

Dominion Medical Monthly

And Ontario Medical Journal

VOL. XXIII.

TORONTO, OCTOBER, 1904.

No. 4.

Original Articles

ON PANCREATIC INFLAMMATIONS IN THEIR RELATIONSHIP TO CHOLELITHIASIS, AND THEIR TREATMENT.*

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Mr. President and Gentlemen,—Your kind invitation to give the Address in Surgery before the Canadian Medical Association, accompanied as it was by other temptations, especially that of a visit to this delightful and important part of Greater Britain, left me no choice but to accept the proposed honor.

My only difficulty lay in the selection of a subject, but as I have been for some time working on the pathology and surgery of the pancreas, I ventured to think that pancreatic inflammations in their relationship to cholelithiasis might prove of sufficient interest and importance to engage your attention.

If my surmise falls short of my wishes and of your expectation, I must beforehand crave your forgiveness.

Among the many complications of gall-stones, pancreatitis in its various forms is now known to be one of the most important, though the relationship has only comparatively recently been recognized.

The bile ducts and the pancreas are so intimately related in

* Address in Surgery delivered before the Canadian Medical Association at Vancouver, B.C., August 24th, 1904.

their development and their anatomy that it can excite no surprise to find them frequently associated in their diseases; and though we frequently find cholelithiasis without pancreatic troubles, it is much less common to have inflammation of the pancreas, whether acute, subacute or chronic, without finding common duct cholelithiasis. The reason for this association is not far to seek; it is due to the junction of the common bile duct and the duct of Wirsung at the ampulla of Vater, and their common opening into the duodenum, a channel always containing organisms ready, under certain conditions, to invade and become virulent.

Pancreatitis is probably always a secondary disease and usually dependent on infection spreading from the common bile duct or duodenum. It may be asked, if common duct cholelithiasis and pancreatitis are so often associated, why should some cases of common duct obstruction go on for months or years without the pancreas participating?

As I shall hope to show by lantern slides and by clinical evidence, the explanation of the presence or absence of pancreatitis as a complication of cholelithiasis is an anatomical one, though the degree of inflammation when infection does occur, is in a great measure a vital process, dependent on the powers of resistance of the individual.

I must ask you to excuse me for taking you back to the dissecting room for a few minutes, as, though doubtless you are well acquainted with the normal anatomy of the pancreas, there may be some who are unacquainted with the great number of variations that may be encountered; which varieties may save a patient from or may commit him to pancreatitis should he be unfortunate enough to suffer from common duct cholelithiasis.

The common bile duct, starting by the junction of the cystic and hepatic duct, courses along the free border of the lesser omentum associated with the portal vein and hepatic artery; it then passes behind the first portion of the duodenum, and soon comes into relation with the pancreas, which it either grooves deeply or passes through or behind, before it pierces the wall of the second part of the duodenum, where it empties into the diverticulum of Vater along with the duct of Wirsung. It may be divided into four portions: (*a*) The supra-duodenal portion; (*b*) the retro-duodenal portion; (*c*) the pancreatic portion; (*d*) the intra-parietal portion. The latter two only are important for our present purpose.

If the choledochus passes behind and not through the head of the pancreas, the duct may escape pressure when the pancreas

is congested or otherwise swollen; whereas if it passes through the gland, any congestion or swelling of the pancreas will, by pressing on the common bile duct, bring on jaundice, with its various sequelæ. Thus is explained, to my mind, many of the cases of so-called catarrhal jaundice, which may come on as an extension from gastro-duodenal catarrh, or in the course of a pneumonia, or during typhoid fever, influenza and other ailments, and which I believe to be often dependent on catarrhal inflammation of the pancreas, leading to pressure on the bile ducts. In some cases I have proved this hypothesis to be correct at operations undertaken for chronic jaundice.

As the duct is completely embraced by the pancreas in 62 per cent. of all cases, we may conclude that in nearly two-thirds a swelling of the head of the pancreas will produce jaundice; and curiously, this percentage coincides with Dr. Cummidge's and my clinical observations and pathological investigations on the urine of pancreatic cases.

Not only so, but when the head of the pancreas embraces the common bile duct, should a gall-stone pass down, it will almost certainly exercise pressure on the gland, and thus directly interfere with its function and with the discharge of its secretion.

The fourth portion is where the duct enters the wall of the second part of the duodenum and ends in the ampulla of Vater, into which small cavity the duct of Wirsung also debouches. This part of the common duct comprises all that portion of the canal contained in the thickness of the wall of the duodenum. It passes obliquely through the muscular coat of the intestine, and then dilates into a little reservoir underneath the mucous membrane, into which the main pancreatic duct also opens. This is known as the ampulla of Vater. This ampulla, a little oval cavity, may be well seen in a section of the wall of the duodenum, in the axis of the common duct. The opening of the common duct is above that of the pancreatic duct, and the two are separated by a little transverse fold of mucous membrane. The ampulla measures from six to seven millimetres in length, and from four to five in breadth, and with the termination of the two ducts, is surrounded by a thin layer of unstriped muscular tissue, forming a sphincter (Oddi).

The ampulla opens into the duodenum by a little round or elliptical orifice, which is the narrowest part of the bile channel. It is important to note that the length of the diverticulum of Vater may vary from zero to 11 millimetres, the average being 3.9 millimetres, according to Opie, who measured one hundred specimens. Viewed from the interior of the duodenum the

ampulla forms a rounded eminence of the mucous membrane, known as the *caruncula major* of Santorini, the opening being seen at the apex of the caruncle. It is distant 8 to 12 centimetres from the pylorus. Above it there is constantly found a small fold of mucous membrane, which must be raised in order that the caruncle and its orifice may be clearly seen. Running downwards from the caruncle is a small vertical fold of mucous membrane known as the *frenum carunculae*. Above the *caruncula major* is found a smaller eminence, the *caruncula minor*, marking the termination of the accessory pancreatic duct, or duct of Santorini, which opens into the duodenum about three-quarters of an inch above the biliary papilla.

The mode of formation of the ampulla of Vater and the termination of the common and pancreatic ducts are liable to great variations.

Letulle and Nattan Lorrier distinguish four types, to which may be added a fifth, recently shown by a dissection now in the Hunterian Museum.

The first type is the classical one described above. In the second type the pancreatic duct joins the common duct some little distance from the duodenum, the ampulla of Vater is absent, and the duct opens into the duodenum by a small, flat, oval orifice. In the third type the two ducts open into a small fossa in the wall of the duodenum, while the caruncle and the ampulla of Vater are absent.

In the fourth type the caruncle is well developed, but the ampulla is absent, the two ducts opening side by side at the apex of the caruncle.

In the fifth type the common bile duct opens along with the duct of Santorini and Wirsung's duct enters the duodenum separately.

It will be readily understood that under ordinary circumstances when a gall-stone passes along the common bile duct and reaches the ampulla of Vater, it will not only occlude the bile passages, but also the chief excretory duct of the pancreas, the secretion of which will be retained. Should infection occur, pancreatitis becomes inevitable, and on the condition of the individual, as well as on the nature of the infection, will depend what occurs, whether a mild catarrh of the pancreatic ducts, an interstitial pancreatitis, an extremely serious suppurative catarrh, or a parenchymatous inflammation in the shape of acute pancreatitis.

Opie, finding in one case a very small gall-stone and a large ampulla of Vater, constructed a pretty theory, which is probably

true in some rare cases, as in the one reported from Dr. Halsted's clinic in the Johns Hopkins Hospital, and in another case that occurred in Buffalo, which was mentioned to me by my friend, Dr. Roswell Park, but which I believe has not yet been reported. Opie says that under these circumstances the bile and pancreatic ducts are converted into one direct tube, as shown in the diagram, and that the bile being forced into the pancreatic duct, sets up acute pancreatitis.

He appears to think that pure non-infected bile is capable of doing this, and he has apparently demonstrated the possibility by experiments on animals. For my own part, I believe that infection is the important factor, and that the bile is simply the conveyer of infection.

That this anatomical arrangement described by Opie is not necessary in order that acute pancreatitis may develop, is shown by cases reported where *no gall-stones were present*, and by an instructive case under the care of Dr. Fison, of Salisbury, where at the autopsy of a fatal acute pancreatitis a gall-stone was completely filling the ampulla of Vater and occluding both the bile and pancreatic ducts. It will be seen that while the normal termination and the second variety of termination of the ducts will favor the onset of pancreatitis in case of common duct cholelithiasis, the variations 3 and 4, in which the two ducts are separate, will possibly save the patient from the serious secondary pancreatic troubles, and in variation 5, a small portion of the gland only will become infected.

But the pancreatic ducts themselves are also subject to great variations that may influence the course of events. The beautifully dissected specimen from the Hunterian Museum, a photograph of which I throw on the screen, and the X-ray photograph of Wirsung's duct injected with mercury, also shown, demonstrate the normal anatomy of the pancreatic ducts and show how the lobules have each a separate duct that opens into the main channel or duct of Wirsung, which itself opens into the ampulla of Vater, or directly into the duodenum, as described; but it will also be noticed that a smaller channel, the duct of Santorini, usually discharges some of the secretion of the pancreas directly into the duodenum, and that in a certain proportion of cases the two ducts communicate.

The diagrams I now point out will explain this. They show the result of observations by Opie on 100 cadavers, in which the ducts were injected and photographed, with the following results:

In 90 specimens the two ducts are united; in 10 two wholly independent ducts enter the intestine.

1. Of the ducts in anastomosis: (1) Duct of Wirsung, larger in 84—(a) duct of Santorini patent in 63, (b) duct of Santorini not patent in 21. (2) Duct of Santorini larger in 6—(a) duct of Wirsung patent in 6, (b) duct of Wirsung not patent, 0.

2. Ducts not in anastomosis, in 10: (a) Duct of Wirsung, larger in 5, (b) duct of Santorini, larger in 5.

In 89 per cent. the duct of Wirsung was larger than the duct of Santorini. In 21 per cent. the duct of Santorini was apparently obliterated near its termination. In 6 cases the duct of Santorini was larger than the duct of Wirsung. In all cases where the duct of Santorini is patent it diminishes in size towards the duodenum. Thus the duct of Santorini cannot be relied on in many cases to supplement the duct of Wirsung, if it be obstructed; moreover, the duct of Santorini, even if patent and communicating with the duodenum, may itself be compressed by a moderate sized gall-stone passing down the pancreatic portion of the common duct. Now it might be argued that, if the two ducts communicate, why should not the duct of Santorini act as a safety valve to the duct of Wirsung when it is compressed, and thus free the pancreas from the retained secretion which is in danger of becoming septic?

It will be seen that in only half or less than half of all cases will the duct of Santorini act as a safety valve if the duct of Wirsung is obstructed, for, although in 63 per cent. of cases the duct opens at the same time into the main channel and into the intestine, yet in probably less than half of these is the anastomosis efficient as a through channel.

The reasons why gall-stones in the common bile duct do not always produce pancreatic inflammation are:

1. Some gall-stones are so large that they never reach the pancreatic portion of the duct, but remain in the supra-duodenal portions of the common duct, producing jaundice, but no pancreatitis. The following is an example:

Mr. S., aged sixty-five, had for two years been subject to occasional attacks of epigastric pain. In January, 1903, a severe attack was followed by jaundice, since which time he had rapidly lost weight, and the jaundice had never disappeared. Pain after food had been a marked feature. He had neither vomited blood nor had melena. There was no dilatation of the stomach, and no evidence of tumor. The recti were rigid. He was seen by a well-known physician, who diagnosed cancer of

the pancreas. An examination of the urine, however, showed an entire absence of pancreatic crystals, proving the absence of cancer and of inflammation of the pancreas. An operation was performed on November 24th, 1903, when a gall-stone the size of a filbert was discovered in the supra-duodenal portion of the common duct and removed through an incision, which was afterwards sutured. The pancreas was normal. The gall-bladder was drained. Recovery was uninterrupted, and the patient is now well.

2. In some cases the bile ducts and pancreatic ducts open by separate orifices, as shown in the illustration, and any gall-stone passing down the common duct will then not necessarily compress or occlude the pancreatic duct.

3. In exceptional cases the duct of Santorini is the principal outlet for the pancreatic fluid, it being of such a size as to afford a safe outlet to the secretion, even when the duct of Wirsung is obstructed.

In order to make the relationship between gall-stones and inflammation of the pancreas quite clear, I shall give the classification of pancreatitis that I recently proposed in the Hunterian lectures, which, I believe, includes all the varieties. Pancreatic inflammation may be catarrhal, in which the inflammatory trouble is in the ducts, or parenchymatous, in which the substance of the pancreas is involved. The former resemble the different forms of cholangitis, with which, indeed, they are frequently associated; the latter bear more resemblance to inflammatory affections of the appendix, "suppurative and gangrenous appendicitis." The following show the classification at a glance:

Catarrhal Inflammations.—(a) Simple catarrh, acute and chronic, (b) suppurative catarrh, (c) pancreo-lithic catarrh.

Parenchymatous Inflammations.—Acute: (a) Hemorrhagic pancreatitis—(1) Ultra-acute, in which the hemorrhage precedes the inflammation, the bleeding being profuse, and both within and outside the gland; (2) acute, in which inflammation precedes the hemorrhage, which is less profuse and is distributed in patches through the gland. (b) Gangrenous pancreatitis; (c) suppurative pancreatitis (diffuse suppuration). Subacute: Abscess of the pancreas (not diffuse suppuration). Chronic: (a) Interstitial pancreatitis—(1) Interlobular, (2) interacinar; (b) cirrhosis of the pancreas.

Although in my address to-day I am only dealing with one cause of pancreatic trouble, yet it is the chief one, and in a very large percentage of cases the only cause of pancreatitis in its

various forms, but in order to make the position clear I will relate the other etiological conditions:

The etiology of pancreatitis may be classified under predisposing and exciting causes. Among the predisposing causes are: (1) Obstruction in the ducts, the result of gall-stones, duodenal catarrh, pancreatic calculi, cancer of the papilla or of the head of the pancreas, ulcer of the duodenum, followed by cicatricial stenosis of the papilla, ascarides, and lumbrici; (2) injury either from a bruise, as by manipulation in operating, or from a crush, as by a blow in the epigastrium, or from wounding by a sharp instrument; (3) hemorrhage into the gland; (4) general ailments, such as typhoid fever, influenza and mumps; (5) certain anatomical peculiarities in the pancreas or its ducts; (6) atheroma or fatty degeneration of the blood vessels; (7) new growth, *e.g.*, cancer or sarcoma.

The chief exciting causes are: (1) Infection conveyed (*a*) from the blood, as in syphilis or pyemia; (*b*) from the duodenum, as in gall-stone obstruction or gastro-intestinal catarrh; (*c*) by extension inwards from adjoining organs, as in gastric ulcer or cancer eroding the pancreas. (2) Irritation, as in alcoholism (doubtful).

