them gently outwards, and introduce the needle, as directed in inguinal hernia, from below, through the falciform process, the fascia lata, avoiding the internal saphenous vein, upwards through Poupart's ligament, withdrawing the opposite end of the suture with the needle. (Fig. 3.) A second stitch is taken through the same tissue, parallel to the first, about one-fourth of an inch nearer the median line. The third stitch is introduced through the *pubic* portion of the fascia lata, paral-

lel to the saphenous vein, and is carried upwards to include Gimbernat's ligament, or its divided fibres if cut in strangulation. (Fig. 4.) A fourth, and as many more stitches as may be required to close the saphenous opening, is carried below and parallel to Poupart's ligament, through the pubic fascia and falciform fascia. In this way the peritoneal pouch is obliterated and the neck of the sac firmly closed.

The folding over of the fascia carries the saphenous opening quite a little to the inner side of its former site, while the femoral vessels are undisturbed in their sheath. (Fig. 5.) The superficial tissue and skin are closely held in conjunction by buried continuous animal sutures and the wound dressed with iodoform collodion, as advised in inguinal hernia.

If the cure of hernia is to be attempted under modern surgical methods, most surgeons will readily admit that it should be by a free dissection, or the open wound method, under rigid antiseptic precautions. Modern operators are divided in opinion as to the treatment of the sac. All are determined that it must in some way be

