



### "20 Arsenical"

Never let a patient lapse from treatment for early syphilis till he has had a minimum of 20 intravenous injections of arsenical. More than "20 arsenical" is advisable as a rule, less than "20 arsenical" never!

Arsenical controls communicability.

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### Syphilis and Pregnancy

BECAUSE:

- (1) During pregnancy active lesions of syphilis are rarely seen, and;
- (2) A history of a previously known primary lesion is rarely obtained;

THEREFORE:

Diagnosis can be made **only** by repeated blood tests.

"Blood Tests for Every Expectant Mother Before the Fifth Month."

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### Pelouze --"--in Line with the March of Progress"

The time is here when we must hasten to erase past faults, and get ourselves in line with the march of progress. None of us is too good to treat gonorrhoea and none is justified in treating it by the old haphazard ways still so commonly held. The same society that looked down upon gonorrhoea as a just reward for what it called "sin" is being rapidly awakened to the enormity of this problem, and the time is here when every physician should know more about the disease itself and what it means to society than about its purely therapeutic aspects.

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"Find V.D. Contacts--Report V.D. Cases"

# The Canadian Red Cross Blood Donor Service in Nova Scotia

## Report on Four Years of Activity

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I HAVE been asked to write a paper on this subject for the BULLETIN. I hesitate to do so because I feel that in the nature of things such a paper cannot be either clinical or scientific. However, many are perhaps unaware of what has been done in the course of the blood donor effort. Therefore this account will consist of a brief historical summary of the inception and carrying out of the blood substitute programme in Canada, followed by a series of somewhat disconnected remarks on the various medical problems which might be expected to interest the readers of this journal.

Transfusion or perfusion of blood or blood substitutes has been essentially an advance of the twentieth century, since the discoveries in its first decade of the various human blood types made blood transfusion safe for the first time. In the Great War of 1914-18, blood transfusions were freely used but their scope was limited because of the necessity to approximate donor and recipient. In the Spanish Civil War a mobile blood bank was operated with somewhat the same limitations. Before the outbreak of the Second World War the use of preserved blood was on an established footing and liquid plasma was being separated and used wherever blood banks were in operation.

By the time hostilities commenced much research had already been done in connection with the preservation of plasma and serum in the frozen, concentrated or dried states. Numerous experiments on blood and plasma substitutes had been carried out. In Canada early work along these lines had gone on at the Connaught Laboratories. In 1940 blood was being taken from student volunteers in Toronto and processed into three times concentrated serum. Some of this material was sent as a liquid to England early in 1940. This could be administered in either the concentrated state or re-constituted to its original volume by the addition of sterile distilled water. Preparation of this material, however, involved certain technical difficulties and the trend, meanwhile, had been in the United States toward dried plasma, and in England toward dried serum.

There had been a considerable controversy going on for some time as to the relative merits of serum and plasma. The pros and cons of this argument are too numerous to set forth in detail here, but briefly the situation seemed to be that serum was more satisfactory to make, but it was claimed that the end product was more toxic than plasma. Ultimately, as far as can be ascertained, both products appear to have been quite satisfactory. The early work in Canada having been on serum, and those most intimately associated with the work apparently having been convinced as to its merits, the Canadian Red Cross Blood Donor Service, when it was inaugurated, was based upon the preparation of serum.

The value and necessity of a blood substitute such as this having been established, arrangements were entered into by the Federal Government, the National Research Council, the Connaught Laboratories of the University of

Toronto, and the Canadian Red Cross Society, for the procuring and processing of blood from Canadian donors for use by Canadian armed forces. In this plan the role of the Red Cross Society was to enlist the donors, set up the clinics, take the blood and carry out the early stages of processing. The National Research Council constituted an advisory body through its Committee on Shock and Blood Substitutes. At the stage of filtration, freezing and drying, processing came under the Department of Pensions and National Health, and the finished product was to be handed over to the Department of National Defence.

The first Red Cross Blood Donor Clinic was opened in Toronto at 410 Sherbourne Street in the latter half of 1940. Some time later clinics were opened in Hamilton and Ottawa. By the end of 1940, 5,325 donations had been received by the Red Cross. In March, 1941, Dr. Charles Best came to Halifax for the purpose of arousing interest in the idea of a Red Cross Blood Donor Clinic here. The demand for dried serum was increasing and it was proposed to establish the Blood Donor Service on a nation-wide basis with a weekly quota of 2,000 donations a week for the Dominion. Of these 1,000 were to come from Ontario, 400 from Quebec, and 100 a week from each of the other provinces, with the exception of Prince Edward Island, which was regarded at that time as unsuitable due to transportation difficulties. These difficulties, by the way, were subsequently overcome and Prince Edward Island was enabled to join in the National project.

According to the outline for the establishment of Red Cross Blood Donor Clinics prepared at that time, all clinics were to have facilities for cutting and rimming the clot, and taking off samples for serological tests. All blood from such clinics in Ontario was to be sent to the Connaught Laboratories for the separation of serum. All centres outside of Ontario were to have laboratory facilities for separating and were to ship pooled serum to the Connaught Laboratories. It was therefore necessary, before a clinic could be opened in any centre, to select and train a technician and equip at least a simple laboratory, and, in the case of serum separating centres, a rather elaborate one. For this reason the Halifax Clinic did not open until September 29, 1941, when, after a summer of preparation, the first clinic was held, and a similar interval had elapsed in the case of other centres. By the end of 1941, Red Cross Blood Donor Clinics were in operation in Toronto, Hamilton, Kingston, Ottawa, Montreal, Winnipeg, Halifax and Vancouver, and a total of approximately 36,000 donations had been taken in the year. Figures for the whole of Canada since that time are not at present available in condensed form. The following statistics taken from the Annual Report of the Red Cross Blood Donor Service in Nova Scotia for 1944 will serve to show the progress of a little over three years. In that time many changes in clinic procedure and laboratory processing have been made. Space does not permit detailed description of these, nor would they be found particularly interesting.

	1941	1942	1943	1944	Since Inception
	1 clinic	1 clinic	16 clinics	27 clinics plus mobiles	
Donations in N. S. . . . .	1,028	4,829	22,392	58,331	86,580

In 1944

Of 58,331 donations—36,978 were from men and 21,353 from women.  
 Weekly average for 51 weeks—1,144 donations.

	New Donors 1944	Previously Registered	Registered Since Inception		
Donors Registered.....	29,166	13,000	Approx. 42,166		
	Number of Clinics Holding Weekly or Bi-weekly Sessions		No. of Sessions		
Permanent Clinics.....	27		1,079		
Mobile Clinics.....	33 centres held a total of 61 clinics				
	1941	1942	1943	1944	Since Inception
Pooled Serum..... (4 litre pools shipped to Connaught Laboratories.)	33	192	809	1,929	2,963

The following paragraphs deal with some of the phases of the work of the Blood Donor Service from its inception up to the present day:

*Blood Typing:* Originally all donors were typed by a macroscopic method and serum was pooled according to type in the following proportions:

Type O—46%	or 1800 c.c.	} in a so-called 4 litre pool which in fact contained only 3900 c.c.
“ A—41%	or 1600 c.c.	
“ B—10%	or 400 c.c.	
“ AB— 3%	or 100 c.c.	

Thus in the early days of the Halifax Clinic on the basis of 100 donations a week, 46 of the donors had to be Type O, 41 Type A, 10 Type Band 3 Type AB, in order that the serum separated from the donations might be pooled. The difficulties involved in such a system in a small clinic were trying to say the least.

In January, 1943, pooling of serum according to type was discontinued in Canada, since it had been shown that in a sufficiently large pool the dilution of any of the agglutinins was very high. Typing of donors was carried on in Nova Scotia for some time, however, partly as a security measure and partly to satisfy the curiosity of the donors. In July, 1944, all typing in Red Cross Clinics in Nova Scotia was discontinued, due to the inability of either the Connaught Laboratories or the Provincial Red Cross Blood Donor Laboratory to provide typing serum on so large a scale.

It is interesting to note that, in spite of the fact that blood typing was widely done by many workers with no previous training, using an extremely simple macroscopic method, surprisingly few mistakes have been found.

