

Dominion Medical Monthly

And Ontario Medical Journal

Vol. XL.

TORONTO, MAY, 1913.

No. 5

Original Articles

TREATMENT OF DIFFUSE SEPTIC PERITONITIS*

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(Continued from April issue.)

The elevated position of the head and trunk, known as the Fowler position, has now been generally adopted, and a study of the statistics shows that it has greatly reduced the mortality of peritonitis. It considerably facilitates drainage, the fluid tending to fall into the pelvis, the serosa of which absorbs less than that of the subdiaphragmatic region, and it also facilitates respiration. The patient is usually placed in the Fowler position immediately after operation, but many surgeons now recommend that when moving patients suffering from any acute abdominal condition to the hospital they should be placed in the ambulance in a semi-sitting position, should remain in this position until the operation is performed, and of course after the operation until all danger is past.

Mr. H. J. Paterson³² says that in his opinion the Fowler position tends to prevent subdiaphragmatic abscess, whilst Dr. Gerster³³ states that since its adoption at the Mount Sinai Hospital, in 1905, subphrenic abscess has been much more common. In my experience the Fowler position has reduced the tendency to subdiaphragmatic abscess, having only had two cases since its adoption, as against four cases in the same length of time previous to this.

Whilst Dr. Bevan⁶ recognizes the advantages of the Fowler position, he points out that it is advisable not to use it in an unduly exaggerated form. His own practice is to allow the patient to lie flat in bed, whilst the head of the bed is elevated from eighteen to

*Read before the Academy of Medicine, Toronto, Jan. 7th, 1913.

twenty inches by two chairs. In order to prevent the patient from sliding down in bed, a bolster is placed below the buttocks, and fixed to the head of the bed by strips of roller bandage.

In order to facilitate the maintenance of the Fowler position, I have, during the last two or three years, been using a Gatch bed, which I have found of the greatest possible value. It not only ensures the patients' being kept in the Fowler position, but they find it so comfortable that after it has been decided that they need no longer be kept in this position they frequently ask to be allowed to remain on the Gatch bed, as they find it very much more comfortable than the prone position, and infinitely more comfortable than sitting up with a back rest and the bolster, as referred to above.

Walther, of Paris, has recommended lateral decubitus as a substitute for the Fowler position, but in my opinion without good reason.

The chief object of Murphy's method of proctolysis is the prevention of peritoneal resorption. The fluid absorbed by the rectum increases diuresis, assuages thirst, and improves the pulse and general condition. Murphy uses a solution of 7 grains each of chloride of sodium and chloride of calcium to 1,000 of water, at a temperature of about 38 degrees C., and finds that nine to ten litres, entering the rectum in twenty-four hours, can be tolerated without inconvenience to the patient. This method of treatment, together with the Fowler position, are the chief factors in the tremendous improvement in the results obtained in the treatment of diffuse peritonitis.

One of the characteristics of saline solution is its tendency to produce hyperemia, and in this connection it should be remembered that Bier teaches that hyperemia exerts a highly antibacterial influence. Noetzel has also demonstrated that intense hyperemia, with abundant secretion of leucocytes, may be produced by warm saline solution.

In cardiac collapse, the intravenous infusion of normal saline containing a few drops of adrenalin, as recommended by Heidenhain²⁸, may be useful, and the same may be said of subcutaneous injections of camphorated oil, ether, caffeine or strychnine.

Halpenny and Gorell³⁴ suggest the possibility that the beneficial effects of saline per rectum may be due to the very marked dilution of the toxins, which facilitates their neutralization, and thus increases resistance to the toxemia.

Koch³⁵ states that in his experience appendicostomy has been much more beneficial in the treatment of peritonitis than continu-

ous proctolysis; but the latter is so much simpler and the results so good that I very much prefer it.

If there is persistent tachycardia, digitalis in small doses, or the application of ice on the heart, may be useful. Turpentine stupes sometimes give relief in cases in which there is marked abdominal distension. Some surgeons are in the habit of giving pituitary extract after operation, and claim that it increases intra-abdominal pressure and stimulates intestinal peristalsis.

Opiates are contra-indicated, as they may increase the already existing toxemia, and prevent peristalsis and leucocytosis.

Vomiting.—If vomiting is troublesome, lavage of the stomach may be practised, but unfortunately the procedure is sometimes painful, and has to be frequently repeated. Dr. Gerster³³ states that at the Mount Sinai Hospital they perform lavage of the stomach before operation if indicated by persistent vomiting, if possible before the patient is anesthetized. Noetzel recommends it as a prophylactic measure, and continues to repeat it until the stomach has resumed its normal mobility. He is of opinion that gastric lavage, commenced at an early stage, and continued for a sufficiently long period, is the only certain means of preventing acute dilatation of the stomach, which is usually not recognized until too late, and is almost invariably fatal.

For post-operative vomiting, Westerman³⁶ recommends continuous siphonage by means of a tube inserted through the nose, fastened by a ribbon to the head, and emptying itself at its free extremity into a vessel placed at the side of the bed. Laxatives should not be administered until after the cessation of projectile vomiting.

CONTINUOUS CURRENT OF OXYGEN.

Weiss and Sencert³⁷ practise suprapubic drainage, and in order to facilitate it, pass a continuous current of gaseous oxygen through the hypogastric tube. This results in evacuation of the pelvic and peritoneal fluid, and may prevent the formation of adhesions. They have shown, both clinically and experimentally, that the current of oxygen tends to produce hyperemia of the serosa, which materially increases its bactericidal and phagocytic characteristics, arrests the development of the bacteria, and neutralizes their toxins. By this method, of which I have so far had no experience, they have recently obtained four recoveries out of five cases.

INJECTIONS OF CAMPHORATED OIL.

Efforts have also been made to increase peritoneal resistance by the injection of horse serum (Pettit) or bacillus acidi lactici (Rogers).

With the object of reducing the resorptive capacity of the peritoneal serosa, Glimm³⁸ has made experimental intraperitoneal injections of from two hundred to three hundred grammes of camphorated oil (one in one hundred). He claims that it is an excellent general tonic, and that it occludes temporarily the subserous lymphatics, rendering it impossible for them to absorb other products, and preventing general infection, toxemia and the formation of adhesions. Leriche³⁹ reports good results in four cases from the injection of camphorated oil after operation.

Hoehne⁴⁰ states that he has had satisfactory results in more than a hundred and twenty cases from the injection of camphorated oil before laparotomy, with the object of preventing the supervention of peritonitis. From one to four days before operation he injects from twenty to thirty cc. of 1 to 10 per cent. oil, and this produces an ante-operative irritation of the peritoneum. According to him, the resulting exudation is gradually absorbed without the production of adhesions.

I cannot see why this should be used to prevent peritonitis, although, if it will prevent absorption of toxic products, there can be no objection to its use in case of diffuse septic peritonitis after the cause has been dealt with.

INTESTINAL OBSTRUCTION.

Intestinal obstruction is a very common complication of diffuse peritonitis, and in the fatal cases is the most frequent cause of death.

Intestinal obstruction occurs in two forms: (1) Paralytic ileus, and (2) mechanical obstruction.

The first form, that is paralytic form of obstruction, is usually met with soon after operation in cases in which the peritonitis has been present for some days. After operation and drainage in diffuse peritonitis there is always a possibility of the supervention of paralytic ileus, and measures should be taken to prevent it. When the bowels have moved after operation, however, there is no longer any fear of this form of obstruction. The danger, then, is from mechanical obstruction, which will occur when adhesions have formed, usually at the end of a week or ten days.

Intestinal paralysis endangers life in one of two ways: (1) By its mechanical results, which include compression of the heart in an upward direction, compression of the lungs, and interference with the circulation in the abdominal and thoracic cavities; (2) by general toxemia, due to resorption of bacteria and toxins from the intestinal contents.

When the obstruction is due to a slight or localized peritonitis it may be relieved by saline cathartics, enemata, and drugs which stimulate peristalsis. Saline cathartics may also be of value in the post-operative paralytic obstruction so often associated with diffuse peritonitis. Strychnine, atropine and physostigmine excite the intestinal fibres and stimulate peristalsis, but physostigmine is the most effectual of these drugs. Salicylate of physostigmine should be injected in doses of grs. 1/50 every two hours for three doses, and then every four hours. Other drugs which have been recommended are oil of ricini and calomel.