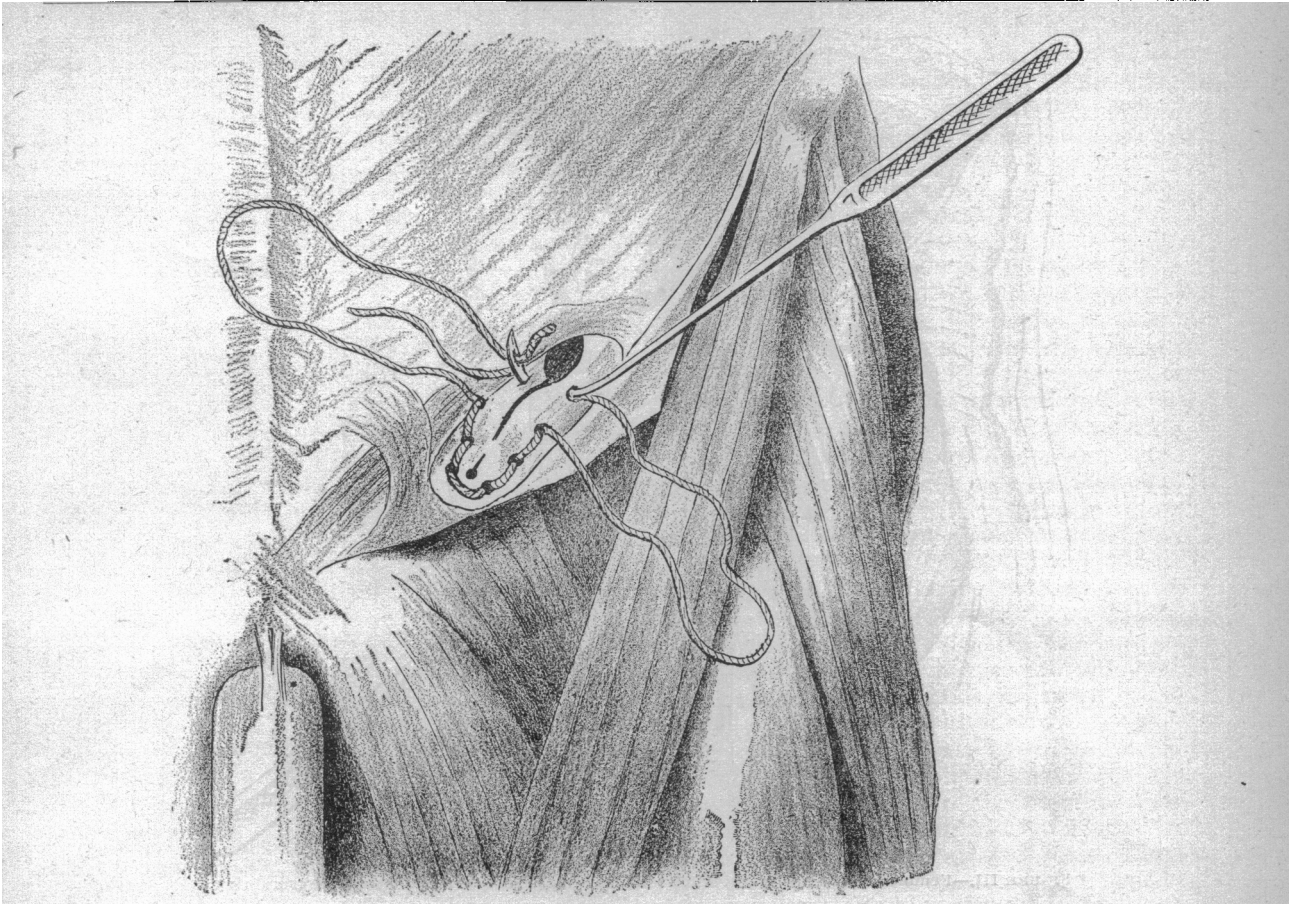


FIGURE II.—The internal ring closed. The completion of the last deep stitch of the double continuous suture.

disposed of. Most advise ligation at its base and removal. Mr. Ball, of Liverpool, and his followers, twist it firmly upon itself, in order to render tense the peritoneum of the abdominal wall before ligation. Mr. MacEwen, on the contrary, whose brilliant results challenge admiration, advises the careful dissection of the sac, folding it back upon itself by a running catgut suture and then, with a needle with eye near the point carried through the peritoneum above the internal ring, the whole sac, puckered into folds, is drawn within to serve, as he thinks, as a buttress for the further protection of the internal ring. The advantages of this method are probably theoretic rather than real. The use of the sac as a plug to close the ring, there sutured and retained, has very generally been abandoned as unsatisfactory. Utilized as proposed by Mr. MacEwen, if it forms a buttress, as supposed, to receive the intestinal impulse, may it not be equally inferred that it would be likely to act as a wedge to press unevenly against the newly formed tissues of the restored canal, and thereby cause harm rather than serve as a deflector of pressure? Although the peritoneum forms a pouch or pocket surrounding the hernial contents, nature did not intend it to

serve as a part of the supporting abdominal wall, but by an even elastic, smooth surface lining the firm muscular and tendinous structures to allow the abdominal contents to glide easily and evenly in every direction. As will be seen by the specimens exhibited, in a very considerable number of cases of old hernia, the disposition of the sac, as advised by Mr. MacEwen, would be quite impossible. In illustration in Case 10, where the sac is nearly the size of a child's head at birth. Again, also, the sac is so intimately blended with the surrounding tissues that, with all due care in dissection, it is so devitalized and injured that, even if aseptically restored within the internal ring, its presence could furnish only a doubtful factor toward the subsequent repair of the parts. On the other hand, not seldom, especially in children, the sac is so thin and unimportant that it may often be comparatively immaterial in what way it is treated.

Normally the internal ring is ovate, and in closing the sac at its mouth it is doubtless better to do this in the direction of its longer diameter, which gives as the resultant a smooth rather than a puckered peritoneum, in the largest degree vitalized and resilient, freely movable upon its exteri-