So long as the concretions remain in the gall-bladder or cystic duct, it is unlikely that the pancreas will participate in the cholecystitis, unless the gland has been originally infected from the duodenum, as possibly occurred in the following case: In this case, gall-stones in the gall-bladder were associated with catarrh of the pancreas, which must have either been due to an extension of the catarrh of the gall-bladder and bile ducts to the pancreas, or have resulted from the passage of a gall-stone from the common duct on some former occasion, which had led to infection both of the bile and pancreatic ducts. A lady, aged fifty, had for several years suffered from attacks of distinct biliary colic, which during the past two months had been followed by jaundice, fever and collapse. There had recently been loss of flesh. On examining the urine, fine pancreatic crystals were discovered, and at the operation on April 30th, 1903, forty gall-stones were removed from the gall-bladder and cystic duct. None were found in the common duct, though the head of the pancreas was distinctly swollen and harder than normal. The gall-bladder was drained. The patient made a good recovery and is now well. Normal weight has been regained, and there is no longer any evidence of disturbed metabolism.

Even if gall-stones pass into the common duct and are not

long detained in it, a catarrhal pancreatitis may supervene, as in the following case: A patient, aged thirty-eight, after being subject to indigestion for years had biliary colic in July, 1899, and passed gall-stones, which were found in the motions. Subsequently the attacks of pain were frequent and severe, necessitating the use of morphia. They were usually accompanied by icterus, which, though slight, probably never quite disappeared. When I saw him in November, 1903, he had lost flesh and was prevented from carrying on his professional duties. The metabolic and digestive signs of pancreatic catarrh were well marked. At the operation, on November 23rd, 1903, no gall-stones were found, though the gall-bladder was thickened and adherent to contiguous organs. The pancreas was firmer than usual, though not very much swollen. Cholecystotomy led to recovery, though the drainage of the bile ducts had to be continued for three months. The patient is now well.

In this case the pancreatic catarrh had evidently been set up by the passage of gall-stones through the common duct. The pancreatitis had, however, persisted, and was not only keeping up painful symptoms, but leading to obstruction of the bile ducts and to interference with nutrition. Now this case would formerly have been called catarrhal jaundice, whereas it was really due to catarrhal pancreatitis, as proved by the digestive and metabolic signs, and later by operation.

I could relate other instances, but this case will suffice to show that pancreatic catarrh may be produced by a passing gall-stone and persist after the cause has disappeared, and that drainage of the bile ducts is followed by cure.

If, after some time, the stone passes, the pancreatic catarrh may subside and leave no trace, or the swelling of the pancreas may persist, become true interstitial pancreatitis, and for a long time keep up pressure on the common bile duct, leading to a persistence of the jaundice, though there is no concretion left to cause obstruction, nor any evidence of disease of the liver beyond the jaundice due to mechanical obstruction. Thus may be explained some of the cases of very chronic jaundice, with so-called chronic biliary catarrh, a number of which cases I have operated on.

While one could not say that there is no such disease as chronic catarrhal jaundice, I suspect that many cases so designated are really instances of chronic interstitial pancreatitis, in which the common bile duct is compressed by the swollen pancreas. The following case is a good example:

Mr. H., aged twenty-six, had had jaundice since the age of

seventeen, it having supervened upon a severe attack of what appeared to be biliary colic, of which he had had several seizures since the age of fourteen. For two or three years he had had severe ague-like attacks, and during that time he lost very seriously in weight and strength; but during the past two years there had been no rigors, and he had also been free from the severe paroxysms of pain, though he had had slighter seizures, after all of which the jaundice became more intense. The patient was then only weighing nine stones, and all the bile was apparently passing into the urine and none by the bowels. There was some swelling in the region of the pancreas, besides slight enlargement of the liver and a very decided enlargement of the spleen. *Fine pancreatic crystals were found in the urine.*

Cholecystotomy was performed on January 31st, 1901, when the gall-bladder was found contracted and adherent, and the head of the pancreas enlarged and very hard, but no gall-stones were present. For a few days the jaundice was deeper; it then became gradually less, until it almost disappeared. In ten days the stools became bile-stained, and had since retained their color. He returned home on April 16th, having gained nearly half a stone in weight. Oct., 1901.—After the previous operation the patient was well for some months, except for slight jaundice. Recently there had been a little discharge of bile from the fistula, which he wished to have cured on account of the inconvenience. Cholecystenterostomy was performed on October 3rd, 1901. The sinus was dissected out and the fundus of the gall-bladder connected to the transverse colon. The patient made a good recovery from the operation and left looking much better. When heard of later he was following his occupation.

If the gall-stone causing obstruction be removed by operation from the common duct and drainage of the infected bile ducts be effected before the catarrhal has passed into the interstitial form of pancreatitis, a complete cure may be expected, as in the following cases:

1. The patient, a lady, aged thirty-four, had had symptoms of gall-stones for four years and had been under treatment for ulcer of the stomach, but there had been no hematemesis. Four months previously jaundice had come on after an attack of pain, since which time the attacks had been frequent, and were always followed by an increase of the jaundice and by rigors and fever. On one occasion the gall-bladder was distended; when seen there was a slight tinge of jaundice. She had lost three stones in weight. There was an absence of enlargement of the liver or gall-bladder, but marked tenderness over the

gall-bladder was elicited. Pancreatic crystals were found in the urine, and digestive symptoms were present.

At the operation on April 23rd, 1903, one large calculus was removed from the cystic duct and some smaller ones from the common duct by choledochotomy through separate incisions in the two ducts. The common duct was sutured and the cystic duct drained. The pancreas was found to be enlarged and inflamed. The patient made a good recovery and is now well.

Were it necessary I could give a good many examples, but another will, perhaps, suffice.

2. The patient, a lady, aged fifty-nine, began to suffer from abdominal pain followed by jaundice and vomiting twenty-six years ago, and she had been subject to attacks at longer or shorter intervals ever since. Fifteen years ago she was in bed for three months with constant pain, but never had rigors. A fortnight ago she had a severe attack of pain followed by jaundice, which persisted. She had lost four stones in weight. There was no enlargement of the liver or gall-bladder, but some dilatation of the stomach. Pancreatic crystals were found in the urine. At the operation, on March 10th, 1903, a small gall-bladder was found, containing two gall-stones, which were removed and the gall-bladder drained. The common and hepatic ducts contained many stones, which were removed through an incision in the common duct. The pancreas was slightly swollen. The patient made a good recovery and remains well.

The explanation of the pancreatitis in these two cases was manifestly the obstruction of the pancreatic duct, with infection of the secretion, but the complete recovery after operation showed that the inflammation was probably only catarrhal, and not advanced interstitial trouble.

If the gall-stone obstructs the common duct for long, what was at first a simple catarrhal pancreatitis may assume a truly interstitial form, and unless drainage of the bile ducts is continued for some time, or permanent drainage in the shape of cholecystenterostomy is established, relapse will speedily occur. The following case is an example:

Mrs. W., aged fifty-seven, had had two operations previously in Scotland. On the occasion of the first operation, in September, 1902, a number of gall-stones were removed from the gall-bladder, which was drained for a few days, but after the wound had healed the attacks had been repeated as before. A second operation was undertaken by the same surgeon, without finding anything definite. After the wound had healed and the temporary drainage had ceased, the attacks again returned, and the

subsequent history up to the time of my seeing her was that she had almost daily attacks of pain, followed by slight jaundice, and on five or six occasions, usually at intervals of a month, she had had violent seizures necessitating the use of morphia. About five weeks ago the pain was so violent as to cause her to faint, and just before coming to London another violent seizure, accompanied by collapse, occurred. A rigor, with high temperature, 104 or 105 deg., had followed each attack, the temperature between the seizures rising nightly to 101 deg. F. or 102 deg. F. She was rapidly losing flesh and strength. An examination of the urine by Dr. Cummidge showed no albumin or sugar, but well-marked pancreatic crystals, which dissolved in from one to one and a half minutes, rendering, along with other signs, the diagnosis of chronic pancreatitis certain. At the operation, on November 20th, 1903, the adhesions were found to be most extensive. There was well marked enlargement and hardness of the pancreas along its whole length, but it was not nodular. The common duct was carefully examined, but found to be free from concretions, and on opening the gall-bladder a probe was passed through it, and the cystic and common ducts, into the duodenum. While the probe was in position, the pancreas was manipulated and found to compress the duct, thus accounting for the obstruction. Cholecystenterostomy was, therefore, performed, the union being effected to the colon by means of a decalcified bone bobbin. At the time of operation the gall-bladder was separated from its fissure in the liver in order to make it reach the bowel without tension. For a few days after operation, bile was discharged from the torn liver surface in free quantities, but there was no leakage from the newly joined viscera. As the bile obtained a free passage into the bowel, it gradually ceased being discharged from the liver, and the tube was able to be left out at the end of ten days. The wound healed by first intention, and the patient was up at the end of three weeks. She was then able to take and digest her food, and has since been quite free from her old attacks. If the interstitial pancreatitis has persisted for some length of time, it is possible that recovery may be incomplete, and although the jaundice may disappear and the digestive symptoms may be alleviated, the metabolic signs found in the urine many months or even years subsequently, show that recovery is only partial. The following are examples:

Mr. D., aged forty-five, had had painful epigastric attacks for twelve months, with vomiting, but no jaundice. There had been deep jaundice since January 1st, with ague-like attacks, and

the patient had lost two and a half stones in weight. Cholecystotomy was performed on March 29th, 1898. Thickened duct felt, together with swelling of the pancreas; thought to be cancer of the head of the pancreas and common bile duct. Drainage of the gall-bladder for ten days. The patient made a complete recovery, and in August was apparently quite well, having gained a stone in weight. He was in good health in 1901. Though apparently well in January, 1904, an examination of the urine gave the pancreatic reaction, and showed that the original damage to the pancreas had not been completely repaired.

Mrs. D., aged forty-six, had had spasms for years. Acute seizure in July, and three times since. Since July, pain and sickness every two weeks. No tumor felt at any time; jaundice occasionally, after an attack of pain; lost one stone in weight. She had never vomited blood and never had melena. There was tenderness over the gall-bladder, but no tumor. Slight enlargement of the head of the pancreas. Cholecystotomy was performed on December 11th, 1899. Empyema of the gall-bladder. Many stones removed from the gall-bladder and cystic duct. Adhesions broken down. Nodular condition of the head of the pancreas found. The patient made a good recovery and was well in 1904, though an examination of the urine showed the pancreatic reaction, and proved that the metabolic functions of the pancreas were still not normal.

In some cases where operation has been delayed, or drainage of the bile ducts not performed or not long enough continued, the original interstitial pancreatitis may pass on into the inter-acinar variety, in which the islands of Langerhans become involved and glycosuria ensues, as in the two following cases:

Mrs. C., aged fifty-one, who was suffering from persistent jaundice with periodical pains and ague-like seizures that had extended over a long period, was operated on in July, 1895, when several gall-stones were removed and others crushed in the common duct. A tumor of the pancreas was felt, which it was thought at the time might be malignant. The gall-bladder was, therefore, drained into the duodenum by a cholecystenterostomy. The patient completely recovered, and has remained well since the operation, over nine years ago, but examination of the urine recently by Dr. Cumbridge showed there to be an abundance of dextrose, but no acetone or diacetic acid. Pancreatic crystals were obtained by the "A" reaction, which dissolved in three-quarters to one minute, but none could be isolated by the "B" method. This showed that although the patient has been relieved by the operation and has apparently

enjoyed good health, yet that she is living with a damaged pancreas and consequently glycosuria.

Mr. D., aged forty-two, had an attack of pain in the right hypochondrium ten years ago, but no jaundice. He had been free from attacks up to six weeks ago, when he had a severe attack of pain in the right hypochondrium, radiating to the back and shoulders, accompanied by rigors and vomiting and followed by jaundice. The jaundice had persisted up to the present; no swelling to be felt. An exploratory operation was performed on October 27th, 1898, when a mass thought to be growth in the head of the pancreas was discovered. The patient made a good recovery, with a great relief to the jaundice. I suspect the enlargement of the head of the pancreas was chronic pancreatitis, as it was too soft for scirrhus. I very freely manipulated it to feel if there was a gall-stone in the termination of the common bile duct, and this may have dislodged the obstruction, leading to the relief of the jaundice. A specimen of his urine was obtained in 1904, and although he was reported to be quite well, this was found to give crystals by the "A" reaction, which dissolved in half a minute, and to contain sugar in fair quantity.

This, along with other cases that I know of, leads me to think that it is unwise not to thoroughly drain the bile ducts, and I consider that drainage ought to be continued until the bile becomes free from organisms and its normal route is free from obstructions.

In certain cases, doubtless, recovery occurs without operation, and I have notes of one case where a gentleman of advanced age had deep jaundice associated with glycosuria and with well-marked pancreatic reaction in the urine, pointing to the case being one of pancreatic diabetes. Under general treatment, combined with massage, he regained his health, and is now said to be quite well. In this case it is quite possible that the massage may have dislodged a concretion which was blocking the common bile duct and the pancreatic duct, but as no search was made in the feces, this cannot be proved. As the patient lives abroad, we have not been able to test the urine, which I suspect will still contain glucose.

This case raises the question whether operation ought to be declined because of the presence of a small amount of sugar in the urine. In future, should the patient's condition be fair, I shall feel inclined to recommend operation in order to remove the obstruction, and by drainage to arrest the pathological process going on in the pancreas.

Suppurative Catarrh.—It is well known that in some cases

of obstruction of the common bile ducts by gall-stones, the infective cholangitis may press on into suppurative cholangitis, an extremely serious and frequently fatal disease: but until I reported my cases in the Hunterian lectures I believe it had never been suggested that the same condition may occur in the pancreatic ducts. The termination probably depends both on the vital condition of the individual and on the form of the infection, for in one of my cases streptococci were found in the pus, whereas usually the organism is the bacillus coli.

