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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 their development and their anatomy that it can excite no surprise to find them frequently associated in their diseases; and though we frequently find cholelithia is 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

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often associated, why should some cases of common duct obstruction go on for months or years without the pancreas participating?

I hope to show by clinical evidence that 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. Cumming'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, 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 found 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 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 l. 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} found in the common duct, though the head of the pancreas was distended, 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 the 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 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 126 lbs. 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 42 lbs. 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 56 lbs. 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. Cumbridge 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 35 lbs. 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 14 lbs. 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 14 lbs. 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 interacinar 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. Cummidge showed there was 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 pass 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 hopeless disease if treated early. If the suppurative catarrh be diffuse and involve the ducts throughout the liver and pancreas, the as-

sociated 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 albuminuria 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 anærobically 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 albuminuria, 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 in-

terstitial 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 diarrhœa 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 meco-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. Salisbury 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 strain 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).

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 flatuency 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 diarrhoea 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. 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 vomiting 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 21 lbs. 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) Steatorrhœa or fatty stools, (b) azotorrhœa or faulty digestion of albuminous foods, (c) sialorrhœa, (d) diarrhœa, (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. Cumbridge 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 this sign is absolutely pathognomonic, yet it is safe to make this assertion, that if the test be skillfully 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 degeneration 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 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 asepsis 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 aft-

erwards 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 hemostatis, 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 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 adhesions 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, diarrhœa 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 practicable, 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 sub-acute 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 gallstones 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 operation, 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, 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 sub-acute 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 stimulation 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 over work, 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 pancreatitis 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 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 a 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 diarrhoea 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 skillful 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.

THE PROGRESS OF MEDICAL SCIENCE.*

By SIR JAMES GRANT, M.D., K.C.M.G., Honorary President.

GENTLEMEN,—Permit me to congratulate you on the arrival of a new session of the Medico-Chirurgical Society, and to wish you a long continuance of the vigor of youth, and the enjoyment of a liberal share of public patronage, in the discharge of the duties and responsibilities of our noble profession. The history of our profession has been too little taught, and the absence of a thorough knowledge of the thorny path, in its advancement, may have led to the want of due reverence, to the work of the past.

How cheery and gratifying it must be to con over the labors of those who have built the very foundation of what is true and ennobling in our profession. How actually little we know of Hippocrates, Dioscorides, Aretaeus or Galen, who mastered many of the great problems of life, and left an imperishable reputation. True, we know more of Vesalius, Morgagni, Ambrose Paré, Boerhaave and Scarpa, who lived nearer our time and surroundings. Their life history is an object lesson and requires careful study and observation to gain even a moderate knowledge of their herculean labors for the good of humanity. The illustrious names of Harvey, Sydenham, John Hunter, Simpson, Lister, Laennec, Bright, Graves, Addison and many others, brighten, like the electric light, the paths of science, even at the present day. We must not discard the work of the old medical masters as effete and of little service in this 20th Century.

Samuel Johnson charmingly summed up his impressions, "If no use be made of the labors of the past ages, the world must remain always in the infancy of knowledge; if every man was to depend upon his own unassisted observation, every man would be marvellously ignorant, and the science of medicine stand still, or cease to be."

As Sir Dyce Duckworth has charmingly expressed, "the present condition of our profession at Home and throughout The Empire is better fitted to inspire hopefulness for the future, than has ever been the case." The investigation now in progress with reference to cancer, the study of malaria, due to Manson and Major Ross, the School of Tropical Medicine, enlarging our knowledge as to a clear conception of those grave diseases, which cut off by the hundred, our brethren in distant parts, the introduction recently of trained nurses into the New York schools, to observe closely the initial causes of disease,—such are fruitful lines of work, and according to a world renowned authority, Sir Joshua Reynolds,

*The opening address at the Session of the Medico-Chirurgical Society of Ottawa, October, 1904.

"those who were determined to excel, must do their work, whether willing or unwilling morning, noon, and night, and they will find it no play but on the contrary, very hard labour."

During the few months elapsed since the close of our last meeting, the scientific world has been truly active, and I will just advert briefly to a few subjects of deep and abiding interest to our profession.

Tuberculosis.—A national Association for the "Study and Prevention of Tuberculosis" was formed at Atlantic City, July, 1904, with Dr. Edward Trudeau, of Saranac Lake, as first President. The ovation given when Trudeau appeared on the platform, surpassed anything the large audience had ever been privileged to witness, which was a marked tribute not only to the pioneer of the Sanitarium Treatment in America, but as well to the widely known qualities of Trudeau, as a physician, scientist and humanitarian. This Association is thoroughly representative of the leaders of the medical profession, and there are evidences of a determination to make the Association of direct practical value, in legislation, in the education of the public, and in bringing about a co-ordination of philanthropic, medical and educational agencies, for the conquest of the great scourge. This Association will doubtless be a source of pride and gratification to physicians, and in fact, to all who take a sympathetic interest in the warfare against tuberculosis, and will prove a Supreme Council on all disputed points, as well as a scientific centre for encouragement in all good work in the line of Tuberculosis.

According to Dr. Knopf, the work of the past two years on this subject has far exceeded the work of the past five years. There are now in the United States 27 Associations for the prevention of Tuberculosis. He advocates in the strongest terms possible a plea for a Ministry of Public Health at Washington, D. C. to be in constant touch with all State and City Boards of Health, and with effective laws to combat Tuberculosis in man and beast, throughout the Union. To check this serious White Plague we require the combined action of a wise Government, well trained physicians, and an intelligent public. Such action accomplished would prove an object lesson to Canada.

The Neurones.—The neurone theory with its protoplasmic processes, or dendrones, and the single axis-cylinder process, with its cone of origin, its collaterals, or side branches, and its terminal arborisation, in fact, our nervous system consists of innumerable such anatomically independent nervous units in contiguity, but not in continuity.

Colic In The Erythema Group.—A recent discussion at Johns Hopkins Hospital on the surgical importance of the "Visceral Crisis in the erythema group" (*Bulletin, July & August, p. 259*), brought to light, some

interesting and instructive manifestations, closely allied to neurotic conditions of the system.

Dr. Osler called attention to the classification of Colic:—First,—Colic associated with intoxications, as in lead poisoning, uremia, and less frequently with morphia. In the morphine habit, when it is gradually withdrawn, colic may be of a severe character.

Second.—A large class of cases of abdominal pain are associated with functional and organic disturbances of the nervous system. Hysteria is sometimes associated with pain, simulating peritonitis, or appendicitis. Abdominal pain, with disease of the lung or pleura, the initial stage simulating appendicitis.

Thirdly.—A group of cases with cardiac conditions, referred to the epigastrium, and in angina pectoris, the attacks of pain may be below the ensiform cartilage.

Fourthly.—There is a large class of cases in which pain is due to lesion of abdominal organs.

Lastly.—Abdominal pain associated with pelvic disease, a common form and difficult to diagnose, also a striking class of cases in which the abdominal pain is of such importance, that cases have been admitted to the surgical wards, and laparotomy performed for functional colic, due to angio-neurotic oedema of the intestinal wall. Dr. Osler has grouped those cases as follows:—

1. Those in which the colic occurs in connection with a pure angio-neurotic oedema (Quinck's disease.)
2. Those in which the skin lesion is simply an urticaria, and the pain supposed to be a colic, may really be part of a nervous affection.
3. A class which develops arthritis with erythema, purpura and colic, defined by Henoch, and known by his names.
4. There are cases in which the lesions are multiform erythema with or without oedema, associated with more or less redness and purpura.
5. A remarkable group of cases with only recurring colic. The surgical and neurotic aspect of these conditions are worthy of serious consideration, in order to avoid a laparotomy, for a case of doubtful abdominal colic.

Medical Inspection of School Children.—The recent report of Dr. Kerr, of London, is well received in England by the Medical Department of the Educational Committee of the London County Council. He draws attention to the fact that, as an institution, the school doctor has been slowly taking root on the Continent for many years. Within five years, in Germany, 676 school doctors have been appointed in 234 towns, and districts, the regulations for the medical examination of school children having been approved by the Minister of Education. In Switzerland,

Austria and other European countries, much in this line of action has been accomplished. The London School Board appointed a medical officer in 1891 and the Bradford School Board in 1893, part of whose duties was regular school visitation, and to-day a number of larger towns have appointed medical officers.

On this important subject, in order to protect the lives of our school children, either the teachers should be required to pass a stiff examination in medicine, or else the children should be safe-guarded by medical supervision. In fact, it is truly speaking false economy on the part of educational authorities to expect teachers to perform the duties of a qualified physician. The Boston system requires a local practitioner to attend the schools for an hour every morning, a marked advance in education.

The Inter-departmental Committee of England, on the Model Course of Physical Exercise, report that, "No form of educational organization can be considered to be complete, which does not make provision for the systematic reference of questions of school hygiene and the special treatment of individual scholars to medical experts.

Congress of Arts and Science, St. Louis, Sept. 1904.—At a meeting of the Arts and Science Department, the President, Dr. Jordan, placed in clear light; the interdependence of the Sanitary and Medical Sciences, and Engineering. In the cause of Public Health, the hygienist and physician cannot afford to ignore the powerful help of the sanitary engineer, who must also be an expert in sanitary laws and conditions.

Alimentary Canal.—The great problem of the present day rests largely in the alimentary canal, and its relationship to the nervous system. How vegetable tissue, such as cabbage, celery, turnips, beets, etc., are converted into blood, or supply the precise material for the formation of blood cells, is still an unsolved physiological enigma. The master minds of our profession have here ample scope for observation. Following in quick succession, the subject of auto-intoxication of intestinal origin, crops up. It is in fact the epoch making work of Professor Bouchard, to whom the credit is chiefly due, of fixing the attention of physicians on the vast importance of this process. Senator and Jaksch have also discussed it, and the prophylactic and antidotal treatment recommended by Bouchard has been modified and superseded. In the normal state, the alimentary canal abounds in microbes. The supposition is that vegetable alkaloids are fabricated in the intestine, absorbed, circulated in the blood, and eliminated by the urine. Bouchard established this important fact by the discovery of ptomains in the fæces. It is now recognized that intestinal digestion is a truly duplex function carried out partly by microbial action and enzymic action of duplex function. Enzy-

mes transform starch into sugar, emulsify fats, convert albumins into peptones and crystalline bodies, and these functions are also carried out by the intestinal microbes, which in fact are the agents of the fermentations produced at the expense of the carbohydrates. In the normal state the system actually defends itself against the various poisons continuously formed in the alimentary canal. The intestinal epithelium is one line of defense; a second, the liver, which arrests and neutralizes the greater part of those which pass the first; the other eliminatory organs, kidneys, lungs and sweat glands carry off injurious materials. Among the other defense organs, the strongholds of a healthy system, are the thymus, thyroid and suprarenal bodies. Thus, at a glance we note a line of work by master minds in the vast subject of auto-intoxication of the intestinal canal.

The Huxley Lecture by Sir William MacEwen (Oct. 8th 1904) has brought to light exceedingly interesting and important facts, derived from a careful study of the Caecum, through defects in its walls as happened in the case of St. Martin's Stomach through the observations of Dr. Beaumont on the digestive process. According to MacEwen, caecal secretion is intermittent and regulated by reflex excitation in the introduction of food into the stomach, and becomes active just before the discharge of the contents of the ileum through the ileo-caecal valve. The caecal surface is studded with Lieberkühns follicles, and more numerous than in the small intestine, and the succus entericus from these glands plays an important part in the digestive process. The caecal secretion is under nervous control, reflex in character, and a like nervous mechanism extends to the ileo-caecal valve, regulating the discharge of the contents of the ileum. Pawlow favors the idea of an acid-reflex in the flow of food through the pylorus, which controls the pyloric orifice, and regulates the escape of the stomach contents too rapidly. It is supposed that a like reflex action regulates the ileco-caecal valve. Caecal movements begin in the appendix, being likely transmitted from the superimposed small bowel. The succus entericus from the glands of the appendix is of assistance in caecal digestion. In the final disintegration of food the appendix exercises a remarkable influence on the presence of those micro-organisms which in the large bowel also share in the digestive process a function of the appendix being to maintain cultures of these organisms in a fit state to act upon the caecal contents and control their multiplication.

Appendicitis and typhilitis are closely connected with derangement of function in these parts, followed by a stasis in the caecal contents, and, finally, a disturbance of the micro-organismal fermentation, inducing structural change in the intestinal wall, a fruitful source of intestinal trouble.

The Great Omentum.—A very conspicuous object for size and fatness, its extremely atrophic condition being an exception, is the Great Omentum. According to Albrecht, who discussed this subject recently before the Gynecological Society of Munich, the omentum was not meant to keep the stomach in its proper position. In fact, there is no clear evidence that fat is the essential part of the omentum, or that the omentum is a regulator of temperature for the benefit of the viscera, nor that the omentum is a form of ligament to keep the transverse colon in place. Albrecht considers that in pathological conditions the omentum serves three protective purposes, fills hernial sacks, (of doubtful advantage,) absorbs fluid effusions in the peritoneum, and by adhesions, limits inflammatory changes, and thus averts peritonitis.

International Congress of Physiology, Brussels, August, 1904.—A lively discussion took place on the Auto-regeneration of peripheral nerves which, according to Bethe of Strasburg, when permanently cut off from their trophic centre do not remain permanently degenerated, but, in fact, they are regenerated and become functional. According to Bethe it must be shown that these regenerated fibres are not connected with the central nervous system, either by physiological or anatomical evidence or both. Langly and Anderson are of the opinion that in nearly all cases after excision of a long piece of the sciatic or crural nerve, or after sewing the peripheral end into the skin, some connection was established between the peripheral end, and the central nervous system. The nerve fibres found in the peripheral stump of a divided and regenerated nerve grow out from the central nervous system. The reliability of the autogenetic theory is still of doubtful character.

Cerebellar Localization.—No localization of the cortex cerebelli has been satisfactorily established. The cerebellar motor elements are really not in the cortex but deeply in the organ itself. Pagano has come to the conclusion that there is a functional localization in the cerebellum.

The Leishman-Donovan Body.—The almost direct and rapid communication between the Dominion and India, through Canadian Pacific Railroad and Steamers, makes it almost a necessity to take a deep interest in "Tropical Diseases." The Leishman-Donovan Body is considered a new genus, belonging to the sporozoa, and supposed to represent a stage in the life history of a flagellate organism, closely resembling a trypanosoma. It is found chiefly in the spleen in cases of chronic fever, and the disease is termed "Cachexial Fever" usually with great enlargement of the spleen. The life history of this parasite outside the body, and how it enters the body, as problems, are still unsolved, the solution of which will clear the way, not only as to our knowledge of this systemic infection, of a septicaemic type, but also of the Leishman-Donovan Body,

which recently Leishman considered might represent a phase in the development of this flagellate.

I am truly glad to note the sound principle exemplified here this evening by young qualified medical men, associating themselves in as cordial a manner possible, with the older practitioners in this Ottawa District, by attending the meetings, joining the Society, and showing a desire to cultivate a spirit of unity, for the good of all concerned. In this City, there should be but one medical society, to strengthen and intensify the character of scientific work, and the idea of isolation, for the interest of the profession, and the public, should not exist in our midst. To one and all, it should be a source of pride and satisfaction to have in the Capital of Canada, the professional talent of which is of a high order, but one society, which would undoubtedly wield an influence for good, throughout the various scientific circles of the world.

In conclusion, let me state, Canada has good reason for hopefulness in her sons. This year is remarkable in that direction. The development of great muscular power, and accuracy of knowledge, as to co-ordinating movements, gained for Scholes the Cambridge Boat Race. The acuteness of observation, and skilled direction of Rifle Range precision, enabled Private Perry, to win gracefully "The King's Prize." Last, though not least, the highest position in Medical Science, Regius, Professor of Medicine, Oxford, the "*Gift of the King*," has been worthily accorded to Dr. Osler.

Such truly are undoubted evidence of the high position attained by our sons, in this First Colony of the Empire.

PRESIDENTIAL ADDRESS DELIVERED AT THE AMERICAN INTERNATIONAL CONGRESS ON TUBERCULOSIS AT THE WORLD'S FAIR, ST. LOUIS, OCT. 4, 1904.

By E. J. BARRICK, M.D., M.R.C.S. Eng., L.R.C.P. Lond. and Edin.. Toronto.

