experienced, and no after-effects. This patient had collapsed under chloroform and also under ether anesthesia on former occasions.

We have endeavored to apply subarachnoid injections of cocain to obstetrics but we reserve this part of our work for further study. In the study of cocain we found that its local action was in an inverse proportion to its degree of dilution, and that the diffusibility increased in proportion to the amount of the liquid injected. Our experience teaches us that the disagreeable after-effects of subarachnoid injections of cocain are, in part, due to the sudden increase of pressure, and may be avoided by the preliminary extraction of a small amount of fluid, and by making the injection slowly. The amount of cocain is also a factor of importance. With more than 1.50 c.c. of 1 per cent. solution, or more than 1 c.c. of a 1.5 per cent. solution of cocain, we generally noted more nausea, headache and weakness. Toxic symptoms occur in the subarachnoid method in very much the same manner as in the intradermic method of cocainization. In the search for substances less toxic than cocain, we considered eucain and nirvanin. The former, in animals, seemed to differ but little from cocain. Nirvanin, even in a 5 per cent. solution, used subcutaneously, proved less toxic than cocain, but only slightly diffusible. The analgesia induced is less pronounced and disappears more rapidly than that caused by cocain. Schleich's mixture is valueless for subarachnoid use.

CONCLUSIONS.

1. To the already known practical routes leading to the subarachnoid space, we propose to add the "low cervical"—in the sixth cervical space—which we find both easy and safe.

2. The cerebrospinal fluid possesses none of the properties of lymph.

3. Contrary to the classic opinion, the cerebral perivascular lymphatic sheaths do not empty into the subarachnoid space. (Sicard.)

4. Liquids injected by lumbar puncture diffuse rapidly toward the different cavities of the brain, and subsequently reach the cortex.

5. The difference in osmotic currents in the cerebrospinal fluid—presence of exosmosis and absence of endosmosis—in addition to the protection afforded by the perivascular lymphatic sheaths, explains the rarity of infection of the cerebrospinal fluid in the course of generalized blood infections and also the gravity of primary infections of the cerebrospinal fluid. (Sicard.)

6. Direct intramedullary medication is feasible and deserving of further trial.

7. Subarachnoid injections of cocain are devoid of danger if made with certain precautions. The solution should be freshly prepared and injected slowly at a temperature of 37 C. and never in a greater quantity than 3 c.c.

8. The extent and duration of the analgesia thus induced is generally in direct proportion to the amount of drug injected. Analgesia is noted in some cases as early as five minutes, after the injection, and in others, for unknown reasons, as late as thirty-five minutes. Its duration is sufficient for the performance of all operations on the lower limbs and pelvis, and may be sufficient to be of service in obstetrics.

9. The disagreeable effects—headache and vomiting—sometimes noted after these injections, are partly due

to the sudden increase of pressure in the subarachnoid space—too rapid diffusion toward the brain—and principally to the amount of cocain used. These post-operative symptoms are never alarming or lasting. They recall the effects of intradermic injections of cocain, and never resemble in severity the symptoms so frequently observed during and after chloroform or ether anesthesia.

10. One c.c. of a 1 per cent. solution of cocain injected slowly is generally sufficient for all practical purposes, and is not followed by untoward symptoms.

11. For obvious reasons, it is a good plan to withdraw a small amount of cerebrospinal fluid prior to making an injection.

12. To the careful surgeon, who aims to gradually divorce himself from the dangers of general anesthesia, and the limitations of superficial analgesia, spinal analgesia, may, under certain exceptional conditions, prove of signal service, and it behooves us to herald abroad the fact that this progressive step was made by a modest American surgeon—J. Leonard Corning.

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THE SURGERY OF BILIARY CALCULI.*

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I shall restrict my remarks to the surgical aspect of biliary calculi, as a consideration of the causation, frequency, symptoms of the various phases, their diagnosis and discriminating diagnoses, widespread complications, prognosis and medical treatment, so-called, would lead

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me far beyond the limits of a thesis of this character.

