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CONTENTS

SCIENTIFIC:

The Rationale of Treatment in Extensive Burns—J. A. Noble	109
What is New in Tuberculosis (Concluded)—A. F. Miller	114
A New Intravenous Anaesthetic—Victor O. Mader	119

DECISION OF CHIEF JUSTICE in Suit against Dr. Alan Curry	122
--	-----

EDITORIAL: Periodic Health Examinations	135
---	-----

CASE REPORTS:

Tumor of the Brain	138
Surgical Reports of Children	139
Pernicious Anaemia and Subacute Combined Degeneration	140
Neurosyphilis	142
Subacute Combined Degeneration	143
Influenza with Complications	145
The Value of the Daily Haemogram in the Study of Acute Sepsis	146

DEPARTMENT OF THE PUBLIC HEALTH	149
---------------------------------	-----

OBITUARY	153
----------	-----

PERSONAL INTEREST NOTES	155
-------------------------	-----

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The Rationale of Treatment in Extensive Burns

By J. A. NOBLE, Mb., Chb., F.R.C.S.Ed.

IT is undoubtedly true that countless lives have been saved owing to the introduction of tannic acid in the treatment of burns. Although eight years have passed since Davidson of Detroit introduced this revolutionary practice and an enormous amount of investigation has been directed thereto, we still find the pathology of this all too familiar form of injury to be shrouded in mystery. But whereas investigators have opposed one another regarding their views as to the cause of death from burns, they have joined unanimously with their clinical colleagues in giving adequate tribute to the efficacy of the tannic acid treatment.

Clinical Course and Pathology: In reviewing this aspect of the subject it is customary, and convenient, to consider separately the progressive phases. The first stage is referred to as that of primary shock, and is characterized by the immediate development of severe circulatory depression, manifested in prostration, pallor, lowered blood pressure and temperature. It is considered to be due to a disturbance of the vasomotor mechanism, and it soon passes off.

In most cases a stage of secondary shock appears in from three to six hours after the injury, of much more serious import than the transitory primary shock. Here there is a continuously progressive fall in blood pressure, accompanied by a diminution in volume of the circulating blood. There is increased concentration of the blood, due probably to loss of plasma, chiefly at the site of injury.

Second Stage. Before coagulation therapy was introduced it was the custom to observe after from six to twenty-four hours that the patient began to show symptoms of a peculiarly severe illness, known as "Acute toxæmia of burns". It is this aspect of the subject concerning which there is such diversity of opinion. The clinical picture is well known, and it was but a short time ago that the surgeon felt helpless in the face of the rising temperature, rapid pulse, quick shallow breathing, cyanosis, restlessness, and the other phenomena which spelled so often a fatal end. And to-day it must be acknowledged that we are almost equally at a loss in the presence of these grave signs. It is here that exsanguination transfusion has proved its worth. But it is in the prevention of this stage of acute toxæmia wherein former methods of therapy have been improved.

That this phase of the condition was popularly known as acute toxæmia is suggestive of the views held regarding its aetiology. The pathological findings at autopsy include:

1. General hyperaemia of abdominal and thoracic organs.
2. Leucocytosis, and destruction of the red blood cells.
3. Thrombi and extravasations through all the body tissues.
4. Degeneration of the ganglion cells of the solar plexus.

5. Oedema and degeneration of lymphoid tissue.
6. Cloudy swelling of liver and kidney cells.
7. Softening and enlargement of the spleen.

These changes are identical with those obtained in certain intoxications, and in infection. Thus it was reasonable for clinicians to assume that some toxin or toxins was the causative factor. But in view of the repeated failure to demonstrate such we have been given two alternative views.

Underhill brought forth evidence to suggest that the increased concentration of the blood is responsible, and his theory has been widely accepted by many American workers. Aldrich claimed that the symptoms are due to baceterial infection of the burned area, particularly with haemolytic streptococci. Various authorities have found that extracts of burned tissue, when injected, do not produce toxic phenomena, further that no toxin can be found in the circulating blood, and also that absorption from the burned area is delayed. These facts have been used against the toxæmia theory. Those who consider the blood concentration to be responsible maintain that the coagulum formed after treatment with tannic acid prevents the fluid loss, which is responsible for this concentration.

The fluid examined after opening blisters has been found to resemble plasma in its composition; and the significance of this lost fluid is apparent when it is recalled that estimations have placed the decrease in blood plasma as being 70% within 24 hours. Apart from that which forms the blister fluid, there is a generalized weeping from the burned area, brought about in part by the increased permeability of the capillary walls. In attempting to restore the normal conditions, it is obvious that whole blood would tend to further increase the concentration; and it is well known that a normal salt solution leaves the vessels, by virtue of their altered permeability, almost as soon as it is injected. The use of gum saline is to be preferred, as it is not open to these objections.

Aldrich, who favored the infective theory, treats his cases with a 1% aqueous solution of Gentian Violet, and others adopting his idea have had slightly better results from the use of a jelly, which is impregnated with the dye. It is claimed to be a specific bactericidal agent, but it is interesting to note that it produced a firm, pliable dressing, preventing exudation and dehydration. In this respect it behaves like tannic acid in producing a coagulum.

An important study of this subject has recently been made by W. C. Wilson, of Edinburgh, and is published in a report on "The medical treatment of men burned in colliery explosions", made for the secretary for mines in Great Britain, by a committee including Professor Wilkie, Professor Haldane, and Mr. Henry Wade. In this report Wilson shows charts, indicating the clinical course of patients under his care, and the relationship of blood concentration to toxæmia and infection. He was able to demonstrate cases in which blood concentration, as registered by haemoglobin percentage, was raised to 130%, without any sign of toxic change. In those cases in which toxic symptoms, of the fulminating variety, did appear, the haemoglobin had fallen to 95%. He inferred from this that increased concentration of the blood plays no part in the production of acute toxæmia. In other cases which developed acute toxæmia he was not able to obtain evidence of infection at the burned site, nor could he obtain cultures on examination of the blood.

The toxæmia theory is the most attractive one, and is only entirely prohibited by the failure up to the present to demonstrate it. However, whether

the coagulum fixes and renders insoluble a toxin, of the nature of a proteose, derived from the burned tissues, or whether it forms an impervious dressing, preventing loss of plasma fluid, thus controlling the concentration of the blood; and whether the coagulum be formed of tannic acid, or of Gentian Violet, it is of no practical importance because it has been definitely established that these symptoms of acute toxæmia can be prevented, certainly in part, by the therapeutic methods outlined below.

Continuing with the course of the illness, it is only necessary to mention in passing the possibility of septic toxæmia ensuing at the end of the first week. At this time there is the danger of bacterial invasion of the dead tissues and the zone of repair where separation is taking place. Finally there is the stage of healing, a process the complications of which are less to be feared now than formerly, inasmuch as more frequent recourse is made to skin grafting, and more concentrated efforts adopted in preventing the mutilating contractures which were all too common reminders of the lack of proper prophylactic care.

Treatment: To combat the shock and collapse, to prevent the loss of fluids from the burned area, and to forestall the absorption of possible toxic products into the general circulation, are the main requirements guiding us in treatment. Shock and collapse may be recovered from rapidly if heat, rest, and alleviation from pain with morphia or codein are provided. However in severe cases of secondary shock the fall in blood pressure may become progressively more severe, and collapse may supervene, the patient falling into a very dangerous state, calling for immediate and thorough treatment. The shortest delay in adopting active measures with this class of case is to add such a severe handicap to his already precarious state, that with amazing suddenness the patient may be found to be beyond succour. This condition should be considered more urgent than an acute abdominal emergency. It calls for prompt administration of fluids intravenously, and rapid coagulation of the burned surface.

Details of Treatment: The patient must be admitted to hospital. As a first aid measure dry picric acid dressings are perhaps best. The loosened epidermis is impervious to tannic acid, therefore the application of this substance in the first instance is not recommended. The use of oils such as carron oil is condemned because they interfere with the subsequent treatment with tannic acid. Upon admission to hospital the patient is put to bed between sterile sheets, and kept warm. Heat is supplied by means of bed cradles under which incandescent lamps are suspended, a temperature of 85-95° being desirable. Morphia is given as needed for the pain and restlessness. In severe cases of profound shock it may be better to supply heat and to administer fluids before the patient is undressed. The blood pressure should be estimated just as soon as other arrangements will conveniently allow. Should it be under 100 mmgm. Hg., 600 cubic centimetres of 6% gum saline is given extravascularly before local treatment is commenced, and a similar quantity immediately following the local treatment. However, if the pressure be above 100 mmgm., it is sufficient to wait until after the lesion has been attended to locally, before 600-1000 cubic centimetres of gum saline is given. This is necessary to counteract the fluid lost during the preparation of the part prior to the application of the coagulant. Fluids may be given by mouth in all cases, and rectal administration may be required in others. It is necessary

to remember, however, that there is generalised oedema during the first stages, therefore the kidneys are not functioning properly, and consequently too much fluid can be given. From 4000-8000 cubic centimetres may be required daily until the concentration returns to normal. A chart should be kept to show haemocrit and blood pressure readings.

It has been emphasized that every moment of delay in dealing with the local lesion is to the patient's disadvantage. Therefore it is essential that he be taken to a warm operating theatre as soon as possible, where the surgeon is cautious in avoiding the least unnecessary exposure. Only one part of the burn is exposed at a time and the treatment of that section is finished before another is uncovered. Anaesthesia is, of course, necessary, and is best obtained with a mixture of gas and oxygen, with perhaps the addition of a small amount of carbon dioxide. Blisters are opened, and loose and devitalised tissue excised. Additional trauma is reduced to the minimum, and older forms of cleansing which consisted in vigorous rubbing and scrubbing are condemned because of the increased exudation of serum and corresponding loss of fluids provoked. Gauze pads, moistened with saline, are used gently in preparing the part for the coagulant. Ether may be required for the removal of oil or tar.

In the early days of tannic acid therapy a simple 2.5-5% aqueous solution was used. This was sprayed on the part periodically until, in about 24 hours, a firm coagulum had formed. A mild degree of sepsis was sometimes found to be a troublesome complication. It can be readily understood that such a form of treatment called for a considerable amount of time and care on the part of the nursing staff. It is also apparent that many valuable hours were lost before the dressing had acquired its final stages of efficiency, and had checked the progress of the illness. Accordingly it is now considered to be an advantage to include acriflavine in the proportion of 1:1000 (or some other mild antiseptic) in the tannic acid solution. Mitchener uses mercuric chloride, 1:2000. Better results are also obtained by using a stronger solution of tannic acid. In Edinburgh we used a 20% solution with considerable success. It is convenient to have tannic acid in packets ready to be dissolved in 100 cubic centimetres of warm sterile water. Gauze is soaked in the solution and it is thus painted on to the prepared area. The great advantage of this technique is that coagulation takes place immediately. Absorption from the burned area and loss of fluids of transudation is forestalled by several hours. Drying can be accomplished satisfactorily and quickly by the use of an electric dryer.

No further dressing is necessary, and the part is left exposed to the air until the coagulum separates, usually during the third week. The electric lamps referred to above may be suspended from the cradle which supports the bed clothes, but care must be exercised to avoid overheating, as excessive perspiration may soften the coagulum. If the burn be superficial, healing may be complete beneath the coagulum, but in deeper burns it is common to find after some days, more or less inspissated serum separating a zone of granulation tissue. This in itself is not an indication for interference.

Particular care must be taken where a coagulum encircles a limb, because of the constriction that takes place. It is best to divide it longitudinally, and thus to guard against the dangers of an obstructed circulation. The shrinking coagulum may cause separation at the edges, and it may fissure and crack, especially along the flexor aspects. When this occurs gauze soaked in alcohol is applied to the appropriate places to prevent the onset of infection, which otherwise would be almost certain to develop in the presence of the continuous discharge therefrom.

It is unusual to find any severe form of infection, but when this does occur, it is shown both locally, in the abundant purulent discharge, and generally by systematic disturbances. The coagulum should be removed and the area treated with fomentations and antiseptic dressings. When as sometimes happens, the front and back of the patient are burned, the part least affected is placed undermost on sterile gauze. Within a day or two after coagulation fresh blisters may form. These are opened, the raised epithelium removed, and the raw areas coagulated.

As the coagulum separates it is cut away and an ointment dressing applied to the raw surface. Wilson favours the following:

Oil of Eucalyptus	1 part
Zinc Oxide	2 parts
Vaseline	8 parts

In softening the coagulum with sterile water it was frequently found that the severe systematic upsets which ensued constituted a serious complication. This was thought to be due to a fresh liberation of toxins. When a concentrated salt solution, such as 2 or 3% sodium chloride, is used, no such phenomena occur.

It is unnecessary to emphasize the importance of keeping daily haematocrit readings. In the presence of rising blood concentration as indicated by high haemoglobin percentages, injections of intravenous gum saline are clearly indicated.

The development of scar contractures should be prevented, by adequate splinting. An account of the plastic procedures adopted in reconstructive work is outwith the scope of this summary. But it is satisfying to note that with the adoption of the principles outlined above, fewer cases of extensive burns are requiring the after care that was necessary in former years. More important still is the fact the burned patient is not exhausted by the prolonged process of suppuration, which formerly left him unfit for further operative interference. But most gratifying of all is the decrease in the mortality rate, both in the early stages from secondary shock, or later, as a result of the onset of acute toxæmia.

Jones:—"Well how are you getting on now you are married?"

Brown:—"It's just like Paradise."

Jones:—"I am glad to hear that."

Brown:—"Yes, we have nothing to wear, and are in daily fear of being turned out."

Patient (at the other end of the phone)—"Is this Dr....who treats crazy patients?"

Nurse, (at office):—"Yes, he treats nervous and mental diseases."

Patient. "Alright, how much does he charge?"

Nurse. "Twenty-five dollars."

Patient (angry). "I am not as crazy as all that." (hangs up the phone).

He—Didn't some brainless idiot propose to you before we were married?

She—Yes. He—I wish to goodness you'd married him. She—I DID.

What is New in Tuberculosis?

(Concluded)

A. F. MILLER, M.D., F.R.C.P. (C).

Nova Scotia Sanatorium, Kentville, N. S.

Oleo thorax: Bernou, a French clinician, in 1922, was the first to propose the use of large quantities of antiseptic oil in the pleural space for its therapeutic value. Since that date much work has been done both in Europe and America, but it is only within the past few years that the nature, limitations and value of this treatment have become clearly known to us. The indications for Oleo thorax are briefly as follows: 1. Disinfection action for the treatment of purulent effusion in the chest cavity occurring in the course of artificial pneumothorax treatment. 2. As an inhibition oleo thorax, that is, to prevent the re-expansion of the lung which is becoming drawn out by pleural adhesions. 3. As a compression oleo thorax, that is, to re-establish collapse of the lung in cases wherein refills of air have failed to keep the diseased lung sufficiently collapsed. 4. Pleuro pulmonary fistula where the opening is a small one. 5. As a substitute for pneumothorax among patients who are unable to come for refills of air over a long period of time. 6. Collapse of rigid wall cavities.

The contra-indications are: 1. Ordinary sero or sero-fibrinous pleurisy complicating artificial pneumothorax. 2. Pleuro pulmonary fistula with a large opening on account of the danger of suffocation or setting up a dangerous aspiration infection.