NO one could but appreciate to the fullest extent the great honor of occupying the distinguished position of President of this International Congress on Tuberculosis. For this honor I am grateful to the noble band of men whose hearts have burned with love and sympathy for those who are or may become the unfortunate victims of the Great White Plague. To these men, not to me, is due the honor of bringing about this great Congress. To one man more than all others is due the honor, and to him this Western World owes a debt of gratitude which can never be adequately realized and never repaid. Nothing short of the strongest love and sympathy for suffering humanity could have impelled Mr. Clark

Bell to so unreservedly consecrate his great talents, his time and his indomitable energy to bring about this splendid result. No man with less ability, energy, tact and perseverance could have accomplished what he has in working out something practical towards stemming the tide of the spread of this the greatest enemy of the human race.

The object eminently uppermost in this movement has been, not to waste time over unsettled scientific questions and controversial methods of treatment, but to seize hold of, and turn to practical use settled scientific and clinical facts. To this end we have endeavored to set in motion a campaign of education by enlisting the services not only of the medical, legal and clerical professions, but statesmen—federal, state, provincial and municipal legislators,—business men, and in fact the whole people, so that some concerted and co-operative action may be taken to utilize the present knowledge on this great question. Thus our efforts have been to bring together at this Congress all the above, so that by discussion and interchange of thought something practical may be evolved and legislation promoted whereby it may be carried into effect.

The good work of organizing this Congress would not have been possible had it not been for the splendid sympathy of the United States Government, and its generous action in inviting the Governments of the various countries in the Western Hemisphere to extend like sympathy and to appoint delegates to the Congress. Such Government sympathy and action I understand is unprecedented in any part of the world. We also acknowledge our indebtedness to the World's Fair management for placing the Congress on its official list of Congresses, and in appointing a Committee on Organization to aid in carrying it out. The loyalty of our officers and delegates, and the praiseworthy work of the local committee in St. Louis have all largely contributed towards bringing about the happy results of this meeting. The practical advantages resulting from Congresses are sometimes marred by the contentions of scientists over debatable scientific questions. We all remember how the good that was hoped for from the British Congress in 1900 was marred by the statement made by Professor Koch regarding the relation of human and animal tuberculosis. Comparatively little seems to be remembered of that Congress save this episode. We are also familiar with the report of the Royal Commission, which was contrary to Professor Koch's statement. The world is rich to-day in settled scientific and clinical facts regarding this disease; the world is poor to-day in practical measures to carry these facts into practice, and bring the benefits within reach of those who are so sadly in need of help.

It was therefore determined by the Management that the supreme work of this Congress should be on lines of preventive medicine includ-

ing preventive legislation, in which the whole people may join and help eradicate so far as possible this great scourge. The question may for practical purposes, be resolved into two factors: 1st The soil, 2nd The seed; no seed, no crop. I shall confine my remarks to Pulmonary Consumption, and the entrance of the germ through the respiratory channel. This brings us to the consideration of two questions: first, how may we best keep the seed and soil apart? and, second, how may the system be fortified against the growth and development of the germs when by chance they have gained an entrance. Generally speaking, the higher the vitality and tone of the system the less susceptible it is to this disease, and the more difficult it is for the germs to get a foothold. How important is it therefore that the campaign of education should commence in our public and other schools so that the whole people may early learn the nature of the disease, and be taught the things to be avoided, and the things to be done, that will tend to a higher state of health. If this were done state and municipal preventive legislation would be more easily secured and carried out, and we would have cleaner streets and lanes, better sewer and water service, and more sanatory dwellings, factories, shops, and other places of business in which most people have to spend the greater part of their lives.

A most encouraging feature is that while all this is being done to fortify the system against Tuberculosis, it fortifies it against disease of every kind, prepares it to more effectively discharge the duties of life and overcome the obstacles that more or less beset the path of every one. There is no disease that produces so much dependance and poverty as Tuberculosis, and there is no disease that is more readily fanned into life and activity by poverty, with its unsanitary surroundings, than the one under consideration. The rich are able to care for themselves. What can be done for those of moderate means, and above all what can be done for the poor? These are questions that have long been, and are to-day loudly calling for solution. In the solution of these great questions what is the desired goal to aim at? Shall it be one of centralization, combines, and trusts where the objects are financial gain and glory, where the benefits are to be brought within reach of only those who are able and willing to pay the highest price, or shall it be decentralization where the work is one of duty, inspired by love and sympathy for the unfortunate victims of this disease, and where the object is to bring the benefits within reach of the greatest number, especially the poor and those of limited means. I beg to submit for your consideration the latter, believing that decentralization is the direction in which relief may be brought within reach of the whole people, and that in this, municipal sanatoria are to play an important part. To this end each municipality or group of

municipalities should have a sanatorium, or what is called by some a "sanatorium ranche", exclusively for its own people suffering from Tuberculosis, operating in conjunction with the local boards of health, to consist of from 25 to 100 acres of suitable land, with an administration building, cottages and tents of moderate cost. Provisions should be made for consumptives in all stages of the disease and in all conditions of life—not a free sanatorium, as such would encourage pauperism, but one where those able to pay, shall pay, and where the poor shall be treated free of charge. In matters of education free schools are being brought within reach of every pupil in every municipality. In many county municipalities houses of refuge are being built for the poor. In nearly every municipality, at the present time special provision is being made in hospitals for those suffering from smallpox, diphtheria and scarlet fever, and general and special hospitals for those suffering from diseases other than contagious. Why not then have municipal sanatoria for tuberculosis, a disease that causes nearly twice as many deaths each year as smallpox, scarlet fever, diphtheria, measles, typhoid fever and whooping cough put together, and directly or indirectly is responsible for one-fifth to one-eighth of all the deaths the world over. On Dec. 15th 1902, Dr. P. H. Bryce, the registrar general of Ontario made this statement, "Since public health boards have been in operation over 20 years, the acute contagious diseases have been lessened nearly 60 per cent. while tuberculosis has increased almost 50 per cent. The reason of the decrease in the former is no doubt owing to the fact that organized methods, including hospitals and other means through boards of health, have been in force in the various municipalities, and of the increase of the latter is that no organized methods have been in operation. The advantages of sanatoria treatment have been demonstrated the world over, and especially so in Germany, where a law has been in force for some years whereby all who earn a wage less than \$1.50 a day are compelled to insure against sickness, old age, and death, and where the insurance companies are allowed the privilege of expending the weekly allowance for sick dues, in caring for the invalids in special sanatoria with gratifying results."

The object of municipal sanatoria is to bring all the benefits of sanatoria treatment within reach of every consumptive in every municipality. This plan is one that commends itself primarily as being above all things along the lines of preventive medicine. In the first place, it prevents death by giving an opportunity to those in the early stages of the disease of being cured; in the second place, it prevents more cases by removing those from their homes who will sooner or later transmit the disease to the other members of the family. It will also be an economic benefit through not only saving life and lessening cases, but will help to prevent

the pauperising of families who spend their all in attempting to save their loved ones, and provide comforts for them during several years of a hopeless fight with a chronic, and under existing conditions, fatal disease. I venture to say that there is scarcely a general practitioner before me to-day, or in this whole country, who, when he recalls his experience does not feel that with a municipal sanatorium within easy reach of his patients, valuable lives might have been saved, and the spread of the disease to other members of the family might have been prevented. A municipal sanatorium should be for the whole people, where every physician should have the right to treat his patients as freely as in their own homes, and where the patients should be free to be treated by the physicians of their own choice. Seeing then that such great advantages would flow from a municipal sanatorium in each municipality, why have they not been established, and what are the difficulties in the way. I answer the apathy and indifference of the public generally, and the great loss entailed therewith. Difficulties have been well defined as things to be overcome. How then may the difficulties in the way of municipal sanatoria be overcome? I answer, 'educate, educate, educate.' A campaign of popular education carried on by national congresses such as the American Congress on Tuberculosis, and the Canadian Association for the Prevention of Tuberculosis, aided by the State and Provincial Associations, backed up by Municipal Anti-Consumptive Leagues similar to the ones in Toronto and Montreal, aided by the medical, legal, and lay press, the pulpit and the platform, should be sufficient to arouse the public to a sense of its duty in this great work of saving and prolonging the lives of the people. When public opinion is thus educated it ought to be an easy matter to secure aid from the Federal Government to assist each state or province in establishing one experimental sanatorium that would be a pattern and object lesson leading on to municipal sanatoria.

It is pretty well established fact that the consumer pays the duty, and as the revenue then is paid by the whole people, it does not seem unreasonable that some of this should be expended in experimental sanatoria as indicated, seeing that large sums are freely expended in experiments in relation to tuberculosis among cattle, and in relation to agriculture, dairying, etc. All that is necessary is that the public be educated up to it. The first step being accomplished it ought not to be difficult to secure state and provincial legislation similar to what was secured in Ontario in 1900, on conditions that the municipality aid in the work. In turn, by-laws may be passed by the qualified electors, conditional on a certain amount of help being secured from voluntary contributions. By this co-operation of the federal, state, provincial, municipal, and voluntary aid, a municipal sanatorium might easily be established and maintained

in each municipality and brought within reach of consumptives in all conditions of life and in all stages of the disease, and thus not only save and prolong the lives of the people, lessen the amount of human misery, but also prove from an economic standpoint to be a good financial investment for all the parties concerned. It must be apparent to every thinking person that a municipal sanatorium in each county municipality would be an important local educator, and as the mind of the public become seized of its importance, patients would more readily be persuaded to take advantage of a local institution, where they would not necessarily have to pass out of the hands of their own physician and out of the reach of their friends, and where their chance of cure and improvement would be greatly increased, and the spread of the disease to their friends and the public generally would be materially checked. In conclusion, may I earnestly plead for municipal sanatoria on behalf of the 8,000 of our people who die each year in the Dominion of Canada, entailing an estimated annual financial loss of \$48,000,000. And on behalf of the over 100,000 citizens of this great Republic, who die annually of this same disease at an estimated financial loss of over \$600,000,000. Let the cry go up from the Atlantic to the Pacific. save the people, save this financial loss, and establish municipal sanatoria for Consumptives.

THE USE OF THE FINSEN LIGHT AND X-RAY AT THE OLD LONDON HOSPITAL.*

By J. PRICE-BROWN, M.D.

This Hospital does not lie in a fashionable quarter of the great old city. It is far from Guy's, or Bartholomew's, or St. Thomas', or Charing Cross; and being situated in the very heart of Whitechapel, is not very frequently visited by medical men from this side of the sea. Nevertheless, it is the great metropolitan centre for the treatment of disease of every kind; and although few of the professional élite from afar may visit it, there is perhaps no place in London where more can be earned of disease in its manifold forms, where public philanthropy has been more lavish, or medical and surgical truth more scientifically investigated.

When, as a post-graduate, I attended London Hospital twenty years ago, it was considered one of the best centres for instruction in general medicine and surgery, offering a wide field of observation to the careful student. Beds almost innumerable and extern clinics large. It

*Read at the Toronto Medical Society, 20th October, 1904.

was a vivid example of what a general hospital was supposed to be. A huge, beneficent charity, where the poor alone could be treated, and to which they came daily in hundreds. And of all the hospitals that I have seen since then, the London still keeps the closest to its record. There the poor abound, poor in garb, crestfallen in feature, apologetic, almost servile in mien; but they offer a wide and interesting field to the eye of the clinical observer.

Although the poor in London are very poor, the rich are very generous; and this old Hospital has made even broader its phylacteries since the days that I first knew it. It has purchased wide areas of land, filled up its own square, and, having extended across the street, has erected in its new wing, large, well ventilated, well lighted wards, operating rooms and waiting rooms. These are for the accommodation of the great number of specialties into which medicine seems now to be divided. This wing is connected to the main building by subterranean passages, which rival in beauty and finish even the much talked of "Tuppenny Tube."

Of all the various sections represented in this vast division of the hospital, there is none more interesting than the one devoted to the use of the Finsen light. I must say, however, that I only stumbled upon it. After spending several hours one morning in the Laryngological section, in which there were over 150 extern patients, I was advised by Dr. Lake, the surgeon in charge, to visit the Finsen Light room before leaving, which I accordingly did.

But a word or two about the history of the light. Prof. Finsen, of Copenhagen, some ten years ago, while engaged in observations on the effect of light upon the skin, had his attention drawn to some old reprints on the favorable results of exclusion of light in the treatment of small-pox. This set him thinking; and he concluded that as the exposed parts of the body in this disease, were the parts usually pitted on recovery, there must be something in the theory; and that, probably, the chemical, or actinic rays of light, were the ones at fault. Basing his treatment on this idea, he prevented these rays from coming in contact with the skins of his small-pox patients, by having the light into their rooms filtered either through red glass or red curtains; with the result, that the usual pitting was almost entirely prevented.

Success in this line led to more thorough investigation as to the effect of light; and the teachings of Charcot, Widmark, Maklakoff, Bowles and others were fully sustained by the researches of Finsen in the same line. They proved that the pigmentation and inflammation of the cuticle, from the direct effects of the sun, were not due to the solar heat rays; but to the refrangible (the so-called chemical) the blue, violet and ultra-violet rays. Instances of this fact are the following: *Irritation from*

sunlight appears hours after exposure, while the effects of a burn manifest themselves immediately. Climbing glaciers when the sun is shining but the temperature below the freezing point, is often followed by erythema of the skin, arising from reflection of light from the ice fields—it cannot be from the heat of the sun. Strong electric light, such as that produced by electric welding of metals, is sometimes followed by inflammation of the skin of a character much more severe than is ever caused by sunlight alone, all due to the larger proportion of chemical rays which electric light contains.

Upon these data, Finsen devised another method of using light for therapeutic purposes; but it was in the opposite direction to the one of the red ray in the treatment of small-pox. Instead of excluding the chemical, or actinic rays, his object was to utilize them directly as curative agents. The data upon which he formulated his method were the following:—

- (1) The power of the chemical rays of light to produce inflammation of the skin, *erythema solare*.
- (2) The powers of the chemical rays of light to penetrate the skin.
- (3) The bactericidal property of the chemical rays of light.

That the chemical rays of light can penetrate the skin, was adequately proved by Godneff. With a trocar he placed small sealed glass tubes containing muriate of silver under the skin of both dogs and cats. Then he allowed some of these animals to remain in the dark; while he exposed the rest of them to the direct sunlight. After an hour he took out the tubes; it being invariably found that the muriate of silver was blackened in the animals exposed to the sun, while the original color of the silver was retained in those kept in the dark, thus verifying the law.

Finsen went a step further. He placed a piece of sensitised paper on one side of a man's ear, letting the blue and violet rays of his apparatus for concentration fall on the other side of the ear. After five minutes trial the paper was unaffected. He next compressed the ear between two glass plates forcing the blood out into the surrounding tissues. Readjusting his apparatus as before, the sensitised paper was blackened in twenty seconds, demonstrating the important fact that these rays penetrate more easily tissues from which the blood has been expelled than those from which it has not. Hence the conclusion was arrived at that, in using the actinic rays for therapeutic purposes, it would be essential to render the area of skin to which they were applied as anemic as possible.

To prove that it was by the use of the chemical rays, that bacteria were quickly killed, Finsen performed many experiments. In the first series, in which ordinary sunlight was used, days and even months were required to kill the germs. In another series, in which plate cultures

were made with thin strata of nutritive material, bright sunlight would kill them in a few hours. While in a third, the blue, violet and ultra-violet rays being separated from the red and yellow by a strong electric light, similar germs placed in a thin stratum of agar were killed in a few seconds.

As a result of all these investigations, scientific as well as therapeutic, Finsen more than five years ago concluded to make a practical use of his discoveries, and forthwith established the first Light Hospital in the world. To this end he used a powerful arc light and confined his first efforts to the treatment of JUPITER.

The results were so successful, however, that within a year of its establishment at Copenhagen the system, with scarcely the slightest change, was inaugurated in London Hospital also.

The method is somewhat elaborate and I will not attempt to describe it minutely. The main feature is the transmission of actinic rays of light to the portion of skin which requires treatment. This is done in a direct line through long telescopic cylinders prepared for the purpose; and in London, as well as Copenhagen, the light used is of a 30,000 candle power.

