

be obtained in rabbits\* with the alcohol-ether antigen as well as with other tuberculo-antigens. In contrast to the results in small laboratory animals, the reaction has been observed in all degrees in cows. Work is at present under way with these animals to correlate these findings with other data.

As it would be impossible in this report to deal with the material that has accumulated in these investigations by analyzing each case, although it is by this method, as well as by subsequent groupings, that we have come to the conclusions we now hold, our purpose will best be fulfilled, it would seem, by presenting the results under various groupings, and by further illustrating the various points by charting the results obtained in particular cases.

*A. Results Obtained in Clinical Normals.*—In the beginning of these investigations samples of blood from clinical normals were used for the purpose of "controls." However, as the application of the tests developed, and as variations both in the test-tube results and the clinical life of certain of the controls were obtained, the conception was formed that from just such material data might be obtained which would throw light upon "immunity to tuberculosis." No doubt this hope originated in the deductions drawn from the results of tuberculin tests on healthy subjects and postmortem statistics regarding the prevalence of the lesions of healed tuberculosis. These allow one to believe that during the life of different individuals exposures to tubercle bacilli and bacillary implantations take place, and that, in those remaining clinically free from tuberculosis, the implantations are successfully resisted within varying periods of time and varying degrees of biological reaction and anatomical involvement. Our belief is that we obtain immunity to tuberculosis (by which is meant definitely established clinical tuberculosis) through exposures or implantations less in amount or virulence than our resistance, and that our resistance or immunity is fostered by these successfully resisted implantations. Whether we regard reinfection to be caused from within or without is not material to the point at issue.

Thus it has seemed to us that if these biological results can be of value (as they seem to be) in the definitely tuberculous, they should, if carried out continuously upon a sufficient number of clinical normals, throw some light upon the problem of immunity. In this way only would it seem possible in humans to contrast the reactions existent before, during, and after successfully resisted implantation. The contrast to this in the reactions following various degrees of early clinical infection is, of course, easily obtained. The value one will attach to the results in this connection will depend upon each observer's belief in the possibility of the tests representing a biological state (or physical condition depending on a biological state) and their specificity.

The list as it at present stands in the class of clinical normals is perhaps far from ideal, but a number of difficulties have arisen that were unforeseen in the beginning. The work was interrupted for about a year, and again observations were begun on individuals, who for various reasons were not again available for further tests. As would be expected, the most consistent series of observations has been obtained upon physicians, their friends, and medical students.

Table 2 gives the total number of cases included in this list, grouped under

\* Caulfeild: Proc. Royal Society, B. vol. lxxxiv, p. 390, 1911.