

individuals being all exposed to the same risks, the susceptible ones are weeded out, while the survivors transmit their insusceptibility to their descendants.

The following is a possible explanation of the immunity which carnivorous animals have for anthrax and other forms of septicæmia to which herbivora are very susceptible. From time immemorial the carnivora have been in the habit of fighting over the bodies of dead herbivora some of which may have died from infection from bacterial organisms, and in this fighting they receive wounds and become inoculated with the infectious material which would be fatal to a susceptible animal. If at any time in the past a similar susceptibility existed among carnivora, with individual degrees of resistance, it can readily be seen that there would be a constant tendency for the most susceptible to perish, and for the least susceptible to survive. In this way a high degree of immunity would be established. Sternberg says: "The tendency of continuous or repeated exposure to the same pathogenic agent will evidently be to establish a race tolerance, and there is reason to believe that such has been the effect in the case of some of the infectious diseases of man, *e. g.*, syphilis, smallpox—which have been noticed to prevail with especial severity when first introduced among a virgin population."

Another factor conducive of natural immunity is temperature. Frogs and chickens are immune to anthrax. In the one case the body temperature is low, 18° C., while in the other it is high, 40° to 41° C., and this may influence the growth of the anthrax bacillus preventing the full and rapid development, which may be necessary for the production of the disease. The blood, lymph, and other juices of the body no doubt exert a more or less germicidal action on bacteria. Metschnikoff's theory of phagocytosis is based on the following facts: leucocytes in circulating blood ingest and destroy any foreign particles ingested; secondly, any injury to the tissues is immediately followed by inflammatory reaction with the migration of leucocytes to the injured spot. Similarly in many instances, the leucocytes rapidly congregate at the seat of the bacterial infection and approach and destroy the bacteria.

Metschnikoff explains this migration of leucocytes on the hypothesis that the chemical substances elaborated by the bacteria attract the leucocytes, and exert what he calls a "positive chemotaxis," and the bacteria are in this way removed. In other cases unfortunately, the