The Canada Lancet

THE OLDEST MEDICAL JOURNAL IN THE DOMINION

VOL. LVI MARCH 1922 NO. 7

The Canada Lancet

A Monthly Journal of Medical and Surgical Science, Criticism and News

VOL. LVI MARCH, 1922 NO. 7

INDEX TO CONTENTS

The Lancet Publishing Company

EXECUTIVE OFFICES, 61 COLLEGE STREET, TORONTO.

35 ST. NICHOLAS STREET., MONTREAL.

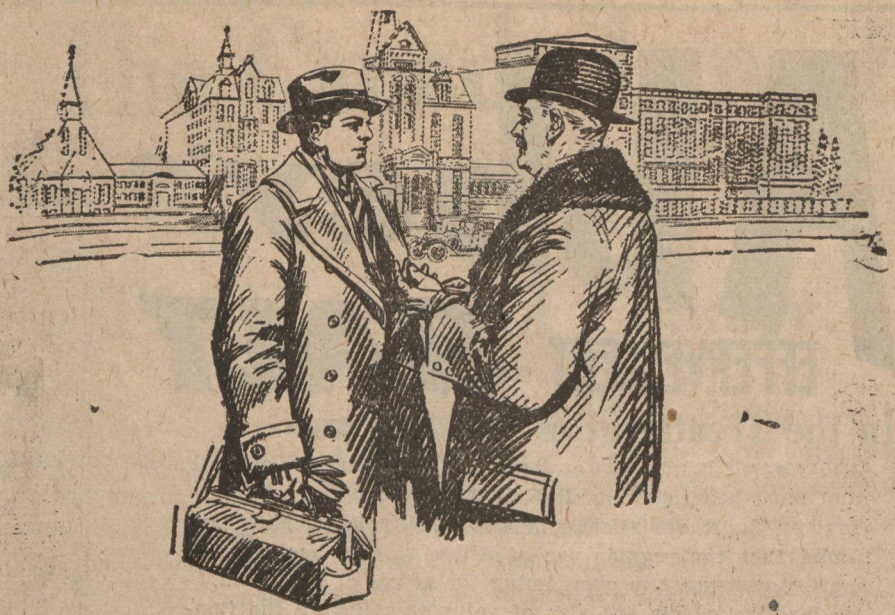
24 DEVONSHIRE STREET, W. C. L. LONDON, ENGLAND.

D. E. MacVANNEL, BUSINESS MANAGER, 61 COLLEGE ST., TORONTO

Printed at Stouffville, Ontario.

The Canada Lancet

Established 1867



DR. SENIOR: "It is really quite a trick to apply the Antiphlogistine jacket in pneumonia, Doctor."

DR. JUNIOR: "Yes I was stumped, at first; that is before the nurse came down and I ordered the jacket put on, as you suggested yesterday, when I saw you."

DR. SENIOR: "I was glad to find one of my old nurses in charge of the case. She has had a lot of experience—the first time she worked with me in pneumonia—some twenty years ago, when many doctors and nurses did not know about Antiphlogistine, - I had to do the job myself."

DR. JUNIOR: "Well, I was wondering this morning, after I had decided to try Antiphlogistine in pneumonia, how the —! — that is I —"

DR. SENIOR: "Now you know, I guess! That is—you know how the jacket is put on and, how comforting it is to the patient."

DR. JUNIOR: "Yes, and more than that, Doctor, the temperature has gone down nearly three degrees since morning. Now—before you go: How long shall we leave it on?"

DR. SENIOR: "Miss Hope knows. But, you send to The Denver Chemical Mfg. Co., 20 Grand Street, New York, and ask for their booklet on how to use Antiphlogistine—now!—don't feel that you are asking a favor. The Antiphlogistine people will also send you a copy of their valuable brochure "The Pneumonic Lung."

The Canada Lancet

VOL. LVI MARCH, 1922 NO. 7

The Reward of Courage.

"The Reward of Courage" is the educational film produced for this Society by the Eastern Film Corporation, 220 West 42 Street, New York, and released just prior to the "National Cancer Week." This is the first of the two cancer films the production of which has been made possible by the special appropriation from the Laura Spelman Rockfeller Memorial as told in "Campaign Notes" for May, 1921.

This is the first time that the cancer problem has been dramatized, and while the story is purely educational, there is enough human interest material included to hold the attention of, as well as to instruct, those who see it. The producers have succeeded in bringing out prominently the salient facts concerning cancer control, without depicting any of its more distressing aspects. There is absolutely nothing repulsive or objectionable in the picture, which unfolds in the course of the story the hopeful message of cancer control by consulting authoritative medical sources immediately when suspicion of cancer is aroused; and corrects many false impressions by declaring that the disease is neither contagious nor hereditary and exposes the dangers of unscientific "quack" treatment. The film is designed especially for use with public audiences and since its release, twenty-two copies have been distributed in different parts the country. The reports received are all commendatory. It has been shown before groups of nurses and physicians, women's clubs and other organized groups, in regular motion picture houses, and in the New England States it is being distributed by the Red Cross to which a copy was made available by Dr. Robert B. Greenough, our Regional Director for the New England district.

The film is in two reels and sells at cost price—$85.00 f. o. b. New York. The Society has three copies for loan purposes and a nominal renting schedule is being worked out. A more detailed synopsis of the story may be had upon request.

Vaccines in the Treatment of Asthma.

Michael L. Landman, M. D.

WE cannot take up the consideration of asthma without paying tribute to I. Chandler Walker of Boston, whose work at the Peter Bent Brigham Hospital is the basis of our present knowledge and understanding of the subject. It was Dr. Walker who first definitely established the relationship between anaphylaxias and asthma and differentiated the four groups of sensitization—pollen, food, animal emanations and bacterial—as the principle factors in its etiology.

Just as sensitization may occur to the protein in pollens, foods, animal hair and dandruff, feathers, etc., so may sensitization occur to the protein in bacteria. Just what the mechanism of sensitization is, is a matter of conjecture. That it does take place is an established fact. As far as bacteria are concerned, sensitization does not take place to the whole bacterial body. It is ncessary that the organism be split up into its component protein elements before sensitization can take place. This presupposes infection with the bacterium and an immune response during which the component proteins are set free. Then, the patient having the idiosyncracy necessary for this peculiar phenomenon, is sensitized to these proteins. After that, every time the patient is infected with this organism, the liberated proteins are too much for his sensitized tissue cells and he suffers protein poisoning, or anaphylactic shock, or an attack of asthma, which are all one and the same thing. The attack continues until his system has overcome the infection and eliminated enough of the toxic protein to bring its content down below his maximum tolerance. Then the attack ceases.

The symptom complex of an asthmatic attack, whether bacterial in origin or due to any other protein, is always the same, varying only in degree and intensity. In asthmas of bacterial origin, however, the elements of primary bacterial infection and later bacterial mixed infection, resulting from the lowered resistance induced by the asthmatic attacks, makes this group of asthmas a distinct clinical entity.

This group is chacterized, in a general way, by the fact that attacks may occur at irregular intervals at any time during the year, and particularly in the spring and fall, when sudden temperature changes predispose to bacterial activity. During the summer months and in warm, equable climates, these patients are fairly comfortable. It is this class of asthmatics who are benefited by change to a warm climate. But, unfortunately, after a season or two, having become acclimated, they again become prone to infections, and their asthma returns.

Clinically, there are three distinct groups of respiratory spasm of bacterial origin.

First. A simple sensitization without complications or mixed infection. This type is chacterized by sudden onset of respiratory spasm, following a cold with cough and no expectoration. In the later stages of the attack, due to stasis, a productive cough results. With the bringing up of expectoration the attack ends, but the cough continues for some time. Clinically, it is comparatively rare, for, due to the lowered resistance induced by the asthmatic attacks, mixed infection with the respiratory group of bacteria takes place, an associated chronic bronchitis develops in time and the clinical picture is no longer as described above. The patient's attacks now come more frequently, more irregularly and more or less all the year round.

Second. These cases usually give a history of susceptibility to and frequent acquisition of colds. These repeated attacks of colds gradually merge into a continuous chronic bronchitis and, after years true asthmatic attacks develop. In the first group, bacterial infection follows sensitization. In the second group, sensitization follows bacterial infection. In well developed stages the two types cannot be differentiated except by the history.

Third. In this group the clinical picture presents an old, longstanding bronchitis with attacks of respiratory spasm and dyspnoea which seems to be asthmatic attacks, but are really not asthma at all. In these cases, due to longstanding, chronic cough, emphysema and bronchiectasis have developed. Mucus accumulates and becomes inspisated in the dilated bronchioles. The irritation of this inspisated mass brings on a violent spasm of cough, with dyspnoea, which closely simulates an asthmatic attack. In this group there is no sensitization whatever, only a chronic, bacterial infection, with mechanical features simulating as asthmatic attack. It is this condition which is benefited by iodides.

Wherever possible, the specific bacterium causing the sensitization should be determined. As in hay fever and in the other protein groups of asthma, skin tests are used for this purpose, and the proteins used for these tests in bacterial asthma are derived from the respiratory group of bacteria. A cutaneous incision is made, on the flexor surface of the forearm conveniently, deep enough to draw serum, but not blood. A small amount of the dry protein is placed upon the incision and it is rubbed in with a sterile probe or tooth pick and a drop of 10th normal sodium hydroxide. A reading is made within half an hour and a reaction is considered positive when a distinct urticarial wheel at least one-fourth of an inch in diameter, surrounded by an area of erythema at least twice that size appears. Another method equally as good in bacterial sensitizations, but not so reliable with other proteins, is agglutination tests, using the patient's serum and emulsions of a 24 hours' growth of these bacteria. Some cases which are insensitive to the skin tests will be detected by the agglutination tests. Both should therefore be done, for

an accurate determination of the sensitizing bacterial protein means almost certain relief. Walker reports 90 per cent. of such cases relieved, the balance greatly improved, and only one case not improved.