The cylinders are four or five feet long. The lenses through which each light passes are four in number, and are made of quartz or rock-crystal, because they allow the ultra-violet rays of shortest wave to pass through in higher degree than is possible with glass. The two lenses near the distal end concentrate the parallel rays, and between these two lenses there is a tube of distilled water, which cools the light by absorbing the intensely heated ultra-red rays. To still further cool this end of the apparatus, a coil of cold water is kept constantly running around it.

Even yet, the light is too hot to be supplied to the skin without burning it, and to avoid such a result another apparatus is used. This consists of a plate of quartz and a convex lens of quartz, both framed in a conical brass ring, which contains two small tubes. Through these a constant stream of water is passed, rendering the skin so cool that it can stand the strongest light; while the attending nurse is pressing the convex side upon the skin, and by this means making it anemic.

The room in the London Hospital, in which the Finsen light is used, is well lighted, large and airy. It is kept scrupulously clean, and has arranged around its walls glass reservoirs of antiseptic solutions. There are also basins for purifying the hands and arms of the nurses who administer the treatment. Pigeon holes for the dressings and towels of the individual patients are also provided.

Electric arc lamps, two in number, each furnishing light through four telescope tubes, hang near each other in the long diameter of the

room. They were the gift of her Royal Highness, the Princess of Wales, now Queen of England. Near the corners of the room are four other lamps, each providing light through a shorter tube. There is then provision made to treat 12 patients at the one time.

In an adjoining building is a dynamo of 480 volts transformed to 55 volts, with a possible current of 50 to 55 amperes. This supplies the required light of 30,000 candle power.

Throughout the light room on each of my visits, there was perfect silence, while arranged in regular order were twelve recumbent figures. Each patient was presided over by his or her individual nurse, while gliding about the room was the lady superintendent. The patients were comfortably reclining on light, movable, iron couches, and each one seemingly remained motionless during treatment.

The nurses all wear washable overclothing, and work with sterilized, uncovered arms. They wear colored spectacles during attendance and sit on high stools beside their patients, each one constantly pressing the cooling lens on the spot to be treated. These lenses as well as the hands of the nurse are again sterilized before treating another patient. The regulation period of each treatment is one hour, repeated as a rule daily, each time upon a new spot; and the whole length of treatment may last into months or even years, according to the severity and persistency of the disease.

The patients are photographed before treatment is commenced; again while in the process of cure; and finally when it is accomplished, or the patient leaves the hospital for good. Records are also kept of the attendance of each patient, the number of treatments with notes, diagrams, etc.

The selection of the part of the diseased surface for treatment is by Unna's method, which consists in pressing on the reddened skin with a glass spatula until the part becomes anemic, revealing any yellow lupoid nodules that may be present. The skin is then cleansed with oil of sesame, and a little ring made around it of undine blue about half an inch in diameter. A piece of moistened lint with a corresponding hole in the centre is then placed over it; and the patient is ready for the pressure of the cooling lens by the nurse, and the transmission of the chemical rays.

Discomfort during treatment is rarely occasioned either by the pressure or the light; and after the hour's seance is over, the part is treated by a dressing of zinc carbonate in lanolin. In from six to twelve hours redness and swelling set in but without pain. This reaction is particularly marked in young people and in persons of fair skin. The dressings are of a soothing emollient character and are repeated as required. At the end of twenty-four hours reaction is fully developed. Bullae often

form and there may be a good deal of serious discharge; but pustulation rarely occurs and necrosis never.

The plan of treatment usually followed is to attack the periphery bit by bit in a circle of rings, the diameter of each being about one third of an inch. The tubercle bacilli are destroyed by the chemical rays for the full depth of the lupus nodule; but the healthy skin is unaffected. The lupus redness persists for a time, but the contraction during healing goes on, leaving a flat, smooth, soft, cicatricial area, which in the end assumes the color of the natural skin. After the whole area has been treated, the surface is carefully examined, and the little nodules that have escaped treatment or that have reformed are again attacked.

Although there is never any fever, the local treatment is supplemented by such constitutional treatment as may be required. This is usually of a tonic and recuperative character.

The treatment, if judiciously and faithfully persisted in, is, in a large majority of cases eminently successful, the patients being both willing and anxious to await results. Yet the method is not without serious drawbacks, the chief ones being the amount of time consumed and the great cost of treatment. There is also the inability to treat very deep tissues, and the impossibility of focussing the rays of light upon the curves of mucous membrane.

With regard to results of treatment, the one particular disease for which the Finsen light has proved itself to be useful is lupus vulgaris. In lupus erythematosus the effect has been marked, although much less certain than in ordinary lupus. In rodent ulcer it has also been tried extensively, and although some writers speak favorably of it, the general opinion is that the prospect from its use is uncertain. Rodent ulcer often spreads too rapidly to be controlled by slow action of actinic rays.

Even in lupus vulgaris there are certain conditions which render a case unsuitable for treatment, such as the existence of dense scar tissue, heavy pigmentation, great vascularity, great depth below the surface, any of which might prevent the proper transmission of light. Conversely to these, the specially favorable conditions are when the disease is limited to a small area, when it is superficial, and when it has not undergone surgical treatment.

The positive advantages of the light treatment are reliability, painlessness, excellent cosmetic results, less liability to relapse, and the avoidance of surgical measures.

Since the introduction of Finsen's method, various improvements have been suggested and tried, the main features being to shorten the time of each treatment, to increase the area of each operation, and to lessen the cost. In Lortet Genoud's lamp these objects are all claimed to

have been attained. In it while protecting from the heat rays, the chemical rays are obtained near their source and before dispersion. The surface of skin affected by the lamp in each sitting is $1\frac{1}{2}$ square inches or about 20 times the surface covered by the Finsen method, while the application only lasts fifteen minutes. There are also the Kjeldsen lamp, the Bang's lamp and others. The last named costing less, and being speedier in treatment than all the others. Each of these was reported well on to three years ago, yet the results can scarcely be what was expected of them, for in old London the Finsen light, as originally installed, still has its sway with its one hour seance, its telescope light, and its 30,000 candle power.

There were a number of interesting points that I noticed on the different occasions that I visited the light room. One was the fact that, then at least, nothing was being treated but lupus vulgaris. By a process of selection, after five years experience, this was the one disease to which the treatment seemed to be specially suited. The nurses all seemed well trained for their work under a thoroughly efficient and courteous lady superintendent. The patients, men and women, were from different stations in life. All seemed comfortable, free from restlessness, and free from pain. The 12 patients were under the charge of the 12 nurses. No questions were being asked. No conversation was indulged in. But a number of the patients, while lying at their ease under treatment, were reading books so arranged as not to produce fatigue. Several women were doing needle work, while a number of others one would imagine were sleeping, but for the occasional glances which they cast about the room.

On examining the lupoid patches, the effect of treatment in many instances was very marked. In some the nodules had entirely disappeared over a large area, leaving a soft though still highly coloured skin. The recently treated spots indicated varied conditions of soreness, while places treated first looked almost like normal cuticle. Of real scar tissue there was little to be seen.

The distance between the telescope tube and the little compressing cylinder, which the nurse applied to the surface, was about four inches; and the spot treated each time was about a third of an inch in diameter. These facts refer to the eight large Finsen tubes in the middle portion of the room; the four single ones, already mentioned, are, I believe, modifications of the original Finsen light, and were designed by Dr. Sequeira, the medical officer who has this department under his care. The cylinders in these are only half the length of the Finsen cylinder, and the area treated each time is said to be about an inch square.

The report was that all cases admitted for treatment were materially benefited, and the large majority of them cured. But as nodules might be formed again at any time if tubercle bacilli had been left undestroyed, the patients were required to report themselves at regular intervals for a year or two, until the physician felt sure that the cure was perfect.

Immediately adjacent to the Finsen light rooms in the London Hospital is the x-ray room. It is small in dimensions, and has three x-ray machines in regular operation, all of which are controlled by a single skilled expert.

The two methods of treatment appear to be supplemental to each other, being apparently under the one management. As instances of this, certain kinds of lupus are passed on from the Finsen light to the x-ray room. These are so-called pus cases, instances in which the Finsen light produces too great irritation, with a tendency to breaking down of the tissues. Also cases in which the lupus penetrates deeply into the tissues. Others in which the mucous membrane of the mouth is seriously affected.

In all these the x-ray may do more than the Finsen light. In some, however, after the deeper and more massive nodules have been treated by the Roentgen rays, the patients are returned to the light room for the work to be completed.

In cancer the result from x-ray treatment were not very satisfactory; and, in malignant disease generally, it was not frequently used, except as an adjunct to operative surgical treatment.

In rodent ulcer, however, the results were very good; and the three patients I saw under treatment were all suffering from that disease. The sittings were each of ten minutes duration, and repeated, when possible, daily. These cases were all instances of facial ulcer. One of them was situated on the side of the face and temple and had a diameter of three inches. The second was wider, situated on the cheek and extending to the pinna of the ear. The third over the lower cheek down to the margin of the lower maxilla. The surfaces of all were clean, and the electrician stated that steady improvement was manifested in each case. When asked about the time required to produce healing, he was non-committal, stating that it might take six months or a year or longer; but that he had great faith in the treatment as it would undoubtedly produce marked improvement in each case, if not perfect cure.

One of the most striking facts in regard to the two methods of treatment, as I saw it in August last, was that the Finsen light was devoted exclusively to lupus, while in that division of the Hospital the x-ray was almost exclusively devoted to the removal of rodent ulcer.

My own impression is that the Finsen light has come to stay. It may be improved and modified and cheapened; but the principle will remain, as a distinct factor in medical science. It contains great potency and it will only take time and experience to find its true limitations. The same might be said of the x-ray. Both are useful aids in the treatment of certain classes of chronic disease; and while, in the ardor of discovery, their range of usefulness may have been exaggerated, they will always without doubt, occupy valuable places in the therapeutics of medicine.

DISCUSSION ON DR PRICE BROWN'S PAPER.

Dr. Graham Chambers said that he was pleased that Dr. Price-Brown had formed such a high opinion of the Finsen light treatment of lupus. During last summer he also visited London and was so impressed by the results obtained by the Finsen treatment that he purchased a lamp from Copenhagen.

Dr. Chambers said that in order to understand the principle of the light treatment one should have in mind the various parts of the spectrum. The divisions towards the red end, etc., ultra-red, red, orange, are known as the heating rays; whereas those towards the opposite end, e. g., blue, violet, ultra-violet, are chemically active. The latter have greater germicidal action, but less penetrating power than the heating rays. Now the Finsen lamp is constructed so that the chemically active (actinic) divisions of the spectrum freed from the greater part of the heating rays are utilized. In the original lamp a solution of sulphate of copper and ammonium was used to filter out the red rays. This, however, was found to absorb ultra-violet as well as heating rays. In order to obviate this loss of germicidal potency, Finsen, in the lamps recently constructed, uses distilled water, kept cool by running cold water, as an absorbent of heat.

It was also found that glass absorbed considerable, but quartz very little, of the ultra-violet rays. In order to avoid this loss, the lenses in the newer lamps are made of rock crystal.

The disease in which the light treatment is most useful is lupus vulgaris, although it has proved of great value in erythematous lupus, capillary nævus and alopecia areata. The reason why in the East London Hospital lupus vulgaris is the only affection treated with the Finsen light is the fact that they have more than they can do in the treatment of the lupus cases alone.

With regard to my experience I have several cases of lupus vulgaris and of alopecia areata under treatment and have every reason to believe that the results will be excellent.

Dr. Charles R. Dickson said it afforded him much pleasure to hear a paper of this nature read before the Toronto Medical Society and listened to with such attention. It is but another proof that at last electricity is coming to its own, for phototherapy is but one of many therapeutic uses of electricity. He had the honor, a couple of weeks ago, to take part in an International Electrical Congress held in connection with the World's Fair at St. Louis, Mo., as a delegate from the American Electro-Therapeutic Association, and on that occasion presented a paper on the subject of phototherapy, a subject in which he had been very much interested for many years and so it was all the more pleasing to listen to the remarks of one who may practically be considered an "outsider" on the question, but who was undoubtedly most agreeably impressed by what he saw in London.

There are many circumstances which militate seriously against a wide spread use of the Finsen light. Chief among these is the initial cost of the genuine apparatus and the subsequent cost of operating it; next is the length of time consumed in each treatment, an hour or more; and the limited area which it is possible to treat at one time; another cause is the comparatively restricted field of usefulness of the Finsen light proper. Many ingenious substitutes have been devised but none of them up to the present time is capable of filling the place of the genuine Finsen lamp and many are comparatively useless, chiefly on account of the lack of penetration. All portions of the spectrum are bactericidal, differing only in degree. The farther we go up from the red end of the spectrum, the shorter and more rapid become the wave lengths of the rays and more powerfully bactericidal, but also the more refrangible and less penetrating; so that the ultra-violet rays while they are more rapidly bactericidal than those below them and thus very materially lessen the time of treatment, yet are largely absorbed by the epidermis and therefore cannot penetrate as deeply as those rays of greater wave length, and are, consequently, less effective in deep seated cases. The Finsen light proper takes in the blue, violet and the lower portion of the ultra violet rays; but the substitute lights give out very few of the blue and violet rays, while being very rich in ultra violet in some cases. Some of these forms of apparatus have a value of their own in other diseases than lupus, and even in extensive areas of lupus, not deep seated, are remarkably efficacious. Lupus recurring in cicatricial tissue, having undergone previous surgical treatment, is frequently very stubborn. In such cases the judicious use of the x-ray over such tissue, followed by the employment of the ultra violet rays, had achieved very happy results at his hands.

In a very aggravated case of acne vulgaris referred to him by Dr. Mac-Murphy, the entire face was involved, pustules were very plentiful, there

were several lumps on the cheeks and under the jaws, and the whole face had a swollen appearance and was deeply pigmented. Fourteen ultra violet rayings during a period of one month sufficed. No fresh pustules appeared during treatment.

In a case of folliculitis barbae (sycosis) of the chin with several spots the size of a ten cent piece, five ultra violet rayings effected a cure, and there was no trace of the trouble ten days after the first appearance of the lesion. The hairs were not epilated.

In carbuncle and furuncle two ultra violet rayings aborted the trouble. Many other uses of the ultra violet rays might be cited.

Some cases of lupus are more suited for x-ray, others for the Finzen light, others do better under a combined treatment, but as a paper of his which deals with this discrimination will shortly be published he did not touch upon that matter.

Rodent ulcer and epithelioma do better under the x-rays than under Finzen light treatment. With regard to the treatment of malignant diseases by the x-rays, the induction of artificial fluorescence of the tissues, previous to and during raying, offers fresh hopes and extends the usefulness of the x-ray.

He did not think that the day will ever come when a Finzen light will be considered a part of the equipment of every physician's office as the writer seemed to hope. Such treatment is much better left in the hands of those specially qualified to use it and none others should attempt it. It will always be a special form not a general form of therapy.

With the writer, he agreed that both the Finzen light and the x-ray are here to stay.

He congratulated all concerned in the presentation and reception of this interesting paper; for when he came to Toronto fifteen years ago and commenced to read a paper on a plea for the use of electricity in medicine about three-quarters of the audience got up and left the room, which led him to repeat his remark that at last electricity seemed to be coming to its own.

Dr. McMaster said as he did not hear the paper by Dr. Price Brown he was not in a position to discuss its merits. He wished to say something, however, about x-rays. His experience now reached back over about nine years working with x-rays and he was only beginning to know definitely in what field the rays were useful. He could almost say before hand in what cases it would be successful and in what ones a failure. Out of fifty seven patches of lupus treated by him, all had been successfully healed but two. One of these was scarcely a failure, as treatment was discontinued before the case was completely well. The patient had lost half the ear and had a large lupoid area beneath and around the ear.

