

founder, an establishment, The Oakes Home, that is entirely unique in its inception and without a parallel in its peculiar scope, either in this country or abroad. It has been my privilege to send to this institution since it was first built over five hundred private cases with the subsequent results of a most gratifying nature. Here the pervading spirit has been that of a home as implied by its name. It may be very seriously questioned if any sanatorium in any climate can offer to a class of consumptives more of the material comforts of life with more opportunities for improvement than can be obtained in this institution.

This preceding course of remarks is not intended as the slightest reflection on the great usefulness of closed sanatoria even in appropriate climates, but simply as an argument against its invariable necessity. It is not my desire in the merest way to detract from the honor and glory of those who have devoted their lives to a cause so worthy and who are destined to leave a lasting monument to their ability and personal sacrifice.

The line of thought is here pursued simply as a plea that, following their example in its essentials and profiting by their experience, much good can be accomplished even without the aid of their special institutions. The sanatorium whose only approximate boundary is the eastern slope of the Rocky Mountains is presented as offering opportunities for the same medical supervision and regard for detail as practiced within the four walls of any existing institution.

At a recent meeting of the American Medical Association, at the conclusion of a discussion on the management and climatic treatment of consumption, a respected member of the profession arose and with great solemnity and impressiveness, pointing upward, said that from an experience of many years he was assured there was but one climate and one home for the consumptive, and that was to be found in Heaven. Despite the epigrammatic inaccuracy of the sentiment expressed, the dramatic incident nevertheless served to illustrate fittingly the surpassing and never-ending importance of the subject. The great tragedy of consumption continually being enacted with its ever shifting scenes and wonderously pathetic situations on the broad stage of humanity demands for the study and proper interpretation of the parts an eternal vigilance, an infinite zeal and a devotion to the cause to be terminated only when the curtain shall drop for the student himself.

SOME PRACTICAL POINTS ON THE TREATMENT OF PULMONARY TUBERCULOSIS.*

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So much attention is at present being demanded by the prognosis and treatment of pulmonary tuberculosis that a few practical suggestions may be of interest to the members of this Association.

THE EVOLUTION OF TREATMENT.

There is so much uncertainty as to prognosis in different cases and such a wide divergence of opinion as to methods of handling curable cases, that great confusion necessarily exists in the mind of the general practitioner. Some tell us to send our patients to a high

altitude, others to a cold climate, while many recommend a warm one; and again, some are in favor of ocean voyages. These various views were strongly advocated for a number of years so that climate alone was considered by many the only essential for the cure of the disease. In a small percentage of cases the results were satisfactory; in very many the histories of the patients after leaving home were too sad to be written. Then arose, from the necessities of the situation, sanatorium treatment, and at first it was believed that such institutions must be established only in certain climates. Consequently, in Colorado, Saranac and Liberty, there sprung up the large, well-known sanatoria, all of which have shown excellent results in the treatment of this disease.

Following the development of this line of treatment of tuberculosis, the physicians of the "Hub" very promptly demonstrated the fact that sanatoria in home climates were as capable of producing good results as those established at points where the climate was supposed to possess all the necessary qualities for cure. Dr. Bowditch led in this movement with the establishment of his sanatorium at Sharon for working classes, and this was quickly followed by the erection of the state sanatorium at Rutland. These institutions have accomplished wonderfully good results, and the consensus of opinion and the weight of clinical evidence are in favor of treating tuberculous patients in an institution where all the régime and environment are conducive toward not only building up Nature's reserve forces, but inculcating in the patients a knowledge of the rules of living.

When we examine statistics, however, we ascertain that only about 10 per cent. of people attacked with this dread disease are able to avail themselves of the advantages of treatment in such institutions, and that, therefore, 90 per cent. run the risk of allowing the disease to develop from an incipient or curable stage to an advanced or incurable one. How often does the family physician, when advising a patient to leave home, meet with the remark: "Doctor, I can not leave home," or, "Doctor, I can not leave my business; I must take my chances." What lessons have we learned by the results attained in sanatoria in different climates, referred to above, that may be practically applied by the family physician to the treatment of this large percentage of patients who can not be sent away? Home treatment should be based on three factors: hygiene, diet and various forms of treatment which are being gradually evolved by experiment in sanatoria.

HYGIENE.