Taking the general run of asthmatic cases with all kinds of sensitizations, only about 50 per cent. respond to the skin tests positively, and only 17 per cent. of these are sensitive to bacterial protein, according to Walker's findings in a series about 200 sensitive cases. In the 50 per cent. which are non-sensitive, a definite determination of the offending protein is practically impossible. Clinical experience, however, has demonstrated that at least half of these are due to bacterial protein sensitization, for they are relieved by the administration of autogenous vaccines made up from their sputums. Walker classifies the balance also as of bacterial origin, but undetermined. The probabilities are that the offending organisms are lurking elsewhere than in the respiratory tract. The tonsils and teeth and accessory sinuses must be examined with the hope that bacterial infection there may be the source of the protein sensitization in some of these. Danysz, of Paris, reports cures with vaccines made up from the bacterial flora in the intestinal tract. The seat of infection and protein sensitization may even be in more inaccessible regions, as in the abdominal viscera. At any rate, cases have been suddenly cured by gall bladder operation, or by an appendectomy. I have seen one case where the trouble was in the endomerium and a curettage gave relief. And Walker reports a case of hernia, the repair of which gave relief. A recurrence of the hernia brought about a relapse of the asthma and a second repair brought relief again.

The treatment of bronchial asthma of bacterial origin consists of:

First. In common with other types, measures to give the patient relief during the attack.

Second. Desensitization against the offending bacterial protein.

Third. Treatment of the infection, both primary and secondary.

To give the patient relief while suffering an attack is of first importance. The efficancy of adrenalin for that purpose is well known. Dr. Peshkin of Manhattan and I have tried out, in the Immunotherapy clinic of the Polvelinic Hospital a mixture of adrenalin and pituitrin. In doses of four or five minims of each, we found that the effect which adrenalin alone gives is delayed from five to ten minutes, but the desired action is immeasurably prolonged. Pituitrin seems to prolong the action of adrenalin. The pulse was invariably lowered. Blood pressure readings were very variable, increased in some cases and lowered in others. One injection a day is sufficient to control a severe case. One every other day a moderately mild one. The use of this mixture in contraindicated in cases with hypertenson. We also noted that with the administration of this mixture vaccines seemed to gain a better hold. This may be due simply to the fact that the endocrene control of the spasm saves the patient from the lowered resistance induced by the attack, and he

is therefore able to maintain a better immune response to the vaccine.

The problem of desensitization in those cases in which the offending bacterium has been determined is quite simple. The sputum is collected, in a sterile container, during an attack if possible, and sent to the laboratory within two hours, at most, with instructions to isolate that organism and make a vaccine from it. The vaccine injections are then given as will be described later. In the non-sensitive cases, since we have no clue as to the sensitizing organism, the problem is not quite so simple. However, we know that in most cases the offending bacterium is among the respiratory group, and these are not many in number. We also know that in order to cause an asthmatic attack the bacterium must infect. The chances are, then, that the infecting organism will be the predominant one. This narrows our problem down to a workable basis and the procedure is as follows:

The sputum is collected and thoroughly washed with sterile saline solution to remove mouth bacteria and other saprophytic growth. Out of the characteristic asthmatic sputum only a thick yellowish plug will remain. Now, some bacteria will grow well on plain agar and others will not grow on this media at all. Some will grow on blood agar and not on any other media. Therefore, in this hunt for a possible causative organism, every possible facility for the growth of all organisms must be given in order to make reasonably sure that the one we are hunting will not be missed. A piece of the washed sputum about the size of a small bean is shaken up in nutrient broth, and from this two sets of broad-surfaced plates, one of plain agar and the other of blood agar, are inoculated and incubated. A reading is made in 24 hours and the predominating growth on each set of plates is isolated and a vaccine made of each. If two organisms happen to be predominant on either set of plates in equal proportions, both are made into vaccines. These vaccines can then be used either separately until relief of symptoms with any one tells us which is the proper one, or they may be all used together.

The organisms found most commonly to cause asthma are Staphylococci, Streptococci, Diptheroids, Bucillus Friedlander and a gram negative bacillus which resembles Colon bacillus. Cases have been reported of occasional sensitization to Pfeifer bacillus, Pertussis bacillus, Micrococus catarrhalis, tetragenus and others. In fact, any infection is capable of sensitizing with its protein. Last year I found a large, gram positive, coffee-bean-shaped tetroid very prevalent in nearly all sputums from various sources. In one instance, at least, there was a definite sensitization to this organism which was relievby vaccine. This fall I have, so far, rarely encountered it.

The specific treatment of bacterial asthma consists of slow and gradual desensitization with vaccine made from the whole bacterial body of the sensitizing organism. The advantage in using vaccine instead of protein prepared from the bacterial body lies in the

fact that in addition to the process of desensitization we are immunizing against infection with the same organism. Since infection with the organism is essential to the production of an attack of asthma, the value of immunization is evident.

The dosage is of extreme importance. To obtain good results with vaccines in asthma it must be remembered that we are dealing with protein hypersusceptibility and that, in administering this protein, we must keep below the patient's maximum tolerance. If the patient's maximum tolerance is crossed, he will be thrown into an attack of asthma. Fortunately, vaccines are not as sensitive as the pure protein would be. We can therefore use it with less caution. However, the dosage must be small and the increases slow and gradual. The initial dose should never be more than 100,000,000 of the bacterium and the increase 25,000,000 every fourth day; or, as Walker uses it, never more than 50,000,000 with an interval of one week. I personally prefer the smaller dose with the shorter interval. The results obtained with vaccines in cases where skin tests have determined the sensitizing bacterium are brilliant. In the non-sensitive cases the results are not so good, but still encouraging. In all I should say that about 50 per cent. are relieved.

The cures, so called, are not permanent. When vaccines relieve the asthma, the patients are free from it from two to six months as a rule. If the sensitization returns, the case is more easily controlled the second time. But a patient with an anaphylactic diathesis, if I may use the term, may be completely desensitized against the protein of one bacterium and be sensitized the next attack with another. So that, if the vaccine which was once effective fails a second time, the sputum must be studied again and a new sensitizing organism found.

The duration of anaphylactic desensitization against bacterial proteins seems to follow very closely my observation of the duration of immunity against the respiratory bacteria. Acquired immunity, either by an attack of bronchitis or vaccination with a mixed vaccine containing the bacteria usually found in sputums from bronchitis, confrs an immunity varying from six weeks to six months. Desensitization with bacterial vaccines seems to give approximately the same period of immunity from anaphylactic manifestations.

The treatment of asthma, no matter what the cause, will fall short of attaining the desired results if the associated chronic bronchitis is neglected. You have all had experience with the treatment of chronic bronchitis with expectorant mixtures. I dare say you have not found the results particularly brilliant. I have had considerable experience, in the past four years, in the treatment of chronic bronchitis, per se, in association with pulmonary tuberculosis and with asthma, and I know of nothing that is half as effective as autogenous vaccines intelligently chosen and properly made. The principal bacterial offenders are Streptococci, principally hemolyticus, Pneumococci, chiefly belonging to group IV, Bacillus Friedlander, and a gram

negative bacillus unclassified. Occasionally staphylococci and diptheroids play a part and Paratetragenus, the gram positive tetroid I mentioned before, when it is running in epidemic form, as it did last year.

In conclusion I may say that since Walker showed us the way, we have made considerable progress in the treatment of asthma, but we have not yet succeeded in permanently desensitizing asthmatic patients. The real problem of the cure of asthma is not the relief or prevention of the attacks, but the removal of the initial sensitization which occurred before symptoms of asthma became manifest. Some day, perhaps, we shall find out what the phenomenon of anaphylactic sensitization is; then, perhaps, we shall also learn how to produce a condition of permanent anti-anaphylaxis. Then we shall be able truly to say that we can cure asthma.

A Consideration of Intestinal Fistula Following Appendicitis.

James C. Kennedy, M.D., F.A.C.S.

AFTER investigating the statistical reports of several large Hospitals in Greater New York, I found the mortality in Appendicitis to be about 16 per cent. This to me was alarming, and should not be. In justice to these Hospitals it is but fair to state that in the clean cases, so called early cases, interval cases, in fine cases, operation at the proper time, no deaths occurred. The cases in which mortality was found were principally those of general peritonitis, suppurative peritonitis, and moribund cases on admission. While this Hospital report investigation was made some little time back, my late experience in Hospital wards together with inquiries made among my Surgeon friends working in Hospitals, I am convinced that conditions have not materially changed to date, and this in the face of the fact, that the medical profession generally speaking, now have a very thorough knowledge of this disease. Wherefore this high mortality? Is it because a timid laity urges the attending physician to carry medical treatment to the danger point, or has the physician presuming on an 80 or 85 per cent. cure by medical means permitted his case to be led beyond bounds where even surgery is hopeless. Perhaps it is unfortunate that it is unethical for medical societies to make an appeal to the public

through the press, so that they might lend aid in cutting down this death rate. Yet it seems more than unfortunate, that the lauding of the ice bag by a distinguished internest for the cure of appendicitis crept into the public press, following which in my own hospital practice recently at short intervals three patients were admitted who had part of their abdominal walls covering their appendices sloughed almost down to their peritoneums. This injurious publication, it is safe to say cost quite a few lives. The prolonged use of the ice bag should be condemned.

The foregoing is but a preface to the introduction of but one of the dangerous sequelae sometimes accompanying this familiar disease. Because Intestinal Fistula holds a prominent place among the many complications that beset acute appendicitis, it must be kept in mind.

It not only entails suffering but often invites disaster, and whether or no the surgeon's technique has anything to do with its production, its relief is, nevertheless, sought at his hands; his prerogative here, at least, is not disputed.

When local treatment does not avail in fecal fistula, the surgeon may encounter a formidable situation, the correction of which can tax his best surgical ingenuity.

A fact familiar to all Surgeons is that many intestinal fistulae particularly of the fecal variety, following acute appendicitis will, if an attempt is made to keep them surgically clean, undergo a spontaneous cure.

The causes and varieties of intestinal fistula following appendicitis are very numerous. With due deference to the members of the medical profession holding to the contrary, we believe the cause most potent in the production of this particular class of fistula, is a neglect of that cardinal rule formulated years ago by surgeons of good judgment and broad experience: "Operate as soon after the diagnosis of acute infective appendicitis is made, if the disease is progressive." In our experience, early operation is not only wise conservatism and life saving, but the surest means of preventing intestinal fistula following the disease in question.