*Serological Testing:* Since the end of 1943, no serological tests whatever have been done on blood received by the Red Cross in Nova Scotia. With one or two possible exceptions every other Red Cross Blood Donor Clinic in Canada either had discontinued testing some time before or discontinued at that time. This will come as a surprise and perhaps a shock to many readers, in view of the great emphasis which has always been laid on the importance of syphilis-free donors in relation to transfusions of whole blood, and also perhaps because of the increasing intensity of the campaign against venereal disease in the past two years. While in other circumstances the Canadian Red Cross Society

would have participated more than willingly in the National campaign, other and more pressing considerations were involved.

As the number of donations a week in Nova Scotia and across Canada increased, the resources of the various Provincial and Civic laboratories were strained to the breaking point. Serological testing had become increasingly elaborate and at a time when trained technicians were at a premium it was becoming necessary to find additional staff to handle the extra work from the Red Cross. The number of definite cases of syphilis picked up through the Blood Donor Service was never high, and for the number of tests done (since the blood of every donor was tested with each donation, sometimes as often as five times a year), from a case finding angle, a similar number of tests done on almost any other group of the population would have accomplished more. Notwithstanding these aspects, had testing been considered necessary in the preparation of safe, dried serum, it would have had to be continued whatever the cost. But meanwhile the Committee on Shock and Blood Substitutes of the National Research Council had, after due consideration, stated that:

- (a) At the very time when spirochetes were most likely to be found in the circulating blood, the serological tests might be negative and, therefore, testing as ordinarily carried out was inconclusive.
- (b) Any spirochetes in the circulating blood when it was taken would not survive the freezing and drying process as carried out. Therefore dried blood serum prepared from blood which had not been serologically tested was permitted to be issued for use by the armed forces.

Since it was considered to be the first duty of the Red Cross Blood Donor Service to secure satisfactory serum for this purpose, testing in Canada as a whole was discontinued.

*Medical Examinations of Blood Donors:* It is admittedly desirable that every prospective donor have a careful history taken and, if possible, some sort of medical examination, at least upon the occasion of the first donation. It must be confessed with regret that in Nova Scotia, although the history as outlined on the clinic card is recorded, with a few exceptions medical examinations have not been possible. The Medical Profession has been so diminished in Nova Scotia that the most that could be demanded of them in most clinics was the presence of a doctor who could insert the needles and to whom questions pertaining to the health of the donors could be referred. With these limitations donors and doctors alike appear to have been fairly well satisfied and it may be stated here that, until the present time, no untoward incidents have occurred. From time to time a donor appears who feels entitled to a complete medical examination. These are usually referred to their own physician after the limitations of the Blood Donor Service in this connection have been explained. Some reliance must be placed on the common sense of the donor, and in the last analysis the Blood Donor Service does not differ from general medical practice, in that the donor or patient must convey information in order to receive attention. Sometimes confidence in the donor in this respect is misplaced, as in the case of a man who gave several donations during a long remission in the course of the chronic lymphatic leukemia from which he suffered.

With reference to the question of reactions, which will be dealt with later, it might fairly be said that blood pressure readings before a donation would help to eliminate some of these. However, since many donors upon the occasion of their first visit to a clinic are in a state of excitement, either suppressed or obvious, true blood pressure readings could not be readily obtained, and it is felt that the neglect of this investigation is not serious.

*Haemoglobin Levels:* The experience of the Halifax Blood Donor Clinic with respect to this matter has been reported by Dr. C. B. Weld in a previous issue of the BULLETIN. The policy in Nova Scotia blood donor clinics has been to accept donations from donors with relatively lower haemoglobin levels than are considered desirable in other provinces. The amount of blood taken has, however, always been carefully adjusted in relation to haemoglobin level, body weight, and age of the donor. Donors must be 18 years of age and weigh 100 pounds in order to give blood at all. The haemoglobin must be in the case of men 80% and in the case of women at least 70%, but an 18-year old girl weighing 100 pounds and with a haemoglobin of 70% is not considered a suitable donor. By a careful working out of this policy and by routine haemoglobin testing it has been possible to secure many more donations than would have been otherwise possible without any demonstrable lasting ill effects to the donors.

*Use of Ferrous Sulphate:* As an important part of the policy in respect to haemoglobin levels, iron in the form of ferrous sulphate in 5 grain pills has been freely given to donors with haemoglobins in the 60 to 80% range. Any donor failing to respond to a moderate amount of iron has been referred to his or her own physician. The iron is supplied by the Red Cross and is given to the donors without charge. Generally it is well tolerated though occasionally a donor complains of indigestion, and either diarrhea or constipation. The Red Cross Blood Donor Service has never at any time given free medical advice to donors except in the form of general suggestions, and iron is supplied in what might be termed only a prophylactic manner in the course of an enterprise leading inevitably in some cases to a lowered haemoglobin level.

*Difficult Venapunctures and Haematomata:* It is only to be expected that in an undertaking such as the Red Cross Blood Donor Service not every venapuncture will be perfectly successful. The three variable factors in this connection are the veins of the donor, the state of the needle and the skill of the doctor. Concerning the first of these it may be said that in Halifax at least, the number of donors rejected for poor veins is very low indeed, and that bugbear of all venesectionists, the fat lady, has proved herself to be a surprisingly good donor, a fair number having given as many as ten or more donations. The needles used in the Blood Donor Service in the Nova Scotia Division are all reconditioned by a Montreal firm, and with careful handling should reach the donor in usable condition. Unfortunately accidents do occur and needles are sometimes damaged when the blood sets are being assembled. The skill of the doctor varies directly with experience. Contrary to the practice in some other divisions the use of local anaesthetic before a venapuncture is routine in Nova Scotia, and both donor and doctor benefit. It is not considered desirable to make more than one attempt to insert the needle in a vein, and repeated attempts are made only with the consent of the donor.

Haemotomata, however, do occur, sometimes when least expected. They are often alarming to the donor who imagines the arm is infected. Once a lady telephoned in a very agitated state because she had considerable discoloration of the arm and a friend had told her that the arm should be opened and the blood removed. As a rule, however, if the donor is warned before leaving the clinic that discoloration may occur, undue alarm is avoided and no more than temporary discomfort is experienced. Once or twice reports have been received of infection of the arm but when these were followed up no substantiating details could be secured. One donor reported a rash on the arm around the site of the insertion of the needle; upon investigation it was found that the elastic adhesive plaster holding the small dry gauze dressing had been left in place for three weeks.

*Reactions:* It is in this connection that the absence of scientifically collected data is most to be regretted. Had there been adequate trained personnel present in the clinics a most interesting series of observations could have been compiled. Reports have been published on this subject from various sources. The conclusions in these do not always coincide with the impressions formed here, but impressions alone are poor stuff with which to meet the testimony of statistics. For what they are worth, however, these impressions are presented herewith.

1. The so-called reaction is difficult to define clearly, consisting as it does in any adverse effect, either subjective or objective, suffered by the donor. Reactions may be immediate or delayed. Immediate reactions occur before the donor leaves the clinic. They may occur before any blood is taken or in the course of the blood flow, but are most common within a few minutes of the termination of the bleeding. These immediate reactions may be mild, consisting of pallor, slight sweating, dizziness, and possibly a feeling of faintness or nausea; moderate, consisting of a marked degree of any of these; and severe, any of the above going on to loss of consciousness which may be followed by vomiting and occasionally accompanied by convulsive seizures, and possibly involuntary micturition. It has been noted that in those donors having the spastic or convulsive type of reaction the preliminary pallor is usually absent, the reaction comes on suddenly, and the face becomes flushed. Pallor usually follows and may persist for a considerable time. It is highly probable that hyperventilation precedes such a reaction but is not noticed as readily as other signs. It has also been noted very frequently that, when fainting occurs, upon return to consciousness the donor remarks that he or she had "a little dream."

Delayed reactions may be said to consist of excessive fatigue in the following two or three days, attacks of faintness, chilly sensations and, more rarely, loss of consciousness some hours or even days after a donation. When the interval is of any length, it is highly improbable that fainting is due in any way to the blood donation, but donors tend to attribute everything that happens for some time after a donation to the giving of blood.

2. Reactions of any of the above varieties probably even occur in less than 5% of all donors at any given clinic or series of clinics.

3. Reactions have no direct relationship to the size of the donation except in a very few cases.

4. Reactions are more common in men than in women.
5. Reactions are more common at the time of the first donation and the likelihood of a reaction diminishes as each successive donation is given.
6. Reactions are more common in donors between the ages of 20 and 30 and in those of average weight or less.

