Technical and Bibliographic Notes / Notes techniques et bibliographiques

Canadiana.org has attempted to obtain the best copy available for scanning. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of scanning are checked below.

Canadiana.org a numérisé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de numérisation sont indiqués ci-dessous.

- ☐ Coloured covers / Couverture de couleur
- ☐ Covers damaged / Couverture endommagée
- ☐ Covers restored and/or laminated / Couverture restaurée et/ou pelliculée
- ☐ Cover title missing / Le titre de couverture manque
- ☐ Coloured maps / Cartes géographiques en couleur
- ☐ Coloured ink (i.e. other than blue or black) / Encre de couleur (i.e. autre que bleue ou noire)
- ☐ Coloured plates and/or illustrations / Planches et/ou illustrations en couleur
- ☐ Bound with other material / Relié avec d'autres documents
- ☐ Only edition available / Seule édition disponible
- ☐ Tight binding may cause shadows or distortion along interior margin / La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure.

- ☐ Coloured pages / Pages de couleur
- ☐ Pages damaged / Pages endommagées
- ☐ Pages restored and/or laminated / Pages restaurées et/ou pelliculées
- ☑ Pages discoloured, stained or foxed/ Pages décolorées, tachetées ou piquées
- ☐ Pages detached / Pages détachées
- ☑ Showthrough / Transparence
- ☑ Quality of print varies / Qualité inégale de l'impression
- ☐ Includes supplementary materials / Comprend du matériel supplémentaire
- ☐ Blank leaves added during restorations may appear within the text. Whenever possible, these have been omitted from scanning / Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été numérisées.

☑ Additional comments / Commentaires supplémentaires: Continuous pagination.

VOL. XIII, No. 1
[OLD SERIES]

VOL. VI, No. 1
[NEW SERIES]

Queen's Medical Quarterly

PUBLISHED BY THE MEDICAL FACULTY OF QUEEN'S UNIVERSITY.

CONTENTS.

OCTOBER, 1908.

Published for the Committee by
THE JACKSON PRESS
KINGSTON, CANADA.

QUEEN'S MEDICAL QUARTERLY

VOL. XIII, No. 1 Old Series — OCTOBER, 1908. — VOL. VI, No. 1 New Series

Queen's Medical Quarterly is presented to the Medical Profession with the compliments of Queen's Medical Faculty. Contributions will be gladly received from members of the Profession and willingly published.

BUSINESS MANAGER: DR. A. R. B. WILLIAMSON.
This number is issued under the supervision of
DR. W. T. CONNELL.

Communications to be addressed to Dr. A. R. B. Williamson, Queen's University, Kingston.

Items of interest or original articles for publication solicited from members of the profession.

Office of Publication—Kingston, Ontario.

MEDICAL EDUCATION.

AT the session of the Ontario Medical Council in July, 1908, a committee was appointed to deal with the whole question of medical examinations and curriculum, and also reciprocity with other provinces and Great Britain, and to report at a special session of the Council to be held in November, 1908.

We trust this committee will be broad-minded enough to recognize that the University degrees in Medicine given by the teaching bodies in this province ought to carry with it the right to practice medicine in the province. This is the arrangement recognized in Great Britain by the British Medical Council and practically also recognized in the provinces of Quebec and Manitoba. Undoubtedly the Medical Council ought to retain control and this they could do by appointing a board of assessors to sit with the examiners or pass upon the examinations of the Universities, and report to the Council. It is perhaps too much to expect that this arrangement can or will be made at once, but we sincerely trust that consideration will be given such a view and that at least some steps in this direction will be taken at the November meeting. As to reciprocity, Ontario has much to gain and little to lose by adopting a basis for reciprocal registration with other provinces and Great Britain.

NA

WATER SUPPLIES AND WATER ANALYSES.

THE source of our water supplies is the rain. In coming down through the dust and gas-laden air, over the dusty roofs of our houses and barns into cisterns, in running over the surface of the soil, over the products of the decay of animals and plants into our streams and lakes, in sinking down into the earth through the humus layer and through the mineral-laden under-strata to the water-arresting ones, and thus to our wells and springs, solution of and suspension with the various substances encountered takes place. Some of these materials are chemical, some consist of living organisms. Of the chemical material some is organic, some inorganic; of the living organisms some are vegetable, some animal.

The inorganic substances that may be met with are variously soluble. Coming through arsenical, iron or lead ores enough might be taken up to render the water harmful; running through the sulphates and carbonates of lime, soda and magnesium a quantity of these sufficient to encrust boilers or fill them with mud, to use up our soap and in excessive cases give those who drink it various alimentary disorders, may be taken up. Of insoluble materials such as fine clay and disintegrated substances giving rise to turbidity, enough to be disagreeable, sometimes harmful, may be taken up.

Of the organic materials met with, some are merely the infusion of plants, either living or dead and now disintegrating, and are mostly harmless. Such material gives rise to color, odor and taste in water, but most of all to food for many kinds of lower forms of both vegetable and animal life. Again the organic matter may be from the bodies of dead animals, human or otherwise, or from their excreta. This also gives odor and color and tastes, often very disagreeable, and certainly very disgusting; and worst of all, such substances may be in themselves poisonous or be food material for pathogenic organisms of various kinds.

Now of the living organisms we have both kingdoms represented, the vegetable and the animal. Of these many are visible and many invisible; many are quite harmless, others just disagreeable and, unfortunately, many are quite dangerous.

Many of the ordinarily harmless ones, when in very large numbers, may become very annoying; for instance, conferva, asterio-

nella, tabellaria or synuria, euglena and volox. These when they grow in large numbers, in stored waters especially, may give rise to very disagreeable tastes and odors (pungency, fishy odors, etc.). Many other organisms are just saprophytes, doing the best they can to free the water from polluting organic matter. Of themselves they are harmless, but in decomposing the organic matter they give rise to very disagreeable conditions and even render the water poisonous if much organic matter is present, just as putrid food is poisonous under the same saprophytic invasion. This poisoned condition is less serious if the material is of vegetable origin, while it may become very serious if it is of animal origin.

During decomposition the dissolved oxygen of the water may be almost entirely removed. Fish and such like animals could not then live in it, and many of the higher plants would be killed out also. Sometimes, however, this removal of oxygen may be a benefit, e.g., typhoid bacilli live a very much shorter time in water when the dissolved oxygen is much reduced or absent. This absence of oxygen is one of the chief reasons why fish are absent in water polluted by the wastes from saw-mills, pulp-mills, starch and glue factories, slaughter houses, and such.

Most of the protozoa in waters are there to eat up the bacteria after these have multiplied and lived upon the organic matter of the water, and are in most cases harmless.

Unfortunately, some of the living organisms found in water are pathogenic to man, to animals or to both. Of the animal parasites, cestodes and vermes may reach us by this route, likewise the various filaria, after the seeding of the water through the intermediary of mosquitoes. The amoeba coli in the tropics reaches the human subject through water, and it is likely that many other protozoal diseases are so transmitted. But with us in northern zones certain bacteria are the important infective agents carried by water.

The surgeons among us always boil the water they use for fear there may be pus producing streptococci or staphylococci, tetanus bacilli, or other wound-infecting bacteria present. The practitioner of dietetics thinks of the bacillus aerogenes capsulatus or of the bacillus enteriditis sporogenes altering the milk and food of their patients to the extent of giving them cholera nostras or the various forms of enteritis and intestinal toxaemias. The sanitarian is afraid that now and then the Eberth bacillus might come along and precipitate an outbreak of typhoid fever, or that the Shiga bacillus in the lower temperate zones or in the tropics might cause epidemic dysen-

tery, or that the spirillum of Asiatic cholera might be there or that the bacillus of anthrax or splenic fever in cattle might be washed into the water course and thus into the pastures from the waste from tanneries and wool washing establishments, etc.