A cause very fruitful in the production of intestinal fistula is the abandoned appendix after the appendical abscess has been evacuated. Leaving the appendix in certain cases is imperative; particularly is this true when its outer surface makes up part of an abscess wall, which has not only limited inflammation but has acted as a barrier against general peritoneal infection. The removal of an appendix in such a case would simply establish drainage into the general peritoneal cavity; while, on the other hand, its perforated inner wall in all probability will not only create but keep up a fistula until its removal under more favorable circumstances. Furthermore taking out of such an appendix at such a time and place would not only involve considerable risk of infecting the tissues behind and about it, but we have more than once, when suppuration was abundant, found it impossible to locate the appendix. A case exemplifing to some extent the foregoing remarks came under my observation about three years ago.

A boy, eight years of age, was brought into the wards of St. Catherine's Hospital in an exhausted condition after having suffered some two weeks with acute appendicitis. Why he was sent to the operating table at this late hour can only be conjectured. A large fluctuating tumor in the right iliac fossa was in evidence. One of my colleagues on whose service he was, hurriedly evacuated a large abscess cavity which was filled with foul smelling pus with a distinct fecal odor. The finger, hastily swept around, disclosed the fact that the appendix was buried in and made up part of the abscess wall and should be dealt with later on. Four months following, the same patient came into my service for the cure of a fistula which discharged a small quantity of a purulent fluid occasionally tinged with fecal matter. A small probe could be passed through the fistulous opening and supposedly into the intestinal canal, and an indurated mass could be made out about the fistulous tract. After packing the tract with gauze an incision was made immediately above the tumor, whch permitted an easy exploration of the condition from within. The caecum was found pressed up against a mass of tissue made up of the obliterated abscess cavity in which was buried the greater part of a very large appendix, with a perforation communicating with a sinus leading through and onto the external abdomnial wall; the inner end of the fistulous tract opening through the base of the appendix into the caecum. This, perhaps, was as large an appendix as is usually seen.

I am convinced that the patient's life would have been seriously imperiled had the first operation been completed, because of the boy's bad physical condition and because its completion would necessitate breaking through the protecting wall of which the appendix formed an integral part, while at the second operation the micro- organisms were contained only in the cistulous tract which, by means at our disposal, could be controlled, thereby permitting an aseptic operation to be done, and hence putting the chances of recovery almost beyond the possibility of failure.

Two factors in the production of intestinal fistula following appendicitis commonly noticed are, a gangrenous area of the caecum, which is either too large to close in at the time of the original operation, or which is not closed because of the danger of infection if extensive reparative work is attempted, and the forming of inflammatory necrosis at the seat of the appendical base, after the appendix has been removed. As an instance of the former, a strong, healthy man, policeman by occupation, came under my observation, with a large fecal fistula which had existed for a year and dated from an operation performed by an excellent and careful surgeon of this city. The surgeon, at operation, found the conditions as described above, and in due time urged operation for the closure of the fistula, but it was refused.

After I had detailed the difficulties that might be encountered in an attempt to close the fistula, the patient again declined, and the

last I heard of him he was doing duty and still had his fistula,—a case of the latter type—that is, where inflammatory necrosis developed after the appendix had been removed is well shown by a case which I had in St. Mary's General Hospital some time ago.

A. J. W., age 35 years, married, born in this country; the condition of his appendix was such that it could only be tied off after free pus had escaped in large quantities. Four weeks later, when his recovery was thought to be about complete, he insisted on leaving the hospital; there was still remaining, however, a small sinus which was to be treated at home by his family physician. After three or four weeks, when summoned to his bedside, I was astonished to find a large fistula, evidently a perforated caecal wall through which immense quantities of fecal matter escaped. The man was septic and had developed a septic pneumonia, from which he died.

A rare case of intestinal fistula is one which originates spontaneously through the rupture of an appendical abscess on to the skin surface; such a case I found on my service at St. Catherine's Hospital four months ago. In the children's ward there was a small boy, much emaciated, about eleven years of age, suffering from a fecal fistula. The child had considerable temperature, pulse weak, was restless and the skin was excoriated about the fistulous opening. He had been sick some weeks at home, the parents refusing to have him operated on until they saw every other chance gone. He was in the hospital but a few hours when a tremendous abscess in his right inguinal region burst, discharging quantities of puss and fecal matter.

Our efforts to give the child strength being futile, and, as on the contrary, he grew steadily worse, we deemed it advisable to make some attempt to close the fistula. He had at the time of the operation and for some time previously, a temperature of 101 degrees, and was emaciated in the extreme from his inability to take food and from loss of sleep. After the fistulous tract had been packed with iodoform gauze an incision was made above the indurated mass, and with the tactile sense alone the caecum was found to be attached to the abdominal wall at about the appendical base. With the finger in the peritoneal cavity as a guide, the mass, consisting of scar tissue together with the fistulous tract, was dissected out.

The tumor on being separated from the caecal wall exposed an oblique opening on the convex border of the caecum about one half inch in length; this was closed, the wound in the gut healed quickly, but the union in the abdominal wall broke down at several points, possibly because of the child's poor resisting power. The patient made a slow but good recovery.

In this city an old lady some 80 years of age, a member of a religious order, suffered from a tumor in the right iliac fossa, accompanied by the usual signs of intra abdominal suppuration . She was informed that she had appendicitis and that in our opinion with or without an operation her condition was serious, particularly because of her age. She was pleas-

ed that the fates, through the instrumentality of a mortal disease, would soon enable her to reap a well-earned reward, which a service of 50 years in the sisterhood had justly entitled her. After two weeks of suffering there was a sudden cessation of pain with a marked diminution in the size of the mass, accompanied by the passage of pus per rectum in large quantities. This abscess would fill up and discharge through the rectum at intervals of about two months, greatly to the discomfort of the patient. She lived to my knowledge for a year following the first rupture, after which time she passed from my observation. This was evidently an evacuation of an abscess cavity into the intestinal canal. The type known as the internal intestinal fistula following an inoperable appendicitis.

Rupture of a diseased appendix into the free peritoneal cavity or of a rupture into an intestinal wall through appendical influences are almost too common to site a case. However, in order to impress on the minds of any who might be skeptical as to the gravity of intestinal fistula following appendicitis, I will mention the following case: W. J., one of my medical neighbors referred a case to me at St. Mary's General Hospital, German, 24 years of age, of excellent habits was sick with appendicitis for six days. On arriving at the hospital his face wore an anxious expression, his eyes were sunken, pulse almost imperceptible, temperature sub-normal, abdomen enormously distended and tympantic. The question immediately arose as to whether or no the man should be troubled with any kind of an incision. Humanity, however, took the place of mortality conservatism. The man's abdomen was opened under cocaine anesthesia, given vent to quantities of pus, irrigation and drainage completed the work; the whole procedure requiring but a few minutes. He lived but a few hours. At autopsy the appendix was found to be ruptured close to its base, permitting the intestine to discharge its contents into the free peritoneal cavity.

In the female the havoc wrought by deep seated appendical abscesses frequently so damages the ovaries and tubes that their immediate removal is demanded. In one instance of this kind after breaking up of adhesions which bound a coil of intestine to the bladder wall, a distinct fistulous opening was exposed in the bladder and intestinal walls; both wire closed, but the patient lost her life from the fury of a strepticoccus infection.

Other varieties of intestinal fistula following appendicitis than those already mentioned, are the fistulae with multiple and cribriform openings and the blind fistula. Sonnenburg, cites a case of the latter occurring in his practice (not post-operative) in which communication had formed between the caecum and a pocket containing a fecal concretion. In this case the appendix had sloughed and left a perforation opening into the bowel at the base of the appendix. The re-active peritonitis had been able to build a wall of adhesions dense enough to shut off the peritoneal cavity. These blind fistulae are rare and are nearly always a surprise to the surgeon

when they do occur. In a series of 257 of my own cases in which I have observed the matter of intestinal fistula, there were four that lasted more than three months and passed from my observation. One which I reported above died, being hopeless from the beginning the other died without there being any attempt made to close the fistula. In 27 cases, fistula occurred but recovered spontaneously. In all these cases I was only able to tie off the appendix. In the remaining 224 cases we inverted the appendical stump according to the Daubarn method in which no fistula followed. During the period in which these 257 cases occurred I have operated on six cases for the cure of intestinal fistula; two of these were my own cases, four were cases on which other men had done the original operation. All did well except the case mentioned.

Recently I have had other cases, a few of which I will briefly mention, they are a type of some others that I am unable to report here

Bessie A., age 14 years, Italian parentage, entered St. Catherine's Hospital December 29, 1919, with an acute abdomen, due to a ruptured and gangrenous appendix, with a history of having been sick four days at home. Previous and family history negative, Physical examination negative except foul breath, furred tongue, parched lips, abdomen enlarged, tender all over especially at McBurney point, Pulse 150, Temperature 104, Urine negative.

Blood examination, red cells 4,-500,000, white cells 27,000, polynuclear 92 per cent, mononuclear leucocytes 1 per cent, lymphocytes large 2 per cent, small 6 per cent. Patient entered hospital 6:45 P. M. same date.