It may not be amiss, however, in describing the surgery of the gall-tracts, to allude to the very great frequency of gall-stones, as almost all organic diseases of the biliary reservoir and ducts are directly or indirectly dependent upon them. The frequent findings of unsuspected gall-stones at autopsies is not a valid contra-indication to operation in cases which, from certain complications, menace well-being and perhaps life.

The causation has been held to be the stagnation of bile with an altered condition of the epithelium, forming both the nucleus and media for their development and resulting from various mechanical, diathetic and inflammatory conditions. It is to the latter, perhaps, that we may look for a simplification of the various existing etiologic hypotheses. The element of infection of the biliary ways in the production of gall-stone is an undetermined quantity. It may be stated that Mignot produced cholelithiasis by the injection of bacteria into the gall-bladder.

The supreme symptom is pain; when this occurs in the right hypochondrium it is always significant. It may vary from slight discomfort to the agony of a biliary colic, which is equaled only by the parturient effort. It is important to discriminate between the intermittent and paroxysmal pain in biliary concretions, from the continuous pain in the inflammatory infective and suppurative conditions of the biliary passages.

In connection with the diagnosis I wish strongly to emphasize that jaundice is not an essential sign of gall-stones and the practice of waiting for icterus as a confirmatory evidence of their existence is illogical and positively hurtful. Jaundice is a symptom common to the whole biliary tract, whether from inflammation, retention or obstruction. While in the latter, jaundice is inevitable, it is also commonly present from extension in simple catarrhal duodenitis. Hunter McGuire¹ says: "According to my observation, at least one-half of the cases of gall-stones are never attended by jaundice and at least one-half the cases of persistent jaundice are not due to gall-stones."

I should like to speak also of the cholangial inflammations and also of the suppurative and infective conditions and their differentiation from lithiasis, but these can not be treated in the scope of this paper, except to call attention to them as being frequent concomitants and resultants of gall-stones; and to urge the early removal of troublesome cholelithiasis in the light of its inflammatory and ulcerative possibilities as well as its undoubted causal relationship to malignant disease.

The relatively small number of operations compared with the undisputed frequency of the disease, indicates that it is either overlooked or fails to give rise to serious trouble, or that the symptoms are mistaken for those of other disorders. The actual mortality is not known, as it is often a vague and undetermined malady and, when grave, is frequently considered only in the light of the complicating conditions. In regard to the surgical mortality, however, sufficient evidence has accumulated to allow us to draw convincing conclusions.

In the past eight years Kehr² has done 307 operations for cholelithiasis—255 women and 52 men. The total mortality was 11.7 per cent. Excluding deaths due to the pathologic condition, as hopeless carcinoma, advanced suppurative condition, etc., the actual mortality was 3.8 per cent.

Mayo Robson³ gives the following indications for surgical operations on the gall-bladder or biliary passages:

1. Recurring attacks of biliary colic, with or without jaundice, and whether the gall-bladder is enlarged or not.
2. Enlargement of the gall-bladder, whether there be pain or not.
3. Persistent jaundice which was preceded or accompanied by pain in the region of the gall-bladder, with or without paroxysms resembling ague.
4. Empyema of gall-bladder, or peritonitis in gall-bladder region.
5. Abscess in region of gall-bladder.
6. Rupture, fistula, or wounds of gall-bladder.

The lessened danger of hernia in this region makes amplitude of exposure the sole consideration.

In tumefaction, linear incision over the prominence is all that is required. For exploration, a small vertical incision through skin, fascia, and peritoneum can be made at the outer border of the right rectus, beginning at the top of the tenth costal cartilage. This can be prolonged downward to any needed length and joined by another incision at right angles to it and across the rectus muscle, to give a liberal exposure of the sub-hepatic space. (Abbe.)