I have occasionally found benefit from the use of hot fomentations, with a little sprinkling of turpentine in cases of great abdominal distension. It is quite possible that the resulting hyperemia may influence the circulation in the intestinal coils, and thus favor peristalsis.

If, however, at the time of operation the coils of intestine are seen to be distended and thinned it is useless and dangerous to employ medical measures. Cecostomy or appendicostomy may be of service, but in severe and advanced cases enterostomy should be performed. In exceptionally severe cases it may be necessary to make multiple fistulae. Volterrani has recently published eight cases, six of which were cured by enterostomy.

My results in enterostomy have not been so fortunate, and I do not think it advisable to establish intestinal fistulae, excepting as a last resource, in view of the unpleasant nature of the complication, and the fact that fistulae of the small intestine and cecum have a deleterious influence upon nutrition. In apparently hopeless cases, I have made multiple punctures of the intestines by means of a fine cannula, the openings afterwards being closed. In two cases at least this procedure has saved the life of the patients, and in the other cases it has at least added very considerably to their comfort.

I should like especially to emphasize the importance of careful observation in regard to the symptoms of mechanical obstruction, which, as previously mentioned, usually appear at the end of a week or ten days, and to urge immediate operation. If, at the end of a few days or a week, the patient suffers from nausea and vomiting, and if a purgative or enema is not effective, it is in my opinion very wrong to delay more than a few hours before resorting to surgical measures. If much time is wasted in this way the patient will become so weak that even though the operation is performed later and the obstruction relieved, recovery will not follow.

Since I have kept a close watch for mechanical obstruction, and have made it a rule to operate at once, I have not lost a single

case from this cause; whereas, a few years ago, several cases were lost, owing to the fact that operation was delayed in the forlorn hope of a result from purgatives and enemata. Several patients operated upon in the country, in whom this complication appeared at the end of a week or ten days, have lost their lives because the surgeon was not called again to give the necessary relief by a second operation.

BACTERIOLOGY.

There is still considerable difference of opinion as to whether the bacteriological findings have any material influence on the prognosis. Haim⁴¹ has recently published the results of extensive investigations in this connection, and states that they indicate that the rare cases of pure streptococcic and pneumococcic infection produce severe constitutional symptoms, are frequently associated with a slightly abnormal appendix, run a particularly severe course, and have a higher mortality than other varieties of peritonitis, especially the cases associated with a pure infection by the colon bacillus. He finds that streptococci and pneumococci predominate in cases in which there is general involvement of the cavity, whilst the colon bacillus is most often associated with the encapsulated variety of peritonitis. The comparative mortality of cases of streptococcic and pneumococcic peritonitis operated upon at an early stage, as compared with that of the colon bacillus peritonitis, is 66 per cent. and 20 per cent., whilst in those operated upon after 48 hours, it is 75 per cent. and 43.7 per cent. Haim reports 27 cases of peritonitis, with 14 deaths. Streptococci were demonstrated in nine of these cases, eight of which ended fatally. When infection is due to the streptococcus or pneumococcus, death usually results from the infection alone, whilst in other cases the patients more often die from intestinal obstruction, embolism, thrombosis or pneumonia.

Dudgeon and Sargent⁴² have pointed out that peritonitis due to microbial infection represents a protective reaction of the peritoneal serosa. They find that cases which recover, if examined bacteriologically, almost invariably exhibit primary infection by the staphylococcus pyogenes albus, and they therefore regard the peritoneal fluid containing this organism as being of a protective nature.

On the other hand, Mr. Rutherford Morison, at the meeting of the British Medical Association in 1911, stated that in his opinion the nature of the infective agent is of practically no significance in relation to prognosis, and Noetzel agrees with this. Noetzel states that recovery has occurred in several cases of pure streptococcic

infection which have come under observation at Rehn's clinic, and he thinks that cases of this variety are so rare that the number is not sufficiently large to allow of a satisfactory comparison with regard to prognosis. He also points out that infection by the colon bacillus may be exceedingly severe, and that many patients die from it.

STATISTICS.

The extraordinary variations in the results reported by different writers are apparently chiefly dependent upon the differences which have been previously referred to in the application of the term "diffuse peritonitis," and upon the fact that in some cases the severity of the symptoms does not correspond to the extent of inflammation. In not a few cases, in which the classical symptom-complex is practically absent, the whole of the peritoneal cavity is found to be involved on opening the abdomen. It is also obvious from a study of the statistics that in some districts, or in the practice of a particular surgeon, opportunities of operating at an early stage are more frequent, and this naturally tends to improve the results. This may be partially due to the circumstances of the people in the neighborhood, to financial conditions, and also to a certain extent to the fact that the general practitioners are favorably impressed in regard to the value of surgery in the treatment of diffuse peritonitis. The statistics also indicate that recovery may result after the most various methods of operation.

In 1890, Stähler, of Strasburg, reported seventy-eight cases of drainage of the peritoneum for peritonitis, with fifty cures and twenty-eight deaths. In 1892, Körte⁴³ reported nineteen cases operated upon, with six recoveries and thirteen deaths (68.5%), and in 1897 he collected one hundred and thirty-three cases from literature, with fifty-one recoveries and eighty-two deaths (61.8%). From the literature appearing between 1885 and 1893 Mikulicz⁴⁴ collected thirty-five cases, with a mortality of 97%, and sixty-eight cases from that published between 1894 and 1896, the mortality being reduced to 52.4%.

The Fowler position was first recommended in 1904 by George and Russell Fowler⁴⁵, who reported one hundred cases operated upon between 1901 and 1904, with sixty-seven recoveries and thirty-three deaths (33%).

Murphy's⁴⁶ technique, which is now generally adopted, and which has given excellent results, consists in rapid removal of the cause of the peritonitis, drainage of the lower part of the pelvis, the Fowler position, rectal proctolysis, and the prevention of peristalsis by withholding food and liquids by the mouth

The treatment recommended by Noetzel in 1905⁴⁷ closely approximates to this, but he recommends lavage of the stomach as a routine procedure, and does not withhold food and liquids by the mouth. Dépage, of Brussels⁴⁸, at the meeting of the French Congress of Surgeons, in 1911, stated that since 1906, at which time he adopted a method analogous to that of Murphy, his mortality had diminished from 40% to 9%. At the meeting of the American Surgical Association, in 1908, Dr. Murphy reported fifty cases of peritonitis, chiefly due to the appendix, with only two deaths. Most of the cases were operated upon in from twenty-two to thirty hours after the onset of symptoms.

In 1902, Rehn⁴⁹ reported ninety-three cases, with forty-two cures and fifty-one deaths (54.8%). In 1905, Noetzel reported two hundred and forty-one cases from Rehn's clinic, with one hundred and twenty-one cures and one hundred and twenty deaths (50%). In 1909 he reported four hundred and forty-nine cases, operated upon between 1891 and 1909, with a collective mortality of 38%, and stated that, during the whole of this time not a single case, however advanced, and even moribund, was refused operation. Between 1900 and 1909, the mortality in the appendicular cases has been gradually reduced from 60% to 14%. The cases reported in 1909 include, in addition to the appendicular cases, sixty-one due to pyosalpinx, with a mortality of 31%; fifteen of puerperal peritonitis, with a mortality of 53%; twenty-seven due to gastric perforation, with a mortality of 37%; nineteen to intestinal perforation, with a mortality of 74%; eleven to perforation of the gall bladder, with a mortality of 55%; four to perforation of the urinary bladder, with a mortality of 50%; three cases of pneumococcal peritonitis, with a mortality of 33%, and one case due to coprostasis, which recovered.

According to Rehn, the principles of treatment of infective purulent processes in the peritoneum are the same in both circumscribed and diffuse suppuration. His method consists in free exposure of the focus of suppuration, flushing with warm saline solution, and closure of the wound with the exception of an aperture for drainage of the deeper part of the pelvis. Noetzel is of opinion that the reduction in mortality is the more satisfactory owing to the fact that a definite prognosis cannot be made in peritonitis, and that there are so many possible causes of death, such as pneumonia, sepsis, subphrenic abscess, peritoneal phlegmon, ileus and inanition.

In 1910, Dr. Gerster reported 609 cases of peritonitis operated upon at the Mount Sinai Hospital between 1899 and 1908, 461 being due to appendicitis. His experience has shown that imme-

diate operation is almost invariably preferable to delay, but that it should be as simple as possible, and patients are, as a rule, operated upon within an hour after admission to the hospital. In the appendicular cases the mortality has been gradually reduced from 79%, in 1899, to 14%, in 1908. As only a small proportion of the cases came under observation within forty-eight hours, the results show that rational treatment of advanced cases will save a considerable proportion of them. His method is to deal with the cause of the peritonitis, to make provision for drainage, but not to flush out the peritoneal cavity. He employs Murphy's method of treatment.