Ether anesthesia, incision over McBurney point, abdomen filled with foul smelling pus, appendix perforated, and gangrenous almost to its base. Appendix tied off because it could not be inverted Mickulitz drain attached to the stump, and a soft fenestrated rubber tube passed out through the flank, wound closed in the usual way, time of operation 15 minutes. The patient to our surprise did not die, but in due time did develop a fecal fistula. After a stormy three months, March 10, 1920 an attempt was made to close the fistula. Caecum was adherent to the abdominal wall, which was freed with difficulty, when a long fistulous opening in its upper wall of the caecum was freshened and closed with number aught chronic gut, followd by lamberts stutures of fine pagenstecher linen some packing about a Mickulitz drain compelted the operation, time of operation 40 minutes. The patient's resistance being extremely poor, after some days the closed caecal fistula again broke down, after another stormy few weeks on April 8, 1920, the final effort was made to close the fistula. Under the anesthesia by the drop method; now much of the abdominal wall had necrosed and sloughed, strong adhesions were severed, the caecum resected and a lateral anastomosis done between the small intestine and the ascending colon. At this operation a large fecal impaction was found high up in the rectum reaching almost into the sigmoid. As the patient was in bad shape, this was hastily broken

up, followed as post-operative treatment with oil and asafoetida enemas, a crescentic flap of skin and fat taken from the adjacent wall was swung around to cover the anastomosis, time of operation one hour and a half, the patient was taken from the table almost pulseless and in profound shock, enemas and stimulation, and after another stormy peroid, she began to improve, her fecal impaction was relieved and her bowels moved regularly. Pathological findings of the resected intestine: Glands of the intestine swollen, round cell infiltration of mucosa and submucosa with the lymphoid cells increased. No malignancy, pathological diagnosis, subacute inflammation of colon. Discharged cured May 5, 1920.

Recently the thin tissue of the plastic operation, covering the anastomosis broke down to some extent which with the usual care soon healed.

Some six months ago we operated on a young man 28 years of age for suppurative appendicitis at St. Mary's Hospital, the appendix was at its outer two-thirds, swollen, inflamed and perforated, the man was septic, the appendix was removed and the stump tied off, because it could not be inverted, as he had free pus in the peritoneal cavity, he was drained through the loin, and the anterior abdominal wall. He made a recovery in due time, leaving the hospital in three weeks, but with a small fistula discharging a thin seropurulent fluid, as he was my private patient, he came to my office to have this treated, despite my best efforts after three months this fistula remained. At my office, with due aseptic precaution we enlarged this fistulous opening at its exit on the abdominal wall, and on passing a probe deep into the tract something hard could be felt at its base, the sinus was still further enlarged and the flat end of a probe passed under a hard fecal concretion which was slowly dislodged, this had evidently escaped us at operation and at its effort to escape embedded itself in the lower end of the fistulous tract at the opening into the caecum, some slight fecal discharge followed the removal of this concretion for about ten days when perfect closure took place. No doubt there were sufficient bacteria embedded in this concretion to cause the seropurulent discharge which kept this fistula open and caused sufficient necrosis about the caecal exit to account for the fecal discharge for the ten days following its removal.

Two points in the treatment of appendicitis which have to do with the production and continuance of intestinal fistula are first, the management of the appendical stump and second, prolonged drainage. We have tried several methods of treating the appendical stump, from the mere tying to the entire inversion of the appendix according to the Edibold method, and in this last I did not succeed. I have finally settled down to the Daubarn method, and when able to invert at all, this has yet to disappoint me.

Ligaturing an appendical stump as you would an artery, when other and better means could be used, should be avoided, because

there is a fluid in the lumen of the appendical stump laden with bacteria which will quickly attack the circle of tissues disabled by compression anemia under the ligature. It must not be forgotten that symptoms at times do not even suggest the pathological conditions of the appendix, I have at operation found a rupture of an appendix come on, so far as symptoms are concerned, within 10 or 12 hours. This is accounted for by the type and verilance of the bacteria entering into the infection.

Of late I have become more radical in these late cases of gangrenous and desperate cases of appendicitis, wherein these hazardous cases of fecal fistula are likely to occur, particularly when the caecal wall has been invaded by bacteria, or where the infection has disturbed the capillaries, disabling the caecal wall to a marked degree. Here I believe the caecum should be removed as is a gall bladder where its walls are thoroughly diseased or if the diseased area of the caecum is not large, excision should be done as in gastric ulcer. A case typifying the latter condition is briefly mentioned here.

J. K. age 42 years, U. S., previous health good, family history negative brought to St. Mary's Hospital April 4, 1920, with the following history. Three nights before admission, drank some rotten whiskey which gave him a severe pain in the throat and abdominal region, this pain finally localized in right lower abdominal quadrant. Physical examination negative except as to his abdomen. Laboratory findings, differential blood count, number of blood cells counted 200, stain wrights. Polynuclear neutrophiles 91 per cent, large lymphocites 2 per cent, small lymphocites 6 per cent, transitional 1 per cent, was operated on soon after admission; right rectus incision; right rectus incision, appendix delivered, gangrenous with much adherent and necrotic omentum, both removed. The caecum was necrosed for a small area about the base of the appendix, this area was removed and the opening closed with three banks of sutures, pagenstecher number aught being used for the last lambert layer, a Mickulitz drain was placed at the point of excision, and brought out in the flank, the abdomen closed in the usual way, Some slight seropurulent fluid escaped for about a week or ten days, when the tube was removed. The abdominal wound healed by primary union. He was kept in bed for four weeks and under observation one week longer, always under appropriate diet, he left the hospital at the end of this time in perfect condition. In just such pathological conditions as this in the past, where I did not follow this procedure I have encountered trouble with fecal fistula.

Surgeons must not flatter themselves that they have said too much as to the dangerous sequelae of appendicitis of which intestinal fistula is one. On the contrary, the strongest evidences can be brought to bear that they have not said enough; if they have, their warnings have miscarried; hence they should continue to warn. The evidence I speak of,

is the continued high mortality of appendicitis in hospital practice, notwithstanding the best skill and care are exercised.

In the two hospitals to which I have the honor to belong, practically all the cases lost in my own service, and that of my colleagues, are late and neglected cases. The early interval cases have a mortality of less than 1 per cent., and a very close investigation will show these to be due to tuberculosis, syphilis and rarely to accident. A chance so small as against the dangerous sequelae of appendicitis, can be conscientiously recommended by both physician and surgeon, particularly will this be true if they bear in mind, that nearly all of the more dangerous sequelae, have a mortality, and that a death rate continues to cling to intestinal fistula following appendicitis. "As the sturdy oak springs from the little acorn so from the tiny erosion in the appendical mucosa, the nidus for the growth of bacteria, springs the death dealing complications of appendicitis." Must the doctor doubting the wisdom of early operation in appendicitis, lose a patient for each sequelae before he is convinced that they are to be reckoned with singly or collectively in every case coming before him? If so, a declining mortality cannot in appendicitis at least, mark the track of progressive surgery.

I am following the plan that I suggest above which appeals to me as the best means to prevent, and deal with fecal fistula following appendicitis.

CONCLUSION

1—Early diagnosis when possible

2—Early operation if the disease is progressive.

3—In so called fulminating and late cases study well the pathology of the caput-coli and the adjacent tissues about the appendical base.

4—If bacteria have necrosed the tissues about the appendical base excise the stump and treat the rent as in gastric ulcer, placing a Mickulitz drain over the lambert sutures, provided the patient's condition will permit the work.

5—In obstinate fecal fistula following appendicitis, practically when producing an artificial anus, not only rendering patients helpless, but indangering their lives, resect the caecum and anastomose the small intestine latterly with the caecum.

6—As a large proportion of fecal fistula following appendicitis close spontaneously, unless of the dangerous variety requiring immediate attention, we should wait from 3 to 5 months for this spontaneous cure.

BOOK REVIEWS.

Psychoanalysis: It's Theories and Practical application. By A. A. Brill, Ph. B., M. D. Lecturer on Psychoanalysis and Abnormal Psychology, New York University. Third Edition, thoroughly revised. Octavo of 468 pages. Philadelphia and London: W. B. Saunders Company, 1922. Cloth, $5.50 net. The J. F. Hartz Co., Ltd., Toronto. Sole Canadian Agents.

A Text-book of Physiology: for Medical students and physicians. By William H. Howell, Ph. D., M.D. Professor of Physiology, Johns Hopkins University, Baltimore. Eighth Edition, Thoroughly Revised. Octavo of 1053 pages, 308 illustrations. Philadelphia and London: W. B. Saunders Company, 1921. Cloth $7.25. The J. F. Hartz Co., Ltd., Toronto. Sale Canadian Agents.

Diseases of the Skin and the Eruptive Fevers. By Jay Frank Schamberg, M. D., Professor of Dermatology and Syphilis, Graduate School of Medicine, University of Pennsylvania. Fourth Edition thoroughly revised. Octavo of 626 pages, 265 illustrations. Philadelphia and London: W. B. Saunders Company, 1921. Cloth $5.50 net. The J. F. Hartz Co. Ltd., Toronto. Sole Canadian Agents.

Infant Feeding By Clifford G. Grulee, M. D., L. L. D., Associate Professor and Acting Head Department of Pediatrics at Rush Medical College. Fourth Edition, Thoroughly Revised. Octavo of 397 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1922. Cloth net $5.00. The J. F. Hartz Co., Ltd., Toronto, Sole Canadian Agents.

Diabetes Sufferers Given Message of Hope.

Discovery Made at University of Toronto will be Means of Prolonging Life Considerably—F. G. Banting and C. H. Best Pushed Experiments All Last Summer.

A message of hope to sufferers from diabetes went out authentically recently from the medical research laboratories of the University of Toronto. The modesty of Medical men and scientific investigators of the genuine brand attempts to minimize the results obtained. The harm of exaggeration and the injustice to both patients and research men in wakening false and premature hopes before the extracts can possibly be manufactured cannot be overemphasized. But the fact remains that one of the most important discoveries in modern medical research has been made at the university here. It is not a cure for diabetes, its authors state. Within six months, however, their discovery will be used on a large scale, they hope, to prolong life quite considerably at least. There will be no secrecy, as from the beginning. The medical profession will know all the facts.

Most significant of all the statements in the article issued by the experimenters to the medical profession through the Canadian Medical Association Journal is the little sentence: "The effects observed in depancreatized animals have been paralleled in man." An active pancreatic extract discovered and prepared by two young doctors, F. G. Banting and C. H. Best, the principal experimenters, first prolonged the life of a diabetic dog fifty-six days beyond the records established before. A definite improvement in the condition of seven human patients is reported in the article from a following highly potent extract discovered as a result of the animal experiments injected twice a day under the skin.

Knowing from the work of previous investigators that something is produced in the pancreatic gland that controls the usage of sugar in the animal body, and believing that this native substance has not so far been extracted because it has been destroyed by the digestive ferments also present in this gland, F. G. Banting began working on this hypothesis that the partial degeneration of the pancreas might affect the digesting cells before those producing the anti-diabetic substance.

