enterorrhaphy with as great rapidity. In its use you are not confined to intestinal unions alone, for you can unite the gall-bladder or stomach with the intestine at any point.

You are not restricted as to the length of the incision, and this being the case the suture is very applicable in pylorotomy, whereby you can remove any length of the pyloric end of the stomach, and unite it with the duodenum by making an incision in its convex surface of the desired length; or the pyloric end of the stomach and duodenum may be cut obliquely, and union then made by this suture.

An additional great advantage which this suture has above all others, is that no foreign substance is used. While the dog will not object to bone, rawhide or brass, the human subject might, and the surgeon has always in his pocket case the material to make a union such as I have described.

And last but not least, the result obtained in these experiments forced upon me the conclusion that Czerny and Lembert's teaching that but two coats of the intestine should be included in any one suture is so far as dogs are concerned not absolutely necessary, for you will observe that I have in every case penetrated the mesenteric coat, gone into the lumen of the bowel, brought the needle out again, from the lumen of the bowel through *all* coats of the intestine, thereby exposing the part penetrated by the needle point to infection, by the drawing of the suture material through the bowel walls. I am satisfied that this result could not have been obtained, were it not that the point through which the thread passes is buried in the tissues and surrounded by contact of serous surfaces.

That this suture is practical, and that the results are equally as satisfactory as any union heretofore advanced, has been fully shown by the specimens submitted for your examination.

DR. OVIATT, Wisconsin—The ideal suture is one which does away with a foreign body of any kind and we have this in Dr. Connell's stitch. Another advantage it offers is that we always have the materials at hand—catgut and a darning needle will answer the purpose. I have used Connell's stitch twenty-five times on dogs with two deaths, both of which were due to accidental causes. I think the next serious criticism to be offered the use of plates and the button is the inability to get an opening of sufficient size. I have done Connell's operation in less than ten minutes.

DR. HERRICK, Ohio—I wish to mention an interesting case of my own. A woman 48 years of age had evident symptoms of closure of the cystic duct. I performed an operation upon the gall bladder by bringing it up to the incision in the abdominal wall and holding it firmly against the abdominal walls to prevent the passage of bile into the abdominal cavity. I removed sixteen stones and washed the bladder out with warm water. I then found another accumulation in the cystic duct and removed them, closed the opening into the duct and closed together the openings in the bladder and in the abdominal wall. I secured immediate complete union and the patient was fully recovered in two weeks.

DR. MURPHY—I wish to thank the gentlemen for the interest they have taken in my subject. I wish to say a few words in regard to the foreign body element. The suture has been used an enormous length of time in all ways. I have not yet tried Connell's suture but am favorably impressed with it. It has been found that in the vast experience of the past the use of the suture method has resulted in a mortality of 47 per cent., while with foreign bodies the

death rate is 24 per cent. I don't care what it is, the approximation that will give that kind of a result is what we want.

E. W. ANDREWS, Chicago—I should like to ask Dr. Connell if this lateral anastomosis is preferred by him to the end to end anastomosis.

DR. CONNELL—In reply to Dr. Andrews I will say that I don't think this is the best, but it is the easiest to make. The other is nearest the ideal when the corners are satisfactorily turned in and the knot buried.

THE MURPHY BUTTON.

Dr. J. B. Murphy of Chicago, made a demonstration on a dog, of the method of making intestinal anastomosis by the use of the "button" bearing his name, after which he made a brief explanation of his method.

DR. H. O. WALKER, Michigan—I wish to speak particularly of Dr. Murphy's button, having used it three times on the human subject. The first case was a case of cholecysto-enterostomy. The conditions at the time of the operation were very unfavorable, and the patient died the following morning. It required fifteen minutes to perform the operation. My next case was that of a woman 38 years old who was brought to me on the 26th of last December. She was suffering from a fecal fistula in the right iliac region and was greatly emaciated. Her suffering was so intense that morphine had to be used liberally. Three attempts had been previously made to close the fistula. I made the incision, found the adhesions and completed the operation in seven minutes. The button was never seen again, probably on account of the negligence of the nurse, but the woman made a good recovery. The next one was a bad case of strangulated hernia which had gone unrecognized seven days when it was brought to me, and at that time general peritonitis existed. I did the operation this time in six minutes, and in operations on the dog have done it in four minutes. One element in particular claimed for the button by Dr. Murphy should be well considered, that is the short duration of time required when it is used.