The 132 cases due to other causes than appendicitis included five due to tumor perforation, with a mortality of 100%; seventeen due to intestinal perforation, with a mortality of 76.5%; sixteen due to complications of hernia, with a mortality of 87.5%; twenty-three to typhoid perforation, with a mortality of 73.9%; thirteen to perforation of gastric and duodenal ulcer, with a mortality of 46.1%; three to perforation of liver abscess, with a mortality of 66.6%; one fatal case of mesenteric thrombosis; eight due to volvulus and intussusception, with a mortality of 87.5%; twenty-four to lesions of the biliary tract, with a mortality of 66.6%; six to hemorrhagic pancreatitis, with a mortality of 83.3%; twenty to unknown causes, six being moribund, and not operated upon, mortality 70%.

In 1910, Kron collected 1,914 cases from various sources, the average mortality being 42%. On analyzing the statistics, he finds that in 1906 Kümmell reported a mortality of 90%, and in 1910 a mortality of 12%. In 1906, Sonnenburg reported a mortality of 76% in cases reported between 1896 and 1899, and in 1907 a mortality of 41% in cases reported between 1900 and 1907.

At the Congress of French Surgeons, held in Paris in 1911, Hartmann reported 56 cases, operated upon at the Bichat Hospital between 1908 and 1911, 46 being of appendicular origin. Of the appendicular cases, 15 were operated upon within the first thirty-six hours with no mortality; ten during the first forty-eight hours, with a mortality of 10%; 13 in from two to four days, with a mortality of 38.5%, and eight operated upon after the fourth day, with death in every case.

Three cases of gastric or duodenal perforation were operated upon in from six to twelve hours after the onset of symptoms, with recovery in every case. The remaining seven cases, two of which were due to intestinal perforation, three to disease of the uterus or adnexa, one to acute enteritis of the large intestine, and one to

perforation of the biliary bladder, did not come under observation for some considerable time after the onset of symptoms, and all died. The patient with perforation of the biliary bladder was not operated upon until four days after perforation had occurred.

The results in these cases confirm the assumption that early intervention is the most important factor in success, *and indicate that the fate of the patient is therefore dependent upon the early diagnosis made by the physician, and upon the prompt removal of the primary cause of the peritonitis.* Further support is given to this view by the fifty cases with only two deaths reported by Murphy, all of which were operated upon within three to forty hours after the onset of symptoms.

As regards ulcer of the stomach and duodenum, Terrier and Hartmann⁵⁰ report fifty-three cases operated upon within twelve hours with 16 deaths (30%); 38 operated upon in from twelve to twenty-four hours, with 22 deaths (58%), and 29 in from twenty-four to forty-eight hours, with 22 deaths (76%).

Siegel states that in peritonitis due to abdominal wounds involving the digestive tract, operation within the first four hours had a mortality of 15%; within five to eight hours, 44%; within nine to twelve hours, 66.6%; and after twelve hours, 70%.

A few surgeons have recently reported good results from primary suture of the wound without drainage in cases of peritonitis operated upon at an early stage.

In Professor Rotter's clinic, 151 cases of appendicular peritonitis were operated upon between January, 1910, and October, 1911. In the thirty cases in which drainage was employed there were twelve deaths (40%), whilst in the one hundred and twenty-one cases which were treated by primary suture there were only 20 deaths (16.5%). As previously stated, he now provides for drainage in exceptional cases only.

Bauer is one of the most ardent advocates of primary suture, and spoke in favor of it at the meetings of the Danischen Chirurgischen Gesellschaft in 1910 and 1911. In 1911, he reported 115 cases of appendicular peritonitis, 67 of which were treated by primary suture, with 62 cures and 5 deaths (7.5%), and 38 by drainage, with 32 cures and 6 deaths (16.5%). Of 14 cases due to perforation of gastric or duodenal ulcer, 10 were treated by primary suture, with 2 deaths (20%), 4 by drainage, with 2 deaths (50%). Ten cases were due to pyosalpinx. Of the five cases which were sutured without drainage, all recovered, whilst of the five in which drainage was employed one died. Of the remaining 15 cases (cholecystitis, typhoid perforation, perforation of gastro-intestinal

tumor), 6 were treated by primary suture, with 3 cures and 3 deaths (50%); 9 by drainage, with 4 cures and 5 deaths (54.5%). He considers that these results indicate the error of extensive and illusory drainage of the peritoneum.

Kryloff⁵¹ reports 40 cases of typhoid perforation peritonitis, with 8 cures and 32 deaths (80%). Eight of these were operated upon within four hours after perforation, with four cures and four deaths (50%); three between four and twelve hours after perforation, with 3 deaths (100%); eight between twelve and twenty-four hours after perforation, with eight deaths (100%); five at the end of twenty-four hours after perforation, with four deaths (80%); two on the second day, with one cure and one death; one fatal case operated upon on the fourth day. In 13 cases, in which there was no definite history as to the exact time at which the perforation occurred, there were two cures and eleven deaths (84.6%).

TABLE SHOWING THE IMPORTANCE OF EARLY OPERATION.

Surgeon.	Varieties of Peritonitis.	No. of Cases.	Time since Onset.	Cures.	D'ths.	Mortal-ity.
Hartmann..	Appendicular	15	Within 36 hours.	15	..	..
Hartmann..	Appendicular	10	Within 48 hours.	9	1	10%
Hartmann..	Appendicular	13	From 2 to 4 days	8	5	38.5%
Hartmann..	Appendicular	8	After 4th day ...	..	8	100%
Hartmann..	Perforating Gastric and Duodenal Ulcer	53	Within 12 hours.	37	16	30%
Hartmann..	Perforating Gastric and Duodenal Ulcer	38	In 12 to 24 hours	16	22	58%
Hartmann..	Perforating Gastric and Duodenal Ulcer	29	In 24 to 48 hours.	7	22	76%
Murphy....	Chiefly Appendicular	50	In 3 to 40 hours.	48	2	4%
Siegel.....	Wounds involving Digestive Tract ...	..	Within 4 hours..	..	..	15%
Siegel.....	Wounds involving Digestive Tract ...	..	In 5 to 8 hours..	..	..	44%
Siegel.....	Wounds involving Digestive Tract ...	..	In 9 to 12 hours.	..	..	63.6%
Siegel.....	Wounds involving Digestive Tract ...	..	More than 12 hrs.	..	..	70%
Kryloff....	Typhoid Perforation.	8	Within 4 hours..	4	4	50%
Kryloff....	Typhoid Perforation.	3	4 to 12 hours...	..	3	100%
Kryloff....	Typhoid Perforation.	8	12 to 14 hours ...	..	8	100%
Kryloff....	Typhoid Perforation.	5	In 24 hours	1	4	80%
Kryloff....	Typhoid Perforation.	2	In 2 days	1	1	50%
Kryloff....	Typhoid Perforation.	1	4th day .....	..	1	100%
Kryloff....	Typhoid Perforation.	13	No definite history	2	11	84.6%

CONCLUSIONS.

1. I should like to strongly emphasize the necessity for early operation in all cases of acute appendicitis. In this way the majority of the cases of diffuse peritonitis dependent upon the appendix would be avoided.

2. The necessity for early recognition of peritonitis and prompt surgical intervention.

3. The importance of a rapidly performed operation, with as little handling of the intestines as is consistent with the removal of the primary cause of the peritonitis.

4. A split rubber tube containing iodoform gauze, or a cigarette drain, should be put down to the bottom of the pelvis through a suprapubic opening, as well as a cigarette drain to the site of the primary lesion. In many cases it will be sufficient to pass a cigarette drain or split tube through the appendicular incision, with or without a small cigarette drain passed to the site of the appendix. The rubber tube should be removed at the end of forty-eight hours, and its place taken by a piece of iodoform gauze an inch wide.

5. The patient should be placed in the Fowler position as soon as a diagnosis of acute appendicitis or perforation is made, should retain this position until the operation is performed, and after operation until all danger is over, that is to say for a period of from four days to a week.

6. Proctolysis is of great value, and should always be used by the continuous drop method of Murphy.

7. Gastric lavage at the time of operation, and if vomiting is troublesome it should be repeated.

8. The administration of physostigmine, 1/50 grain every two hours for three doses, and then every four hours until the bowels move, seems to be of value.