The oils commonly used are: sterilized olive oil, cottonseed oil, light petroleum or Nujol; Gomenol, 1-10 per cent., may be added to any of these oils on account of its disinfecting properties. I have not the time to deal with the technique we employ, the precautions to be observed, the complications that arise, and their treatment. Oleo thorax should be undertaken only by one who has had considerable experience in its use. Despite the great care that must be exercised in the employment of oil as a therapeutic measure, I feel it has a recognized place in treatment, especially in dealing with purulent effusions which develop as a complication of artificial pneumothorax.

Phrenicectomy or Hemi-Diaphragmatic Paralysis: The third method to bring about collapse of the lung is by evulsion of the phrenic nerve. Simple phrenicotomy, that is, severing or crushing the phrenic nerve was first proposed by Stuertz in 1911, for patients suffering from tuberculosis in whom artificial pneumothorax treatment had failed to bring about benefit. I may tell you that up to 1922, phrenicotomy had been performed on some 24 patients, but as it was observed that the function of the diaphragm returned in about 35 to 40 per cent. of the operated cases, it was felt that this measure had a limited value in effecting the collapse of the lung. It was not, however, until that year, following the research studies of Felix on the anatomy of the phrenic nerve, that this procedure again received renewed at-

tention. Felix explained that the return of function, following a simple phrenicotomy, is due to the fact that accessory fibres arise not only from the 5th cervical, but also, from the 3rd, 4th, 6th, 7th and 8th cervical to join the main stem of the phrenic below the site of resection. In order to interrupt impulses coming from accessory branches, Felix proposed an evulsion or removal of the phrenic nerve after having cut it, by winding it around hemostatic forceps and withdrawing it as one would a basting thread. By extracting 10 centimeters or more of the nerve one may feel quite sure of the complete interruption of all impulses to the hemidiaphragm. If one takes less than 10 centimeters of nerve fibre, and fails to sever accessory or communicating fibres, a return of diaphragmatic function may be expected in about 25 per cent. of cases. The immediate effect of paralysis of the diaphragm is that it loses its tone, becomes flacid and rises in the thorax, partly pushed up from below by the positive intra-abdominal pressure and partly drawn up from above by the intra-thoracic negative pressure. In the ensuing weeks that follow the muscle fibres of the diaphragm begin to atrophy and the membrane becomes converted into a sheet of fibrous tissue. It may be six months, a year or longer, before the diaphragm reaches its maximum height.

The effect of hemi-diaphragmatic paralysis, when the rise of the diaphragm is not prevented by pleural adhesions, is to produce a reduction in the volume of the hemithorax. The greater the rise of the dome of the diaphragm, the greater the collapse of the diseased lung and therefore the greater the benefit. The reduction in the lung volume may at times amount to one-sixth (400 cm.) or even one-third (600 cm.).

The indications for phrenicectomy are briefly as follows: 1. In patients in whom pneumothorax is impossible on account of pleural adhesions. 2. As an alternative to artificial pneumothorax in selected cases of tuberculosis. 3. As a preliminary measure to a thoracoplasty operation. 4. As a supplementary measure for incomplete pneumothorax or an unsatisfactory thoracoplasty. 5. For uncontrolled haemoptysis. 6. For a few cases of unilateral basal bronchiectasis and old chronic pulmonary abscesses with free bronchial drainage.

The contra-indications: (a) The majority of extensive bilateral exudative or productive lesions (b) Undrained empyema (c) Marked intestinal tuberculosis (d) Severe cardio-vascular-renal disturbances.

The results of phrenicectomy among 75 patients operated at the Nova Scotia Sanatorium are of exceeding interest:

Greatly improved.....	37 or 49.4%
Improved.....	19 or 25.3%
Stationary.....	6 or 8.0%
Worse.....	5 or 6.7%
Dead.....	6 or 8.0%
Nerve not found.....	1 or 1.3%
Return of function.....	1 or 1.3%

The immediate cause of death was in no instance due to the effect of the operation; cavities were completely closed in 20 or 33.3 per cent., and tubercle bacilli disappeared from the sputum in 30 or 40 per cent. of these cases.

Paravertebral Thoracoplasty: Thoracoplasty, next to Pneumothorax, is the most important of the operative measures used for the treatment of pulmonary tuberculosis. Cérenville, of Switzerland, in 1885, was the first

to attempt collapse of a part of the affected lung by the resection of ribs. His method was greatly improved upon later by Spengler, Brauer, Wilms and Sauerbruch. This operative procedure commonly known as "paravertebral extra-pleural thoracoplasty", has been in use since 1911, and has long passed the experimental stage. It, with artificial pneumothorax, is undoubtedly the most important advance in the treatment of tuberculosis during the past half century. The operation is used when all other therapeutic measures, medicinal, climatic, dietetic and pneumothorax, have failed to bring about benefit. Thoracoplasty consists in the removal of 1 to 8 inches of the posterior ends of the upper 11 ribs, usually in two or three stages, without opening the pleura or touching the lung. The gaps left by removal of portions of the ribs are filled by a coming together of their remaining ends. This naturally reduces the size of the chest on the operated side and compresses the contained lung thus setting it at comparative rest; obliterates cavities and promotes the formation of fibrous or scar tissue throughout the lung. These various changes bring about encapsulation of tuberculous foci and reduce catarrhal inflammation in the bronchi, with the result that fibrosis in the lung is stimulated, sputum diminished and, in many cases, the complete disappearance of tubercle bacilli comes about. Within a few months the cut ends of the ribs grow together and bony ridges form between them, with the result that respiratory movements on this side are practically abolished. The effect of thoracoplasty is permanent and respiratory function cannot be restored after the disease is healed, as is possible after artificial pneumothorax. This is no serious disadvantage, as it is found that one functioning lung is all that is required to supply the normal needs of respiration.

Indications: 1. Patients with chronic unilateral fibrotic disease in whom artificial pneumothorax is unsatisfactory or cannot be induced. 2. When the lung fails to re-expand after pneumothorax treatment. 3. Pyopneumothorax. 4. Recurrent hemoptysis not relieved by other means. 5. Carefully selected bilateral cases of tuberculosis. 6. A few cases of unilateral bronchiectasis.

Contra-indications: 1. Rapidly progressive bilateral tuberculosis. 2. Cases of extensive tuberculosis of one lung accompanied by recent active lesion in the better lung. 3. Marked cardio-vascular-renal conditions.

Results of treatment in 1,159 cases collected from many sources:

Apparently cured, i.e., able to work.....	36.8%
Greatly improved.....	24.4%
Unchanged.....	2.7%
Worse.....	2.6%
Died, from causes directly or indirectly connected with operation.....	14.1%
Died, from causes not connected with operation, but from natural course of disease to progress in the better lung.....	19.4%

The 61 per cent. of cures and improvements equal the results of artificial pneumothorax treatment. Practically every one of the 1,159 patients suffered from far advanced tuberculosis with cavities, and would likely have died from tuberculosis, had the operation not been performed.

Supplementary Operations: *Extra-Pleural Pneumolysis*, also called *Apicolysis*. This operation may be used when thoracoplasty fails to close a large upper lobe cavity. It consists in separating that part of the lung in need of additional compression from the chest wall and the adherent pleura

on the inside. The space is carefully filled with some solid substance such as fat, lump of moldable wax-paraffin mixture, muscle, gauze pack or rubber dam. Unfortunately the filling used is badly tolerated by the tissues and infection or infusion often develops. The operation is not specially popular in this country and has been used more in France and Germany.

Intra-Pleural Pneumolysis: By this we mean the cutting by the electric cautery of thin, firm, isolated adhesions within the pleural space. It is indicated in cases with certain types of adhesions which interfere with incomplete or unsatisfactory collapse of the lung by artificial pneumothorax. This measure is now used somewhat more extensively than formerly. The operation, however, is not without its drawbacks, and only one who has been trained in the use of the thoracoscope and who has skill in the use of the diathermy cutting cautery should attempt to do work of this kind. We hope to start pneumolysis among a number of our patients during the coming year.

Multiple Intercostal Neurectomy consists in the local injection of pure alcohol into the intercostal nerves. Immobility of the corresponding intercostal muscles is produced. Combined with phrenicectomy it may be found of benefit among a few carefully selected cases of tuberculosis.

Heliotherapy in Pulmonary Tuberculosis: There is but a limited field of usefulness for the application of ultra violet radiation among patients suffering from pulmonary tuberculosis. Accurately spaced doses prescribed cautiously may not harm one suffering from an old fibrotic lesion. Exudative or progressive infiltrations, on the other hand, may be fanned into activity by the careless administration of the quartz or carbon arc lamp. Ultra violet rays should not be ordered for patients suffering with fever, tachycardia or other symptoms of toxemia, as unpleasant reactions and even spread of disease may occur.

Complications in Tuberculosis: I intend to deal only with two complications which commonly occur in the course of pulmonary tuberculosis.

Tuberculous colitis, as you well know, has, until comparatively recent years, been one of the most distressing complications occurring in the course of tuberculosis. The symptoms so frequently mentioned in text books are not early symptoms, but the later manifestations of hopeless disease. To avoid this unfortunate complication, diagnosis must be established in time. This may now be done by the X-ray film and by that alone. At the Sanatorium we have for many years given all patients at admission a barium meal and then have had them carefully X-rayed and fluoroscoped. Once the diagnosis has been established we have with appropriate treatment brought about in many cases marked improvement and even cure of the ulcerations in the intestinal tract.

Our plan of dealing with intestinal tuberculosis is briefly as follows: (1) A bland or smooth diet is prescribed for the patient. (2) We order for some a course of ultra-violet light radiations, for others, cod liver oil and tomato juice—two to four teaspoonsfuls of cod liver oil floated upon the top of three ounces of tomato or orange juice. This is taken immediately after meals and must be served *cold*. The value of oil and tomato juice lies in its high vitamin content, A and D. We find some patients who cannot tolerate cod liver oil. For these we prescribe Haliver oil with Viosterol. At times we use all three measures upon patients. It is true that all cases do not respond

to our method of treatment, but these are usually among those who were hopelessly ill before treatment was begun.

Tuberculous laryngitis: Tuberculosis of the larynx, considered for many years almost as serious a complication as tuberculous enteritis, has no longer the gloomy outlook it once had. I have come to see that rest of the vocal cords, or what we say, *voice silence*, is of incalculable value in the treatment of this condition. The patient is advised not to use his voice, for any purpose whatever, for a period of at least three to six months. In addition we generally employ mild antiseptic sprays,—oil or water, for the larynx. There are a few patients who may also be benefitted from the application of the cautery needle. For patients who are hopelessly ill, tuberculosis of the larynx may still be a distressing complication. I find that blocking off the superior laryngeal nerve with the injection of 85 per cent. alcohol may at times relieve pain and dysphagia.

There are other therapeutic aids in the treatment of tuberculosis, but time does not permit me to deal with them. My experience leads me to believe that any person suffering from tuberculosis is not receiving proper consideration unless he has been carefully X-rayed and an effort made to determine if any of the surgical procedures to which I have referred are likely to be of benefit to him. You may not know that artificial pneumothorax itself offers twice the outlook for recovery as compared to conservative treatment alone. To overlook these means in pulmonary tuberculosis or to miss them at a time in which they are possible, is on a par with overlooking surgery in early cancer.

The day has passed when we can complacently advise the tuberculous patient to live as much as possible in the open air and feed him liberally with milk and fresh eggs. This was the accepted line of treatment some ten or fifteen years ago. While some of these principles may still have to be carried out for many consumptive persons who cannot or will not accept institutional care, it is well for you to know that there has been a notable advance within comparatively recent years in our practice of dealing with tuberculosis. Home treatment for the majority of tuberculous sufferers, no matter how well carried out, cannot compare with the treatment that is available in an institution where all the facilities, x-ray, dietetic, pneumothorax, phrenicectomy, thoracoplasty, are at hand. I would like to feel that every tuberculous person, except the hopelessly ill, who is under your care, has the benefit of a careful x-ray examination. The films should then be submitted to one who has special knowledge in interpreting the pathological changes that occur in the lung in the course of tuberculosis. Information at this time might also be given as to the nature of the disease, progressive or retrogressive, whether home or institutional care is to be advised, and whether or not one of the operative procedures I have mentioned, is likely to be of benefit. If advice of this nature is not to be had in your own locality, by all means send the films to the Nova Scotia Sanatorium, and our radiologist, as well as myself, will look them over and advise you to the best of our experience and ability.

A New Intravenous Anaesthetic

VICTOR O. MADER

DURING the past three months I have had the opportunity of using E. 334-1 (Evipan-soluble) in twenty-two cases. Although this experience is not sufficient to warrant definite conclusions, I feel that a preliminary report on this new intravenous anaesthetic is justifiable.

Through the courtesy of the Medical Research Laboratories of the Winthrop Chemical Company I have been supplied with thirty ampules of the drug. E. 334-1 is the sodium salt of N—methyl—cyclohexenyl—methyl—malonyl—urea, and is supplied as a white powder. It is readily soluble in water and is used intravenously in a ten per cent solution. The dose of the drug is calculated according to the body weight of the individual. A maximum of ten cubic centimetres is used for a patient weighing one hundred and sixty-five pounds.

Injection into the median basilic vein is made slowly, one and one-half to two minutes should be taken to complete the injection. Narcosis occurs in about thirty seconds. The jaw drops, the blood pressure falls slightly and, after one or two deep yawns, the respirations become shallow and regular; the pupils dilate. Care must be taken to keep the jaw forward and the air passages clear. The colour is bright and the pulse remains unchanged through the duration of the anaesthesia. The patient awakes rapidly, and in my cases, with one or two exceptions, without nausea or other untoward symptoms.

This anaesthetic should be classified as an uncontrollable anaesthetic but it is detoxicated so rapidly that it approaches controllable anaesthesia in the ebbing of the effect.

The therapeutic index is stated to be between three and five, which is very high for any anaesthetic. In addition, it eliminates the disadvantages of inhalation anaesthesia.

The cases in which I have used Evipan cover a fairly large variety; fractures, abscesses, chest surgery and others, except operations on the abdomen.

Good anaesthesia can only be depended upon for from seventeen to twenty minutes, but may be enhanced by the use of preliminary morphia or nambutyl. These I have avoided in cases so far. Morphia is said to increase the danger of the anaesthetic, as death, when it occurs from overdosage in animals occurs as a result of respiratory failure.

It should also be mentioned that ether anaesthesia may be used, if it is found that the operation cannot be completed within the time limit. I have not, as yet, found it necessary to use ether.

The following cases may be of interest:—

1. G. Halifax Military Hospital, weight 116 pounds, epididymectomy. 8.25 cubic centimetres of Evipan used followed by 1.75 cubic centimetres given fifteen minutes later. The operation required twenty-five minutes and the patient recovered consciousness in thirty minutes. This is a larger dose than is recommended.

2. V. M. A. C. Victoria General Hospital, weight 120 pounds, (Dr Atlee) Injection of alcohol into broad ligament. 8 c.c.'s of Evipan used. The patient remained in a state of complete narcosis for one hour and twenty minutes. The long anaesthesia may be explained either by the absorption of the alcohol or the fact that this patient had previously suffered from liver disease.

3. J. M. Victoria General Hospital, weight 115 pounds, (Dr. H. K. MacDonald) Empyema, 8.5 c.c's of Evipan gave satisfactory anaesthesia for fifteen minutes. The patient recovered as he was being taken from the operating room. There was no respiratory distress at any time during the operation.