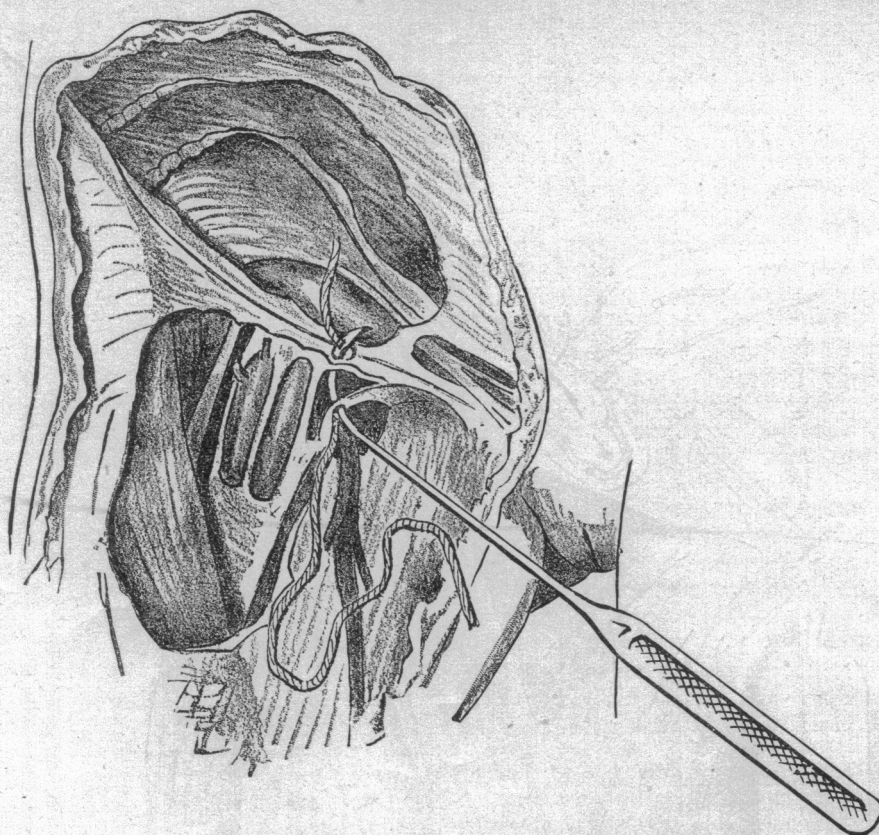


FIGURE III.—Femoral hernia. The first stitch taken parallel to the vein for closing the crural ring.

only loosely attached fascia. In the attempt at this normal restoration no method, theoretical at least, is equal to that of closing the mouth of the sac in continuous seam. Good results, however, follow all the various ways for the obliteration of the mouth of the sac at the internal ring. The method of sewing may be in considerable variety. The simple over and over stitch will give good results. I cannot doubt, however, that the closure of the canal and abdominal wall by my method of suturing with double stitch has certain marked advantages. It is equally simple in application and carries a double thread, like the shoemaker's stitch, from opposite directions, through the same opening. The approximation of the tissues thereby is even and uniform, and necessarily nothing can escape its grasp. The continuity of stitch renders equal pressure, an important gain over the interrupted suture, while a single knot only is required. It is necessary to use a needle with the eye near the point, which must also be in considerable curve. To avoid unnecessary multiplicity of instruments, I have had the larger size of Hagedorn needle drilled with eye near the point, which serves a very good purpose. It is, however, more convenient to have the needle set in a firm handle as here exhibited, and I have found a certain ad-

vantage in continuing each end of the eye in a narrow slot in order to catch and hold the thread from slipping. (Fig. 6.) Well prepared catgut may be safely used in this operation, however, I cannot doubt that the tendon suture, especially that prepared from the tail of the kangaroo, is in every way greatly superior.

When to operate is a subject of the greatest interest, but the limit of this paper must necessarily debar its discussion. Judged from my own experience, the operation is permissible in the very large proportion of all the sufferers from hernia. There is much to be said in favor of operation upon children. Certainly in adults all hernia imperfectly controlled by a truss should be carefully considered from the view of the advisability of operation. In the old large hernia, irreducible in great measure, rendering the sufferer incapacitated for all active pursuits, the operation should be advised.

Adherent omentum is likely to be so much changed as to render its return to the abdominal cavity ill-advised, but the removal of it appears to add little to the danger of the operation. Age *per se* should not debar operation. I have myself operated upon one child of 16 months who, after recovery from ether, gave little evidence of any discomfort. Several of my patients