9. In regard to morphine after operation, my rule is to allow a single dose of 1/6 to 1/4 grain if the pain is severe, which is not to be repeated. Many cases get on without any morphia at all, and from my own observation I am quite convinced that the employment of frequent doses of morphia in these cases increases the tendency to intestinal paresis and obstruction. The most troublesome cases are those in which the attending physician has ordered repeated doses of morphia. I know that many surgeons do employ morphia in repeated doses after operation, and claim that it has not only produced no ill effect, but has been beneficial, but this is contrary to my experience.

10. The morning after operation I order a 1-2-3 enema (i.e., an enema consisting of 1 oz. of glycerine, 2 oz. of magnesium sulphate, and 3 oz. of water). This enema is repeated every morning for the first five or six days, and usually no purgative is given until the end of this time, when calomel, followed by a saline or a dose of castor oil, is given. If distension is troublesome, a rectal tube is inserted, and left in for some hours.

11. If symptoms of mechanical obstruction appear, immediate operation should be performed, without wasting time in giving enemata which are ineffectual.

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SUPPLEMENT

I should like to supplement the paper which appeared in the April and this number of this journal under the above title by a brief analysis of the cases of diffuse septic peritonitis which have come under my own observation during the last few years (1907 to 1912, inclusive). Of these cases, 282 were due to appendicitis, and the following tables show the gradual diminution in mortality during this period, and also the improvement in the results when operation is undertaken at an early stage:

Date.	No. of Cases.	Cures.	Deaths.	Mortality.
1907	33	24	9	27.2 per cent.
1908	42	32	10	22.8 per cent.
1909	40	33	7	17.5 per cent.
1910	43	37	6	14.0 per cent.
1911	59	54	7	11.1 per cent.
1912	65	59	6	9.2 per cent.
1907-1912	282	239	45	15.1 per cent.

In addition to these 282 appendicular cases, I have had eleven cases of peritonitis associated with perforation of the stomach, with six cures and five deaths, one fatal case of perforation of the ascending colon, two cases of perforation of the gall-bladder (both of which recovered), five cases of perforation of typhoid ulcer (with three recoveries and two deaths).

TABLE SHOWING THE IMPORTANCE OF EARLY OPERATION.

Variety of Peritonitis.	No. of Cases.	Time Since Onset.	Cures.	Deaths.	Mortality.
Appendicular	19	Within 12 hours	19	0	0%
"	76	Within 24 hours	73	3	3.9%
"	100	Within 48 hours	80	11	11.0%
"	32	Within 3 days	26	6	25.0%
"	28	Within 4 days	21	7	35.8%
"	14	5 to 6 days	9	5	79.0%
"	13	A week and more	4	9	50.0%
Perforated Gastric Ulcer	4	Within 12 hours	4	2	50.0%
"	7	Within 18 hours	3	3	50.0%
"	1	2 weeks	0	1	100.0%
"	1	3 days	0	1	100.0%
Perforation Ascend. Colon	1		0	1	100.0%
Perforation Gall Bladder	2	3 and 12 hours	2	0	0%
Typhoid Perforation	5	12 to 30 hours	3	2	40.0%

It will be seen from the foregoing that recovery took place in one case of perforation of the stomach, in which perforation had occurred two weeks before operation was undertaken. The reasons for this were: (1) That the perforation was in the anterior wall, immediately adjoining the lesser curvature, and (2) that the stomach was empty when perforation occurred, making it possible for adhesions to form before any of the contents of the stomach reached the peritoneal cavity. These adhesions, when separated, were found to surround an abscess containing about an ounce of pus. I am mentioning this case simply to show that one may have a perforation of the stomach without septic peritonitis.

Pituitrin in Labor.—Gussew (*Zentra. für Chir.*) has used pituitrin in forty-six cases of labor. He used a solution in 1 cc. ampoules containing 0.2 c.c. of 20 per cent. extract of the posterior lobe of the hypophysis. He injected 0.75 c.c. except in three cases, when 1 c.c. was used. The smaller dose seemed to work more satisfactorily. The labor pains began some ten minutes after the injection. The author considers pituitrin a valuable and reliable agent during the act of labor and afterwards. Chloroform narcosis and the hypodermatic injection of morphine interferes with the action of the drug.

Pneumonia.—A. Netter (*Presse Medicale*) employs colloidal silver successfully in pediatric practice in all varieties of infection. He has found a fifteen per cent. ointment efficacious in lobar and broncho-pneumonia. The seat of application should be previously well rubbed with a brush. In broncho-pneumonia, injections of a relatively dilute preparation—0.25 per cent. collargol—are often administered, while in serious cases as much as one, two or even five per cent. preparations are given intravenously. Netter claims pneumonia can sometimes be arrested on the third day by this measure.

THERAPEUTIC NOTES

Scarlet Fever.—William Mackie (*The Medical Officer*) being favorably impressed with the Milne treatment of scarlet fever in private practice, made a trial of this treatment in hospital practice in 1911-12. The Milne treatment consists of the brushing of the throat every second hour for the first 24 or thereby, according to results, with 1 in 10 carbolic oil and the inunction of the surface of the body all over, hairy parts and all, with undiluted eucalyptus oil—twice daily for the first four and once daily for the next six days, making 14 inunctions in all. According to Dr. Milne, the patient is then in a condition to be discharged without danger to himself or anyone he may come in contact with. Dr. Mackie supplemented this treatment in the hospital by giving the patient a daily bath when the grade of temperature permitted, and by continuing the daily inunction with eucalyptus oil up to the very day of discharge. The very best eucalyptus oil was used. Dr. Mackie states 44 cases of scarlet fever were admitted to the Fever Hospital, Royal Burgh of Elgin, during the year. Of these 22 were treated on the ordinary lines and 22 according to the lines laid down by Milne. As two of the latter remained undischarged, only twenty were reported on. Of those treated on the ordinary lines, the average length of residence in hospital was 43.4 days; of the latter, by the Milne treatment, 29.5 days, or a saving of 13.9 days per case in the latter series. Dr. Milne's treatment is fully set out in his book, "A Plea for the Home Treatment and Prevention of Scarlet Fever."

Cerebro-Spinal Meningitis.—Phebe L. Dubois (*J. A. M. A.*) says the treatment of cerebro-spinal meningitis may be divided into prophylactic, specific and general. Prophylaxis consists in quarantining cases and looking for carriers. The specific treatment consists in the intraspinal injection of antimeningitis serum. If a cloudy fluid is found on lumbar puncture, the serum should always be injected. The sooner the serum is injected the better, and it does no harm even if some other organism is the cause of the trouble. The serum is warmed and allowed to run in slowly by gravity. The amount administered depends on the amount withdrawn—usually a little less in amount up to 40 c.c. than the cerebro-spinal fluid withdrawn—using change in the blood pressure as a guide to the dose. In ordinarily severe cases, a lumbar punc-

ture is done, the fluid drawn off and serum injected every day for four days. For general treatment—urotropin, as formaldehyde after its administration appears in the cerebro-spinal fluid—when the patient is restless or in pain in order to procure enough sleep. The diet should not be too limited. Conjunctivitis is best treated with argyrol. The bladder must be watched for retention. Before the use of the serum the mortality averaged 75 per cent.; since using the serum, 50 per cent.

Abdominal Ptosis.—H. H. Oldenborg (*J. A. M. A.*) states that while most writers have recommended gymnastic exercises, few have given directions as to how they should be performed. In these cases the abdominal walls are relaxed, there is more or less pronounced lumbar lordosis, round shoulders, flat-chestedness and acute epigastric angle. To correct these conditions, it is necessary to strengthen the upper spine, develop the chest, and so increase the lung capacity, strengthen the abdominal walls, and overcome the lordosis. With children much can be done with good hygiene, plenty of outdoor air and regulated gymnastics.