The organic matter in the water may favor the propagation of these various organisms in it, though the non-pathogenic organisms are more likely to be so favored. It often happens that in heavily polluted waters (that is, chemically) pathogenic bacteria do not live as long as in less polluted waters. Russel and Harris, for instance, found by their celloidin capsule method that typhoid bacilli lived frequently six days in Lake Michigan water, but rarely more than three days in the water of the Chicago drainage canal.

It is with the organic matter that the living organisms have come. Practically all of the human infective organisms found in water are derived from excreta. Nature has in her the means of dealing completely with such excreta pollution if she is given sufficient time and opportunity, but in crowded districts this is practically not given her. All natural waters have more or less organic matter present in them. Each class of water is a standard to itself in this respect and it is impossible to fix an organic standard to fit all waters. The standard must be for each individual water.

The chemist tells us whether organic matter is present in small or large quantity. The more present the more certainly will living organisms be found and the greater the number. The bacteriologist tells us how many are present, and from the bacteriologist's report that there are many organisms present we may justly infer that there is much organic matter present.

In the chemist's report from the data he can get he can tell with some accuracy whether the organic matter is from animal or vegetable origin. If it is from an animal origin (and as this is usually excretal, and such excreta may be carrying pathogenic bacteria) we may infer that pathogenic bacteria are probably present.

The bacteriologist may be able to tell us whether there are pathogenic organisms present. He cannot always do so, but he can get a little closer than the chemist. He can by showing the presence of Colon bacilli, for instance (organisms that live chiefly in the intestines of man and higher animals), be fairly certain that this organic matter has come from the intestine, and we know that it is the intestinal content that most frequently carries pathogenic bacteria to a water.

The chemist can tell us from the data he obtains as to amount of the nitrates and the free ammonia in comparison to the quantity of albuminoid matter present, whether the pollution is recent or not. The bacteriologist can tell us from his knowledge of the longevity of the various organisms found, especially of the Colon bacillus and streptococci under the conditions present, as to how recent infection of the water is, and thus as to the possible infectiveness of the water.

Sometimes he can isolate the pathogenic organisms. Typhoid bacilli, cholera spirilla, anthrax bacilli, streptococcus and staphylococcus pyogenes, the bacillus aerogenes, amoeba coli, the embryos of and cestodes have been isolated from disease-producing drinking waters.

There are, however, difficulties in the way, almost insurmountable, to recovering these agents of infection in any given sample so that another method is made use of in practice, viz., the colon bacillus is sought. This bacterium can be rather easily isolated and recognized. It is chiefly a saprophyte and may multiply in water when it first enters. At any rate, they are found in appreciable numbers, even in a water that has not much faecal matter in it, though they do not live a great while in natural waters. If they are found in a water, then excretory material has most probably reached the water recently; and if it has, then there has been every chance for infective organisms also to have reached it; so that when colon bacilli are found in a drinking water, the sanitarian looks on that water as a suspicious one, especially if the organic matter is at the same time there in appreciable quantities. When the colon bacillus is not present in water sample, it is next to impossible that other infective organisms could be found.

It is quite possible that colon bacilli from conditions in their new environment in the water may acquire pathogenic powers. Certain animals inoculated with colon bacilli show lesions simulating very closely those found in man suffering from typhoid fever. There are undoubted cases of infection from colon bacilli in the human being on record (Windsor outbreak); and so far as the patient is concerned he is nearly as seriously burdened as if he had typhoid.

Colon bacilli in a water recovered from farm land with a small human population, though present quite frequently (as in the Croton supply of New York city), cannot be looked on as such a serious indicator of danger as if these were from sewage of human origin, as, for instance, in some of the great lake water supplies. It is here

that a knowledge of source and local conditions is essential in properly interpreting analytical findings.

In explanation of the difficulty experienced in finding pathogenic bacteria in water, certain facts must be considered. Most commonly by the time search is called for, the offending bacteria have disappeared. The optimum conditions for these infective organisms are body temperature, concentrated nutriment such as can be got from living tissues, a field unoccupied by other forms and such other conditions as they have learned to use their toxins on in living organisms, in order to render these favorable to themselves. When they reach natural waters they accommodate themselves, fortunately for us, very indifferently. Copeland found that typhoid bacilli rarely lived more than eight days in sterile natural waters; thus colon bacilli under otherwise similar conditions lived 14 days in unsterilized Lake Michigan water, whereas in the water of Chicago drainage canal they lived but three days. Houston in England found that on unsterilized earth typhoid bacilli rarely lived over 48 hours, whereas on sterile earth they were recoverable in 15 days or even more. In mud at the bottom of streams they have been recovered after three months' time. Typhoid bacilli have been isolated from faeces thrown on frozen ground (and thus kept in cold storage) after four months. This is probably true of the other pathogenic organisms spoken of above depending on whether they are strictly pathogenic or facultatively saprophytic.

It is a question still as to whether many infective agents actually multiply to any great extent or over any lengthened period in natural water. It seems to be rather the survival of the stronger ones.

Direct sunlight, oxidation, and dilution of their food, repeated separation of the individuals in the water from one another and their enzymes, by the winds and the currents, the settling of suspended matter, the action of saprophytes and their products, and many other untoward conditions, render their existence uncomfortable and precarious, and assist in their destruction.

To recapitulate: When we find a quantity of organic matter over the normal, for a particular water, we say it is chemically polluted and might make a good medium for pathogenic bacteria if they come along; but that in most cases when we find this increased organic content we have at the same time dangerous infection as the organic matter usually comes from excreta.

If we find Colon bacilli in a water, then we suspect faecal con-

tamination to have taken place. It may, however, have been just a chance infection, but when present over a continued period then we must abandon this hope.

If we find both Colon bacilli and increased organic content, we are practically justified in saying that in all likelihood faecal pollution of the water has taken place.

It is not a visionary conclusion to come to, that if Colon bacilli can reach water there is nothing to prevent typhoid bacilli or other infective agents reaching it also.

Finally: Colon bacilli are not found habitually in pure water, hence their presence indicates sewage contamination.

JOHN A. AMYOT, M.B.,
Bacteriologist Provincial Board of Health.

NOTES ON WATER ANALYSIS AND INSPECTION.*

*Contributed to discussion on water supplies in Laboratory Section, Canadian Medical Association, Ottawa, June, 1908.

AN increasingly important part of the examination of a proposed water supply lies in the sanitary inspection of the sources of supply. The same statement will hold with regard to any suspected supply whether well, stream or lake, and it is an examination which local sanitary authorities are apt to overlook. Every week water samples are received at the laboratory for examination where a local inspection by a qualified inspector would have at once revealed sources of contamination so patent as not to necessitate further examination. Again, too frequently samples are received at our laboratories without sufficient data being sent to allow conclusions to be properly drawn; the data absent having usually to do with the situation of supply, nearness to possible sources of contamination, human or animal, trend or slope of ground in case of well, and like data. Thus inspection and analysis may be considered to be essential and

complementary. A proper inspection reveals the possible sources of contamination, while bacterial and chemical analysis reveals actual infection or pollution, but cannot do more than give an idea of probable sources in most cases. In my experience, too much dependence has often been placed by local sanitary authorities on isolated or a few chemical or bacterial tests of a water supply. True the water in the cases I have in mind passed careful bacteriological examination, but as is well known by all bacteriologists the individual sample is after all but a small bulk of water and conditions of wind, current, rainfall often makes a marked variation in the constitution of water sampled. A sanitary inspection in these cases where trouble afterward arose revealed at once fairly patent sources of infection. I do not desire in the least to belittle analyses, as I indeed look upon it as the final court of resort, but sufficient number of tests must be made before a positive opinion can be given. Of course, this is the position taken by all bacteriologists. As previously remarked, inspection often makes an analysis unnecessary as revealing sources of contamination so patent as to at once condemn the source. On the other hand, of course, inspection alone would at times pass a supply which analysis condemns, but in such cases further examination generally reveals the infecting source. Sanitary water inspection is a matter for the trained observer, and trained men in this line are not numerous in Canada, I suppose because there has been no public demand for them, though that there is need for them is evident to any with "eyes to see and ears to hear" that take note of the marked prevalence of typhoid in urban and rural communities throughout Canada. With the gradual growth of our country there will continue to be increasing contamination of the sources of water supply unless steps be taken to prevent this contamination. Some such act as the "Rivers Pollution Act" of Great Britain will yet find place on the statute books. But that day looks to me to be some distance in the future when even our largest and richest cities cannot be roused up to set a good example in the proper disposal of their sewage.

