

extremely emaciated, no tumor, stomach enormously dilated and partly full, the lower border apparently resting on the pelvic brim; no free hydrochloric acid. Operation Jan. 5, 1898. The so-called large fibrous hypertrophy of the pylorus was found. Obstruction almost complete. Pylorotomy and gastroduodenostomy. It was noted after the anastomosis was effected that the opening was rather too close to the suture line, but as the patient was in bad condition it was not corrected. Button passed on the twenty-first day. Patient discharged Jan. 31, 1898. Six weeks later, having up to that time gained thirty-two pounds in weight, patient was suddenly seized with symptoms of acute pyloric obstruction. His condition rapidly became worse, and in three weeks the man was reduced to a remarkable degree, the emaciation being beyond anything I have seen. As he was unable to return to the hospital, I proceeded to his home at Kasson, Minn., where I found him confined to his bed and partly delirious from starvation. With the help of my brother, Dr. C. H. Mayo and Drs. Bedient and VanCleve of Kasson I made a gastrojejunostomy. No attempt was made to ascertain the cause of the recent obstruction on account of his weak condition. For two weeks following the patient remained in a precarious condition, from which time his recovery was rapid, and in two months he had gained forty-two pounds and is now apparently well and of greater weight than ever before.

*Case 4. Cancer of the pylorus; gastro-enterostomy.*—A. A., male, aged 70 years, Norwegian; admitted to St. Mary's Hospital Aug. 2, 1894. Gastrojejunostomy for malignant pyloric obstruction. Death on the fourteenth day from aspiration pneumonia. Postmortem showed union complete; button in the stomach. Case reported in *Annals of Surgery* for 1895.

*Case 5. Cancer of the pylorus; gastro-enterostomy.*—J. K., male, aged 58 years, German; admitted to St. Mary's Hospital March 5, 1895. Gastrojejunostomy for malignant pyloric obstruction March 8, 1895. Button passed on the twentieth day. Discharged April 5, 1895. Remained in good health for thirteen months, then died from rapid return of disease.

*Case 6. Cancer of the pylorus; gastro-enterostomy.*—D. D., male, aged 60 years, Welsh; admitted to St. Mary's Hospital June 30, 1896. Gastrojejunostomy July 2, 1896, for obstructive cancer of the pylorus. Button passed the eleventh day. Discharged July 18, 1896. Lived for more than one year in comparative comfort before death from extension of the disease.

*Case 7. Cancer of the pylorus; gastro-enterostomy.*—M. T., male, aged 42 years, German; Feb. 26, 1898. Gastrojejunostomy for acute pyloric obstruction six weeks after pylorotomy for malignant disease (see Case 3). Button not passed, so far as is known. Patient now, three months after, has gained fifty-two pounds in weight and is in fine condition.

#### DISCUSSION.

Dr. J. B. MURPHY of Chicago—I have been much pleased with the emphasis laid by the essayist upon the importance of early exploratory operation in these cases and consider this one of the most important points in the paper. I would like to compliment the author upon the energetic manner with which he has pursued his ideas. I have made a number of exploratory operations in order to determine the diagnosis. If we are to have good results and permanent cures, which I believe we should have just as in cases of removal of the cervix for carcinoma, in the early stage, it is proper to make an early exploratory incision for the exposure and examination of the pylorus, a procedure involving a risk of less than 1 per cent. When one considers the number of cases that occur every day in practice, we are justified in taking these chances, and the time will come when we are obligated to make an exploratory incision and not allow the large number of cases of malignant stenosis of the pylorus to go on to a fatal termination as we do now. The method of drawing forward the pylorus is important, and enables us to bring it immediately out of the abdomen, and facilitates the operation. Gastro-enterostomy has become a well-recognized procedure and has much to recommend it. When a surgeon performs this operation he has rarely seen the case from the beginning, and when a medical man refers the case to the surgeon for gastro-enterostomy the patient has usually been allowed to pass beyond the line of the preservation of his life and is sent to the surgeon for operation so that he may die easy. If you let carcinoma of the cervix go on a certain time hysterectomy will be useless. In the pylorus, however, a longer time usually elapses after operation before secondary infection occurs. It makes the obligation to operate greater, because the symptoms exist for a more prolonged period and we should not be compelled to do gastro-enterostomy at such late days.