Somewhat the reverse of this triangular incision is proposed by Czerny, who begins his incision in the median line and prolongs it transversely to the right at the level of the umbilicus.

The oblique or transverse incision of Courvoisier, parallel with, and one-half inch below the lower border of the ribs, is capable of easy extension and gives adequate room for manipulation.

Bevan employs an S-shaped incision, for which most liberal exposure is claimed.

Of the operations on the gall-bladder, I shall discuss cholecystotomy, cholecystodesis, modified cholecystotomy without suture and cholecystectomy.

CHOLECYSTOTOMY.

Incision of the gall-bladder and suturing the cut edges to the parietal incision, with drainage, like many important life-saving surgical procedures, is of American origin, having been first performed by Dr. Bobbs, of Indiana, in 1867. It is the simplest of the gall-bladder operations, is applicable to the majority of cases, and the mortality is practically nil in cases without jaundice. In 115 cases, Mayo Robson⁴ lost 5, 3 of which were complicated with cancer and 2 with infective cholangitis and jaundice. Excluding these there were no deaths in 100 uncomplicated cases.

Technique.—The usual vertical incision three inches downward from the tip of the tenth costal cartilage usually exposes the gall-bladder. If adherent, as the result of previous severe or existing inflammation, it should be freed from neighboring viscera. The next and most important technical step is the complete and careful surrounding of the gall-bladder with sterile gauze so disposed as to entirely wall off the field of operation from the peritoneal cavity. It is convenient to introduce two stout silk ligatures into the fundus to act as guy-lines. The contents may then be aspirated and the gall-bladder incised for exploration with the finger. Calculi may be removed with the finger, forceps or scoop. After all the discernible stones have been extracted, the operator should make a careful palpation of the ducts. If any stones are detected they should be removed by the appropriate maneuver. The edges of the gall-bladder incision are then sutured to the peritoneal and fascial margins of the wound by chromicized catgut. A non-

perforated rubber drainage-tube is introduced and the parietal wound partly closed by sutures. Copious dressings should receive the bile, or it may be siphoned into a bottle by rubber tubing. At the end of ten days the bile may be dammed up by a pad, and the opening usually closes in three or four weeks. If a sinus persist, there is usually a stone imbedded somewhere in the biliary tract, but many stones, overlooked or left, work out later.

Fistulæ resulted in 50 per cent. of Robson's cases where the gall-bladder was sutured to the skin, but in only 7 out of 160 cholecystotomies where it was sewn to the aponeurosis, all of which were ultimately cured by appropriate means.

The earlier operations were always, and a certain number are now, done in two stages. It avoids the risk of peritonitis, especially in the infected cases. It is much simpler and should commend itself to the inexperienced operator. To the expert it is less often required. Kehr employed it only 3 times in 100 cases. In acute cholecystitis, where the gall-bladder is small, deeply seated and can not be satisfactorily sutured to the incision, Riedel advocates the two-stage method, by allowing adhesions to form about a gauze tamponade, before incising the gall-bladder. The chief objection to the operation in two stages is that an impacted stone in one of the ducts could not be removed and might require a second operation.

CHOLECYSTENDESIS.

Immediate suturing of the gall-bladder after incision and extraction of the stone was first suggested by Langenbuch.⁵ It is requisite that the bile-channels be open. It is the ideal operation in that it leaves no biliary fistula, but it presents the danger of peritonitis from leakage, prevents needful drainage of the inflamed tracts and walls off the cholecystitis and also cuts off the escape of any remaining concretions. It should be reserved for early cases, with slight inflammatory changes. Two rows of Lembert sutures are required.

MODIFIED CHOLECYSTOTOMY.