DR. RUTH, Iowa—I have for some time been considerably interested in intestinal work, and when Dr. Murphy's button first came out, I thought simply that it was another appliance to be tried, but upon second consideration of its claims I fell in love with the thing. I performed my first experiment on the 10th of last January and have done many since then, and in no case has there ever developed a fistula, and in no case did the dog die as an immediate result. One point about the button which I wish to especially recommend, is the fact that no foreign substance is left permanently in the abdominal cavity. To the question, will the button pass out, I can say that it will. But even if we have to make a secondary laparotomy occasionally to recover a retained button, it nevertheless has sufficient recommendations.

REPORT OF A CASE OF SUCCESSFUL END-TO-END SUTURING OF INTESTINE.

Read in the Section of Surgery and Anatomy, at the Forty fourth Annual Meeting of the American Medical Association.

BY ERNEST T. TAPPEY, M.D.

DETROIT, MICH.

There is a decided division of opinion among surgeons on the subject of the methods employed in uniting different portions of intestine. Some are eager to try, if not to adopt, each new device in the way of plate, ring or button, as it makes its appearance; and others either cling to the older method of

suturing or go back to it after having had a trial of the newer methods. The latest device as far as I am aware, is the Murphy button. This, like all others of the class, labors under the disadvantage of remaining for some days as a foreign body of considerable size in the intestine, and at the same time possesses the undoubted advantage of rendering the operation of union much shorter than the older method of suturing.

Abbé has found that the older plates and rings that necessitate only a slit in the side of the intestine in the performance of an anastomosis, are defective in their later results. The opening contracts one-half to two-thirds and as the original opening is one inch and a half, it gradually becomes only three-quarters of an inch or half an inch. Abbé therefore has given up using his catgut rings and other contrivances of this kind, and depends upon the suture entirely, making the opening four inches long. This he considers a very important feature of the operation. (*Med. Record*, April 2, 1892.)

It is to add to the literature of the subject of suturing that I report the following case: Here the wound was one of the small intestine and I preferred to depend upon the suture rather than upon the Murphy button, though I was tempted to use the latter and was dissuaded only by the thought of the button in the intestinal canal after the operation should have been completed.

Alex. McDonald, a man about 40 years of age, remained in Port Huron, Mich., on his way home and while there March 19, 1893, a left inguinal hernia became strangulated. He was allowed to remain in this condition five days. Then a surgeon cut down to liberate the gut, but found a knuckle gangrenous. The wound was not closed but the intestine was sewed to the skin and the patient was then sent to Harper Hospital in Detroit, where he came under my care. I found the whole sac black and gangrenous, and gangrenous tissue about the opening in the intestine, the contents of the bowel discharging through the wound entirely and none through the anus. The sac was amputated at once. I then waited a week until all necrosed tissue had sloughed away and healthy granulations covered the wound surfaces. April 4, chloroform was administered and I proceeded to repair the intestine, with the kind assistance of Drs. McGraw and Walker. The adhesions were broken up, about two inches of the gut excised, a V-shaped piece of the mesentery removed and the cut surfaces then brought together with silk sutures—first the mesentery then the mucous membrane and finally the peritoneal coat of the intestine; here two rows of continuous Lembert sutures were applied. The external wound was left open and packed with iodoform gauze. The patient took chloroform very badly; the action of the heart was so weak that chloroform was withheld and nitroglycerin was administered hypodermatically. The latter part of the operation was performed while the patient was conscious. There was comparatively little sensation, the patient lying still and not complaining while the sutures were being placed in the peritoneal coat. This was of considerable interest to me, for I had seen a short time before, a discussion in the London *Lancet* as to the sensitiveness of the peritoneum, Lawson Tait and others maintaining that it is extremely sensitive, and still others maintaining exactly the contrary.