The majority of patients that come under our observation, suffering from pulmonary tuberculosis, give histories of non-hygienic surroundings, which are naturally much more manifest in the environment of the poor than the rich. All live in imperfectly ventilated rooms, especially at night. They should be taught to live, during the daytime, in rooms where the temperature is between 60 and 65 F. and thoroughly ventilated. The heating of living and sleeping rooms should be systematically arranged. Stoves should be discarded, and, as far as possible, open fireplaces and steam or hot-water radiation substituted. At night patients should sleep with open windows, regardless of the weather conditions; their bodies should be protected by covering, but their heads and throats should be unprotected. No heat at all should be allowed during the night, except in very cold weather, when an open fireplace may be used. Dust should not be allowed to gather in the rooms, and patients should be taught to collect the sputa in a proper

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receptacle and subsequently burn it. The hygienic care of the body should be carefully impressed on all patients. Many tuberculous patients are averse to bathing, having a mistaken idea that it is a dangerous proceeding. They should be taught the intimate relation between the action of the skin and the lungs, and instructed to keep the proliferous circulation in proper condition. These patients should be encouraged to take at least two warm baths a week and a cold sponge daily.

Where it is possible they should be encouraged, excepting in inclement weather, to sleep outdoors. The comparatively good results attained by patients who have slept on verandas or open platforms for a number of weeks justifies the belief that the percentage of cures would be greatly increased if patients at large could be brought to this method of sleeping. As far as possible in city homes patients should be advised to sleep on the roofs. It is also well to encourage them to provide better ventilation during their working hours in the various offices or places where employed; and among those who live at home all day we should inculcate the habit of spending as many hours as possible in the open air.

DIET.

Diet is an all-important factor in the treatment of pulmonary tuberculosis. In advanced cases at all times, and in a very few incipient cases when they first come under observation, specially arranged diets are necessary. In 90 per cent. of incipient cases, however, nothing is better than a good "home" table and three substantial meals a day. Plenty of fats, vegetables, milk and eggs should be provided. Patients should not only be allowed but required to consume daily from one to two quarts of milk and from six to eight raw eggs. In addition they should eat as much meat as an ordinary healthy person would consume, regardless of the foregoing articles mentioned. Pastry and sweets should be strictly prohibited. In cases of either acute or chronic gastritis patients should be required to resume the regular diet after the proper treatment has removed these conditions.

The use of liquor in incipient tuberculosis has been as strongly advocated by some authorities as it has been condemned by others. There seems to be abundant evidence, however, that the judicious use of stimulants is of very great benefit in promoting appetite and assisting assimilation of food. Our two best agents for this purpose are whisky, in small doses of one or two drams three times a day, or a Manhattan cocktail half an hour before meals, and ale or stout, preferably the former, during the meal hour. Often patients, who have been losing weight, whose digestion is slightly impaired and appetite uncertain, with the aid of a bottle of Bass' ale will eat and digest a very satisfactory dinner, and, within a short time, there will be an improvement in nutrition and weight.

NEED OF INDIVIDUAL TREATMENT.

To be successful with our patients we must use various methods of treatment as auxiliaries to dietetic and hygienic influences. No general line of treatment can be laid down for even a small majority of patients. We must not expect to successfully treat pulmonary tuberculosis in the abstract, but every case must in justice be treated in accordance with its individual manifestations of disease, idiosyncrasies and complications. Probably it is this individualizing of patients that is largely responsible for the comparatively flattering results obtained among sanatorium patients over those attainable in private practice in the same climate. Pa-

tients frequently present complications of one sort or another demanding treatment in order to remove conditions which, if allowed to remain, will greatly interfere with the fight for life and restoration to health. I will refer here only to some of the more common phases of this disease and its complications requiring such auxiliary treatment.

THE UPPER AIR PASSAGES.

It is astonishing how a large percentage of even incipient cases of pulmonary tuberculosis present lesions of more or less severity in the upper air passages, and it is a question whether quite a number of patients may not attribute their trouble primarily to conditions of the nose and pharynx which have, by reflex irritation, created a nidus for pulmonary infection. Chronic congestion or infiltration of the arytenoids, if discovered early, may be easily cured by prompt local treatment. Unrecognized, such a case, at least in a fair majority, either leads to fatal laryngeal conditions or is the indirect cause of prevention of cure of incipient pulmonary lesions. Statistics show that not less than 25 per cent. of persons suffering from pulmonary tuberculosis have more or less involvement of the larynx and nasopharynx. Of this number 38 per cent. present congestion or infiltration of the arytenoid cartilages, interarytenoid space, ventricular bands or vocal cords; 32 per cent. show ulceration in one or more of these places; most frequently on the cords or interarytenoid space; 30 per cent. have some abnormal conditions of the nasopharynx. The nasopharynx and larynx should be treated locally, all foreign growths should be removed and abnormal conditions remedied before we can expect to accomplish satisfactory results in the main or pulmonary disease.

