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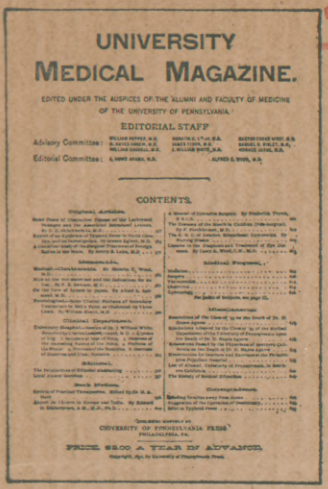

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CONTENTS.

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# PROPHYLAXIS IN THE TREATMENT OF TUBERCULOSIS

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# PROPHYLAXIS IN THE TREATMENT OF TUBERCULOSIS.[1]

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With the demonstration of the parasitic nature of tuberculosis began a new era in its treatment. In the past the medical profession has had no resources in its struggle with this disease except such as it could draw from empiricism, but in the future its combat will at least be founded upon a rational basis. All that has been found useful in the past can now be used more intelligently and more effectively because we can give a reason for its use, and can discriminate in its application; and the new light has already enabled us to discover pathways which promise to lead us to the El dorado in which will be found the precious substances that will cure.

From the organic theory of tuberculosis we can learn many valuable lessons in treatment. The organic theory as now elucidated can be briefly summarized as follows:

(1) Tuberculosis is a parasitic disease due to the implantation and development of a vegetable organism in the tissues of the body.

(2) For the successful implantation and development of this organism the tissues of the body must constitute a proper soil, which may either mean that they contain a certain something conducive to the development of the organism, or they lack a certain something which would interfere with the development of the organism.

(3) The symptoms which we recognize as constituting the disease we call tuberculosis are partially due to the irritating presence of the parasite, partially due to the destruction of tissues which takes place during the effort of nature to cure, and partially to the absorption of poisonous products of the organism.

(4) When death takes place from tuberculosis it is usually due to the ptomaines produced by the organisms causing the disease, but may be due to destruction of tissue, or to the inflammation set up by the parasite.

(5) The severity and rapidity of progress of a case of tuberculosis is in proportion to the fertility of the soil and the number of organisms implanted.

(6) The soil for tuberculosis is not exhausted, but, on the contrary, is enriched by the growth and development of the organism producing the disease, and is likewise enriched by the growth and development of organisms producing other diseases.

[1] Read before the Pennsylvania State Medical Society, Philadelphia, June, 1894.

(7) Fertile soil for the development of tuberculosis can be transmitted from parent to offspring, and can be produced by mode of living and by occupation.

(8) Tuberculosis cannot exist without the organism which produces the disease, and therefore no new case can arise without having an old one to spring from.

A most valuable lesson taught by the organic theory of tuberculosis, and one hitherto unrecognized, is prophylaxis in the treatment of the disease. Tuberculosis is strictly a parasitic disease, and as such is always a local disease. It is local, however, only in its cause, for the absorption of the products of the tubercle bacillus sets up constitutional symptoms, and death usually results from the absorption of those products. It might therefore be termed a constitutional disease with a local cause. Nature makes a strong effort to get rid of all parasites, and in tuberculosis this effort manifests itself in the formation, breaking down, and casting off of the tubercular nodule. Unfortunately, this very process may be the means of extending the disease. When a tubercular nodule breaks down the escaping organisms are liable to find their way back into the circulation, and to form new deposits. Re-entrance into the circulation may take place at the seat of ulceration where the broken-down tissue seeks exit, through a denuded surface in the mucous membrane of the respiratory tract, through the peribronchial glands, and through the stomach.

Were it not for auto-infection or re-entrance of the organisms into the system all cases of tuberculosis would get well. It is very rare that the first invasion of the organism is powerful enough to produce death. In those cases which are called acute tuberculosis, and in which death ensues in a few weeks, it is quite probable that the large number of organisms which are capable of producing such a result are not taken into the system at one time, but have been grown in the system in some gland, and have suddenly been set afloat in the circulation by the breaking down of that gland. Most cases of tuberculosis are simply a prolonged series of invasions of the organism in which each new invasion is the outcome of a former abortive effort at cure. This accounts for the long duration of tuberculosis, and also for the variation in its duration in different persons. Where the resisting power of the individual is good, the various invasions are apt to be mild and the breaking-down process slow, making the intervals between the invasions longer. The sanitary environments, and the habits of life also, are pregnant factors in determining re-infection, and consequently the duration of the disease. Hence we have the duration of tuberculosis ranging from a few months to many years. And yet the disease is the same in all persons, differing only

in the rapidity of the breaking-down process, and in the number and size of the invasions.

A clear knowledge of the nature of tuberculosis and a full appreciation of the influences which bear upon its development are of primary importance in its treatment. Auto-inoculation, whilst it cannot be absolutely prevented, can be, to a great extent, controlled, and the rapidity of the breaking-down process can in many cases be materially checked. Along this line lies all scientific treatment of tuberculosis so far known, and along this line all future effort in search of remedies or modes of treatment must be made. When we can absolutely stop all auto-inoculation we can cure the disease, and until we can do that deliberate and unfailing cure is impossible. In those cases in which recovery takes place this is the process by which it is brought about, and as far as we are now able to see it is the only process by which it is possible.