Two months' treatment healed it all up, but a small spot behind the ear. This, no doubt would have cleared up if treatment had been continued. The other case was not a regular case of lupus, but was a tubercular infection of the fascia and sheaths of the muscles of the thigh, deeply situated in places. It was a complete failure in this case. In superficial skin cancers, situated about the eyelids, nose and face, he had met with nothing but success. The character of the tube and the technique used determined whether success or failure was to attend the case. Three cases of cancer of the lower lip had entirely recovered, the cosmetic effect being perfect. One of them returned twice in the old site and the other once. There was no doubt about their character, they were epitheliomata. No glands were affected in any of the cases, and they had not been irritated by any procedures for their removal. The hope for a cure in these cases is found in taking them early, and using a tube with a suitable vacuum at a proper distance. A case can be injured rather than improved by using faulty technique and unsuitable tubes. He had several failures of lip cases, but they were all in cases that had been operated on by the knife or had plasters applied, and the disease had extended to the adjacent glands or the tissues of the neck. Marked improvement had followed the use of the rays in several deeply seated carcinomata, but no cures had resulted. In all, the pain was greatly mitigated or relieved altogether, and in the case of breast cancer, where there was a profuse, foul smelling discharge, it was either completely removed or markedly lessened. The use of opiates could be almost completely discontinued. Nothing more than this was expected from the treatment, and even this could not be attained by any other known remedy. Almost all forms of chronic skin disease troubles are rapidly improved and cured by the rays, chief among which are chronic eczema, salt rheum, and acne vulgaris. The transformation in these cases by the rays is amazing and it is believed to be permanent. In these cases the character of the radiations and the method of their use are all important factors. As the doctor had no experience with Finsen light, he did not wish to discuss its merits, but one thing was certain that it would never replace x-rays. He was, however, convinced that there was a great field of usefulness for ultra violet, as well as other forms of light.

Dr. A. A. Macdonald said that cases which were operated on and then rayed did better than those operated upon. In malignant disease he thought that after operating much good would be derived from raying.

ARMSTRONG vs. BRUCE.

This was an action brought by Charles Armstrong, of Brampton, against Dr. H. A. Bruce, for burns received from a hot water bag while the latter was performing an operation upon him.

The facts of the case are briefly as follows: Dr. Bruce was called to Brampton by Dr. Lawson, on November 23, 1903, to see Mr. Armstrong who was suffering from acute Intestinal Obstruction.

Armstrong had been sick with the usual symptoms of obstruction for two days and Dr. Lawson had given purgatives and enemata without result. When Dr. Bruce saw him he had severe abdominal pain, distention, rigidity of the muscles, vomiting, a very weak pulse and a sub-normal temperature with hippocratic facies.

A room in Armstrong's house had been prepared that morning for the operation by a trained nurse, a graduate from Galt Hospital, engaged by Dr. Lawson, acting for Armstrong. Dr. Bruce took with him a Kelly pad, which can be filled with hot water instead of air and said to the nurse "this is an improvement on the old Kelly pad, as it can be filled with hot water as well as with air and serves to keep the patient warm during the operation, obviating the necessity for hot water bottles. Fill it just as you would an ordinary hot water bottle." The nurse took it and had it filled with boiling water and placed it under the patient. While this was going on, Dr. Bruce was washing and disinfecting his hands and placing his instruments, sutures, etc. The operation was proceeded with and the obstruction was found due to a knuckle of bowel being strangulated in the internal abdominal ring and adherent there. This was separated with some difficulty and withdrawn, when a small portion of bowel—about the size of a five-cent piece, was found to be gangrenous. This was turned in and sewn over with Lembert sutures, so that it might be thrown off into the gut.

The patient made a nice recovery from the operation, but the next day he was found to have received superficial burns across the back and thighs. These were painful but not severe and were healed at the end of seven weeks when he was able to be up and about the house. Altogether he was confined to the house about ten weeks.

When Dr. Bruce's account was sent later, Armstrong declined to pay it, stating that he had been burned and put to extra expense with nursing, and therefore requesting that the account be reduced. Dr. Bruce replied that he was not in any way responsible for the burns and therefore could not on their account reduce the bill. As no payment was made at the end of six months, after several requests, Dr. Bruce sued him for \$100.00, amount of his account, and a week later Mr.

Armstrong issued a writ against Dr. Bruce for \$5,000.00. He claimed that the operation was unnecessary and that he had been burned through negligence.

The trial was held at Brampton on October 25th, before the Hon. Justice Meredith. Mr. William Mulock acted as solicitor for Dr. Bruce and Mr. Riddell as Counsel.

Expert evidence was given by Mr. I. H. Cameron, Drs. J. F. W. Ross, Geo. A. Bingham, John Caven, Wm. Hall and J. A. Lawson. Miss Faulkner, graduate of Toronto General Hospital; Miss Eastwood, superintendent of Victorian Order of Nurses; Miss Patton, superintendent of Grace Hospital; Miss Graves, head nurse at St. Michael's Hospital, and Miss Gray, superintendent of Home for Incurables, were present to give evidence on behalf of Dr. Bruce, but the judge, after hearing the medical evidence, did not think it necessary to call upon them.

The evidence for the defendant was to show that the preparation of the patient, placing him upon the operating table and the filling of hot water bottles, et cetera, came under the familiar knowledge of the nurse and her duty, and that the surgeon had nothing whatever to do with these details. It was clearly shown, even by the evidence of the nurse involved, that nurses receive during their training, instructions in the filling of hot water bags and that they know the proper temperature of water for this purpose and that a surgeon is justified in trusting them with the filling of these and is not required to examine these bags to assure himself that they are not too hot.

It was shown that after a surgeon is disinfected and prepared for the operation, it would be grossly wrong and a source of danger to the patient for the surgeon to feel hot water bags, which are unsterilized. That a surgeon must trust the nurse with the preparation of solutions, sponges, hot water bottles, et cetera, and that it is impossible for a surgeon to attend to these details. Any mistakes made in these preparations would be a danger to the patient and might result fatally. Operations are performed nowadays, with safety which were not possible a few years ago. This is owing to the development of antiseptic surgery and the efficient training of nurses and their help at an operation is absolutely necessary to the successful carrying out of the antiseptic details. The surgeon could not be expected to attend to these details and must necessarily trust his nurses.

The following judgment was delivered by The Hon. Justice R. M. Meredith:—

The plaintiff sustained a very painful injury, and one which has caused him some loss. These facts do not necessarily entitle him to relief

from the defendant. In order to have damages in this action he must satisfy the Court that the defendant has been guilty of some actionable negligence. The defendant is a skilled gentleman, a gentleman of the medical profession, and what would in an ordinary individual be but mere negligence would in his case, no doubt, be gross negligence. Had he done that which the nurse testifies he did, it would in my judgment, have been gross negligence. Whether I would be obliged to say that the injury which the plaintiff sustained was the natural effect of that negligence is another question and one which I need not determine. What I have now to find is whether the plaintiff has affirmatively shown that there was negligence on the part of the defendant occasioning the injury of which he complains.

I am unable to find upon the evidence that the nurse's statement is accurate. She is, I think, quite mistaken as to the direction proceeding from the defendant in regard to the filling of the pad. I am satisfied that she has confused that which he said in regard to sterilizing his instruments, with that which he said in regard to filling the pad. I have no manner of doubt that if the doctor had said to any experienced nurse that she was to fill that pad with boiling water it would at once have struck her as an extraordinary thing, and one calling for some explanation. Nothing of that sort took place. It was a thing that could not have been done by Dr. Bruce, unless through a slip of the tongue. He never meant that she should do that which she did. So that the probabilities are altogether against the story of the nurse. And the direct testimony very greatly preponderates in favor of the defendant. We have Dr. Bruce's own statement, which is worthy of at least as much credence as that of the nurse. No doubt every one is naturally prejudiced in his own favor in a case of this kind, and Dr. Bruce's action in saving himself against a charge of negligence is to be to some extent affected by his interest. On the other hand, the nurse is saving herself from a charge of negligence, and probably an action for the recovery of damages. They stand upon an equal footing as far as that is concerned. Then there is the testimony of the other two medical gentlemen, who say that the nurse is mistaken. Upon the whole I find that the direction to fill the pad with boiling water was not given but the direction was given to fill it as if it were a hot water bottle, and if that be so, the plaintiff's case seems to me to fall to the ground. I cannot find any negligence in Dr. Bruce having under the circumstances assumed that the nurse would perform her duties properly. I cannot think that upon this branch of the case anything like a case is made out for the plaintiff. It is not contended that liability arose by reason of any relationship of master and servant having existed between the defend-

ant and the nurse. The facts would not support any such contention. There was no such relationship.

The only question which causes me any trouble is as to the disposition of the costs. Under all the circumstances of the case, I think I am fairly exercising my discretion in making no order as to costs of the action.

The action will be dismissed without costs if the case go no further. If it go further, dismissed with costs, and there will be judgment for the defendant on the counter-claim with costs on the Division Court scale, without any set-off.

REFORM OF INEBRIATES.

The reformation of inebriates is the object of the new organization which will be known as the Inebriate Reform Society of Ontario, and of which a general committee met November 16th at Government House. His Honor, Lieut-Gov. William Mortimer Clark, presided.

The means to be taken by the association in carrying out its propaganda were outlined. It will advocate the adoption of the probation system, "home" or dispensary treatment in suitable cases, and the establishment of municipal sanatoria for indigent inebriates. It will also ask for legislation similar to the Imperial Inebriates Act of 1898. A general interest in the movement will be awakened by visits to municipalities, and the distribution of literature on the subject. In the meantime it will favor long sentences for confirmed habitual drunkards.

In these projects the co-operation of the Premier of Ontario and the Provincial Secretary will be asked. In addition, the Toronto Board of Control, the county judges, police magistrates, and the inspectors of prisons and charities will be requested to lend their aid.

A draft constitution was considered and a list of persons to form the Executive suggested. Both matters will be discussed at a general meeting of the society.

Among those present were: Dr. Harley Smith, who acted as secretary, Dr. Rosebrugh, Dr. Carveth, Dr. Bruce Smith, Dr. Oldright, Rev. Dr. Gilray, Mr. Edward Taylor, City Relief Officer, Mr. C. Ferrier, superintendent of the Victoria Industrial School, and Mr. Smith, superintendent of the Boys' Home.

Physicians desiring to contribute papers upon Internal Medicine, at the next meeting of the Pan-American Medical Congress, which meets at Panama January 2nd-6th, 1903, will kindly send titles at their earliest convenience to the Secretary of the Section on Medicine, Dr. Judson Daland, 317 South 18th Street, Philadelphia, Penn.

CURRENT MEDICAL LITERATURE

MEDICINE.

Under the charge of A. J. MACKENZIE, B.A., M.B. Toronto.

A CASE OF MALIGNANT ENDOCARDITIS.

In the *Boston Medical and Surgical Journal*, Oct. 13th, Adams report a case of this disease which was diagnosed as typhoid fever, on account of temperature, pain in sides, enlargement of spleen, delirium and an erythematous eruption. By the sixth day, no rose spots appeared and Widal reaction was negative on the third, seventh and thirteenth days. On the sixteenth day a systolic murmur was discovered at the apex, lungs were normal and no heart symptoms. The temperature ranged from 99 to 105, with very considerable daily variations but without chills or sweats. By the twentieth day the murmur was a loud, churning sound, heard all over the heart area. The patient became rapidly worse, dying on the 25th day. The pulse throughout the attack was soft, full and regular, at the last very compressible, the rate varying from 80 to 100 till the 16th day, after which it was 120 or more, the respiration in the latter period being 30 to 50.

AUTOPSY.—Heart: The pericardium contains about one ounce of clear fluid; no adhesions. Size of heart $4\frac{1}{2}$ by $5\frac{1}{2}$ inches. Many petechial hemorrhages on anterior surface, particularly over right auricle and ventricle, just within the visceral serous covering. Heart fat fair in amount. Heart muscle flabby. Veins of heart distended with dark, liquid blood. On section, right auricle contains post-mortem clots and partly organized ante-mortem clots. The auricular appendage has organized clots (marantic). Right ventricle contains ante-mortem clots fully organized; probably marantic in origin. Tricuspid valves seem to be competent, but covered with a fibrinous exudate of recent origin, and valves are somewhat thickened. Papillary muscles and chordæ tendineæ practically normal. Left auricle negative. Left ventricle contains ante-mortem and post-mortem clots. Mitral valves are thickened and eroded and are covered with an ulcerative exudate forming excrescences of various sizes, some as large as a hazel nut, and in the exudate tendineæ thickened and imbedded in the inflammatory exudate. Heart muscle is pale and shows areas of brown atrophy, with areas of recent myocardial inflammation. Coronaries patent; no sclerosis. A few patches of beginning sclerosis in the aorta. Aortic and pulmonic semilunar valves normal." Other organs did not show distinctive lesions.

CONCLUSIONS FROM A SERIES OF MEASUREMENTS OF BLOOD PRESSURE IN FEVERS, BEFORE, DURING AND AFTER THE ADMINISTRATION OF STRYCHNIA.

1. The cases included in this study were all febrile. Among them were 31 cases of typhoid fever, 4 of pneumonia and 15 others with a variety of diagnoses.

2. In 32 cases the strychnia was given by mouth and in 18 subcutaneously. The total daily dose was usually $\frac{1}{8}$ gr., sometimes $\frac{1}{6}$ gr. Except in a few instances, the diet and position of the patient remained the same throughout the experiment.

3. The records were continued for days, and occasionally for weeks before and after the drug was given, in order that the regular range of variation in the blood pressure might be ascertained.

4. The measures were taken with Stanton's modification of the Riva-Rocci instrument. The maximum pressure was recorded as the height of the mercury column at the moment of the disappearance of the radial pulse, and the minimum as the trough of the wave of greatest oscillation of the column.

5. Measurements were taken at various intervals of time succeeding the administration of strychnia, from a few minutes to several hours. The observations extended over about eight months and included over 5,000 measurements.

6. The total result is negative. I have been unable to convince myself that strychnia exerts any influence upon the blood pressure of febrile cases when given in manner and dose above mentioned.

7. In the twenty-four hours following the administration of the drug there was a rise 5 mm. or more of pressure in 16 cases, a fall in 17 cases, and no change in 24. The average pressure in the 50 cases that received a daily dose of strychnia was no greater than in 18 cases without any drug.

8. To me one of the most striking features of the investigation was the fact that while strychnia and whiskey seemed to be entirely without influence upon the blood pressure, the sight of the dinner-tray or the prospect of getting up produced a most obvious, though transient, rise in the pressure. The only permanent gains in pressure occurred when the patient reached the crisis in pneumonia, or when convalescence enabled him to get up and walk.

9. As in the alcohol research of last year, I do not wish to be construed as saying that the drug under investigation is of no value. To prove so general a negative my work is altogether insufficient. My conclusion is, that in the dosage employed strychnia does not raise or in any way affect the maximum or minimum blood pressure so far as can be determined by the instrument employed.

BROMETONE.

In the *Medical Age*, Sept. 25th, 1904, there is the report of a case of Epilepsy treated by a new remedy named Brometone which proved effective and available when stomachic disturbance made it impossible to use the ordinary preparations of Bromine. The case described has no features of particular interest except a development rather late in life, and had been treated with Bromides until it was found that they could not be used to advantage. The patient was put on this preparation with very satisfactory results, no nausea ensuing and the attacks disappearing up to the time of reporting, viz. sixteen months. The chemistry of the drug is given as follows:—

“Willgerodt, in a paper dealing with tri-chlor-tertiary-butyl-alcohol, or aceton chloroform, mentioned having obtained a similar product containing bromine in place of chlorine, which he called tri-brom-tertiary-butyl-alcohol, but he did not make a careful examination of its chemical and physical properties, and seems not to have considered at all its pharmacological properties. The bromine compound is produced by the action of caustic alkalis upon mixtures of bromoform and acetone. The excess of acetone and bromoform having been distilled off, the new bromine compound is removed from the residue by distillation with steam, the product being finally purified by recrystallization from alcohol or other suitable solvent. The purified substance is a white crystalline body having a camphoraceous odor and taste. The melting point is about 167 degrees C. It is soluble in most of the organic solvents, as alcohol, ether, benzene, etc., slightly soluble in cold and more soluble in hot water.

“This compound, since it is a derivative of the fatty acid series, when administered in various ways to animals possesses decided anesthetic properties; recovery from small quantities takes place without any apparent untoward results. The drug appears to have very little influence upon the heart or circulation, as shown by myocardiographic and blood-pressure tracings taken from curarized animals.” (*American Journal of Physiology*, vol. 8, No. 5.)

Brometone contains about 77 per cent of bromine and possesses the sedative and characteristic action of that agent. It is preferable to the bromides, because it does not give rise to nausea, vomiting, or any other alimentary disturbance. Moreover, it does not seem to produce the undesirable systemic depression often resulting from the commoner bromides. And although the patient has been taking brometone day after day for over a year, he has not been afflicted with skin rashes or any other indications of bromism.

SURGERY.

Under the charge of H. A. BEATY, M.D., M.R.C.S., Eng.