Dr. McARTHUR of Chicago—We might reverse the method

in making a gastro-enterostomy prior to the removal of the carcinomatous or constricted pylorus. If a passage were to be provided prior to the removal of the pylorus, the patient could better stand an operation later for the removal of the stomach.

Dr. JOHN B. HAMILTON of Chicago—Three years ago a case came under my observation, when I acted from similar motives to those contained in Dr. Mayo's suggestion, and the patient is still living. She was at that time 30 years of age, had vomiting, was greatly emaciated, weighed only about ninety pounds and could retain nothing in the stomach. Malignant disease of the pylorus was suspected, but no hemorrhage was present; an exploratory incision was made. When I opened the abdomen I found no glandular involvement, but there was great enlargement of the duodenum at the pylorus. I opened the stomach and passed my finger into the pylorus and examined it. I found that it yielded to the finger pressure and then inserted one, two and three fingers so as to forcibly dilate it, thus performing Loretta's operation. Finding that I now had a free opening and believing the case to be non-malignant I closed the stomach wound in the ordinary way. The woman today weighs about one hundred and forty pounds.

## INTESTINAL ANASTOMOSIS BY A NEW METHOD.

Presented to the Section on Surgery and Anatomy at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY WILLIAM F. METCALF, M.D.

DETROIT, MICH.

Since Lembert, about 1825, asserted that the union of serous surfaces was to be aimed at in intestinal anastomosis, many methods of suturing have been introduced and many mechanical substances used to facilitate the suturing, but no appliance has yet been invented in the use of which the union should not be fortified by suture. This being true, if device is to be used, it should possess the following qualifications: 1, it should be rigid so as to hold the parts firmly in apposition; 2, it should, as soon as its function is performed, as soon as the suturing is done, pass quickly away to leave the lumen of the gut free; 3, it should be easy of introduction.

In gastrectomies upon dogs I found it difficult to make a satisfactory union between the intestine and esophagus. This led me to experiment with various appliances to facilitate suturing. When I decided to use sugar I had cylinders of hard candy prepared, around which I filed grooves. This made them easily broken at the line of filing. To overcome this objection I had molds prepared in which to run the sugar. Many different sizes being needed, a consideration of expense led me to adopt the following method of preparation.

Cylinders of sugar are prepared carefully so as to exclude the presence of air spaces. These cylinders vary in size by the eighth of an inch, the smallest being one-half inch in diameter. By the aid of a file they are broken into pieces, one and one-half inches long. Around the center of each piece a groove is burned by a screwdriver one-eighth of an inch wide. The ends are rendered cone-shaped by the same instrument and smoothed by moistened fingers. They are then dried and wrapped in oiled paper to keep them from long exposure to the air. This device enabled me to make the union of the intestine and esophagus in less time and more satisfactorily than was possible by either the bone or metal buttons, or by unaided suturing. I then began its use in intestinal anastomoses with results that were satisfactory except for the fact that numerous adhesions would occur between the line of union and mesentery, liver, parietal peritoneum and other loops of intestine. The first four

specimens presented are samples of these adhesions. Baum's recommendation to apply to the line of union absorbable tissue is obviously wrong. I proved this to my own satisfaction, however, by careful experimentation with the application of gold-beaters' skin and the fibrous coats of stomachs and bladders. In all cases operated upon by various methods the autopsies showed one condition ever present, that the omentum became adherent to every accessible point of wounded tissue. This observation led me to direct the efforts of nature by wrapping a fold of the omentum around the gut at the point of union. This I found prevented

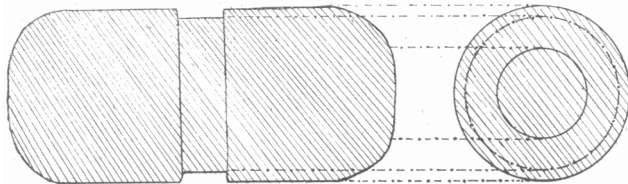


Figure 1.

adhesion in nearly every case, as the remaining specimens show. I knew at the time that Dr. Senn recommended the use of omental grafts and afterward learned that Dr. Theodore A. McGraw had protected his line of suture in the large intestine by covering it with a fold of omentum. Leaving the blood supply of the omentum undisturbed I consider a valuable feature of the method.