Auto-inoculation can be largely controlled in two ways, by building up the system of the patient so as to enable it to resist new deposits, and by preventing the readmission of the organisms into the system. For the building up of the system every possible resource must be drawn on, and the food-supply, the digestion, the assimilation, and the elimination all carefully studied and corrected, where faulty, so that the largest possible amount of nutrition may be obtained with the smallest possible consumption of force and energy. Increase in weight and strength and the restoration of the normal functions of the different organs of the body is the best evidence we can have that this is being accomplished. Improvident expenditure of force must be guarded against. Violent or prolonged exercise, depressing mental influence,—anything, indeed, that makes an unusual demand upon the muscle or nerve resources of the body should be scrupulously avoided. Forced nutrition should be practised as far as it is compatible with the maintenance of a healthy condition of the stomach. Ample sleep should be taken, and the nervous system always kept in a good vigorous condition.

The re-entrance of the tubercle bacillus into the system can be prevented to a large extent by the sterilization of all broken-down tissue as soon as it is given off. Of course re-entrance at the seat of exit, if there are broken blood-vessels at the place of ulceration, cannot be protected against; but fortunately the channel through which a broken-down nodule empties itself is frequently a non-absorbing surface. Re-entrance through denuded mucous membrane of the trachea and through peribronchial glands is also difficult to guard against. But when the broken-down tissue has once made its exit from the body, it is comparatively easy to prevent it from again infecting the patient. This can be accomplished by immediately sterilizing it whilst still in a moist condi-

tion. All sputa of tuberculous subjects should be ejected into a sputum cup, containing a liquid and, if possible, a germicide, and where this is not practicable into a paper handkerchief. Handkerchiefs made of other material should not be used, because the sputum dries too readily in them and the patient is very apt to rub it up or scatter it in pulling his handkerchief apart. When handkerchiefs are used they should not be allowed to become saturated, and should, after using, be burned. Under no circumstances should tuberculous matter ever be allowed to remain and dry on bedclothing or upon furniture, carpets, etc. In short, all tuberculous matter given off by a patient should be devitalized at the earliest possible moment after it has made its exit from the body.

It is quite likely that reinfection sometimes takes place through the stomach. Tubercular matter is frequently swallowed by patients voluntarily and still more frequently by accident. Broken-down tubercular matter is apt to adhere to the pharynx and to be swallowed with food in eating. The living organisms in such matter may meet their death in the stomach through the agency of the gastric juice, but may also run the gauntlet of the stomach if the secretion of gastric juice is deficient or if protected by undigested food, and be carried into the circulation with the chyle, finding lodgement in whatever part of the body best fitted to receive them. It is therefore of the greatest importance that patients be instructed not to swallow sputa. Where the expectoration is profuse, it is well to have the patient gargle the throat with an astringent before eating. Sometimes the hands and mouth are smeared with sputa, and for this reason the precaution of washing these ought to be taken before eating.

Where a patient is living in a room in which preventive measures have not been practised, such room ought to be carefully disinfected. This disinfection does not consist of burning sulphur or whitewashing, but in completely renovating the room. The walls should be scraped and then washed with a five-per-cent. solution of carbolic acid. If the walls have been painted they should be rubbed down with bread and then washed with carbolic-acid solution. The floor should be scrubbed with a carbolic-acid solution, and every particle of furniture, carpet, bedding, etc., in the room should be either subjected to a temperature above 158° F., or disinfected with a five-per-cent. solution of carbolic acid or a one-tenth-per-cent. solution of corrosive sublimate, to which must be added some tartaric acid, citric acid, hydrochloric acid, or muriate of ammonia, to prevent the coagulation of albumen. I have more than once seen the improvement of a patient date from his removal from infected quarters, and I have no doubt but that some of the benefit which is usually credited to change of climate is really produced by removal from infected homes.

The importance of prophylaxis in the treatment of tuberculosis cannot be over-estimated. Whatever brilliant results may be obtained temporarily by drug treatment, upon prophylaxis must depend to a great degree permanent results. No case of tuberculosis should be called cured until it has withstood new invasions of the disease for four or five years. I am convinced that for fully that length of time a case of tuberculosis which has apparently recovered may carry the slumbering embers of the disease in a partially broken-down gland or secreting cavity, and is prone to new invasions of the disease. It has been shown that the tubercle bacillus can maintain its vitality for a very long period, probably a year, at least in dried-up broken-down tissue. A room containing such dried-up tissue is, therefore, a source of danger to the patient for a long time after he has apparently recovered from the disease, and may be the means of precipitating a fresh attack. The only safe thing for the patient in the light of modern science is, (1) To make his surroundings absolutely free from danger from infection, (2) and to prevent him from reinfecting himself by keeping him in the best possible state of health, so as to be able to resist the disease, and by inhibiting the reintroduction of ejected organisms into the system.