Chief Surgeon Canadian Pacific Railway, Ontario Division ; Surgeon Toronto Western Hospital.

THE TREATMENT OF DIFFUSE SUPPURATIVE PERITONITIS FOLLOWING APPENDICITIS.

In the *Columbia Medical Journal*, September, Dudley P. Allen strongly advocates the following method of treatment in diffuse suppurative peritonitis following Appendicitis:—

1. A lateral incision is made low down in the right iliac fossa. An opening in this situation gives direct access to the cæcum, facilitates thorough washing of the peritoneal cavity and forms subsequent drainage.

2. With the patient turned on his right side the peritoneal cavity is thoroughly irrigated with normal salt solution, or sterile water, by means of an irrigation apparatus having a funnel held high above the patient, and a large rubber tube leading from this to a nozzle twelve or fourteen inches long which can be carried to every part of the abdomen.

3. The operator's hand prevents the escape of intestines, and at the same time by keeping the incision open and the intestines back from the tube, allows of the free escape of the irrigation solution.

4. Shock, so frequently met with in returning to the abdomen, intestines which have escaped during the process of cleansing the abdominal cavity, should be avoided. Intestines distended by gas have a great tendency to escape from the abdominal incision, especially if this be in the middle line. With the incision in the right iliac region, and the patient turned on his right side, this tendency is much decreased.

5. When the washing has been thoroughly accomplished, two large glass drainage tubes are inserted into the plevis and one into the right flank, wicks being placed in these to aid drainage. Gauze is now lightly packed in the abdominal incision around the tubes. The patient is returned to bed and kept turned well to his right side to facilitate drainage.

Gastric lavage may be employed to empty the alimentary tract and quiet peristalsis.

The writer believes that in cases of obstruction, independent of, or subsequent to laparotomy associated with great distention and a state of collapse, such as to preclude all hope of the successful removal of the obstruction by laparotomy, the quick formation of a fæcal fistula may give relief and rescue the patient from impending death.

THE TECHNIQUE OF PROSTATECTOMY.

Ramon Guiteras, New York, advocates the following technique in the operation of prostatectomy:—

The patient is prepared in the usual manner, etherized, and placed upon his back upon the operating table. A lithotomy guide is then passed through the urethra into the bladder and the patient placed in the lithotomy position. An external perineal urethrotomy is then performed opening the membranous urethra. This opening should then be dilated to permit the introduction of a pair of curved scissors into the urethra until they have passed the apex of the gland, when a transverse incision is made in its floor.

When the lateral lobe is freed, the forceps are then placed upon it and it is delivered. The gland having been removed, it is well to palpate the region to see that everything is free. The bladder is then flushed out with hot water, followed by a second irrigation of 1 in 10,000 bichloride of mercury solution, and a perineal drainage tube is inserted into the bladder. The tube remains in the same position as in the case of an ordinary external urethrotomy, and is removed at the end of a week, after which a large sized catheter is passed through the entire urethra into the bladder and allowed to remain until the urethra closes above it and the perineal opening has filled in.

THE SURGERY OF THE INTERNAL JUGULAR VEIN.

In the *Scottish Medical and Surgical Journal*, September, Jas. H. Nicoll advocates the ligature or excision of the internal jugular vein, as a preliminary to operative measures in connection with the mastoid. A considerable number of cases so treated have yielded results which appear to warrant the following conclusions:—

I. Preliminary legature of the jugular vein is, an operation of trivial risk, as the primary step in the operative treatment of the case, if it is performed with clean hands and instruments. Ligature of the jugular, however, undertaken towards the end of a mastoidectomy when infective thrombosis has been discovered in the sinus or performed hurriedly after accidental wounding of the sinus, is an operation which, performed with contaminated hands and instruments, carries grave risks of septic complications.

Excision of the jugular vein, on the other hand, in cases in which, on exposure of the vessel it is found that though infective thrombosis has extended down the lumen constitutes an operation of some severity, the dissection extending in most cases from the clavicle to the mastoid. For this the operator must be prepared, even in cases in which the

symptoms have given no indication beforehand of the condition of matters revealed by the incision.

2. Preliminary occlusion of the jugular vein in cases in which there is reason before operation on the mastoid to suspect infective thrombosis of the sinus constitutes the patient's main chance of recovery. To disturb the walls of a thrombosed sinus in exposing it, to palpate it for evidence of thrombus, and finally to open it and break up the purulent thrombus in removing it with the spoon over a patent jugular channel, sucking in debris with each inspiratory effort, cannot be regarded as sound surgery.

3. Preliminary occlusion of the jugular vein, in cases (most often in children) in which there is reason to suspect tubercular caries, permits the performance of a much more radical mastoidectomy than can be attained in cases where a patent jugular vein converts an accidental wound of the sinus from a comparatively trivial incident to an accident bearing serious disadvantages and grave risks.

GYNAECOLOGY.

Under the charge of S. M. HAY, M.D., C.M., Gynaecologist, Toronto Western Hospital; Consulting Surgeon Toronto Orthopedic Hospital.

SECONDARY ABDOMINAL OPERATIONS.

In the August 6th number of *St. Louis Medical Review*, Dr. Louis S. McMurtry writes on the above subject. As to what an abdominal surgeon's standard of attainments should be he quotes from Greig Smith as follows: "To be prepared at the appearance of any complication, to apply the best known surgical technics; to do what is wanted, and no more than is wanted; to have the manner and method of each procedure mentally laid down in clear and definite lines; and generally to perform the operation in steady, straightforward, workmanlike manner through the endless complications that may arise, is no trifling call on the capacities of a human being. Much of it may be learned by intelligent practice, at the expense of the patients; much may be learned by careful study and practice on the dead body; but most of all will the young surgeon derive information from a close and intelligent personal attendance at the operations of our great masters. Abdominal surgery is no longer a field for legitimate and versatile experiment; certain fixed and useful laws and customs have been laid down by the dearly bought experience of great men; the abdominal surgeon ought to begin fully equipped with such knowledge as has been gathered for him." The writer says our knowledge of intra-peritoneal diseases and their complications has advanced wonderfully in these latter years, and our operative technique has been greatly improved, but with all our increased resources the standard set up by Mr. Smith in the words quoted, remains to invite

the best efforts of surgeons doing abdominal and pelvic surgery. He endeavors to show that when we have disregarded this essential basis of operative work, and wandered away towards greater achievements by more devious methods, we have met with disappointment and have been compelled to retrace our steps. However methods may change, this standard of surgical efficiency must ever be the basis of successful work.

Dr. McMurtry says the necessity for a secondary operation, often unavoidable in skilled hands, is to a certain extent a reproach to surgery and an annoyance, often an embarrassment, to the surgeon. This class of operations present special and exceptional difficulties, and often, after the best efforts of skilled surgeons, terminate in disaster or failure. With the improvement in operative methods and skill, secondary operations have diminished.

Referring to post-operative ventral hernia the writer says the most common cause is suppuration of the incision. Fifteen years ago ten per cent. of cases of abdominal section were within three years followed by hernia at the site of operation. With more thorough skill disinfection, with improved suture material for buried sutures, with more care of the operator's hands when exposed to septic material, with the use of sterilized rubber gloves by assistants and nurses, with more perfect hemostasis, with diminished insult to the tissues, and with greater care in adjusting sutures, suppuration of the abdominal incision has greatly diminished.

He also mentions the old-time glass drainage tube as a frequent cause of hernia. The substitution of the rubber covered gauze wick (when drainage is used at all) is a decided improvement. The old method of fixation of the pedicle in hysteromyomectomy at the lower angle of the parietal incision with the serre-noend was a common cause of hernia.

In considering secondary suppurating foci, the doctor says they are usually the result of incomplete operations in inflammatory conditions where adhesions divide the suppurative area into multiple pockets; or in suppurating cases wherein the drainage tract becomes obstructed by adhesions. Such complications are common after vaginal operations for suppurative salpingitis and peritonitis, often requiring secondary operation by abdominal section.

Regarding adhesions as a cause of secondary operations the writer says while these conditions were caused in great part by septic processes, there can be no doubt that in a large proportion of cases the injury to the epithelium of the peritoneum from excessive washing and mopping was the cause of adhesions. Nothing has done so much to lessen the frequency and extent of post-operative peritoneal adhesions as the modern

practice of sequestering the general peritoneum by broad layers of gauze, and limiting all traumatism of operation and peritoneal toilet to the immediate pathologic area. Another important means of guarding against the formation of post-operative peritoneal adhesions is the liberal use of normal saline solution. Salt solution has a special application to the peritoneum, and one of the most positive is its power to so attenuate septic material as to enable the peritoneum to dispose of it without injury to its own surface. Foreign bodies, such as sponges, instruments, etc., left in the abdominal cavity and requiring secondary operation for their removal is much less common than formerly.

The essayist says in reference to vaginal section that since it is impossible to deal with the diseased structures by sight, and with appreciation of complications by vaginal incision, many secondary operations were necessitated. Vaginal incision and drainage of tubo-ovarian abscess is a valuable procedure in septic patients, but it is only in a limited proportion that complete cure is effected by this means. Secondary operation by abdominal section is required in the great majority of cases in order to obtain a radical cure. These facts are becoming generally recognized. This class of secondary operations is among the most difficult known to surgery.

In speaking of conservative surgery he says diseased ovaries were punctured, or cauterized, or resected, and left in situ; infected tubes were loosened from adhesions, washed out with antiseptic solutions, and left in the abdomen with the expectation of restoration to normal structure and function. The application of this so-called principle of conservative surgery has necessitated more secondary operations than any other modern surgical innovation.

Dr. McMurtry, in concluding his paper, says that to operate on neurotic patients without demonstrable lesions, is a misapplication of surgery and should not be done even for the so-called moral effect, which at best is rarely more than a temporary impression.

OBSTETRICS AND DISEASES OF CHILDREN.

Under the charge of D. J. EVANS, M.D., Lecturer in Obstetrics, Medical Faculty,
McGill University, Montreal.

THE ULTIMATE RESULTS OF INDUCED LABOR FOR MINOR DEGREES OF PELVIC CONTRACTION.

Richard C. Morris, M. D., in *American Journal of Obstetrics*, Sept. 1904, reviews what might justly be termed the excessive popularity of Cæsarean section in the treatment of pelvic deformity at present. This paper calls attention to the value of the premature induction of labor and is most timely.

The opinion of such a competent observer and operator as Dr. Mor-

ris, the physician in charge of the Preston Retreat at Philadelphia, merits the closest attention.

At the outset, he clearly expresses his opinion of the value of Cæsarean section in cases of pelvic deformity where absolute indication is present, namely, a true conjugate 7.5 c.m. or less in generally contracted pelvis, or 7 c. m. in the flat pelvis. For the lesser degrees of contraction he holds that the induction of premature labor has its legitimate place, and must not be relegated to the obstetric garret in favor of the more brilliant Cæsarean section.

The results of Krönig and Zweifel, in 504 cases of labor in flattened pelvis, observed in the Leipzig Clinic, shows that, with conjugates of between 9.5 and 7 c.m., intervention for contraction alone was required in less than 9 per cent of the cases. In 222 cases of generally contracted pelvis, with conjugates of 10 to 7.5 c.m., assistance was required in but 9 per cent; 8.5 to 7.5 c.m., in 16 per cent; 9.5 to 8.5 c.m., no assistance was required. Thus, in 91 per cent. of these 726 cases, the labors were normal.

He quotes the Retreats record of 2,000 consecutive cases without a Cæsarean section, and with but one craniotomy and that upon a dead infant.

The causes of failure in this operation are the interruption of pregnancy earlier than the degree of contraction demands, leading to loss of the child from excessive prematurity, or at a period too late, necessitating a difficult operative delivery with its attendant evils.

To avoid these errors, the widest experience, painstaking study and a keen mechanical sense are required.

Four factors are to be taken into consideration in these cases. The size of the pelvis can, as a rule be easily determined. The expulsive energy of the uterus can be estimated from the history of the previous labors in multiparæ, but this experience fails us in the case of primiparæ and must be left to the actual test of labor. The determination of the exact duration pregnancy is the most important difficulty presented in these cases. Cessation of menstruation and the date of quickening, or better still, the date of conception, when known, permit of a fairly accurate prediction. The remaining factor, the size of the child's head, presents considerable difficulty in estimating. Instrumental mensuration cannot be depended upon. Pinard's table, founded on the measurements of a large number of fœtal heads showing the biparietal diameters to be 8¼ c. m. of the thirty-sixth week, 9 c. m. of the thirty-eighth, and 9½ c. m. of the fortieth week, is a useful guide, when the duration of pregnancy is certainly known.

In the author's opinion Müller's manual engagement of the head by suprapubic pressure and a study of the relation of the head to the symphysis by vaginal and abdominal examination, is the most reliable method. He gives a table of thirty cases in which he has induced labor for moderate degrees of pelvic deformity. In these he induced labor usually two and not more than four weeks before the estimated full period of pregnancy, depending upon the degree of contraction and the estimated size of the head. When available, the history of previous labors in multiparæ and the record of the infant's size at previous labors were taken into consideration.

The most satisfactory method in the author's experience of inducing labor is as follows: the patient is given a few whiffs of chloroform if nervous, the anterior lip is seized with a double tenaculum and a hollow linen bougie with a stylet, having the curve of a prostatic catheter, is passed into the uterus along the anterior wall. As the bougie is inserted the stylet is gradually withdrawn. The bougie must be inserted at least half way to the fundus. If necessary, the cervix is then slightly dilated and a full sized Vorhees' bag is inserted into the uterus, being folded and caught in an appropriate forceps. This is then dilated and a weight attached to the stem by means of a cord, so as to exert a continuous traction upon it.

By this means he has never failed to obtain sufficient dilatation to permit delivery in from $6\frac{1}{2}$ to 53 hours, the average time being $29\frac{1}{2}$ hours.

He recommends the Tendelenburg-Walcher posture, leaving the case for a reasonable time to test the patient's own expulsive efforts before assistance is rendered.

In the thirty cases tabulated in the paper, there was neither maternal mortality nor morbidity. Twenty-three of the infants are living and well at the present time. Seven infants died, two were still-born and one from craniotomy after version, the occiput rotating backward with the chin and impacted above the pubis. This case was delivered during his absence on vacation by an assistant. The other still-born infant was the result of a prolapsed cord which was pulseless when discovered.

Two infants died from prematurity, the result of too early interruption of the pregnancy. In one of these, a false history of the pregnancy was given with purpose, and in the second a very fat abdominal wall interfered with estimating accurately the size of the child's head.

In concluding his paper the author asks if Cæsarean section could have given better results as regards maternal and fetal mortality and morbidity. Ten per cent primary fetal mortality and seventy-seven per cent of the children living to-day from two to ten years of age is an excellent record.

OPHTHALMOLOGY AND OTOTOLOGY.

Under the charge of G. STERLING RYERSON, M.D., C.M., Professor of Ophthalmology and Otolology, Medical Faculty, University of Toronto.

SHOULD DEAF PEOPLE MARRY?

Dr. H. M. Hatward discusses this question in the *Medical Times*, of New York, Nov. 1904. Some years ago Professor Fay, of Gallaudet College, published an exhaustive work on the subject of the marriage of deaf persons, as his part of the work of the eleventh census of the United States. The term "deaf" in its widest application includes all degrees of imperfection of hearing. Von T. o. t. c. d. cares that every third person, between twenty and fifty years of age, is more or less deaf in one ear. There is reason to believe that slight imperfection of hearing is scarcely less important, in connection with heredity, than total deafness. Fay began his work in 1889, and the inquiry has continued uninterruptedly ever since. A blank form is circulated which is too lengthy to reproduce here. Several thousand have been returned, with the questions more or less completely answered.

The number of marriages of which the results with regard to offspring have been reported, one or both parents at the time of marriage being deaf, is 3,497. Of these 419 were very recent, consequently no offspring could be expected of them. There were therefore 3,078 marriages of more than a year's standing. The total number of children born of these marriages is 6,782. The proportion of sterile marriages was large, 14.1 per cent. Marriages of the deaf are more common in America than in Europe. This is probably due to the fewer restrictions on marriage in America, and the more prosperous general condition of the deaf. The majority of the married deaf have married deaf rather than hearing partners; the proportion in which both parents were deaf being 72, 5 per cent.