With such an absence of sewage treatment and purification the filtration of water becomes a question of more importance. I have not had an opportunity of studying sand filtration on a large scale such as is proposed by the city of Toronto for example, but I have had for several years the opportunity to study mechanical sand filtration. This is the system under which the water is filtered through sand under pressure, after the addition of a measured amount of

alum (varying with character of water) to precipitate the chalk, etc. This precipitate soon forms a scum on surface which acts as an nidus for usual water bacteria and the scum layer acts as a very efficient filter, acting partly mechanically and partly biologically. This is the system installed at the Military College, and the water filtered is drawn from Navy Bay, a bay on the river just east of Kingston harbor. The pipe extends 300 feet out from shore. This water is open to some contamination from Kingston sewage and also from the drainage of a portion of Barriefield common. Bacteriological examination practically invariably detects colon bacilli in amounts of 1 cc. and streptococci are occasionally found. The chlorine content is practically that of St. Lawrence water in neighborhood of Kingston, viz., 5 per million. (Capt. Cochrane, chemist of the Royal Military College, gives the chlorine average content of water taken here as 4.5 parts per million, while Toronto observers quote 7 parts well outside Toronto Island, and United States Geological Survey (Hydrographic Branch) gives 7 as average of St. Lawrence river above Ogdensburg).

Now this system when properly looked after efficiently purifies the water—reduces the count per cc. at 37°C. between 90 and 95 per cent. and the gelatine count at 20°C. from 70 to 90 per cent. Thus the count of the unfiltered water at 37°C. has averaged 80 in the last 16 examinations, while filtered has run from 1 per 2 cc. to 10 per cc., average 3. Further, colon bacilli are usually absent from filtered in amounts up to 10 cc., while in 100 cc. they are present in 50 per cent. of samples. But such results have not been secured by haphazard, but only after careful supervision by a chemist, bacteriologist and engineer. The water had to be tested to get exact alum required and this had to be accurately adjusted; rate of filtration, frequency of cleaning, etc., had to be determined and the whole in the end controlled by bacterial tests. It has been found that only by such careful supervision can such a plant be made to work efficiently. "Constant watchfulness is the price of security."

In 1907, of some two hundred water samples submitted to bacterial analysis in our laboratories, one hundred and two were from wells, either town or rural. These wells show up very badly in the analyses, as 58 out of the 102 were infected with colon bacilli, showing up in 1 cc. samples. Of course this is not really a fair test of our well waters as samples were under suspicion, but it makes one hesitate to drink water from rural wells unless one has had an opportunity at least of local inspection. With local option

on the spread, this subject to the passing visitor becomes of considerable moment. In 1908 to date the percentage of infected wells has been averaging quite as high and seems to bear out a statement made by Professor Shutt, chemist of the Central Experimental Station, Ottawa, that "the majority of farm well waters submitted to him for analysis were little better than cesspools." Of course, in rural districts the infection of surface water supplies (wells and springs) is most often due to animal sources (manure and other stable refuse), and as a rule the danger of acquiring disease, apart from diarrhoeal affections, is slight when infection is from this source. It is, however, not possible to distinguish between colon bacilli from animal and human sources, so that the bacteriologist unless acquainted with "surroundings" of water supply (data only obtained by accurate local inspection) cannot in his report accurately point out danger. This danger increases with the probability of the infection being of human origin.

In the state of Minnesota it is now the rule not to make analyses of samples sent to the laboratories, but to send out an inspector who, after an accurate survey, may then proceed to make field "plates" from the water, which plates are then sent to the laboratories for incubation and examination. In other words, Minnesota places inspection first and if necessary then starts bacteriological examination on the spot and sends this material to laboratories for completion of analysis. This system has much to commend it, though it might seem to many to be expensive, but one epidemic of typhoid prevented would in money saved equal the expense for years. With county health officers (free from political control) a system of this character could readily and profitably be adopted in the province.

W. T. CONNELL.

ALOPECIA AREATA.

THERE is some ground for believing that alopecia areata is on the increase in this section of Canada. A careful review of my scalp cases, both in private and hospital practice, during the past eight years, shows only 42 cases of alopecia areata, but of these, 27 occurred in the last three years. The disease appears to be much less common in Canada than in Europe.

The etiology is somewhat obscure. Experienced dermatologists the world over are beginning to look upon the affection as of dual origin—in some cases trophoneurotic, in others undoubtedly microbic. Jacquet's theory that dental caries is a cause of alopecia acata is interesting, but the occurrence of the two conditions in the same patient must, I think, be looked upon as quite accidental. Recently I examined 100 cases of disease of the scalp at the Vienna clinic, and notwithstanding the fact that 87 per cent. showed defective teeth, there were only five cases of alopecia areata. Crocker, in discussing the subject at a later date, stated that Jacquet's observations had not been borne out in his clinic at University College Hospital.

Evidence is not wanting that the disease is frequently due to disturbance of the nervous system. I have at present two such cases under observation; one, male, aged 50, developed typical patches of alopecia areata over the occipital region five weeks after being thrown from a 'bus in a runaway accident in the city of Belleville, the other, male, aged 25, had two well-marked areas, each about the size of a penny, when first seen by me seventeen days after a sudden family bereavement.

That the disease is possibly of microbic origin no one at present denies. Few will agree that the identity of the organism has been established. The French school consider the disease contagious. Sabouraud, who during the past three years has published a number of papers on the subject, concludes that the affection is due to a microbacillus. The English, Viennese and American schools favor the theory of the dual origin. Norman Walker, of Edinburgh, is perhaps the strongest advocate (outside of France) of the contagiousness of the affection. In an exhaustive study of the records of 4,000 cases of skin disease at the Edinburgh Infirmary, he found 200 cases of alopecia areata, but in only one of these was a possible nerve influence suggested. True to his convictions, he recommends the non-admission to schools of all children suffering from this disease. One of the most striking examples of the contagious character of the disease is supplied by Bowen, of Boston, who reports an epidemic in a girls' home, where, after the introduction of one case, 63 out of 69 girls were affected. Even granting the contagiousness of the affection in some cases, I am of the opinion that such a combination of circumstances is necessary that transmission must be rather exceptional.

The diagnosis, as a rule, offers no difficulty. The only affection in this country likely to be confounded with it is tinea tonsurans.

The sudden falling out of the hair in spots is strongly suggestive of alopecia areata. The microscope, however, is necessary to clear up the diagnosis. In the case of tinea tonsurans, the parasite is found usually in great numbers, while in alopecia areata the typical "alopecia stumps" or "exclamation points" (!) are everywhere in evidence.

The prognosis is easy. Fully 85 per cent. of all cases under 40 years of age recover in time, whether treatment is instituted or not. The remaining 15 per cent. usually get well under treatment. After 40 the prognosis grows less favorable with the advance of years.