The following cases exemplify three different types of suppurative catarrh, which it will be seen is an extremely serious, though not necessarily a hopeless disease if treated early. If the suppurative catarrh be diffuse and involve the ducts throughout the liver and pancreas, the associated septicemia is very serious, as the following case seen with Dr. Hector Mackenzie proves:

Mr. W., aged sixty-five years, seen on January 4th, 1904. He had had attacks of gall-stones seven years before, and two seizures during the last two years, both of which were followed by jaundice. His present illness started on November 23rd, with severe pain, followed by jaundice. On December 20th a very severe attack of colic was followed by more intense jaundice and enlargement of the liver, with irregular temperature. The patient had had albinuria for seven or eight years. When I saw him there was tenderness above and to right of the umbilicus and he had severe pain. A specimen of the urine was examined and found to give a marked pancreatic reaction (pointing to acute inflammation), and to contain calcium oxalate crystals. On opening the abdomen on January 7th, firm adhesions were encountered, and on detaching the omentum, phlegmonous cholecystitis was discovered, with gangrene of the fundus of the gall-bladder: pus escaped freely, but the peritoneal cavity was saved from being soiled by means of sponge packing. The common duct was enormously dilated and embraced by the swollen pancreas, but no gall-stones could be felt. On opening the common duct a large quantity of pus and bile escaped. By means of the scoop passed into the common duct and the fingers passed behind the pancreas, a number of gall-stones were extracted, but a hardness could be felt at the papilla which could not be removed. On laying this open after incising the duodenum, a gall-stone was removed from the ampulla of Vater and pus was immediately seen to flow from the duct of Wirsung. The duodenum was then closed, the gangrenous upper part of the gall-bladder was removed, and the common

duct and gall-bladder were drained. The patient bore the operation well, and from that time onward had no more fever, but for the fortnight during which he lived his temperature was persistently subnormal. He had no peritoneal symptoms, and the bowels were moved freely from the second day onward. Calcium chloride had been given before the operation, and at the operation he lost no blood. None was given subsequently to operation, as the rectum was intolerant of injections, and on the eighth day there was rather free oozing of blood from the drainage track, which had to be treated by gauze packing, after which the calcium chloride was renewed and no more bleeding occurred. On the eleventh day the patient became somnolent and declined to take food. From this time he got gradually weaker and died comatose on the fourteenth day in a condition almost resembling that associated with acute atrophy of the liver.

If the suppurative catarrh takes on a very acute form, the development of abscesses in the liver and pancreas may occur and the condition becomes one of pyemia, when the chance of recovery will be very remote, as in the following case:

The patient, a lady, aged sixty-five years, seen with Sir William Broadbent and Dr. Bousfield, was suffering from deep jaundice, suppurative cholangitis, pancreatitis and parotitis of pyemic origin; rigors, with a temperature of 105 deg. occurring daily, or even twice a day, the acute symptoms having come on within a fortnight, though there had been a history of gall-stones for years. The common and hepatic ducts were filled with gall-stones, which were removed through an incision in the common duct and a large quantity of extremely offensive pus and bile was evacuated. At the same time the right parotid gland (the seat of inflammation) was incised. The bile was examined bacteriologically and found to contain the bacillus coli in large numbers; next in numbers were streptococci and another rather fine bacillus, which appeared to grow anaerobically only, and there was a fine spore-bearing organism, probably the bacillus coli putrefaciens. The urine gave a well marked pancreatic reaction. The patient, who had also heart disease and abuminuria, appeared to be doing well for twenty-four hours, when she died suddenly, apparently from cardiac thrombosis.

If the suppurative catarrh assumes a subacute form, it may end in a simple pancreatic abscess, which can be successfully evacuated as in the following case:

Mrs. P., aged sixty-one, gave the history of having been subject to biliary colic for three or four years, though there had

been no jaundice till two and a half years ago, since which time the attacks of pain had always been accompanied by rigors and by deepening of the jaundice. Within a short time of my seeing her, the symptoms had become aggravated and the loss of flesh had become extreme. The patient was so ill that the question of cancer of the pancreas was raised, but the pancreatic reaction in the urine definitely pointed to inflammation and not to growth. At the operation I found the pancreatic portion of the common duct packed with large gall-stones, and the head of the pancreas was markedly swollen. On passing the scoop through the opening in the common duct from the pancreatic portion of the duct, a stone the size of a cherry was extracted, it being covered with offensive pus. This had apparently lodged in a cavity in the head of the pancreas. A profuse discharge of bile and offensive pancreatic fluid, with pus, continued to pass for a week, after which the discharge became gradually less. She made a good recovery, and remains well a year later.

In general, subacute pancreatitis starting as suppurative catarrh, with the formation of a localized abscess, the pancreas may be so damaged that after the abscess has been cured by drainage, the extensive interstitial pancreatitis may ultimately lead to the death of the patient at a longer or shorter interval, as in the following case:

Mr. H., aged forty, had suffered from continuous fever, with exacerbations associated with rigors, that recurred almost daily. He gave the history of failing health for nine months and of having had gall-stone attacks much longer, but the acute symptoms associated with jaundice had only been present for a fortnight before I saw him. The pancreatic reaction was found in the urine. At the operation on October 11th, 1900, he was far too ill to bear a prolonged search, and as the adhesions were very firm, I felt it desirable only to drain the bile ducts through the gall-bladder, though a marked swelling of the pancreas made it appear probable that an abscess might be present. A large quantity of muco-pus drained from the gall-bladder, and a number of gall-stones were removed. The abscess of the pancreas discharged through the drainage tube, after which the pancreatic swelling subsided. The patient made a slow though steady recovery, and returned home early in December. Though he was able to get out and to take food, he never fully regained his strength, and died in February of the following year. At the necropsy the pancreas was found to be much enlarged, and to be the seat of interstitial pancreatitis. The cavity where the abscess had been was occupied by a little pulpy material, but

no further collection of pus was found, nor were any gall-stones discovered in the bile ducts. A microscopic examination of the pancreas showed advanced interstitial pancreatitis.

Cirrhosis or Atrophy of Pancreas.—If the infective catarrhal condition persists and does not assume the more dangerous suppurative form, or even if simple obstruction of the pancreatic duct persists from any cause, with only mild infection, we may have an almost analogous condition to the one occurring in cirrhosis of the liver due to the development of fibrous tissue. This more chronic form of interstitial pancreatitis ends in cirrhosis or atrophy of the pancreas, which is probably inevitably fatal from glycosuria. I think it is possible that if it were discovered at an early stage it might be arrested by the removal of the cause, though when fully developed the condition is probably not amenable to any form of treatment.

Acute Pancreatitis.—If a small gall-stone happens to descend into an unusually large diverticulum of Vater and to lodge there, it will make a thorough channel from the common bile duct into the pancreatic duct, and so set up acute pancreatitis, the infected bile being forced direct into the pancreatic duct, as in Dr. Halsted's case reported in Opie's work on the pancreas.

But the anatomical conditions just mentioned, though evidently potent, are certainly not necessary for the production of acute pancreatitis. Any gall-stone or stones impacted in the pancreatic portion of the duct, or even filling the ampulla of Vater, may produce acute pancreatitis, as in a case under the care of Dr. Fison, of Salisbury (*Lancet*, 1904).

A man, aged thirty-nine, had a sharp attack of diarrhea on March 27th, 1904, having been previously constipated. The next day, about one and a half hours after dinner, he was seized with severe epigastric pain, followed by vomiting. At 5 p.m. he looked anxious and ill, and the abdomen was tense and tympanitic, but there was no jaundice. The vomiting persisted. There was tenderness over the gall bladder, and to a less degree over the stomach, but no enlargement of the liver or any indication of tumor. Temperature, 98 deg.; pulse, 110.

The next day the temperature was 97 deg. and pulse 120, the vomiting continuing; morphia was given. On the 30th the temperature was 96.8 deg., the pulse 125, small, weak and thready, respiration 36. The pain was easier. Urine scanty and dark. Operation on evening of the 30th, fifty-four hours after first attack of pain. Very extensive fat necrosis found in subcutaneous tissues and in omentum, mesentery, etc. Large quantity of brown, inoffensive fluid in peritoneum. Incision

made into tissues around pancreas through meso-colon. Gall-bladder drained through another incision, many gall-stones removed. Free drainage of abdomen. After recovery from anesthetic the vomiting persisted, and the pulse remained absent from the wrist up to death some hours later. At post-mortem examination, a pint of bloody fluid in peritoneal cavity. Base of meso-colon filled with friable, offensive material, blackish-brown in color and here and there streaked with pus. Pancreas much swollen, and weighed seventeen ounces. Hemorrhagic infiltration in centre of body and another in tail, consistency very firm, with swelling of lobules. In the cystic duct were three gall-stones, in the common duct four, and in the hepatic duct four. One gall-stone, three-eighths of an inch in length, completely filled the ampulla of Vater, into which the duct of Wirsung opened, one-third of an inch from the papilla. The duct of Wirsung did not contain bile.

Urine sent for examination by Dr. Cummidge showed crystals soluble in one-half minute by the "A" reaction, and a few crystals by the "B" reaction soluble in the same time.

The following is Dr. Salusbury Trevor's report of examination of the pancreas:

The gland is enlarged in all its diameters, the margins being rounded off and producing, as a consequence, a sausage-shaped contour. In the head, the middle of the body and the tail are chocolate-colored areas which are fairly sharply differentiated from the surrounding parenchyma in which the normal lobulation is visible. The duct of Wirsung is not bile-stained. The portion of common bile duct attached to the head of the gland appears to be somewhat dilated. Around the gland, as well as in it, are numerous typical foci of fat necrosis.

Microscopical Examination.—Sections have been prepared from the head, body and tail in most instances to include the chocolate-colored areas as well as apparently normal parenchyma.

General Features.—The dark-colored areas are due to necrosis of the parenchyma, associated with hemorrhage, and in the sections from the head and tail are demarcated off from the neighboring gland acini by well marked zones of inflammatory small-celled infiltration. In the tail section, inflammatory reaction is absent, the necrosed areas merging gradually with the unaffected parenchyma. In the necrosed areas the gland parenchyma is only barely recognizable by a faint alveolar structure, all gland elements having disappeared. The whole of these areas stain badly. In the necrotic portions the smaller blood vessels are filled with more or less hyaline thrombi.

Around the necrotic areas in the head and body is a deposit of old blood pigment, and the appearances rather suggest that here the lesions are of older date than those in the tail. Inflammation is most marked in sections of the head. The remaining gland parenchyma is badly preserved owing to auto-digestion, and the head appears to show a slight grade of chronic interstitial pancreatitis of the interlobular type. Throughout the sections the islands of Langerhans are found with difficulty, and from comparisons with other sections their number in the tail sections, at all events, appears to be diminished. Two of the islands of Langerhans found in the tail sections are very large in size; the cells, however, are rather broken up and into one of them hemorrhage has occurred. Minute changes are not recognizable, owing to bad preservation of the tissue. The epithelium of Wirsung's duct shows distinct signs of a catarrhal change.

Summary.—The condition is one of acute pancreatitis with hemorrhage and necrosis (the acute form of hemorrhagic pancreatitis in Mayo Robson's classification).

Owing to Dr. Fison's kindness I am able to show photographs of the extensive fat necrosis and the microscopic appearance of the damaged pancreas.

The following is a case of gangrenous pancreatitis due to gall-stones, which recovered after operation.

Mr. S., aged fifty-eight, had for six years been subject to paroxysmal attacks of acute pain starting in the right hypochondrium and radiating over the abdomen and through to the right scapula, the attacks being accompanied by vomiting and more or less collapse. On several occasions he had passed small gall-stones.

About ten weeks before I saw him he was seized with an attack, which did not, as usual, yield to morphia; the liver became enlarged and tender; there was a great amount of flatulence and acidity, and a feeling of discomfort generally. After this seizure he had ague-like attacks and jaundice of varying intensity, and from that time a tumor steadily developed in the epigastric and right hypochondriac regions. He rapidly lost flesh and strength, and when he was taken into a surgical home for operation he was so feeble and emaciated that it was questionable whether he would be strong enough to bear it. Jaundice was well-marked and the tumor in the upper abdomen, which was tense, tender and fluctuating, was still enlarging. He had had diarrhea six times a day for several days before admission, and the motions were bulky and pale and contained fat.

The urinary pancreatic reaction was well-marked. Just before operation he vomited clear fluid, not containing bile. Operation was performed on April 5th, 1902, when a pancreatic cyst was exposed between the stomach and colon, containing four pints of straw-colored fluid. Inside the cyst was found a mottled black slough with grey patches, two and a half to three inches long by one and one-quarter inches broad, and one-half inch thick, evidently pancreas. (See photographs XVII. and XVIII.) The gall-bladder and ducts contained thirty stones, two the size of walnuts; one of these was found at the junction of the cystic and common duct, and pressing on the latter. The cyst of the pancreas and the gall-bladder were drained by separate tubes with the stomach and the first part of the duodenum between them. On being put back to bed the patient was quiet, but vomited frequently. He made a steady recovery without any untoward symptoms and left for home on May 2nd, 1903. On March 3rd, 1904, the patient was the picture of health and had gained one and one-half stones in weight. He told me that the gall-bladder opening had closed, in six weeks and the pancreatic fistula in nine weeks.

Symptomatology.—It is quite unnecessary for me to give the ordinary symptomatology of cholelithiasis, or of pancreatitis in its various forms, as I have done that elsewhere, but it may reasonably be asked, How can it be told when catarrhal or interstitial inflammation of the pancreas has supervened on cholelithiasis? So long as the concretions remain in the gall-bladder or cystic duct it is extremely unlikely that the pancreas will participate in the cholecystitis, unless the pancreatic duct has become infected at the same time as the bile ducts.

As soon as gall-stones pass into the common duct, even if they are not long detained in it, a catarrhal or even a parenchymatous pancreatitis may supervene, but if the gall-stone remains in the pancreatic or interparietal portion of the common duct, setting up infective cholangitis, a pancreatitis is almost certain to occur.

The symptoms of pancreatic catarrh, passing on to interstitial pancreatitis, vary according to the cause; for instance, if it be due to gall-stones, there will be a history of painful attacks in the right hypochondrium and epigastrium, associated with jaundice, and possibly accompanied by fever of an intermittent type often resembling ague. Tenderness at the epigastrium, with some fulness above the umbilicus, will usually be noticed; loss of flesh soon becomes marked, and if the pancreatic symptoms predominate, the pain will pass from the epigastrium

round the left side or even to the renal and scapular regions. Fat and muscle fibres may be noticed in the motions as soon as the obstruction to Wirsung's duct is complete, and the pancreatic reaction will be found in the urine. If gall-stones be not the cause, there may be merely an aching, or painful attacks not at all pronounced, or the symptoms may come on painlessly, associated with dyspepsia, and with slight jaundice soon becoming more marked. In such cases, if the swollen pancreas tightly embraces the common bile duct the gall-bladder may dilate and give rise to a suspicion of cancer of the pancreas, which the rapid loss of flesh will tend to confirm. In the latter stages pale or white and bulky motions may be passed and a hemorrhagic tendency may be noticed. The liver is usually enlarged when the common bile duct is tightly gripped, and in several cases I have found cirrhosis of the liver, doubtless due to the long-continued stagnation of septic bile in the ducts. I have seen well-marked enlargement of the spleen on four occasions. In one patient the fever and the enlarged spleen gave rise to a suspicion of ague, the organisms of which were said to have been found in the blood, and on several occasions the repeated rigors have led to the diagnosis of malarial fever.

In 60 per cent. bile was present in the urine. In 40 per cent. calcium oxalate crystals were found. In 4 per cent. the oxalate crystals were associated with bile. In none of my cases was glycosuria found, though in two cases it developed several years later. Opie reports having found glycosuria in one out of twenty-two cases. Glycosuria only occurs as a very late symptom. Death may occur from asthenia, due to long-continued jaundice, or from some intercurrent disease, predisposed to by the loss of flesh and debility.