The chief cause that leads deaf people to marry each other is the deep feeling of fellowship and sympathy which has its roots in the similarity of condition of all deaf people. Marriages in which both partners were deaf are somewhat less productive than those in which one was a hearing person. Between marriages of the congenitally deaf and those adventitiously deaf there is not much difference in productiveness. Marriages of deaf persons from whatever cause (one or both partners being deaf) are far more liable to result in deaf offspring than ordinary marriages. Contrawise, the marriages of the deaf are liable to produce more hearing than deaf offspring, the proportion of hearing children being 75. per cent. This is in accordance with the law of heredity that a physical anomaly existing in a parent tends to be transmitted to the offspring and, on the other hand, with the law of heredity that the offspring tends to revert to a normal type. It is found that in marriages where both the part-

ners are deaf the proportion of deaf offspring is not increased. In the majority of cases no intensification of the liability to deaf offspring seems to be caused by the union of two deaf persons. Where the pathological condition of the two partners is the same, as is probable in the majority of consanguineous marriages of deaf persons, there is doubtless an intensification of the liability to deaf offspring, but happily such marriages are rare? It may be stated with certainty that congenitally deaf persons, no matter to whom married are far more liable to have deaf offspring than are adventitiously deaf persons. Deaf persons having deaf relatives however they are married, and hearing persons having deaf relatives, and married to deaf partners, and very liable to have deaf offspring. Where neither of the partners, being themselves deaf, have any deaf relatives, the liability to deaf offspring is slight, perhaps not much more than ordinary marriages. The possession of deaf relatives seems to be a trustworthy indication of a liability to deaf offspring.

The marriages of the deaf most liable to result in deaf offspring are those in which the partners are related by consanguinity. The statistics indicate that *it is exceedingly dangerous for a deaf person to marry any blood relative, no matter what the character or degree of the relationship may be, and no matter whether the relative is deaf or hearing, nor whether the deafness of either or both or neither have other deaf relatives.* Consanguineous marriages among the deaf should be prohibited.

THE SURGICAL TREATMENT OF BRIGHT'S DISEASE FROM OPTHALMIC STANDPOINT.

George F. Suker, Chicago, *New York and Philadelphia Medical Journal*, June 4, 1904.

The cases which form the basis for the conclusions arrived at in this paper belong to that variety of Bright's disease which presents certain characteristic lesions of the eye fundus. The writer refers to statistics which show that fully 20 to 30 per cent. of all cases of Bright's disease develop eye lesions during some stage of the disease, and that the tenure of life, under the very best medical care, is about two years after the recognition of this complication. About 75 per cent die during the first year, at least 85 per cent. of the remainder during the second year, scarcely any surviving for three or four years.

Suker has collected all the cases of chronic Bright's disease operated on by decapsulation of the kidney, in which there were definite and distinctive eye changes. He found 17 which belonged to this category. In all these, death resulted earlier than the average time under the best medical and hygienic treatment, the mortality being 100 per cent. These cases prove the utter failure and uselessness of the operation.

LARYNGOLOGY AND RHINOLOGY.

Under the charge of PERRY G. GOLDSMITH, M.D., Belleville, Fellow of the British Laryngological, Rhinological and Otological Society.

THE TREATMENT OF LARYNGRAL TUBERCULOSIS WITH FORMALIN.

Lockard *Laryngoscope*, Oct. 1904, in a paper dealing with the medical treatment of laryngral tuberculosis, points out the general superiority of formalin applied topically to the larynx. He does not think it superior in all cases, but may have to be used with, or followed by lactic acid.

For the following reasons he considers formalin the most satisfactory remedy:—

1. It surpasses all other bactericides in solutions of a strength which can be tolerated.
2. In tubercular ulcers it is fully the equal of, and probably superior to, lactic acid.
3. Its effect upon vegetations is prompt and pronounced.
4. In infiltrated cases it is by far the most satisfactory remedy.
5. It possesses some anæsthetic properties.
6. It is the only remedy of the curative class that can with safety be placed in the patient's hand, thus maintaining a continuous cleansing, germicidal and stimulant action.
7. Its field of usefulness comprises all of the varied types of the disease.

THE ETIOLOGY AND DIAGNOSIS OF OZENA.

Theisen, *Laryngoscope*, October, 1904, in an interesting paper on this question, offers the following conclusions.

1. Sinus disease probably causes ozena in a certain percentage of cases, or at least, it must be considered a strong predisposing cause.
2. Suppurative processes in the accessory sinuses, as shown by Pearce's investigations, are frequently present in certain of the infectious diseases of childhood, particularly scarlet fever, measles and diphtheria, and, for this reason, these infectious diseases must be considered at least possible etiological factors of ozena.
3. That while a certain percentage of cases are caused by sinus disease, this is not sufficient to explain the pathogenesis of the whole clinical picture of ozena.
4. The large number of ozena patients having pulmonary tuberculosis, would certainly point to the nasal condition as a strong predisposing cause for the development of the tuberculosis condition.

NOTES ON NASAL SUPPURATION.

Mackie, *Journal Laryngology*, October 1904, in a very practical paper, dealing with purulent discharge in the nose, discusses these cases along the following points:—

1. The essential cause of suppuration is defective drainage.
2. Defective drainage is mainly due in childhood to adenoids and lymphoid hyperplasias.

3. Later it is the result of hypertrophies and deformities, resulting from lymphoid hyperplasias during the period of active growth and development.

4. Adopting this view of the rational history of nasal suppuration, the whole subject becomes more intelligible and a simpler and more rational treatment becomes possible.

In discussing the treatment, he believes in following the rules of general surgery, where thorough exposure and drainage of the whole diseased area are essential to good results. He believes tinkering surgery in sinus disease does more harm than good. If the physician has not complete confidence in his ability to handle the case completely, he should not begin.

This applies more particularly to the chronic cases, accompanied by marked structural changes. He endeavors to preserve as much tissue in the nose as is possible, even if there should remain a slight discharge. If danger from extending infection threatens, he proceeds to thoroughly remove all diseased tissues. In disease of the posterior ethmoidal cells, he operates boldly on the middle turbinal at the outset, when the middle turbinal remains red and turgid after the application of cocaine and adrenalin, and the patient complains of post-nasal discharge.

He has almost always found a diseased ethmoid. Disease of the sphenoidal sinus is considered the easiest to treat. He considers simple intra-nasal treatment is sufficient for the majority of frontal sinus cases. His experience with antrum suppuration leads him to think that the majority of cases are not due to dental causes, but to obstruction and infective disease in the neighborhood of the natural opening. He emphasizes the fact that the antrum trouble is very often kept up by other sinus disease.

X-RAY THERAPY AND SKIAGRAPHY.

Under the charge of JOHN McMASTER, B.A., M.D., C.M., Toronto.

AMERICAN RÖENTGEN RAY SOCIETY.

The 5th annual meeting of the above society was held in St. Louis, Sep. 9, 10, 12 & 13. Over 150 active x-ray workers, from all parts of the States, are members of the society and attended the meeting. Dr. McMaster, of Toronto, was the only Canadian member present. There were 19 papers presented, five of which formed a Symposium in the action and use of x-rays in tuberculous disease of the chest, joints, peritoneum, testicle, bones and glands. The testimony is becoming universal of the beneficial effects to be derived from this agent in all forms of tubercular disease, be it situated where it may. Statistics, while not always reliable, aid somewhat in forming opinions on the merits of any therapeutic agent. The table which is appended and which was compiled by the president of the society, from data obtained from its working members, shows in unmistakable language that the attention of the whole medical world is challenged to this question. The most skilful observers and workers in x-ray therapy contributed towards this compilation and its authenticity is above suspicion.

Tubercular Disease of	Number of cases treated.	Number cured.	Number improved.	Failures.
Long and flat bones.....	71	26 (33%)	25 (35%)	21 (29%)
Joints.....	141	54 (38%)	53 (37%)	34 (25%)
Tendon sheaths.....	27	19 (70%)	6 (22%)	2 (7½%)
Peritoneum.....	32	13 (40%)	8 (25%)	19 (35%)
Testicle.....	21	7 (33%)	10 (48%)	4 (19%)
Lymphatic glands.....	226	79 (35%)	92 (40%)	55 (25%)

The table refers only to such tubercular diseases as are usually treated by surgical means. The reports of the treatment of a large number of unmixed tubercular infection of the lungs were even more encouraging. Six papers were read on the treatment of the various forms of malignant disease. The character and quality of the radiance required for the different forms of cancer, as well as the details in technique necessary for success, were fully demonstrated. The discussion on this subject was exhaustive and probably the ablest ever heard on this subject at any medical meeting on this Continent. That definite progress has been

made in the treatment of cancer and sarcoma will no longer be doubted. The cases that are curable by x-rays are capable, in most cases, of being clinically diagnosed. From the reports given, it is evident that all cases of sarcoma ought to be rayed, for many of the apparently hopeless cases are curable by x-ray alone. The whole subject of sarcoma was investigated and a large number of cases reported. The technique used in these cases and the character of the x-radiance, determine whether success or failure is to result.

The following members either read papers or took part in the discussions: Leonard, of Philadelphia; Johnston, of Pittsburg; Burdick, of Chicago; Kossabian, of Philadelphia; Smith, of Chicago, Grubec, of Chicago; Scott, Kansas City; Boggs, of Pittsburg; Hulst, Grand Rapids; Hickey, Detroit; and others.

Radiography, with all that pertains to it—apparatus, technique, developers, etc., etc.—came in for a large share of attention. One cannot review this field of work, noting the many advantages conferred upon the profession by the use of x-rays from a diagnostic point of view, without being astonished that more medical men do not avail themselves of its manifold uses. It is perplexing to consider that the medical colleges of this country are taking such meagre steps to acquaint the young of the profession with a knowledge of one of the greatest diagnostic aids, as well as therapeutic agents of this century.

Papers on stethoscopic radiography and the interpretations of radiographs of the chest were given by Kassabian and Hickey. A better understanding of the shadows produced in chest work will result from these papers. Many mistakes have been made in the interpretation of radiographs of the chest and abdomen. The diagnosis of brain tumors and softening was dealt with in a paper by Pfahler, of Philadelphia.

That this society is doing a grand pioneering work along the lines noted above is evident. It is gratifying to know that the members of the society are taking every pains to do their work in a scientific manner, and to establish on a sound basis the diagnostic and therapeutic value of x-radiance.

The following case shows that in all obscure cases of pain in hand or foot, a radiograph should be taken. A lad had been in several hospitals in New York at different times and his complaint was diagnosed rheumatism, or some similar affection by all the physicians under whom he was placed. He was disabled for over two years and had sought relief from many. At last he came under the care of Dr. Carl Beck, who took a radiograph of the offending foot and found a broken needle embedded in the tissues about the ankle joint. Its removal entirely relieved the boy who had no knowledge of how it had got into the foot.

PROVINCE OF QUEBEC NEWS

Conducted by MALCOLM MacKAY, B.A., M.D., Windsor Mills.

PROVINCE OF QUEBEC NEWS.

The first regular meeting for the Session 1904-5, of the Montreal, Medico Chisurgical Society, was held in October, Dr. J. A. Macdonald in the chair. Dr. G. H. Mathewson presented a living case, a child eight months old, with a glioma of the retina of both eyes. An investigation of the literature on the subject showed that the majority of cases of this nature occur in early life. Dr. H. A. Lafleur and B. D. Gilles showed a pathological specimen of encephaloid cancer of the gall bladder. The patient was a man about 61 who had no definite symptoms until August 1904, although he had lost weight for a year past. At this time he began to suffer from vague pains which he attributed to strain. Towards the middle of August the tumour became visible and the patient began to sink rapidly until the second week of October, when he died. The autopsy showed adherent intestine, and the affected gall bladder filled with gall stones, the cystic duct being much dilated. The growth had penetrated into the sac of the gall bladder thus explaining a number of small passages of blood per rectum during life. Notwithstanding the large number of stones found in the gall bladder there had been no jaundice at any time. The literature showed comparatively few cases as compared with cancer of the bile ducts and the liver itself.

Dr. D. J. Evans read a paper on Eclampsia, and pointed out the numerous theories which had been advanced to account for its occurrence. He thought that the females most disposed to this much dreaded complication of child birth were (1) the spare, active, women inclined to constipation and inactive skin. (2) The lymphatic women with poor circulation. The subject naturally divided itself into the pre-eclamptic and the eclamptic stages. In considering the former, little that was novel was brought forward, with the exception of the treatment by thyroid extract. This had been given under the supposition that the trouble was due to a temporary contraction of the exterioles of the kidney and other organs, and some success had been claimed from its use. In the eclamptic state Dr. Evans quoted the findings of the '96 Geneva Council which recommended emptying the uterus if the convulsions were frequent. Some time was taken up with the consideration of the Pozzi dilator, the concensus of opinion being that the instrument in its present form was dangerous and awkward for one man to handle. Decapsulation of the kidney and lumbar puncture were mentioned as

methods which were highly praised by their advocates. Drs. Lúpthon Smith, Reddy and T. P. Shaw took part in the discussion.

Dr. J. A. Hutchison showed a boy eight years old upon whom the Lorenz method for reducing a congenital dislocation of the hip had been performed a year ago, when it was found that the head of the bone was very small and the acetabulum shallow. A very good result was obtained. Hutchison also showed a case of separation of the epiphysis of the femur due to direct violence, in a boy fourteen years old. An open incision was required to replace it, and it was maintained in position by a silver wire. At present, about a year after the accident, there is one inch of shortening, due, as the skiagraph shows, to want of perfect apposition of the epiphysis to the shaft. Dr. Chas. Martin read a most interesting and instructive paper on the value of urinary examination in nephritis, comparing the clinical with the post-mortem findings. The paper was based chiefly upon the cases which have been examined at the Royal Victoria Hospital during the past ten years, the statistics of which were collected by Dr. W. W. Francis. Dr. Martin pointed out the comparative frequency of normal urine findings in cases which showed post-mortem large areas of both kidneys involved by malignant growths. The frequent occurrence of casts without albumen and vice versa was alluded to, and in conclusion he stated that he agreed with Cabot when he said that after all the two most important things in the routine examination of urine were the quantity and the specific gravity. Drs. Hamilton, Armstrong, Shaw, and Lauterman, shared in the discussion. Dr. G. Mathewson reported a case of quinine amaurosis. The patient was confined on March 4th, 1904, and on March 6th developed symptoms of puerperal septicemia. Quinine sulphate was started on March 9th and kept up until March 26th, a total quantity of 150 grs. having been administered. On the fourteenth of March the patient became delirious, on the fifteenth blindness set in, on the sixteenth the temperature was subnormal. By the ophthalmoscope on March 26th the optic disc was seen to be pale, the fundus hazy with almost complete contraction of all the blood vessels. Treatment with nux vomica and amyl nitrite was instituted and by April 9th the patient could count fingers. On April 29th she could walk about the ward, and on May 11th color vision for blue returned, followed by vision for red and green. Evidently this was a case of idiocyncrasy for quinine as many people had taken a far larger quantity of the drug without ill effects.

The District of St. Francis Medical Association held its regular November meeting in Sherbrooke. Dr. Austin in the chair. Dr. Bachand read a concise yet complete paper upon the treatment of diseases of the frontal sinuses. The author stated the various operations and pro-

cedures advocated for the relief of this trouble, and then entered into particulars in regard to the details of the methods employed. He personally found that much could be done for the relief and cure by medical treatment by way of the natural passages, after removal, if necessary, of the superior turbinated bones. The paper which was well received was read in French, although the discussion which followed, lead by Dr. Farwell was conducted in English.

Dr. Farwell presented a case report of a patient who had suffered from mastoid disease. This patient was a child of eight years of age who for a long time had suffered from middle ear disease following scarlet fever, and when it came under the speaker's care the process had extended well into the mastoid region and the petrous portion of the temporal bone. There was also a discharging sinus in the scalp. Operation showed that the bone destruction had gone on to such an extent that eventually a sequestrum almost the size of a walnut had to be removed. This included the whole of the mastoid tubercle and a portion of the petrous bone containing the groove of the lateral sinns and the upper surface, about one inch in length. A skull marked to correspond to the bone removed was shown, and the unique specimen passed around for examination. During the discussion which followed Dr. Bachand showed a number of fine specimens demonstrating the different forms of operations practised in mastoid disease. Several cases of interest were reported by the members. Dr. King mentioned one in which a patient suffering from carcinoma of the pylvis and duodenum had lived for nine weeks upon nutritive enemata alone. Dr. Williams reported a case in with some seven weeks after a laparotomy wound had practically healed, there had developed a frecal fixtula. Dr. Cameron reported another case of paresis and blindness following the taking of wood alcohol. The patient took several drinks and then feeling ill returned home when paresis, more particularly of the lower extremities supervened and this was followed by the gradual onset of blindness. Dr. Bachand who had followed up the case went on to say that all treatment was of little avail, as after a period of very slight improvement the condition relapsed to one of total blindness. The fundus showed at first a choked disk followed by optic neuritis. In the discussion Dr. Austen drew the attention of the Society to Dr. Buller's work on the subject, and it was decided to follow the example of the Montreal Medical Society and petition the Government to put some check upon the supply of this article in its present unprotected form with no warning label. After the admission of four new members the meeting adjourned.