Many drugs have been recommended for the local treatment, but all aim at moderate stimulation of the affected areas. In the trophoneurotic cases I am in the habit of applying once in ten days equal parts of carbolic and alcohol, and giving internally hypophosphites with arsenic. While the above local application is of undoubted value, no matter what the causal agent may be, for some years I have treated nearly all my cases of the disease occurring in children with the X-rays. The method is the same as that employed in the treatment of tinea tonsurans. The results have been uniformly good, a generous growth of hair appearing, as a rule, in from ten to twelve weeks.

JAS. THIRD.

THE THREE GRACES*.

*Read to the nurses of the Greeley and Weld County Hospital, Colorado, May, 1908.

"AND now abideth these three, Faith, Hope, and Charity," such was the expression which emanated from one of the world's strongest intellects, enumerating the virtues found in a beautiful character. It is not, however, my intention or privilege to speak to you of the value of the Christian graces, notwithstanding the fact that possessing these, together with tact and good health, well equips you to enter the portals of the nursing profession. My drawing your attention to the three sisters is rather for the purpose of comparison and emphasis, thereby making you more intimately acquainted with what I have ventured to term the three graces of applied nursing—Rest, Air and Water.

A working knowledge of the physiological application of these measures is an essential part of the mental equipment of both physician and nurse. A knowledge of the principles involved in the terms rest, air, and water should be a vital part of each one of us, so that our patients may intuitively receive all the benefits which accrue therefrom.

While we should have faith, it is also wise that we "should have a reason for the faith that is in us."

Rest is the first essential in the chain which leads to recovery from acute illness or injury. When a bone is broken we place the fragments in apposition, and by means of splints immobolize the parts, placing them at rest. Rest here relieves pain and favors correct union. When an eye is acutely inflamed it is protected from the light by bandage, or otherwise, and placed thereby at rest. When a joint is inflamed or affected with acute rheumatism it is placed in a position of greatest ease, and kept there at rest. Rest in these instances relieves the pain incidental to the disease, and favors a return to their normal condition. When the body is attacked by acute disease out first aim is to conserve the vital powers. This we accomplish by putting the patient to bed and keeping him there at rest. When considering the subjects of circulation and respiration, you will call to mind the fact then emphasized, that when exercise is taken the pulse and respiration are both increased in frequency; while the opposite condition obtains when the body is at rest. With the body at rest the fire burns low. The fuel represented by the blood is pumped more slowly through the system to meet the lessened requirements; while the fire draughts, the respiration, is not called actively into play. Less fuel is consumed and less waste resulting from combustion requires to be excreted. In this way the vital forces are conserved to meet the demands of the disease and are enabled to put up a more active and prolonged combat. Rest, therefore, aids recovery, because the demands on the body are so small, that all possible energy remains to overcome the disease. When the disease is prolonged, or unusually acute, or if the patient by age, temperament or bodily habit, lacks ordinary vitality, the reserve forces may be sorely needed ere the conflict is over. By absolute rest in such cases as these, we mean maintaining the patient in the reclining position at all times, during feeding and while the urinal and bedpan are in use. No exertion on the part of the patient attempting to attend to his own needs is allowable, nor should there be the least fatigue incidental to the daily toilet or sponging. Many

a seeming successful issue after a hard fought day has come to an untimely end owing to sudden cardiac failure. This is induced by too great or too sudden a tax on the heart in its weakened and flabby condition. Such a tax is exemplified by so simple an incident as sitting up to take a drink; a result that warns us not to allow any strain, in these prolonged and critical cases. Rest or absolute rest is not difficult of accomplishment in the hospital where you have full control of the patient, but when nursing patients in their own homes it is a different matter. Here you have interested relatives to advise and often interfere, making your task more difficult and the patient's welfare less secure. The beneficent and healing action of "the innocent sleep" rest of mind and rest of body was well known to the "Lord of English speech."

> "Sleep that knits up the ravell'd sleeve of care,
> The death of each day's life, sore labour's bath,
> Balm of hurt minds, great nature's second course,
> Chief nourisher in life's feast."

It is a rather common occurrence for a physician to be called to see a patient suffering with pneumonia, say in the month of December. It is not uncommon when called to such a case to find several friends in the sick room with windows and doors likewise closed to avoid all drafts. The air of the room is well laden with the pulmonary excretions of the patient and his sympathetic friends, while the unfortunate sick man with difficulty gets sufficient air to meet the combined demands of his body and the disease. In addition we may find the temperature of the room at 80 or 85 degrees, a further condition which tends to befog the mind and reduce vitality. The patient under these circumstances has one great and outstanding want—more air (and fewer friends). Part of one or both lungs is disabled because of the pneumonic area. Respiration is shallow and painful. Oxidation is rapidly going on and the temperature is high. He must have a supply of air to meet these demands and it should be furnished both plentiful and pure. Vitality is sure to ebb if the sick man has to breathe and re-breathe his own poisonous exhalations.

What is true of pneumonia is also true in all acute febrile diseases. There is no disease in which the patient does not receive material aid if supplied with plenty of pure air; in some it is absolutely essential. The system thereby more readily maintains its vigor, the mind is more clear, and the natural appetite encouraged. At least one hospital in New York has established open-air wards on the roof with devices to protect patients from wind and weather.

This experiment has been accompanied by gratifying success. The open-air treatment of pneumonia at all times and seasons has many enthusiastic advocates who claim excellent results.

Respiration, according to Oliver Wendell Holmes, is the third wick in the lamp of a man's life. When the supply of air is shut off this wick immediately goes out, and is followed quickly by the other two wicks, the brain and the heart. Similarly, if the respiratory wick be not shut off but receive instead a supply of noxious, impure air, the wick burns dim and low. The other wicks likewise respond, and emit but a feeble light. Contrarywise, when the air supply is pure and free, the respiratory wick burns clear and bright, followed again by the other wicks, bright and clear. The lamp of life is well trimmed and burning.

Mayhap it will be part of your future duty to assist in overcoming a prejudice, now happily growing less, against the use of fresh air in acute sicknesses, more especially if the outside temperature should be low. The friends will distrust the physician's judgment in ordering open windows, lest the sick one should take cold and thereby increase his disability. The infectious nature of colds is now, however, a matter of common knowledge and I have tried to show you that fresh air increases the vitality and therefore the resistance to other infections as well as the resistance to the disease that at present exists. There seems also to be a well-defined belief that those who have a high temperature possess an immunity to so-called colds. While I present no scientific proof of this, yet so widespread a belief has usually good clinical support. A second misapprehension existing among those who are ignorant, is to the effect that as long as the room is cool the air is fresh. Coolness and freshness with them are synonymous. Doctor M. H. Fussell, of Philadelphia, in a recent article on pneumonia tells a story illustrating the fact that the physician as well as the layman is sometimes slow to realize the value of nature's cure. He was called in consultation to see a patient with pneumonia. The room was very warm and the air oppressive and impure. When talking over the case he laid special stress on the value to the patient of cool, fresh air. He was greeted with the response: "That's all right, but how shall we treat the patient?"

The third sister whom I wish to keep as a life-long friend is water. That a person can live many days on water alone is a well-known fact; longer than on any other single article of diet, and longer than on all other articles of diet combined. Deprived of

water, a person suffers untold agonies before he is relieved by death. These have been described by many writers in history and romance. You remember the story of Dives and Lazarus where the rich man, Dives, now resident in Hades, implores Father Abraham to send Lazarus to him, that he may moisten his tongue with the tip of his finger dipped in water.