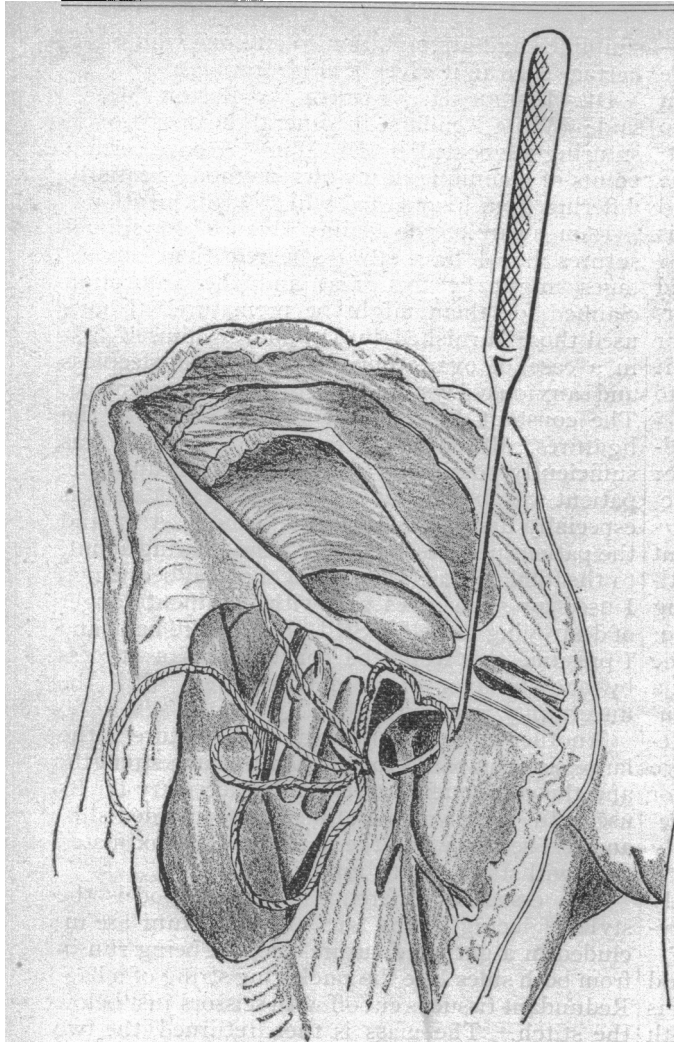


FIGURE IV.—Femoral hernia, showing a third stitch taken for closing of the canal by the use of the double continuous tendon suture. The stitches are represented as loosely drawn in order to show the method of suturing. The needle is passed through the firm pubic fascia and the outer border of the saphenous opening, and when drawn closely will fold the latter inwards.

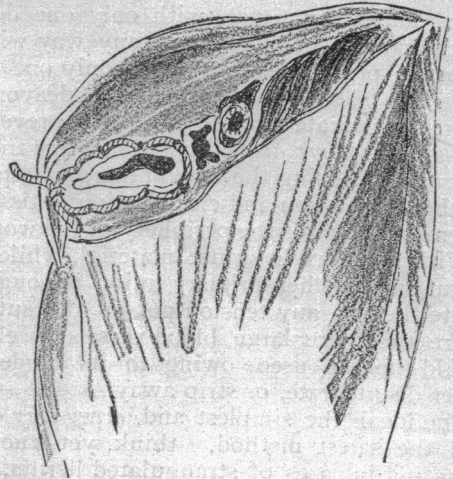


FIGURE V.—Shows the internal ring closed by the double continuous tendon suture. Stitches loose to show method of suturing.

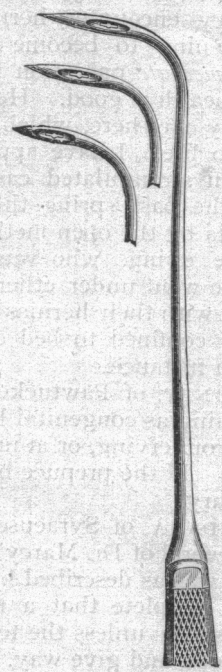


FIGURE VI.—Needle used in the application of the deep double continuous suture.

have been past 70. My friend Dr. L. S. Pilcher, of Brooklyn, has twice operated, followed with complete cure, upon patients, each over 80 years of age. Dr. John H. Mackie, of New Bedford, writes me: "I operated on a man aged 83, right inguinal hernia, strangulated; recovery perfect, but one year later I operated on the same man for left strangulated hernia and he made a good recovery, living several years."

The advisability of operation in any given patient is always to be seriously considered as an independent problem, the factorage of which must consist of many individual details. There is little question that the large percentage of sufferers from hernia will profit from the surgery of the near

future whom the conservative surgeon of to-day conscientiously relegates to the truss bearing army of invalids.

DR. T. H. MANLEY, of New York City: With reference to Dr. Marcy's paper there are a few points on which I wish to make a few comments. They are briefly, first, that the method described and practiced by him is no open method at all, and has no claim to any such designation. The next is, that though Dr. Marcy has fair results, there has been no mention of the operation of Dr. Chas. McBurney, of New York, which is the *only, real* open method applied in the operations of hernia. By this method McBurney has now operated

more than forty times, with only one death—which had no connection in any way with the operative procedures—and with only one return of hernia. McBurney, instead of endeavoring to secure immediate union, purposely prevents it, and always *aims at* healing the furrow from the bottom, by keeping the wound margins separated till the granulation and cicatrization of tissue has progressed towards the periphery of the wound.