Then, again, we have a condition of sepsis, indicated by elevation of temperature, rapid pulse, night sweats and loss of flesh. Temperature is best controlled by rest, cold sponging or inunctions of guaiacol applied to the axillæ or groins. In selected cases we can administer fever capsules composed of phenacetin, acetanilid and quinin, two grains each. As for the rest treatment, it will be found very valuable even when the temperature reaches only 100 in the evening. Night sweats are best controlled by the old-fashioned remedy, atropin. Agaricin has been used in many instances with favorable results, but has more often failed in my hands. With respect to night sweats and temperature it must be noted that these are, generally speaking, due to sepsis from mixed infection, and we can often control the amount of secretion by antiseptic inhalations by ichthyol, creosote or any of its derivatives. The internal administration of creosote and some of its derivatives has a very beneficial effect on sepsis, but its symptoms are best controlled and the condition removed by the internal administration of ichthyol in very large doses. This drug has been used very extensively among the profession, abroad and in America, for the past seven or eight years with very excellent results. It should be given in doses of thirty grains three times a day.

COUGH.

Cough is best controlled by one of two drugs, heroin or codein. Morphin should always be avoided. Codein is given in doses of one-quarter of a grain every three hours during the day and at bedtime if necessary; heroin given in doses of one-twelfth grain generally accomplishes the same purpose aimed at in the administration of codein. However, it must be stated that heroin acts favorably only in about 50 per cent. of cases.

There are various other drugs, none of which deserve serious consideration, as they are usually advertised by agents commercially interested in their purchase.

Another complication requiring special attention in the treatment of pulmonary tuberculosis is that of more or less chronic gastritis, and often dilatation of the stomach. In such instances all medicines should be discontinued and a careful analysis of the contents of the stomach should be made after a test breakfast. Where hypochlorhydria exists this should be corrected. In the majority of instances, however, the most desirable method of treatment is stomach lavage about three times a week, and, in cases where dilatation exists, this should be followed by Einhorn's electrode. We must remember that the necessary overfeeding of our patients will periodically give us more or less gastric disturbance, and that this condition must be removed before we can expect any good results in the way of hypernutrition.

THE BLOOD.

Some observers have stated that there is a condition of anemia which antedates the development of tuberculous infection. While not willing to assume, at the present time, that this assertion is not correct, I simply wish to state as a matter of record that, according to data compiled during the past year, forty-two cases showed that pure tuberculous disease itself, whatever its seat (Cabot), has no effect on the blood, that fluid being normal in every instance; second, that sixty cases would seem to show that the *Diplococcus lanceolatus*, associated with the tubercle bacillus, is the primary cause of the severe anemia; third, that twelve cases showed that, when we have a case of tuberculous diarrhea, it is the drain on the body albuminoids and not the tuberculosis which is the cause of the severe chloranemia met; fourth, that the slight rise in temperature we often get in pure tuberculosis has not the slightest effect on the hemoglobin; fifth, that the temperature we get in mixed infection drains the red corpuscles of their vitality and lowers their number; sixth, that in mixed infection, with cavity and moist râles, and secondary anemia with leucocytosis, seventy-five cases showed the polymorphonuclear cells increased at the expense of the leucocytes, the leucocytes being of the large variety. But when the moist râles disappear and the cavity dries up leucocytosis disappears. Seventh, the blood of pulmonary hemorrhage does not show any nucleated red cells.

Where anemia does exist it must certainly be corrected before we can expect good results from other treatment. Good diet, outdoor life, the intelligent administration of iron and arsenic combined will generally prove efficacious. Static electricity is a very powerful agent in improving nutrition when given in conjunction with one of the foregoing remedies.

Hydrotherapy is also a very powerful factor in placing the victim of incipient tuberculosis in a condition to overcome the disease. In all large cities, and in many small ones, there can be found hydrotherapeutic establishments where patients can be sent and treated two or three times a week.

