

make an assertion which I have no doubt will be considered somewhat arbitrary. It is, that whatever of so-called specific effect lies in the antitoxine obtained from the immunized animal, as opposed to the bacillus and the toxine of diphtheria, is accomplished by the excitement of leucocytosis, and after all the end is reached by the same physiological process.

The ultimate aim of all antitoxic agents must be the overwhelming of the toxic element of the germ, and this can only be accomplished by a great excess of physiological tissue building material. Let us observe the process by which this antitoxic effect is brought about. In the first place, the physiological relation of protonuclein would of course preclude the idea of its action as a direct specific antidote to a specific poison, such as that observed between chemical agents, or even physiological antagonists, as for instance the hydrated sesquioxide of iron against arsenic, or atropia against morphia, or chloroform against strychnia. Were this the principle of the functional activity of protonuclein, its therapeutic range would be limited to such an antagonism, but, as I am prepared to show, by careful experimental records, its effect is first observed when the system has been thoroughly charged with it, thus preventing the expression of the toxic agent by a preoccupation of the nutritive field, and an investment of the attacking germ. I have often noticed a leucocyte, thoroughly charged with original nuclein, adhere to the cell of a sarcoma, and after bursting itself, send the round cell floating away in the field created and almost emptied of its contents. Such effects have been observed also upon the blood after days of treatment with protonuclein. This appears to me to be the very *ultima thule* of therapy; and the question will be—has been, very naturally asked after such developments: "If such be the power of a substance capable of investing, controlling, and overwhelming toxic agents, where is the limit of its action?" If I spoke the truth boldly, as it should be spoken, I should answer that, properly applied, I can see no limit of its resisting power. When side by side with my own experiments I have observed what I admit to be the wonderful effects of antitoxine in the organism on the bacillus and toxine of diphtheria, I have, nevertheless, felt that protonuclein was as far superior to it in pathological results as the whole realm of pathology is greater than a single disease.

And now we come to the question of practical interest to the general profession, "How is it possible to extract this delicate substance from the animal tissues?" and its corollary, "What are the methods used to preserve its cellular activity?"

There are three forms of nuclein material now before the profession.