Some years ago it was a frequent practice to limit the amount of water supplied to fever patients. This era has now passed. The demand for water is often used as a gauge by parents in determining the presence of fever. They will inform you that the fever was high because the patient was so thirsty. A number of years ago Osler, at his clinic, delivered these parting words to a typhoid patient: "Get better, get better on water, my man, inside and out." A patient with a high temperature loses his appetite. While there is more or less aversion for food, thirst remains; and the taking of this should be freely encouraged. When absolute rest is enjoined, water should be frequently brought to the patient. During delirium it is still more necessary to see that the sufferer is well supplied. When the temperature is high, the body tissues are undergoing rapid changes, oxidation is active to maintain the high temperature, and the waste products are correspondingly increased. In infectious diseases we have in addition, the specific toxins or poisons of the disease itself, t e .d-products of the infecting germ, as it lives and has its being within its host. In eliminating these waste and poisonous products a constant supply or excess of water is of great assistance. The kidneys and skin are thereby rendered more .tive in removing that, which if too concentrated may destroy the patient—so-called death from the intensity of the toxæmia.

The external application of water, so frequently indicated, is too large a subject to more than allude to. In closing, I ask your intimate and personal friendship for these three graces, rest, air, and water. If you count these among your intimate friends you will help many a sick one to health, many a life lamp, dim and low, to its former clearness. They do not constitute a panacea for every ill, but their presence in the sick room renders a prognosis more hopeful. A thorough understanding of their characteristics will enable you to lend your moral support to the physician in charge. Many are prone to place too implicit a faith in medicinal treatment, failing to realize or understand the recuperative force of these simple measures.

CHARLES B. DYDE.

Greeley, Colo.

MEDICAL SELECTION FOR LIFE INSURANCE.

(Continued from April Quarterly).

THOSE who survive the earlier years of intemperance seem to have a toughness of constitution, which counterbalances their excesses to some extent, though not wholly. These elderly topers are sometimes emulated by younger men, who are confident they can do likewise with impunity, but who fail to realize that the pathway of these exceptional cases is strewn with the tombstones of their comrades who started with them in the alcoholic contest.

The influence of total abstinence on longevity is much more debatable. Many total abstainers are so by necessity. They have a constitution which does not permit the use of the smallest amount of alcohol without feeling it, or else they have a neurotic tendency impelling them to drink to excess, if at all.

The question is sometimes asked whether the kind of alcoholic drink used makes any difference on mortality. The popular fallacy that beer is less harmful than wine or spirituous liquors is not borne out by statistics. Amongst the Germans beer-drinking is regarded as comparatively harmless, nevertheless the mortality of German companies considerably exceeds that of American and English companies. Among wine and spirit drinkers a large part of the extra loss is upon actual drunkards, while the remainder must be ascribed to the injurious effects upon the constitution of supposedly moderate though really immoderate indulgence. Among beer-drinkers, pretty much of the whole of the extra loss, it would seem, must be attributed to constitutional effects. It is the danger of acquiring the habit of intoxication that makes spirit drinking the more formidable of the two; while undoubtedly the habit of drinking either beer, wine, or spirits, beyond a certain medical limit, not well defined, because it cannot be the same for all constitutions (and usually exceeded by those who drink at all), tends in many cases toward disease. Investigation does not show that those who drink only occasionally, and not to intoxication, or those who drink habitually, but lightly, are in any way injured. It does not show that all of those who drink heavily must die prematurely. It does show, however, that there is enough injury done to a sufficient number of individuals to make the death loss distinctly higher on the average. The coincidence between excessive drinking and lower vitality may be partly due to bad

risks taking to drink, as well as to good risks becoming bad because of drink.

Many of the above remarks regarding use of alcoholics apply equally well to drug addictions. It is a curious fact, that drug habitues have increased more rapidly in localities where prohibition of alcoholic drinks is enforced. If a person has really become a victim of a drug, a permanent cure is a rarity. We therefore look with disfavor upon any case where the use of some narcotic drug is acknowledged, and we must not lose sight of the fact that nearly all drug habitues are confirmed liars, epsecially with regard to their private weakness.

When we come to take the family history of an applicant, we are confronted with great difficulty because of real or assumed lack of knowledge on many points that are essential. It is astonishing how many people are entirely ignorant of the duration of life or cause of death of different members of their immediate family. Not infrequently such causes of death as the following are given: "Natural causes," "grief," "general debility," "decline," "marasmus," "childbirth," "shock," "don't know," etc., etc. Before such indefinite terms are recorded on a medical blank, the examiner should make rigid enquiry in reference to symptoms which were present during the last illness, duration of illness, previous health, etc. It follows naturally that whoever reviews and acts on the medical report will place the worst possible interpretation on all equivocal answers pertaining to the family history. The idea of consumption is so dreaded, by the laity especially, that a case of it in the family record is forgotten as soon as possible, or some fable about it is gradually invented, amplified and polished, until finally it passes as the truth. The possibility of any present family contagion should be guarded against. It is very important to know whether an applicant has lived or been intimately associated with a person having tuberculosis or who has recently died of the disease.

Tuberculosis and cancer are the two most important diseases which influence heredity on account of their frequency. In addition a number of other diseases have to be taken into account; such as, diabetes, epilepsy and insanity. Apoplexy and chronic interstitial nephritis also seem at times to run in families, probably from the fact that they are all manifestations of disease of the arterial system, which seem to be capable of hereditary transmission. Besides these conditions, a short-lived family history, where parents and grandparents only reach 60 years or less, has a marked influence on the

longevity of the descendants. On the other hand, a long-lived family history, where at least three of the parents or grandparents have passed 70 years, is a factor distinctly in favor of longevity among the progeny.

Let us now go further into the personal history of an applicant. This consists mainly of a record of the diseases he has had. In ordinary practice the presumption of ill-health is uppermost; in life insurance work the applicant is presumptively in good health. In the one case the physician starts out with a known or probably abnormal, in the other with a presumptive normal. To obtain accurate information is very difficult, but a skilful examiner will usually get at the truth. A patient will tell his physician every symptom that he has and frequently much more, but an applicant for insurance will only tell what he has to, because in many instances he thinks it the business of the examiner to dig out the information as best he can. We are quite aware that simple ailments may develop into serious troubles. Thus a simple diarrhœa may be the forerunner of typhoid fever. An ordinary cold may be the initial symptom of measles, which may be fatal in itself or it may develop into a case of tuberculosis. If such trivial diseases have passed without becoming serious they are of no importance in our estimate of a risk. Other diseases, serious in themselves, will have weight according to the remoteness of their occurrence and their sequelae. The medical examiner is the eyes and ears of the medical department of an insurance company and sets forth fully and accurately the answers the applicant makes in regard to his personal history. An attempt will not be made to go over the whole list of diseases, or symptoms of disease, however we will take up several and give the points which are essential to intelligent action on a case.

Abscesses.—When, where, and from what cause have abscesses appeared. Whether subacute and readily removable, or severe, chronic, and involving important structures.

Asthma.—What age it first occurred; if attacks diminish or increase in severity or frequency; if cough precedes, accompanies or follows attack; if attacks occur during the day or night; if at certain seasons of the year only; if complete relief is felt during intervals between the attacks; if change of climate or locality has been sought for relief and with what result; if there is evidence, however slight, of emphysema, cardiac disease, Bright's disease, nasal polypus, diseases of liver, etc.

Amputation.—Cause; date; whether below or above knee or elbow joint; result.

Appendicitis.—How many attacks; date of first; if more than one, date of each; whether operation was performed and appendix removed; date of operation. Examine locality for presence of tenderness or induration; presence of scar indicating operation, etc.

Blood-Spitting.—When; if more than once, how often; quantity; presence or absence of cough; loss in weight; if under treatment, a full history.

Calculus.—(Renal or hepatic). Number of attacks; dates; if operation, when, etc.

