

BIOLOGICAL CURVES OBTAINED DURING THE ONSET AND COURSE OF TUBERCULOUS INFECTION

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IN 1911 one of us published preliminary reports* upon the effect of certain tuberculous sera upon tuberculo-antigen. This effect was estimated by the lessened adsorption that antigen-serum mixtures had for complement in contrast to that of the corresponding antigen-salt mixtures. This phenomenon is exactly the reverse of complement fixation, and although the technic is an adaptation of the latter, the protocol necessary for the routine demonstration of this reverse phenomenon differs from the necessary arrangement for complement fixation.

As the purpose of this paper is to demonstrate the relation between the clinical progress and biological curves obtained by the repetition of these test-tube reactions, together with repeated quantitative estimations of the tuberculin sensitiveness, we do not propose to deal extensively with the technic of the methods, which have been fairly fully outlined in the former publications. The technic therein given is essentially the basis of the present report, although various modifications have been adopted to increase the delicacy and accuracy of the test. One important detail of the technic might, however, be mentioned, and that is the necessity of estimating the natural hemolytic strength of the serum to the corpuscles of whatever system used. In the former reports this factor was controlled rather than eliminated. Subsequently we found it consumed less time and gave greater accuracy to first absorb the natural hemolysin by incubation of the inactivated sera with washed sheep-corpuscles.

As we have found it necessary, for convenience of expression, to introduce two terms descriptive of the end-results of the test-tube reactions, a brief discussion of the nomenclature at this point may facilitate the subsequent use of these terms.

The technic adopted to demonstrate this reverse phenomenon to complement fixation is based upon the fact that all antigens are capable of non-specifically adsorbing complement in various degrees. Now, if to an appropriate series of antigen dilutions, whose complement-adsorbing capacities are quantitatively shown, sera are added, it will be found that certain sera give—(1) true complement fixation (the demonstration of this taking place in appropriate antigen dilutions where only minimal parts of a unit of complement

* Caulfeild: "Investigations on Pulmonary Tuberculosis," *Jour. Med. Research*, January, 1911, p. 128; Caulfeild: "Correlation of Clinical Progress with The Results of Immunological Studies," *Arch. Int. Medicine*, October, 1911, vol. viii, p. 440.