Fetal Membrane in Skin Grafting.—Nicholas Sabella (*The Medical Record*) says the materials or organs generally thrown away after the child is delivered can be utilized to the best advantage in skin grafting. He enumerates seven principal methods of skin grafting: (1) Thiersch's, (2) Reverdine's, (3) Wolf's, (4) Pedicle flap intact, (5) Pedicle flap not intact, (6) Cuticle scrapings used while fresh, (7) Old scrapings preserved in a bottle with normal saline solution and used when needed. The disadvantage of all these methods is that of taking the grafts from the patient himself or from a volunteer. All this can be avoided by the use of the amnion and the umbilical cord. By keeping them immersed in normal saline solution and changing the solution a few times before the use of the organs, they will keep alive for over seventy-two hours. When the patient is ready for grafting the organs are dipped several times in a new solution of normal saline and then they are cut up into pieces in any shape and size desired. The cord should be cut open and the blood-vessels scraped out. The surface of the cord and amnion which is to be placed on the ulcer should be the continuation of the inner surface of the cord. Dr. Sabella claims he has tried this method on several patients and gained great success with it. It is especially adapted for those cases in

which the areas to be grafted are so large that enough grafts cannot be obtained from the patient himself.

Infantile Convulsions.—Weiss, Boice, Lake, Bell (*N. Y. M. J.*) discuss in a symposium the treatment of infantile convulsions. Weiss gives a tepid bath with cold affusions to the head if there is fever; or hot mustard bath if no fever. Following this he gives chloral hydrate, alone or with the bromides, by the rectum. During teething small doses of alcohol. Chloroform or amyl nitrate inhalations may be tried. Following an attack, the bowels should be cleared with calomel or castor oil. Boice thinks first of chloroform inhalations, using them just to the point of stopping the convulsions. Then he empties the bowels with high colon injections. To prevent recurrence, he then throws into the bowel a mixture of chloral hydrate and sodium bromide. He also uses the mustard pack, prepared by mixing a tablespoonful of mustard in a quart of tepid water; a towel moistened with this is wrapped around the child's body, and kept there until it is a well-defined red. If the convulsions still continue, morphine is administered hypodermically. Lake empties the stomach and bowels, the former by mustard, ipecac or warm water by mouth or apomorphine hypodermically, or with the stomach tube. The lower bowel may be cleaned out with warm soap-suds enema. Then he immerses the child in hot bath and gives a few whiffs of ether or chloroform. Bell gives the following treatment: Ten minutes in a mustard bath at 100° F., with mild friction; no bath when there is loss of blood, anemia, diarrhea with inanition or cardiac disease. Next he gives the soap-suds enema, and if it seems likely there is food or poison in the stomach, an emetic, usually ipecac, is given at once. If these measures are not effective, then an enema containing chloral hydrate and sodium bromide is given; if this fails, morphine hypodermically.

Hydrocele in Infants.—J. H. Nicoll (*B. M. J.*) operates as follows: An incision, one to one and a half inches long, is made in the skin just above the groin over the inguinal canal, and the cord exposed just below the ring. The testicle and hydrocele are pushed up into the wound, and the upper end of the hydrocele sac is exposed by a few snips of the scissors. The exposed sac is then emptied by trocar and cannula. The collapsed sac, with the testicle, are then pulled out of the wound, and the sac is dealt with

either by tearing out its internal serous lining, by complete incision, or by bisection and suture of its halves back to back behind the testicle. Replacement of the testicle in the scrotum and suture of the wound in the groin complete the operation.

Intestinal Putrefaction.—In the *Journal American Medical Association*, a writer on disturbances of the heart discusses disturbances due to the absorption of irritants from the intestines, alcohol, tobacco, and caffeine. The heart may be made slow, rapid or irregular. Removal of meat from the diet is most successful in the management of intestinal putrefaction. One of the best laxatives to use is agar-agar. As to bowel antiseptics, none is more efficient than salol, 5 grains three or four times a day. Washing out the colon with high injections is often of value. Lactic acid bacilli, best the Bulgarian, are often of value in intestinal fermentation. A tablet may be eaten with a little milk-sugar, or with a small lump of cane sugar, after each meal. One-sixth of an ordinary compressed yeast cake, dissolved in a glass of water, may be taken once or twice a day. Foods which cause fermentation should be eliminated.

Asthma.—Stadler (*Med. Klinik, Berlin*) remarks that as the patient is generally seen first in an attack, he needs prompt and effectual help. For this, reliance may be had on epinephrin, a subcutaneous injection of 0.5 c.c. of 1 per thousand solution, in the upper arm. This gives remarkable relief in from three to five minutes. The by-effects, palpitation, etc., pass off in a few moments, and the patient soon sleeps. In his experience he has never known it to fail.

Hemorrhage.—Charles G. Levison (*J. A. M. A.*) says for a number of years it has been an accepted procedure to employ horse serum hypodermatically in hemorrhage due to diminished tendency of the blood to coagulate, and experience has proved this remedy very effective. It has been employed in varying quantities, and the results have been excellent in hemophilia, purpura, melena neonatorum, and in operations associated with a long-continued icterus. Levison reports a case of cystotomy where a cystic tumor was removed, the area cauterized, but the bleeding persisted for seven days. Tincture of iron, alum, epinephrin and antipyrin were used locally, as well as packing and the injection of horse-

serum. Horse-serum was then applied locally. A flask of this was poured into the bladder, and the hemorrhage ceased almost at once, and there was no further bleeding. In a case of gall-bladder hemorrhage after cholecystenterostomy, the results were immediate after a flask of horse-serum had been poured in and the gall-bladder packed. The bleeding did not occur.

Acute Coryza.—Volland (*Merck's Report*) recommends 10 to 15 drops of a one per cent. solution of morphine hydrochloride, in acute coryza, especially if the nasal breathing be interfered with. He claims it will relieve in a day. Dionin is equally effective, according to a note in *Phar. Zeitung*. A dionin tablet taken at 5 o'clock in the afternoon and another before going to sleep at night has entirely relieved a "cold" in the course of 24 hours.

Eczema.—M. Boekhart (*Merck's Report*) particularly recommends alcohol for acute and chronic seborrhœic and non-seborrhœic, but not in weeping and ulcerating eczema. It is harmless and a very good antiparasitic. He advises to sponge carefully the diseased surface and the adjoining skin twice a day by means of a plug of cotton wool soaked in alcohol (90 per cent.). This is to be done immediately before the application of the drugs used in the treatment of the eczematous tissue (powder, dry painting, ointments, tar, etc.). It relieves the itching and wards off post-eczematous furunculosis and pyodermatitis. It should be continued some time after the eczema is cured.

Pneumonia.—P. B. Aquino (*Semana Medica*, Buenos Aires) emphasizes the efficacy of local applications of the salicylates in pneumonia. He uses a mixture of 10 gm. of salicylic acid in 90 per cent. alcohol, with 10 gm. of castor oil. The skin is washed with ether, and one to two spoonfuls of the solution applied on gauze. This is covered with cotton and rubber tissue, held in place by a bandage. The dressing should be renewed about every six hours. The treatment is supplemented with heart tonics, enemas and an alkali internally, as the salicylic acid is eliminated through the kidneys, and is irritating to them. Defervescence never failed on the third day. Camphorated oil as a heart tonic was injected each day—0.01 or 0.02 gm.

Reviews

Solidified Carbon-Dioxide. By RALPH BERNSTEIN, M.D., Philadelphia. Hammond, Ind.: Frank S. Betz Co.

This book, which is fully and well illustrated, gives a clear and comprehensive exposition of the use of the remedial agent, solidified carbon-dioxide, in the treatment of cutaneous neoplasms. It sets forth in a practical way the author's results, and his clinical experience. He has found this agent an admirable one in various cutaneous manifestations. These results are strikingly portrayed in the many excellent illustrations.

Medical Laboratory Methods and Tests. By HERBERT FRENCH, M.A., M.D. (Oxon.), F.R.C.P. (Lond.); Assistant Physician, Guy's Hospital, etc. Third edition. Toronto: The Macmillan Company of Canada, Limited.

With the third edition of this practical handbook, new methods and tests have been introduced and old ones modified. The subject matter is clear and concise and confined to chemical and microscopical methods which have become established in clinical medicine. Students and general practitioners will find this small book of great value.

The Development of the Human Body. A manual of human embryology. By J. PLAYFAIR McMURRICH, A.M., Ph.D., LL.D.; Professor of Anatomy in the University of Toronto; formerly Professor of Anatomy in the University of Michigan. Fourth edition. Revised and enlarged. With two hundred and eighty-five illustrations, several of which are printed in colors. Price \$2.50 net. Philadelphia: P. Blakiston's Son & Co.

One sees in this new edition several chapters almost entirely rewritten to come up to the additions to the knowledge of human and mammalian embryology within the last few years. Practitioners and students can be assured the work has been well done, and that the book presents accurate statements of present-day knowledge of the development of the human body. It can be highly recommended as a first-class book upon the subject.