A modification of cholecystotomy, by Poppert, of Giesen, has recently been described by Coley,⁹ as follows:

The first steps of the procedure recommended by Poppert are the usual ones, namely, the incision of the gall-bladder and removal of the calculi; then, however, instead of directly suturing the bladder to the abdominal wound, he establishes between the two a narrow drainage by means of a thick and long drain, which is fixed by a suture in the lowest point of the incision in the bladder, and the lips of the wound are drawn as tightly as possible around it. The other end of the drain is sutured to the abdominal wound and is surrounded by a wick of iodoform gauze, which at the same time serves as a dressing for the bladder incision. The bile flows out through this tube of caoutchouc. In ten to fifteen days the obliteration of the bladder around the drain ceases, as is shown by the fact that the bile impregnates the wick and soils the dressing. At this time, however, the adhesions having been formed around the drain, there is no longer any danger of the bile escaping into the peritoneum. Then the iodoform wick can be taken out, and at the end of from three to four weeks the drain is removed. The fistula closes rapidly.

The author has practiced this mode of drainage in forty-seven cases of simple cystostomy, and in ten cases of cystotomy combined with cysticotomy or choledochotomy. He has never had a failure, and claims the following advantages for his method:

1. It is extremely simple, and may be practiced in all cases where the bladder is distended or contracted. The method can be employed even in friable bladders—which heretofore have

been considered as unfit for operation—and even in worse conditions.

2. It does not cause the formation of tight adhesions between the bladder and the abdominal wall and does not cause any painful contractions of the bladder and great biliary canals when the bladder and liver resume their places.

3. It affords protection against peritonitis, for as the bile flows out of the cystic wound it is absorbed by the tampons. The tamponade becomes particularly valuable when it is necessary to open an abscess situated above the bladder.

This has also been done by many American surgeons, and cases were reported by Longyear, of Detroit, and Hall, of Cincinnati, in 1893.¹²

CHOLECYSTECTOMY.

Excision of the gall-bladder was first performed by Langenbuch in 1882. It is regarded by Thiriar as the least dangerous of the operations on the gall-bladder. Its indications may be summarized: 1. As a secondary operation for persistent mucous fistula, as a result of insuperable obstruction of the cystic duct. (Robson.) 2. When the gall-bladder is contracted and can with difficulty be brought into the incision, extirpation can be practiced if the common duct is undoubtedly free. 3. Where the friability of the organ from inflammatory disorganization precludes other indicated procedures. 4. Malignancy, gangrene and ulceration.

The operation is anatomically exceedingly simple, requiring only blunt dissection of the attachment to the liver and ligation of the cystic duct, followed, or not, by drainage. The portion attached to the liver in a necrotic gall-bladder was left by Gaston, and the remainder trimmed away after ligation. Dr. Clinton Cushing¹⁶ assumes that as the gall-bladder is absent in certain animals, such as the horse, the deer, and the elephant, it is probably, like the appendix, a vestigial organ, and can be removed without detriment to the physiology of the economy, and that, being a cul-de-sac, a serious disease having once occurred was likely to return. He advocated excision in all cases of operation for gall-stones, save obstruction, to prevent reaccumulation or renewal of inflammation. He reported six cases, all followed by recovery.

On the other hand, Rose⁸ considers the function and retention of the gall-bladder very important and advocates exploration of the ducts by incision at its base, and clearing the tract of stones by that avenue. He found that disablement of the gall-bladder caused compensatory dilatation of the other ducts, and that the continuance of such disablement or cholecystectomy would lead to new secondary lithiasis in the branches of the hepatic duct.

The surgery of the gall-bladder is almost perfected, but the management of calculi in the ducts by the various methods is as yet unsettled. I shall discuss the following operations on the ducts: Cholelithotripsy, cysticotomy, choledochotomy and choledochostomy.

CHOLELITHOTRITY.

Cholelithotripsy, or crushing the calculus in the duct, has been said to be preferable to incision. This is accomplished by: *a*, finger pressure; *b*, pressure by padded forceps; *c*, needling. The first is the least objectionable and Robson reports thirty cases with one death. Needling or breaking the stone into fragments was suggested by Mr. Thornton; crushing was suggested by Mr. Tait, and is the least of his wonderful work in this field. Both crushing and pressure by padded forceps have some of the dangers of incision and may present others, such

as leaving debris as nuclei for further concretions. They were practiced before the surgery of the ducts had reached its present stage of advancement, and are infrequently employed at this time.