The annual report of the Montreal Health department for last year has been completed and contains many interesting details. The total

mortality for the period of twelve months has been 20.21 per 1000 or 4.56 less than the mean rate for the preceding 18 years. 3.04 per 1000 and 2.37 per 1000 less than in 1901 and 1902 respectively. Tuberculosis caused fewer deaths than in the years immediately preceding. Before 1900 the deaths numbered 692; 1901, 647; in 1902, 644; and in 1903 only 633. Two deaths were caused by smallpox or eight less than in 1902. In this connection the health officer shows that out of 90 cases of smallpox in the city not one person suffered from the disease who had been vaccinated during the past five years, and he stated that the civic officials who were going around the schools vaccinating, were now meeting with no opposition; whereas two years ago over a thousand scholars refused to attend school because they had to submit to vaccination. The following interesting table was appended to the report:

Vaccinated since five years	90
Vaccinated some years ago.....	0
Unvaccinated.....	13
	77
	<hr/>
	90

Measles caused 77 deaths or 7 less than last year; 24 by scarlatina or 40 less than in 1902, 21 less than 1901 and 108 less than 1900. Diphtheria and diarrhoea cannot be compared with previous years on account of their having been classified according to the new international system. Typhoid fever caused a mortality of 90, or 4 more than in 1902 and 40 less than in 1901, and 30 less than in 1900. Bronchitis 224 deaths, or 6 more than in 1902; pneumonia 528 or 16 less than in 1902.

The total birth rate for 1903 was 36.08 per 1000. French Canadians 43.64 per 1000; other Catholics 30.69, and Protestants 20.52; that is .43 per 1000 higher than in 1902 and 3.54 higher than in 1901.

The marriage rate was 10.16 per 1000 or an increase of .94 over the rate in 1902 and 2.01 over that for 1901.

The Hotel Dieu has recently been presented with a new ambulance of the most modern type, fitted with every contrivance which the most expert makers have considered useful in connection with such a vehicle. It is the gift of a number of citizens of all races and creeds, who have subscribed generously to the appeal of Mrs. J. G. H. Bergeron, and is considered by many who have seen it as being the finest hospital ambulance in America.

Dr. Geo. Armstrong who has been ill for several weeks past has again been able to resume his duties at the General Hospital.

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EDITORIAL

CHANGE OF OPINION REGARDING CONSUMPTION.

Tempora mutantur et nos in illis mutamur is truer perhaps with regard to the changed opinions on consumption than on any other disease. As far back as the memory of any medical gentleman living can go, there have not been wanting those who have been vaunting the virtues of some remedy for the disease. But it remains as true to-day as it was many years ago, when a very eminent physician wrote that "no medicinal remedy has, as yet, been found which can be regarded as a specific for tuberculosis."

The pioneer in the matter of applying common sense to the management of consumption was undoubtedly Dr. George Bodington, of Sutton Coldfield, in England. In 1840, he published his treatise on pulmonary tuberculosis, and the natural, rational and successful methods of curing the disease. He advocated a generous diet, and abundance of fresh air, holding that the weather was never too cold for such patients, and that their rooms should be kept well aired, so that they would resemble the air outside. But both he and his book met with the most vehement opposition, and he was forced to close his sanatorium, the first of its kind in the world.

Dr. Henry MacCormac published a similar book in 1855, and with the effect of drawing down upon himself a violent storm of abuse. He read a paper in 1861, on the preventibility of consumption, before the Royal Medical Society. The society refused to accord him the usual vote of thanks, regarding the paper as the effort of a deranged intellect.

Veritas magna est et prevalebit. The great Dr. Hughes Bennett, with all his brilliancy of language and force of character, espoused these despised views. "The diet must be of a nutritious kind, good ventilation is essential, and proper exercise promotes the appetite" are his words towards the more modern views now prevailing everywhere.

Dr. P. W. Latham, in 1864, urged "a generous diet, continuous ventilation, and regular exercise in the open air." Bennett and Latham were not hooted at so boldly as had been the case with Bodington and MacCormac, though there were not lacking those who sneered to scorn their teachings.

Felix Von Niemazer, whose work on phthisis will ever stand as a monument to clinical study, held, in 1871, that "a patient should be placed under conditions to invigorate the body, diet and fresh air are of the utmost importance, and the great value of climate is that the patient may spend much of his time out of doors."

Villemin, by a series of beautiful experiments proved, in 1865, that tuberculosis is a communicable disease. Others corroborated his findings. In 1882, Robert Koch made the announcement that he had discovered the germ of the disease. Here was the final proof of what had been held to be the fact, both on clinical and experimental grounds. Now the entire medical profession ranges itself on the side of these views.

Not many months ago, Dr. Latham gave an address before the Hunterian Society in which he sums up the treatment thus: (1) a continuous supply of fresh air with no unnatural changes of temperature and avoidance of dust, (2) good nourishing food in proper quantity (3) absolutely regular life, and (4) graduated exercise without strain.

Veritas nihil veretur nisi abscondi. Under the above method of treatment, 30 per cent., of the cases are being cured, and practically all are being benefited. Let the people of this country wake up, and dot the land here and there with suitable sanatoria for the treatment and isolation of tuberculosis.

Steadily, but surely, we are getting at the truth.

MEDICAL EDUCATION IN JAPAN.

Japan has been very much before the world's gaze of late. We learn from the *St. Louis Medical Review* that Professor Kakichi Mitsakuri, of the Imperial University of Japan, gave an address in St. Louis a short time ago on the Medical Education of Japan. He mentioned that in 1771 a Japanese physician got hold of a Dutch text book on anatomy and, along with some friends, set to work to make a translation. It took them many years to make out their translation of the book, which they rewrote eleven times. This was the first introduction of western medicine into the country. Chemistry, military tactics, natural history, etc., followed.

In 1868, The Imperial University was established. It has a four years' course, admitting one hundred students to each course.

The students who study medicine must take German, as this is the medical language of Japan. The professors in medicine are now all Japanese, who speak German, except two honorary professors.

The course of study is based on the model of the American Universi-

ties. At the end of the second year, the student passes an examination on anatomy, physiology, chemistry, pharmacology, general pathology, etc., and at the end of the fourth year, and examination on medicine, etc.

Attached to the University is a hospital having about four hundred beds. Hundreds of patients go to the hospital daily, so that the students have an excellent opportunity for bedside instruction.

After the student receives his degree at the end of four years he may practice without further examinations. Many, however, stay on at the University three years longer, or go to Germany.

Of late years a number of medical schools have been established to which the students go directly from the Japanese high schools. In these Medical Schools the Japanese language is used. The course of study is full and these schools turn out a very good class of physician. The graduates of these schools may practice without passing a state examination.

There is a third class of medical students who go through an irregular course. These obtain a license by passing state examinations, the first being on the primary subjects and the second on the final branches.

These various forms of schools and licensing bodies have not yet been able to supply the demand for physicians throughout the country, but in course of time the supply will be adequate.

THE ADVANCES IN MEDICINE AND SURGERY.

A short time ago at Leeds, Dr. A. W. Mayo Robson, delivered an address on the above topic. He passed under review some of the achievements that have been made in the healing art, and pointed to the great possibilities for the future. Some of the statements contained in the address are worthy of notice.

The question was raised what some of the great surgeons of the past would think if they visited a modern operating room. They would be astonished to see the patient sleeping quietly, and the most perfect system of cleanliness and asepsis in practical use. Anæsthesia is one of the greatest boons conferred on humanity, and the nineteenth century would have been a prominent one in the history of medicine if it had nothing else to record. The statement was made that it is almost as important to select a good anæsthetist as a good surgeon. The returned surgeon would be attracted by the care and attention to detail. The boiling of instruments, the sterilization under high pressure steam, and the cleansing of the hands, would all be new to him. But this astonishment would be greatly increased by visiting the wards a few days later to find the wounds all healed and the patients doing well with normal tem-

peratures. The lecturer mentioned that, in 1884, when he was appointed to the surgical staff, his predecessor left to him a blood stained coat that had been in use for years. This was at once discarded for washable goods.

To show how great the progress has been, the statistics of the Leed's Infirmary were referred to. In 1870 there were 469 operations with a death rate of 6.6 per cent. while in 1901 there were 4385 operations and a death rate of 2.7 per cent., although the magnitude of the operations performed had been in many cases infinitely greater.

The last report of the Leed's Infirmary gives the following operations, not one of which appears in the report for 1870. The radical operation for hernia, 109; osteomies, 38 cases; removal of the vermiform appendix, 78 times; operations on the gall-bladder, 38; prostectomy, a number of times; several operations on intestines, as removal of a gangrenous portion; operations on the stomach, 94 cases. This is surely no mean advance for 30 years, and much of it in less than 30 years. With regard to the removal of the appendix, it was unknown 25 years ago; and prostectomy for the relief of urinary obstruction is an operation that was not heard of prior to 1885.

But surgery has made great progress in the direction of repair, as well as in the removal of diseased parts. Where a bone has been lost in the arm or leg, a new one can be engrafted and built up. Nerves that have been divided can be rejoined; and a portion of healthy nerve can be transplanted to make good a deficiency. This operation of inserting a portion of healthy nerve was first performed by a Leed's surgeon in 1889, and the motion and sensation restored to a hand that had been paralyzed. But physicians have not been idle, and the work of Hitzig, Ferrier, Horsley, Jackson, Gowers bear splendid fruit in a knowledge of the nervous system which enables us to locate disease, and operate with success.

In the report for 1870, no mention is made of any operation on the lungs or the chest. But now a portion of diseased lung can be removed, and the surgical treatment of an abscess in the chest is looked upon as an ordinary affair. In the "Seventies," Dr. Allbutt and Dr. Wheelhouse, in the Leed's Infirmary, removed fluid from the pericardial sac. But the heart itself has been attacked surgically. Within the last ten years, 38 cases of stab and bullet wounds have been sutured, with 13 cures. Hospital gangrene, pyæmia, erysipelas, septicæmia, and other forms of blood poisoning, secondary hemorrhage, and such like surgical misfortunes, have practically disappeared. It was not uncommon to meet with tetanus after operations 30 years ago, but now it is almost never seen in such a connection. Wise legislation has practically abolished hydrophobia.

In the report of the Leed's Infirmary for 1870, no case of abdominal section was mentioned; whereas in 1901, no less than 569 patients had abdominal sections performed for diseases of every organ in the cavity. In 1875, ovariectomy was performed on 12 patients, of whom 5 died. In 1901 there were 64 ovariectomies, with only 4 deaths, and some of these were malignant, gangrenous, or suppurating cases. It is only necessary to mention the advances during the past 20 years in the knowledge we possess regarding malaria, yellow fever, the serum treatment of diphtheria, tetanus, typhoid fever, and septicæmia. Those achievements must be regarded as triumphs.

But in the matter of preventive medicine, great strides have been made. In 1854 the average life of males was 39.91, and in 1890 it had increased to 43.66. The average life of women has been lengthened by 5 or 6 years. It is impossible for people living now to realize how much vaccination has accomplished. In the German Empire, during the year 1899, not a single death occurred from small-pox in any large city; and only 28 deaths in the entire population of 54,000,000. These deaths took place along the frontier towns. This excellent showing is due to the strict enforcement of vaccination and revaccination in Germany. With regard to consumption, in 1850, there were 3,250 deaths in every 1,000,000. To-day there are only 1,200 deaths in the same number.

In closing, Dr. Robson referred to the progress that is being made in the treatment of lupus and rodent ulcer by the x-rays; and to the active manner in which the etiology and treatment of cancer were being prosecuted at the present moment. As yet, however, the sheet anchor in cancer is early removal by good surgical methods.

CONSUMPTION SANITARIUM.

Representatives of several counties of Western Ontario, including Waterloo, Wellington, Perth, Oxford and Brant, met in Galt November 15th to discuss the question of erecting a sanitarium for consumptives, to be controlled by the counties and cities interested. A resolution was adopted favoring the scheme, and it will be presented to the several Council boards in December next. In discussing the matter it was pointed out that the present sanitarium at Gravenhurst would not take incurable patients, and it was felt that an institution, where those who were not in a position to have proper medical treatment could be taken care of, was a crying necessity.

WILSON'S INVALIDS' PORT.

This is a good wine, and is very carefully medicated with pure and reliable extracts. It contains extract of kola nut, antiseptic salts, aromatics, and iron. It is a valuable tonic in general debility and anæmia. It has been employed in such conditions as anæmia, grip, fevers, malaria, dyspepsia, neurasthenia, insomnia, heat affections, general debility, neuralgia, loss of appetite, etc. We can recommend this wine to those requiring to prescribe a medicated wine.

PERSONAL AND NEWS ITEMS.

Dr. Edgar, of Hamilton, has removed to 16 South Bay street.

Dr. Brandon, who arrived in North Bay lately, has opened an office.

Dr. Balfe, of Hamilton, has removed to 225 North James street, the former residence of Dr. Woolverton.

Dr. Leonard W. Jones closed his office at Athens and has moved to Portland, where he will practice his profession.

Dr. Harris Popplewell, of Brantford, was married in the last week of October to Miss Jennie Fairchild, of Monmouth.

Dr. Ward Woolner, formerly of Collingwood, spent a few days at his home in Parkdale, prior to leaving for Ayr, where he will settle.

L. G. Stewart, M.B., 266 Sherbourne street, sailed in the end of October for Glasgow. He is taking a post-graduate course in Edinburgh and London.

The engagement is announced of Miss Etta Sparks, daughter of Dr. R. E. Sparks, Kingston, to Dr. Charles P. Johns, formerly of Kingston, now of Winnipeg.

A fashionable wedding took place in Brantford recently when Miss Anna Wisner, daughter of Mr. W. S. Wisner, was united in marriage to Dr. Courtland Fissette, of that city.

At the home of Mr. and Mrs. Benjamin Rothwell, Listowell, on 18th October, the marriage was celebrated of their daughter, Miss Nellie, to Dr. Major Henry Langs, of Hamilton.

Dr. J. Watson, who has practised medicine for the past twelve years in Unionville, Ont., has removed to 329 College street, Toronto, where he will resume his professional work.

At the residence of Mr. and Mrs. J. B. McNeill, Berwick Hall, Jarvis street, on 5th November, Dr. Millage Philips, of Chatham and Miss Mary McNicoll, Toronto, were married.

Miss Edith M. Spring, the well-known violinist, daughter of Robert Spring, postmaster at Parry Sound, was married at Parry Sound on October 26 to Dr. W. A. Maclean, of St. Catharines.

Dr. G. E. Marshall, graduate of the College of Physicians and Surgeons, who has just graduated, has opened an office for the practice of his profession at No. 280 Hunter street, Peterborough.

Dr. W. C. Barber has been appointed assistant superintendent of the Kingston Insane Asylum, and Dr. W. T. Wilson has been transferred from the staff of the Hamilton Asylum to the London Asylum.

A pretty wedding took place in Maxwell at the Congregational church, when Miss Mary Isabella McDougald, third daughter of John A. McDougald was married to James P. Hope, M.D., of Alexandria.

The Hospital at Parry Sound was destroyed by fire on 13th November. The fire began at noon, but its cause is unknown. The patients were all removed safely, though with much difficulty. The building was well insured.

Dr. M. L. Dixon, of Frankville, left on 27th October, on an extended trip to Boston, Baltimore and New York where he will visit the leading hospitals. He was accompanied by Dr. Connerty, of Smith's Falls.

Dr. T. W. Griffin has sold his medical practice at Debec to Dr. George O'Donnell. Dr. Griffin will take a post graduate course at Johns Hopkins University, Baltimore, after which he will practice in Woodstock.