The Bradshaw Lecture on the Biology of Tumors. By C. MANSELL MOULLIN, M.A., M.D. (Oxon.), F.R.C.S. London: H. K. Lewis.

This is a lecture delivered at the Royal College of Surgeons of England on Thursday, December 5th, 1912, and has been published in book form by the request of the Council of the Royal College of Surgeons. The price is two shillings net. It can be taken for granted that a lecture by this distinguished surgeon would deal with the subject in an authoritative manner.

E. Merck's Annual Report of Recent Advances in Pharmaceutical Chemistry and Therapeutics. Vol. XXV. Darmstadt: E. Merck Chemical Works.

The annual report of the celebrated house of E. Merck, Darmstadt, Germany, has now become a welcome classic to the physician and pharmacist. With it one can quickly scan the field of modern pharmacotherapy. It is presented free of charge to scientific institutions, libraries, clinics, physicians, pharmacists, wholesale druggists, etc. Copies can be ordered through booksellers, or by addressing the house direct. The German edition of this year's report contains a General Index of the whole series of twenty-five annual reports.

Pye's Surgical Handicraft. A manual of surgical manipulations, minor surgery, and other matters connected with the work of house surgeons and surgical dressers. Edited and largely re-written by W. H. CLAYTON GREENE, B.A., M.B., B.C. (Cantab.), F.R.C.S. (Eng.); Surgeon to St. Mary's Hospital; Lecturer on Surgery in the Medical School, etc. Sixth edition; fully revised, with some additional matter and illustrations. Publishers: The Macmillan Co. of Canada, Ltd., Toronto. 1912.

When one contemplates the world-wide diffusion this splendid classic has enjoyed since its first publication, in 1884, its power for good must be considered as well-nigh without bounds. House surgeons and dressers—aye, and countless blossoming surgeons—have advanced to the dignity of skilful craftsmen in the applied art of surgery, and, to no small degree—through the knowledge acquired from the study of this work—have been able to render surgical

service to humanity throughout the habitable globe, of incalculable value.

The editor of the present edition has added an immense amount of most valuable material, bringing it quite up to date. One might mention especially the chapters on X-rays and of the taking and interpretation of skiagrams, and those dealing with modern genito-urinary surgery, syphilis, etc.

The work is beautifully illustrated, and the publishers have turned out a book that reflects on them the greatest credit.

Diseases of the Ear. By RICHARD LAKE, F.R.C.S.; Surgeon, Diseases of the Ear, etc., London School of Clinical Medicine. 287 pages, four colored plates and 77 original illustrations. Fourth edition, revised and enlarged. Price, \$2.50. Toronto: D. T. McAinsh & Co.

The medical student and general practitioner require no better book than this on Diseases of the Ear. There are four beautiful plates, as follows: (1) Acute conditions; (2) Chronic non-suppurative conditions; (3) Chronic suppurative conditions; (4) Tympanic membranes—pathological conditions. The illustrations are new and especially suitable; the text complete, practical, modern, the technique of examinations and operations being concise and clear. The treatment is succinctly set out. There is an appendix of considerable therapeutic value.

Vaccine Therapy. Its Theory and Practice. By R. W. ALLEN, M.D., B.S. (Lond.), late Clinical Pathologist to the Mount Vernon Hospital for Disease of the Chest; late Pathologist to the Royal Eye Hospital; late Gull Student of Pathology, Guy's Hospital. Fourth edition. Price, \$3.00 net. Philadelphia: P. Blakiston's Son & Co.

Two and one-half years have expired since the third edition of this, the best book on the subject of vaccine therapy, appeared in 1910. During these two and one-half years, there have been considerable developments and extensions made, which have called for this fourth edition. The book has been enlarged and completely rewritten. It is essential to progressive medicine, especially to those interested in this form of treatment.

Dominion Medical Monthly

And Ontario Medical Journal

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Published on the 20th of each month for the succeeding month. Address all Communications and make all Cheques, Post Office Orders and Postal Notes payable to the Publisher, GEORGE ELLIOTT, 219 Spadina Road, Toronto, Canada.

VOL. XL.

TORONTO, MAY, 1913.

No. 5

COMMENT FROM MONTH TO MONTH

A few cold-blooded facts concerning Dr. Friedmann and his "Cure" should prove interesting reading at the present time.

1. Dr. Friedmann came to New York with the idea of immediately beginning to practise his "profession."

2. The New York State Medical Association refused him permission—as would have been done in any province in the Dominion of Canada.

3. The Washington authorities suppressed his activities under an Act of Congress controlling "The Manufacture, Sale and Importation of Sera, Vaccines and Other Viruses, for Use in the Treatment of Human Beings."

4. But they very liberally allowed him to try out his alleged "cure" on cases in New York hospitals, provided: (a) That he hand over his cultures so that they could be proven at least harmless to humans; and (b) that the cases treated should be under personal government supervision.

5. And this is being most carefully and dispassionately done by Drs. Anderson and Stimson of the Washington Bureau of Health.

6. To date no single authentic case, as observed by impartial eyes, has shown any but evanescent improvement.

7. In practically all cases, unless the "culture" had been given intravenously, *nothing* has happened.

8. Animal experiments on monkeys, rabbits and guinea pigs have likewise been *negative*.

9. The organism is not like the tubercle bacillus as we know it only in being acid-fast. It grows on anything rapidly.

10. It does not produce anything like tubercles in any known warm-blooded animal.

11. Tens of thousands of sufferers from tuberculosis are eagerly waiting the "cure."

One person is dying of tuberculosis every three or four minutes.

12. Yet Dr. Friedmann, who avers that he alone possesses the wonderful secret of the method of using his remedy, complacently assumes this responsibility, refusing to touch the spring that will open "the innermost workings of his mind" in this connection.

13. Whilst we in Canada fall on his neck and scientifically embrace him as the one and only tuberculosis emancipator.

And yet, in spite of all, it is only fair that we should keep our minds open and wait for the report of the United States authorities. It is certain to be absolutely fair. Let us be guided only by this and not by press statements emanating from Dr. Friedmann or his associates, not that he and those around him may not be honestly in earnest, but then the medical profession is sadly too familiar with the thing known as "honest over-enthusiasm."

Let us wait patiently the truth, always hoping that Dr. Friedmann's claims may be proven.

The Marriage Laws in Ontario are under reconstruction at the hands of the Ontario Legislature. This is the thin end of the wedge of eugenics in this province.

The clear eugenical rule is: "Let abnormals marry normals without trace of defect, and let their normal offspring marry in turn into strong strains; thus the defect may never occur again. Normals from the defective strain may marry normals of normal ancestry; but most particularly avoid consanguineous marriages."

There is another side to the subject, however, and that is the sociological. Here the feeble-minded, drunkards, paupers, sex-offenders, and criminalistic should be prevented from marrying their like or cousins of any person belonging to a neuropathic strain. Segregation of such persons during the reproductive period for one generation would show good results for future generations. In this way the crop could be materially reduced.

The subject is so important economically and sociologically that the essential features of any marriage law should be medical certificates for both contracting parties, and the issuance of the licence by a qualified medical practitioner.

The Fly Pest can be most efficiently abated by commencing early and working early, late and all the time. It is too late in any season to begin when flies are buzzing about in plenty.

If search is made early, all garbage and refuse disinfected thoroughly and removed, and animal manure properly disposed of once a week in winter-time, the best steps will be taken. Chloride of lime should be used plentifully in garbage and refuse, in stable and manure.

In the early spring, when each fly is creeping lazily out from its winter rendezvous, its immediate destruction will prevent subsequent myriads. All winter long the search should be prosecuted, and it is during winter and spring that the most effective work can be done.

Physicians can do much by continually reminding households to be ever vigilant.

Chloride of lime should be a household article, ever ready to be sprinkled upon each addition to the covered garbage can.

Self-drugging is increasing in many parts of the world. It is as apparent in Canada as in other countries. The advance in education, the decadence of polypharmacy, and the multiplication of proprietaries may have much to do with it.

Prescription writing of a single ingredient or of a proprietary appeals to the intelligence of the average individual, and many people come to know what protargol, antifebrin, phenacetin, chloral hydrate, calomel, aspirin are for and how to use and even recommend them.

