

an animal refractory to tuberculosis. These attempts must be regarded as having, so far proved unsatisfactory. The tuberculins introduced by Koch, in the hope that they might prove antitoxins, are now generally regarded as lacking specific action: owing, apparently to the fact that in tuberculosis no such immunity is induced at any stage of the disease. Tuberculin cannot, therefore, confer specific immunity to tuberculosis; on the contrary, there appears to be the objection to its use, that it may distinctly irritate the tissues. Carefully employed, however, in selected cases, tuberculin appears to have in some instances effected a cure. This result, according to Whitaker, appears to have taken place not through any action of the agent upon the bacillus itself, but by an increase of inflammatory action in the tubercle, whereby the death of the bacillus was effected. Aside from the possibility that the irritation thus artificially induced may sometimes be excessive and thus defeat its end, it has been noticed by good observers that the agent has no therapeutic action on recent miliary tuberculosis, and is not capable of checking the spread of this process.

Other experimenters have employed the serum obtained from the blood of animals supposed to be refractory to tuberculosis. Among the more prominent of these experimenters is Maragliano, of Genoa, who reports the results obtained clinically from the injection of serum derived from dogs, asses, and horses treated with the toxins of tuberculosis. Paquin, of St Louis, claims good results from the use of the serum obtained from the horse. Stubbert, at the Loomis Sanatorium, claims distinct therapeutic powers for an anti-tubercle serum prepared at the biochemical laboratory of the United States Government. One can only say that, as yet, equally successful results have not been obtained by other impartial observers.

In a paper recently published in the *American Journal of the Medical Sciences*, Dr. Trudeau and Dr. Baldwin sum up the results of four years of experimental work in their laboratory, testing the anti-toxic power of serums in tuberculin poisoning as manifested in sound and in tuberculous animals. They state that with a full appreciation of the uncertainty of correct conclusions from tests of the serums other than their own product which were tried with tuberculin, only one indicated anti-toxic power; this was obtained from a horse inoculated with non-virulent cultures. The apparent protection against fatal tuberculin poisoning occasionally seen, cannot be regarded as necessarily due to the specific anti-toxic powers of the serums, for similar effects were obtained occasionally from physiological salt solution. None of the serums appeared to prevent local or general reaction from small doses of tuberculin, nor to influence the temperature of tuberculous animals. Disappointing as these results may seem, the writers feel that in the light of recent contributions to our knowledge of the mechanism of immunity,