Cough—(habitual). History of; if not present at time of examination, ascertain when cough commenced; how long continued; if treatment was sought; when; for what length of time; if change of climate was sought; when; to what point; how long remained there; character of expectoration, etc.

Dizziness.—Slight or severe; frequency; cause; if relief has been sought by treatment; if it is of daily, weekly or monthly occurrence; if it disqualifies from active work at any time, etc.

Diarrhoea—(chronic). Full history.

Discharge from Ear—When; whether purulent, bloody, offensive; sanious; gritty; continuous or intermittent; abundant or scanty, etc. If entirely recovered, how long since.

Dyspepsia.—Probable cause; duration of each attack; frequency and severity of attacks; treatment and its result. If now necessary to restrict diet.

Fistula.—If operation has been performed; when; with what result. If fistula exists, describe fully.

Gout.—When first occurred; when last; frequency of attacks; severity; if probably hereditary.

Headache (habitual).—Frequency; severity; probable cause; if attacks have increased or decreased in severity or frequency. If accompanied or unaccompanied by dizziness, nausea, vomiting, ear trouble, error of vision, etc.

Heart (palpitation)—If attacks are slight or severe; if accompanied or unaccompanied by dyspepsia, fainting; cause of; examine heart carefully.

Insanity.—Date of occurence; duration of disease; place of treatment.

Loss of Consciousness.—To what due; when; number of attacks.

Neuralgia (persistent)—Nerves affected; history of entire trouble from inception to date of examination; cause; if opiates have been used in treatment.

Paralysis.—Whether partial; hemiplegic; of central or peripheral origin. Existing paralysis, of course, disqualifies; local paralysis during continuance.

Rheumatism (acute or chronic)—Duration and severity of each attack; joints involved; date of last attack; present condition.

Pneumonia—Date and length of illness; length of time since complete recovery. If more than one attack, how many; length of each.

Sunstroke.—How many attacks, when; if loss of consciousness, for what length of time unconscious; how long confined to bed; how long before perfect recovery; if any sequelae since, such as vertigo, headache, dizziness, etc.

Syphilis.—Date of initial lesion; what subsequent symptoms appeared; if treatment was resorted to, over what period; when all symptoms disappeared; if married, children living; whether any have died; at what ages; any still-born; any evidence whatever of present constitutional infection.

Typhoid Fever.—Date and length of illness; length of time since complete recovery, etc.

Having taken up somewhat in detail the occupation, habits, personal and family history, let us consider briefly the physical examination. Insurance companies do not expect paragons of physical perfection but are willing to insure men and women of "*average good health*," not, be it noted, "average health." More than 90 per cent. of all applicants belong to this class and are acceptable, so far as regards physical examination. In some cases conditions are found which cause a rejection of the applicant outright. Among these are organic diseases of the heart, blood-vessels and kidneys; tuberculosis in any form, organic disease of the brain or spinal cord and other less frequent conditions. In other cases the abnormal conditions found cause postponement only. An applicant with an intermittent or irregular pulse, or with an albuminuria or glycosuria, frequently recovers in a few months and then there is no objection to accepting him.

The race—white or colored—should always be given, as few if any of the large insurance companies are willing to insure a colored person.

An examiner should satisfy himself regarding the condition of sight and hearing of an applicant and if impairment of either exists full particulars should be incorporated in his report.

Another important point is the appearance of the applicant. Whether erect, active, healthy and vigorous, or pale, sallow, stoop-shouldered or narrow-chested.

Effort should always be made to ascertain the exact height and weight, and if the examiner doubts the accuracy of figures given, he should personally measure his height and see him weighed. Loss of weight, especially if recent, should be carefully investigated in reference to probable cause, amount lost, and if not still losing over what period the weight has remained stationary.

Careful physical examination of the heart, blood-vessels, respiratory organs, nervous system, abdominal and pelvic organs, and an analysis of the urine reveals the present condition of the applicant.

Finally, unimpaired health, positive identification, with all that can be desired in the way of freedom from disease since birth, and a long-lived ancestry, without taint of inherited malady, are not alone sufficient in estimating the financial value of a risk, as another important element must be considered, viz., the moral hazard. This term should not be understood as applying strictly to the morals of the individual—it is used to designate the greater or less risk incident to circumstances and surroundings which may vitiate the true function of life insurance, or which may have an important bearing upon the life expectancy. It is impossible to separate clearly this moral hazard from what we may be allowed to call the physical hazard of each healthy life. The two are mutually dependent and it is for this reason that the former is necessarily considered in conjunction with the latter before a decision can be reached. We believe the following rules should govern the examiner in recommending and the company in accepting a risk:—

1. There should be no suspicion of speculation.

2. The amount of insurance should be commensurate with the means of the applicant.

3. The occupation should be free from pernicious influences.

4. It is desirable (though not essential) that stability of employment should be shown by the applicant.

5. The applicant should be sufficiently educated to read and understand the terms of the contract with the Company and to write his name.

6. When the applicant is a woman, it should be determined if she is dependent on others or if others are dependent on her; if she is in receipt of an income either from investments or from her own labor; if she pays the premiums from her own means. If she is married, is husband already insured? Is he insurable, and does he apply with his wife?

WALTER A. JAQUITH, M.D.

Newark, N.J.

OPSONINS—A SHORT REVIEW.

WRIGHT has it that the physician of the future must be an immunisator, and as a step in that direction has placed in possession of the medical profession a means whereby the physician may, at least in a small way, assume that rôle. Dame Nature has been an immunisator for ages, so that those who practise vaccine-therapy have in her a worthy precedent. Inasmuch as her means are at times insufficient and results delayed, it is the duty of the "immunisator" to unite with her by supplying in as far as possible those agents which will bring about immunisation.

Immunity is, as we know, increased resistance to, or power to repel, an infection, and the power of resistance resides chiefly in the body fluids, more particularly the blood-serum, though primarily derived from the cells of the body. Bacteriologists designate those bodies in the blood-serum, active in defense of the body, as "protective substances," classified as anti-toxins, bacterio-lysins, agglutinins, opsonins, etc. Immunity produced by the introduction from without of these "substances," e.g., as contained in anti-diphtheritic serum, is called "passive" immunity, but when these substances are produced within the body by its cells, which have been stimulated by infection or vaccination, we speak of this immunity as "active."

The great interest centering around opsonsins is due to the fact

that not only are they concerned intimately in that most important process of resistance to bacterial invasion, phagocytosis, but their discovery in the blood has produced a very promising therapeutic agent, vaccine-therapy. This must interest all therapeutists, but to the laboratory-worker "opsonins" are of still further interest. They have not yet been classified according to Ehrlich's side-chain theory, and until put into their proper class they will be the subject of a great variety of experiments by laboratory workers.

Slowly the characteristics of opsonins have been discovered. Wright and Douglas[1] first declared that "opsonins normally present in serum are destroyed by heating at 60°C. for ten minutes. Bulloch[2] later declared that the opsonins of normal and immune sera were specific in nature, only increased in amount for the specific organism present in an infection, or as a result of specific vaccination." Simon[3] in his experiemnts disagreed with Bulloch, though acknowledging the importance of vaccine-therapy. In his work on the opsonic index calculations, he claimed more accuracy from his "percentage" index, as compared with Wright's original "bacillary" index. In the former, instead of counting the bacillary content of each polymorphonuclear neutrophilic leucocyte, Simon simply notes whether or not the leucocyte is phagocyting. The ratio of the number of phagocyting leucocytes as noted in the smear when the patient's serum is used, compared with the number of those in the smear when the control or standard serum is used, gives the opsonic index.