The symptoms of pancreatitis may be conveniently classified under (1) digestive symptoms, (2) physical signs, (3) metabolic symptoms, (4) symptoms artificially produced.

1. *Digestive Symptoms*: (a) Statorrhea or fatty stools, (b) azotorrhea or faulty digestion of albuminous foods, (c) sialorrhea, (d) diarrhea, (e) dyspeptic disturbances, (f) emaciation, (g) nausea and vomiting.

2. *Physical Signs*: (a) Presence of swelling or tumor, (b) fever, (c) pain and tenderness with muscular resistance, (d) pressure on adjacent organs, (e) hemorrhage, (f) jaundice, (g) fat necrosis (evident only when the abdomen is opened).

3. *Metabolic Symptoms*: (a) Glycosuria, (b) other urinary changes.

4. *Special Symptoms Obtained by Artificial Means:* (a) Alimentary glycosuria, (b) Sahli's symptom.

I am sorry that the time at my disposal will not allow me to dwell on these symptoms individually, but as I have recently done so in my Hunterian lectures, which can be seen in the *Lancet* for March 19th and 26th, and April 2nd, 1904, I need only now refer to them collectively. I would at once say that no single symptom alone will justify the diagnosis of pancreatic disease, but with such a number of symptoms and signs as those I have related, it is a mystery to me how the idea has gained so firm a hold that pancreatic diseases are, as a rule, undiagnosable. For instance, Opie only last year wrote: "Disease of the pancreas is rarely recognized during life," which is a reproach that I hope will in future have no justification. Although in any single case we may not have all the symptoms and signs that I have mentioned, yet in no case ought we to fail to find digestive or metabolic or physical signs if disease of the pancreas be present. Different diseases of the pancreas, it will be seen, as one would expect, present very various grouping of symptoms, but in nearly every, if not in every, case since Dr. Cummidge and I have been working together at the subject, we have found most valuable help from the urinary pancreatic reaction. Although we must not yet say that this sign is absolutely pathognomonic, yet it is safe to make this assertion, that if the test be skilfully carried out it affords most valuable positive or negative evidence, when taken with other symptoms, in not only establishing the presence or absence of some disease of the pancreas, but in assisting in the differentiation of simple from malignant disease, a most important matter when surgical treatment is in question.

For the significance of the urinary test, and for the somewhat complicated and elaborate method of carrying it out, full details will be found in the Arris and Gale lecture, published in the *Lancet* for March 14th, 1904.

Treatment.—The treatment of catarrhal inflammation of the pancreas and of chronic interstitial pancreatitis will at first be by general and medical means aiming at the cause, whether that be gall-stones, pancreatic calculi, duodenal catarrh, gastric ulcer, alcoholism or syphilis; but if, after a fair trial of medical treatment not too long continued, the jaundice and loss of weight continue, and the signs of failure in pancreatic digestion and metabolism are manifesting themselves, the question of surgical treatment should be seriously considered, for the condition is one that if not relieved early will certainly lead to serious degen-

eration of the gland or become dangerous to life in other ways. When operation is undertaken before the process has advanced to well-marked interstitial pancreatitis, my experience is that complete cure is effected in a very great proportion of cases, but if interstitial inflammation has become well-marked and has advanced either to the interacinar form or to cirrhosis, an arrest of the process is all that can be looked for. As proof of this statement, in some of my own cases, apparently well several years after operation, a pancreatic reaction can yet be obtained in the urine, while in two cases glycosuria has developed; thus showing that inflammation of the pancreas, if at all advanced, leaves abiding changes, and the sooner the morbid process is checked the less likelihood there will be of a permanently deficient metabolism.

Surgical treatment will vary according to the cause and the symptoms. Where there is evidence of obstruction, whether in the pancreatic or common bile ducts, the cause in the greater number of cases, twenty-seven as compared with twenty-four, will prove to be concretions which should, if possible, be removed, and, as proved by my experience in this class of cases, the hope of cure or of great relief is very promising.

Not only is it desirable to remove the cause of obstruction, but at the same time the bile ducts should be drained, either by means of cholecystotomy or cholecystenterostomy. Where no obstruction in the shape of gall-stones or pancreatic calculi can be found, I would still advise drainage of the bile ducts by one of these operations. It has been argued that it is difficult to comprehend how drainage can do good in these cases; for proof of its efficiency I would appeal to the list of examples that I have given and to the after history of the cases which I have operated upon. The drainage of the bile ducts acts, not only by removing one source of irritation in the shape of infected bile, but at the same time it relieves tension and allows the infected pancreatic secretion to escape, besides also freeing the blood from a poison which seriously damages it and the system at large. Besides the beneficial effects of drainage, in many of the cases the cause of obstruction is also removed. Whether advanced chronic interstitial pancreatitis will be completely cured by operation, it is difficult to say, for in some of the severer cases a pancreatic reaction is found long after operation and after all other symptoms have cleared up, but in several cases that have been tested years after operation, the pancreatic reaction has entirely disappeared, thus apparently proving that the case is cured. Moreover, I suspect that the operation arrests

the process of disorganization, even if it cannot alter the changes that have already occurred. Doubtless, in some the disease was a catarrhal inflammation of the pancreas, which was arrested either before interstitial inflammation had actually developed or before it had advanced too far, and probably in none of the cases had the interstitial change advanced so far as to become interacinar or to present the advanced stage of atrophy or cirrhosis, as in none of the cases was sugar present in the urine at the time of operation, though the metabolic functions of the pancreas were impaired, as shown by the presence of the pancreatic reaction, and the digestive functions were affected, as shown by the condition of the feces.

Whenever the pancreas is involved, either in catarrh or in chronic inflammation, the surgeon must be prepared to do a thorough operation for exposure of the whole length of the common duct, as well as the head of the pancreas. I trust that I shall be pardoned if I give in detail the operation which I have been accustomed to perform, and which I have found both convenient and efficient.

Details of Operation.—I have been able to modify the operation for exploring the head of the pancreas and the common bile duct in such a way that what was formerly a most difficult procedure, involved prolonged manipulation, special appliances and at least two assistants, is now a comparatively simple operation, in the greater number of cases only requiring the help of one assistant and not requiring the use of any special apparatus. By this method the time involved in the operation is reduced considerably, and where adhesions do not give unusual trouble it is easy to complete the work in from thirty to forty minutes, which not only means a saving of time and fatigue to the operator, but a considerable saving of shock to the patient. I always employ a firm sandbag under the back opposite to the liver, which not only pushes the spine, and with it the pancreas and common duct, forward, but acts like the Trendelenburg position in pelvic surgery, by letting the viscera fall away from the field of operation. I then make a vertical incision over the middle of the right rectus, the fibres of which are separated by the finger, which I find to be the most expeditious and the most effective method of exposing the gall-bladder and bile ducts, but when it is necessary to open either the common duct or the deeper part of the cystic duct, instead of prolonging the incision downwards, as was formerly done, I now carry it upwards in the interval between the ensiform cartilage and the right costal

margin as high as possible, thus exposing the upper portion of the liver very freely. It will now be found that by lifting the lower border of the liver in bulk (if needful, first drawing the organ downwards from under cover of the ribs) the whole of the gall-bladder and the cystic and common ducts are brought close to the surface, and as the gall-bladder is usually strong enough to bear traction, the assistant can take hold of it by fingers or forceps and by gentle traction can keep the parts well exposed, at the same time that, by means of his left hand, with a flat sponge under it, he retracts the left side of the wound and the viscera, which would otherwise fall over the common duct and impede the view. It will now be observed that instead of the gall-bladder and cystic duct making a considerable angle with the common duct, an almost straight passage is found from the opening in the gall-bladder to the entrance of the bile duct into the duodenum, and if adhesions have been thoroughly separated, as they should always be, the surgeon has immediately under his eye the whole length of the ducts, with the head of the pancreas and the duodenum. So complete is the exposure that, if needful, the peritoneum can be incised and the common duct separated from the structures in the free border of the lesser omentum, but this is not necessary except where a growth has to be excised. The surgeon, whose hands are both free, can now with his left finger and thumb so manipulate the common duct as to render prominent any concretions which can be cut down on directly, the edges of the opening in the duct being caught by pressure forceps. The assistant can now take hold of the forceps with his left hand, as that instrument, with the sponge, will form a sufficient retractor, since the duct is so near the surface. When the duct is incised there is usually a free flow of bile, which it must be remembered is infective, but a sponge in the kidney pouch and the rapid mopping up of bile as it flows by means of sterilized gauze pads, avoid any soiling of the surrounding parts, and if thought necessary the bulk of the infected bile can be drawn off by the aspirator either from the gall-bladder or from the common duct above the obstruction before the incision into the duct is made. After removing all obvious concretions, the fingers are passed behind the duodenum and along the course of the hepatic ducts to feel if other gall-stones are hidden there, and a gall-stone scoop, the only special instrument that I use, is passed up into the primary division of the hepatic duct in the liver and quite down to the duodenal orifice of the common bile duct, and to ensure the opening into the duodenum being patent, a long probe is passed into the bowel. The incision

into the bile duct is now closed by an ordinary curved round needle held in the fingers without any needle-holder, a continuous catgut suture being used for the margins of the duct proper, and a continuous fine green catgut or spun celluloid thread being employed to close the peritoneal edges of the gut. In such cases where the pancreas is indurated and swollen from chronic pancreatitis, and is likely to exert pressure on the common duct for a time, I insert a drainage tube directly into the duct and close the opening around it by a purse-string suture, the tube being fixed into the opening by a catgut stitch which will hold for about a week, but where this is not done I usually fix a drainage tube into the fundus of the gall-bladder in the same way, as this drains away all infected bile and avoids pressure on the newly sutured opening in the duct.

So easy is it to remove impacted stones after this method of exposure, that I now never spend a long time in manipulating stones impacted either in the cystic or common duct, but at once incise the duct, remove the concretions, and close the opening without damaging the duct by prolonged manipulation. Although there is seldom any fear of leakage or of infection, yet owing to the separation of extensive adhesions there is usually some tendency to pouring out of fluid in the first twenty-four hours. I therefore generally insert a gauze drain through a split drainage tube, bringing it out by the side of the gall-bladder drain. The wound is closed in the usual way by continuous catgut sutures, first to the peritoneum and deep rectus sheath, next to the anterior rectus sheath, and lastly to the skin. Even in acute or subacute, as well as in chronic pancreatitis, this method is advantageous, as at the same time that the pancreas is exposed the bile ducts can be explored, and if the cause be gall-stones they can be removed. Should it be necessary to expose the under surfaces of the pancreas an extension of the incision downwards gives enough room to raise the transverse colon and to get directly at the body of the pancreas through the transverse meso-colon.

To those having little experience in this operation the modifications which I have employed may seem trivial, but to those who have experienced the difficulties of the ordinary operation I feel sure that the method which I have described, which enables the pancreas and the whole of the bile passages to be dealt with close to the surface, will be sufficiently appreciated. But the technique of the operation is not the only important part of the treatment of these serious cases, which require thought and

care, not only before and at the time of, but subsequently to, operation.

A careful study of the causes of mortality in operations on the common duct, associated with jaundice and pancreatitis, shows that the hemorrhage, either immediate, consecutive or secondary, cannot be ignored as a danger, and that shock, apart from hemorrhage, has next to claim our attention. Sepsis is no longer the bugbear that it used to be, thanks to a rigid all-round sepsis, the employment of gauze drainage, and the careful avoidance of soiling the wound by infected bile. Although there is a greater tendency to bleeding in chronic jaundice from pancreatic disease than when jaundice is due to gall-stone obstruction, I think there can be no doubt that in all cholemic conditions the blood becomes so altered that the coagulability becomes seriously diminished, and that these features demand serious attention before any operation is undertaken in cases of common duct cholelithiasis.

I now always employ chloride of calcium in the case of jaundiced patients, both before operation in thirty grain doses by the mouth, and afterwards in sixty grain doses by the rectum, twice or thrice daily for several days.

I think it is important to ligature all bleeding points and not to trust simply to forcipressure, and while in non-jaundiced patients adhesions may be simply separated, in these cases I prefer to divide adhesions between ligatures where practicable. Where there is persistent oozing of blood from innumerable points, a tampon of sterilized gauze forms a useful means of hemostasis, and this may be made more efficient by employing at the same time a solution of suprarenal extract to the bleeding surfaces.

The best treatment of shock is preventive, and to that end it is desirable to lose as little blood as possible, though I do not agree with those who assert that shock in operation is always dependent on loss of blood.

The patient is enveloped in a roughly-made suit of gamgee tissue, and where he is very feeble, or the operation is likely to be prolonged, it is performed on a heated table. A large enema of normal saline solution, with or without stimulant, given from fifteen to twenty minutes before, and the administration of from five to ten minims of solution of strychnia subcutaneously just before commencing anesthesia, are useful. Expedition in operating is an important factor in lessening shock, especially in abdominal surgery, for it stands to reason that prolonged manipulation and exposure of the viscera in

patients so ill as are those composing the class of cases which we are now considering must generally be, will be badly borne, for it is not only the work of the surgeon but the deep anesthesia that adds to the shock, since for the operation to be well and expeditiously performed the muscles must be thoroughly relaxed.

After the operation, a pint of saline fluid with one ounce of brandy is given by enema, and five minims of solution of strychnia are given subcutaneously in two hours and repeated if desirable.

Subcutaneous injections of saline fluid or intravenous infusion are only rarely required.

Statistics.—In order to ascertain the after results of the operations, letters were recently addressed to the friends or medical attendants of all the patients who had not been recently heard of. In one case, where the cause was due to pancreatic calculi, these were removed both from Wirsung's and Santorini's ducts with complete recovery, and the patient is now well. In twenty-seven cases of catarrhal or interstitial pancreatitis, where gall-stones were found obstructing the pancreatic portion of the common duct, choledochotomy in nineteen, cholecystotomy in five, and cholecystenterostomy in three were followed, not only by immediate recovery, but, as ascertained by recent reports, the patients are now well, except one who has since died from acute bronchitis; one who, twelve months later, died from cirrhosis of the liver, and one who, eight and a half years subsequently to operation, is apparently well, though sugar has recently been found in the urine. In twenty-four cases, where obstruction to the common bile duct was due to an inflammatory condition of the pancreas compressing the bile duct, though probably in many of the cases originally due to gall-stones, yet where gall-stones were not actually present at the time of operation, the bile ducts, and thus indirectly the pancreatic ducts, were drained, in twelve cases by simple cholecystotomy, and in nine by cholecystenterostomy; in three cases adhesions were separated and no drainage of bile ducts was performed. Of these twenty-four cases twenty-two recovered.