Concentrated on Problem.

So impressed with the feasibility of Dr. Banting's hypothesis was Prof. J. J. R. Macleod an investigator himself in this field of research for over 15 years, that every opportunity was given to the young doctor from London to push on his experiments. As the best man to assist. Dr. Banting, Prof. Macleod chose Charles H. Best, a clever young graduate in the physiology and bio-chemistry course, who celebrated his twenty third birthday a few days ago. Together they concentrated upon the problem in hand.

Work on the new hypothesis began in May. All through the heat of the summer the two young men, soon fast friends, pushed their experiments night and day. Both had served overseas. They had this in common too, and they often slept beside their work.

Everything that Banting possessed in the world he staked on the result. He had just been appointed a junior position in surgery and an assistant in general physiology at the University in London, Ontario, when he got his idea while reading an article dealing with the Isles of Langerhans, a peculiar tissue of the pancreas to which no definite function had been proved up to that time. Banting had won his licentiate of the Royal College of Physicians and his membership in the Royal College of Surgeons overseas, and was not a "green" youth by any means.

Strangely slow in speech and unassuming, he might be, but also strangely he soon won the reputation of coming across with the punch at the critical moment. Going overseas with the C.A.M.C. in 1917, the year after graduation at Toronto University, he not only won his way from private to captain, but was decorated with the M. C., and wounded at Cambrai. Short term periods on the staff at the Christie Street and Sick Children's hospitals preceded his moving to London two years ago.

But a taste of research work as assistant to Prof. Miller, professor of physiology at London, had prepared the ground for his own idea when it suddenly came.

Aided in Many Ways

Best, as a physiologist and a bio-chemist, supplemented Banting and aided him in many ways. He, too, was a believer in taking the chance. Born in Maine, of Canadian parents, he came to Toronto for his education, and was the president of the year of 1920. He was only 18 years of age when he enlisted and went overseas with the second tank battalion.

It was one day in last December when Banting and Best stood facing each other rather fatefully with hypodermic syringes, prepared to give themselves the first dose of the extract they had made from a whole ox pancreas at last. They had to prove to their satisfaction that it was not toxic. "I wouldn't ask anybody to take something that I wouldn't take myself," was Banting's attitude of mind. So Best gave Banting the first "shot." Later on. Banting returned the experimental compliment. Both lived to tell the tale.

"Pancreatic Extracts in the Treatment of Diabetes Mellitus," as the article is called in the Canadian Medical Association Journal,

is signed by J. B. Collip, W. R. Campbell and A. A. Fletcher as well. Dr. J. B. Collip was a third partner, who joined forces with Banting and Best in January after the experiments on human beings were begun. A professor of biochemistry in the University of Edmonton on a year's leave of absence at Toronto University, his Alma Mater, Dr. Collip greatly facilitated the progress of the experiments through his work in refining and concentrating, or removing all toxic qualities from the extract. Doctors Campbell and Fletcher, of the department of medicine, and the Toronto General hospital, superintended the experiments to make use of the discoveries from animals in connection with human beings.

Step by Step.

Step by step, the paper signed by the five leads up to the experiments on the seven human beings. A long step forward towards this result was taken when it was proved that the active principle of the preparation was essentially the same from whatever animal it was prepared. This afforded a much more practicable method of securing larger quantities of extract. "A method was finally evolved," the article says, "by which an active extract, which would retain its potency for at least one month could be obtained from normal adult ox pancreas. Daily injections of pancreatic extract prolonged the life of a completely diabetic dog to seventy days, at the end of which time the animal was chloroformed. Allen states that in his experience completely diabetic dog to seventy days, at the fourteen days."

All through the summer and up to the present time the experimental work has been done on dogs. By the removal of the pancreas a condition which apparently most closely stimulates diabetes in man was obtained.

"Diabetes is a condition in an animal," Prof. McLeod explained, "Which makes it incapable of oxidizing sugar, so that sugar and the starches can no longer be utilized. It is by extracts to counteract this condition that a cure, if there ever is a cure, will come."

Extract is Prepared

"As the results obtained by Banting and Best led us to expect that potent extracts, suitable for administration to the human diabetic subject, could be prepared, one of us (J. B. Cooping) took up the problem of the isolation of the active principle of the gland. As a result of this latter investigation, an extract has been prepared from the whole gland, which is sterile and highly potent, and which can be administered subcutaneously to the human subject. The extract containing the active principle is being further purified and concentrated. A detailed report of the method of extraction, purification and concentration will be published at an early date.

"Patients were placed on a constant diet," the report continues, "varying with the severity of each individual case, and their reaction to such treatment studied for a period of a week after which various samples of extract were administered and the effects observed. The same effects as were obtained in animals were obtained in

man," the report goes on.

These effects on human beings are summarized this way: "Following the production of what appears to be a concentrated internal secretion of the pancreas and the demonstration of its physiological activity in animals, and, under careful control, its relatively low toxicity, we are presenting a preliminary report on the pharmacological activity of this extract in human diabetes mellitus. Clinical observations at this juncture would appear to justify the following conclusions:

1. Blood sugar can be markedly reduced to the normal values.

2. Glycosuria (sugar in the urine) can be abolished.

3. Acetone bodies (which cause many of the toxic symptoms in diabetes) can be made to disappear from the urine.

4. The respiratory quotient shows evidence of increased utilization of carbohydrates (which means that by analyzing and comparing the amount of oxygen consumed and the amount of carbon dioxide given off, you can show that sugar, rather than proteins and fats, are being burned by the tissues.)

5. A definite improvement is observed in the general condition of these patients and in addition themselves report a subjective sense of well-being and increased vigor for a period following the administration of these preparations.

First Case Reported.

The first case reported is that of a boy, aged 14, a severe case of juvenile diabetes. Previous to his admission to the hospital he had been starved without evident benefit. During the first month of his stay in hospital careful dietetic regulation failed to influence the course of the disease and soon his clinical condition made it evident that he was becoming definitely worse. "On January 11 the extracts given were not as concentrated as those used at a later date, and, other than a slightly lowered excretion and a 25 per cent. fall in the blood sugar level, no clinical benefit was evidenced."

But the experiments were continued. "Daily injections of the extract were made from January 23 to February 4 (excepting January 25th and 26th). This resulted in immediate improvement." Charts show the marked fall in the amount of sugar in the urine and the blood.

Another patient it is learnt from another source ate dates for the first time in three years after taking the extracts. He took sugar in his tea, and altogether 110 grams. He ate eleven times more sugar than on an ordinary day under diet, something that would have killed him previous to taking the extracts.

All Were Improved.

"All patients," says the report, "were clinically improved. It is difficult to put in words what is meant by clinical improvement. Those who have been treating diabetes will have recognized as early signs of improvement: a certain change in the skin, the appearance of the eyes, the behavior of the patient, his mental and pyschic activity, and physical evidences as well as his testimony of increased vigor and desire to use his muscles—This is the nature of the im-

provement seen clinically as a result of the administration of these extracts, and, while it is of temporary nature, we believe that it justifies the hope of more permanent results following more adequate and carefully registered dosage."

"Do you think that the effect of continued doses will not have some permanent effect, so that the administration of the entracts can be discontinued?" Dr. Banting was asked. While very reticent, he admitted the possibility that the extracts might give the pancreas a rest and to this extent might have permanent effects.

"When can patients be treated?" Dr. Banting was asked. "Not for three to six months," the doctor replied, decidedly. Not even to his own friends could he supply extract, he declared, even if he so desired. As it was, he said, lack of extract had forced the doctors to discontinue their injections in the case of some of the people who were undergoing the experiment.

Difficulties of Manufacture

"Why can't you manufacture the extract in large quantities right away?" "Because it's a different matter making it by the test tube full and by the barrel full," he declared. Prof. Fitzgerald, in charge of the Connaught laboratories, has provided us with facilities for making it in large quantities, and we are working as hard and just as we can, because we are very anxious to make further investigations."

It has been found that the extract is highly poisonous when given in improper amounts. This shows a decided danger in regulating the dosage, necessitating slow and careful work. All the investigators who have been interviewed have insisted on the importance of this part of the work.

Whether he thought it likely that the extracts could ever be administered by mouth instead of by injections every day was another question the doctor was asked. He would not answer. He did not know, he said. Certainly, though, administration by the mouth was something for which they would undoubtedly try.

The modern treatment of diabetes consists in a reduction of the amount of carbohydrates (the sugars and starches) and, if necessary, also of protein (meat, eggs, etc.) in the diet to such a degree that the percentage of sugar in the blood returns to the normal level. Prof. MacLeod explained "When this is accomplished," he said, "the weakened functions of the body which control the assimilation (metabolism) of the starches and fats are relieved of the overstrain under which they have been progressively laboring and as a result of which they have been progressively becoming more weakened. The rest afforded the functions by reducing of the diet allows them to recuperate so that after some time it is not infrequently the case that some carbohydrates can again be tolerated without producing the symptoms of the disease."

Final Proof Unavailing

Prof. MacLeod, pointed out how it had usually been considered that some structure in the pancreas, such as the Isles of Langerhans, forms the organs in which this

function resides, and that the latter is carried out by means of an internal secretion. Final proof up to these experiments of these hypotheses had been unavailing, however, because experimental diabetes in animals following the removal of the pancreas and diabetes in man is frequently associated with pathological changes in the gland, it has been impossible to show that the administration of an extract had any significant or appreciable effect in reducing the stored-up sugar or ameliorating the symptoms at all. Some of these attempts, however, especially with more modern investigators have met with a certain amount of success, at any rate, warranted to justify further intensive research.

Not alone were the objective symptoms relieved by the administration of the Toronto extract. Prof. McLeod admitted, but the well-being of he patient was undoubtedly strikingly improved. "But these clinical observations would not have been warranted," he added, "had Banting and Best not previously shown in experiments on diabetic (depancreatized) dogs that exactly similar results are obtained, and, most encouraging of all, that in one animal at least life could be prolonged by daily injections of extract far beyond the time during which untreated animals could live.