The recovery was not interrupted by any complications. There was no leakage of the bowel, no rise of temperature above 100. Ten days after the repair of the bowel I curetted the external granulating wound, pared the edges of the skin and sutured them together. This was done without an anæsthetic. There was union by primary intention except one-half inch at the lower angle. Patient was kept on fluid food for three weeks. He left the hospital at the end of five weeks.

DISCUSSION.

DR. MURPHY of Chicago.—I have used the suture repeatedly and it has many advantages, but it has the disadvantage as to time required and as to leaving stitch holes behind inviting infection and if suppuration results from any method that method is not a success. The element of contraction always pertains to lateral approximations and in a lesser degree always to circular ones. If it is wished to make a lateral approximation, anywhere that this can be done an end to end approximation may be done, and where it can be made end to end the button can be used. The foreign body element has been brought up repeatedly in the consideration of the button and this is the very least thing that concerns it; if this is the strongest opposition it is to meet we welcome it because we feel positive that that objection amounts to nothing. I could conceive of a pathological condition which would prevent the free passage of the button but I hope that none of us will get the button into an intestine which is diseased from end to end. The element of time is an exceedingly important one and with the button an approximation can be made in the very shortest possible time. Recently in an operation for removal of a dermoid cyst, I began the incision at 11:34 o'clock, the cyst was removed at 11:39, it took until 11:43 to locate the intestinal obstruction and at 11:48½ the resection and placing of the button was complete; the external wound was closed at 11:58, the whole operation having lasted nineteen minutes.

DR. JELKS of Arkansas.—I should like to ask Dr. Murphy if the use of the button is applicable to gunshot wounds of the abdomen.

DR. MURPHY.—It is a peculiar fact that in bullet wounds of the abdomen the perforations of the intestines are as a rule in close proximity so that ordinarily you can take out a single section one to three feet in length and the ends then buttoned together. It is known that a section of intestine three feet long can be taken from a dog and that animal survive, and it is believed that the same could be done with the human subject. It has already been demonstrated by Dr. Andrews that fifteen inches can be removed.

DR. GASTON of Georgia.—This is an appropriate occasion to bring to the attention of the members of this Section an operation done in 1859 where I had occasion to reunite an intestine from which thirty inches had been removed in the case of a man who had attempted to commit suicide. We removed three pieces of gut each over ten inches long. This was when Simm's silver wire suture was first coming into use and we effected with wire as nearly an absolute end to end union as possible. Seven interrupted sutures were put into the circumference of the gut. We found that the ends adjusted themselves to each other accurately by the contraction of the circular fibers of the intestine. The man was kept under the influence of opium after the operation, five grains being given every three hours for forty-eight hours. The final result was favorable and in less than a month the man was up and going about his business. I had the dejecta watched for several weeks but no signs of the sutures were found. Some years after the man died

from other causes and on *post-mortem* we found that the sutures had entirely disappeared, and there were no signs present of any operation having been done on the intestines.

DR. VERRY of Chicago.—This button of Dr. Murphy's is a good thing and its application a good one. If it should get dammed up in a constriction of the intestine another button can be put in to help it out.

DR. TAPPEY of Michigan.—I feel that the Murphy button is of wonderful utility and I will be glad to use it in some cases. I would like to ask Dr. Murphy if he will say anything on the subject of the sensitiveness of the peritoneum.

DR. MURPHY.—I could say nothing from my own experience as I have never operated on the peritoneum when an anæsthetic was not used.

DR. BOUFFLER of Chicago.—The element which Dr. Tappay has brought out is the keynote to the situation—that is the element of time. I have made a few resections and even where you can get the intestine out it takes time. I don't believe a double row of stitches can be done properly in less than twenty minutes. In two cases it took me twenty minutes; one died because he was wounded a few hours previous and I lost time, and also lost the effect of handling the intestines as little as possible. Persistent handling of the peritoneum lessens its vitality and greatly increases the danger of infection. In consideration of that item, we should have some means of doing the operation in less than twenty minutes.

Another point—surgeons operating in this locality frequently forget their anatomy and fail to recall the manner of the attachment of the mesentery, therefore manipulating the intestines from one end to another. This would be entirely unnecessary if they would remember the obliquity of the attachment of the mesentery to the posterior abdominal wall. Every point that shortens the time of the manipulating of the intestines increases the recoveries. The Murphy button does this. I should not be very much afraid of its causing an obstruction, but would feel very comfortable that it had saved to the patient a fifteen minutes' manipulation of his intestines.