With reference to suture material, while I find catgut useful when primary union is sought for, where there is any tension put on the suture or where there are large blood-vessels to close, it should not be used, owing to its tendency to either disintegrate, or strip away.

The ideal, the simplest and, *every way* considered the safest method, I think, yet known for operating in cases of strangulated hernia, is McBurney's. Here, every time, we can promise *permanent* cure, if the patient survive operation. But he must be operated on early. General practitioners, when they encounter hernia resisting taxis, and threatening to become constricted, should advise *immediate* operation provided the patient's general health is good. He can effect a radical and speedy cure here, which in itself entails no danger to life. I have applied the McBurney method in strangulated cases. I have operated during the past spring three times for strangulated hernia by the open method; two recovering and one dying, who was practically moribund when he went under ether.

Both surviving, with their hernias permanently closed, and being confined to bed only twenty-eight days in each instance.

DR. J. O. WHITNEY, of Pawtucket, R. I., said there is no such thing as congenital hernia. It is due to straining from crying, or at urination with adherent prepuce. If the prepuce be split up no trusses are necessary.

DR. H. D. DIDAMA, of Syracuse, N. Y., had been present at several of Dr. Marcy's operations. The performance was as described by him. The stitching was so complete that a return of the hernia was impossible unless the tendon should be absorbed too soon and give way. But his experience has proved to him and should satisfy us that this tendon never gives way, and that we need not lie awake fearing any bad result from this source. He uses no drainage whatever and never needs any. He never removes a suture because none ever appears on the surface of the skin. There are never any stitch abscesses which are so common in laparotomies performed by sewing through the entire thickness of the abdominal walls.

Dr. Marcy's operation does not confine the patient to the bed for a long time, sometimes not more than two or three days, and there is no pain in any considerable number of cases, and not even inconvenience. His operation seems simplicity

simplified and a temptation to any one who has a hernia, even if it gives him no trouble.

DR. JOSEPH H. WARREN, of Boston, Mass., said: While I endorse in general the operation of suturing advocated by Dr. Marcy, I have certain points of technique in my own method essentially differing from his method which I will mention.

I am aware of the claims advanced for animal sutures, but I have always feared their advantages might be too great and the absorption claimed for them might be premature. I have used those furnished by Dr. Marcy himself first in a case of ovariectomy, and I passed sleepless and anxious days and nights in consequence. The constant dread of the melting away of the ligatures, although perhaps not probable, was sufficiently possible to give me no rest until the patient was beyond doubt cured. The case was especially dangerous, as acute mania set in and the patient persisted in tossing and kicking about, to the total destruction of a mechanical bed which I used for such cases and with imminent danger of destroying herself. Still, the ligature held, and I presume this would be construed as a success by one in favor of animal ligatures. Still the uncertainty remains.

Another objection to the animal ligature is the large size compared to silk of the same strength, and the consequent large needle necessary for its use. In my own operations I use braided silk, and feel secure when the parts are approximated they will stay so until united.

The essential difference in my method is the style of lacing. The sac and omentum are included in a gathered suture, the silk being run in from both sides like the puckering string of a bag. Redundant tissue is cut off with scissors just below the stitch. The mass is then returned, the two ends of the suture being left outside and the mass drawn down by them to the internal surface of the ring. A series of stitches is taken in the edges of the ring, each suture being interrupted, all passing each other at the centre, forming a multiple cross or star-shaped plan. This is the first stage. After this I insert a series of stitches superimposed upon the first, each stitch being taken some distance back from the edge of the ring, the stitch not passing entirely through the muscular walls but entering the surface, passing backward and coming out beyond the point of entrance about $\frac{1}{4}$ inch. These stitches are tied sufficiently tight to pucker the tissues and infold the muscular tissue at the site of the ring. This results in a raised cicatrix, the elevation pointing toward the abdominal cavity and rendering a recurrence of the hernia at that spot less likely, whereas in the plain lacing of the tissue a depressed scar results which offers a constant *point d'appui* for the intestines to work against, and sooner or later may allow the entrance of the wedge and consequently rupture.