The reason why reactions occur is hard to establish. Although the manifestations are accompanied by alterations in pulse rate, blood pressure, etc., as well as the more obvious physical signs above-mentioned, the causes without doubt reside largely in the influence of "mind over matter." It is very difficult indeed to evaluate reactions from a psychological standpoint and in any single donor the causative elements may be mixed. As with many forms of human behaviour, fear is a prominent factor. A very large part is played by apprehension and fear of the unknown, which accounts for the frequency of reactions at the first donation. Some part is played by the primitive subconscious fear of the loss of blood or the sight of blood. Some reactions, particularly in men and especially in service men, seem to be definitely associated with a fear of needles. The anxiety and strain of a slow or difficult donation often leads to trouble afterwards. Hysterical exhibitionist tendencies are sometimes displayed by women who, if left alone without an audience, recover rapidly. These are easily detected by absence of any change in colour at any time and a great display of distress, which readily deceives the unsuspecting and sympathetic attendant.

In addition, a sort of mob psychology develops in relation to reactions. If, in the recovery room at a clinic where a number of donors are sitting drinking coffee and apparently quite well, one reaction occurs, it is not uncommon for others to follow due, presumably, to the power of suggestion.

The predisposing physical factors appear to be mainly hunger and fatigue, with a possible third in women in relation to the menstrual cycle. Of these hunger is the most important. In the early days of the Blood Donor Service in Halifax when much emphasis was laid upon fat-free meals on the day of a donation reactions were extremely common, particularly at evening clinics, due to the fact that many donors not knowing what was fat and what was not tried to "play safe" by starving. Further reference to this will be made later in connection with fatty serum.

*Handling of Reactions in Blood Donor Clinics:* The word handling is used advisedly since the procedure can scarcely be called "treatment." After an experience of over three years the Red Cross Blood Donor Service in Nova Scotia has finally adopted a policy of "masterful inactivity" where reactions are concerned. In other words, nothing is done except to place the donor prone on a bleeding table or cot or, if need be, the floor, minister to his or her immediate needs and allow recovery to take place spontaneously. Those of us who have dealt with large numbers of donors over a long period are quite convinced that no drugs or stimulants will materially serve to prevent a reaction, avert a threatened one, or shorten the course of one fully developed. The one *preventive* measure of any worth is to keep the donor on the bleeding table for some time after the donation is finished. This unfortunately slows the flow of donors through the clinic. In some centres sufficient space is available to allow for a bed for each donor after the donation, and in these clinics reactions are almost unknown.



To avoid severe reactions, attendants in charge of the so-called "recovery rooms" where donors rest and drink coffee after a donation are repeatedly warned to watch for colour changes, which usually develop before the donor is conscious of any ill effects. If as soon as an alteration in colour, even if not actual pallor, is noted, the donor is persuaded to lie down, the reaction is rarely more than mild. When a moderate or severe reaction occurs, its course will not be altered by anything other than recumbency and reassurance.

The use of alcoholic stimulants in blood donor clinics is a much debated question. In some provinces alcoholic stimulants are freely administered to those donors requesting something of the sort, whether signs of reaction are present or not. It need hardly be said that such requests are by no means rare under those circumstances. In the early days of the Halifax Blood Donor Clinic whiskey was kept on hand but it was found that donors receiving whiskey had a marked tendency to vomit and no appreciable shortening of the reaction was noted. Now all clinics are warned against the use of alcohol for the following reasons:

1. It is unnecessary.
2. It is undesirable.
3. It is expensive.
4. If a donor who had been given alcohol suffered a delayed reaction it might be attributed to the alcohol.
5. The reputation of the Red Cross would tend to suffer through the routine use of alcohol. Many clinics are held in church halls and objection to their use for this purpose would be almost certain if alcohol were in evidence. The latter may appear to be a secondary consideration, but when it is borne in mind how large a part in the accomplishments of the Red Cross is played by goodwill, it will be seen that this aspect cannot be neglected.

Perhaps the most important single factor in combating reactions is the attitude of clinic personnel. If before and during a donation the donor is reassured and cheered by the calm and pleasant demeanour of the workers, a reaction is less likely to develop. If, when a reaction occurs, those assisting the donor can contrive to produce the impression that there is nothing remarkable or dangerous or shameful in the occurrence, the donor will recover more rapidly and with his or her self-respect unharmed. The preservation of the latter is of great importance, especially in men who tend to fear they will be considered effeminate. A donor who leaves the clinic feeling ashamed and humiliated will not return, whereas proper emphasis on the relative triviality of the episode will bring him back to try again. Occasionally it is necessary to advise a donor not to return because of repeated severe reactions or other physical reasons. Even then the donor may be sent away with undamaged self-esteem to assist the Blood Donor Service in other ways.

The worst mistake that can be made by anyone connected with a blood donor clinic is to relax even momentarily from the position that nothing is surprising and that no emergency is too great to be handled competently and effectively. In a word "morale" is important in a blood donor clinic as elsewhere.

*Fat in Serum:* It was originally stated that if blood were taken too soon after a fatty or even a normal meal the serum when separated would be cloudy

or creamy, and that such fatty serum could not satisfactorily be dried. Great precautions were taken, therefore, to avoid this. Donors were required to eat no fat or fatty food for twentyfour hours before a donation with the result, as has been stated before, that many donors ate almost nothing. Generally speaking, as might be expected, very little fatty serum was encountered with such rigid precautions. But from time to time a donation was found to have fatty serum, in spite of the fact that an obviously reliable donor, when questioned as to diet, stated emphatically that no fat had been taken, at least within the preceding six to eight hours. There were, therefore, some grounds for suspecting that individual variations in fat metabolism played some part.

Subsequently the objection to fatty serum in relation to the drying process was somewhat reduced in importance by the use of much larger pools in which a few fatty donations did not affect the drying qualities. However, the dried serum from such pools when reconstituted tended to be rather cloudy and was therefore unsuitable since, in the absence of proof to the contrary, the cloudiness might be taken to mean contamination. Further, in the early stages of processing cloudiness of the serum due to fat made sterility testing very difficult, since tests were read as negative or positive according to whether the broth containing the serum in question remained clear or became cloudy on incubation. As time went on, however, on general principles, the dietary restrictions were relaxed somewhat since it was found that the majority of donors could take meals containing a moderate amount of fat and still give blood the serum of which was quite satisfactory. Relationship between the time of the meal and the time of the donation is obviously important.

The principal reason for relaxing the rules as to diet lay in the fact that the increasingly large numbers of men and women in the armed forces who wished to be blood donors could not arrange for special meals. It was thought that in view of the need for more serum it was better to get as many donations as possible from all sources and to discard those too fatty to use. That the working out of this policy has not entailed an unjustifiably large proportion of such discarded serum will be seen in the fact that in 1944 only 2.42% of all donations were not pooled because of fatty serum. The greatest number of donations with fatty serum came from centres holding evening clinics and it would seem, therefore, that the cumulative effect of the day's meals is more important than a single meal containing fatty food.

*Haemolysis:* The question of haemolysis of blood cells is of interest in view of the fact that blood travels from the clinics throughout the province to the Provincial Laboratories over road, rail and, in the case of the Cape Breton Clinics, sea. Considering the many stresses and strains to which such blood is subjected the amount of haemolysis is surprisingly low. In 1944 out of 58,331 donations only 975 or 1.67% were haemolized. 299 of these were from Cape Breton Clinics and, since some degree of haemolysis in blood from this source has been fairly constant, we have been forced to conclude that the ferry trip across the Straight of Canso with the accompanying shunting of express cars is responsible.

A considerable number of other donations were haemolized due to accidents in handling. In one case the blood from a clinic took almost a week to reach Halifax during the hottest week of summer and in several other cases

boxes containing bottles of whole blood were badly mishandled in transit. The contents of some bottles were frozen with resulting haemolysis.