Dr. G. F. Emery has left Gananoque for Ottawa to locate permanently in practice as a specialist. On Friday night he was tendered a farewell banquet by citizens and presented with a handsome parlor cabinet and a gold-headed cane.

Dr. J. Halpenny has severed his connection with the Winnipeg general hospital and Dr. A. M. Campbell, recently appointed by the board, takes over the position of medical superintendent, with its duties and responsibilities. Dr. Halpenny has been in the hospital continuously since May, 1900, for a short time as house surgeon, and for nearly four years as medical superintendent.

Dr. W. H. B. Aikins, of Toronto, had a pleasant visit to Cincinnati, where he attended the meeting of the Mississippi Valley Medical Association, and joined in a reunion of a number of medical friends from

different portions of the United States who visited Italy together in 1883, after spending the winter session at the General Hospital in Vienna.

The annual meeting of the Ottawa Medical society was held at the rooms of the Literary and Scientific Society. These officers were elected for the year:—President, Dr. W. I. Bradley; first vice-president, Dr. L. C. Prevost; second vice-president, Dr. J. F. Dowling; secretary, Dr. R. Law; treasurer, Dr. H. S. Kirby; librarian, Dr. R. L. Gardiner; curator, Dr. F. W. McKinnon; executive council, Drs. Powell, Cousens, Grant and Chabot. Reports were read covering the work of the year. There is a cash balance in the bank of about \$75 or \$100. The council will meet soon to outline the work for the year.

BOOK REVIEWS.

DR. VINCENT'S INFANT NUTRITION.

The Nutrition of the Infant, By Ralph Vincent. M.D., Member of the Royal College of Physicians of London, Physician to the Infants' Hospital. Late Senior Resident Medical Officer, Queen Charlotte's Lying-in Hospital, London; Bailliere, Tindall and Cox; Toronto: J. H. Carveth & Co., and Messrs. Chandler and Massey.

The author has given a very reliable and trustworthy exposition of our knowledge of the important subject of infant nutrition. The book contains much useful information on the natural and artificial feeding of infants and the bacteriology of milk. He then takes up the normal growth of the child and such conditions and diseases as inanition, malnutrition, rachitis, scorbutus and the mortality among infants. The book contains excellent instructions regarding the preparation of artificial food. Upon the whole we can recommend this book to all who wish a useful work on the subject of infant feeding.

THE MEDICAL NEWS VISITING LIST.

It is issued in four styles to meet the requirements of every practitioner. The Weekly, Monthly and 30-Patient Perpetual contain 32 pages of data and 160 pages of classified blanks. The 60-Patient Perpetual consists of 256 pages of blanks alone. Each in one wallet-shaped book, bound in flexible leather, with flap and pocket, pencil and rubber, and calendar for two years, \$1.25. Thumb-letter index, 25 cents extra. **By mail, postpaid, to any address.**

The text portion of *THE MEDICAL NEWS VISITING LIST* for 1905 has been thoroughly revised and brought up to date. It contains among other valuable things, a scheme of dentition; tables of weights and measures and comparative scales; instructions for examining the urine; table of eruptive fevers; incompatibles, poisons and antidotes; directions for effecting artificial respiration; extensive table of doses; an alphabetical table of diseases and their remedies, and directions for ligation of arteries. The record portion contains ruled blanks of various kinds, adapted for noting all details of practice and professional business.

BLAKISTON'S PHYSICIANS VISITING LIST.

The edition for 1905 is now issued. An examination of this year's visiting list shows that it is in every way complete. It is now in its fifty-fourth year of publication and is well known to every physician. The edition for this year contains a good deal of useful information on doses, emergencies, incompatibles, etc., etc. It is issued in several forms as the regular, perpetual and monthly editions. The regular edition for 25 patients per day is sold at \$1.00 and is bound in limp leather with flap and pocket. The paper and every feature of the book are excellent. Philadelphia: P. Blakiston's Sons and Company. Toronto: Chandler and Massey.

THE DOCTOR'S RED LAMP.

A Book of Short Stories concerning the Doctor's daily life. Selected by Charles Wells Moulton. The Saalfeld Publishing Company, Chicago, New York, and Akron, O. Messrs. Chandler and Massey, Toronto, 1904. Price, \$2.50.

This is the second volume of the Doctor's Recreation Series. The present volume contains among many other stories the following: *The Surgeon's Miracle* by Joseph Kirkland, *The Doctor's of Hoyland*, by Conan Doyle, *Doctor Santos*, by Gustave Morales, *The Curing of Kate Negley*, by Lucy S. Furman, a *Doctor's Story* by E. M. Davy, *John Bartine's Watch*, by Ambrose Bicree, *Two Wills*, *Ian Maclaren's Doctor of the old School*, etc., etc. The mechanical make-up of the book is certainly very fine. Scattered throughout it there are a number of very fine plates. The paper, type and binding are such as would please the most fastidious. The stories are all particularly appropriate in a volume intended for the doctor's recreation reading. These stories throw much side light upon the work of the doctor in different countries and under very varied conditions. In addition to furnish the reader much pleasure, they also yield much profit and valuable information. We would expect this series shall enjoy a large sale.

INTERNATIONAL CLINICS.

A quarterly of Illustrated Clinical Lectures and especially prepared Original Articles on Treatment, Medicine, Surgery, Neurology, Pediatrics, Obstetrics, Gynaecology, Orthopedics, Pathology, Dermatology, Ophthalmology, Otolaryngology, Rhinology, Laryngology, Hygiene, and other topics of interest to students and practitioners. Edited by A. O. J. Kelly, M. A., M. D., Philadelphia; J. B. Lippincott Company, Vol. III., fourteenth series, 1904. Price, \$2.00.

The present volume is of special interest as it contains a very full and valuable symposium on syphilis of twelve articles. These articles are of more than passing interest. They take up every phase of a disease whose manifestations are legion. The treatment is particularly well covered by them. The other sections of this quarterly issue are Treatment, Medicine, Surgery, Gynaecology and Neurology. There are a number of very fine plates in connection with the articles, on syphilis being particularly helpful. We congratulate the Editor on his splendid collection of papers and the publishers on the handsome make-up of the book.

 A TEXT-BOOK OF THE DISEASES OF WOMEN.

By Charles B. Penrose, M.D., Ph. D., formerly Professor of Gynecology in the University of Pennsylvania. Fifth edition, thoroughly revised. Octavo volume of 539 pages, with 221 fine illustrations. Philadelphia, New York, London: W. B. Saunders & Co.; Canadian Agents, J. A. Carveth & Co., Limited, 434 Yonge St., Toronto, 1904. Cloth, \$3.75, net.

With astonishing regularity a new edition of this excellent text-book is called for, and it appears to be in as great favor with physicians as with students. Indeed, this book has taken its place as the ideal work for the general practitioner. The author presents the best teaching of modern gynecology, untrammled by antiquated ideas and methods. In most instances only one plan of treatment is described.

The new edition has been carefully revised, much new matter has been added, and a number of new original illustrations have been introduced. In its revised form this volume continues to be an admirable exposition of modern gynecology.

 A HAND-BOOK OF SURGERY.

For Students and Practitioners. By Frederick R. Griffith, M.D., Surgeon to the Bellevue Dispensary, New York City; Assistant Surgeon at the New York Polyclinic School and Hospital. 12mo volume of 579 pages, containing 417 illustrations. Philadelphia, New York, London: W. B. Saunders & Co.; Canadian Agents, J. A. Carveth & Co., Limited, 434 Yonge St., Toronto, 1904. Flexible leather, \$2.00, net.

Dr. Griffith has given us a little work of great merit. It is a brief outline of the principles and practice of surgery, written as concisely as is

possible with clearness. We are sure it will be valuable alike to the student and the practitioner, because the entire subject of surgery is covered, including all the specialties, as Diseases of the Eye, Ear, Nose and Throat; Genito-Urinary Diseases; Diseases of Women, etc. There are also articles on Life Insurance, Rape, Sexual Perversions, Microscopy, and on many other subjects of great importance to the practising surgeon. There are 417 illustrations, selected for their clearness, accuracy, and general usefulness. We predict that Dr. Griffith's work will be to Surgery what Dr. Stevens' manual is to Medicine.

A TEXT-BOOK OF MATERIA MEDICA.

Including Laboratory Exercises in the Histologic and Chemic Examinations of Drugs. For Pharmaceutic and Medical Schools, and for Home Study. By Robert A. Hatcher, Ph. G., M.D., Instructor in Pharmacology in Cornell University, Medical School of New York City; and Thorald Sollmann, M.D., Assistant Professor in Pharmacology and Materia Medica in the Medical Department of the Western Reserve University of Cleveland. 12mo volume of about 400 pages, illustrated. Philadelphia, New York, London: W. B. Saunders & Co.; Canadian Agents: J. A. Carveth & Co., Limited, 434 Yonge St., Toronto, 1904. Flexible leather, \$2.00, net.

Students of medicine, as well as pharmacy students, will undoubtedly welcome this work. The authors are teachers of much experience and in this forelying book present a work on the subject of Materia Medica in an entirely new way, teaching by actual experimental demonstration. Part I. comprises a guide to the study of crude drugs, both official and unofficial; while in Parts II. and III. the histologic and chemic examinations of drugs are considered in a scientific, yet clear and simple manner. All the histologic descriptions are supplemented by laboratory exercises of important drugs, so that the student becomes insensibly acquainted with their construction. Throughout the entire work general stress is laid on the recognition of adulterations. We can strongly recommend this work as reliable, practical, and excellent in every way.

DAVIS' OBSTETRICS.

New (2d) Edition. A Treatise on Obstetrics. For Students and Practitioners. By Edward P. Davis, A.M., M.D., Professor of Obstetrics in Jefferson Medical College; Professor of Obstetrics and Pediatrics in the Philadelphia Polyclinic, etc. New (2d) edition, thoroughly revised and much enlarged. Octavo, 800 pages, with 274 engravings and 39 full-page plates in colors and monochrome. Cloth, \$5.00, net; leather, \$6.00, net. Philadelphia: Lea Brothers & Co.

From a practical standpoint this work is all that could be desired. Dr. Davis has furnished a thoroughly scientific and brilliant treatise on

Obstetrics. His method is original and comprehensive, and the scope of the work includes cognate subjects of great importance which are not met with in other books on the subject.

In preparing this new edition Professor Davis has subjected it to a complete rewriting throughout, resulting in an enlargement of about two hundred and fifty pages. Together with the established principles and practice of Obstetrics he has incorporated the latest additions to our knowledge of the subject, which promise to be of permanent value. In its new form it accordingly represents the science and art of Obstetrics to the date of issue. The work has always been notable for the abundance and instructiveness of its illustrations. The series has been revised equally with the text, and any engravings or plates susceptible of improvement have been replaced.

THE PHYSICIAN'S POCKET ACCOUNT BOOK.

By Dr. J. J. Taylor, is a neat, compact, easily kept and strictly legal book, carried in the pocket, always with you, showing each person's account at a glance. All entries are made but once, on the day when the services are rendered, in plain, legal language, and require no posting or further attention. Published by the Author, 4105 Walnut Street, Philadelphia.

By always being able to show all inquirers the exact state of their accounts wherever you may meet them, showing date and nature of each transaction, you will save more than enough in one year to buy account books for a hundred years. Being simple and complete, it will save you much valuable time in keeping your accounts and much needless worry as to their correctness.

The book contains Obstetric, Vaccination, and Death Records and Cash Accounts. The book is $4\frac{1}{4} \times 6\frac{3}{4}$ inches, containing over 224 pages. Prices. Bound in Leather, \$1.00. Also bound in manilla boards with separate leather case. Price of case and two manilla books, \$2.00. Subsequent manilla books to use in the case, 60 cents each; two for \$1.00; three for \$1.40. Also large size for desk or office use, \$4.00. Address Dr. J. J. Taylor, Author and Publisher, 4105 Walnut St., Philadelphia, Pa.

MISCELLANEOUS.

VISITING AND POCKET REFERENCE BOOK FOR 1905.

The following is a comprehensive contents: Table of Signs and how to keep Visiting Accounts, Obstetrical Memoranda, Clinical Emergencies,

Poisons and Antidotes, Dose Table, Blank leaves for Weekly Visiting List, Memorandum, Nurses Addresses, Clinical, Obstetrical, Birth, Death and Vaccination Records, Bills Rendered, Cash Received, Articles Loaned, Money Loaned, Miscellaneous, Calendar 1905 126 pages, Lapel Binding, Red Edges. This very complete Call Book will be furnished by the Dios Chemical Co. of St. Louis, Mo., on receipt of 10 cents for postage.

AWARDS AT THE ST. LOUIS EXHIBITION TO MESSRS. BURROUGHS, WELLCOME & CO.

Gratifying evidence of the recognition extended to British commercial enterprise is furnished by the honours awarded by the Committee of the St. Louis Exhibition to Messrs. Burroughs, Wellcome & Co's., Exhibit of "Wellcome" Brand Chemicals, "Tabloid" and other pharmaceutical products, and "Tabloid" Medical Equipments. Three grand prizes and three gold medals have been conferred for the scientific excellence of these products.

The Committee on Awards of the Louisiana Purchase Exposition, St. Louis, have conferred upon the Wellcome Chemical Research Laboratories the distinction of a grand prize and three gold medals, in recognition of the importance and educational value of the chemical and pharmacognostical researches conducted in these laboratories under the direction of Dr. Frederick B. Power.

W. R. WARNER & CO'S., PREPARATIONS. GRAND PRIZE.

Highest award of the Louisiana Purchase Exposition, (St. Louis), was awarded to Wm. R. Warner & Co., for Pharmaceutical Preparations over all competition.

JAEGER PURE WOOL.

Many supposed chronic disorders of the respiratory organs, of the stomach & digestive organs, & of the bowels; rheumatic complaints, lumbago, & other diseases attributed to chill; excessive corpulence, etc., may be remedied, alleviated, & above all, *prevented*, by treating the body as the highly sensitive, warm-blooded organism which it is, provided with a complex apparatus of pores & blood-vessels, whose functions are of vital importance. Hitherto the general tendency has been to treat the body as though it were an inanimate dummy on which anything, however hygienically unsuitable, might be hung, at the dictate of fashion or habit.

The JAEGER Clothing being pervious throughout, because made *wholly of porous Wool*, keeps the tissues constantly drained of the superfluous fat & water, which, under unsanitary covering, are responsible for many of the disorders enumerated above. Under the JAEGER covering the flesh becomes literally *hardened*, acquiring greater specific weight, & the body is far better fitted to resist the attacks of epidemic & other disease, as disease germs find a much more favorable soil in which to multiply when the tissues are spongy & watery.

It is quite a mistake to suppose that the JAEGER Clothing & Bedding are enervating, or more fitted for invalids than for healthy people. The strongest man may succumb in a few days to congestion of the lungs, bronchitis, rheumatic fever, etc., brought on through his unsanitary clothing, or through sleeping in damp linen sheets.

That pervious All Wool Clothing & Bedding protect the body from chill is intelligible to everyone, but it is a common error to suppose that such Clothing & Bedding are "hot in summer." Heat is felt to be oppressive when the natural action of the pores is hampered, and the perspiration cannot escape. If the covering is *impervious*, there is a strong desire to throw everything off from the stifled skin; but the wearer of porous, woollen covering, through which the skin can *breathe*, is no more oppressed by it than is a cricketer by his flannels, which every athlete knows to be the coolest, safest, most comfortable wear for hot weather.

THE BERNIER EXPEDITION.

The daily journals have not given many particulars of the Dominion Government expedition which left Quebec sometime ago to make a complete survey of the northern coast of Canada. This expedition, which sailed in the S. S. Arctic, will also establish a series of police posts on Hudson Straits and elsewhere, and for this purpose a large and ample supply of food was taken. Among other things, the Government have purchased a large quantity of Lacto-Globulin, having decided that this food will be of decided benefit on sledge journeys, and as a special diet in sickness, and to give a salutary variety where so much preserved and sterilized food must of necessity be eaten.

There seems little doubt that Nansen had been furnished with a highly nourishing and readily carried food of this nature he would have reached the North Pole when he made his famous last dash, and Captain Bernier has recognized this fact by taking a considerable quantity of the most nourishing and easily assimilated food known.

It is a matter of some congratulation that this food should be a Canadian discovery and made in Canada.