Hektoen and Ruedeger[4], following Ehrlich's exposition of the union of toxins with cell-receptors, described opsonins as consisting of a haptophore group, for anchoring to the bacterium, and a functional or opsoniferous group. It was early noted that heating was more destructive of opsonic effect in normal than in immune sera. Muir and Martin[5] conclude that the thermolabile opsonin of normal serum, and the thermostable opsonin of immune serum, are distinct classes of substances, showing different combining relationships and heat resistances.

Dean[6] from his experiments observed that by mixing appropriate dilutions of heated immune serum with dilutions of normal fresh

---

[1]Wright and Douglas—Proc. Roy. Soc., 1903, 72, p. 357; 1904, 73, p. 108.
[2]Bulloch—Lancet, 1905, 2, p. 1603.
[3]Simon—Journal Exp. Res., 1907, 9, p. 487.
[4]Hektoen and Ruedeger—Jour. Infect. Dis., 1905, 2, p. 128.
[5]Muir and Martin—Proc. Roy. Soc., 1907, 79, p. 187.
[6]Dean—Proc. Roy. Soc., 1907, 79, p. 399.

serum greater phagocytosis was obtained than from the sum of the two acting separately. Cowie and Chapin[7] noted the same phenomenon with diluted heated normal serum and diluted fresh normal serum, when staphylococci were used. H. E. Eggers[8] confirms the observations of Cowie and Chapin in some few sera, using pneumococci, but 75 per cent. of the sera tested showed inactivable thermostable elements to pneumococcus. One serum inactivable to pneumococcus and streptococcus was in a small degree activable to staphylococcus.

Hektoen[9] argues for the specificity of opsonins in that his absorption experiments indicate that "the bacteriopsonins and hemopsonins in human, rabbit and dog serum are distinct substances, and normal serum may contain several more or less distinctly specific opsonins for alien red corpuscles." The probability of the specificity of opsonins in normal serum is further enhanced in that "soon after infection or inoculation, there may occur a depression in the opsonic index, which is specific for the infecting or inoculated microbe."

Present knowledge, then, would indicate that, though heat is destructive of opsonic effect in both normal and immune sera, both can be activated by fresh or diluted fresh normal serum, inasmuch as the phagocytosis is greater in each case than the sum of the phagocytosis when each serum is acting separately. The specificity of the opsonins of normal serum, at least in some degree, as declared by Bulloch, obtains as time goes by more and more confirmation. The specificity of immune opsonins is undoubted. It does not seem probable that the combining arrangement of opsonins with bacteria can be expressed as analogous to that of toxins with cell-receptors; there is undoubtedly an intermediary body and a complement-like substance. Whether the complement or thermolabile element is a common one or there are several varieties of complement has yet to be shown. The intermediary group is specific in character, and increased in amount during infection or following inoculation.

Interesting as are these problems, which have to do with the modus operandi of opsonic action, the records in vaccine therapy are of greater practical interest to the physician. It is not my purpose in these notes to deal with these records, but only to refer to one or two very interesting points in that connection.

---

[7]Cowie and Chapin—Jour. Med. Res., 1907, 17, 95, 213.
[8]H. E. Eggers—Jour. Infect. Dis., 1908, 5, p. 267.
[9]Hektoen—Jour. Infect. Dis., 1908, 5, p. 261.

In vaccine therapy E. E. Irons[10] notes a "specific" reaction in the administration of gonococcus vaccines to those suffering from gonorrhoeal infections. The reaction occurred on administering larger doses than are usually given at the outset of the treatment of these cases, and consisted of a rise of temperature, etc. This reaction corresponded to the tubercular reaction in tubercular cases. Control cases gave no such reaction. If these observations are substantiated, it may be possible to clear up diagnoses of obscure systemic infections, e.g., arthrites, etc., when a history of gonorrhoea is not obtainable.

The benefit obtained by treatment of localized tubercular infections, e.g., joints, bones, etc., by T. R. or B. E. is much enhanced by the addition of Prof. Bier's hyperaemic method. The rationale of this treatment is easily understood. By means of tuberculin inoculation, we may increase the amount of opsonins and other protective substances against the tubercle bacillus, circulating in the blood-stream. By passive hyperaemia we bring more of these protective substances in direct contact with the diseased focus, and thereby overcome the infective agent. Tubercular foci are remarkable for their poor blood supply, at least when proliferation has advanced to a considerable degree; so by means of the "hyperaemic" treatment we may overcome this difficulty. Certainly as both methods are excellent, a combination of the two should be productive of more rapid and certain results than are obtained when only one means is used.

W. GIBSON.

---

[10]E. E. Irons—Jour. Infect. Dis., 1908, 5, p. 291.

SCARLET FEVER.

UNLIKE diphtheria, we do not know the causal agent in scarlet fever, hence our diagnosis must be based on clinical evidence only. With a typical case, presenting a bright red punctiform rash, fever, angry red sore throat with exudate, rapid pulse and an onset with vomiting, a mistake cannot be made. But, as occasionally happens, a case presents itself showing but slight symptoms, such as a scattered fine red rash, coated tongue with the tip only red, slight elevation of temperature and pulse, with an onset with vomiting. In the absence of a history of scarlet fever in the community, such a case would often remain undiagnosed except desquamation should be marked. In my experience at Ottawa, however, there were several cases with symptoms similar to above with a history of possible exposure to scarlet fever, in which scarlet fever was diagnosed though the symptoms were not clear, and the patients sent in to the Isolation Hospital there to develop in a week or ten days a typical attack of scarlet fever. It is the mild cases that give the main trouble in diagnosis, and it is due to such mild cases going unrecognized that the disease is kept alive in the community to break forth at times in epidemics of varying severity.

While most text-books give the differential diagnosis between scarlet fever and such diseases as measles, erysipelas, and certain drug rashes, my experience has been that most difficulty is found in distinguishing it from German measles (Rubella) and from certain intestinal toxaemias accompanied by rashes. In the case of German measles, the constitutional disturbance is slight and transitory, the rash scattered, slightly raised, larger and salmon-tinted, not distinctly red in color, while the posterior cervical glands are almost always enlarged. It is the mild cases of scarlet fever which may here be taken for Rubella or vice-versa, but the question comes to be of considerable importance when other children are in the family and the problem of removal to hospital has to be faced.

In the case of the intestinal toxaemias in which trouble arises, there is in these frequently an acute onset with vomiting, high fever, rapid pulse and a red rash about neck, chest and abdomen. herTe is, however, usually diarrhoea in these cases and inside 18-24 hours under treatment, the rash and other symptoms tend to subside. The throat is seldom complained of in these cases, though in some it is red and dry looking.

The chief symptomatic points in scarlet fever on which stress should be laid in diagnosis are: 1st. The abrupt onset with vomiting and fever. 2nd. The angry red sore throat with at least some exudate over tonsils, the redness always involving the pharynx and the submaxillary glands being enlarged. 3rd. The tongue heavily coated in centre and very red at edges and tip. The strawberry tongue does not appear till the third to sixth day. 4th, and most important. The fine punctiform rash appearing 12 to 30 hours after onset of symptoms and developing first on chest, soon spreading over body. The toxic type present these symptoms in a graver form, and in epidemics it is not uncommon to have a few cases die in from 12 to 48 hours after onset, in some cases ere rash appears, and diagnosis can only be made from the prevalence of the disease and exclusion of other factors.

As to treatment, as we know nothing positively about its causative factor or its exact "modus operandi," our treatment must be largely symptomatic. An ordinary case requires but little medication except perhaps an occasional purgative and measures to relieve the severity of the throat symptoms (such as spraying, irrigation, swabbing or use of gargles, as indicated). But all scarlet fever patients should be kept in bed, even the milder forms, for at least two weeks. Liquid diet should be the rule for first week in ordinary cases, semi-liquid for second and most of third, abundant liquid being always supplied. Any of the usual fluid diets are permissible, though milk is the diet of choice, though meat broths and albumin water are not contraindicated, as they seem to have no appreciable effect either on the prevalence or duration of nephritis. The urine must be carefully watched and examined at least three times per week, and active measures instituted if required. Basham's mixture will be found useful as a tonic diuretic after the second week.