*Contamination of Serum and Sterilization of Equipment:* It is not widely known that in the year 1943 difficulty almost amounting to disaster befell the Red Cross Blood Donor Service across Canada in the form of gross contamination of the blood serum. For obvious reasons everything possible was done to prevent the knowledge of this misfortune from becoming public. The contamination developed at the time of a greatly increased demand for serum which was met by the opening of many new clinics. As a result sterilization was being done under all kinds of conditions and whole blood was being shipped to distant laboratories for processing. I am not at liberty to give the figures connected with the contamination of the serum in this publication, since as long as the Blood Donor Service is operated as part of the war effort they must not be printed. However, in order to overcome the difficulty it was necessary to inform a considerable number of people connected with clinics of what had happened, and, since one of the lessons learned as a result of the experience has a real bearing on operating room procedure, I see no harm in discussing the matter in this paper.

Without going in detail into all the steps that were taken to establish the source of the infection of the serum, it was finally conclusively proved that the fault lay in deficient sterilization. By the simple introduction of a particular kind of indicator into the interiors of blood and serum bottles and other autoclaved supplies, the difficulty was overcome. Indicators had been in use from the beginning but were placed in the load as a whole only. They were of the less accurate Steam Clox design and usually showed sterilization when in fact it had not been accomplished. Much of the sterilization for blood donor clinics across Canada was and is still done voluntarily by the operating room staffs of small hospitals. In spite of the fact that sterilization of Red Cross supplies was inadequate when contamination was occurring, no increase in infected wounds after operations was noted anywhere. The hospitals, therefore, had every reason to believe their sterilization adequate. Yet it was not.

It must be borne in mind, of course, that a wound and a bottle of blood are not alike in their response to the presence of bacteria. In a wound the natural resistance of the tissues to infection is of paramount importance; whereas the bottle of blood constitutes in itself one of the best known culture media. One bacillus entering a wound has little chance of causing infection; one bacillus in a bottle of blood may become a million before processing is complete.

The fault in sterilization generally seemed to lie in a failure to understand what does the sterilizing. When approached on the subject many operating room supervisors said indignantly, "Our gauge shows a pressure of 25 pounds." Steam pressure does not sterilize—only heat sterilizes, and failure to recognize this fact was responsible for a false sense of security. The temperature in every part of the load must be 250 °F. or better. When this was pointed out, it was claimed that the associated temperature gauge showed a temperature at least this high. Since, however, these gauges were only superimposed on a scale, the real changes upon which were registered by pressure, the actual temperature of the load was not shown. Many autoclaves did not

have thermometers attached to the outlet valve, the only place where the temperature shown has any bearing on the temperature in the lowest part of the load. Many autoclaves were not fitted with satisfactory air evacuation mechanism. But even with such equipment satisfactory sterilization could be obtained if pressure and other readings were ignored and reliance placed solely upon indicators. The ATI indicators which were introduced, showed a colour change from magenta to green which could only take place satisfactorily if a temperature of 250 °F. had been reached in the presence of steam. Since the use of these indicators has been made a rule in the sterilization of Red Cross equipment, the rate of contamination of the serum has diminished almost to the vanishing point.

It is not the purpose here to suggest or imply inefficiency in operating room technique in Nova Scotia, but attention is drawn to the narrow margin of safety which exists, and which is dependent more on tissue resistance than upon 100% asepsis. If this is recognized, constant vigilance can be employed to prevent any further encroachment upon the margin and greater security may be attained.

In conclusion may I add a word in the direction of post-war planning. It is possible that the Canadian Red Cross Society will see its way clear to the sponsoring of civilian blood and plasma or serum banks as a peace-time project. The need for some such project has become increasingly apparent to the medical profession, especially those members connected with hospitals, and to the general public. Certainly it has been only too apparent to those concerned with the operation of the Red Cross Blood Donor Service. Since its inception hardly a week has gone by without one or more requests for help in obtaining donors. Most of these requests would never have been made had adequate blood bank facilities been available.

As a result of Red Cross Blood Donor Service activities in Nova Scotia alone some 43,000 donors have been registered in the province. Many of these, both service and civilian, are, of course, not natives or residents of the province and after the war will return to their homes in other parts of Canada. This depletion together with other factors will probably reduce the number to around 10,000. This in turn will be augmented by the return of Nova Scotian service men who have given blood elsewhere during the war. In other words there will be in Nova Scotia after the war is over about 15,000 persons who have given blood at least once and of these 10,000 will have given more than once, and 3,000 or 4,000 will certainly have given between five and ten times. These have become accustomed to the idea and if properly approached would be willing to go on and co-operate in a peace-time project for the relief of human suffering. If each of these gave blood only once a year, the needs of Nova Scotia would be more than met. In addition a large number of people are accustomed to organizing and assisting in blood donor clinics. If proper use is to be made of these available sources of supply and assistance, no valuable time should be lost. If continuity of effort is preserved, the transition from war-time to peace-time activity can be accomplished without overcoming many obstacles, but plans should be formulated before it is too late and before the people have ceased to be donor-minded. In the formulation of these plans the medical profession of Nova Scotia is vitally concerned, since it is in their interests that a satisfactory system be instituted and without their help no plan however excellent can succeed.

# Disseminated Skeletal Tuberculosis

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**T**UBERCULOSIS may be manifested in many organs of the body. This is a well established fact.

On account of the complexity of the disease, differential diagnosis is often very difficult, requiring the aid of every diagnostic facility at our disposal.

When the skeleton is involved in tuberculosis, the articulations are most frequently affected, although, in rare instances, the bone may be primarily involved at points remote from the joints. In cases where the articular surface is diseased, it is not an easy matter from the roentgenological point of view to determine whether the lesion has originated in the non osseous structures of the joint or at the bony surfaces.

Tuberculosis, affecting the spine, is usually confined to one body, although the adjacent vertebral structures including the transverse processes, posterior arches, or adjacent rib areas may be affected by extension of the original lesion. Occasionally hematogenous spread of the disease may produce another lesion in a vertebral body distant from the original diseased vertebra, this is more often seen in adults than in children.

Tuberculous osteomyelitis of the shafts of the long bones, which usually occurs in children is often complicated by similar lesions in other bones and death from generalized tuberculosis is likely to occur.

True disseminated tuberculosis of the skeleton in an adult is a rare condition. Jungling<sup>1</sup> described 9 cases from the literature and cited 46 other cases. Van Astyne and Gowen<sup>2</sup> reported on an adult with involvement of one humerus, radius and ulna. Among 6 cases reported by Hodges<sup>3</sup>, one was in a child with lesions of the femur, radius and skull. In this case as in those noted above, tubercle bacilli were demonstrated by guinea pig inoculation. Kelly<sup>4</sup> presented a case report of a negro, age 24, admitted to hospital complaining of pain in the neck and spine of three weeks duration. Radiographic examination of the lungs disclosed no evidence of parenchymatous involvement. Films of the skull showed multiple punched out areas of bone destruction from .5 to 1 cm. in diameter in the frontal and parietal bones as well as in the shafts of both femurs. The ribs and scapulae were likewise involved and the 10th dorsal and 4th lumbar bodies showed partial collapse. The course of the disease was that of continued fever and progressive decline. Repeated chest films revealed no pathological changes. Death occurred seven weeks after admission.

Autopsy findings revealed characteristic bone lesions with caseation and necrosis. The lymph nodes were likewise involved. The pericardium was affected and miliary tubercles were found in the lungs, liver, kidney and spleen. It was decided that the primary source may have been in the caseating thoracic lymph nodes with miliary invasion of the viscera a terminal development.

We wish to present two case reports, which, on account of the rarity of the condition and striking similiarity are worthy of consideration.

With reference to the first case, the exact diagnosis was a problem until subsequent developments facilitated our decision. The second case presented certain features at the onset that rendered the diagnosis comparatively simple especially with Case No. 1 still fresh in our memory.

*Case No. 1.* White male, age 21, occupation, student, admitted to Tuberculosis Unit, City Hospital, June 18, 1940.

History of the present illness dates back to January, 1940, when he noticed a tired feeling and lack of energy. In March a severe cold with fever developed. A chest film taken at another hospital disclosed a moderate right sided pleural effusion. Physical examination of the chest prior to admission confirmed the above findings. No rales were heard.

On admission to the Unit, he complained of general malaise, slightly productive cough and pain over the right chest posteriorly.

Temperature ranged from 99 to 101, pulse, 80-100, respiratory rate slightly increased. On June 20th the blood picture—R.B.C. 3,880,000, Leucocytes 10,600, Hbg. 74%, lymphocytes showing a slight increase. Urine essentially negative, Widal negative.