CYSTICOTOMY.

Cysticotomy is the operation for incision of the cystic duct, and extraction of stone with or without suturing. The cystic and hepatic ducts and the upper part of the ductus communis choledochus can be reached by an incision through the anterior layer of the gastro-hepatic omentum, the liver and gall-bladder being drawn strongly upward. Cysticotomy is rarely required and only when a stone is so firmly impacted that attempts at dislodgment by manipulation and pressure fail. Drainage should be established with or without suture. Kehr operated on the cystic duct 23 times without a death.

CHOLEDOCHOTOMY.

Courvoisier estimated that 4 per cent. of gall-stones were located in the common duct, but Robson says from a surgical standpoint, 20 per cent. is not too high. Clayton Parkhill¹³ says that stones were removed from the common duct 200 years ago. Courvoisier deliberately planned and performed the operation of choledochotomy in 1890, but Marcy, of Boston, removed a stone from the cystic duct the year before. The lower part of the choledochus may be reached by cutting through the peritoneum at the right of the first or second portion of the duodenum toward the median line. All manipulations, and especially suturing of the common duct, are rendered far more easy, as urged by Deaver,¹⁴ when the finger is inserted in the foramen of Winslow, thus elevating the duct in the border of the gastro-hepatic omentum. It can be accurately palpated and an impacted stone can sometimes be pushed into the duodenum or back into the gall-bladder. The cystic and also a portion of the hepatic duct can be palpated. When the stone is located, linear incision of the duct can be made with the finger behind it, great care being exercised to prevent injuring the portal vein. In all operations on the duct, a sandbag under the back brings it more easily within reach. The feet should be lowered to allow the colon to gravitate downward, the liver being held up by large retractors. Gauze pads should be snugly packed about the field of operation. Adhesions, which usually exist, should be very delicately severed. If suturing is contemplated it should be done in layers, fine catgut uniting the muscularis, and Lembert sutures of silk, the peritoneum. Halsted⁶ has described minute hammers for elevating the duct and putting it on a stretch to facilitate suturing. It is difficult to prevent leakage by any method, and it is best to drain. If it is inexpedient to suture, the entire efficacy of drainage with gauze has been abundantly proved and its employment ardently insisted upon, by W. E. B. Davis, who has made so many important contributions to the surgery of the gall-ducts. The importance of this suggestion is well illustrated by a recent report. Quénu⁷ collected 95 cases of suture of the ducts with a mortality of 35.5 per cent., while the mortality in the cases without suture was only 18 per cent. In these were included 6 personal cases. In 2, sutures were used; both died. In 2 others biliary intoxication appeared; the sutures were cut and the patient recovered. The other two were not sutured and recovered.

Fenger⁹ also believes that the common duct should not be sutured as a rule, and never without drainage, from

the site of incision in the duct, and particularly drainage of the gall-bladder to prevent biliary intoxication. McBurney¹⁵ has suggested that the anterior wall of the duodenum be opened at the junction of the first and second portion, and the common duct approached through the intestine. This obviates the difficult exposure and manipulation of the duct by the usual method, gives easy access to the stone by dilatation and slight incision of the duodenal opening of the duct, allows free probing for other stones, greater safety in suture of the duodenum, and more rapid recovery. He has performed the operation six times. Parkhill,¹³ of Denver, has made a Murphy-button anastomosis between the common duct and duodenum with success, and Robson reports two similar anastomoses, by suture, with recovery.