The severer cases simply require "more care" and a longer period of it. These are the cases in which the throat symptoms require more active treatment and in which complications are most common, though even the mildest case may develop serious complications. In the cases with severe angina, antistreptococcus serum was given a thorough trial. In two cases of the toxic type with severe angina, an initial dose of 20 cc. followed by 10 cc. every six hours for five doses did seem to be of some benefit, but in others no benefit whatever resulted, although the serum was used fresh, early and in adequate dosage.

Of the complications, submaxillary adenitis was the most frequent, in fact may be considered a symptom, but in a fair percentage of cases is severe enough to require treatment. Children as a rule object bitterly to the use of ice which is probably the best early treatment. Heat is better borne and is thus more satisfactory. This adenitis proceeds to suppuration much more frequently than in diphtheria, but nevertheless very large swellings will frequently resolve without pus formation. When pus is present it, of course, must be evacuated.

Nephritis is one of the most serious complications. A transient albuminuria early in the fever is quite common, but unless persistent and accompanied by casts and deficient excretion is of slight significance. The true nephritis develops usually in the second or third week, but if patient has been kept quiet in bed with careful dieting, the danger of the complication can be to a considerable extent minimized. Some authorities give as high as 8 per cent. of cases showing this complication, but at the Isolation Hospital 2 per cent. only occurred over a period of three and one-half years.

Otitis media is another serious complication and occurred in 9 per cent. of cases in the hospital, and in 42 per cent. of the cases of this complication both ears were involved, as a rule, one ear following the other. Almost invariably the otitis becomes suppurative and the membrane tympani is either perforated by pus or paracentesis has to be performed. This complication is quite frequent in very young children and the appearance of discharge may be first intimation of its presence. A careful routine examination should be made of the ears if there be any elevation of temperature, considerable restlessness or peevishness, and in such cases the otitis can often be diagnosed early and a paracentesis performed. This most certainly shortens the duration, lessens the severity of the attack and the danger of permanent bad effects. This complication is undoubtedly the most serious one not only from the danger of extension to mastoid, lateral sinus or meninges, but also from the danger even with best care of its leaving permanent defects of hearing. About 80 per cent. of the children with this complication recovered completely, still the after history of a few cases followed was not good, as a recurrence of the otitis occurred after ordinary colds. In 20 per cent. some permanent damage (or death) was left, and in a number radical mastoid operations had to be performed.

Nervous symptoms are frequent in severe cases of fever; nocturnal delirium is common, but usually transitory. If persistent and

accompanied by marked restlessness, excitement and some retraction of the head, meningeal involvment is highly probable. Extension occurs most commonly from middle ear in these cases, but may be through the ethmoidal cells or via the blood stream. The possibility of the complication being tubercular, the fever seemingly lighting up the process, must be kept in mind. Two cases of tubercular meningitis so developed under my care at Ottawa. A lumbar puncture and examination of the fluid will differentiate.

As to prophylaxis, I have nothing to add to the usual rules, except to say that I believe the nose and throat discharges to be the most dangerous materials in spreading the contagion and that if isolation is to be effectually carried out, it must be extended in certain cases till all nasal and ear discharges have ceased. In large cities there should be some detention home where the patients could be transferred after the fourth week so that they would be away from the more active cases, and where patients could be kept outdoors as much as possible.

W. T. SHIRREFF,
Hazeldean,
(late Supt. of Isolation Hospital, Ottawa).

BOOK REVIEWS.

Principles of Pathology. Volume I, General Pathology. By J. G. Adami, M.A., M.D., F.R.S., Professor of Pathology, McGill University. Pp. 948: Lea & Febiger, Philadelphia, Publishers. Price $6.00.

The appearance of this volume will be welcomed by all English-speaking Pathologists as presenting in a readable, orderly and logical manner the principles underlying the development of morbid phenomena. Prof. Adami states in his preface: "In working over each section, I was forced, with Virchow, to recognize the cell and the changes undergone by it as the basis of all pathological study; and thus eventually to guard against constant reversion to elementary but basal and all-important matters, was compelled to write an intro-

ductory section upon the cell and its properties, more particularly in relationship to morbid changes." He thus devotes the first 175 pages of this volume to a review of the principal points in cell structure and function, its physical and chemical composition, metabolism, inherited characters, growth and relationship of its constituent parts in carrying out its functions. This is a portion that is relegated in large part by other pathologists to the domain of physiology, but we believe he has done a very distinct service in thus co-relating the two studies so that their intimate relationship is clear to the student.

The second section is devoted to a study of the causes of diseases. Inherited morbid conditions are first considered with a study of thier actual inheritance or acquirement during intrauterine life or parturition. We would recommend these chapters to a study of those who still believe in the "germ" and "sperm" inheritance of actual morbid states. Defects in development and monstrosities are very fully described and explained and a clearer classification laid down than found in any work known to the reviewer. The modes of action of the external agents of disease are very clearly defined. While the important animal parasites are described fairly fully, the description of the pathogenic bacteria is left to special text-books on the subject and discussion confined to their relationship to disease production. The conditions resulting from excess or defect of the internal secretions are also discussed, together with the pathology of the "constitutional diseases." The discussion of these latter groups of disorders is very suggestive and will repay all physicians to read.

The next portion of the book is devoted to the subjects of inflammation, repair and development of immunity, and in these subjects Prof. Adami is at his best, as might be expected from a writer whose previous articles on first mentioned subjects have become classics.

The concluding portion of volume (400 pages) are devoted to the progressive and retrogressive tissue changes such as hypertrophy tumor formations, the various degenerations, and necrosis. These subjects are all well presented, the study of tumors being particularly full. Adami's own classification of tumors (embryological tissue basis) is here given somewhat modified from its original publication, but the author does not use it alone. While this classification is a good one scientifically, and when mastered is sufficiently explanatory, it seems to the reviewer that there is no possible chance for its adoption in our day and generation, as the ideas expressed by the new terms can be as well explained without such coinage of new

terms. Taken altogether, this is a book for the advanced student of pathology, or one who wishes a broad and comprehensive grasp of the subject. It will also be found of marked value by the practitioner who wishes to keep abreast of the times, and we are sure many of its suggestions will alone repay for its reading.

* * *

Pathogenic Bacteria and Protozoa. Third edition. By W. H. Park, M.D. Director of the Research Laboratory of the Department of Health, New York City, and Anna W. Williams, Assistant Director. Pp. 642: Lea & Febiger, Philadelphia, Publishers. Price $3.00.

This well-known book has now reached its third edition. In it will be found a fairly complete and up-to-date discussion of the pathogenic micro-organisms, both animal and vegetable. This combination makes the book valuable for teachers, students and practitioners.

J. T.

MEDICAL NEWS AND NOTES.

Dr. M. I. Beeman, of Newburgh, and Dr. W. T. Connell, of Kingston, were delegates from Eastern Ontario to the meeting of the American Public Health Association at Winnipeg, August 25th to 28th.

J. L. Sweeney, of Dover, N.H., and A. Y. Thompson, B.A., of Strathroy, Ont., received the degree of M.D. as result of supplemental examinations in September, 1908.

Dr. Jas. Third has announced to the profession of the city and district that he will confine his attention in future to office and consultation practice in internal medicine and diseases of the skin.

The fifty-fifth session of the Medical Department, Queen's University, began on Sept. 30th. At the date of going to press (October 10th) 51 freshmen had registered. This number will be increased somewhat before final date of registration (16th October). Other years are also back in full force and total registration will be over 210.