To what an enormous extent self-drugging has grown in the United States can be seen from a perusal of Bulletin No. 56, U. S. Public Health Service. In the past ten years that country has imported 400,000 lbs. of opium, fully 75 per cent. of which is manufactured into morphine. Of this, 80 per cent. is used by victims of the drug habit. Then it is estimated that 150,000 ounces of cocaine are used illegitimately in the same country annually. Add to these figures the hundreds of pounds, yes, tons of chloral and other hypnotics, as well as the coal tar derivatives, and one must stand aghast at the awful toll of human wrecks, equalling if not surpassing the wrecks from the abuse of alcoholic beverages. Surely a vast field is this for temperance workers!

It would be a difficult matter to suggest a remedy, but the medical profession could protect its skirts to some extent by doing all its own prescribing. The manufacturing pharmacists have made this an easier work than in former years, when pills, powders, mixtures had to be compounded by the hard-worked practitioner.

Editorial Notes

SCHOOL HYGIENE

The Fourth International Congress on School Hygiene will be held in Buffalo August 25th-30th inclusive, under the patronage of the Honorable Woodrow Wilson. His Royal Highness the Duke of Connaught has accepted an invitation to attend.

It is desired to bring together a record number of men and women interested in improving the health and efficiency of school children; moreover to make this Congress—the first of its kind ever held in America—one of direct benefit to each individual community.

There is now being arranged a comprehensive programme of papers and discussions covering the entire field of school hygiene. There will be scientific exhibits, representing the best that is being done in school hygiene, as well as commercial exhibits of practical and educational value to school people. Nor will the entertainment of the delegates in any way be a minor feature. Plans are being made for a series of social events, including receptions and a grand ball, a pageant in the park, and excursion trips to the great industrial plants of Buffalo, as well as to the wonders of Niagara Falls and the Rapids. Buffalo itself has just taken up a collection of \$40,000 for the purpose of covering the expense of the Congress.

Delegates will attend from all the leading nations, from every college and university of note in America, and from various other educational, scientific, medical and hygienic institutions and organizations. The Congress is further open to all persons interested in school hygiene. Membership may be secured on the payment of a five dollar fee. Applications should be sent to Dr. Thomas A. Storey, College of the City of New York, New York City.

It is greatly desired to secure large membership of the Congress.

The man of to-morrow depends upon the child of to-day, and the child of to-day, roughly speaking, spends half his waking hours under the influence of school conditions.

Among the delegates to this Congress from Canada are: Prof J. George Adami, Dr. Grace Ritchie England, Montreal; Dr. F. Montizambert and Dr. Charles A. Hodgetts, Ottawa, who is chairman of the Ontario Committee. Sir James Grant, Ottawa, is an honorary vice-president.

CRILE'S REVOLUTIONARY THEORIES REGARDING SHOCK

In the *Boston Medical and Surgical Journal* recently there was an exceedingly thoughtful article by Risley regarding recent theories concerning shock. The writer has been specially interested in the exposition of Crile's theory regarding shock and "anoci-association," which Risley has set forth in a most lucid manner.

The essential beauty of Crile's theory is that it has pragmatic value—it is a working theory, which we can use, and apparently with benefit. As Risley points out, while the essential factors in shock are trauma, the anesthetic, a primary rise with a following fall in blood-pressure, decrease in body-temperature and vasomotor inhibition, paralysis and then exhaustion, the great contribution of Crile seems to be in showing that in the presence of shock *there are important changes in the cells of the brain*. These changes may result from such noxious influences as trauma, fear and infection. Bear in mind the deadly influence of fear.

These changes in the brain-cells are radical, influencing the size of the cell itself, involving the cell-plasma, cell-membrane and nucleus. In severe shock the cell may even be reduced to a disorganized mass of protoplasm, showing that, under the terrific morbid nerve-influence the cell may literally become "busted"—to quote Risley's own words.

Crile then goes on to show that these degenerative cell changes are the same, whatever the cause, whether acting over a short period or resulting from disease. But his most interesting observation, perhaps, is that ether, while rendering the patient unconscious, does *not* prevent that deeper somatic agony which ends in brain injury. It is but "a veneer that covers the deeper suffering of the patient (or patient's brain cells)." Ether, therefore, is one of the determining causes of shock. For instance, he proved experimentally that under ether four times as much injury is done to the cells as under nitrous oxide.

These facts furnish the foundation for Crile's methods for the treatment and prevention of shock. This depends upon the ability to block off the brain from the noxious influence, this being accomplished by the conjoint use of local anesthetics and the preliminary use of morphine.

But let us consider first the treatment of shock itself. Crile believes that intravenous infusion is of prime importance because it causes, in the first place, an increase in the venous pressure in the vena cava and consequently the output of the heart is at once increased, the amplitude of the strokes lengthened, the chambers

being full, the contractions become more forcible and blood-pressure begins to rise. The combination of small, frequently repeated hypodermic injections of strychnia, together with saline infusion, produces a more constant pressure than ether alone. Over-stimulation is followed by greater depression, hence large doses of strychnia are absolutely contraindicated, for such doses produce vasomotor paralysis and shock the same as trauma does. It is as reasonable to treat shock with large doses of strychnia as to treat strychnine poisoning with trauma. No justification can be found, experimentally, for the use of alcohol, nitroglycerine or amyl-nitrite as stimulants. As regards alcohol, in not a single instance was there a sustained improvement in the blood-pressure or respiration. On the contrary, the most constant and marked effect on the blood-pressure was a decline. The final breakdown was more sudden with drugs than in control animals. Adrenalin, however, administered cautiously and continuously, with a limited amount of saline, proved the best stimulant, in addition to external pressure by Crile's rubber suit or bandaging of extremities.

The great advance made by Crile in the treatment of shock has been in elaborating a logical *prophylaxis*. This we are in a position to study and to see clearly his reasons for.

It is an unpleasant thought that although our patient is unconscious from general anesthesia, yet the nerve impulses inaugurated by operative injury of the nerves reach the brain and produce harmful changes there which are the precursors of shock. It is clear that if general anesthesia cannot prevent the damage done to the brain in the course of operation some means must be devised to prevent this damage. It is known that cocaine, in addition to its ability to block sensory impulses, also blocks impulses that cause the response of the entire nervous system, under general anesthesia. If we combine, therefore, a local with a general anesthetic and avoid fear previous to operation, by the use of sufficiently large doses of morphine to bring the patient to the operation in a quiet, contented frame of mind, it matters not how poor the risk or how extensive the operation, the nervous system is protected and the immediate operative risk is eliminated.

The elimination of the factor of fear is an extremely important one and can be entirely accomplished only by the most careful cooperation on the part of the nursing and operating staff. The patient should be told of all the preparations to safeguard his welfare before, during and after operation; his room should be quiet and free from outside disturbances.

Fear is stronger than will, but under morphine a mental state is produced in which one is neither brave nor a coward, because this drug destroys the associational power of the brain, and the patient is let in a quiet state of mental and physical repose.

If we can, therefore, prevent fear and obtain an innocuous substitute for ether, and block harmful nerve impulses from the brain, we have a condition best described by the word *anoci-association*, that is one in which the patient is both mentally and physically protected from nocuous impulses or influences.

(The difference between anoci-association and anesthesia is as follows: Although inhalation anesthesia confers the beneficent loss of consciousness and protects from pain, it does not prevent the nerve impulses from reaching and fatiguing the brain cells, and hence does not prevent shock or the train of later nervous impairments so common following shock, i.e., neurasthenic post-operative states.)