"Many other corroborative results of the remarkable potency of the extracts have been collected," said Prof. McLeod. "And Collip is concentrating on the best method to prepare them in bulk. These methods, it has been decided, should not be published in detailed fashion until they are thoroughly worked out and the proper dosage has been determined; for we have found out that not only marked toxic effects may be the result of improperly prepared extracts, but that their antidiuretic effect is readily lost by apparently trivial deviation from the prescribed method."

"We are sufficiently impressed with the results so far obtained to state," said Prof. McLeod, "that the pancreatic extract may prove to be a very useful remedial agent in clinical diabetes. We are going to hurry the investigation to completion, so that every detail of the proper method of preparation and administration may be published soon."

Winnipeg Medicos Have Novel Idea

Preliminary steps toward the construction of an office building for the exclusive use of dentists and physicians have been taken here, according to an announcement by one of the doctors interested in the project. One hundred doctors have signified their interest in the proposed building.

The object is to erect a building specially designed for the use of the medical and dental profession. The rents would be controlled by the members of the association. The building likely would be put up on a side street, in order to avoid the high rentals.

EXCLUSIVE SHIRTINGS TAILORED to MEASURE

Distinctive designs and effects in fine quality—Madras shirtings,—Wool taffetas,—Crepe flannels and Silk mixtures.

English Shop Shirts are perfectly tailored from exclusive fabrics, imported direct from England, Scotland and France. It is our privilege to have a clientele in Canada from coast to coast, and throughout the United States, with the result that we are the largest makers of Exclusive Custom Shirts.

Samples and Measurement forms will be gladly sent to out of town clients, and orders completed with particular attention.

Stanley H. Bosworth

"The English Shop"

SPORTING OUTFITTERS, SHIRTMAKERS,
DISTINCTIVE TAILORS, HABERDASHERS,
98 and 100 West King Street, Toronto.

Review of Happenings in the Medical World.

New Director for Red Cross

Dr. Fred W. Routley of Maple, Ont., has been appointed Director of the Ontario Division of the Canadian Red Cross Society, and is taking over his duties immediately at the office of the division, 410 Sherbourne street, Toronto.

Dr. Routley graduate in medicine from the University of Toronto in 1907, and has had an extensive general practice at Maple, Ont., for thirteen years. He is a brother of Dr. T. C. Routley, Organizing Secretary of the Ontario Medical Association.

Dr. Fred Routley has been active in medical circles, having been largely instrumental in organizing York County Medical Society, of which he held the office of President for six years; he has also served on the General Purposss Committee of the Ontario Medical Association. As a Fellow of the Academy of Medicine in Toronto, he has kept in touch with the latest developments in medical science.

Campaign Against Cancer.

Efforts are being made to get the public in Canada and the United States interested in a campaign against that dread disease, cancer, which is now killing one out of every ten persons over forty years of age. It is unquestionable that many of these deaths are preventable, since cancer is frequently curable if recognized and properly treated. In a circular recently issued by a prominent life company to help in the dissemination of useful information about the disease, it is pointed out that cancer begins as a small local growth which can often be entirely removed by competent surgical treatment, or, in certain external forms, by radium, X-ray or other methods. Cancer is not a constitutional or blood disease, and it is not communicable. It is not inherited. Its beginning is usually painless, and its insidious onset is often overlooked. Other danger signals must accordingly be recognized and competent medical advice obtained at once. Every persisting lump in the breast is a warning sign. All such lumps are not cancer, but even innocent tumors of the breast may turn into cancer if neglected. Any sore that does not heal, particularly about the mouth, lips or tongue, is a danger signal. Persistent indigestion in middle life with loss of weight and change of color, or with pain, vomiting or diarrhoea, call for thorough and competent medical examination.

Death of Dr. G. A. Bingham

The death of Dr. George Arthur Bingham at his residence, 68 Isabella street, following an attack of pneumonia was a great loss to the

The late Dr. Bingham was a son of the late William Bingham, of Armagh, Ireland. Born in Durham County, Ontario, in 1860, he received his primary education at Bowmanille High School, and graduated in 1884 from Trinity University, as M.D. He was a member of the Ontario College of Physicians and Surgeons, and from 1884 to 1889 was assistant anatomical demonstrator. In 1889 he was elevated to the professorship of practical anatomy in that institution. In 1904 he became a senator of Toronto University, and in 1905-6 was president of the Ontario Medical Association. He was councillor of Toronto University and a member of the Alumni Association. He became head surgeon of Toronto General Hospital in 1907 and was also a consulting physician on the staff of the Hospital for Sick Children.

For some years Dr. Bingham was a public school teacher at Harriston, Ontario. A member of Old St. Andrew's Presbyterian church, he was also prominent in the Masonic order, being a 32nd degree Scottish Rite Mason. He was an Oddfellow, and a member of the National and the Albany Clubs. His widow survives.

WILL BE GREATLY MISSED

Dr. A. Primrose, C. B., Dean of the Medical Faculty at the University, spoke in high terms of his late colleague. "He will be a great loss to the University, and to the hospitals in which he worked. A man whose ideals have always been placed high, he was an outstanding member of the profession. He was an excellent teacher in clinical surgery and will be greatly missed by the large body of students, and colleagues with whom he had been associated."

To Check Spread of Tuberculosis

Government inspection of cattle in Wentworth was advocated by J. J. Evel, president of the Hamilton Health Association, recently on his return from Ottawa, where he attended a convention of the Canadian Association for the Prevention of Tuberculosis. That diseased cattle were supplying many Hamilton homes with milk, was the opinion of Mr. Evel, and he though that with inspection of the herds or pasteurization of all milk coming into this city, the spread of the disease among children could be decreased. Ottawa had regulations such as he suggested for Hamilton, and they were found to be satisfactory, he said.

Dairymen would not be heavy losers under the arrangement of inspection, Mr. Evel pointed out, as when an animal is condemned two-thirds of its value up to $250, is allowed by the Government. The health viewpoint was more important than the financial aspect of the question, said the chairman. He strongly favored the action of Martin Kerr, principal of the Earl Kitchener School, who is distributing milk to the scholars.

Mother Saved Without Chloroform

Whether the use of chloroform or ether will be continued much longer in connection with surgical operations is a question asked here by citizens who have heard of a caesarian operation performed at Mount Forest, Ont., recently under local anesthesia.

The mother was reported to be out of danger. The child is healthy and weighs 10 pounds.

It is believed that the case is unique in the annals of surgery on this continent. When the family doctor arrived he at once saw that not only was delivery in the usual way impossible, but also that an immediate operation was necessary to save the mother's life. A surgeon, who desires to remain anonymous, was summoned from a neighboring city. He decided that the administration of chloroform would inevitably cost the patient's life. The caesarian section was therefore performd after a hypodermic application of novacain to deaden the nerves. Throughout the operation the patient was conscious and felt no pain and talked to the nurses and doctors.

Ability to Relax Lengthens Life

At the monthly meeting of the Toronto Liberal Women's Association held in the Margaret Eaton Hall, Mrs. Beaton, president, was in the chair. It was reported that membership had increased by 124 since the last meeting.

A delegation was appointed to wait on the School Board to protest against the proposed discontinuance of manual training and domestic science classes.

In regard to a recommendation for changes in the guardianship law, Premier Drury sent word that the Government proposed to take this up, but thought the time had not yet come for the introduction a law requiring a medical examination before marriage. He thought, however, that educational propaganda along this line would be of advantage. Election of officers will take place at the next meeting of the association, and Mrs. Howard Stowe was made chairwoman of the nominations committee. Vocal selections were rendered by Miss Elsie Charlton.

Dr. George D. Porter addressed the meeting on health topics. The avoidance of worry, he said, was one of the most important things to observe if good health and long life was to be retained.

Some form of relaxation was necessary as a preventative and the best form of relation was work. Sleep was a beneficial form of relaxation, and of that each normal human being required eight hours.

Abraham Lincoln, he said, never relaxed and would have gone mad at 52 years of age had he not taken to light reading. Sir Walter Scott overworked himself during the Winter time, and so killed himself, although his Summers were spent in hunting and fishing. Prince Albert, consort to Queen Victoria, never relaxed, and died at 42. Lloyd George relaxed frequently and was pointed to as the ideal public man in this regard.

A healthful hobby, which would take a person outdoors, he approved of. So a boy collecting bird's eggs was on a surer road than the one collecting stamps. Dancing, if not carried on too late, was good, and bridge had its advantages as a relaxation, if not developed into a dissipation. Sensible walking shoes were good. For the business man a walk home in the evening instead of the morning was advocated. Golf, tennis, swimming and skating were beneficial if pursued moderately.

Cigarettes to excess were injurious. Early in the day they may prove stimulating, but gradually as evening comes on they dull the mind. Women, not having to use their heads in the same way as business men, were at liberty to smoke or not, as they liked. Women, he said, reacted less to heat and cold than men. If men attempted the light attire of women during the cold weather they would not live.

Dr. King Put Up Strong Fight

In the fight with disease which ended last week, Dr. King, brother of the Premier, wrote a book on "The Battle With Tuberculosis and How to Win It," a remarkable instance of courage and energy under the drawback of physical weakness.

Chatham Opens Hospital Wing

The General Public Hospital, was thronged with visitors on Saturday afternoon and evening, the occasion being the opening of the new wing. This addition to the building contains 16 rooms for patients, as well as other rooms necessary for the administration and work of the institution. It cost $92,000. Of the 16 patients' rooms 12 were provided by people and organizations of Chatham and vicinity, the donors including Mr. and Mrs. Charles Austin, Mr. and Mrs. Manson Campbell, Mr. and Mrs. Archie Park, Dr. and Mrs. T. K. Holmes, the 24th Kent Regiment Chapter I. O. D. E., the Graduate Nurses' Association, Major George Smith Chapter I. O. D. E. the Park Street Methodist Church, the first Presbyterian Church the North Harwick Assisting Society of the General Public Hospital, the Newkirk Women's Institute and the nurses of the hospital, in memory of the late Miss Wood, a valued superintendent.