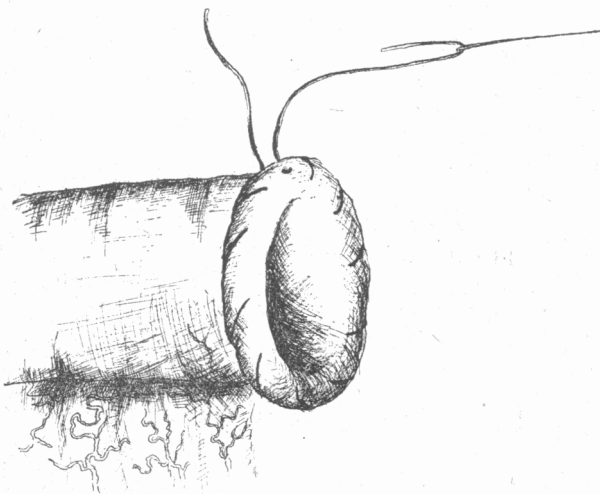


Figure 2.—A Catgut draw suture.

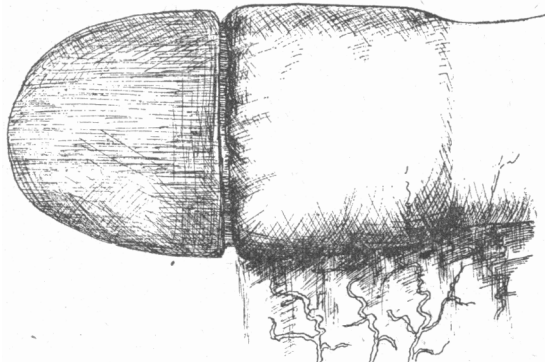


Figure 2 B.—One end of button in place.

I will now call your attention to the method of applying the sugar approximator. (Fig. 1.) In end-to-end anastomosis, a spiral suture of carbolyzed catgut is passed as shown in A of Fig. 2 to bring the edges of all the coats of the gut together to the bottom of the groove shown in B. The size of the approximator

should be such that its insertion will necessitate a slight stretching of the gut. To do this without crushing the tissues, I have had made the forceps as shown in Fig. 3. Their importance is enhanced by the fact that temporary spasmodic stricture occurs near the line of section. Insertion of the other end into the gut is made in the same manner, the spiral suture tied, when the ends will appear in apposition as in Fig. 4. The groove should be shallow, to permit the placing of the first line of suture as near the edge of the serous coat as possible. I use fine braided silk. The next suture is placed in the same manner

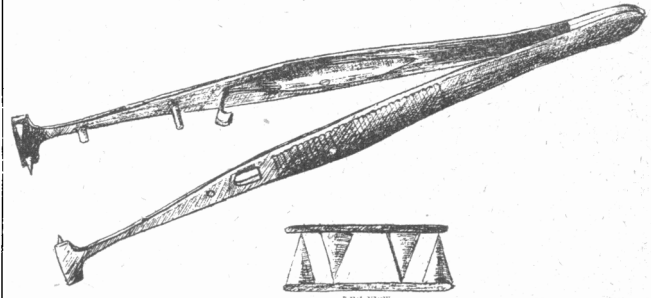


Figure 3.—Forceps.

and about one-sixteenth of an inch from the first, the gut slipping easily over the cylinder to permit accurate co-aptation. Fig. 5 represents a longitudinal section showing sutures tightened and approximator in place. Fig. 4, omitting the red line of suture, presents the appearance of the completed union.