4. C. C. Victoria General Hospital, weight 145 pounds, thenar abscess. 7.5 c. c's gave seventeen minutes anaesthesia.

5. F. B. Halifax Infirmary, weight 120 pounds, dilation of urethra (female) following scar due to radium treatment of caruncle. 8 c. c's of Evipan gave eighteen minutes of anaesthesia.

6. H. M. Victoria General Hospital, weight 170 pounds, felon. 6.3 c. c's gave seven minutes of anaesthesia.

7. Victoria General Hospital, weight 130 pounds, incision of cellulitis of knee 6 c. c's of Evipan used. This patient was irrational and confused for nearly one hour after returning to the ward.

8. O'L. Halifax Military Hospital, weight 150 pounds, dislocation of semi-lunar cartilage of knee. 9 c. c's of Evipan gave fifteen minutes of anaesthesia.

9. D. Victoria General Hospital, weight 150 pounds, skin graft to orbit. 9 c. c's of Evipan gave eighteen minutes of anaesthesia. This man had previously been operated upon several times under ether anaesthesia. The contents of the orbit had been removed for a malignant growth. He remarked especially how easy the induction and recovery from this anaesthetic was in comparison with others he had taken.

10. S. Halifax Military Hospital, weight 155 pounds, skin graft. 9 c. c's of Evipan gave twenty-two minutes of anaesthesia.

11. N. Halifax Infirmary, weight 160 pounds, suppurative-teno-synovitis of finger. 9 c. c's of Evipan gave eleven minutes of satisfactory anaesthesia.

12. R. C. Victoria General Hospital, weight about 130 pounds, second stage thoracoplasty. 10 c. c's Evipan gave fifteen minutes of excellent anaesthesia.

This patient was operated upon two weeks previously under spinal anaesthesia. At the first operation three ribs, nine, ten and eleven, were resected. At this operation the incision was made with procaine infiltration anaesthesia, the Evipan being administered when the ribs were exposed. Four ribs were resected and wound closed while the patient remained in narcosis. Recovery occurred before the patient reached the ward.

13. R. C. A. M. Victoria General Hospital, weight about 115 pounds, bi-lateral Colles fracture. 8 c. c's of Evipan gave thirty minutes of anaesthesia. (Dr. H. K. MacDonald).

This patient was extremely nervous and had had several anaesthetics before. She stated that she was as much distressed and nauseated with this

anaesthetic as she was with any of the others. (This may be explained by the neurotic type).

14. G. Halifax Military Hospital, weight 135 pounds, fracture of tibia and fibula. 8 c. c's of Evipan gave excellent anaesthesia for reduction. Patient recovered while plaster cast was being applied. The patient did not remember returning to the ward from the operating room.

15. M. Victoria General Hospital, weight 135 pounds, Colles fracture. 7.5 c. c's of Evipan gave ten minutes of anaesthesia.

16. E. C. Victoria General Hospital, weight 150 pounds, Ischio-rectal abscess. 8 c. c's of Evipan gave fifteen minutes of anaesthesia. This patient complained of nausea and vomiting which lasted for half an hour after recovery.

17. R. C. Victoria General Hospital, weight about 120 pounds. This is the same patient as No. 12, third stage thoracoplasty. Local infiltration anaesthesia used as in No. 12. Ribs four, three, two and one resected under Evipan narcosis. Patient recovered in fifteen minutes.

The points which have impressed me most as a result of rather limited experience with Evipan are:—

First—the value of a safe intravenous anaesthetic in chest surgery where general inhalation anaesthesia is contra-indicated and other operations where lung disease contra-indicate other anaesthetics.

Second—that it can apparently be used with safety as an adjunct to local procaine anaesthesia.

Third—Its value in minor surgery where only short anaesthesia is necessary. This may be limited to a very few minutes if desired, and the patient may move about or go to his home within an hour.

I wish to thank Dr. W. L. Muir for his help in the administration and supervision in the cases operated upon by me, and his care and vigilance in the use of a drug which is new to both of us.

The Opportunist.

Teacher (warning her pupils against catching cold).—"I had a little brother seven years old and one day he took his new sled out in the snow. He caught pneumonia, and three days later he died.

Silence for ten seconds.

Then voice from the rear.—"Where's his sled?"

They say they multiply quickly. The little boy was standing in front of the rabbit hutch. "What's twice two" he shouted to the rabbit. There was no response. "What's twice two?" he repeated. "There I knew teacher was wrong when she said that rabbits multiply rapidly."

They'll Turn Up.

"I want to find my long lost relatives," writes a Colonial. "How can I do it?" Pretend you won a prize in the Irish Sweepstake.

Decision of the Chief Justice in Suit Against Dr. W. Alan Curry

IN THE SUPREME COURT.

MARSHALL v. CURRY

CHISHOLM, C. J.

The plaintiff, a master mariner residing at Clifton in the county of Colchester, brings this action in which he claims \$10,000 damage against the defendant who is a surgeon of high standing, practising his profession in the city of Halifax.

The plaintiff in his Statement of Claim alleges:

- (1) That after being employed to perform and while performing an operation on the plaintiff for the cure of a hernia and while plaintiff was under the influence of an anaesthetic, the defendant without the knowledge or consent of the plaintiff removed the plaintiff's left testicle;
- (2) In the alternative, that the defendant was negligent in diagnosing the case and in not informing the plaintiff that it might be necessary in treating the hernia to remove the testicle; and
- (3) In the further alternative, that in removing the testicle in the above mentioned circumstances, the defendant committed an assault upon the plaintiff.

The defence, in addition to general denials, is: that the removal of the testicle was a necessary part of the operation for the cure of the hernia; that the necessity for removing the testicle could not have been reasonably ascertained by diagnosis before any operation was begun; that consent to the further operation was implied by plaintiff's request to cure the hernia; and that the plaintiff's claim is barred by the Statute of Limitations.

The plaintiff is 52 years of age; he has followed the sea since he was 16 years of age; and he has never been married. About 30 years ago he met with a serious accident in falling from the fore-yard of a barque some 40 or 45 feet to the deck. His spine was fractured, with injury to the nerve trunks coming off the spinal cord. This injury resulted in a permanent disability in that the plaintiff lost sensation on the back of his legs and around the buttocks and it caused some paralysis of the muscles of his feet.

The plaintiff came to the defendant in 1921, when defendant went over his history and examined him. Besides the conditions above mentioned, the examination showed that plaintiff's bladder was paralyzed; and he had to wear a rubber urinal. Paralysis of the bowel was discovered. He had no control over his bowels, except when very constipated. His bladder was very septic; and the urine contained numerous pus cells and albumen. He had an old compound fracture of one arm and of one foot caused by the fall.

In that year, 1921, the defendant treated the bladder and performed a circumcision. The plaintiff was admitted to the Victoria General Hospital on February 3rd, and discharged on March 28th.

He was again admitted on June 18th of the same year and discharged on July 5th, having been treated for a fistula.

In May, 1929, plaintiff sent for the defendant. He was then in a very serious state, suffering from fever, headache, dry tongue, sinus and general septic poisoning. An examination proved his urine to be badly infected he had stones in his bladder and a large stone in his kidney. The defendant operated in May, drained his bladder, and removed stones. After that he was treated with injections, and the condition of the bladder improved. He had a severe pain in the left loin. A few weeks later an abscess formed around his kidney. The defendant operated a second time—in June—and found a large abscess in the region of the left kidney, with foul-smelling pus, which defendant drained. It was not thought advisable to remove the stone at that time on account of his physical condition. He remained in hospital continuously for six months and never went out during that period.

The plaintiff says with respect to the hernia in his left groin:

"I simply told him (defendant) I wanted the hernia cured. He examined me. He said 'all right'. That was his words."

The operation took place on July 19, 1929. A day or two later the plaintiff was informed by the defendant that the testicle had been removed because it might have caused trouble. He says he did not give consent to the removal and was never told that it might be necessary. After he became cognizant of what had been done, the plaintiff made no complaint until December, 1931.

The defendant states that plaintiff had asked him in July, 1929, what he thought of this hernia. The defendant replied that there was a reasonable chance of curing it; that he thought it was a case suitable for the ordinary hernia operation; the abdominal muscles were in a reasonably good condition. In the operation the defendant found the muscles very much weaker than he had anticipated. In opening the inguinal canal the testicle appeared and was found grossly diseased; it was enlarged, nodular and softened. In order to cure the hernia it was necessary in defendant's opinion to obliterate the canal completely so as not to leave any space. The defendant deemed it necessary to remove the testicle in order to cure the hernia, and also because it would be a menace to the health and life of the plaintiff to leave it. That, he says, was his best judgment in the circumstances. After the operation the defendant cut the testicle in two and found multiple abscesses in it. The defendant gave, as his opinion that if the testicle had not been removed, it might have become gangrenous, and the pus might be absorbed into the circulation, and a condition of blood-poisoning have set up.

Subsequent to the operation complained of, the defendant performed other operations on plaintiff. He removed the stone from the kidney the following month, August, and in September he removed a stone from the back part of the penis. Plaintiff's health improved after this.

Except on the question of plaintiff's virility, there is really no conflict of testimony in the case. Plaintiff himself admits that the injury to his spine from the fall thirty years ago led to impairment. He mentioned certain activities of which he was capable before the operation complained of and which he is now incapable. Medical testimony does not support the plaintiff's statement on the point.

The defendant called as witnesses three eminent surgeons to support the propriety of his procedure.

Hon. Dr. George H. Murphy, Minister of Health, said, that having heard defendant's narrative of the circumstances, he considered that there was nothing else to do but what defendant did, if he wanted to do "good surgery."

Dr. H. K. MacDonald said that taking defendant's statement of the facts as correct, the further operation was absolutely necessary. He was unable to see any other procedure that could be adopted to perform "good surgery". He would expect some complications to ensue endangering the plaintiff's life, if the testicle had not been removed; and he said that a surgeon could not anticipate its condition before the operation.

Dr. John George MacDougall agreed that a surgeon could not have anticipated the condition. He stated that for the health and possibly the life of the plaintiff the further operation was absolutely necessary.

The defendant's professional skill was not challenged on the trial. That he brought to the professional task upon which he entered the amount of knowledge and skill necessary for the performance of the task, was not gainsaid. Nor could it be contended on the evidence that the operations conducted by him were not skilfully performed. The evidence of the medical witnesses supports the opinion that the condition of the testicle revealed by the operation could not reasonably have been anticipated before the operation was begun. That removes from the case the allegation that there was negligence on defendant's part; and, as I conceive the matter, leaves only the question of the assault which is involved in the second paragraph of the Statement of Claim and is concisely stated in the fifth paragraph, together with the question raised as to the time within which the action might be brought.

The following findings are supported by the evidence:

1. That there was no express consent by plaintiff to the removal complained of;
2. That there was no implied consent thereto in the conversations between plaintiff and defendant before the operation; the exigent situation which arose was not then in the mind of either of them;
3. That the extended operation was necessary for the health and in the opinion of the defendant reasonably necessary to preserve the life of the plaintiff.

On these findings it becomes necessary to consider the questions of law which arise with respect to the rights and liabilities of the patient and surgeon and on what principle the action of the defendant must be justified. It seems to me that that justification must be found either in an assent implied by the circumstances which arose or in some other principle—broader than and outside of any consent—founded on philanthropic or humanitarian consideration.

The cases dealing with the duty of the surgeon when he finds himself confronted with an emergency such as arose in the case at bar are few and the questions raised are novel. It may therefore be useful to deal with them at some length.

In 20 *Halsbury's Laws of England*. pp. 332-3, the law is laid down as follows:

"When during an operation a practitioner forms an opinion that it is necessary in order to save the patient's life, to remove some organ or limb, and accordingly removes the organ or limb, the practitioner cannot be charged with negligence for having taken that step, unless there is evidence that express instructions were given by the patient that no organ or limb should be so removed, and that the operation was performed negligently, and it is for the jury to consider whether such instructions were communicated or not."

The text-writer seems to be dealing with negligence; and for this statement of the law he cites the case of *Beatty-Cullingworth*. (1896) which is not published in the regular law reports, but is noted in the *Transactions of the*

Medico-Legal Society, Vol. VI (1909) p. 132, and in the *British Medical Journal* for November 21st, 1896. The case was tried in the Queen's Bench Division by Mr. Justice Hawkins with a jury. The defendant performed an operation of double ovariectomy. Just before the operation, the plaintiff told the defendant that if both ovaries were found to be diseased, he must remove neither, as she was going to be married. He replied, "You must leave that to me" or "You may be sure I shall not remove anything I can help." The plaintiff denied having heard the remark. The surgeon and assistant surgeon affirmed that the plaintiff's life and health would be imperilled by failure to complete the double operation. The jury brought in a verdict for the defendant, the judge in effect telling them that there was tacit consent to the double operation. The jury added the observation that "an action ought never to have been brought". The judgment was upheld in the Court of Appeal and leave to appeal in *forma pauperis* was refused by the House of Lords: "*Taylor's Med. Juris*, (8th ed. 1928) Vol. 1, p. 94. Hawkins, J., observed to the jury:

"If a medical man, with a desire to do the best for his patient undertakes an operation, I should think it is a humane thing for him to do everything in his power to remove the mischief provided he has no instructions not to operate. There was here no question as to the propriety of the operation, and the defendant always told the plaintiff she must give him a free hand if you think tacit consent was given you must find for the defendant."

From the conversations preceding the operation I assume the judge believed there was a tacit or implied consent, and the jury in all probability based their verdict on that ground. If that be so, the case is not of much assistance in considering the case at bar.

Turning then to the American cases, one of the earliest is the case of *Pratt v. Davis* (1906) 224 I 11, 300. The plaintiff in this case, who had long been subject to epileptic seizures, was examined by the surgeon and it was found that her uterus was contracted and lacerated and the lower part of the rectum diseased. On May 13, 1896, the surgeon operated for these troubles. She remained in the sanitarium several weeks and then returned to her home. On July 29, her brother-in-law, at the request of her husband, took her again to the sanitarium and a second operation was performed by the same surgeon who removed her ovaries and uterus. Neither operation was successful and the patient grew worse mentally and was after some time adjudged insane. An action was brought in which it was not claimed that the second operation was unskillfully performed, but that it was performed without her authority or consent. On appeal from a judgment in her favour, Chief Justice Scott stated the rule, which applies to most cases and is generally accepted as a correct statement of the law:

"Ordinarily, when the patient is in full possession of all his mental faculties and in such physical health as to be able to consult about his condition without the consultation being fraught with dangerous consequences to the patient's health, and when no emergency exists making it impracticable to confer with him, it is manifest that his consent should be a prerequisite to a surgical operation."

It was held that the consent of the husband, to the second operation his consent being necessary, was not given and the judgment of first instance was affirmed. But Chief Justice Scott continued:

"Where the patient desires or consents that an operation be performed and unexpected conditions develop or are discovered in the course of the operation, it is the duty of the surgeon, in dealing with these conditions, to act on his own discretion, making the highest use of his skill

and ability to meet the exigences which confront him, and in the nature of things he must do this without consultation or conference with any one, except, perhaps, other members of his profession who are assisting him. Emergencies arise, and when a surgeon is called it is sometimes found that some action must be taken immediately for the preservation of the life or health of the patient, where it is impracticable to obtain the consent of the ailinger injured one or any one authorized to speak for him. In such event the surgeon may lawfully, and it is his duty to perform such operation as good surgery demands, without such consent."

It will be observed that in this case the term "good surgery" appears, I think, for the first time in the cases.