THE LIGHT TREATMENT.

During the past few months the attention of the profession has been very strongly attracted toward the good results possible to obtain in the treatment of pulmonary tuberculosis by different light rays. We know how efficacious are the ordinary rays of the sun toward destroying the virility of the tubercle bacillus, and that six or seven hours' exposure will render innocuous the most virulent sputum. Beneficial results of light in

living and sleeping rooms are too well known to be mentioned here. It is generally conceded that patients living in sunless rooms will never—no matter how favorable their other symptoms—recover from tuberculosis. Light may be applied by the general practitioner in the simple form of sun rays to the bared chest; the patient selecting certain hours of the day, stripping to the waist and gradually tanning the chest as freely as the face. When possible, instead of using this mild form of light treatment, it is better to give them exposures to the rays of the arc light. Very beneficial results have been obtained with the arc light at my hands in cases of mixed infection and in some of empyema. Pus products very soon show a marked decrease.

The most powerful light rays at our command at the present time are very properly called the "x- or unknown rays." They are far more searching, their action is much more powerful and good results are obtained in a much shorter space of time in the treatment of carcinoma. With this treatment we are, to a large extent, groping in the dark. At present it is not a safe agent in the hands of the general practitioner unless he has taken a special course of training in the physics of the x-rays.

It is now a demonstrated fact that the x-rays are a specific form of treatment in external tuberculosis as well as carcinoma. In the writer's hands both external carcinomatous and tuberculous growths have been thoroughly inhibited. It is impossible to state at the present time whether the results obtained by different observers in this direction will be more permanent than surgical interference, but there is strong reason to believe that they will. The treatment of internal disease, whether of carcinomatous or tuberculous character, has not been as well demonstrated as that of the external variety, but from the present indications it is to be hoped that very many cases of both of these diseases can be radically cured. The question before the profession at the present time is whether the x-rays lose any of their power in passing from healthy tissue to diseased tissue; or whether sufficient force and penetration can be employed on internal diseases without destroying the intervening healthy tissue? If this can be accomplished we have no reason to doubt that in the x-rays we will shortly have our most potent agent in the treatment of pulmonary tuberculosis. Satisfactory results have been obtained in the treatment of internal carcinoma, and as the effect of the x-rays on external tuberculosis is so radical, reasoning from analogy, it should be as effective in internal tuberculosis as well as in carcinoma, provided the tuberculous process be sufficiently circumscribed or localized. In carcinomatous conditions of the uterus and in external tuberculosis or lupus, the writer has seen neuralgic pains disappear immediately, the secretion suppressed within a very short time, and the activity of the disease inhibited. Let us hope, therefore, that before long we shall be able to obtain as successful results in the treatment of internal tuberculosis. The technic of x-ray treatment should be carefully observed. The tube should be placed about 8 inches from the surface of the body and all areas not to be acted on should be protected by sheet lead and absorbent cotton soaked with water. The skin should not be too rapidly tanned or x-ray burned, and in treating the lungs it would be well to alternate the points of exposure. Vaseline can be rubbed on the surface at night. Exposures should be of ten to twenty minutes' duration and repeated three or four times a week. The mucous membranes are more tolerant of the x-rays than the skin. Possibly the x-rays

may have an inhibiting if not a resolvent effect on tuberculous infiltration or consolidation without cavities.

SURGICAL TREATMENT.

Surgical interference in pulmonary tuberculosis has not heretofore held out much hope. Tuberculous empyema, complicating pulmonary tuberculosis, should always be turned over to a surgeon for proper treatment. Tuberculous cavities lying near the surface or non-specific abscesses, when located near the base of the lung, are subjects for surgical interference. When these cavities are located in the upper lobes it is better to employ intratracheal antiseptic injections or creosote, or to inject these fluids directly into the cavity with a hypodermic needle through the chest walls.

Compression of the lung by nitrogen gas can be passed over in a few words with the following comment: It is applicable only when no pleuritic adhesions exist or where, if they do exist, they can be broken down with a legitimate amount of pressure.

SERUM TREATMENT.

Finally, the treatment of pulmonary tuberculosis by different sera must be referred to. After a number of years of trial this form of treatment is still in the experimental stage. In cases of mixed infection anti-streptococcic serum, in doses of 15 c.c., will act as a specific against streptococci, thereby reducing temperature and sepsis and greatly stimulating the patient's nutrition. Two or three injections are generally all that is required.