Two out of fifty-one patients died as a direct result of the operation: one, a cholecystotomy undertaken in a patient reduced to the last stage of exhaustion before a surgical opinion was sought and where at the necropsy a cirrhotic condition of the head of the pancreas was found, and a second, in which a cholecystenterostomy was undertaken in the presence of adhe-

sions that appeared too formidable to deal with considering the poor condition of the patient, who succumbed a few hours later. In this case necropsy revealed a stone in the pancreatic portion of the common duct which would have been discovered had the patient's condition permitted a thorough exploration. From four, the letters were returned as "Gone; no address." The remaining sixteen completely recovered. Of three patients in whom the pancreas was found enlarged at operation, nothing beyond separation of adhesions and manipulation being done, all recovered. In one of these cases glycosuria has supervened and is still present, though the patient seems to be well. The after history of one cannot be traced. Of the third, word has been received to say that she is well fourteen years after operation.

Thus I have no hesitation in advocating operation in this class of cases after general and medical means have had a fair, but not too long, a trial, and the results I have given will, I think, justify my conclusions. A search through the literature of the subject has revealed the facts that (apart from my own cases, fifty-one in number, with two deaths, or a mortality of 3.9 per cent.) there have been sixty-two operations for chronic pancreatitis recorded, of which eight died, yielding a rate of mortality of 12.9 per cent. These cases have all been verified for me independently.

The subacute form of pancreatitis is more amenable to treatment than the acute, as the indications are so much more definite and there is more time for careful consideration. Though it has usually only been attacked when an abscess has formed, and is manifestly making its way to the surface, yet there is no reason why in some cases surgical treatment should not be adopted at an earlier stage. As in the acute condition, morphine may be required to relieve the pain and lessen the collapse. Distension, if present, demands attention, and may have to be relieved by lavage of the stomach and turpentine enemata, or by the administration of calomel by the mouth. Calomel is also of benefit as an intestinal antiseptic, for which purpose it may be given in small, repeated doses, followed by a saline aperient. As soon as the constipation is relieved, diarrhea is apt to supervene, when salol and bismuth, with small doses of opium, may be given. If surgical treatment is decided on, an incision through the upper part of the right rectus will not only be useful for exploring the bile passages and removing any concretions, but will also enable the operator to palpate the pancreas and to locate any incipient collection of pus, which, if practic-

able, should then be evacuated by a posterior incision in the left or right costo-vertebral angle. If the posterior incision be thought impracticable, the collection of pus may be removed by aspiration and the cavity opened and packed with gauze, which may be brought forwards through a large rubber tube, which procedure will, in the course of from twenty-four to forty-eight hours, establish a track isolated from the general peritoneal cavity. In abscess of the pancreas, which usually assumes the form of subacute pancreatitis, and which we must distinguish from the acute suppurative pancreatitis where the pus is diffused through the gland, or where the abscesses are small and multiple, the suppurating process is limited by a pouring out of lymph, so that should the patient survive the initial more acute stage, and discovery of the pus-containing cavity be made, the condition is one decidedly amenable to treatment by drainage. The anatomical relations will readily explain the course along which the pus burrows, should it burst through its lymph barriers—for instance, in one case I was able to evacuate an abscess from the right loin in a young man, aged twenty-four years, that had been mistaken for a perineal abscess, yet the kidney was quite healthy and the grumous pus had come from the pancreas and had passed behind the peritoneum, covering the second part of the duodenum. The patient recovered completely. In another case I opened the abscess in the left iliac region that had apparently started from the body of the pancreas and which had burrowed in the same way behind the peritoneum. The patient recovered from the operation, but developed trouble in the left side of the thorax and died suddenly several weeks later. In one case of acute suppurative pancreatitis the abscess was subphrenic, and was evacuated by an epigastric incision to the left of the mid-line; unfortunately the patient was too ill to bear a prolonged operation, otherwise I should have drained from the left loin, which might possibly have saved the patient. In another, where the symptoms were rather acute and the patient was extremely ill, I discovered pus between the liver and the stomach, and, although drainage was apparently complete, the patient succumbed in a few days to exhaustion due to the septic process that had been initiated before the abscess was opened. In two other cases, the sequence of suppurative catarrh, I successfully drained abscesses of the pancreas through a tube in the common bile duct after removing the gall-stones which had obstructed Wirsung's duct. In one of these cases, the patient, a woman aged seventy-two years, remains quite well; and in the other, a man aged forty years, recovered from the opera-

tion, but three months afterwards died from exhaustion, and at the necropsy the empty abscess cavity was discovered in the head of the pancreas, the rest of the gland being affected with chronic interstitial inflammation. In one of my cases, in a man aged thirty-five years, a pancreatic abscess burst into the stomach, setting up acute gastritis, the condition being proved by an exploratory operation. It was treated by gastro-enterostomy to drain away the foul stomach contents. The patient is now quite well, four years later. In another case, a young married woman aged twenty-six years, the abscess apparently burst into the bowel, and although recovery was tardy, she ultimately got quite well without operation. The diagnosis was made from the symptoms and by an examination of the swollen pancreas under an anesthetic, and subsequently by the presence of a pancreatic reaction in the urine. It is important in these cases to see that the cause is removed, if that be possible—for instance, gall-stones or pancreatic calculi—so that if recovery occurs there may be nothing left to lead to a recurrence of the trouble.

It will thus be seen that I have had eight cases of abscess of the pancreas under my care, one of which was complicated by acute hemorrhagic pancreatitis. Six were operated on, with recovery in five, although in one of the cases the relief was only for a few weeks and in another for a few months. In the eighth case, which was not operated on, the abscess burst into the bowel and was discharged, the diagnosis having been made by an examination of the tumor under an anesthetic, by the presence of digestive symptoms, and by the discovery of the pancreatic reaction. When inflammation of the pancreas has ended in abscess, chronic interstitial pancreatitis will also probably be present, as was shown at the necropsy of one of my cases that died some months subsequently. It is possible that in some cases the interstitial change may be local, though in others it may be general, and may then lead to atrophy of the gland and to glycosuria. A search through literature reveals a considerable number of pyemic abscesses of the pancreas, but those resulting from subacute pancreatitis are not common. Besides my own seven operations for abscess of the pancreas, with two deaths, there have been seven others recorded, with three deaths. Thus of fourteen cases, five died, giving a mortality of 36.6 per cent.

Treatment of Acute Pancreatitis.—The pain at the onset is so acute as to necessitate the administration of morphine, and the collapse will probably demand stimulants, which, on account

of the associated vomiting, may have to be given by enema. In the early stages the symptoms may be so indefinite that the indications for surgical treatment are often not clear enough to warrant operation. But as soon as acute pancreatitis is proved, as it may be by the combination of symptoms, together with the urinary test, the surgeon must not wait until the collapse has passed off, as that may be dependent on septic absorption, which can only be relieved by operation. The simulation of intestinal obstruction will probably lead to efforts to secure an evacuation of the bowels and relief to the distension. Just as in perforative or gangrenous appendicitis, an early evacuation of the septic matter is necessary to recovery, so in this equally lethal affection, an early exploration from the front, either through the right rectus, for reasons stated previously, or through the middle line above the umbilicus, or from behind, through the left costo-vertebral angle is indicated in order, if possible, to relieve tension, to evacuate septic material, to secure free drainage and to arrest the hemorrhage which leads to disintegration and necrosis of the pancreas. The after treatment will be chiefly directed to combating shock and keeping up the strength until the materies morbi, both local and general, can be thrown off. Even if no pus be found, no harm should accrue by such an exploration, which can be made in a few minutes through a very small incision in the middle line above the umbilicus, if necessary with the aid of cocaine. After establishing the diagnosis by the discovery of fat necrosis, a posterior incision in the left costo-vertebral angle will not only enable the diseased organ to be very freely examined, and if necessary drained for the evacuation of pus and gangrenous material, but will also secure free drainage of the lesser peritoneal sac. If, however, the inflammatory collection of the tensely distended and inflamed gland be incised from the front, as is advisable in certain cases, gauze packing and gauze drainage may usually be relied on to prevent general infection of the peritoneum. If there are signs of obstructed common duct the gall-bladder should also be drained, and if gall-stones are discovered they should be removed, if this can be done without seriously adding to the length of the operation or imperilling life by adding to the shock, otherwise they may be left and removed on a subsequent occasion if free drainage of the bile passages can be secured. I have had seven cases of acute pancreatitis under my care and have operated on five, three of which recovered. Of the two cases where operation was not consented to, and where medical treatment alone was carried out, death occurred

in the first case on the third day, and in the second case after a week's illness, attended in both with great pain and incessant vomiting.

I have already described a case of gangrenous pancreatitis in a man, aged fifty-eight years, in which I was able to open a collection of fluid through the great omentum above the hepatic flexure of the colon and to extract a slough of the pancreas, and at the same time to drain the gall-bladder and remove all gall-stones, recovery being ultimately complete.

In another case, in a middle-aged man run down by overwork, but who was otherwise healthy, a sudden, severe epigastric pain was followed by high fever, rigors, epigastric swelling and obstruction of the common duct. Abdominal distension, chiefly of the upper part, and an ill-defined epigastric tumor pointed to the pancreas, and fat in the motions, with the pancreatic reaction in the urine confirmed the diagnosis of pancreatitis.

As there had been a previous history of gall-stones, the question of common duct cholelithiasis as a cause was thought probable.

Exploration revealed a considerable tumefaction of the whole length of the pancreas, but especially of the head of the gland. Omental and visceral adhesions, together with the extreme illness of the patient, rendered a careful examination impossible, and as the gall-bladder was acutely inflamed and distended, cholecystotomy was performed. Within the next twenty-four hours nearly two pints of muco-purulent material tinged with bile escaped. No gall-stones were felt. The patient recovered and is now well.

In another case of a young married woman suffering from acute suppurative pancreatitis, the viscera were found hopelessly matted together. There was extensive fat necrosis all over the abdomen. I evacuated a subphrenic abscess containing masses of necrosed fat and dark, slate-colored pus. The patient was only temporarily relieved, and succumbed on the third day.

In this case I think I ought to have drained through the costo-spinal angle on the left side as well as from the front, but the patient was so ill that I feared to do more lest death should occur on the table.

In case of traumatic hemorrhage pancreatitis in a man, aged twenty-eight years, on whom I operated, drainage through the loin, as well as in front, was adopted, but did not save life, as at the time of operation peritonitis was already advanced.

In another case of a middle-aged medical man, the diffuse fat necrosis and adhesions of the viscera and omentum into a dense mass, presented a formidable obstacle to complete exploration, but as no evidence of any collection of fluid either in the pancreas or in the lesser peritoneal sac could be obtained, and as no gall-stones could be felt either in the gall-bladder or bile ducts, I simply performed the peritoneal toilet and closed the abdomen, recovery following and ending in complete restoration to health. It is worthy of note that in this case the diagnosis was confirmed before operation by the urinary pancreatic reaction.

A case was reported by Dr. Chas. D. Muspratt, of a woman, aged forty years, who had been admitted to the Royal Victoria Hospital, Bournemouth, on December 3rd, 1903, in a state of collapse, and suffering from severe abdominal pain, with incessant vomiting. The abdomen was opened within twenty-four hours of the onset of acute symptoms, and the omentum and intestines in the neighborhood of the pancreas were found deeply blood-stained with numerous spots of fat necrosis. The pancreas was almost purple, and extremely tense. An incision was made into the dark gland, and very free bleeding followed, which was arrested by ligature. Gauze drainage was employed, and complete recovery followed. This is apparently the first case in which direct incision of the pancreas has been adopted, and the operator is to be congratulated, not only on having the strength of his convictions in treating acute hemorrhagic pancreatitis on the lines of other phlegmonous inflammations, but on the success of such treatment.

In a case reported by von Mikulicz, in 1903, a patient under the care of Dr. C. B. Porter, of Boston, was operated on by a deep incision into the inflamed gland, with an excellent result. This is apparently the second case in which the pancreas was deliberately incised during acute inflammation, with a successful result. Woolsey (*Annals of Surgery*, November, 1903) gives a summary of three cases of this affection successfully dealt with by laparotomy and drainage. The first two cases were operated on in the early stage—the first on the third day, and the second twelve hours after the onset. The first case was a hemorrhagic one and showed fat necrosis, the second case showed no fat necrosis nor bloody fluid, but the latter appeared on the removal of the gauze drain two days after the operation. In the third case there was marked but temporary glycosuria.

Dr. C. G. Kempe, of Salisbury, on December 11th, 1902,

excised a portion of the head of the pancreas affected with acute hemorrhagic pancreatitis. It was done within two hours of the onset of hemorrhage. The patient, unfortunately, died from diarrhea fifteen days later.

The argument that the mortality will be less if the surgeon waits for the formation of a local abscess is fallacious, as it takes no consideration of the large percentage of those who die before such a favorable result is presented, and in the second place many patients never develop a local abscess, the process being diffuse from the onset. The high mortality of an early operation in acute cases is due to the fact that in many of these fatal instances intestinal obstruction was suspected, and the collapsed patients were subjected to a prolonged search for the seat of the supposed lesion. Of fifty-nine reported cases of operation during the acute stage, twenty-three recovered; these include my own cases and those just referred to. Although this is a large mortality, it must be borne in mind that the disease is a lethal one and usually ends in death if not treated surgically.

The lessons which one may learn from recorded cases are not to wait until the system is over-weighted with absorbed poison before operating, and not to spend too long a time over the operation.

In conclusion, if we were to base our opinions on the post-mortem records of the past, inflammatory affections of the pancreas would have to be considered among the rarest of diseases, but recent clinical observations and operative experience show that such conclusions would be far from accurate, and I think I have been able to demonstrate, both from my own and from the experience of others, that inflammatory affections of the pancreas or its ducts are very much more common than is generally supposed. Fortunately, in showing the frequency of pancreatitis, and the very serious nature of the acute, subacute and chronic varieties of the disease, I have been able to demonstrate that we can do very much for these patients by timely surgical intervention. But I want to convince my audience that if only we can have the assistance and support of our medical colleagues, nearly all the cases forming the subject of my address to-day (that is, pancreatitis due to gall-stones) may be prevented by timely interference, and that with barely 1 per cent. of risk.

We know that gall-stones may exist in the gall-bladder without causing any trouble, and without giving notice of their presence, but as soon as they pass into the cystic duct, or as

soon as they begin to produce catarrh, they fortunately give ample evidence of their presence.

Were the concretions removed in that stage there should be no mortality, and as can be proved both by my own personal experience in several hundreds of cases, and by the experience of other operators of large experience in this line of work, the operative treatment of cholelithiasis undertaken before the onset of deep jaundice and infection of the bile and pancreatic ducts, is, with due care and in skilful hands, almost devoid of danger.

Hence, in advising surgical treatment of gall-stones at an early period, I am advocating a truly beneficent procedure which would prevent the occurrence of many of those truly serious cases of pancreatitis that cause danger to life.