Standard chest film examination June 19th is as follows:—Right Lung:—There are several small discrete areas of opacity, of an inflammatory nature, scattered throughout lung parenchyma, there is no disseminated mottling characteristic of miliary Tb. Moderate pleural thickening is seen. No fluid is demonstrable. Left Lung:—Negative findings apart from a small discrete area, about the size of a bean in the 2nd interspace outer zone. Summary:—The above noted inflammatory changes in conjunction with the history of pleural effusion are considered to be tuberculous.

From June until December, no noteworthy change developed in patient's condition or examination findings. There was a persistent low grade fever with rapid pulse, weight practically stationary and a moderate increase in the lymphocyte ratio on differential blood examination was noted.

Radiographic examination of the lungs in July and October showed no appreciable change apart from a lessening of the pleuritic thickening.

On December 7, 1940, he was referred for radiographic examination of the bony pelvis on account of a vague pain in the lumbo sacral region and herewith is a summarization of the X-ray report:—

“Examination included the lumbar vertebrae and bony pelvis. There is a localized osteolytic lesion involving the left transverse process 4th lumbar vertebra, no evidence of bone regeneration noted. A partial obliteration of the shadow left psoas muscle present, however no circumscribed soft tissue mass can be detected. The lateral films of this area showed no involvement of the lumbar bodies or intervertebral spaces.

“Three small circumscribed areas of rarification in the body of the ileum, immediately lateral to the left sacroiliac articulation, were also visualized.”

Further investigation included a radiographic examination of the skull on December 14th as follows:—

“Stereo films of the skull revealed punched out areas of rarification, three in number, about the size of a dime (1.5 cm.) in the right parietal and frontal areas—slight bony eburnation surrounds these areas.”

In February, 1941, a soft tissue inflammatory swelling over the left ankle joint developed, no radiographic evidence of periosteal or cortical bone invasion was detected. This swelling subsequently resulted in a chronic discharging sinus and the smear was positive for T.B.

In March, 1941, he was discharged to his home in the City. A chest film prior to discharge revealed little change in the character or extent of the small discrete lesion in each lung. No evidence of recent disease was demon-

strable. In January, 1942, radiographic studies were made of the bony pelvis and lower dorsal spine for symptoms referable to these areas. This disclosed active tuberculosis of the right hip joint with early destruction of the femoral head. The 12th dorsal body showed a minimal invasion of the inferior margin, and the adjacent intervertebral disc was partly destroyed. A large lumbar abscess, which was aspirated, developed as a late complication.

During the following months the patient's condition became progressively worse, and a terminal meningitis developed prior to death in May, 1943.

*Case No. 2.* K. C., age 30, colored, a native of the B.W.I., admitted to hospital May 29, 1943.

Complaints: Pain in the right shoulder, weakness of the right arm, pain and stiffness in the neck, loss of weight and strength.

Past history revealed that he had an operation on his neck two years ago and apparently from the position of the scars this was for caseating cervical lymph nodes. No family history of tuberculosis or malignancy was obtained.

His present illness began about six weeks ago with soreness and stiffness of the neck muscles, gradually increasing in severity. The positive findings on physical examination were a diffuse tender swelling over the right scapula posteriorly with some wasting of muscles of the right upper arm. In addition a soft fluctuant swelling below the angle of the right scapula was felt, from which there was some discharge. Rigidity of the neck was marked and there was very little movement of the right arm.

The blood picture revealed R.B.C. 3,750,000 W.B.C. 12,350, Hbg. 70%, Blood culture was sterile. Sputum examination negative for T.B. Wasserman negative. Temperature range from 100-102, pulse rate high.

X-ray examination on admission is as follows:—"Lower dorsal and lumbar vertebrae examined. The 1st and 2nd lumbar bodies show a definite rarification, chiefly anteriorly, there is no evidence of collapse. The intervertebral spaces are normal.

"Studies of the bony thorax revealed oval areas of rarification, 6th, 10th and 12th ribs averaging 2 x 1 cm. in size near the scapular line on the right side. We also note a similar type of lesion involving lower articular margin of the right glenoid cavity. Films of the skull were negative for pathology.

"Studies of the cervical vertebrae revealed a destructive process involving the 6th c.v. with partial collapse of the body and invasion of the adjacent intervertebral disc, an appearance consistent with a Cervical Potts Disease. A localized paravertebral abscess was seen in the lower cervical region. Standard film examination of the chest was negative for parenchymatous pathology."

Within the three weeks following admission, the temperature was lower. Considerable pain and swelling developed in the right shoulder and upper arm. Incisions were made in both areas, bacteriological examination of the smears from the arm, by Dr. D. J. Mackenzie was positive for T.B.

During September and October, the patient's condition became progressively worse, high fever was present, no meningeal symptoms reported.

The final chest film in August revealed no lung pathology. Death occurred in October, 1943.

*Summary:* Differential diagnosis in skeletal tuberculosis, from a radiological standpoint, is difficult in view of its similarity to multiple myeloma. The widespread skeletal invasion of the long and flat bones with the charac-

teristic punched out rarified areas is common to both conditions. Observation of the case will ultimately reveal a characteristic spine or joint lesion which clinches the diagnosis in favor of tuberculosis.

In Case No. 1, the original chest picture of a residual pleural thickening (following on a pleural effusion) with subsequent clearing, pointed strongly to tuberculosis. A chest film prior to death when meningeal symptoms were present, would probably have shown a miliary lesion of the lungs.

In Case No. 2, the characteristic cervical spine lesion was the deciding factor.

A collaboration of the clinical and radiological findings with proper evaluation of the evidence obtained, is necessary for a final diagnosis.

#### REFERENCES

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2. Van Alstyne and Gowan (rev. lit. J. B. and J. Surg., 1933).
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We desire to express our appreciation to Drs. J. G. B. Lynch and M. J. Macaulay for their kind permission to use the information contained in the case reports presented here.



**Report of the Joint Committee of the Representatives of the Provincial Medical Board and The Medical Society of Nova Scotia in Respect of Ways and Means Whereby Practising Physicians in the Province of Nova Scotia Would Be Members of The Medical Society of Nova Scotia**

TWO meetings of this Joint Committee were held with a view to determining the advisability of seeking amendments to The Medical Act to provide, in effect, that all practising physicians in Nova Scotia would, as one of the requirements of holding a license under The Medical Act, be a member of The Medical Society of Nova Scotia. The purpose of such legislation is to place the Society in a position to say that it represents the medical profession in Nova Scotia in its entirety and thereby strengthen the position of the Canadian Medical Association in respect of any representations to responsible Ministers and the Parliament of Canada arising out of any Health Insurance or similar plan.

While the Joint Committee has recognized the advisability of having a united voice for Nova Scotia physicians, and as well for the profession as a whole in Canada, it has come to the conclusion that it is inadvisable to seek any amendments of The Medical Act at the 1945 session of the Nova Scotia Legislature or indeed, to achieve the purpose by means of the Provincial Medical Board or change in The Medical Act. While a number of considerations have influenced the Committee, it is deemed proper to refer to the following:—

- (a) Opposition might be encountered to such amendments by members of the public; if not, from members of the profession; and the amendments might be regarded as being of a controversial character.
- (b) The Legislation might be regarded as coercive.
- (c) The fact that an ulterior purpose, although not a sinister one, is intended to be achieved, may be regarded by some physicians as a reason why the amendment should not be passed. The Committee of the Legislature would, it is thought, want to know all the reasons for the Legislation.
- (d) The uncertainty as to the attitude which might be given to the Legislation as a matter of Government policy.
- (e) The fact that the Society is intending to do indirectly by Legislation what it may not be able to do directly.

An alternative plan, designed to achieve the same purpose has been suggested, which plan this Committee considers desirable as not involving amendment to the Medical Act. This method contemplates membership of all physicians in the Society by means of alterations and amendments to the Society's By-laws. Even those physicians who will not or who neglect to pay annual fees, will be members of the Society. As a consideration the *Bulletin* will be sent to all practitioners whether the annual fees are paid or not. The proposed amendments to the By-laws require the sanction and approval of the Governor-in-Council, but it is considered such amendment should be unobjectionable. Such members who do not become active members may be considered as not taking advantage of the Society's educational and other facilities and thereby are not keeping pace with advanced theory and practice. The names of such members could from time to time be submitted to the

Provincial Medical Board by the Society for such action as the Board might consider advisable.