In *Mohr v. Williams* (1895) 1 L. R. A. N. S. 439, the plaintiff consulted the defendant about a difficulty in her right ear. The defendant advised an operation to which plaintiff consented. After the plaintiff became unconscious under the influence of anaesthetics the defendant examined the left ear and found it in a more serious condition than the right and in greater need of an operation. He called the attention of the family physician who stood by and was present at plaintiff's request to the conditions he discovered. He performed the operation on the left instead of the right ear. The patient brought an action to recover damages for assault and battery on the ground that defendant performed the operation without her consent, and she recovered judgment. On appeal, Brown J., after stating that the question was new in the State of Minnesota, there being no case of that State called to his attention and very few cited from other Courts, observed:

"It was said in the case of *Pratt v. Davis*, 37 Chicago Legal News, 213, referred to and commented on in 60 Cent. L. J. 452: 'Under a free government, at least, the free citizen's first and greatest right, which underlies all others,—the right to the inviolability of his person; in other words, the right to himself—is the subject of universal acquiescence, and this right necessarily forbids a surgeon or physician, however skilful or eminent, who has been asked to examine, diagnose, advise, and prescribe (which are at least necessary first steps in treatment and care), to violate, without permission, the bodily integrity of his patient by a major or capital operation, placing him under an anaesthetic for that purpose, and operating upon him without his consent or knowledge.' 1 *Kinkead, Torts*, S. 385, states the general rule on this subject as follows:

"The patient must be the final arbiter as to whether he shall take his chances with the operation, or take his chances of living without it. Such is the natural right of the individual, which the law recognizes as a legal one. Consent, therefore, of an individual, must be either expressly or impliedly given before a surgeon may have the right to operate."

There is logic in the principle thus stated, for, in all other trades, professions, or occupations, contracts are entered into by the mutual agreement of the interested parties, and are required to be performed in accordance with their letter and spirit. No reason occurs to us why the same rule should not apply between physician and patient. If the physician advises his patient to submit to a particular operation, and the patient weighs the dangers and risks incident to its performance, and finally consents, he thereby, in effect, enters into a contract authorizing his physician to operate to the extent of the consent given, but no further."

But he adds:

"Reasonable latitude must, however, be allowed the physician in a particular case; and we would not lay down any rule which would unnecessarily interfere with the exercise of his discretion or prevent him from taking measures as his judgment dictated for the welfare of the patient in a case of emergency. If a person should be injured to the extent of rendering him unconscious and his injuries were of such a nature as to require prompt surgical attention, a physician called to attend him would be justified in applying such medical or surgical treat-

ment as might reasonably be necessary for the preservation of his life or limb and consent on the part of the injured person would be implied. And, again, if in the course of an operation to which the patient consented, the physician should discover conditions not anticipated before the operation was commenced, and which if not removed, would endanger the life or health of the patient, he would though no express consent was obtained or given be justified in extending the operation to remove and overcome them."

Where a person injured by an accident is rendered unconscious, and requires immediate surgical treatment according to this judgment, the consent of the injured and unconscious person may be implied; and, also, where consent to a certain operation has been given, and in the operation serious conditions not to be anticipated, are discovered endangering the life or health of the patient, the surgeon is justified in extending the operation to remove such conditions. In the case, however, it must be assumed that the condition of the patient's left ear was not considered to be of so serious a character as to cause immediate danger to her life or health and that there was reasonable opportunity of obtaining her consent to the operation of the left ear.

The next case of importance to which I desire to refer is *Bennan v. Parsonnet* (1912) 83 N. J. L. 20, where a new principle of law is propounded, namely, that of holding the operating surgeon to be the representative of the patient to give consent. The plaintiff applied to the defendant to operate upon a rupture in his left groin, which two years before had been unsuccessfully operated upon by another surgeon. The patient was put under an anaesthetic by two assisting surgeons, who, when defendant came into the operating room, directed his attention to a rupture in his right groin, which the surgeons considered to be a more serious menace than the other and likely to cause his death should strangulation occur, dangers not to be apprehended from the rupture that had once been operated upon. The defendant operated upon the more serious rupture and intended to operate upon the other but was prevented by the patient's condition under the anaesthetic. The patient upon being informed that the operation would be completed on the following day, apparently acquiesced, but later declined to go on with the operation, and brought an action for assault and battery. The jury found for the plaintiff on the ground that the operation was performed without the patient's consent. The defendant appealed and the verdict was set aside as against the weight of evidence.

Garrison. J., said:

"It is true that the (trial) judge in his charge laid down the common rule with substantial correctness, but it is also true that the introduction of anaesthesia into the practice of surgery has modified the application of the common law rule, in certain fundamental respects of which the law must take notice."

He then refers to the common law rule as stated in *Kinhead on Torts*, sec. 375, and by *Brown, J.*, in the above mentioned case of *Mohr v. Williams* (95 Minn. 261) and adds:

"Without stopping to point out the fallaciousness of the premise that a surgical operation can be contracted for and performed according to plans and specification. it is enough to say that the entire foundation of the supposed analogy is swept away by the surgical employment of anaesthesia which renders the patient unable to consent at the very time that the rule of the common law required that his consent be obtained. . . To meet this fundamental change in the condition of the patient it is imperative that the law shall in his interest raise up some one to act for him—in a word, to represent him in those matters of affecting his welfare concerning which he cannot act for himself because of a condition that has become an essential part of

the operation. The conclusion therefore to which we are led is that when a person has selected a surgeon to operate upon him and has appointed no other person to represent him during the period of unconsciousness that constitutes a part of such operation, the law will by implication constitute such surgeon the representative *pro hac vice* of his patient, and will, within the scope to which such applies, cast upon him the responsibility of so acting in the interest of his patient that the latter shall receive the full benefit of that professional judgment and skill to which he is legally entitled. Such implication affords no license to the surgeon to operate upon a patient against his will or by subterfuge, or to perform upon him any operation of a sort different from that to which he had consented, or that involved risks and results of a kind not contemplated. . . . If the surgeon transcends his implied authority as thus defined, the question of his skill and wisdom is irrelevant, since no amount of professional skill can justify the substitution of the will of the surgeon for that of the patient."

In 1913 the question came up for consideration in Oklahoma in the case of *Rolater v. Strain*. 50 L. R. A. N. S. 880. A young lady stepped upon a nail which penetrated the great toe of her right foot, and inflammation set in. The wound not having healed, a surgeon made an examination and advised that an operation was necessary to effect a cure, and that the operation should be made by making an incision in the foot or toe so as to drain off the joint and remove foreign matter that might be found therein. She consented to the operation upon the express condition that no bones should be removed. An anaesthetic was administered and in performing the operation a sesamoid bone was removed. An action of assault and battery was commenced based upon the contention that the removal of the bone was unauthorized. A verdict was rendered in her favour and the case came up for review before Galbraith (Commissioner) who stated that the questions presented were new, if not novel, in his jurisdiction, and that there were few cases to be found anywhere on the questions presented. After referring to the cases of *Pratt v. Davis* and *Mohr v. Williams*, he followed the general rule laid down in the latter case and held that the operation was performed without the patient's consent and against her orders. He also found that the conditions did not constitute an emergency case. In support of his opinion, he cited a Texas decision handed down in 1913, in which the court of that State said:

"The law as enunciated by the few courts which have passed thereon, is not as clear and satisfactory as it should be in cases of this character, but it seems to be reasonably established that a physician is liable for operating upon a patient unless he obtains the consent of the patient, if competent, and if not, of some one who under the circumstances, would be legally authorized to give the required consent. Of course, consent may be presumed from circumstances, without direct proof; but there must be consent in every case, except in an emergency when to delay to obtain consent would endanger the life or health of the patient; *Rishworth v. Moss*, 159 S. W. R. 122."

One more American case is worth mentioning, that of *Schloendorff v. New York Hospital* (1914) 211 N. Y. R. 126. Although the action was against the hospital, and it was held that the hospital was not responsible for the acts of the surgeon, the case contains a concise restatement of the law by a famous jurist, which cannot fail to command attention and respect. It is relevant, also to the contention that the case at bar is for assault. The plaintiff came to the hospital suffering from some disorder of the stomach. The house surgeon discovered that she had a fibroid tumour. He consulted the visiting surgeon who advised an operation. She consented to an ether examination and she said she told the house surgeon there must be no operation. The ether was administered and while she was unconscious a tumour was removed.

Her testimony was that this was done without her consent and knowledge—was in fact against her wishes; but in this she was contradicted by the surgeons. Following the operation, as was deposed to by some witnesses, gangrene developed in her left arm, some of the fingers had to be amputated, and her sufferings were intense. She brought an action for trespass. Cordozo. J. said:

“In the case at hand, the wrong complained of is not merely negligence. It is trespass. Every human being of adult years and sound mind has a right to determine what shall be done with his own body; and a surgeon who performs an operation without his patient's consent, commits an assault, for which he is liable in damages. (*Pratt v. Davis*, 22 Ill. 300; *Mohr v. Williams*. 95 Minn. 261). This is true except in cases of emergency where the patient is unconscious and where it is necessary to operate before consent can be obtained..”

There are two cases in the Province of Quebec. where the questions discussed in the above came under consideration; *Parnell V. Springle*. (1899) 5 *Revue de Jurisprudence*, 74 and *Caron v. Gagnon* (1930) 68 *Quebec Official Law Reports*, 155. In *Parnell v. Springle*, the facts were that the plaintiff who was suffering from some derangement of the womb consulted the defendant, a surgeon. The latter advised that a minor operation was necessary. She entered the hospital for the purpose and was put under the influence of anaesthetics and after the abdomen had been opened it was discovered that her case was much more serious than at first it was supposed to be, that the ovaries were honeycombed with sacs of pus and the tubes leading from the ovaries to the womb were clogged with matter in a state of putrefaction. This state was discovered by the bursting of one of those tubes. The surgeon conferred with three other surgeons who were present and they agreed that it was absolutely necessary for the preservation of the patient's life, that the ovaries should be removed at once. It was considered impossible then to get the patient's consent to the major operation. Curran, J., the presiding judge, held that the surgeon acted legally and with prudence and was in duty bound in the circumstances to perform the major operation in order to preserve the life of his patient.

In *Caron v. Gagnon* the facts were much the same. The wife of the plaintiff had suffered from some malady of her genital organs from the time of the marriage in 1927 and during the year 1928 had consulted the defendant, who was a specialist in gynecology and obstetrics. He advised an operation called “curetage” a scraping of the womb. which was performed and was attended with success. In May, 1929, the patient was rushed to the hospital on account of an attack of acute appendicitis, and upon being informed by the defendant that it would be necessary to operate immediately and remove the appendix, the husband said “well, if she must be operated on, I want her to be operated on at once and for all”. Nothing whatever was said about any treatment of the ovaries. When the incision was made the surgeon found that, in addition to a diseased appendix, the patient's ovaries were both badly diseased and in such a condition, according to his and other medical testimony, that their removal within a short time would be necessary. They were accordingly removed in this operation and the patient subsequently recovered. After the operation the surgeon informed the husband who apparently made no objection and merely asked the surgeon not to inform the wife at the time.

Plaintiff subsequently brought an action for damages, alleging that the surgeon removed his wife's ovaries without either his or the wife's consent, and thus rendered her sterile. The surgeon contended (1) that he had the consent

of the husband, and (2) that the operation was necessary to restore the patient to health. The matter came on for trial before Sir Francois Lemieux, C. J. and that distinguished judge, while finding there was some evidence of consent, took occasion to deal with the rights and duties of a surgeon in the absence of consent. It was admitted that ordinarily consent was necessary before an operation was begun. The medical testimony, he pointed out, showed that the operation complained of was urgently necessary in the interest of the patient. With the conditions which the surgeon found, and the medical testimony that the removal of the ovaries was for the welfare of the patient the defendant was held not to be liable in the action for damages.

In the above cases these propositions of law find support:

1. That in the ordinary case where there is opportunity to obtain the consent of the patient it must be had. A person's body must be held inviolate and immune from invasion by the surgeon's knife, if an operation is not consented to. The rule applies not only to an operation but also to the case of mere examination, and it is pointed out in *Taylor's Medical Jurisprudence*, p. 59 that although the fact that a visit paid by a private patient to a practitioner implies consent to a certain amount of examination it must not be concluded that such a visit entitles the practitioner to compel an examination more intimate than the patient desires. Such an examination can only be made with the patient's consent; if made without such consent, it is technically an assault.

2. That such consent by the patient may be expressed or implied. If an operation is forbidden by the patient, consent is not to be implied; and *Taylor* again says: "It must be constantly remembered that in this connection silence does not give consent, nor is compliance to be taken as consent".

3. That consent may be implied from the Conversations preceding an operation or from the antecedent circumstances. It is said that if a soldier goes into battle with a knowledge before hand that surgeons attached to the army are charged with the care of the wounded, the consent of the patient may be implied therefrom for such operations as the surgeon performs in good faith upon the soldier.

I am unable to see the force of the opinion, that in cases of emergency, where the patient agrees to a particular operation, and in the prosecution of the operation, a condition is found calling in the patient's interest for a different operation, the patient is said to have made the surgeon his representative to give consent. There is unreality about that view. The idea of appointing such a representation, the necessity for it, the existence of a condition calling for a different operation, are entirely absent from the minds of both patient and surgeon. The will of the patient is not exercised on the point. There is, in reality, no such appointment. I think it is better, instead of resorting to a fiction, to put consent altogether out of the case, where a great emergency which could not be anticipated arises. and to rule that it is the surgeon's duty to act in order to save the life or preserve the health of the patient; and that in the honest execution of that duty he should not be exposed to legal liability. It is, I think, more in conformity with the facts and with reason, to put a surgeon's justification in such cases on the higher ground of duty, as was done in the Quebec cases.

In *Pratt v. Davis*, the right is spoken of as a license: "Perhaps, too," said the court "the various cases which might be supposed of a sudden and

critical emergency, in which the surgeon would be held justified in a major or capital operation without express consent of the patient, might be referred to the principle of an implied license".

The phrase "good surgery" has appeared in some of the cases. Its use is not helpful; it is general and vague and I think ambiguous. It may mean good execution by the surgeon, and in that meaning it does not touch the question of the surgeon's right to operate. In these emergent cases, it is not useful to strain the law by establishing consent by fictions—by basing consent on things that do not exist. Is it not better to decide boldly that apart from any consent the conditions discovered make it imperative on the part of the surgeon to operate, and if he performs the duty skilfully and with due prudence, that no action will lie against him for doing so; as I have stated, that is the jurisprudence established in the Province of Quebec, and I think it can well be adopted in other jurisdictions.

In the case at bar, I find that the defendant after making the incisions on plaintiff's body, discovered conditions which neither party had anticipated, and which the defendant could not reasonably have foreseen, and that in removing the testicle he acted in the interest of his patient and for the protection of his health and possibly his life. The removal I find was in that sense necessary, and it would be unreasonable to postpone the removal to a later date. I come to this conclusion despite the absence of expressed and possibly of implied assent on the part of the plaintiff.

A further defence raised is that plaintiff's case is barred by the Statute of Limitations, R. S. N. S. 1923, Chapter 238, Section 1 of which enacts that actions of assault and battery shall be commenced within one year after the cause of such action arose.