Antitubercle serum undoubtedly possesses, in selected cases where mixed infection is not marked, the power of stimulating nutrition and, by increased phagocytosis, aiding in the removal of the tuberculous deposit and temporarily, we know not for how long, increasing the resisting power or partially immunizing the patient.

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SYMPOSIUM ON TUBERCULOSIS.

Two articles of this series have previously appeared in THE JOURNAL. They will be found in the issues of November 22 and 29. The remaining articles will be continued in succeeding issues as follows:

Recent Investigations Concerning the Relation of Human and Bovine Tuberculosis. D. E. Salmon, D.V.M., Washington, D. C.

The Intertransmissibility of Human and Bovine Tuberculosis: A Review of the Experimental Evidence. R. E. Dinwiddie, M.D., Fayetteville, Ark.

Discussion on the above seven articles.

Sanitary Measures for the Prevention of Tuberculosis in New York City, and Their Results. Herman M. Biggs, M.D., New York City.

Discussion.

THE MICROSCOPE IN THE DIAGNOSIS OF SCARLET FEVER.*

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Since Dr. W. J. Class¹ called the attention of the medical profession to the causative germ of scarlet fever, I have been in a position to learn the value of the microscope in the early diagnosis of this disease.

In the year 1894 there was established at my residence by the Chicago Health Department a sub-laboratory for the examination of cultures from anginas. It was at first only intended to assist in the diagnosis of diph-

theria, but it was soon found that the culture gave more or less valuable evidence in almost every disease which attacks the respiratory tract. In differentiating influenza from other inflammations it is invaluable. The extensive use of the culture has demonstrated to me that the term pneumonia is a general one, and that there are several germs that are capable of causing a pneumonic condition in the lung tissue.

The term pneumonia is as indefinite as that of tonsillitis. While the lung tissue is so constructed that a certain train of clinical symptoms follows the invasion of any one of these germs, the prognosis and treatment largely depend on the nature of the invading germ. La grippe pneumonia, tubercular pneumonia or typhoid pneumonia represent distinct and characteristic conditions. Through the Health Department Laboratory I have been in touch with the various prevailing infections in my part of the city, and have examined yearly more than a thousand cultures.

Dr. Class made his announcement at the beginning of what has since proven to be the most extended epidemic of scarlet fever Chicago has ever known. During the previous four years I had become familiar with the nature of the inflammations caused by the *Staphylococcus albus*, and as soon as Dr. Class called my attention to the coccus he described, I found that it differed in many important respects from the *Staphylococcus albus*.

The Class coccus was at first limited to the cultures from those who were suffering from scarlet fever. I soon noticed that it was also found in the anginas of nurses or attendants who had come in contact with the disease. In those who were immune from previous attack of scarlet fever it was capable of causing only an angina.

Unless the bacteriologist is familiar with the Class coccus he would take it for a vigorous growth of the *Staphylococcus albus*, but a study of several cultures of the organism extending over some days will reveal its individual characteristics. These are so peculiar that it is difficult to place it in any class of bacteria. It is very sensitive to environment and is modified in form so it may appear as a diplococcus, a streptococcus or a strepto-bacillus, merging from one to the other in the same culture. Only by studying many cultures can one appreciate this variation in form. It also has a wide variation in size—from a point which can just be distinguished with an oil immersion twelfth to (in old cultures) a coccus a third the diameter of a red corpuscle.

The multiplication is by division and it multiplies in all of its varying sizes. Because of its minute form it can penetrate almost any tissue of the human body.

The shape, as usually seen, is round, with what appears to be a hole in the center. This is due to refraction or to staining qualities. As the germ increases in size a dividing line may be seen in the center. In the older cultures, where the coccus is large, on each side of this center line the cell substance stains in the shape of a crescent with the points toward the line. It is very susceptible to environment and is often seen to assume the streptococcus form or to become egg-shaped and sometimes almost a bacillus. These are a few of the important characteristics. A more extended description has been given by Drs. Class, Wynkoop and Jakes.

Before one is able to understand the value of microscopic evidence in the diagnosis of scarlet fever, one must appreciate that the scarlet fever germ is a pathogenic organism which requires a susceptible condition in the patient to permit its entrance into the blood and tissues, where it multiplies and produces the disease known as scarlet fever. Individual resistance and because one

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