The suggested amendments (which may require some revision) are as follows:—

### Article III Membership

To be repealed in its entirety and the following substituted therefor—

1. The membership of the Society shall consist of all members of the medical profession in the Province of Nova Scotia whose names appear in "The Medical Register," or who are honorary, associate or corresponding members hereinafter referred to.

2. There shall be five classes of members namely:—

- (a) Honorary Members.
- (b) Corresponding Members.
- (c) Associate Members.
- (d) Active Members.
- (e) Members not in good standing.

3. Honorary members shall be members of the profession, or others, who have distinguished themselves by their attainments in medical or allied sciences or who have rendered signal service to this Society. Honorary members shall be elected only on the recommendation of the Executive Committee and as hereinafter provided.

4. Corresponding members shall be members of the profession not resident in Nova Scotia and who by virtue of contributions of their writings to the Society shall be deemed worthy of such recognition. Corresponding members shall be elected only on the recommendation of the Executive Committee and as hereinafter provided.

5. Associate members shall be (a) members of the profession temporarily resident in the Province of Nova Scotia who are not eligible for active membership and (b) such other members of the profession who are listed in "The Medical Register" and who are not carrying on practice in Nova Scotia as a consequence of retirement, sickness, service in any of His Majesty's Forces, or (c) other reasons which in the sole opinion of the Executive Committee is considered proper for Associate membership. The Executive shall submit to the annual meeting in each year the names of associate members.

6. Active members shall be those members of the profession resident in the Province of Nova Scotia who are actively engaged in the practice of medicine in the Province, whose names appear in "The Medical Register," and who have paid their annual membership fees and are otherwise in good standing.

7. Members not in good standing shall be those members who have failed to pay their annual membership fees and who are in arrears for two years. By virtue of membership they shall receive the BULLETIN of the Society, but they shall not be entitled to attend its meetings or hold any office. They may be restored to active membership by payment of the annual fee due and payable for the current calendar year. The names of members not in good standing and who have not been in good standing for three calendar years

shall after sufficient notice is given and with the approval of the Executive be sent to the Registrar of the Provincial Medical Board with the recommendation that the Provincial Medical Board take action as the circumstances may warrant.

8. The following shall be the method of election of Honorary and Corresponding members, viz:

The names of those persons desired eligible as Honorary or Corresponding members shall first be submitted to the Executive Committee, constituted as hereinafter provided, and the Executive Committee shall recommend for membership such persons whose names have been submitted as shall, by it, be considered desirable; whereupon the Society shall proceed to vote upon such application so recommended in the open meeting.

#### Article IV

Amend Article IV Branches by deleting the second paragraph.

Further amendments would be required relating to the time in which the annual fee is to be paid and also in respect of branches and otherwise to meet the circumstances.

#### Method of Procedure

Article XIII provides for alterations and amendments.

Two meetings of the Society are required, which meetings may be special meetings, or one of which may be the annual meeting.

(1) A requisition, in writing, should be prepared and signed by fifteen members, requesting the President to call such special meeting. Such requisition should state the object thereof, namely, to amend the By-laws in the form heretofore suggested or to similar effect.

(2) Notice of the meeting (at least fifteen days) should be given and such notice will set out the proposed amendments.

(3) The meeting should be held and the amendments approved.

(4) If the amendments are approved, a further special meeting (or the annual meeting) should be called upon requisition to the President, signed by fifteen members, which requisition shall state the object, namely, amendment of the By-laws of which notice was given at the aforementioned special meeting.

(5) Notices of the two special meetings will similarly state the objects thereof and the nature of the resolution should be set out in the Notice, that is, the form which the amendments are to take.

The meeting should be held and the amendments passed.

(6) If passed, the amendments require approval of the Governor-in-Council and the amended By-laws certified under the hand of the Secretary of the Society with the seal affixed should be forwarded to the Deputy Provincial Secretary for approval.

## Abstracts from Current Literature

EARLY DIAGNOSIS OF PULMONARY TUBERCULOSIS. Mattison, B. F.: Amer. Jour. of Public Health, 1944, 34: 1163.

Mattison selected for study three counties in upstate New York. Two were predominantly rural; the third included a city of about 200,000 population. In addition to the information routinely available from clinic and hospital records, the patients were questioned in detail as to the reasons for their first medical consultation. The time lags were determined between appearance of symptoms and seeking medical care, between the first visit to a physician (for symptoms referable to the chest) and the initial X-ray examination, between that X-ray examination and a definite diagnosis of tuberculosis, and between that diagnosis and reporting of that case to the health department. The observations indicate that case finding among the symptomatic cannot be expected to result in a majority of cases being discovered at a minimal stage; contact examination among associates of diagnosed patients, although yielding a high proportion of early cases, is limited in its scope, especially among urban residents. Mass roentgenography would appear to be needed if substantial reduction of cases which are advanced at the time of discovery is to be achieved.

APLASTIC ANEMIA, ACUTE AGRANULOCYTOSIS AND THROMBOPENIC PURPURA COMPLICATING MAPHARSEN THERAPY. Freeman, H. E.: Arch. of Dermat. and Syphil., 1944, 50: 320.

In the case reported by Freeman, a man aged 37 gave a history of having had syphilis for twenty years and of having taken treatments irregularly over a period of two years until January, 1943. When treatment was first begun, he had several febrile reactions, but thereafter he had tolerated his treatments. Neoursphenamine was the arsenical employed. In March, 1943, the patient entered military service. He was found to have a positive serological reaction and further therapy was advised. Mapharsen was the arsenical used. On May 18, 1943, the patient first noticed a purpuric eruption on the arms and forearms. He was at that time receiving mapharsen (0.06 gm. twice weekly) and bismuth subsalicylate weekly. After he received the tenth injection of mapharsen, the purpura appeared, but two more injections of mapharsen were given. The total amount of recent treatment was five injections of the bismuth preparation and twelve of mapharsen. The author saw the patient ten days after the onset of purpura and four days after the last dose of mapharsen had been administered. In view of the history and clinical observations the following diseases were considered after preliminary examination: (1) blood dyscrasia due to mapharsen (arsenical thrombopenia?), (2) infectious mononucleosis, (3) monocytic leukemia and (4) purpura of other origin than that of drug intoxication. The first blood smears indicated that the severe anemia was aplastic, with agranulocytosis. The patient's condition became progressively worse and he died on the ninth day in the hospital, nineteen days after he first noticed his purpura. The etiological factor in this case is considered to have been the trivalent arsenical. The patient had received bismuth subsalicylate, but he had none of the symptoms of salicylate intoxication. No evidence of infectious mononucleosis or of aleukemic leukemia was found.

NEW PLAN IN TREATMENT OF HYPERTHYROIDISM. Rea, C. E.: Surg., St. Louis., 1944, 16: 731.

Twenty patients with severe hyperthyroidism were treated by Rea with a combination of intravenous pentothal, spinal and inhalation anesthesia. The purpose of the spinal anesthesia was to inhibit medullary adrenal releases during the operation and thus to forestall the occurrence of an immediate severe postoperative reaction. It is not intended to secure anesthesia to a level which would permit the operation being done under this agency alone. The adrenals are important, as suggested by the reactions accompanying the so-called Goetsch test. If there were signs of hyperadrenalism, one would expect an increase in the blood sugar. Examination of the blood sugar did not reveal any increase, probably because of the short time factor in performing the operation. No accurate method for the determination of epinephrine in the blood is available. A somatic analgesia to about the fourth dorsal segment must be derived from the use of spinal anesthesia if one hopes to inhibit the splanchnic nerves to the adrenal glands. Procaine hydrochloride was used as a spinal anesthetic, the dose varying from 80 to 120 mgm. The head of the table may be tilted downward 10 degrees for a few minutes to assure high enough anesthesia. In so doing the patient's head should be raised on a pillow to prevent the anesthesia from extending to the cervical segments. No pressure drugs have been used to prevent or treat falling pressure. When it fell greatly, the Trendelenburg position and intravenous fluid were used. It is not necessary to use spinal anesthesia for all thyroid patients.

HYPERTHERMIA AS MANIFESTATION OF NEUROCIRCULATORY ASTHENIA. Friedman, M.: War Med., 1944, 6: 221.