The plaintiff's contention is that he had three years, and not one year, within which to bring the action by virtue of Section 32A of The Medical Act R. S. N. S. 1923, Chapter 113, as amended by Chapter 34 of the Statutes of Nova Scotia for 1930. That section is as follows:

"32A. No person duly registered under this Chapter shall be liable to any action for negligence or malpractice by reason of professional services requested or rendered, unless such action be commenced within three years from the date when in the matter complained of such professional services terminated."

The action is not one of negligence or malpractice, but one of assault and battery. The operation, if unlawful, was technically a surgical battery for which the defendant is liable. The distinction between an unauthorized operation amounting to assault and battery and negligence such as would constitute malpractice is that the former is intentional, the latter unintentional, 115 Kan. 562.

The Statute of Limitations, Section 1, and not Section 32A of The Medical Act applies, and the plaintiff's claim is thereby barred. The plaintiff's action will be dismissed with costs.

C. J.

Editors' Note. This case is of interest because it has happened to one of our local physicians, and is likely to happen to any man practicing Medicine in the course of his duty. We therefore present the judgment for the information of the profession at large. It is interesting furthermore in connection with this case that Dr. Curry is a member of the Canadian Medical Protective Association. We were interested in seeing to what extent that Association would

support him. The idea went abroad that it cavilled somewhat over the paying of the bill presented to Dr. Curry by his lawyer—although eventually they did pay it. We confess that we were ourselves victims of the idea, and those of us who are members of the Association were considerably perturbed in consequence. Seeking the fullest possible explanation of the matter for ourselves and for our readers, we found that Dr. MacDougall of this city, who was very greatly interested in Dr. Curry's defence, is our Nova Scotia representative on the Executive of the Association; we therefore asked him if, from his full knowledge of the case both from the Association's side and from Dr. Curry's, he would let us have his comment upon it. He has kindly consented to do so, and we are presenting it in this issue.

After all, the Canadian Medical Protective Association is *our* protective association, not a profit-making insurance company. We must expect our officers who are our trustees to question lawyers' fees which to them seem exorbitant, and it is to our own interest to support that attitude. And even if it does not do everything, even if it does expect that every practicing doctor shall keep within the law and protect himself as fully as possible, it still offers very real protection at very low cost. We hold, however, that both its advertising and its by-laws should be so clear as to be at once apparent as to just what the Association does not do as well as what it does. It will be found that it does a great deal, and it seems to us that at a time when protection for doctors is becoming more and more a necessity we would be doing ourselves a favour if we gave this Association of ours a hundred per cent. membership.

DEAR DR. GOSSE:—

You very kindly asked me to make some comments for publication in THE BULLETIN, re the Canadian Medical Protective Association and its activities.

As one of the Nova Scotia Executive ever since the Association began to function, I feel it my duty to the profession, to at least touch upon a few points that are of concern to the medical men of this province at present.

We rejoice with Dr. Curry in his complete victory and vindication in the suit brought against him during the past year. This case occurring in the practice of a confrere, whom we all know so well as a man of high standing in his profession, and in the community, emphasizes at least two things:—

- (1) That in the honourable and proper discharge of his duties any medical man, at any time, may have a suit brought against him maliciously.
- (2) The necessity of organized protection, as given by the Canadian Medical Protective Association. Every doctor in this province should avail himself of its protection. No doctor can afford to be without it.

This Association founded in 1901 was incorporated in 1913. It is a legally constituted body, by Act of the Parliament of Canada, and became affiliated with the Canadian Medical Association in 1924. It is in the true sense of the word, ours. It has a well drawn up constitution and by-laws, under, and according to which, it operates.

At the Home Office (Ottawa) the business is conducted by an elected Executive Committee, consisting of six medical men and a local King's Counsel of very high standing, designated "General Counsel of the Association."

"The general objects of the Association shall be:

- (a) To support, maintain, and protect the honour, character and interests of its members.
- (b) To encourage honourable practice of the medical profession.

- (c) To give advice and assistance to and defend and assist in the defence of members of the Association in cases where proceedings are unjustly brought or threatened against them.
- (d) To promote and support all measures likely to improve the practice of medicine.

That in pursuance of the said objects, this Association has undertaken to assist in defending civil actions for damages for alleged malpractice in the practice of medicine or surgery, where such actions appeared to the Executive Committee and to the General Counsel of the Association to be unjust, harassing or frivolous, or where it appears otherwise to be reasonable to afford the member whose conduct is impeached, an opportunity of defending himself before a court of law."

The business pertaining to these objects has always been conducted in a painstaking and thorough manner, as the many cases successfully terminated show, and the members defended and protected will declare.

Important amendments were made in eight of the by-laws, at the Annual Meeting in Saint John, June 20, 1933. One of which, of special importance and interest at the present time, is here quoted in full:—

"Old by-law No. eighteen is repealed and the following is substituted: 'In assisting in the defence of an action against one of its members the Association undertakes, subject to these by-laws, to pay the taxable party and party costs of his defence reasonable and properly incurred along with reasonable and proper witness fees and counsel fees to be settled by the General Counsel of the Association, and such costs should be paid out of the funds of the Association. If in any such case a verdict awarding damages or costs should be given against such member the Executive Committee in its discretion may assist in any appeal from such verdict to a higher court, or, subject to these by-laws, shall assume payment of the damages and costs so awarded'."

The following new by-law was added at the same time as the above:—

"New by-law No. nineteen reads as follows: 'The Association will not assume payment of damages or costs and is not liable in any action in which an adverse verdict is given by reason of evidence which establishes that the damage, or any part thereof, was caused by the act, default, negligence, error or mistake of any person other than the defendant member; or by the member having been under the influence of intoxicants, anaesthetics or narcotics; or by the member acting in violation of any statute, law or ordinance, or in the commission of any criminal act or act with criminal intent'."

If members have in mind changes in the by-laws, either amendments or additions, for the purpose of clarifying the meaning, adding to the usefulness of the Association, it is suggested that these be submitted to the Secretary early, so that they may be gone over with care and put in proper form for consideration at the Annual Meeting this June.

During the past year twenty-seven actions, threatened or brought against members of the Association, came before the Executive. The total cost of defending members is in some cases very large. One in British Columbia amounting to around \$4,000.00—made up of party and party costs, fees of defending counsel, witness fees, etc., and the entire cost was paid by the Association. The record of the Association during all the years it has been in operation is notable. The actions brought (and they are many) were defended

to the full limit, and the financial or contractual obligations re costs, solicitors' fees, etc. were fully discharged by it. Take Dr. Curry's case for example—the Association provided to defend the action, a local counsel of outstanding ability, and his fees, and all other charges were assumed and paid in full by the Association, i.e. the defendant bore none of the expenses; and if there had been any charges or fees for special witnesses they would likewise have been paid, according to the terms of the contract with the members. This case illustrates well the fine record of high class service, and protection given by the Association to its members, during all the years it has been in operation. The amount and quality of protection it has given and is now giving for a five dollar bill is not equalled by anything I know. Such protection for one and three-seventh cents per day is practically a gift, and its reliability is undoubted. To maintain its strength and effectiveness, its membership must be adequate. It is our own organization, each and every member contributes to the good of all, and all to the good of each. Protect yourself by becoming a member, if not already one, and at the same time help to protect all.

This is a well managed business organization. Members should be understandingly conversant with the by-laws governing its activities, and be guided accordingly. Misunderstandings, annoyance, delays and unnecessary expense may thus be avoided. Take one example; "When a member is threatened with an action he should at once communicate the facts to the Secretary for consideration by the Executive," and await instruction, instead of engaging counsel privately. Blank application forms and other literature may be obtained from—

Dr. J. FENTON ARGUE,
Secretary-Treasurer,
116 Nepean Street,
Ottawa.

(Sgd.) J. G. MACDOUGALL

Report on Tissues sent for examination to the Pathological Laboratory, from February 1st, 1934 to March 1st, 1934.

The number of tissues sectioned is 143. In addition to this, 22 tissues from 9 autopsies were sectioned, making 165 tissues in all.

Tumours, simple	12
Tumours, malignant	28
Tumours, suspicious	1
Other conditions	102
Tumours, pre-cancerous
Tissues from 9 autopsies.....	22—165

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and the Secretaries of Local Societies.

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PERIODIC HEALTH EXAMINATIONS.

THE periodic health examination was first brought to the attention of the medical profession by Dr. Dobell of England in the year 1860. Very little notice, however, was paid to this subject until the matter was forcibly brought to our attention by the publication of the results of the examination of recruits for the British Army for the World War. Most physicians are familiar with the figures. It will be remembered that at the age of 18, 38 per cent. of the recruits were rejected on account of physical impairments; that in the age group from 18 to 42 years, 64 per cent. were rejected, and at the age of 50, 89 per cent. Lloyd George's famous dictum on this subject was well warranted.

The strongest argument in favour of periodic health examinations is found in the results of examinations of groups of apparently healthy people.

The examination of school children is now an established procedure in most parts of the world. In the United States different ways of encouraging this work among the school children have been adopted. In Virginia they have what is called the "Five point system." All the school children are examined annually on five points; sight, teeth, throat, hearing and weight. The child measuring up to a certain standard in each one of these five points is given a certificate, signed by the Commissioner of Health and the Commissioner of Education, stating that he is a "Five point child." This system has been in vogue for a number of years, and has been responsible for a great interest in the work, both by the pupils and the teachers. In Southampton County in the year 1927 there were 2,371 children examined by the Health Officer. Of these, 11.9% had defective vision, uncorrected (most of them errors in refraction), .9% defective hearing; 33.8% were more than 10% under-weight; 47.5% had some dental defect, and 24.3% had either pathologic tonsils or hypertrophied adenoids, necessitating operation. These figures compare closely with the results of observations in other parts of this State. In Rockbridge County, Virginia, Mr. R. M. Irby, Superintendent of Education, took a particular interest in the work and made a study of this efficiency of school children in relation to health. In the year 1930-31, 17% failed to pass their examinations in the group having defects corrected; com-

pared with 27% of failures in the group with defects uncorrected. Mr. Irby estimated that one-third of the failures in his County was due to defective health and that the reteaching of these failures cost the County \$12,000.00 per year. He also stated that the average defective child spends one more year to complete his seventh grade than is required for the average "five point" child to do the same.

The value of periodic health examinations to young adults is shown in the results of examinations of students at Dalhousie University. For the past three years the University has maintained a Students' Health Service. Each student is required to submit to an annual physical examination, which is carried out by the staff of the Dalhousie Public Health Clinic. The examination consists in a thorough physical, including sight, hearing, examination of the throat and teeth, urinary analysis and fluoroscopic examination of the chest. Some of the findings are as follows. In the year 1932-33 there were 929 students examined, 215 women and 714 men. Thirteen percent. were found suffering from skin diseases, (chiefly acne, vulgaris, and seborrhoeic dermatitis); 22.8% had defective vision, uncorrected; 14.1% had pathological tonsils; 5.9% required dental treatment; 15.8% showed evidence of past and present disease of the lungs; 12.3% had abnormal feet, and 3.2% suffered from organic heart disease. Of the commoner disabling conditions there were found 30 students suffering from organic heart disease, 5 from active tuberculosis, and 3 from diabetes. All this in a group of apparently healthy and vigorous college students.

In the older age groups we would naturally expect to find stronger evidence to justify the advocacy of the periodic health examination. Such is the case. Dublin, of the Metropolitan Life Insurance Company, reports in the American Journal of the Medical Sciences, October, 1925, on the examination of over 16,000 male policy holders in that Company. In the age group 45 to 54, a most important age group including men at the best period of their life, the following impairments were found; defective vision uncorrected 29.4%; pathologic tonsils 17.1%; carious teeth 9.2%; organic heart disease over 4%; slight arterial thickening 18.2%; blood pressure twenty points above normal 8.3%. Forty per cent. of this group suffered from constipation and over 17% from haemorrhoids. It must be remembered that this group should be considered selective, in so far that the individual members of it were sufficiently healthy to pass examinations for life insurance.

Several of the life insurance companies are now using the periodic health examination as a means of prolonging the life of the policy holder and incidentally, making more money for themselves. F. C. Middleton in an article on the periodic health examination, published in the Canadian Public Health Journal, June, 1929, mentions the work of the Metropolitan Life Insurance Company in this respect. In 1914, 6,000 policy holders of this company were examined and given advice concerning the correction of defects. Five years later only 217 of this group had died, against an expectancy of 286; and ten years later only 421 had died, whereas, according to the expectancy tables, 513 should have died. In other words, there was a saving to the Insurance Company of 92 lives. Dr. Dublin, the statistician of this Company, showed that by the spending of \$60,000.00 in that period there had been a saving to the Company, in more premiums collected and less death claims paid out, of \$120,000.00. He also showed that over a nine-year period there was an

average decrease in mortality of 18% in those taking advantage of the periodic health examination compared with those not doing so.

The value of periodic health examinations in children, young adults, and especially those past the prime of life, is unquestioned. It has been sanctioned by the Canadian Medical Association, the Canadian Public Health Association, the American Medical Association, and special record forms indicating the scope of the examination have been issued. The Department of Health of Canada have issued a booklet dealing with the subject.

We must agree, however, that, so far, the periodic health examination does not occupy the place of importance it deserves in the practice of medicine. Very few people take advantage of it, and most physicians do not stress the importance of it to their patients. Worth while changes come about slowly. The practice of medicine, up to the present time, has been chiefly curative. This is not sufficient. Our duty as physicians is not only to cure, but wherever possible to prevent. The general practitioner of to-day should gradually educate his patients to take advantage of the preventive measures modern medicine has to offer, and among these measures there is none more important than the periodic health examination.

H. G. G.



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CASE REPORTS

TUMOR OF THE BRAIN.

R. M. boy aged 5 years 11 months. Admitted January 18, 1933.

Previous History: No bearing on case.

Family History: Nothing significant.

History of Present Illness.

Sometime in March, 1932, that is ten months before admission, the boy began to vomit every morning upon arising from bed. A few weeks later the vomiting occurred several times each day; it was very forceful and had no relation to meals or the taking of food; and was unaccompanied by any nausea.

This state of affairs continued until July, four months later when he began to have headaches. He was admitted to a hospital where he was placed on a special diet in an attempt to stop the vomiting. In the latter part of July he was discharged from this hospital unimproved.

There does not seem to have been any change in his condition until October when he was re-admitted to the same hospital as his condition had not improved any. He was discharged one month later unimproved. While he was in the hospital or shortly after, this point is not very clear, his legs began to get weak, and he was soon unable to walk and had to remain in bed. About the same time he began to lose weight and to complain of dimness of vision.

In November he was taken to an ophthalmologist who it is said dilated his pupils and found an "injury to the eye". He was confined to a dark room for two weeks and emerged totally blind and has been that way ever since. Roentgenologic examinations of the skull and the Gastro-Intestinal tract revealed no abnormalities. There appears to have been little or no change in his condition up to his admission to the Children's Hospital in January.

Examination on admission:

Mother states that he vomits as severely as ever and that he has occasional headaches. Recently he has had occasional attacks of urinary incontinence and for the past three weeks he has complained of pain in the left arm.

On admission he appeared fairly well, well developed, good colour and nutrition but obviously blind yet bright and keen mentally and with no complaint of headache and no nausea or vomiting. He can walk with assistance, but has some spasticity of both legs.

His skull shows no abnormality of shape and no areas of tenderness. Temperature 99; pulse 110; Respiration 25. All systems were negative except the Nervous System.

Nervous System:

General attitude and behaviour normal; talks normally without slurring or hesitancy and all the higher functions appear quite normal.