At the opening ceremonies which were largely attended, speeches were delivered by J. W. Ward, warden of Kent; Ald. Lauriston, representing the City of Chatham; Dr. T. K. Holmes and Mrs. W. G. Merritt, president of the Ladies' Assisting Society. Dr. Battisby led in prayer.

The Warden of Kent in the course of his address presented the hospital management with a check for $7,500, being the second and final payment on the county's $15,000 grant to the cost of the new wing.

In the evening dainty refreshments were served by the nurses, and a large number of people took advantage of the opportunity to inspect the building. Miss Helene Landon delighted the visitors with selections on the harp, and also with vocal solos, playing her own harp accompaniment.

Accepts Call to Edinburgh

Dr. B. P. Watson, M. D., F. R. C. S. E., F. A. C. S., Professor of Obstetrics and Gynaecology on the Faculty of Medicine of the University of Toronto, has accepted the professorship of obstetrics and diseases of women in the University of Edinburgh. Dr. Watson, who is at present in charge of the department of obstetrics and gynaecology at the Toronto General Hospital, will resign his present charge and, it is expected, will proceed to Edinburgh in July.

The University of Edinburgh is one of the greatest medical schools in the world. It is the largest in the British Empire, and the selection of Dr. Watson from the staff of the University of Toronto is considered a notable tribute to the Toronto Faculty of Medicine. The position is one of the Empire's premier professorships and has been held by many famous medical men. Sir James Simpson was an incumbent when he discoverd chloroform and introduced anaesthesia into midwifery.

Dr. Watson is a graduate of the Scottish University. He came to Toronto from Edinburgh ten years ago to take his present position, severing his former connection with that institution to come to Canada. He is a gold medalist of the University of Edinburgh.

(Continued on page 224)

The Canadian Medical Association

Honorary President—Sir Thomas Roddick, Montreal.
President—Murdoch Chisholm, Halifax. Annual Meeting 1921, Halifax, N. S.
Vice-Presidents ex-officio—Presidents of Affiliated Provincial Societies.
Secretary-Treasurer—J. W. Scane, 836 University St., Montreal.
Associate Secretary—T. C. Routley, 127 Oakwood Ave., Toronto.

THE COUNCIL

ASSOCIATION'S MEMBERS

Geo. A. Bingham, Toronto	F. N. G. Starr, Toronto	W. G. Reilly, Montreal
N. J. Maclean, Winnipeg.	A. I. Mader, Halifax	A. S. McElroy, Ottawa
C. F. Martin, Montreal	N. Allin, Edmonton.	E. W. Archibald, Montreal.
J. S. McEachern, Calgary.	W. G. Stewart, Montreal	B. D. Gillies, Vancouver.
J. G. McDougall, Halifax	H. A. Stewart, Saskatoon	W. S. Galbraith, Lethbridge

REPRESENTATIVES FROM AFFILIATED ASSOCIATIONS

Alberta—F. W. Gershaw, Medicine Hat, ex-officio; A. T. Turner, Innisfail; E. L. Connor, Lethbridge.
British Columbia—I. Glen Campbell, ex-officio; A.S. Monro, G.S. Gordon, Vancouver
Manitoba—R. D. Fletcher, er-officio; T. Glen Hamilton, N. J. Maclean, Winnipeg; D. A. Stewart, Ninette.
New Brunswick—G. G. Melvin, ex-officio, St. John; C. J. Veniot, Bathurst; G. C. Van Wart, Fredericton.
Nova Scotia—John Stewart, ex-officio; K. A. MacKenzie, Halifax; J. K. McLeod, Sherwood, Sydney.
Ontario—J. Heurner Mullin, ex-officio, Hamilton; F. W. Marlow, Toronto; Fenton Argue, Ottawa; T. C. Routley, Toronto.
Saskatchewan—J. A. Valens, ex-offio; P. D. Stewart, Saskatoon; F. W. Hart, Indian Head.

EXECUTIVE COMMITTEE

ONTARIO

G. S. Cameron, Peterboro	Fenton Argue, Ottawa.	C. F. Martin, Montreal
W. Grant, Montreal.	E. Archibald, Montreal.	W. G .Reilley, Montreal.

PROVINCIAL BOARDS

Norman Gwyn, Toronto (Chairman) T. C. Routley, Toronto (Secretary); J. H. Elliott, Toronto (Medicine); E. R. Secord, Brantford (Surgery); Alan Brown, Toronto (Pediatrics); V. E. Henderson, Toronto (Therapeutics, Pharmacology and Physio-Chemistry); F. W. Marlow, Toronto (Gynaecology); G. W. Mylks, Kingston (Obstetrics); F. C. Trebilcock, Toronto (Ophthalmology); Perry Goldsmith, Toronto (Ear, Nose and Throat); Goldwin Howland, Toronto (Neurology and Psychiatry); G. E. Richards, Toronto (Radiology and Physio-Therapy); J. G. Fitzgerald, Toronto (Pathology, Bacteriology and Immunology); H. W. Hill, London (Public Health); D. King Smith, Toronto (Dermatology); J. H. Mullin, Hamilton (ex-officio.)

MANITOBA

J. Halpenny (Chairman), F. C. Bell (Secretary), W. Boyd, A. T. Mathers, E. L. Pope, Winnipeg.

ALBERTA

T. H. Whitelaw (Chairman), A. C. Rankin, L. C. Con, Edmonton; A. Fisher, Calgary

NEW BRUNSWICK

W. W. White, St. John; Chas. P. Holden, Fredericton.

NOVA SCOTIA

J. G. McDougall (Chairman), G. H. Murphy, K. A. McKenzie, D. F. Harris, W. H. Hattie, Dr. A. G. Nicholls, Halifax.

PRINCE EDWARD ISLAND

A. MacNeill, Summerside; W.J. McMillan, Charlottetown; J.C. Houston, Kensington

SASKATCHEWAN

R. H. MacDonald, A. A. Croll, G. R. Peterson, G. R. Morse, T. W. Walker, Saskatoon

Gen. Fotheringham Returns to Varsity.

Surgeon-General Dr. J. T. Fotheringham, about whose treatment by the university since his return from the war a heated controversy has been conducted by many prominent doctors and surgeons of the city, who criticize the new system in vogue, resumes active duties on the teaching staff, it is learned today. One lecture a week will be given by Dr.Fotheringham in clinical medicine. These will begin on February 27. Dr. Fotheringham, in reality, never left the staff. On his return from overseas he continued as an associate professor at a salary of $750 a year. The new systef, however, did not permit him to teach, but he was to draw his salary for five years. This was called "organizing off the staff" by the doctors who have been calling for an investigation of the new system of full-time professorships and of medicine in general as now organized at the university.

Major-General J. T. Fotheringham, C.M.G., M.A., M.B., was assistant director of medical services of the Second Canadian Division France, and director-general of medical service, Canada, until June, 1920.

With many other Toronto surgeons and physicians Dr. Fotheringham sacrificed his practice during the war for the greater good of his country.

Fellowships Open To Canadians

The fellowships supported by appropriations of the Rockefeller Foundation and the General Education Board will be open to Americans or Canadians of either sex holding or qualified to hold degrees of doctor of medicine or doctor of philosophy from approved universities.

The appropriations total $100,000 a year for five years.

Real Progress Made in Cancer Treatment

The West London hospital, while not claiming discovery of a cancer cure, announces remarkable results from a new X-ray apparatus.

The experience of two hundred patients shows that eighty per cent are so far relieved as to enable them to resume ordinary life. Of these two hundred, only ten are dead after a lapse of years, yet a very considerable number had been pronounced inoperable by competent surgeons. One man with tumor which closing gullet prevented swallowing, necessitating artificial opening of the stomach is now apparently in good health and able to eat meat. Another case of a woman with cancer of the breast pronounced inoperable, is apparently well, all sign of the tumor having disappeared.

Some cases definitely have not improved and a few seem to have gone backwards. No case of cancer of the stomach has been treated. It is thought that this condition is unlikely to prove favorable for this treatment.

The hospital adds that "at present all statements necessarily are tentative."

Mount Royal Hotel Company

8 %

Convertible Debentures

Are a First-Class Investment

WE—W. A. Mackenzie & Company, Limited—make this statement in the full consciousness that our reputation will, and should, suffer if it were found to be untrue.

Nevertheless, we have never offered or seen Corporation Securities offered, the earning powers of which have been so well founded.

The Mount Royal Hotel is no experiment for the men undertaking its operation. They are not a group of "hopefuls" and "enthusiasts", but a company of far-seeing successful hotel men—with a reputation of 16 financially successful hotel enterprises at the back of them.

There is not a single phase of the commercial or legal aspect of this investment that we have not thoroughly investigated.

We know The United Hotels Company of America have purchased $1,000,000 of these 8 per cent. Convertible Debentures for cash.

We know the hotel will have the greatest possible support from the great transportation companies and from the people of Montreal and elsewhere.

We know that the estimated income is understated.

We know that the estimated expenditures are overstated. We know the earnings should be ample to meet all interest and dividend requirements.

And we know that the Common Stock now given as a bonus to investors should prove one of the most profitable in Canada.

And so—knowing all these things—we unhesitatingly recommend you to invest in these 8 per cent. Convertible Debentures at par, carrying a 30 per cent. Bonus of Common Stock.

W. A. Mackenzie & Co.,

Limited.