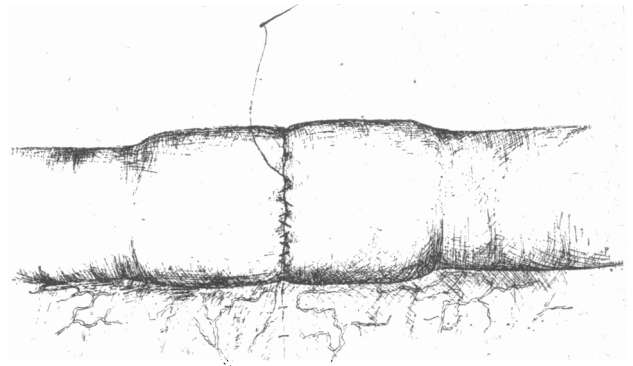


Figure 4.—Ends approximated, showing placing of first suture.

The subsequent narrowing of the lumen of the gut depends upon the extent of union of the serous surfaces, the extent of this union governing the amount of fibrous tissue formed, to which the subsequent contraction is due. In order to show you the extent of contraction in any case, it would be necessary to permit the animal to live several months and present a

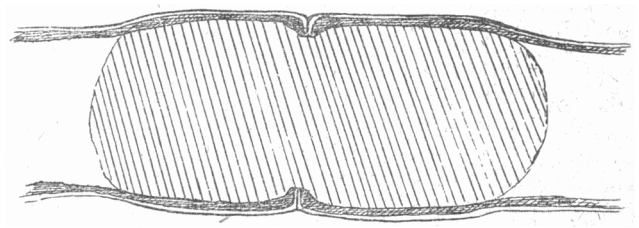


Figure 5.

photograph of a microscopic section. This, time would not permit me to do on this occasion. Specimen No. 9 is one showing lines of suture too far apart, that is, the union of too great an extent of serous surfaces. The operation is completed by wrapping a fold of omentum around the line of union and secur-

ing it by one stitch at the mesenteric border. Lateral anastomosis may be done in substantially the same manner.

The advantages of the method are: 1, the approximator will quickly disappear and will therefore give no future anxiety; 2, with the approximator in place the mesentery may be accurately adjusted by rotating before suturing; 3, the ease and rapidity with which the union can be effected (Specimen 8 shows one removed from a dog upon which I operated without assistance); 4, the ease, rapidity and cheapness of manufacture of the approximator; 5, the spiral catgut stitch uniting the edges of the coats, tends to prevent accumulation of fluid and formation of abscess beneath the mucous coat; 6, a doctor of average surgical ability can perform the operation when emergency demands.

#### DISCUSSION.

Dr. H. H. GRANT of Louisville—I have done several of these operation both anatomically and surgically, and have gotten along as well without artificial aid as with it. The device suggested is a slight modification of the one we are familiar with, merely using a potato or turnip and preparing it just before the operation. The device facilitates the operation in the hands of those who have had little experience in the handling of the needle but the time occupied is not much less than a skilled operator would employ without much aid. If we must use a mechanical device we should employ the Murphy button. It is true that failure has occasionally resulted from imperfect approximation of the surfaces with the Murphy button, but this results largely from a want of familiarity with the mechanism of the button. If the serous surfaces are brought accurately together, the necessity for the use of sutures will rarely occur. The employment of these devices takes time and adds to the risk of hemorrhage. There is very little to do in securing apposition of the surfaces other than that which nature will take care of, and I question whether it will be to the interest of the profession to substitute anything for the Murphy button which can usually be dispensed with.

Dr. METCALF, in closing: I agree with the gentleman who has discussed my paper that it is an easy thing to do an intestinal anastomosis, but it is not easy at times to make the anastomoses that we are called upon to do. My experience is that I can do the operation in one-half the time that I used to be able to do it, and in such a way that there will be less serous surface to approximate. The results will be more accurate and the subsequent contraction less."