The cranial nerves on both sides are normal except the optics. The fundi-oculorum show papillitis with marked engorgement of the veins.

There is slight spasticity of both arms and much more definite spasticity of both legs, more marked on the right. There seems to be no muscular

weakness or wasting and as far as could be determined in a blind boy of this age, no definite evidence of inco-ordination. All sensory functions were normal.

There were bi-lateral Babinskis, plus knee and ankle jerks, greater on right than left. No ankle clonus. The tendon jerks of the arms were slightly increased also slightly more marked on right than left. The organic reflexes were normal except for the history of periods of urinary incontinence. And the abdominal and cremasteric reflexes were very sluggish especially on right.

The Kahn test on the Blood was normal and the spinal fluid normal, as regards pressure, chemistry, cytology and serology.

Course of the Disease:

Apart from a very infrequent vomiting the child was comfortable and apparently free from headache, ate well, slept well and acted well in all ways. The child was seen in consultation by several, but no surgery was deemed justifiable.

After January the 22nd when the Lumbar puncture was done, there were no complaints of vomiting or headache and the pulse rate and other functions appeared normal until the early morning of the 27th when on awakening he complained of headache, and vomited. The vomiting and headache continued all during the morning and the pulse rate began to fall; along about 10 o'clock in the morning he lost his well look and became pale, the pulse being now down to 50 and the vomiting severe and the headache severe, and he became semicomatose. A little later slight twitching of both hands became evident and the pulse became irregular. And shortly before noon he ceased to breathe and the pulse beat ceased. Post Mortem examination performed by Dr. R. Smith the Provincial Pathologist showed a Medullary Spongioblastoma in the left lobe of the cerebellum, close to the cerebellar pontine angle and about the size of a small olive.

M. J. CARNEY.

Surgical Reports of Children.

The benefits of surgery to the following class of case is shown in the case reports from The Children's Hospital. These cases were all operated upon since Jan. 1st, 1933, and they are all, except one, now healthy with perfect function.

There were 6 acute appendix cases, 4 osteomyelitis ones and 5 Inguinal hernias.

The appendix cases were all acute, 4 abscess cases, one with general peritonitis.

In 4 the abscess was simply opened and drained and at a later date the appendix removed (a two stage operation as a safer procedure).

The after treatment of these cases were dealt with by encouraging drainage with wet pads, allowing the drainage tubes to separate themselves, avoiding distension with morphia and enemas, preventing discomfort by giving fluids both by mouth and by bowel and feeding as soon as the appetite required food. Children do better with fluids and food.

The appendix was removed within 3 months of the primary operation.

The Osteomyelitis cases.

Cne a Brodie's abscess size of walnut at lower end of tibia had a history of only 3 weeks duration without marked symptoms. Little temperature or

feeling ill. A slight swelling above ankle with slight limp and pain on pressure were only symptoms. The free movement of ankle joint with tenderness limited to the shaft above epiphyseal line and the short duration of symptoms excluded tuberculosis. An X-ray showed the cavity in bone and an incision to bone with a burr entering the marrow produced pus, followed by drainage, and the child then allowed to walk and use his limb as much as he likes. Diseased tonsils were present in this case.

Another case of osteomyelitis began from a hockey stick bruising his shin, resulting in the unusual manner of the inflammation at the point of entrance of nutrient artery of tibia, and here the pus was found under the periosteum and also in the marrow upon drilling a hole into it with a burr. The pus shot out under tension from under the periosteum as well as marrow. This case eventually lost practically the whole tibia and now has a new one as good as the old, and the boy is well. This boy's tonsils were found diseased and removed.

A third case entered hospital with severe pain in shoulder region, and high fever. A diagnosis of osteomyelitis was made without the aid of X-ray, which is a useless procedure as a diagnostic measure in acute osteomyelitis. This case was an early one. The burr entered the marrow at upper end of humerus shaft before the inflammation had gone on to pus formation. *Symptoms* were immediately relieved. Tonsils were definitely unhealthy.

The fourth case, one of epiphysitis was instructive. Diseased tonsils appeared to be the localizing cause and site of onset. There had been an old healed lesion of middle ear and right hip. An attack of influenza initiated a severe attack in hospital which began with a severe tonsillar infection, which lit up the old otitis media and initiated a fresh attack on the left hip, which was diagnosed as a severe and virulent acute osteomyelitis. Early operation revealed much pus in the deep tissues and under the periosteum and into the hip joint with marked destruction of head of femur. Drainage was instituted, and immediate relief was a temporary result but the same condition appeared in the other hip soon after, which was opened and drained. The illness was prolonged into a chronic septicaemia, resulting in death, the usual ending in this condition.

The 5 hernia cases were associated with phimosis in most of them. The combined operations were done together. No dressings were used and the child fixed to avoid soiling with urine or faeces. This is an easy matter in a young child. One case was under one year, three about two years and one six.

After six months of age, operation on inguinal hernia is the only satisfactory method, and the phimosis cured at same time.

DR. WEATHERBE

Pernicious Anaemia and Subacute Combined Degeneration.

Mr. A. B. Age 52. Carpenter. Feb. 17, 1932.

Complaints: Abdominal pain, vomiting, anorexia and headache.

Family History: Negative.

Personal History: The patient was healthy until 1917 when he began to have daily attacks of vomiting, without pain jaundice, or other associated symptoms. Five years ago he had an attack of pain in the right hypogastrium, radiating to the back. It was of colicky nature and accompanied by vomiting

and jaundice. These attacks have recurred about once a year, with or without jaundice.

About four years ago the patient suffered a peculiar illness in which fever and partial paralysis of the arms were prominent. This was followed by a general swelling of the body of indeterminate nature, but described by him as dropsy. About this time he began to notice some stiffness of the legs with numbness and tingling in the feet, and soreness of the tongue at intervals.

At this time his case was diagnosed as pernicious anaemia and treated with liver. Response was satisfactory and the patient was able to return to work. During the last three years he has kept well on small and irregular doses of liver, but the condition of the legs grew progressively worse.

Present Illness: Began about ten days ago (Feb. 7) with marked weakness, vomiting, anorexia and abdominal pain of dull steady nature which was worse at night, but did not radiate and was unchanged by food or soda. The symptoms had become steadily worse, so that when seen on Feb. 17 he had kept no food on his stomach for several days and was too weak to rise from bed.

Examination: A thin, red faced man, without edema, cyanosis, jaundice or pigmentation of any kind.

Alimentary: Edentulous. A large patch of leucoplakia on the mucous membrane of the left cheek. The tongue of congenitally fissured type, pale and slightly coated. Papillae present on the dorsum, but a little smoothing of the edges. Abdomen normal.

Cardiovascular: Pulse regular 70, vessels soft, left border just outside nipple line, haemic murmur present, B. P. $\frac{112}{70}$.

Nervous: Slight mental confusion, memory good. The cranial nerves normal. Vibration sense lost at both ankles. Tactile thermal and position sense everywhere normal. Right and left knee jerks increased, with bilateral extensor planter responses.

Muscular: Normal except in the legs where weakness and spasticity are present, with wasting particularly of the left thigh muscles. There is complaint of flexor spasms in the legs and the gait is spastic-ataxic.

The stools showed a trace of occult blood. Urine negative. The blood picture was typical of pernicious anaemia, red cell count under three million, haemoglobin 54%, whites 3,200 and cell diameter increased.

Treatment started Feb. 19, 1932 with thirty grams of ventriculin and one hundred and fifty grains of Blauds pill daily. This was well tolerated in spite of gastric distress.

On Feb. 29 he complained of severe sore mouth and on each lower eyelid about its centre, was a vesicle the size of a grape seed, filled with cloudy fluid. Haemoglobin had dropped to 42%, the white cells were only 1,900 and the red cell count was unchanged.

Dosage was doubled, after which there was a rapid symptomatic improvement. The appetite improved, he gained strength and complained less of his legs. Blood response however, was poor, so that by the twenty-ninth of March the red cell count was 3,500,000 HBO, 66%, whites 3,500. At this time he was obliged to return to his home in the country, with instructions to carry on with twenty grams of ventriculin and 150 grains of Blauds pill daily. He felt well, had a good appetite and could walk clumsily.

Seen again on July 29, 1932 he felt about as he did four months before, except that his legs were very much better. Haemoglobin 61%, red cells 3,400,000, white cells 2,940. He had taken ventriculin irregularly and none at all during the last month or six weeks. The Blauds pill he had taken regularly, probably because it was cheap.

Physical signs were about the same, except that vibration sense was present in both legs where it was absent before. Both plantors remained extensor. There was less spasticity in the legs and the gait was much improved, so that he could step over obstacles which he previously crawled over.

A communication three months later stated that he felt fairly well, his legs were better than they had been for years. He was taking his ventriculin irregularly and continuing his Blauds.

There has been no report since.

Discussion: The points of interest are the appearance of symptoms suggestive of chronic gastritis ten years before the anaemia which may have led to the failure of gastric secretion thus causing the pernicious anaemia.

Also the effect of massive iron dosage on the cord lesion, which caused constant improvement in the cord symptoms, even when no anti-anaemic substance was being taken and when the blood condition was actually declining.

J. W. REID

Neurosyphilis.

(No. 16,045 Clinic File), a woman of 56, presented herself for examination with the complaint that she had been "taking funny turns" during the past twenty years. She could not remember details about the first "fit", but it seems certain that it did not follow an accident or an acute illness. Up until 1917 she had only occasional attacks, but since then she has had them in bouts of two to three several times each week. The greater number have occurred in the evenings. There seemed to be no constant precipitating factor, but stooping sometimes seemed to bring on an attack. She was usually able to tell when an attack was coming, but she can not describe a definite aura. She frequently cried out before and during the attacks. They most commonly began in the right foot with a feeling of numbness and pain. This sensation would then spread to the trunk and face and then to the right and left arms in that order. She never lost consciousness, but always seemed dazed with even minor attacks. Her limbs usually became rigidly extended. Clonic movements never occurred. She never bit her tongue. During an attack her face would become congested; afterwards it would be pale. Headache was an occasional sequela. Drowsiness or paralysis never appeared.

Inquiry into the functions of other systems revealed a history of unreduced dislocation of the left shoulder, a wound of the left forearm and swelling over the right knee cap.

Physical Examination: Revealed a middle aged woman who was easily influenced by suggestion. Cranial nerves 2-12 normal with the exception of sluggish reactions of the pupils to light.

Motor Functions:

Upper Limbs: Wasting of the muscles of the left shoulder girdle with defective motor power in all movements (disuse atrophy). Power in the

right arm was good with the exception of extension of the wrist and fingers where power is diminished (old wound of extensor muscles).

Trunk: No deformity or weakness.

Lower Limbs: Consistency, tone and motor power were normal. Co-ordination accurate.

Superficial and Deep Reflexes: No abnormalities.

Sensation: Responses to stimuli were inconstant, and the defects found did not correspond to any anatomical lesion and they could be altered by suggestion.

Bones and Joints:

Unreduced dislocation of the left shoulder. A small hard mass was attached to the patella.

Other Systems: No abnormalities noted.

Laboratory Examination:

Blood: Kahn 4 plus.

C. S. F. Initial Pressure 130 mm. (water); Free Respiratory Excursions; Final Pressure 90 mm.; Cell Count, 3; Globulin, Normal; Lange Curve, 1112121000; Kahn Test, Negative; Chlorides, 0.70%.

Comment. This case is reported because of the age of onset of the first symptoms. In convulsions developing after the age of thirty the diagnosis of idiopathic epilepsy is a dangerous one until careful repeated examinations have ruled out the commonest causes of epilepsy arising after this time—namely, cerebral tumor, cerebral arterio-sclerosis—cerebral syphilis. In this case the age of onset was too early for cerebral arterio-sclerosis and the duration of the symptoms without production of focal signs or increased C. S. F. pressure too long even for a cerebral tumor of the slowly growing type. The large functional element present is recognized but signs of organic diseases are present.

The sluggish reaction of the pupils to light, the positive blood Kahn together with the suspicious colloidal gold curve would seem to justify a diagnosis of neuro-syphilis. We believe that it is of cerebral type, the underlying pathology probably being gummatous leptomeningitis.

Treatment. The attacks have been almost entirely controlled by large doses of bromide alternating with luminal. It has been noticeable that when her medicine has run out there have been just as many seizures as formerly. In preparation for more vigorous antileptic treatment she has been taking Pot. Iod. gr. 30 daily for a month.

Subacute Combined Degeneration.

No. 11, a business man of 51, was referred for neurological examination on Nov. 30, 1933. His presenting symptoms were numbness and tingling of the toes during the preceding year. There had also been increasing ease of fatigue, some irritability and nervousness and lack of power for prolonged mental effort during the same period. For 4 months he had noticed increasing dyspnoea on exertion and occasional oedema of the ankles.

To direct questioning he recalled that his tongue and mouth had been very sore for several periods of two to four weeks during the year. His finger

tips frequently felt numb and tingled. For a few months he had noticed "indigestion" especially after eating potatoes and meat. His past, family and personal history revealed no facts relevant to his present condition.

Examination showed a pale nervous man who became quite tired as he gave his story.

Cranial nerves 2 and 4-12 normal in function. Ocular fundi normal.

Upper Limbs: There were no changes in the size, consistency or tone of the muscles. Motor power was good in all movements, co-ordination was accurate and there were no involuntary movements.

Trunk: There were no deformities and motor power was good.

Lower Limbs: There was no apparent wasting. The consistency and tone of the muscles were slightly diminished and motor power was moderately impaired in all movements. Distal movements were affected most. Co-ordination was slightly defective. There were no involuntary movements.

Reflexes: Pupillary, corneal, arm and abdominal were normal. The knee and ankle jerks were absent even with reinforcement. Both plantars were extensor.

Sensation: To light touch, pin prick, heat and cold was everywhere normal. Vibration was not appreciated below the third lumbar spine. Sense of position and passive movement were slightly defective in both lower limbs.

Gait: Slight clumsiness on irregular surfaces.

Cardio-Vascular System: The heart was slightly enlarged, both feet and ankles were oedematous and a few rales were present at the right base posteriorly. Peripheral vessels soft. B. P. 128/72.

Other Systems: Both maxillary antra were dark to transillumination; otherwise there were no abnormalities.

Laboratory Examination: The urine was normal. R. B. C. 2,690,000; Hbg., 55%; C. I. 1.02.

The red cells showed changes in size and shape and there were some polychromatic cells present. The average size of the red cells seemed to be increased. The white cells were scanty in the smear and lymphocytes predominated.

Diagnosis: Pernicious Anaemia. Subacute Combined Degeneration. Chronic Myocardites Degeneration.

Treatment: In view of the presence of cord changes it was decided to treat him as an ambulatory patient. Until liver extract for intramuscular injection could be obtained he was advised to take at least half a pound of fresh liver a day together with one drachm each of marmite and Ac. H. C. L. Dil., three times a day. Within five days he commenced to feel more vigorous. Intramuscular injections of 10 cc. of Connaught Lab. liver extract were then given at weekly intervals for five weeks. During this time he took fresh liver whenever he could get it (averaging two pounds a week) and he also had four ounces of marmite. The red cell count rose steadily and on Jan. 29 was 5,230,000. Hbg. at that time was 94%. No reticulocyte crisis was noted. Disappearance of symptoms took place more rapidly and three weeks after treatment was started he was free of all symptoms apart from the numbness and tingling of the toes. On Jan. 20 he was started on a two weeks course

of 150 grs. of fresh Blaunds Mass¹ daily. A preparation with high vitamin A content followed this for two weeks. On Feb. 24 vibration could be appreciated from the toe joints of the left leg and from the middle of the tibia of the right. Sense of position and passive movement were now normal and co-ordination was accurate. The plantars remained extensor. The numbness and tingling of the toes had practically disappeared.