SOME CASES ILLUSTRATING DIFFICULTIES IN THE DIAGNOSIS AND TREATMENT OF TUMORS.*

BY WM. OLDRIGHT, M.A., M.D.,

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The cases to be presented are from various regions in the domain of general surgery, but most of them happen to be abdominal.

Most persons are aware that the best training for the meeting of difficulties and successfully dealing with them is to have met with difficulties and to have followed up the solution of them either alone or with others; furthermore, if the difficulty and its solution are presented to the same *coup d'oeil*, we do not get as good a training, as great a benefit, as if the difficulty "give us pause," and we have to work out the puzzle before getting the answer. It, therefore, seems to me that it is a useful exercise for us to accompany each other in the clinical examination of cases, the peculiar treatment of them, the *pros* and *cons* of diagnosis and treatment, as they occurred to us at the time, and in the observation of the results. Taking my turn, I shall endeavor to give such historical sketches of some cases occurring within the last four months.

*Read before the Ontario Medical Association, June, 1904.

Case 1.—Mrs. —, aged forty-seven, nullipara, living with her husband, was seen with Dr. M. Wallace on the night of February 16th last. About three weeks previously she was in a store, and was seized with sudden, sharp pain in the right iliac fossa, so severe that she had to sit down, her pallor and faintness being noticed by the employees.

She was attended by another practitioner before Dr. Wallace was called in. During the period of attendance by both these gentlemen there was high temperature and pain, both varying in degree. The diagnosis had been involved in obscurity, the tenderness, at first in the right side, and the continuous high temperature, caused the practitioners to interrogate the case for typhoid and to have the Widal test made (with negative result).

Before I saw her the pain had made itself very manifest in the left iliac fossa, as also a tense tumor, the upper edge of a mass being felt as high as the anterior superior spinous process of the ilium and a little beyond the middle line; it did not give fluctuation either per vaginam or in the abdominal wall. I suppose I must incur the reprobation of some of my brethren by not sharing an indiscriminate horror of the sound; I will join with them in emphasizing the wrongness of using it when there is any danger of conveying infection into the endometrium or of employing undue force to cause its entry into the canal; but it is of value for diagnostic purposes when used with proper provisos and precautions. In this case the vagina was clean, and having sterilized the sound in a flame and soaked my hands in mercuric bichloride solution, I introduced two fingers of my left hand so that the os was between their tips, and passed the sound along the interspace, and by easy, forceless manipulation introduced the sound, and thereby found that the uterus lay on the right side of the mass, somewhat anterior and superficial to it. The mass was pressing firmly down on the vaginal vault.

We are now confronted with the question of differential diagnosis. The three conditions which most readily suggest themselves are extra-uterine pregnancy, hemocele, pelvic abscess; two less likely, but possible, are ovarian tumor with suddenly twisted pedicle, and pus tube. Against this last are the sudden onset and the size. The largest pus tube I have as yet seen is one of a pair I removed some years ago, about twice the diameter and twice the length of the normal unimpregnated uterus. The symptoms, as a rule, come on slowly. Had an ovarian tumor attained a size sufficient to cause sudden pain from rotation and twisting of its pedicle, it would have been detected. Next, what about hemocele or extra-uterine pregnancy; the sudden pain

and the menstrual phenomena are suggestive; as to the pain occurring on both sides, I have had five cases where I have found mischief on both sides, and have had to tie off and remove the appendages on both, all I am thankful to say, recovering; and in three of these there was high temperature. Regarding pelvic abscess there was nothing to contraindicate its probability except the sudden onset of the symptoms.

The imperative necessity of operation without delay was impressed upon the patient, and she left the hotel for St. Michael's Hospital. The double preparation having been made, the patient was anesthetized. Although the probability of extra-uterine pregnancy or hematocele was greater than that of pelvic abscess, yet remembering the possibility of the latter, and finding that there was no intervening space between the vaginal vault and the wall of the mass, I determined to adopt the precaution of using the aspirating needle, selecting a prominent spot about three or four centimetres to the left and slightly posterior to the os. The result was that I got pus. Keeping the needle in position, I slid a narrow-bladed knife along it, with its edge looking inwards and forwards as the safest direction; pus now coming freely along the knife blade, the needle was withdrawn, and a pair of hemostatic forceps was introduced along the flat of the knife, and the forceps blades were separated to a sufficient extent to allow of the introduction of two pieces of drainage tube, about as thick as one's little finger, these being fastened to the opening by a looped knot. About fifty ounces of foul-smelling pus escaped, and the cavity was washed out. Saline solution was used for many days, and not any irrigant, which might prove injurious if absorbed or retained.

Only such details need be given as may be of service in a like obstinate case, such as the strengths of solutions, not given in detail in our text-books, and suggestions dealing with complicating difficulties which arose. After some time the opening became so contracted that the introduction of any instrument to wash out was painful. The patient was again anesthetized, the tough cicatrized mucous membrane divided with a knife, and the subjacent tissues by forceps, after Hilton's method, and by a cranial perforator, the edge of the latter being guarded towards the external lateral direction by a covering of absorbent cotton for fear of accident to the uterine artery or ureter. Having explored the cavity with a finger, I scraped and irrigated it as thoroughly as possible with a blunt curette, a narrow channel at the upper end not being opened up to admit the curette, for fear of making a passage through into

the cellular tissue. After a few days antiseptic and astringent douches were tentatively used, watching carefully for possible ill results and gradually making the solution stronger. Amongst these were mercuric bichloride, at first in the strength of 1 in 4,000 and in small quantity, gradually increased to 1 in 2,000, flushing; then formaldehyde, at first 1 in 1,500 and winding up with 1 in 600; then potassium permanganate, 1 drachm to the pint, zinc sulphate and boric acid, winding up with 2 drachms to the pint, as the cavity became contracted and its walls thicker; for one period the cavity was dried out and bismuth subiodide insufflated; the last applications were washing out with 2 per cent. carbolic, followed, sometimes, by tinct. benzoin co., and sometimes by the zinc astringent. I show you Pölk's intra-uterine applicator, a cannular tube introduced by means of an obturator, the tube being either used to introduce gauze through, or left in the opening for a day or two to enlarge it. The patient, having finally passed a probation of ten days without any tent or other drainage, and the cavity allowing the sound to pass in only about two centimetres, she went to the country the week before last with the hope and expectation that this will finish her cure.

The source of infection I do not know; was rupture of a small abscess or pus-sac (tubal it might be) the cause of the sudden pain, the primary symptoms not having been sufficient to attract attention? The patient seemed to be doubtful whether there had not been some pain and other disturbance before the onset of the pain above described.

Case 2.—Mrs. —, aged forty-two, multipara. I had previously done a hysterectomy for multiple fibroma on a relation of this patient; but for her case I am indebted to Dr. Wallace, who asked me to see her on the night of April 8th. Her youngest child is sixteen years old, and her menses having ceased she made a diagnosis for herself and inserted a hard rubber catheter into the os uteri. After this she had pains and chills, and sent for Dr. Wallace. Her temperature had varied in the ten days before I saw her from 98 to 104. In the interval between the consultation and arrangement for it she had improved. The bimanual examination revealed some tenderness about or above the cervix, the uterus being pushed over slightly to the right, indistinct fulness being felt in the left iliac fossa. The patient's condition improved for a few days, but she was worse on the 13th, and I saw her again; the above signs had increased, a soft, fluctuating mass, not tense, being discernible on the left side, notwithstanding muscular tension

and resistance. She was removed to the hospital that day to be ready for emergency; temperature came down to normal and so remained until the second day after, when we operated, opening the abdomen about three centimetres to the left of the median line by an incision extending from a point three centimetres below and to the left of the umbilicus to about the same distance from the os pubis, the incision being about eight centimetres long. A cyst in the broad ligament presented itself to view (see *a*, diagram *A*); about thirty ounces of clear semiviscous fluid were removed by trocar and cannula; the interior of the cyst was examined, but no embryonal products were found; at the bottom of it and towards its inner border was seen a bulging in the surface, shown at point *b* in the diagram, about the size of a twenty-five cent piece; its greatest protrusion being about seven millimetres; it was deep down in the pelvis; its relation to

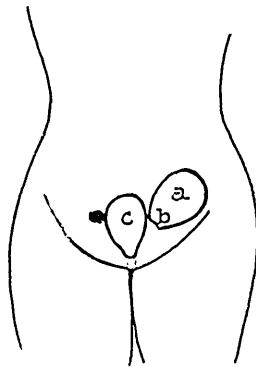


DIAGRAM A

the uterus (*C*) being close to its left border about midway between the os and fundus. I decided not to explore the region subjacent to this protrusion until I had made all preparations to secure and dispose of the wall of the cyst and to be ready to deal with possible contamination or bleeding; this preparation consisted in securing the whole contour of the cyst-wall by interlocking ligatures, leaving the last ligature to be tied after entering an aspirating needle into the supposed cavity to be explored. The circle (*a*, diagram *B*) was at a distance of about three centimetres from the bulging bottom of the cavity, and the cyst wall was cut away about one centimetre from the ligatures, so that when the last ligature, still loose, should be tied, we would have a tube, the orifice of which would be sewed to the parietal peritoneum and abdominal wall, in the same man-

ner as in the drainage of the gall-bladder; the length of the tube as above described was left so as to permit of this being done without undue dragging; and the orifice could be left large or made small by the extent to which the last ligature would be drawn. All being thus prepared, the aspirating needle was introduced at *r*, and a few drops of pus showed themselves in the piece of glass tubing between the needle and receiver. When this was perceived, the little cavity was carefully packed with gauze around the needle, the orifice was secured to the abdominal wall, and the wound in the latter closed, but not completely at this stage, loose sutures being left on the inner side, so that an assistant could pass his index finger down between the piece of sac-wall and the uterus, with its tip on the little pus cavity below close outside the point at which the

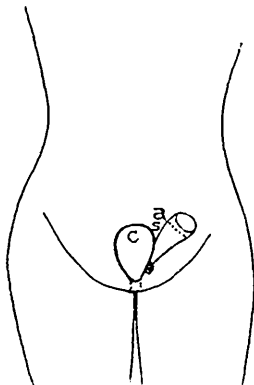


DIAGRAM B.

needle had entered, while I placed an index finger in a similar situation inside the shortened sac tube, and, thus guided, passed a narrow knife blade down alongside the needle into the little pus cavity, and then enlarged the opening with forceps sufficiently to insert two pieces of drainage tube of one-quarter inch lumen. The closure of the wound and the orifice in the abdominal wall around the drainage tubes was now completed, and some saline solution run into one tube, flowing out through the other.

The patient is making a good recovery, some recurring tachycardia with anemia and pain around the waist-line delaying the recovery; but for this I would have had the patient brought up here to-day. Some of the sutured edge of sac sloughed away with the discharge during the healing process.

Two or three days ago, by the use of the probe, I detected a roughness which I thought might be a stitch, about five centimetres down from the orifice, near the bottom of the sinus, and yesterday this was demonstrated to some members of the post-graduate class and others, and after a little fishing with this pair of alligator forceps, I seized, and with slight traction drew out, the silk-worm gut stitch which I show you. Silk-worm gut was only employed in the external wound, and by what process the stitch was inverted to a depth of two inches or more is a puzzle which I thought worth mentioning.

(To be continued in our November issue.)

TUBERCULAR PERITONITIS.

BY C. H. MAYO, A.M., M.D.,

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We may truthfully say that the contagious and infectious diseases have served an important purpose in the development of civilization, by forcing a knowledge of hygienic laws, compelling the world to the isolation of the one and the watchful care of the other, and teaching the lesson that physical and mental development must go hand in hand, would man be near perfection and reproduce a high type of his kind.

History records the terrible ravages of these diseases when transplanted into virgin soil, as shown by the disappearing peoples of the Pacific Islands and the Indians of our own country. We find, also, that the wonderful fecundity of the mixed races is held in check by their low physical resistance.

Our knowledge of tuberculosis is keeping pace with the general medical and surgical progress of the age. Considering this question, we find the surprising reports from those places in which large numbers of necropsies are made, that from 78 per cent. in the United States, to as high as 89 per cent. in Germany, of all cases examined, show the presence of active, latent or healed tuberculosis.

These figures are possibly somewhat high for the total population of the countries where taken, as such examinations

would be made most frequently upon those who had seen much hardship and finally terminated life in some charity hospital. The evidence tends to show that, while the tubercle bacillus often causes great destruction of tissue, it seldom causes death unless the infection is mixed with other germs, if we leave out of consideration the effect produced in the brain.

Peritoneal tuberculosis was found 284 times in 13,922 necropsies, as collected by Grawitz and Bruin, and noted by J. B. Murphy in his recent most thorough monograph upon the subject. Barschke found that but two cases which he could consider as primary out of 226 cases, the lungs being involved in 200 of the number. While always due to the tubercle bacillus, it is practically always secondary to tuberculosis in other regions. Although it is possible for infection to be introduced to the peritoneum by the blood stream, the lymphatics or by extension of tissue, we know as a clinical fact that it does reach it most commonly through the tubes, the uterus, appendix or perforating ulcer. In fact, it would seem that the peritoneum is more resistant in this than it is in other infections, and when the primary focus, which supplies the local infection, is removed, it is capable of wonderful repair. We find about five women afflicted to one man, from the frequency of tubal tuberculosis. The ages most commonly affected are from twenty to thirty years, although there are some cases in children between the ages of two and five years.

A tuberculous family history is reported in from 30 per cent. to as high as 71 per cent., although the highest does not seem excessive when we consider how commonly the disease is found in some form.

From the pathological findings, the peritoneal type is usually classified into miliary with ascites, the adhesive or fibroplastic, the suppurative or mixed infection and the nodular. Wunderlich analyzed five hundred cases which showed 68 per cent. exudative, 27 per cent. fibro-adhesive and 4 per cent. purulent. Practically the pathological findings vary with the purity of the infection and the resistance of the tissues involved. The great majority of the infections are in the lower half of the abdomen, which is always found most diseased adjacent to the source of infection, the inflammation gradually fading as we get further away from the primary focus. This is true of most all varieties of the disease. Tubal infections usually present the purest type of the miliary variety with ascites, the uterus and appendix next. The mixed infections develop the other forms according to the virulence of the contamination.

Tuberculosis of mucous membrane is a very chronic condition, leading to ulceration, and in the appendix to perforation, also occasionally in the bowel. We have seen four cases in the upper abdomen which recovered after laparotomy with removal of the fluid, and in which the source of infection could not be located in the limited examination then made, although many adhesions were found about the region of the gall-bladder, pylorus and duodenum. The local miliary deposit in the peritoneum, and in the complete freedom of such condition in the pelvis, would tend to refute the old theory of gravity being a cause of the increased frequency of tuberculosis of the pelvis. One was in a man, the other three were in women. They were all in older individuals, being from forty to fifty years of age.