The *prophylaxis*, therefore, which is to produce a state of *anoci-association* consists first in gaining the confidence of the patient, reassurance of a favorable outcome, the generous enough use of morphia before operation to produce a state of mental relaxation and content, nitrous oxide and oxygen anesthesia, nerve-blocking by cocaine or novocaine, great care to prevent loss of body heat, injury to tissues handled, and trauma to any but the immediate site of operation, speed reasonable to safety and a similar anocuous after-care. Crile, in abdominal operations, uses the quinine and urea hydrochlorate injected into the peritoneal edge before sewing up. The anesthesia produced locally by this drug lasts for 24 to 48 hours, and protects the patient almost entirely from the wound pain, as it is the pulling of peritoneum, which is the greatest factor in the causation of the post-operative wound pain.—*Med. Standard.*

DEATH BY ELECTRIC CURRENTS

The greatly extended use of electricity in the service of man during the past thirty years or so has not been wholly without its dangers to human life. A considerable amount of knowledge has been amassed during this period as to the precise manner in which electric currents prove fatal, and this has been ably set forth by Dr. A. J. Jex-Blake in the first two of the Goulstonian Lectures recently delivered by him before the Royal College of Physicians of London. Post-mortem evidence as to the cause of death by electric currents in industrial accidents has usually been negative,

at one time suggesting asphyxia, and at others organic vascular or nervous lesions of the brain and spinal cord. The results of experiments upon animals show that dogs are most sensitive to the passage of the current, and that death may be due to asphyxia from prolonged muscular tetanus, to primary cardiac failure of the respiratory system, or to the two latter combined. Grave nervous symptoms may also manifest themselves in animals exposed to currents of high voltage. In human beings the element of shock plays an important part, though actual death generally takes place from primary heart failure, due to fibrillation, from failure of the respiratory system, or to gross nervous lesions following at a later period. It is pointed out that the degree of danger depends on many other factors than mere voltage of current. Alternating currents are, *cactibus paribus*, more dangerous than continuous. Practically, wetness of the skin of the hands or feet is a factor of very great importance, for when the extremities are dry, conductors carrying currents of 500 volts may be touched with impunity. Artificial respiration still remains the best mode of treatment in cases of apparent death from electric currents, and this should be persisted in until it is *certain* that death has occurred.—*Medical Press and Circular*.

THE FRIEDMANN TREATMENT FOR TUBERCULOSIS: ITS INVESTIGATION BY THE UNITED STATES PUBLIC HEALTH SERVICE

On March 8 the Secretary of the Treasury, on the recommendation of the Surgeon-General of the Public Health Service, caused a board of medical officers to be detailed to make a thorough investigation of Dr. Friedmann's alleged cure for tuberculosis.

These officers proceeded immediately to New York and arranged with Dr. Friedmann for demonstrations of his remedy upon persons suffering from tuberculosis. These demonstrations are being carried on in certain New York hospitals through the courtesy of their respective authorities, and will be continued until sufficient information has been obtained for the forming of an opinion as to the merits of the treatment.

Dr. Friedmann has submitted to the Board a culture of the bacteria which he states are used in his method of treatment. In addition to the observation of persons under treatment by Dr. Friedmann, the Board of Officers will make experiments to ascertain whether this culture is, as Dr. Friedmann claims, harmless to warm-blooded animals.

Considerable time will necessarily be required to carry out these investigations. The work will be carried on as rapidly as possible. In the meantime the public is informed of the inadvisability of tuberculous patients travelling long distances in the hope of receiving treatment. Those to whom it is administered for demonstration purposes are selected by the hospital authorities from among their patients; the number selected constituting only a small proportion of available volunteers.

Certain statements purporting to be expressions of the opinion of the Board of Officers of the Public Health Service carrying on the investigation have appeared in the newspapers. These officers have expressed no opinion, and will not be in a position to do so until the work has advanced sufficiently far to warrant some conclusion in regard to Dr. Friedmann's treatment.—*Public Health Reports*, March 21, 1913.

THE GLASGOW LISTER WARD AND MUSEUM

As a memorial to the late Lord Lister, and as a means of perpetuating his memory in a way that it is hoped will prove both interesting and instructive to every member of the medical profession for all time to come, one of the wards in the Royal Infirmary, Glasgow, in which he worked out and first put into practice the principles of Antiseptic Surgery, is to be reserved and utilized in the following way. One part of the ward is to be refurnished as it was in his time with such objects as it may be possible to acquire; while the other part is to be made into a museum for the exhibition of anything associated with the life and work of the great master.

It is, therefore, asked that any who may have letters, pamphlets, books, or other objects of direct personal association with Lister and his work will either present or loan them to the museum.

Professor John H. Teacher, M.D., Hon. Curator of the museum, will be pleased to receive any objects addressed to him at the Royal Infirmary, Glasgow, Scotland.

The names of all donors or senders of objects are to be affixed to the exhibits.

News Items

Dr. Charles V. Vipond, Montreal, has returned from Florida.

Dr. H. A. Bruce, Toronto, has returned from Atlantic City.

Dr. S. M. Hay, Toronto, will spend several months abroad.

Dr. W. W. Ogden, Toronto, has gone on a trip to the Mediterranean.

Dr. J. George Adami has become connected with the editorial staff of the *Buffalo Medical Journal*.

Dr. Walter Bapty, Victoria, B.C., has been appointed inspector of hospitals for British Columbia.

The new Hospital for the Insane, Brandon, Man., was formally opened on February 8th.

The Federal Government at Ottawa will not, for some time to come, create any new cabinet position such as Minister of Public Health.

The Vancouver General Hospital treated 5,500 patients during the last hospital year. The daily cost per patient per day was \$1.93.

The Montreal General Hospital now makes compulsory the retirement of attending physicians upon reaching the age of sixty-two years.

The Government of Alberta will bonus two doctors to the extent of \$4,000 to take up medical work in the outlying districts of Northern Alberta.

The Jordan Memorial Sanatorium for Consumptives at River Glade, N.B., will be ready for occupation the coming summer. The outlay on this institution will be about \$150,000.

The *Western Medical Press*, Regina, commences on its fifth year.

The Saskatchewan Medical Register has nearly 600 licentiates enrolled.

Halifax is moving towards the establishment of a Tuberculosis Hospital.

Infant mortality for Manitoba in 1911 was 128 to the thousand, while in 1910 it was 145.

The Canadian Medical Association meets in London, Ontario, on the 24th, 25th, 26th and 27th of June, 1913.

Dr. Albert Lesage has been appointed Professor of Pathology at Laval University in succession to the late Dr. Hervieux.

Professor F. F. Westbrook, dean of the Faculty of Medicine of the University of Minnesota, is to become President of the new British Columbia University.

M. J. Haffey, M.B., M.R.C.S. (Eng.), L.R.C.P. (Lond.), late of London and Vienna Hospitals, desires to announce that he will begin the practice of the diseases of the eye, ear, nose and throat at 152 Carlton Street, Toronto.

Dr. J. W. S. McCullough, Deputy Registrar-General for Ontario, has issued a Physician's Pocket Reference to the International List of Causes of Death. Copies may be obtained by applying to Dr. McCullough, Parliament Buildings, Toronto.

The Æsculapian Club, Toronto, held its last regular meeting for the season of 1912-13 on the evening of the 13th of March. The following officers were elected: President, Dr. J. M. Cotton; Vice-President, Dr. Bruce L. Riordan; Treasurer, Dr. Edmund E. King (re-elected); Secretary, Dr. George Elliott (re-elected); Executive Committee, Drs. H. B. Anderson, H. J. Hamilton, W. J. O. Malloch, and Samuel Johnston.

New York Skin and Cancer Hospital, Second Avenue, corner 19th Street.—The Governors of the New York Skin and Cancer

Hospital announce the following course of clinical lectures and demonstrations in the out-patient hall of the hospital on the following Wednesday afternoons at 4.15 o'clock, on surgical diseases of the skin: April 2, Dr. Bulkley; April 9, Dr. Bulkley; April 16, Dr. Bulkley; April 23, Dr. Bulkley; April 30, Dr. Bulkley; May 7, Dr. Bulkley. Surgical Treatment of Malignant Diseases—May 14, Dr. Bainbridge. Each lecture will be illustrated by cases, models, colored plates, photographs, etc. The lectures will be free to the medical profession, on the presentation of their professional cards.

The annual meeting of the Ontario Health Officers' Association will be held in the Parliament Buildings, Toronto, May 29th and 30th, at which all the Medical Officers in the Province are required to attend, as provided in Section 42 of the Public Health Act. Arrangements are being made for reduced rates on the principal lines of railway, and a large attendance is expected. The programme will be issued at an early date.

For temporary occlusion of a large vessel a soft clamp, compressing fingers or angulation by traction on a tape or silk strand placed beneath are all to be preferred to the application of a ligature, which may damage the vessel wall.—*Am. Jour. Surgery.*

The great number of artificially fed children who die in infancy is appalling, and it is due more to improper nourishment than from any other cause. By helping the infant to a point where it can help itself by proper feeding is within the province of every physician.—*Am. Jour. Surgery.*

In preparing the radial artery for transfusion it adds much to the simplicity of the procedure to dissect out the two venal comites en masse with the artery, separating the latter from the former only at the terminal inch (for cuffing). This little variation of the procedure vastly reduces the amount of handling which the artery receives, and provides a means of tying its minute branches at a distance from it, for both of which reasons the production of clotting in the artery by the dissection is obviated.—*Am. Jour. Surgery.*