Friedman attempted to determine (1) the frequency, nature and identifying characteristics of hyperthermia frequently found in neurocirculatory asthenia and (2) the effect of various agents and stimuli on the temperature of such hyperthermic patients. His studies were made on 30 soldiers of an average age of 26 years who manifested symptoms of neurocirculatory asthenia. The diagnosis was made when symptoms of fatigue, dyspnea on slight exertion, palpitation and precordial pain were experienced by a patient who, in addition, exhibited signs of a neurovascular disorder (facial flush, cold, wet hands, labile pulse, dermatographism, tremor of outstretched hands and inability to refrain from respiration for over thirty-five seconds) but no indications of organic disease. A patient with the syndrome of neurocirculatory asthenia was considered hyperthermic if his oral temperature was found to be 99.2° F. or above on more than three occasions during ten days of observation. Eleven of the 30 patients were found to exhibit an episodic type of fever accompanied by moderate tachycardia, increased tremor, localized perspiration and coldness of the skin of the extremities. Despite extensive clinical, laboratory and roentgenographic investigations, no evidence of infection was found in any of the hyperthermic patients. The character of the fever was found to differ in certain respects from that of fever observed in patients with a typical chronic infectious process. The hyperthermic patients also exhibited during their febrile periods significantly different clinical conditions than those usually found in febrile patients suffering from chronic infectious disease. Epinephrine hydrochloride, amphetamine sulfate, citrated caffeine, typhoid

vaccine and psychic stimuli were found capable of inducing elevations of temperature in these patients during normally febrile periods. No sedative, however, was found which was capable of preventing or reducing their febrile reactions. The fever with its accompanying signs observed in these patients is thought to result from abnormal activity of the hypothalamus.

PHYSIOLOGICAL EFFECTS OF DRINKING UNDILUTED SEA WATER. Elkinton, J. R. and Winkler, A. W.: *War Med.*, 1944, 6: 241.

Elkinton and Winkler cite cases of shipwrecked persons who died after drinking undiluted sea water. The mind was usually affected, and suicidal attempts were common. The clinical syndrome following the ingestion of undiluted sea water is one in which disturbances of the central nervous system predominate. Modern views seeks to relate the ill effects of the drinking of sea water to its hypertonicity, it being a salt solution with an average concentration of 3.5 per cent. Experiments with human and animal subjects following the ingestion of hypertonic saline solution suggest a reasonable tentative explanation of the deleterious and ultimately fatal effects of this procedure. Persons deprived of fresh water can drink little if any sea water without becoming further dehydrated. This dehydration at first affects both intracellular and extracellular fluid. With persistent drinking of sea water dehydration of the cells progresses much more rapidly than does that of the extracellular space, the volume of which is maintained by the retention of sodium chloride. Ultimately extreme intracellular dehydration produces disturbances of the nervous system with terminal respiratory failure, while the absence of extracellular depletion permits the circulation to function adequately until the end. It has been urged that castaways emulate seals, which do not drink sea water but meet their water requirements entirely from the body fluids of fish. The extensive promotion of this emergency measure has far outstripped its experimental investigation. While entirely reasonable from the point of view of salt excretion, since concentration of salt in the body fluids of fish is nearly isotonic, it ignores the fact that much urea is formed from the protein of fish and this urea requires extra water for its excretion. Ingestion of fish does not ameliorate dehydration in human beings, since all the water in the fish is required for the excretion of the urea. Seals, like dogs, presumably can excrete the urea with a smaller volume of water and can so retain some of the water for other purposes.

MENINGOCOCCIC INFECTIONS. Whitaker, W. M.: *U. S. Naval Med. Bull.*, 1944, 43: 650.

Whitaker describes the clinical manifestations of meningococcic infections observed in a study of 116 cases at the U. S. Naval Hospital, Farragut, Idaho, during a thirteen month period. He divides infection resulting from the meningococcus into three phases: (1) the nasopharyngeal, (2) the septicemic or invasive, and (3) the meningeal. Failure to recognize the signs and symptoms of the second (septicemic or invasive) phase has been a major factor in delayed treatment and consequent high mortality. Fever, chills, headache, characteristic rash and arthralgia, in the presence of an epidemic, are sufficient to warrant the diagnosis of a meningococcic infection and to require early treatment while awaiting laboratory confirmation. The mortal-

ity rate seems to parallel the intensity and severity of the skin lesions. Evidence of adrenal damage with vascular failure must be carefully watched for, particularly in patients with extreme skin manifestations of the purpura fulminans or intense petechial types. Prognosis in such cases, while always grave, is not hopeless if early intensive treatment is instituted. A total mortality rate of 4.3 per cent occurred for all cases, treated or untreated, with a corrected rate of 1.72 per cent for cases treated for at least twenty-four hours. No evidence was obtained in this series of meningococcal infections to warrant further employment of antitoxin. Early diagnosis with prompt institution of chemotherapy, preferably by the parenteral route, maintaining a high concentration of the drug in the blood and spinal fluid, leads to rapid control of the infection and ultimate complete recovery in over 98 per cent of meningococcal infections.

"SINGLE INJECTION" METHOD IN DIABETES MELLITUS. Peck, F. B.: West Virginia Med. Jour., 1944, 40: 341.

Peck states that at the Indianapolis City Hospital the principles of diabetic regulation have been altered. Instead of attempting to prescribe the individual's diet to suit the action of standardized insulin preparations, the opposite course was adopted, that of adjusting the insulin preparation to fit the individual circumstances. This is accomplished by prescribing three equal meals, no supplementary feedings, and the same laboratory criteria as previously required to establish control with insulin and protamine zinc insulin when given in separate doses. In order to provide a base line for comparison of methods, each case is first controlled as well as possible with separate doses of insulin and protamine zinc insulin. When this has been accomplished, the total dosage is given before breakfast each morning in the form of a suitable admixture in a single dose. If postprandial levels rise unduly, a greater proportion of insulin is needed in the mixture; if daytime reactions occur, less insulin is prescribed. Just as is the case when giving protamine zinc insulin separately, the dose of this component is governed by the blood sugar level as determined before breakfast. Usually patients who require less than 40 units daily, have done well with 3:2 mixtures (3 parts of insulin to 2 parts of protamine zinc insulin); for those who need between 40 and 50 units daily the 2:1 mixture is usually suitable, while the more severe cases needing in excess of 50 to 60 units each day have required 3:1 or even rarely 4:1 combinations. Of more than 150 patients who have been observed under these conditions in the last two years, only 3 have been changed back to the separate injection method. Diabetic control has been at least equal to that accomplished with multiple injections and usually superior to it.

PREVENTIVE ASPECTS OF CORONARY DISEASE. Plotz, M.: N. Y. State Jour. of Med., 1944, 44: 227.

Plotz thinks that preventive measures are possible for a certain number of patients with coronary disease or myocardial infarction. First there is the patient who has already had one attack of coronary thrombosis. Next there is the man with angina pectoris. Next there are middle aged and aged persons with electrocardiographic evidence of heart damage without symptoms. Given certain conditions, their coronary arteries will fail. Somewhat less

vulnerable but still requiring special vigilance are patients with hypertension, diabetes, myxedema, polycythemia or elevated blood cholesterol from any cause. Coronary thrombosis practically never occurs in an undamaged artery. It is preceded by an atheroma. Terrifying pain, shock and changes in the cardiogram are only the final act in coronary thrombosis. Preceding this there may be a prodromal stage of precordial pain resembling coronary pain. It is like a prolonged, atypical attack of angina pectoria and is a reflection of reduced coronary circulation and anoxia of the heart. If a patient falls into one of the vulnerable categories such an attack should lead one to suspect an impending coronary thrombosis. A man who suddenly develops angina pectoris for the first time should be put in the same category. These patients should be treated as though they had a cardiac infarction. Bed rest for five to fourteen days and use of papaverine to increase the pulmonary circulation are essential. Patients should be warned against the use of glyceryl trinitrate at this stage. If it does not relieve pain promptly, it should not be used again, because the repeated use lowers the blood pressure and increases the possibility of infarction. Sharp and prolonged reduction of blood pressure may be fatal to a patient of the vulnerable classes. Therefore he must be protected against such events as shocking operations, spinal anesthesias, which lower the blood pressure, and severe hemorrhages. In this connection the author cites several illustrative cases and says that for the past two years he has employed slow plasma transfusion for those patients whose systolic blood pressure has fallen below 90. He feels that several lives have been saved by preventing the coronary head pressure from falling too low.