Fenger collected 44 cases of choledochotomy in 1896, with a mortality of 18 per cent. He has operated on 7 cases, with 1 death, a mortality of 14.3 per cent. Kehr has had 7 operations with a mortality of 11.7 per cent.; Peterson¹¹ 20 cases, with 4 deaths, a mortality of 20 per cent.; and Robson 49 cases, with a mortality of 6.1 per cent., jaundice and suppurative cholangitis being present in all of his fatal cases.

CHOLEDOCHOSTOMY.

Choledochostomy, or attaching the duct to the incision in the anterior abdominal wall is rarely necessary, always difficult and sometimes quite impossible.

CHOLECYSTENTEROSTOMY.

Cholecystenterostomy, or making a permanent fistula between the gall-bladder and intestinal canal, by suture or mechanical appliance, is indicated to short-circuit the bile in: 1. Irremediable obstruction of the common duct from *a*, stone; *b*, adhesion; *c*, angulation; *d*, chronic catarrhal cholangitis producing jaundice. 2. Persistent biliary fistula. 3. Obstructive jaundice from pressure of cancer.

The first cholecystenterostomy was performed by Winwarter, of Liège, in 1880, who sewed the gall-bladder to the colon and attached both to the abdominal wall. After union had occurred, he opened the approximated surfaces and sewed the cut margins together, as we do in making lateral anastomosis by suture. After five attempts he succeeded. But it was the genius of a southern surgeon, Dr. J. McFadden Gaston, that gave to humanity the operation of duodeno-cholecystenterostomy,¹⁷ in 1882. This was first performed on the human subject by Terrier, in 1889. However, it has been a safe and generally applicable procedure only for the last dozen years. The introduction of that most ingenious surgical device of the age, the Murphy button, has given the operation a much wider scope by the simplicity of the device and the rapidity with which it can be applied. Murphy collected thirty-eight cases without a death, some years ago, all that had been reported up to that time. Many of these operations have been done since with uniformly good results.

There is a certain class of cases where, owing to the contracted condition of the gall-bladder, or fixity of the duodenum in the depths of the loin as a result of inflammatory changes, the viscera can not be made to approximate each other and in that event the colon may be substituted. While it should be our aim to restore parts to as nearly a normal and physiologic condition as possible, still where it is inconvenient and impossible to switch the bile into the duodenum, we may utilize the

colon, as has been frequently done, without detriment to the economy in the supposed necessary presence of bile in the small intestine. This possibility was abundantly proved by the elaborate and carefully conducted experiments by Robson¹⁸ on a case of biliary fistula, which he epitomized in the following conclusions:

1. The bile is probably chiefly excrementitious, and like the urine, is constantly being formed and cast out.

2. Though the bile probably assists in the absorption of fats, its presence in the intestine is not necessary for the digestion of such an amount of fat as is capable of supporting life and keeping up nutrition.

3. Increase in body-weight and good health are quite compatible with the entire absence of bile from the intestines.

4. The antiseptic properties of the bile are unimportant. 5. Whatever little antiseptic quality bile may have is probably derived from its admixture with the gall-bladder fluid.

6. The supposed stimulating effect of the bile on the intestinal walls is not necessary for a regular action of the bowels.

COLOCHOLECYSTOSTOMY.

I beg leave to briefly report the following case of colocholecystostomy for chronic catarrhal cholangitis with gall-stones:

B. J. G., male, aged 27, had a severe attack of biliary colic attended with tenderness and jaundice in February, 1897. He had had several light attacks of hepatic colic some weeks before, and he had been in Johns Hopkins Hospital, Baltimore, awaiting operation, but improved, and so it was deferred. He was operated on after the severe attack in 1897, by Dr. J. F. W. Ross, of Toronto. A number of stones were removed, a fistula made and a drainage-tube kept in for two weeks. The fistula remained open until June, 1897, when Dr. Ross closed it by suture, and the patient, who had been in bed the whole of the four months, was up in a week. In November, 1897, he again had a number of attacks of colic and jaundice, which kept up intermittently until March, 1898, when Dr. Louis McLane Tiffany, of Baltimore, opened the gall-bladder. As he found no stones, he closed by immediate suture, fixed it to the abdominal wall, and closed the incision throughout.