This reduplication of tissue also gives a larger uniting surface, the edges and contiguous surfaces being freshened that adhesion may more readily take place. This freshening is most completely done with scissors or scraping rather than with a sharp scalpel, it being my experience in special and general surgery that torn or roughly dressed tissues heal more readily than those cut with sharp, keen scalpels. My preference for the fingers or tearing instruments in place of sharp instruments is founded on good results obtained by this method, and this is especially the case in the cutting of arteries and veins. When put on the stretch and thus severed the vessel is closed so effectually that in my own practice I have never had a case of secondary hæmorrhage, and the primary loss of blood is very slight.

At one time I advocated the use of the galvanocautery in securing a consolidation of the hernial rings. Several cases were successfully treated by this method, and should a very large hernia with weak walls present itself I think I should still prefer this method. The adhesive and contractile power of a burn is well known, and it is as powerful in the hernial rings as elsewhere.

In ordinary cases the freshening and lacing is sufficient. In the majority of cases I still adhere to the subcutaneous injection, and in selected cases, those of good physique and where the hernia is small and of recent occurrence, I still have good results, a ratio of 96 per cent. Its failure in the hands of some operators is not due to the operation. It is due to the selection of cases in the first place that ought never to have been attempted; and secondly it is due to non-observance of minor matters of technique. While I have given its description in the plainest manner possible, I am convinced that there are elements of technique which can be caught only by intuition or careful clinical instruction. The fact that it is practiced by advertising specialists with advantage to the patient and pecuniarily to themselves, and that they claim to have license from me (a claim not founded on fact), proves that there is some good in it.

My name has unfortunately become so firmly united with the operation by injection that many think I advocate no other method and practice no other part of the profession. This is untrue in both cases. My motto is to choose the best for the case in hand, and I would not for a moment be prejudiced in favor of any pet method to the prejudice of the case. The case in all its details determines my method of procedure.

DR. H. J. HERRICK, of Cleveland, O., said: I have taken much interest in the papers presented looking to the relief of this distressing and frequent danger to which so many are subject. Most of the cases reported are of those which have come under the care of the surgeon when the emergency was upon them. In this connection I

desire to call attention to that large class of cases in which the hernial tumor is so large and the opening so patent that strangulation is not and is not liable to be present, but, on account of the size and inconvenience as well as danger of inflammation, life becomes intolerable except as it may be devoted to nursing this as yet almost hopeless infirmity.

Have we not a duty towards this class of sufferers? In illustration of the points indicated I will mention the following cases: A young man 28 years of age came to me from a neighboring city with a double scrotal hernia each side of which was the size of the two fists, the openings so great that the gut could not be retained with any appliance. Patient was anxious for matrimony and the business of life, yet with the existing deformity could not. I advised an operation for the radical cure. Not being satisfied with any of the concealed, obscure and empirical means that had been devised, I proposed an open radical operation, which I made upon both sides at the same operation. With antiseptic precautions I made an incision along the neck of the sac 3 inches in length, dissected my way to the sac, emptied it of its contents, at the same time drawing it out. Holding the empty pouch I applied a temporized clamp made by the handle of a dressing forceps closely to the neck, then amputated the sac near the clamp, leaving space for the closing of the neck with a continuous suture, with care to bring the edges of the amputated sac in apposition. The ligature used was the iron dyed silk. Thus the peritoneal cavity was kept closed from the entrance of air, fluid or any septic material. The edges of the ring were made bare and brought together with an interrupted suture of the same material. In the same way I brought together the divided parts of the deep fascia, also superficial fascia and connective tissue and finally the integument, taking special care to leave no contused or lacerated fibres, remove all clots and bring together gently in apposition all the divided parts. No drainage tube was used. Antiseptic dressing was made. The case proceeded to recovery with no unfavorable symptoms, temperature having reached only 100°. In two weeks' time the wounds were entirely healed, with no suppuration. After three weeks, patient returned to his home, since which time he has pursued his former plans of matrimony and business with no return of the hernia. About two months ago a woman with an inguinal hernia of the left side came to me. The tumor was the size of the two fists and involved the left labia, which was very greatly distended and tumefied. It could not be retained by truss, and being required to gain her living by work she expressed the feeling that she would rather die than endure the suffering and care necessary. I advised the open operation for radical cure, to which she con-

sented. The operation was performed two months later in substantially the same manner as in the previous case. The large pouch of the labia was treated antiseptically with a bichloride solution, with the expectation that no suppuration would occur. Owing to its size, tumefaction and inelastic structure suppuration followed and came near destroying the hopes in the case. The inflammation did not extend to the line of deep incision, but was limited to the pouch of the labia, which being opened freely, cleansed and washed with sol. carbolic acid, inflammation subsided and all dangerous symptoms subsided, so that patient before I left home was up, parts perfectly healed, and discharged from the hospital apparently well. It is too early at present to speak assuredly of the absolute success of the operation, though all appearances at present justify the fullest hopes.