THREE CASES OF ACUTE INTESTINAL OBSTRUCTION TREATED BY ABDOMINAL SECTION.

1. *Intussusception*—2. *Volvulus of Sigmoid*—3. *Strangulation by Meckel's Diverticulum.*

BY A. J. OCHSNER, B. S., F. R. M. S.

CHICAGO, ILL.

In reporting these cases of acute intestinal obstruction, due to mechanical causes, I am aware that so small a number of cases cannot have any definite influence upon the plans of treatment which have been discussed with so much vigor in the medical societies in all parts of the world, especially since the general introduction of antiseptic surgery has made surgical treatment, theoretically at least, very attractive.

The fact that individualization is of especial importance in cases of intestinal obstruction makes each additional observation of some value.

I need not detain you by discussing the general subject of intestinal obstruction. This has been done so thoroughly by men of great experience in almost every civilized country, and especially well by our own Professor Senn, that I can certainly not improve upon it. I will consequently at once proceed to consider the cases which I have treated:

Case 1.—December 15, 1892, I was called to see Edwin N., a bright, healthy child, 3 years of age, at 741 N. Clark St. His physician, Dr. O. N. Huff, gave me the following history: A week ago the child fell a distance of a foot or two, and complained of a little pain in the region of the cæcum for a few moments, but almost immediately resumed his play. From that time he repeatedly had small twinges of pain in the same region but not severe enough to cause any anxiety on the part of his parents. Within the last six hours he began to suffer severely from pains in the abdomen and to complain of nausea.

The pain was very severe and spasmodic, and during the attacks the abdominal walls were tense and a hard sausage-like mass could be felt and seen to the right of and a little below the umbilicus. A rectal examination gave a negative result. The child had a constant inclination to evacuate the bowels, but the attempts remained fruitless, except there was a small amount of mucus passed once or twice.

Dr. Huff and Dr. R. G. Bogue, who had already examined the case, made the diagnosis of intussusception, which I readily confirmed. I immediately proceeded to perform an abdominal section. After the patient was anesthetized, the abdomen was washed and shaved, then washed again with soap and water and with strong alcohol. An incision four inches long was made in the median line below the umbilicus. The transverse colon was brought out of the wound and was found to contain an invagination of six to eight inches each of the ascending colon and the ileum. There were no adhesions and the serous surfaces were not inflamed; nevertheless it required a considerable amount of force applied alternately by pressure from below and by traction from above to reduce the intussusception. The vermiform appendix, which was five inches in length and almost without any mesentery, had formed a loop around the ileum at its point of entrance into the cæcum. I ligated the appendix at its origin, disinfected the stump with strong carbolic acid, inverted it into the lumen of the cæcum and covered it with a fold of the peritoneum from either side, by means of a few fine silk stitches threaded in ordinary cambric needles. The peritoneal cavity was then closed with silk stitches grasping all the layers of tissue of the abdominal wall.

A sufficient amount of morphia was administered during the first four days to control pain and to lessen peristalsis; on the fifth day a small glycerin and warm water enema was given which effected a slight evacuation of the bowels. A daily evacuation was obtained in the same manner after this for the first two weeks. The stitches were removed on the ninth day. The wound healed primarily throughout. Rubber adhesive straps were used to support the abdominal scar for six weeks after the operation.

There was scarcely any deviation from normal in pulse and temperature after the operation, and the child showed almost no shock. He was permitted to sit up three weeks after the operation and to walk about a week later. His diet consisted of milk and broth for four weeks, and of very simple and easily digested food for two months more.

The child is in perfect health at the present time, six months after the operation.

In this case it is probable that at the time of the original fall the vermiform appendix was thrown around the ileum, causing a slight constriction, and that this in turn gave rise to the intussusception; consequently the removal of the appendix would be likely to prevent a recurrence. This peculiarity in this case seems to me to be of especial interest.

It was deemed wiser not to attempt to reduce the intussusception by means of large enemata, because