In June of the same year, while still in the hospital, the patient was again seized with attacks of colic and transient jaundice, which, in the absence of Dr. Tiffany, induced his assistant, Dr. I. R. Trimble, to again open the gall-bladder for exploration. He wrote me that he found no stones, but thought he had succeeded in passing a rubber catheter through the cystic duct and thence into the duodenum. The gall-bladder was sutured and attached to the abdominal incision, which was closed by buried and superficial silkworm gut sutures.

On July 3, he received a blow on the head, which resulted in a fracture of the skull, which was elevated by Dr. Robert Pillow, of Columbia, Tenn.

In August, 1899, fourteen months after the third gall-bladder operation the pain and colic returned and was rather frequent and more severe than ever before. On October 1, he had an attack that lasted four days, and could obtain no relief. He came to see me in Nashville and, while there, had one of the most severe attacks of biliary colic I have ever seen. I gave him 2½ gr. of morphin, hypodermically, in less than three hours without any appreciable effect on the pain. He was not accustomed to taking morphin, and after the operation 1/8 gr. had a very satisfactory and complete effect.

On Oct. 12, 1899, in the presence of jaundice which had existed fitfully for two months, I made an exploratory operation through the old scar parallel with the ribs. As the gall-bladder was attached to the parietes, it was opened, and a black, tarry fluid was found therein and one large gall-stone, perfectly black and somewhat larger than a cherry-stone, together with some smaller crystal-like stones. An effort was

made to catheterize the ducts, which it was reported had been done before without success. The gall-bladder was irrigated and temporarily packed with gauze. It was then dissected from the parietes below and a careful palpation of the ducts made, but no other stones could be detected. The adhesions were very considerable as the result of so many previous operations and such long-continued inflammatory trouble, and the gall-bladder was much contracted. I did not wish to content myself simply with the removal of the two small stones, nor yet did I desire to close it up again or give him another biliary fistula, both of which had failed to give permanent relief. Kelly, Senn and Murphy had all advised a cholecystectomy, but after I found no calculous obstruction to account for the recent colic and existing jaundice, I concluded that it must be a chronic catarrhal cholangitis with intermittent inflammatory obstruction. I thereupon deemed it unwise to do a cholecystectomy, and decided to make a cholecystenterostomy. The duodenum, however, was so matted with adhesions and the gall-bladder was contracted to such an extent that I did not think I could make the anastomosis with safety. I, therefore, utilized the hepatic flexure and made a Murphy button anastomosis with gauze drainage. There was no untoward symptom. A little bile came out after the removal of the gauze, on the third day, but none thereafter, and the drainage tract closed quickly. The jaundice faded, urine cleared up and he had two normal bowel movements a day, whereas, he had previously been obliged to take purgatives daily. He went home at the end of two weeks, with a clear complexion and a gain in weight; has had no trouble since, but the button has not passed.

McGuire reports a button retained over a year after cholecystenterostomy, but Treves has never known one to remain in the gall-bladder.

NOTE—I have had a communication from Dr. Ross since this paper was read, referring me to a report of the first operation performed by Dr. Ross, upon this patient; the specimens were illustrated in the *International Clinics* for October, 1897, Vol. iii, 7th Series. About 3000 gall-stones were removed which were denominated by Ross and also by Frerichs, "biliary gravel."

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A CASE OF PERFORATING GASTRIC ULCER.*

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For the following case I am indebted to Dr. A. B. Beaver, of Ridgway, Pa., who kindly referred the patient to me Sept. 20, 1899.

The patient was a man, by nativity a Swede, aged 57 years, by occupation a tanner. He said that his father died at the age of 90 and his mother at the age of 45—cause unknown. He had two brothers and two sisters,

*Read before the Fourth District Branch of the N. Y. Medical Association, Buffalo, May 8, 1900.