### THE ADVANTAGES OF A PERMANENT ABDOMINAL ANUS AND OF TOTAL CLOSURE OF THE SACRAL END OF THE RECTUM, IN OPERATIONS FOR CANCER OF THE RECTUM.

Presented to the Section of Surgery and Anatomy at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

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In the *Therapeutic Gazette* for May, 1897, I published fifteen cases of amputation of the rectum by Kraske's method, to which I have since added two more, making seventeen in all. Three of the patients died, giving a mortality of 17.07 per cent. Of the fourteen cases that have recovered, six have now passed beyond the three-year limit and may be considered reasonably safe from recurrence. Two of the men, in spite of the loss of the coccyx and part of the sacrum, ride bicycles with ease. Besides these the paper included a number of other cases of cancer of the rectum, operated on by other methods.

As a result of my experience in these cases, I have

reached a definite conclusion as to what is the best course to pursue. Evidently after the operation the bowel must continue to be emptied of its contents. There are only three ways in which this can be done. First, in those rather rare cases in which the sphincter can be preserved and the lower end of the bowel sutured to the upper, *i. e.*, a resection rather than an amputation of the rectum we restore the natural function of the bowel through the normal anus. Second, if the anus and sphincter have had to be removed, we can suture the sacral end of the rectum at the end of the resected sacrum, pass it through the gluteal fibers and make an artificial sphincter, or rotate it to such an extent as to make a sort of supplementary sphincter. I have not tried bringing the end of the rectum out through the fibers of the gluteus maximus muscle. Both of the other methods I have tried, but

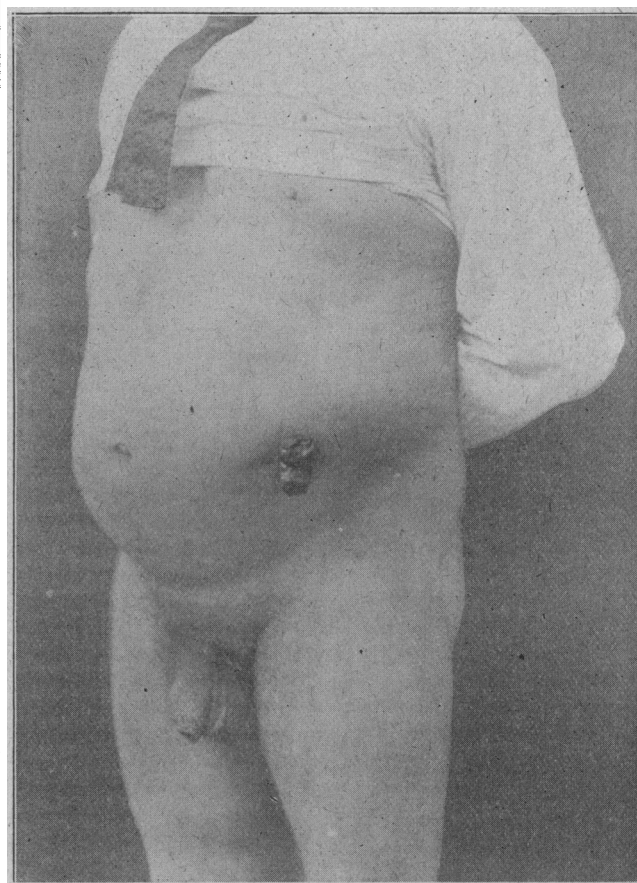


Figure 1.—The inguinal anus in Case 1.

neither has proved satisfactory. Rotation of the bowel has been followed by infection in the folds of the rectum and not very satisfactory results as to retention of feces. The sacral anus has not been satisfactory, first because it necessitates the patient's wearing for the remainder of his life, day and night, a napkin, partly on account of the constant escape of mucus, and partly on account of the want of control of the feces. In addition to this, there has always followed a greater or less prolapse of the bowel, which in some cases even reached six inches. No perineal napkin can be worn tight enough to produce pressure sufficient to prevent either of these annoyances.

Besides the annoyance of wearing a napkin, the involuntary escape of mucus and feces and prolapse of the bowel, the sacral anus has another danger at