Tuberculosis of the peritoneum, as produced by leakage from a local infection of a mucous membrane is a common cause of ascites. Such cases usually develop exacerbations of temperature from 100 to 103 deg., with an evening rise, even in the quiescent stage. It is not uncommon to find a history of more or less pain in the lower abdomen, which seems to be increased by peristalsis of the intestine, and is relieved when the abdomen is increased in size with fluid, just as is the case with tubercular pleurisy. When the infection is in the pelvis, the fluid prevents a thorough examination bimanually. There may often be but little pain upon vaginal examination, and a variable amount of movement may be found in the uterus and adnexa. With less fluid there is a more rigid abdomen, which is often boardlike in this respect and is therefore suggestive of the condition, as it is less painful than the other types of infective peritonitis, and the disease usually has already run a more chronic course.

Many cases of tubal tuberculosis will be found in operating for chronic and subacute appendicitis. It is advisable, in women, to always gain an idea of the pelvic condition, if possible, while the abdomen is open, if the diagnosis is questionable; especially is this true if free fluid is found without a sufficient active condition of the appendix to account for its production.

In many instances, the only diagnosis possible is a tumor or a condition of the abdomen which it will be safer to explore than to leave, with our knowledge of the effects of the disease of the peritoneum. However, in most cases a fairly exact diagnosis is possible and will be made.

Unintentionally, forty-two years ago, Spencer Wells operated upon a case of tubercular peritonitis. The operation was only an incision, diagnosis of the condition and closure of the

wound, yet the case went on to recovery. Since then, many hundred similar cases have been subjected to the same treatment, with a good percentage of cures. Rouch collected 358 cases with 70 per cent. of immediate recoveries, and 14.8 per cent. of cases lasting more than two years, with very many well, although a less period had elapsed. Wunderlich collected 344 cases, with 23.6 per cent. of deaths and 23.3 per cent. of cures over three years. Czerny thinks the cures are between 40 and 50 per cent.

The majority of the operations have been by open incision, with a more or less thorough removal of the fluid and closure of the wound without drainage. Occasionally some operators have made a practice of drainage, but with increased risk of mixed infection, intestinal perforations and also ventral hernia. By many it was considered a good plan to insert a quantity of iodoform emulsion in glycerine at the time of evacuation of the ascitic fluid. Others removed the fluid by trocar and injected air into the abdomen. The reasons given as to why relief was obtained were various and many. Some said the effect of anesthesia was favorable; others that the operative trauma produced a reparative effect, and that the reduction of nourishment by removal of fluids was influential—that the removal of fluids and fresh flow of serum was destructive to the tubercle bacillus. Many thought that the air was influential, and held the abdomen open for a certain period, while other surgeons allowed the light to enter the incision as freely as possible. However, it was from some or all of these methods that recovery was frequent from one operation, or in many cases, from two or three similar repeated procedures.

It was found by operation, where the condition was general with ascites, that a serous peritonitis was converted into that of a plastic fibrinous type which walled in the local infection, usually originally a mucous membrane lesion, and maintained it as a local condition, excluding the general peritoneal cavity from its influence.

In our surgical work upon tubercular peritonitis, we have practised very many of the methods in vogue at the particular time the operations were made; but as some cases required two or three operations and a few relapsed after apparent cure, and others were not cured at all, we were gradually led to search for the original lesion and remove it, leaving the peritoneal condition to cure itself, and closing the abdomen without drainage. We have found the abdominal conditions always to point to the source of disease by the congestion, increased matting of

the miliary deposit or increase of general adhesions. There is usually a tubercular node of the tube near the horn of the uterus, and the repeated attacks of peritonitis are so many indications of leakage from the tube. A point picked up from a lecture of J. B. Murphy some years ago, was that in the tubercular tube the fimbriæ are open and turned out, while in gonorrhœa or mixed infection they are turned in and closed.

We find that tuberculosis of the vulva, vagina and cervix is not a common disease, and that tuberculosis of the uterus is uncommon during menstrual life, when the mucous lining is naturally thrown off every month; but on the contrary is found before puberty and after the menopause. Tuberculosis of the tube is rather common, and while there is much discussion as to how the infection reaches this location, it nevertheless does, and acts upon the mucous membrane as a local lupus. When leakage occurs we have developed an initiative peritonitis, yet not always with peritoneal evidence, except the local congestion. The fimbriæ being open, the ascites prevents what might become protective adhesions. When the abdomen is open and the ascitic fluid removed by sopping with sponges, the serous peritonitis is converted into a plastic, adhesive variety effectively, in the cases benefited, by walling in the tube.

It would seem impossible that tubal tuberculosis or lupus would cure itself, except by degeneration of the tubercular deposit and final obliteration. The earlier work done, while favorable so far as it went, did not remove the original focus of leakage, and while seeming primary recoveries occurred in a proportion of cases, many returned for repeated operations, and others died within a few months or years of general or local tuberculosis. In fact, Borchgrevink thought the medical treatment as successful as the surgical, reporting twenty-two operative and eighteen medical cases, under the methods at that time in vogue. In our work we have found that the increased percentage of such cases occurring in women is from tubal involvement; we also found occasionally, in tubercular peritonitis, even when the tube appeared in fair condition, that drying the peritoneum and closing the abdomen resulted in a primary cure, yet they later appeared with pelvic masses, and a second laparotomy, with the removal of caseating tuberculous tubes, resulted in permanent recovery. Such conditions as before stated led us, in all cases where at all warranted by the condition of the patient, to attempt the removal of the primary focus of leakage or infection. Of course, some cases must be refused

operation, as their general condition will be such as to render an operation extremely hazardous as well as futile.

In males, our incision is over the appendiceal region, while in women it is so arranged as to explore the pelvis. A tubercular appendix in an early stage, before miliary deposits appear, may at times be diagnosticated at operation by the large size of the glands of the mesenteriolum.

The utmost care must be employed not to open the bowel in separating plastic adhesions of the intestine, as they are the most difficult fistulæ to close, and usually gradually exhaust the patient. As a rule, it is best to keep close to the parietal or pelvic peritoneum, separating as few adhesions as possible in exposing the region affected. In one case we were only enabled to locate the uterus by following the round ligament to its attachment. In some cases the tubal mass can be pierced and its entire contents of caseating debris and lupoid material removed, leaving the outer fibrous and peritoneal layers *in situ*, then applying iodine or iodoform emulsion in glycerine to the diseased area, and closing the abdomen without drainage. We have made this complete operation upon twenty-six cases of tubal origin, with only one death.

These conclusions are based upon 144 operations for the relief of tubercular lesions involving the peritoneum, at St. Mary's Hospital, where the operative work is done by W. J. Mayo and myself. There were 59 operations for tubercular peritonitis by the older methods; 42 were cured, 15 improved and 2 died. There were 58 operations for the removal of tubercular tubes, with 56 recoveries and 2 deaths, and 27 cases of tubercular appendicitis without a death.

The Physician's Library

E. B. Treat & Co., 241 West 23rd Street, New York, announce the following important books for early delivery:—

Diseases of the Stomach and Intestines. With an account of their relations to other diseases, and the most recent methods applicable to the diagnosis and treatment of them, designed to meet the need of general practitioners. By BOARDMAN REED, M.D., Philadelphia. In a series of eighty-two lectures, complete in one volume. 1,024 pages. Illustrated. Half morocco, \$6.00; cloth, \$5.00.

Blood Pressure. As affecting heart, brain, kidneys and general circulation. A practical consideration of theory and practice. By LOUIS F. BISHOP, A.M., M.D., Physician to Lincoln Hospital and French Hospital, New York. 12mo, cloth, \$1.00.

Disorders of Metabolism and Nutrition. By PROF. DR. CARL VON NOORDEN, Physician-in-Chief of City Hospital, Frankfurt-on-Main, and Assistants. Authorized American Edition, edited by BOARDMAN REED, M.D. The fifth of the series of monographs, "Saline Therapy," 75 cents, is now ready. The preceding issues are: "Obesity," 50 cents; "Nephritis," \$1.00; "Colitis" (Colica Mucosa), 50 cents; "Acid Autointoxication," 50 cents; and will be followed shortly by "Gout," "Diabetes," "Limitations of Liquid Food," etc.

A Text-Book of Pathology. By JOSEPH MCFARLAND, M.D., Professor of Pathology and Bacteriology in the Medico-Chirurgical College of Philadelphia; Pathologist to the Medico-Chirurgical Hospital, Philadelphia. Handsome octavo volume of 818 pages, with 350 illustrations, a number in colors. Philadelphia, New York, London: W. B. Saunders & Co. 1904. Canadian agents: J. A. Carver & Co., Limited, 434 Yonge Street, Toronto, Ont. Cloth, \$5.00 net; sheep or half morocco, \$6.00 net.

It was with anticipations of much pleasure and interest that the reviewer began reading Dr. McFarland's work on pathology, and he can truthfully say that his greatest expectations were more than fulfilled. The book is excellent—excellent as regards

both text and illustrations. Of the latter there are a number of beautiful ones in colors, printed directly in the text. Dr. McFarland's thirteen years' experience as a teacher of this subject, besides his extensive personal research in the laboratory, has fitted him most admirably to write a text-book on pathology, and this superb foregoing work is all that any one—student or practitioner—could desire. Unlike most works on pathology, the subject is treated, not from the professor's point of view, but from that of the student, the many difficult theories of the science being explained in clear, concise language. Quite a few works on pathology have come to the reviewer's desk within the last few years, but none has reached the standard of excellence held by Dr. McFarland's work.

The Practical Application of the Roentgen Rays in Therapeutics and Diagnosis. By WILLIAM ALLEN PUSEY, A.M., M.D., Professor of Dermatology in the University of Illinois; and EUGENE W. CALDWELL, B.S., Director of the Edward N. Gibbs Memorial X-Ray Laboratory of the University and Bellevue Hospital Medical College, New York. Second edition, thoroughly revised and enlarged. Handsome octavo volume of 690 pages, with 195 illustrations, including four colored plates. Philadelphia, New York, London: W. B. Saunders & Co. 1904. Canadian agents: J. A. Carter & Co., Limited, 434 Yonge Street, Toronto, Ont. Cloth, \$5.00 net; sheep or half morocco, \$6.00 net.

This excellent work has attained the distinction of two large editions in one year—a proof not only that such a work was needed, but also of the book's practical value. The vast amount of literature accumulated during the past year has been very carefully digested, and the latest knowledge and advancements incorporated. A practical feature of the work lies in the fact that nearly all the illustrations represent actual clinical subjects, showing the benefits of the X-rays at various stages of their application. The chapters by Caldwell give full details regarding the use and management of the apparatus, the text being fully illustrated with many photographs and drawings, including four full-page colored plates. The second edition has been brought strictly down to date, especially the case histories cited; and by the addition of much new matter and a number of new illustrations, the usefulness of the work has been greatly extended. It is the latest and best book on this subject.

Lea's Series of Medical Epitomes.—Magee and Johnson's Epitome of Surgery. A Manual for Students and Practitioners. By M. D'ARCY MAGEE, A.M., M.D., Demonstrator of Surgery and Lecturer on Minor Surgery; and WALLACE JOHNSON, Ph.D., M.D., Demonstrator of Pathology and Bacteriology in Georgetown University Medical School, Washington, D.C. In one 12mo volume of 295 pages, with 129 engravings, Cloth, \$1.00 net. Philadelphia and New York: Lea Brothers & Co., Publishers. 1904.

The authors and editor have made an earnest endeavor to furnish an authoritative, clear, compact presentation of the essentials of modern surgery. While this little book is by no means intended to take the place of a text-book, it will be found convenient for study many times when a large book is inaccessible; while for students' use in quizzing themselves or each other, in preparation for college or state board examinations, it will be of the utmost service. As with the other volumes of this excellent and very popular series, the questions are not interspersed with the text, but follow each chapter, thus permitting consecutive reading without interruption.

The Doctor's Leisure Hour.—The Doctor's Recreation Series.

Facts and Fancies of Interest to the Doctor and His Patient. CHARLES WELLS MOULTON, General Editor. Arranged by PORTER DAVIES, M.D. The Saalfield Publishing Co., Akron, Ohio, Chicago and New York. Canadian agents: Chandler & Massey, Limited, Yonge Street, Toronto.

We are privileged to examine Volume I. of the series, of which we understand the number will be eight, and we are glad to be able to say that we have examined this with a great deal of pleasure. The contents of the volume are various. There are a compilation of short, readable stories, humorous and otherwise, on such subjects as the student, the professor, the young doctor, the diagnosis, the disease, the patient, the prescription, the remedy, the desperate case, the operation, the inquest, general practice, some famous doctors, the country doctor, the doctor's wife, the doctor's hours, Madame le Docteur, the microbe, Christian Science, the oculist, the dentist, the chemist, our friend the apothecary, the family, at the beginning, until the doctor comes, the young hopeful, the father, the wife, the fee (very important), in the doctor's waiting-room, and among ourselves, chapters which will be found interesting and profitable reading. We venture

to predict that this delightful series will find its way into the library of the great majority of practitioners, and that it will prove a solace after many a hard day's work. It will prove a refreshing mart to which to turn when wearied with well-doing. We congratulate the editor in conceiving this series, Dr. Davis in his splendid arrangement of it, and the publishers, that they are the fortunate medium of bringing same before our profession. The first volume is bound in a neat, handsome style, and all will be the equal of the first in this respect.

Lea's Series of Medical Epitomes.—Nagel's Epitome of Nervous and Mental Diseases. A Manual for Students and Physicians. By JOSEPH DARWIN NAGEL, M.D., Consulting Physician to the French Hospital, New York. In one 12mo volume of 276 pages, with 46 illustrations. Cloth, \$1.00, net. Philadelphia and New York: Lea Brothers & Co., Publishers. 1904.

In this age of rapid progress and evolution of new theories and sciences the student of medicine, who in four years is supposed to master the intricate and varied details of his chosen profession, and the busy practitioner, who must still spend a good part of his time in research and study to keep abreast with the rapid strides of advance, both feel the daily need of a text-book which will give them the essence of the subject which they are pursuing. It is with this idea that the author has undertaken to gather the various facts and data contained in the numerous text-books and pamphlets on the diseases of the mind and nervous system, and to weave them into a compact fabric, easily studied by those who are in search of precise information.

There is not a single author or lecturer of high standing, whose teachings have not been incorporated in a condensed form into the pages of this volume.

Illustrations are used throughout the volume wherever the understanding can be better helped by the combination of text and pictures, and the price of the volume (\$1.00), based upon the certainty of a very wide usage, is low enough for every student's purse.

Dominion Medical Monthly

And Ontario Medical Journal

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Published on the 15th of each month. Address all Communications and make all Cheques, Post Office Orders and Postal Notes payable to the Publisher, GEORGE ELLIOTT, 201 Beverley St., Toronto, Canada.

VOL. XXIII.

TORONTO, OCTOBER, 1904.

No. 4.

THE PLAGUE OF PATENT POTIONS.