E. DAVID SHERMAN, M.D.

Abstract Editor



## Personal Interest Notes

**D**R. C. J. W. Beckwith, Divisional Medical Health Officer for Cape Breton, has been appointed full time Medical Superintendent of the City Tuberculosis Hospital at Halifax.

Major F. Murray Fraser arrived in Halifax the end of March from a half decade of active service with the Royal Army Medical Corps in Africa for the first re-union with his wife and son since the days of the Munich crisis.

Major Fraser, son of Mrs. Fraser, and the late Hon. J. Fred Fraser, has seen service with the British forces in Abyssinia, Madagascar, Kenya Colony, British and Italian Somaliland and Bjbouti.

He graduated from Dalhousie Medical School in 1932 and went to Europe for a post-graduate course in 1934, spent two years studying in London, Dublin and Vienna and then opened a practice and established a home in Cheshire, England.

When Chamberlain returned from Munich, Major Fraser saw the handwriting of war on the wall, and sent his wife and son, Murray, back to Halifax and waited for the declaration of war, which came six months later, to join the R.A.M.C.

Major Fraser was first sent to Ethiopia, where he saw the Italians driven out and in the months and years that followed he witnessed the collapse of Mussolini's dreams of an African Empire.

The toughest fighting he saw was in Madagascar, where the pro-Vichy officers and their native Malagashe troops "fought a hard battle." "Of course, from the point of view of the present fighting in Europe, it was absolutely nothing, but the French put up what I thought was a darn good scrap at that time," he said. The French on Madagascar were not pro-Nazi, but neither were they pro-Ally. They fought to save Madagascar for themselves.

Major Fraser who is returning to Africa for another two months' service after his sixty-one days' leave is up, predicted a vast post-war development in what was once known as the "Dark Continent." The string of air bases which have been built by the Allies through the jungles and deserts, he feels, will bring new life to the Africans and their country and new trade opportunities to the entire world.

As for his own post-war plans, Major Fraser intends to take his family back to their home ten miles from Liverpool and resume his private medical practice. (*Halifax Mail*, March 27)

Major J. A. F. Young, R.C.A.M.C., formerly of Pictou, has been appointed second-in-command in medicine of No. 10 Canadian General Hospital overseas, a 1,200 bed hospital.

Dr. G. Murray Smith, Liverpool, recently of the staff of the Victoria General Hospital, Halifax, has joined the staff of the Nova Scotia Sanatorium, Kentville, where he will do post-graduate work.

Dr. C. J. W. Beckwith, Divisional Medical Health Officer for Cape Breton, was the guest speaker at the weekly meeting, early in April, of the

Sydney Rotary Club. Preventive medicine as applies to the community was the subject of his talk. He outlined the work of the Public Health Department in Cape Breton since 1941, and told of plans for an expansion in the post-war era. Many other matters on health were touched on by the speaker. Dr. L. R. Meech was chairman.

The marriage of Marjorie Earle Watson, daughter of Mr. S. H. Earle, Halifax, and Lieutenant Colonel T. M. Sieniewicz, R.C.A.M.C., took place in Hamilton, Ontario, on March 10th. Lieutenant Colonel T. M. Sieniewicz, who recently returned from overseas, has been assigned to duty in Halifax.

Major F. A. Minshull, R.C.A.M.C., returned from overseas the end of March and is at present in Toronto. Major Minshull graduated from Dalhousie Medical School in 1930, practised in Halifax for a short time, and then moved to Newfoundland. He enlisted at the outbreak of the war and has taken part in the major Western engagements prior to sailing for home. He was medical officer in charge of the ship during the homeward voyage, a troop-ship which brought over 400 more war brides and their children to the Dominion.

Major W. S. Gilchrist, R.C.A.M.C., (Dal. 1927), a native of Pictou, and who formerly was a medical missionary at Angola, Africa, returned from overseas the end of March and has been taken on the strength of No. 6 District Depot at Halifax.

Captain David B. Morris, R.C.A.M.C., (Dal. 1937), who formerly practised at Windsor, was among the stretcher cases returning from overseas during April.

Hon. Dr. F. R. Davis, Minister of Health and Welfare for Nova Scotia, is at present confined to his home with illness. We are delighted to hear that he is progressing favourably and expects to resume his activities in a short time.

Dr. J. E. Park of Oxford met with a painful accident in a motor car collision in February causing a dislocated ankle which confined him to hospital for a number of weeks, and from which he is slowly recovering.

Schenectady, N. Y.—Dr. E. Gordon Young, professor of biochemistry at Dalhousie University, Halifax, Nova Scotia, was one of the speakers on the 250th Union College Town Meeting here, broadcast by radio station WGY at 1:30 p.m., Sunday afternoon, (April 22). This broadcast was a part of the Conference on Premedical Education held at the college beginning Friday, (April 2) and sponsored by Union College and the Albany Medical College.

Dr. Donald Slaughter, Dean of Southwestern Medical College, Dallas, Texas, was the other speaker. They discussed the subject, "Will We Have Enough Competent Physicians in the 1950's?"

Dr. Leonard B. Clark, professor of biology at Union College, acted as moderator.



## Obituary

DOCTOR Peter McFarlane Carter, who had been in poor health for a couple of years, died at his home in Sydney on April 3rd. Doctor Carter was born in Antigonish on December 23, 1878, son of the late Mr. and Mrs. James Carter. He graduated from St. Francis Xavier University, and from Dalhousie Medical School in 1907. He taught school for a time at Reserve Mines before entering college, and later conducted a pharmacy in Sydney which he sold to Harry Pollett. He had practised in Sydney since his graduation and was one of the city's best known professional men. He is survived by his widow, the former Edith McVey of Sydney and one daughter, Mary, and one son, Alfred.

The death occurred at Saint John on April 19th of Doctor Matthew Allison Curry, former leading Halifax medical practitioner, after an illness of several months, at the age of eighty-eight. Doctor Curry was a native of Windsor, where he practised for many years after his graduation from the University of New York in 1883. He at one time lectured in Clinical Medicine at the Medical College of Dalhousie University and before leaving for Rothesay to reside officiated at the opening of the new Dalhousie Medical Dental Library. He was also one of the oldest members of the Board of Commissioners of Victoria General Hospital. Doctor Curry was married on June 14, 1892, in St. Paul's Church, Rothesay, by the rector, Rev. George Exton Lloyd, to Miss Florence Alice Robertson, daughter of the late Mr. and Mrs. James F. Robertson of "Karsalie," Rothesay. In June of 1942, they celebrated their golden wedding anniversary. While he made his home in Halifax, he and Mrs. Curry enjoyed many delightful visits to England to visit their daughter and her family. While residents of Halifax Doctor and Mrs. Curry lived at 71 Morris Street, now the headquarters of the Nova Scotia Division of the Canadian Red Cross.

Doctor Curry is survived by his wife, one daughter, Mrs. Fraser, wife of Rev. A. E. Fraser, rector of Solihill, Warwickshire, England, and a son James R. Curry, manager of the Bank of Nova Scotia at Sackville, N. B., and several grandchildren.

The BULLETIN extends sympathy to Dr. J. E. Park of Oxford in the loss of his wife Jessie Katherine Guthro, daughter of Alexander and Christena MacDonald Guthro, which occurred on April 17th. Mrs. Park had not been in good health for some time and the loss of a son, Lance-Corporal Ferdie Park, who was killed in action on September 17, 1944, during the siege of Boulogne, France, was a great shock to his mother.

### Not Cancelled

The art contest sponsored by Mead Johnson & Company on the subject of "Courage and Devotion Beyond the Call of Duty" (on the part of physicians) has *not* been cancelled or postponed.

The closing date remains May 27, 1946.

There will be no annual exhibit *this year* of the American Physicians' Art Association, due to the cancellation of the American Medical Association meeting which had been scheduled to take place in Philadelphia, June 18-22, 1945.

For full details regarding the \$34,000 prizes and the "Courage and Devotion" contest write Dr. Francis H. Redewill, Secretary, A.P.A. Association., Flood Building, San Francisco, Cal., or Mead Johnson & Co. Evansville, Ind.