Comment: The regression of the nervous symptoms and of some of the signs would seem to justify this preliminary report.

Ever since Minot and Murphy reported² the first cases of pernicious anaemia successfully treated with liver, there has been a growing realization among the profession that subacute combined degeneration of the spinal cord is not a mere complication or antecedent of the anaemia, but is rather an associated disease. The dramatic therapeutic successes obtained in the treatment of anaemia have not been reached in S. A. C. D. In fact, the incidence of myelopathy has become greater as the number of treated cases has increased.

In many instances the onset of cord changes during treatment of the anaemia can be traced to insufficient dosage of the anti-anaemic substance, but in many this has not been possible. The reason is not yet known definitely, but recent experimental work seems to indicate that S. A. C. D. is a deficiency disease. Mellanby has shown³ that lack of vitamin A can result in cord changes. Gildea, Kattwinkel and Castle⁴ produced degeneration of the spinal cord with a diet deficient in the anti-neuritic portion of vitamin B. Recently, Sargent and Harris have reported in the B. M. J. a measure of success in the treatment of S. A. C. D. with massive doses of iron. This, at first glance, seems to be irrational for pathologists tell us that the organs of bodies dead of pernicious anaemia are full of iron. That is true but it is not so in the living. Not infrequently a case of hyperchromic macrocytic (pernicious) anaemia will change during treatment to one of hypochromic microcytic (secondary) anaemia and will then respond only to iron.

Is it possible that in S. A. C. D. iron metabolism is upset by lack of an intrinsic factor in the gastric juice and that this interferes with the proper absorption of the extrinsic factor which we believe is of importance? If this is so the use of large doses of iron as an adjunct to liver or stomach therapy would seem rational.

References:

1. Formula as given in Maritime College of Pharmacy bulletin of Jan. 19. 1934.
2. Minot, G. R. Murphy W.P. "A Diet Rich in Liver in the Treatment of P. A." J. A. M. A., 89:759, 1927.
3. Mellanby, E. The Experimental Production and Prevention of Degeneration in the spinal Cord. Brain, 1931, liv. 247.
4. Gildea, E. F., Kathvinkel, E. E. & Castle, W. B., Experimental combined system Disease. New Eng. Jour. of Med. 1930, ccii, 523.

IAN MACDONALD.

Influenza with Complications.

I am presenting this case to show the many complications of a simple attack of Influenza.

The patient, aged 25, weighing 190 pounds and in perfect health, consulted me on Feb. 26, 1932 for a pain in the right ear. He had been suffering from "Flu" for three or four days, with a very bad cough. Further history shewed that he had had an acute Otitis Media of the right ear at 10 years of

age; at the age of fifteen his tonsils were removed. The ear had never troubled him since that time. On examination, wax was found completely filling the canal and imbedded in the wax was a piece of pencil lead about one inch in length. Pus followed removal of the wax. The drum was completely gone. The mastoid, although not shewing any swelling, was tender to pressure. The temperature was 99. On Feb. 27th, he had severe pain in mastoid, chills and bad cough. The mastoid was tender with no swelling. He was sent to the hospital for mastoid operation the next morning. That night his temperature went to 103 with chills and rusty blood streaked sputum. Pain and tenderness of the mastoid had abated and the ear was discharging well. A chest examination shewed a bronchial pneumonia. On this account, and as the ear symptoms were abating, the mastoid operation was postponed. Leucocytosis at this time was 12,000.

The pneumonia progressed favourably, and he felt much better. On March 6th he had severe pain in the left frontal sinus which abated under shrinkage and hot compresses, but left a copious nasal discharge. On March 16th he had a similar attack in right frontal and right antrum with a purulent discharge. An X-ray taken at this time shewed an infection of both frontals and the right antrum. The left antrum shewed a perfectly round cyst. The mastoid process shewed necrosis. The anterior half of each middle turbinate was excised for frontal drainage; the right antrum was washed out several times and the cyst in the left antrum was punctured letting out one ounce of clear straw coloured fluid. By March 27th under shrinkage, suction and lavage the nasal condition was completely cured. Temp. normal, leucocytosis 6,000 and the patient was up and about his room. For the next three weeks he was extremely irritable, so much, that the nurses would keep away from his room. He was allowed to go down town, but it did not make him any better. He had no pain or tenderness and the ear was not discharging. Another X-ray shewed the mastoid to be as before. On April 23rd the mastoid was opened, found badly necrosed and filled with pus and granulations. The tip cells were removed, the lateral sinus uncovered also the dura covering the middle fossa. On April 27th, his temperature went to 103 with chills and swelling over the right ear to the eye and cheek. After two days of hot compresses the swelling subsided somewhat and pus was found under the temporal fascia and localized by its attachment to the skull. This was opened and drained. After this the patient made a rapid recovery and was discharged on May 15th.

R. H. STODDARD

The Value of the Daily Haemogram in the Study of Acute Sepsis.

Septicaemia as an entity is unfortunately much too common. Submucous resection of the nasal septum is a frequent surgical procedure. The occurrence of the former as a complication of the latter is of such infrequent occurrence that the combination is a rarity. Careful search of medical literature has not revealed a single reported case.

Miss M. H. Age 31 years. School teacher.

During the past four years she had the constant sensation of a cold in the head, especially upon awakening in the morning, otherwise she always enjoyed good health. Three years previously she had an operation on the

nose with no relief from symptoms. On December 4th, 1933, sub-mucous resection of the septum was performed. The evening temperature was 99.4°F. and the patient was moderately comfortable. On December 5th the temperature continued to rise to 101.4°F. On December 6th the temperature reached 102.2°F. On December 7th at 8 p. m. the patient had a severe rigor which lasted for about an hour, and temperature was recorded at 104.4°F. pulse 130.

The physical examination was negative. A tentative diagnosis of septicaemia was made and later confirmed clinically and by laboratory assistance. From December 7th to 17th the temperature range was from 103°F. to 106°F. pulse 115 to 130. There were daily rigors or sense of chilliness during that interval. Daily intramuscular and intravenous injections of large doses of anti-streptococcic serum were given (4 different brands being used). On December 18th the temperature dropped to 101°F. and on December 19th it was normal. On December 20th the temperature reached 105.8°F. and was normal again on December 22nd, with no further recurrence.

No attempt will be made to discuss the case from the point of view of diagnosis or treatment. The diagnosis was confirmed by clinical and laboratory findings and the treatment was along well recognized lines.

An effort will be made to show the value of daily haemograms in the presence of an acute sepsis. The value as shown not by the total leucocyte count but by means of the differential white cell count. Reference to the table of haemograms given below will show what valuable information was obtained with regard to both prognosis and treatment.

The white cell differential count as shown on December 29th, 1933, which is almost normal and which was made when recovery was well established will suffice as a basis for comparison, so that changes occurring in the blood picture at a time when evidence of disease appeared to be most acute, showed that a favourable prognosis might be entertained in spite of the fact that the clinical evidence was otherwise unfavourable.

Considering the leucocyte estimation we note a low total count in the presence of a severe infection; a count which continues to fall ominously for four days after the onset of symptoms, shows a slight rise on the fifth day and a definite rise on the sixth day to 19,000. This was the first definitely encouraging feature in the whole course of the illness. Along with the total count we note another unfavourable feature in the relatively low number of neutrophiles, and an unfavourable reaction shown by the increase in young and immature neutrophiles (juvenile and stab cells) with the decrease in number of the more mature neutrophiles the segmented forms. From December 12th, 1933 we note that the proportion of segmented forms as compared with the immature forms of neutrophiles is slowly and gradually reversed and continues to improve in the direction of normal. This instance alone was enough to indicate that recovery began on that date, in spite of the fact that there was no other clinical evidence of improvement until December 17th, five days later, when the temperature, pulse and other clinical signs showed evidence of improvement. On December 15th, 1933, two days before there was apparent improvement in the patient's condition, eosinophiles re-appeared in the blood picture and this combined with the improving neutrophile differentiation was further ground for encouragement. Regarding the lymphocytic side of the picture the course of events is not nearly so definite. The lymphocytic side of the haemogram may be considered a reflection of the neutrophile side of the picture. The low proportion of neutrophiles shows the

evidence of an acute infection tending to paralyze defensive leucocyte powers. The monocyte count gives from the beginning the impression of an infection with a tendency to clear up. This side of the picture was numerically lowest from December 13th to 18th when the neutrophile total was rising and although more definitely showing evidence of acute sepsis may be interpreted as a decided improvement in the reaction of the defensive powers of the patient.

The rise in temperature to 105.8°F. which occurred on December 20th, 1933, was reflected by very slight change in the blood picture, the improving course of which was not interrupted and it was felt that this was due to serum reaction.

The above resume of the blood charts which follow at the end of this report is presented in the hope that it may prove interesting and also in the hope that it may stimulate the use of frequent, or if possible, daily haemograms in the interpretation of progress in acute infections which will no doubt be useful in many instances as an index of the efficacy of treatment.

J. W. MERRITT, M.D.

I am indebted to Dr. H. W. Schwartz and Dr. V. N. MacKay for their co-operation in the management of this case and for permission to publish this report.

Date	Temp. Max.	Min.	Hbg.	Erythro.	Total Leuc.	Eosin.	Bas.	Myel.	Juv.	Stabs	Segmented	Total Neutrophiles	Lymph.	Monoc.
Dec. 7	104.4	101	.....	.....	11,300	1	1	0	6	8	63	77	10	11
" 8	104.6	101.2	.....	.....	9,900	0	0	0	13	7	52	72	17	11
" 9	104.8	103.4	.....	.....	8,400	0	0	0	14	7	50	71	21	8
" 10	106	105	.....	.....	7,400	0	0	0	9	4	59	72	14	13
" 11	105.2	104	.....	.....	9,600	0	0	0	17	7	54	78	10	12
" 12	104.8	103.2	.....	.....	19,000	0	0	0	23	9	39	71	15	14
" 13	104	102.2	.....	.....	10,200	0	2	0	19	10	49	78	6	14
" 14	104.2	101.8	.....	.....	12,000	0	1	0	18	5	61	84	7	8
" 15	104	102	.....	.....	11,200	1	0	0	20	3	63	86	11	2
" 18	101.2	99	.....	.....	12,000	1	0	0	17	6	50	73	20	6
" 19	99	98-2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
" 20	105.8	98.2	.....	.....	9,900	1	1	0	9	3	67	79	14	5
" 22	99.2	98.6	.....	.....	10,400	1	0	0	9	4	69	82	11	6
" 29	98.4	98.2	64%	3,680,000	8,600	2	1	0	5	1	55	61	32	4
Dec. 9	Swab from nasal cavity showed streptococcus pyogenes.													
" 11	Culture of discharge from naso pharynx showed growth of streptococcus pyogenes.													
" 12	Blood culture at end of 48 hours showed pure growth streptococcus pyogenes.													

What Every Woman Doesn't Know—How to Give Cod Liver Oil.

What Every Woman Doesn't Know is that psychology is more important than flavoring in persuading children to take cod liver oil. Some mothers fail to realize, so great is their own distaste for cod liver oil, that most babies will not only take the oil if properly given but will actually enjoy it. Proof of this is seen in orphanages and pediatric hospitals where cod liver oil is administered as a food in a matter of fact manner, with the result that refusals are rarely encountered.

The mother who wrinkles her nose and "makes a face" of disgust as she measures out cod liver oil is almost certain to set the pattern for similar behavior on the part of her baby.

Most babies can be taught to take the pure oil if, as Eliot points out, the mother looks on it with favor and no unpleasant associations are attached to it. If the mother herself takes some of the oil, the child is further encouraged.

The dose of cod liver oil may be followed by orange juice, but if administered at an early age, usually no vehicle is required. The oil should not be mixed with the milk or the cereal feeding unless allowance is made for the oil which clings to the bottle or the bowl.

Mead's 10D Cod Liver Oil is made from Mead's Newfoundland Cod Liver Oil. In cases of fat intolerance the former has an advantage since it can be given 1/3 to 1/2 the usual cod liver oil dosage.

Department of the Public Health

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Those physicians wishing to make use of the free diagnostic services offered by the Public Health Laboratory, will please address material to Dr. D. J. MacKenzie, Public Health Laboratory, Pathological Institute, Morris Street, Halifax. This free service has reference to the examination of such specimens as will assist in the diagnosis and control of communicable diseases; including Kahn test, Widal test, blood culture, cerebro spinal fluid, gonococci and sputa smears, bacteriological examination of pleural fluid, urine and faeces for tubercle or typhoid, water and milk analysis.

In connection with Cancer Control, tumor tissues are examined free. These should be addressed to Dr. R. P. Smith, Pathological Institute, Morris Street, Halifax.

All orders for Vaccines and sera are to be sent to the Department of the Public Health, Metropole Building, Halifax.

Communicable Diseases Reported by the Medical Health Officers for the month of February, 1934.

County	Cer-Spi. Meningitis	Chicken Pox	Diphtheria	Influenza	German Measles	Measles	Paratyphoid	Pneumonia	Scarlet Fever	Poliomelitis Anterior	Tbc. Pulmonary	Tbc. other forms	V. D. G.	V. D. S.	Whooping Cough	Goitre	Erysipelas	TOTAL
	Annapolis	3	..	1	1
Antigonish	4	..	..	..	..	..	..	..	..	..	..	..	..	4
Cape Breton	3	..	..	..	..	..	2	..	..	..	..	..	..	..	..	5
Colchester	3	3	..	..	..	..	..	..	..	..	6
Cumberland	11	..	..	..	..	1	..	..	..	12
Digby	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
Guysboro	3	..	..	1	..	..	1	..	..	..	..	..	..	5
Halifax City	6	18	..	..	..	..	19	..	..	..	..	..	..	22	..	1	66
Halifax	1	..	..	..	..	..	..	..	1
Hants
Inverness	1	..	5	..	..	..	3	..	..	..	..	3	..	..	..	..	12
Kings	23	..	..	..	3	2	..	..	..	1	1	..	..	..	30
Lunenburg	25	..	..	..	..	..	..	2	..	..	..	..	1	..	..	..	28
Pictou
Queens	1	..	..	..	..	..	..	..	..	1
Richmond
Shelburne	2	..	..	..	5	..	1*	..	..	1	..	..	..	..	9
Victoria
Yarmouth	1	..	..	..	..	..	..	..	..	..	1
TOTAL	35	21	33	7	1	..	16	40	1	2	..	5	4	22	..	1	188	

* (suspected)

RETURNS VITAL STATISTICS FOR JANUARY, 1934.

