

THESES ON TUBERCULIN TREATMENT.¹

BY PROFESSOR DR. SAHLI.

I SUBMIT the following propositions to the Congress on Tuberculosis:—

First: All the various tuberculins are essentially identical. The apparent differences are dependent on the various degrees of admixed impurities. The active principle of all tuberculins is the protein of the tubercle bacilli. There is no proof of the existence of a tubercle exotoxin. The fact that it is impossible to produce high sensibilisation for tuberculin by previous tuberculin injection in healthy animals is no argument against tuberculin being actually the toxin of tuberculosis. The best tuberculins are those prepared from cultures as free as possible from adventitious albumins.

Second: To avoid disastrous mistakes in therapeutic dosage it is advisable to provide the practitioner with tuberculin in suitably graduated dilutions as is done in the case of Beranek's tuberculin. Not only the absolute dose, but also the concentration of the dilution is of importance. The same dose will prove more active in concentrated solution than when further diluted, because of the greater rapidity of absorption.

Third: The use of tuberculin for diagnostic purposes ought to be condemned. It is unreliable both positively and negatively. Diagnostic injections are dangerous. The only diagnostic procedure I advise is the cutaneous reaction with graduated dilutions. Its purpose is not diagnosis in the ordinary sense, but the determination of tuberculin sensibility in order to fix the proper initial dose for treatment.

Fourth: Tuberculin treatment is free from danger only if more obvious clinical reactions are avoided. In this case it is so harmless that it may be undertaken even when the diagnosis is not absolutely certain in order to effect prophylaxis in cases where infection is probable, although the disease is quiescent. Only such a mild method allows us to derive all the benefit possible from tuberculin treatment. Tuberculin treatment is chiefly valuable in incipient cases.

Fifth: In advanced cases tuberculin treatment may sometimes produce a certain symptomatic effect, but this effect does not compare with the utility of tuberculin in incipient cases.

Sixth: In order that tuberculin treatment should be widely available for the most favourable incipient cases, it is indispensable that the general practitioner, and especially the family physician, should render himself proficient in tuberculin treatment.

Seventh: Correct tuberculin treatment is only possible if based on a solid and thorough knowledge of the action of tuberculin. I have laid special emphasis on this point in my monograph on the subject, the fourth edition of which I present to the Conference.

Eighth: The theory of the therapeutical action of tuberculin may now be regarded as well established. The therapeutical action is essentially of the same kind as the tuberculin reaction. Even so-called reactionless tuberculin treatment is based on reactive processes. The reaction of tuberculin consists in stimulation of the natural healing forces. The significant factor is the increased production of what I have called inflammatory antibodies and the specific tuberculin amboceptor. The latter has the effect of increasing both the local counteraction in the foci by the production of tuberculin-opyrin and the general detoxication of the pre-formed tuberculin. This detoxication depends upon the decomposition of the tuberculin by the amboceptor over the intermediate stage of tuberculin-opyrin into innocuous and inactive products. This detoxication is especially the cause of the antithermic effect of small doses of tuberculin.

Ninth: Tuberculin acts favourably only in cases where the human organism is not already sufficiently under the influence of absorbed tuberculin—that is, generally in slighter cases.

Tenth: It is not necessary to increase the doses of tuberculin to the furthest limit of tolerance. Many cases improved more with a much smaller dose, which I term the individual optimum dose. This optimum dose ought not to be overstepped.

Eleventh: The large doses of tuberculin recommended recently for the purpose of reducing temperature have no curative action. The reduction of the temperature depends in these cases only on an artificial production of an anti-anaphylactic state—that is, the same condition of things which causes the advanced cases not to react to tuberculin.

Twelfth: Tuberculin treatment has not the character of a true immunisation, though it produces immunisatory effects in the organism. In actual immunisation we try to produce as completely as possible a state (I wish to emphasise the word *state*) of immunity. This is impossible of attainment in tuberculosis. In tuberculin treatment we only look for stimulation and activation of the counteractions of the body at each injection. To try to express the mode of action I have called the therapeutical action of tuberculin an immunisatory healing action, in opposition to actual immunisation, which is a final state never obtained in tuberculosis.

Thirteenth: All localised tuberculosis is suitable for tuberculin treatment, provided that the patient's system is not already overloaded with tuberculin, and he is, therefore, too seriously ill. As a rule acute cases cannot be treated by tuberculin.

Fourteenth: Tuberculin treatment by means of multiple cuti-reactions after the method described by me at the International Congress on Tuberculosis in Rome, 1912, has been proved harmless, and useful especially for incipient cases. It is based on the principle of enlarging the reactive surface. The strongest local (cutaneous) reaction is produced with the smallest amount of tuberculin.

Fifteenth: Well-diluted tuberculin treatment constitutes a real and great therapeutical progress.

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REMARKS ON THE TECHNIQUE OF ELECTROCARDIOGRAPHY FOR CLINICAL PURPOSES.

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I.—The Electrodes. The Compensator and the Condenser.

In the Oliver-Sharpey lectures on the Electrical Action of the Human Heart as delivered and published,¹ I did not find time or space for any description of the technique of electrocardiography. But since then I have learned from various inquiries that have been addressed to me, as well as from trade catalogues containing approved directions for the pursuit of electrocardiography, that the simplified technique which I now follow is not generally known. It may be of service therefore to describe as briefly and untechnically as possible the simplified procedure that I consider to be best adapted to clinical use.

It has been assumed by recent clinical authorities on the technique of electrocardiography that it is necessary to use unpolarisable electrodes and a compensator in order to balance what are called "skin-currents" in circuit. I made use of these accessories 30 years ago in my first investigation of the subject, and they are in daily use in my laboratory for other purposes, but for taking electrocardiograms I have long since abandoned them.

At the Brussels Congress of Physiology in 1905 Professor Max Cremer showed that a condenser in the circuit gets rid of accidental fluctuations of current without interfering with the comparatively short alternating currents of the electrocardiogram. His subsequent publications,² and those of Zwicke³ and of Gildemeister,⁴ have fully confirmed the statement. Electrocardiograms taken (1) with unpolarisable electrodes and compensation; (2) with ordinary metal electrodes and a condenser of sufficient capacity (20 to 50 microfarads) are indistinguishable from each other; theoretically, according to Gildemeister, the error caused by the condenser to the first ventricular wave amounts to 1 in 2000—i.e., is negligible.

¹ A paper read before the Fifth Annual Conference of the National Association for the Prevention of Consumption and other Forms of Tuberculosis on August 4th, 1913.

² THE LANCET, May 24th and 31st, 1913.
³ Sitzungsberichte der Gesellschaft für Morphologie und Physiologie, München, 1905.

⁴ Zeitschrift für Biologie, 1911, p. 32.

⁵ Zeitschrift für Biologische Technik und Methodik, 1913.