I used in this last operation the clamp used for the treatment of hæmorrhoids and found it a most appropriate instrument. By reason of the handle it enabled the assistant to hold the part in the most convenient way for suturing, and the thumb screw enables the surgeon to regulate the pressure to be applied so cautiously as not to endanger the integrity of the parts.

Feeling that the profession has a new duty to perform to this class of unfortunates, these cases in this connection may not be amiss.

DR. MARCY, in closing the discussion, said that the large number present at this late hour (nearly midnight) shows the interest which American surgeons have in the subject under debate. He would detain the members but a few moments, although many points of both interest and profit had been alluded to only briefly. He would ask a critical examination of the specimens of the peritoneal sac which he had been to the trouble of bringing, since they showed important pathological changes which appeared recently to have been, in a large measure, overlooked. They are of the first importance to understand if we are to utilize the sac by any method of surgical procedure. Cloquet, in his masterly work, emphasized the great changes which the sac in old herniæ usually presented. Dr. Manley evidently entirely misunderstood the use Dr. Marcy made of the words open wound. This was in contradistinction to subcutaneous methods of treatment, as by the yet too generally accepted plan of Dr. Wood of subcutaneous closure by the wire suture, or the methods of cure by injection. He was quite familiar with Dr. McBurney's operation, and had only recently carefully reviewed his method, showing what he thought were primal faults. Elsewhere, in all parts of the body, the aim of modern surgeons was to secure primary union, and it would indeed be strange if a hernial wound should prove an exception. Why not adopt this plan in the closure of all laparotomies, if so greatly to be preferred. Dr. McBurney's

method has found advocates chiefly because the hernial wounds, as ordinarily dressed, are very liable to become infected. Dr. Warren has referred to the large size of the animal suture, as compared with silk, which is necessary to be used. This, in a measure, is true if catgut is used, but does not apply to tendon. On the contrary, the tendon suture, the size of silk, is very much stronger, as may be tested by the samples here shown. Dr. Pancoast has just made an eloquent plea for the use of his iron-dyed silk. However he, with most others, admits that it generally must be removed. At the best, silk is encapsuled, while the aseptic animal suture is replaced by bonds of living connective tissue cells. Upon this fact, long since demonstrated, is based, in a large measure, the method here advocated, and it is not too much to believe that the profession will early accept the great gain resulting from the use of the aseptic animal suture in the coaptation of all aseptic operative wounds.

Blind surgery is bad surgery. As advocated, each step of the operation is directed by seeing the exact condition of the parts. The reformed peritoneum is carried within the firm tissues of the abdominal wall. The inguinal canal is reformed. The refreshed pillars of the ring are closed in even continuous suture. The coaptated skin is covered by a layer of germ-proof iodoform collodion. The wound, if aseptic, remains so, and Dr. Warren may rest undisturbed by dreams or visions of discontent, while the patient in security goes on to rapid convalescence.

A PLEA IN FAVOR OF EARLY LAPAROTOMY FOR CATARRHAL AND ULCERATIVE APPENDICITIS, WITH THE REPORT OF TWO CASES.

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The literature of the surgical treatment of affections in the ileo-cæcal region has been increasing very rapidly during the last few years. A great deal has been said and written concerning the propriety of surgical interference in cases of perforative appendicitis, typhlitis, paratyphlitis and perityphlitis. Post-mortem examination and clinical experience have demonstrated that with few exceptions localized and diffuse peritonitis as well as suppurative inflammation of the connective tissue originating in the ileo-cæcal region, are caused by an antecedent affection of the appendix vermiformis, which has resulted in perforation or gangrene of that structure. While it cannot be said that unanimity of opinion exists among surgeons in reference to the exact indications for