County	Births		Marriages	Deaths		Stillbirths
	M	F		M	F	
Annapolis	8	2	6	15	9	2
Antigonish	10	11	9	6	9	0
Cape Breton	94	105	55	39	34	4
Colchester	24	29	8	13	11	0
Cumberland	22	23	17	22	18	1
Digby	14	12	7	6	7	0
Guysboro	5	11	7	5	5	2
Halifax	89	96	44	68	48	3
Hants	20	8	13	12	8	0
Inverness	23	22	3	16	11	1
Kings	18	26	20	10	5	0
Lunenburg	28	29	16	29	20	2
Pictou	40	33	16	20	24	4
Queens	8	11	5	7	3	1
Richmond	14	10	3	3	4	3
Shelburne	20	9	2	12	10	1
Victoria	2	2	0	2	0	0
Yarmouth	25	32	9	25	20	3
TOTAL	464	471	240	310	246	27

OBITUARY

The BULLETIN extends its sympathy to Mrs. MacKenzie, wife of Dr. K. A. MacKenzie of Halifax, in the death of her mother, Mrs. Bessie Morrison, which occurred at the home of Dr. MacKenzie on March 1st. Mrs. Morrison was the wife of the late Dr. D. N. Morrison of Sydney and mother of Dr. L. N. Morrison of Mahone. Mrs. Morrison had been ill since last May.

There passed away at Windsor on Monday, February 5th, Mrs. Pauline MacLellan, mother of Dr. Robert MacLellan of Rawdon. Mrs. MacLellan was eighty-four years of age and up to the time of her death experienced very good health.

The death occurred at Weymouth on February 9th of Simeon Melanson, father of H. J. Melanson. Mr. Melanson, who was seventy years of age, had been ill for a year and confined to his bed during the past month.

The BULLETIN extends its sympathy to Dr. and Mrs. H. A. Payzant of Dartmouth in the death of their only daughter, Edith Payzant, which occurred on March 2nd.

At New Glasgow on February 18th there occurred the death of Mrs. Elizabeth Patton, mother of Dr. J. W. T. Patton of Truro. Mrs. Patton was ninety-one years of age and until a few months ago was quite active and in good health.

On February 23rd, at Canning, the death occurred of Mrs. William Rand daughter of the late John and Alice Wickwire. Mrs. Rand was twice married, her first husband having been the late Dr. E. A. Kirkpatrick, a leading eye, ear and throat specialist who practised for many years in Halifax.

At a recent meeting of the Halifax Branch of the Medical Society of Nova Scotia the following resolution was passed concerning the late Dr. John Stewart.

"That this Society feels a great personal loss in the death of Dr. John Stewart. Dr. Stewart was our most distinguished member, and for years had held up a great ideal of medical ethics and scientific endeavour before us. Individual members recall with gratitude his help and advice in many difficult moments. We felt that our local medical school was honored in having him for its dean. The work he did for it helped in no small way to make it the institution it has become.

We also recall with gratitude the great sacrifice that he made to command the Dalhousie Unit during the war. Those of us who served under him have particular reason to remember his amazing thoughtfulness and outstanding kindness.

But not only did he honor our Society through being a member of it, he made a great contribution to medical science on this continent as the pioneer of Listerian surgery. Surgeons all over North America, but particularly Canadian surgeons, will remember him with gratitude for that, and will hear of his passing with regret. To this regret the Halifax Branch of the Medical Society of Nova Scotia adds its own. To his relatives we extend our sincerest sympathy in their loss—which so greatly is our own".

Halibut or Cod?

The question is frequently asked: "What is the difference between halibut liver oil and cod liver oil? The answer is difficult. Both are fish oils, both contain vitamins A and D.

Halibut liver oil, however, cannot be classed as a type of concentrated cod liver oil, because the ratio in which vitamins A and D exist in halibut liver oil is widely different from the ratio usually found in cod liver oil. Halibut liver oil should not be considered as "cod liver oil by the drop."

Halibut liver oil is relatively very low in vitamin D, though high in vitamin A, and, therefore, cannot be used economically as an anti-rachitic agent.

It is possible that the ratio of these two vitamins, as found in cod liver oil, plays some important part in its therapeutic effectiveness as observed over many years' experience. It may even be possible that there are other factors in cod liver oil, at present unknown, which may account further for its therapeutic value.

Vitamin Concentrates

In our laboratory, we have prepared a concentrate of vitamins A and D, in their natural form, directly from cod liver oil, which would show an activity many times greater than the most extreme claim made for any cod liver oil concentrate or substitute at present offered to the medical profession.

However, we offer a cod liver oil concentrate, under the trade name Alphamette Liquid, and the capsule form—Alphamettes—in a concentration which experience has shown to be reasonable and practical.

The potency is high enough for every purpose to which vitamin A and D therapy may be applied in medical practice, but it is not so high as to subject patients to the danger of hypervitaminosis.

The capsule form—Alphamettes—represents the vitamin value of three teaspoonfuls of a good type of medicinal cod liver oil, and this potency has been deliberately selected.

Is the Use of Halibut Liver Oil a Fad?

We do not know. The choice, however, rests primarily with the physician, and in our capacity as manufacturing biological and pharmaceutical chemists catering to the profession, we endeavour to supply products which meet the demands of the profession. We, therefore, offer, in addition to Alphamettes (our capsules of cod liver oil concentrate), capsules of Halibut Liver Oil Plain and Halibut Liver Oil 250-D, which conform with the usual standards of potency for these products.

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Personal Interest Notes

DR. COLIN G. SUTHERLAND of Montreal recently spent a week with his parents, Mr. and Mrs. Hector T. Sutherland, High Street, New Glasgow.

Dr. A. L. Wilkie of Montreal visited his parents, Mr. and Mrs. C. N. Wilkie, Antigonish, for ten days in February.

Dr. F. B. Day of Thorburn spent a few days recently at Camp Hill Hospital.

Dr. J. W. Smith, Sr., of Liverpool, was recently called to Sackville, N. B., on account of the ill health of his son, Murray.

Dr. and Mrs. G. Victor Burton and Mr. and Mrs. J. Donald Burton all of Yarmouth, left on Friday, February 16th for New York.

Dr. S. W. Williamson of Yarmouth paid a visit to Providence, R. I. during the last month.

Congratulations to Dr. and Mrs. John Stewart Murray, nee Elsie Bond, River John, Pictou County, on the birth of a daughter on January 2nd, Janice Marie.

Miss Mary Flinn, the blind sister of Dr. Z. M. Flinn, Dalhousie 1932, is one of seven blind persons who are presenting in Los Angeles a Booth Tarkington Comedy in the near future. Miss Flinn is a daughter of Dr. John W. Flinn of Prescott, Arizona, who formerly practised in Wallace, Nova Scotia, and is well known to many members of the profession in Nova Scotia.

The Halifax papers announce the appointment of Dr. O. G. Donovan of Halifax as Assistant Medical Director of the Workmen's Compensation Board.

In 1708 there was published in Rouen an account of the experiences of a French surgeon, M. Diereville, who came to Port Royal in 1699, and remained a year in the Colony. The book was written partly in prose and partly in verse. In a recent issue of the Proceedings of the Champlain Society mention is made of this work and Mrs. Webster, wife of Dr. G. C. Webster of Shediac, N. B., has been engaged to make the translation. Dr. Webster is, perhaps, our chief medical historian and doubtless considerable interest will be taken in reading the story of this early French surgeon.

What's in a Name? The guillotine so popular in France before and during the Revolution was devised by, and named after, Dr. Joseph Ignace Guillotin, a brilliant physician in Paris. A recent booklet published by the Denver Chemical Company shows a cut of Dr. Guillotin demonstrating this device to Louis XVI who was later beheaded by the instrument he adopted. It is also noted that during the Reign of Terror the Doctor himself narrowly escaped being thus beheaded.

for sick as well as normal babies

'Dextri-Maltose, Carbohydrate of Choice

"As to the kind of extra carbohydrate to be added, whether lactose or maltose, I believe dextrin-maltose to be better in general in cases of fat indigestion (infantile atrophy)."—C. H. Dunn: *The Hygienic and Medical Treatment of Children*, Southworth Co., Troy, New York, 1917, V. 1, p. 418.

In discussing the treatment of decomposition Feer says: "The period of repair may be shortened by giving suitable additional food; the best, probably, being buttermilk to which carefully regulated proportions of dextrin and maltose preparations or malt soup are added."—E. Feer: *Text-Book of Pediatrics*, J. B. Lippincott Co., Phila., 1922, p. 284.

In the treatment of infantile atrophy, Fischer recommends the following: "The carbohydrate should be increased by gradual addition of dextri-maltose.

"Malt soup or dextrimaltose (Mead's) should be added in teaspoonful or more doses to each feeding until the point of carbohydrate tolerance is reached."—L. Fischer: *Diseases of Infancy and Childhood*, F. A. Davis Co., Phila., 1925, V. 1, p. 285.

Grulee, discussing treatment of decomposition, observes: "As a rule it is best to start with 2 to 2½ or 3 ounces of albumin milk to the pound weight in 24 hours; the sugar to be added is in the form of a maltose-dextrin mixture. One should never delay too long in adding this."—C. G. Grulee: *Infant Feeding*, W. B. Saunders Co., Phila., 1922, p. 265.

Referring to the hypotrophic infant, Herrman writes: "In mild cases, the addition of dextrimaltose instead of cane or milk sugar may be sufficient to obtain a gain in weight."—C. Herrman: *The treatment of nutritional disorders in artificially-fed infants*, New York M. J. 114:158-160, August, 1921.

In discussing artificial feeding in athrepsia, Hess states: "The carbohydrates are usually added in a slowly fermentable form, such as the maltose and dextrin compounds, which are usually started by the addition of four grams per kilogram (1/15 ounce per pound) and increased until eight grams or more per kilogram (½ ounce per pound) of body weight are added."—J. H. Hess: *Feeding and the Nutritional Disorders in Infancy and Childhood*, F. A. Davis Co., Phila., 1928, p. 278.

Concerning the treatment of marasmus, Hill says: "When the stools have become smooth and salve-like, carbohydrate, in the form of dextri-maltose, may be gradually added up to the limit of tolerance."—L. W. Hill: *Practical Infant Feeding*, W. B. Saunders Co., Phila., 1922, p. 281.

"A spasmophilic baby on bottle feeding should receive a limited amount of milk—a pint, or at the most 24 ounces in the 24 hours—to which cereal gruel and some form of sugar is added, preferably one of the malt dextrin preparations; also the early addition of other foods than milk to the baby's

diet."—M. Jampolis: *Infantile spasmophilia*, *Interstate M. J.* 25:652, Sept., 1918; *abst. Arch. Pediat.* 35:691, Nov. 1918.

With reference to the treatment of diarrhea, Lust writes: "After several days, 2% to 3% of a maltose-dextrin preparation may be added (Dextri-Maltose). This is preferable to the easily fermentable lactose or cane sugar."—F. Lust: *The Treatment of Children's Diseases*, J. P. Lippincott Co., Phila., 1930, p. 145.

"The treatment of artificially fed children in the first of these groups consists in putting them on a low fat dietary, and giving them carbohydrate in the form of one of the less fermentable sugars—e.g. dextrimaltose."—L. G. Parsons: *Wasting disorders of early infancy*, *Lancet*, 1:687-694, April 5, 1924.

Pearson and Wylie in discussing the treatment of milder cases of inanition say: "Regulation of this disturbed organismal balance is obtained by the addition of carbohydrates, while fat and casein are reduced. For this purpose dextrimaltose and flour are better than the ordinary sugars, since they are more slowly absorbed and have greater efficacy in their powers of controlling the flora in the large intestine."—W. J. Pearson, and W. G. Wylie: *Recent Advances in Diseases of Children*, P. Blakiston's Son & Co., Phila., 1930, p. 116.

Regarding the treatment of marantic infant, Raué states: "After the intolerance to sugar has been overcome a carbohydrate, preferably Dextrimaltose, may be added."—C. S. Raué: *Diseases of Children*, Boericke & Tafel, Phila., 1922, p. 427.

In discussing the treatment of atrophy, Thursfield and Paterson, state: "If the baby continues to improve, the next step in the treatment is to add to the milk one of the less fermentable carbohydrates, such as dextrimaltose; . . ."—H. Thursfield, and D. Paterson: *Diseases of Children*, William Wood & Co., 1929, p. 105.

"I also find dextrin-maltose an excellent addition to albumin-milk when the first object of that food has been achieved and a gain in weight is desired in this way I have succeeded in feeding albumin-milk far beyond the period usually advised, with highly gratifying results."—F. L. Wachenheim: *Infant-Feeding; Its Principles and Practice*, Lea & Febiger, Phila., 1915, p. 158.

"Dextri-maltose has been substituted for lactose not infrequently, when the tolerance for the latter continues low."—J. H. West: *Low fat, high starch evaporated milk feeding for the marasmic baby*, *Arch. Pediat.* 48:189-193, March, 1931.

"Malt sugar is indicated when others fail to produce a sufficient gain, or when malassimilation of fat is evident."—O. H. Wilson: *The role of carbohydrates in infant feeding*, *Southern M. J.* 11:177, March, 1918; *abst. Arch. Pediat.* 35:447, July, 1918. •

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Dr. John H. Budd, Dalhousie 1933, was recently successful after a competitive examination in securing a surgical internship at the Charity Hospital, Cleveland. He is a son of Mr. and Mrs. F. W. Budd of Halifax, N. S.

Dr. R. P. Smith, Provincial Pathologist was called to Newfoundland in January to give evidence in the Hawco murder trial.

Dr. C. J. Sparrow of Sydney will be the Reserve Branch delegate to the Canadian Legion's Ottawa Convention in March. Few medical men, in general practice, have maintained their interest in ex-soldiers as continuously as Dr. Sparrow.

Dr. Hugh N. MacDonald of Whycomomagh, formerly of Kirkwood, Lake Ainslie, visited Halifax during the latter part of February to attend the "Queen's Alumni Luncheon".

Dr. J. G. MacDougall has returned from a very pleasant trip to Bermuda.

Dr. N. MacDonald of Sydney Mines is to be congratulated upon his recent appointment as Health Officer for that town.

Dr. J. P. McGrath of Kentville gave a very interesting address before the local Rotary Club on the subject of "The Socialization of Medicine". In his talk the Doctor dealt with the present system, the reasons for a change, the different forms of health insurance, their advantages and disadvantages, and the possibility of their application to our Canadian system. State Medicine was fully explained to the Rotarians and it was the Doctor's opinion that it would be much more ideal than our present system.

Dr. Clarence W. Thorne, Dalhousie 1918, who has been visiting at Lower Granville, left on February 8th for his home at Melfort, Saskatchewan.

News comes from Truro that Dr. W. R. Dunbar has been reappointed Medical Health Officer of that Town at a meeting held on Friday, February 9th.

Dr. J. P. and Mrs. McGrath sailed on February 24th on the S. S. "Laurentian" for New York. Dr. McGrath will spend his time in the study of diseases of the eye, ear, nose and throat whilst at New York.

Rest Cure. According to a doctor, an hour or two spent by a man in his garden is pleasant relaxation from work. Jobbing gardeners seem to have the same idea.

That Sweepstake Feeling. Blank despair.

Striking Truth. "Boxing," says a writer, teaches the sense of fair play. Yes, one learns to consider the other fellow's rights.

Natural Mistake. An aeroplane crashed on the roof of a house in America recently. I understand that the ground floor tenant immediately wrote a stiff note to the owner of the flat above.

NEO-LUATOL

Chemically Pure Bismuth Hydroxide in oily suspension

This product affords a safe and effective method of treating syphilis in all its manifestations.

NEO-LUATOL is of slow and gradual absorption. It is very active, being noted for its high contents in metallic bismuth.

NEO-LUTATOL is offered in boxes of 12 ampoules of 2 cc. *to be injected intramuscularly*; also in boxes of 50 and 100 ampoules and in bottles of 30 cc.

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