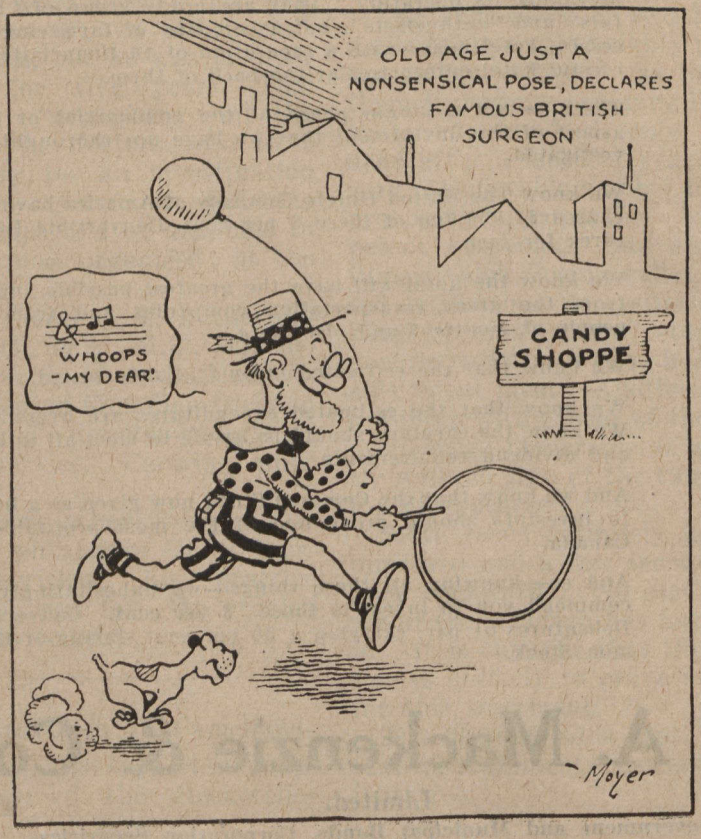
Government and Municipal Bonds, Corporation Securities

38 KING STREET WEST, TORONTO

The doctor attributes his appointment to the reputation of the University of Toronto Medical School. "The eyes of the world are upon the scheme of reorganization which has been going on here for th past two or three years," he said yesterday, "and my experience here is what Edinburgh looks to give an impetus to the work there and to introduce the new methods which we have had an opportunity of doing here." The fame of the Faculty of Medicine of Toronto has spread throughout the world, and it is to such schools that the Empire is looking, Dr. Watson stated. Men come from all over the continent and even from Europe to attend the departments of the Toronto faculty.

Saved Child; Denied Medal

Because it was her own child she saved, Mrs. Frieda Girling, 28 years old, will not receive a Carnegie medal for an act of heroism which has made her perhaps the most talked of woman in the White Plains section.



Twisted Joints of Little Child Become Straight.

The twisted joints of a little child seemed to straighten out under the hands of Mrs. Mattie Crawford of the Pentecostal Brethren as she laid them upon his crippled little legs and prayed over him at the Church of Christ, Cecil street, on Saturday night.

Sobs, laughter and shouts of joy and thanks burst from the gathering of some 600 people who crowded the church to its doors as the woman who carried the child placed it upon the platform, where it walked about before the eyes of those assembled. At first its steps were timid and uncertain, but it seemed to gain confidence with every step and was soon walking with the ease and assurance of a normal child.

Crippled From Birth

This child, whose apparent cure was seen by hundreds, is Gordon Richards, two years of age, 471 West Richmond street. The woman who brought him to the meeting said his legs had been twisted and curled under him from birth. The legs were straight and of normal appearance at the close of the meeting.

In all, 65 persons were annointed and prayed for at Saturday night's meeting.

Raymond Hillier, 12 Coleman avenue, a boy who said he had been blind in one eye, over which a filament had grown, told the audience he could see after Mrs. Crawford had laid her hands over the eye.

Claims Sight Restored

He then placed his hand over the good eye and avowed he could count the lights or the pipes of the organ with that one which had previously been useless.

Others who attended meetings on Saturday and Sunday and declared themselves cured of deafness, eye trouble, rupture, partial paralysis or lameness were; J. E. Glancey, 173 Milverton boulevard; Robt Watson, 46 Essex street; Henry Vandewater, 65 Valley road Mrs. Earnright, 527 Dufferin st., Arthur Watson, 670 Parliament street.

French Doctor Claims Serum Cures Sea-Sickness

Dr. Pozerski, head of the laboratory of the Pasteur Institute, has discovered a cure for sea sickness, it is announced. All the future transatlantic traveller with a weak stomach needs is to be innoculated with Pozerski's serum by the ship's doctor as soon as he gets on board and thereafter he can laugh the best efforts of the storm king to scorn.

For months past, Dr. Pozerski has been experimenting with an ingenious apparatus invented by a well-known engineer. M. Jouan, which reproduces every movement of a storm tossed vessel. He put all sorts of animals, rabbits, guinea pigs, chickens and pigeons in the apparatus none of which was effected even after six hours of the roughest movements. Dogs, on the other hand, suffered severely in 30 per cent. of the experiments unless given some of the Pozerski serum.

Combatting Tuberculosis

Year by year increased attention is being given the world over to the all-embracing problem of lessening the number of deaths from tuberculosis. Reporting cases of this malady to the health authorities is now compulsory—a marked step forward.

Commenting on such compulsory reporting, a leading British medical journal says "If it be possible to direct some of the enthusiasm against the spread of tuberculosis towards better housing conditions of the poor, we venture to predict that this dread plague will decline more rapidly than has been the case in the past. And with the decline of the disease, through action set in motion against overcrowding and allied conditions, we should also see a palpable improvement in the health and morals of the people in other directions."

Pneumonia Vaccine is Still an Experiment

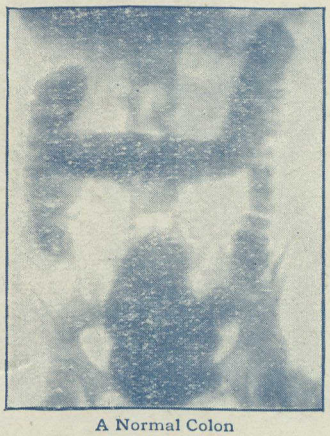
Experiments on prophylactic inoculation against pneumonia have not yet yielded sufficiently convincing proof of its efficacy to warrant universal application in the belief of a special committee of the New York Academy of Medicine that has investigated the matter.

Although they can not now recommend promiscuous use of the vaccines, the medical experts found that the vaccines have some value against there of the fixed bacteriological types of lobar pneumonia and that under the circumstances and until such time as the rules against spitting and unprotected coughing and sneezing are universally followed, the most promising means of preventing acute respiratory diseases lies in the prophylactic vaccine inoculation.

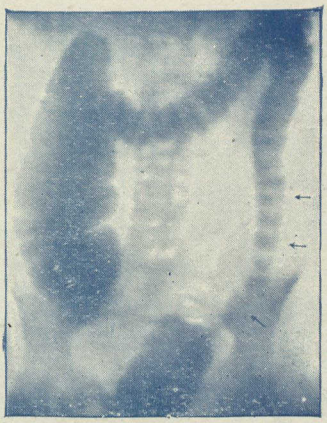
Use of the vaccines by persons coming in continuous contact with pneumonia is approved by the committee.

Galt Doctor Breaks Leg.

Coming out of the General Hospital, after having assisted in performing an operation, Dr. J. C. Hawkins slipped on a step and in the fall broke his right leg at the ankle. He was carried back into the institution and the fracture set. He is now on crutches.



A Normal Colon



A Spastic Colon. Darkest Portion Shows Dilatation—Arrows Indicate Spastic Condition.

Dilatation and spasticity

A prominent authority of international reputation who has made an exhaustive study of the therapeutic value of Liquid Petrolatum says that laxatives of all sorts increase the spasticity of the intestine, whereas liquid petrolatum lubricates and protects the sensitive surface of the spastic bowel, at the same time softening the intestinal contents so as to permit passage through the bowel without mechanical irritation.

NUJOL is especially suitable for all forms of intestinal constipation. It is the achievement of an organization of fifty years' experience in the making of similar products.

Nujol is scientifically adapted by both viscosity and specific gravity to the physiology of the human intestines. In determining a viscosity best adapted to general requirements, the makers of Nujol tried consistencies ranging from a water-like fluid to a jelly. The viscosity of Nujol was fixed upon after exhaustive clinical test and research and is in accord with the highest medical opinion.

Sample and authoritative literature dealing with the general and special uses of Nujol will be sent gratis. See coupon below.

Nujol

A Lubricant, not a Laxative

Nujol Laboratories, Standard Oil Co. (New Jersey)
Room 703 44 Beaver Street, New York

Please send booklets marked:

☐ "In General Practice"
☐ "A Surgical Assistant"
☐ "In Women and Children"
☐ Also sample.

Name.....

Address.....

Mercurosal

A Remarkable Antisyphilitic

MERCUROSAL, a new synthetic chemical, is unquestionably the most noteworthy addition to the list of available antiluetic mercurials.

It is the answer of our research chemists to the quest for a mercury compound that would combine the convenience of the soluble salts of mercury with the therapeutic virtues of some of those that are insoluble, such, for example, as the salicylate of mercury.

Although Mercurosal has just been announced to the profession there is already an impressive bibliography on the subject. The authors of these papers give unstinted approval of the new product. And their opinions are based on hundreds of cases of syphilis in which Mercurosal was the mainstay of the treatment.

The reports of all investigators show that Mercurosal has low toxicity—only one-seventh that of bichloride of mercury. Moreover, there is abundant clinical evidence that Mercurosal possesses high spirocheticidal value, and that its administration, either intramuscular or intravenous, is not attended by untoward symptoms.

Parke, Davis & Company

BIBLIOGRAPHY

SMITH: Mercury in the Treatment of Syphilis; *Illinois Medical Journal*, May, 1920.

BREMERMAN and McKELLAR: Mercurosal in the Treatment of Syphilis; *The Medical Standard*, January, 1921.

MARCHAND: Mercurosal; *New Orleans Medical and Surgical Journal*, May 1921.

ROBINSON: Report of a New Mercury Compound for Intravenous Use; *Southern Medical and Surgical Journal*, October, 1921.

KEANE: A Preliminary Report and Study of the Value of Mercurosal in the Treatment of 60 Cases of Syphilis; abstracted in *Bulletin of the Wayne County (Mich.) Medical Society*, October 31, 1921.

INTRAVENOUS

The usual dose is 0.1 gram intravenously, repeated every 2 or 3 days for 10 or 12 doses. Courses of injections should be alternated with arsphenamine treatments.

INTRAMUSCULAR

The usual dose is 0.05 gram intramuscularly, repeated every 4 or 5 days for 10 or 12 doses. Courses of injections should be alternated with arsphenamine treatments.