“How do thy potions with insidious joy
Diffuse their pleasures only to destroy.”

—*Goldsmith*

A matter which would seem to be of very great importance is beginning to engage the attention of the public at large, and, for the moment, more particularly, the medical profession. We have recently received several communications from some of our brethren on the subject, and at the last meeting of the Canadian Medical Association, held in Vancouver, August 23rd to 26th, 1904, the following resolution was submitted:

“It is a well-known and established fact that many of the most popular and saleable patent and proprietary medicines contain large quantities of alcohol and noxious drugs, which are very injurious to the health of those making use of them, not only by their direct influence on health, but by creating a depraved appetite for their continued use, which lead to the loss and disability of many valuable lives, and that the sale of these medicines is largely due to the manner in which they are adver-

tised, their vendors making exaggerated and misleading statements through the general press, literature, posters and pamphlets, as to their healing virtues and life-saving qualities, thereby inducing sufferers from disease to purchase them to their very great injury, morally, mentally and physically. The great and growing increase in the consumption of these drugs is daily impressed on our profession by our observations of the injurious effects which are produced by them on a large and daily growing number of our population, and we feel that some urgent and effectual means ought to be adopted by those who are responsible for the health and welfare of the people that will control and restrict the sale of these most injurious and pernicious preparations.

"And this Association, composed of the leading medical men from one end of the Dominion to the other, feels that the time has arrived when this great and growing evil to the public health must be suppressed; and this Association would strongly urge the Federal Government, through the department having the control and jurisdiction over matters of this nature, to take immediate steps to thoroughly investigate the nature and contents of these preparations, and to suppress the pernicious and misleading form of literature and advertising by which this sale is so largely brought about, and adopt such general and effectual measures in connection with this matter as will insure the safety of the public health, and that a copy of this resolution be forwarded to the department of the Government having control of such matters."

It is perhaps difficult to attempt a thorough inquiry into the causes which are producing the great increase in the consumption of patent nostrums, but at least two reasons may be mentioned: (*a*) The greed of gain which impels individuals or companies to enter into the manufacture of such supposed remedies as a money-making scheme, and (*b*) the greed of gain in the individual, as manifested in the desire to save money by becoming his own diagnostician, and thereby saving the fee of the medical man.

There is still another cause which might be mentioned, a

cause for which the medical fraternity is largely responsible, viz., the indiscriminate recommendation of various remedies, "specially prepared for physicians' use." Picking up a journal and casually glancing through the advertising columns, the eye will rest on an advertisement for a remedy which may be called "Vaporine" (cures while you aren't looking). The writer remembers a few years ago being visited by an agent representing this preparation, who assured him their dealings were *only* with physicians. To-day it is advertised in the press at large, "Specially recommended by the medical profession."

Another class of the community which seems to delight in recommendations is the ministerial profession. Themselves, no doubt, very excellent authorities on matters appertaining to their own calling, are, notwithstanding their ignorance in matters medical, often quite willing to give unqualified praise regarding the healing properties of certain remedies, of which they know as little as they do of the pathology of the disease for which the remedy is praised.

But of the evil itself: How very disgusting are some of the ads. we read in the papers—open exploitation of abortifacients; manhood lost and regained (if you don't believe it, look at the pictures, before and after); syphilis and other appetizing matters served up publicly; piles cured (while you wait) without the aid of the surgeon's knife; and, too, that good old standby, "Pits Cured" (no matter what the cause). Verily a very interesting array of information for your child to read in the morning paper! Occasionally the makers of these wonderful remedies kindly (?) take the medical man into their confidence, and assure him, "Dr. So-and-so is using our potion, with truly marvellous results." A maker of boots once had the impudence to send the writer a sample of a wonderful salve made by himself, and guaranteed to cure burns, bruises, boils and the "buckwheat scratches," and also handed him a list of the names of a few rather prominent medical men who were using his wonderful remedy.

So much for the etiology and symptoms of this widespread evil: What about treatment?

It would seem that the treatment ought not to be difficult.

In many of these cases the advertisements simply claim impossibilities, as anyone can see for himself in the daily paper. Messrs. D—— Lie & Co. guarantee to cure this, that and the other organic disease by means of their infallible remedy. It matters not if it be a case of sclerosis of the cord or degeneration of the kidney; all ills yield to their wonderful treatment. *and a vast mass of the public believe them.* In other words, they are obtaining money under false pretences, and as such offenders, ought to be easily made to suffer. Why not make it an offence for any newspaper or journal in this country to publish the advertisement of any foreign nostrum vendor, and a still more serious offence for any Canadian to make or advertise for sale any remedy which could be adjudged by a competent board of inspectors an imposition on the general public. Incidentally, it would go far to cure the evil if every manufacturer of such stuff were by law compelled to give the contents, with exact proportions, printed on the outside of each bottle. In this way it could be readily ascertained if one were taking an undue proportion of bad whiskey with one's bitters.

Lastly, as to prognosis. If one is to reflect on the innate selfishness of the genus homo, the outlook is not of the best. The fact is, the public at large "do not want to be 'done good.'" Certainly, if left to themselves, I dare say they would prefer to prescribe for themselves and go on spending their money on the sure cures (and the sure failures in so many cases).

From an economic point of view it is just a question if the wise minority should not rise up and surround the great unthinking majority with adequate safeguards against the growing plague of universal and indiscriminate dosing.

NEWS ITEMS

MCGILL UNIVERSITY has celebrated its seventy-fifth birthday.

DR. D. N. MCLENNAN has removed from Carlton Street to 126 Bloor Street, West.

LORD STRATHCONA has contributed \$50,000 towards the purposes of the Medical Faculty of McGill University.

ANOTHER Chinese leper has been captured on the streets of Vancouver, and transferred to the leper colony on D'Arcy Island.

WE are glad to be able to announce that Dr. Herbert A. Bruce, of Toronto, is recovering rapidly from an operation for appendicitis.

THE attention of our subscribers is drawn to the change in office of publication of the DOMINION MEDICAL MONTHLY to 203 Beverley Street.

ST. PAUL'S HOSPITAL, Vancouver, has recently opened a fine new wing. This hospital can now provide accommodation for four hundred patients.

THE Toronto General Hospital had 514 patients in residence in the month of September. There were 1,112 cases in the outdoor departments. At the Emergency 231 accident cases received first aid.

DR. J. ALGERNON TEMPLE, Professor of Gynecology in the University of Toronto Medical Faculty, delivered the opening lecture for the session of 1904-5, on the evening of October 4th. We will have the pleasure of publishing the address in full in our next issue.

DR. S. J. TUNSTALL, Vancouver, accompanied by Mrs. Tunstall, has been East for five weeks, visiting Montreal, Boston, New York and Toronto. Dr. Tunstall, as President of the Canadian Medical Association, has been discussing the question of Dominion registration with prominent Quebec physicians.

DR. GEORGE F. BUTLER has severed his connection with the Alma Springs Sanitarium, at Alma, Michigan, where for nearly five years he has been medical superintendent, and has returned to Chicago, where he will henceforth limit his practice strictly to internal medicine. He will fill the chairs of Professor of Therapeutics in the College of Physicians and Surgeons, and Professor of Medicine in the Dearborn Medical College. He has also been appointed as one of the attending physicians in the Samaritan Hospital. Dr. Butler will continue to edit and publish his magazine, *How to Live*, and it is understood that he has under way another medical work for a Philadelphia medical book publisher.

PRESIDENT AMADOR, of the Republic of Panama, has appointed the following officers of the Fourth Pan-American Medical Congress, to be held in Panama the first week in January, 1905: Dr. Julio Ycaza, President; Dr. Manuel Corrales, Vice-President; Dr. Jose E. Calvo, Secretary; Dr. Pedro de Obarrio, Treasurer, and Dr. J. F. W. Ross, Dr. J. Tomaselli, Dr. M. Gasteazoro, Committee-men. There will be but four sections, surgery, medicine, hygiene and the specialties, to which the following officers were appointed: Surgical Section: Major Louis LaGarde, President; Dr. E. B. Harrick, Secretary. Medical Section: Dr. Moritz Stern, President; Dr. Daniel R. Oduber, Secretary. Section on Hygiene: Colonel W. C. Gorgas, President; Dr. Henry E. Carter, Secretary. Section on Specialties: Dr. W. Spratling, President; Dr. Charles A. Cooke, Secretary.

Correspondence

To the Editor of DOMINION MEDICAL MONTHLY:

Dear Sir,—In the Ju'y number of your paper I notice a synopsis of the discussion which took place after the reading of the life insurance papers at the recent meeting of the Ontario Medical Association. You credit me as stating that,

“If the doctors are not sufficiently paid, it is largely their own fault. There are physicians who are willing to accept the present fee, and so long as the company could get the services of such men, they could not be expected to pay more.”

Permit me to say that I was not the author of those remarks. I do not know the name of the gentleman who was responsible

for them, but from what he said I came to the conclusion that he referred to the fees paid by fraternal assessment societies, rather than those paid by regular life insurance companies.

I will be much obliged if you can find space for this letter in your next issue, as I do not care to be put on record as being the author of the remarks above referred to.

Yours truly,

PERCY C. H. PAPPS, •
Actuary.

Special Selection

RESPIRATORY TRACT.—AFFECTIONS, SYMPTOMS AND TREATMENT.

BY DR. ARTHUR B. SMITH, SPRINGFIELD, O.

The average physician is frequently vexed in finding a condition which resists his best efforts to bring about a cure. This holds good in almost every disease at some time or other, but particularly in affections of the respiratory tract, where there may be a great variety of symptoms in several cases of the same disease.

Almost every physician has some favorite prescription for coughs, bronchitis, laryngitis, etc., which he uses until suddenly it seems to lose its efficacy—why, no one knows. Then another remedy takes its place until it, too, fails to give the desired result. It is rarely that one finds a cough remedy which will be consistently good in the majority of cases. Theoretically there appears to be a well-founded objection to the use of cough syrups in general, but nevertheless there are times when nothing else gives satisfaction; therefore, the physician pins his faith to that remedy from which he and his patients derive the most good. It is not always easy to find such a remedy, but when it

is once found, it is equally difficult to dispense with, and often the physician is almost compelled to resort to a routine treatment. In such cases, of course, he wants the best.

There are constantly being placed on the market new formulas for affections of the air passages. Some of these formulas are of undoubted benefit in some cases, but usually it will be found that the results are far from satisfactory. Many of them cannot be taken when there is any gastric complication, as is sometimes the case, because of consequent nausea and vomiting. Others seem almost invariably to act as cardiac depressants and are highly objectionable for that reason. With the advent of heroin, however, these disagreeable features have, to a great extent, been avoided. Heroin, in the vast majority of cases, can be tolerated by even the most sensitive stomach, and, if any disturbance should occur, it can easily be obviated by decreasing the dosage and then gradually resuming the previous amount. Heroin can be prescribed, in cases which are complicated by an enfeebled heart, without danger of depressing effects. As compared with codeine, its sedative action on the respiration is much more powerful. The fatal dose of heroin is said to be one hundred times the efficacious dose, while with codeine the efficacious dose is one-tenth of the fatal dose. In other words, heroin is ten times safer than codeine, and can be given in much larger doses, if necessary, without danger. It appears to exert a specific action on the centre of respiration without causing disturbances of any other organs or centres, and there is no danger of acquiring any habit by its use.

In phthisical patients the well-known lack of appetite and intolerance of various foods render it imperative to give remedies which will not in any way interfere with the digestive functions, while at the same time controlling or alleviating the cough and other distressing conditions.

Some time ago my attention was called to a preparation composed of a solution of heroin in glycerine, combined with expectorants, called Glyco-Heroin (Smith). Each teaspoonful of this preparation contains one-sixteenth grain of heroin by accurate dosage. It is of agreeable flavor, therefore easy to

administer to children, for whom the dose can be easily reduced with any liquid, or by actual measurement. It possesses many advantages not shown by any other preparation I have used, and has none of their disagreeable features.

In citing some of the cases treated with this remedy, I shall not go into a minute description of any case, but briefly state the conditions which existed and the results obtained, which were uniformly good.

Case 1.—S. B., aged sixteen. Caught a severe cold while travelling. This developed into an unusually severe attack of bronchitis with mucous rales, pain, cough and some slight fever. Prescribed Glyco-Heroin (Smith), one teaspoonful every two hours, decreased to every three hours. After a few doses were taken there was a decided improvement, the respirations were slower and deeper, the expectoration freer and the temperature normal. In a few days the patient was practically well and able to return to school. No medicine except Glyco-Heroin (Smith) was given, and the results from its use were excellent.

Case 2.—W. L., aged thirty-one. Acute bronchitis. Painful cough, with difficult expectoration, particularly when in a reclining posture. Glyco-Heroin (Smith) in teaspoonful doses every three hours gave speedy relief and a cure was effected in a few days.

Case 3.—S. W., aged sixty. Chronic bronchitis. Had coughed for years, with expectoration of a thick, yellow purulent and very offensive matter. Had lost flesh gradually until about twenty pounds below usual weight. No appetite, very constipated, pains all over chest, night sweats and insomnia. Patient on the verge of nervous prostration and greatly weakened. She was given bromides, a tonic, and Glyco-Heroin (Smith), the latter in the usual dose at intervals of two hours. The first few doses were not well borne, as they seemed to cause some nausea, but by giving a smaller dose and then gradually increasing it, tolerance was soon obtained, and the results were remarkable. The cough and expectoration greatly decreased, the appetite improved and the patient became much better in every way. The treatment was continued as before, except that

the Glyco-Heroin (Smith) was given every three hours. In three weeks the patient was eating almost everything she pleased, and sleeping well. The night sweats had stopped, together with the cough, and, as the patient expressed it, she "felt like another woman." At present she is in perfect health and needs no medicine except an occasional laxative.

Case 4.—B. E., aged twenty-six. Severe bronchitis accompanying an attack of influenza. Various remedies were tried in this case, with negative results, until Glyco-Heroin (Smith) was given in teaspoonful doses every three hours. In a short time decided relief was obtained and the cough stopped permanently.

Case 5.—R. L., aged six. Capillary bronchitis, with pains over chest, cough and difficult expectoration. Glyco-Heroin (Smith) administered fifteen drops every three hours. After taking a few doses the condition was much improved, and a speedy return to perfect health followed.

Case 6.—W. H., aged five. Whooping-cough. Spasmodic paroxysms of coughing, sometimes being so severe as to cause vomiting. Tenacious mucus was present, requiring great expulsive effort to loosen it. There was little fever, but the patient was much prostrated and weakened by the cough. Glyco-Heroin (Smith) was given in ten-drop doses every two hours, with good results. This was combined with hygienic treatment, the patient being given as much fresh air as possible. In a few days the condition was much ameliorated, the cough under fair control, expectoration was freer and easier to raise, and convalescence uneventful. The case was discharged cured, and there were no unpleasant sequelæ, the patient at present being in perfect health.