

the purer the state in which these poisons are obtained the less prominent is their albuminous character, but they are such unstable bodies that it is difficult to make out much of their chemical relationships. Their most prominent feature is their intense toxicity, which is many times greater than that of the ptomaines. A study of the toxins of diphtheria and tetanus show that they are undoubtedly responsible for the disease phenomena associated with these infections. Closely allied to these toxins were found to be the poisons ricin and abrin and snake venom. The experimental work of Roux, Behring and Ehrlich soon demonstrated that these poisons differed from other poisons in that the recovery from a non-fatal dose conferred a partial immunity to a larger dose, and that this condition of immunity could be enormously and rapidly increased by repeated, gradually increasing doses. The further discovery that this immunity resided in the plasma of the blood and passed into the serum, and that this serum injected into another animal conferred on it an immunity proportional to the amount of serum, and the degree of immunity of the animal from which it was drawn lead to the recognition of the anti toxins, and the discovery of the anti-toxic treatment of these diseases. The discovery of the toxins and of the corresponding anti-toxins naturally stimulated to an enormous extent research along this line. The work of Pasteur upon anthrax, chicken cholera and other infections rested upon methods of immunity production by the introduction of weakened or killed organisms of disease, and aimed at producing in the animal a condition similar to that which results from the attack of an infection. It was, in fact, the production of an active immunity in the animal. The work of Behring, Roux and Kitasato lead to a method of curing an already existing infection by a method of passive immunization, and from this naturally arose the hope that it might be possible to do the same for all infections. Investigation, however, soon showed that the problem was not so simple as at first sight appeared, and the first difficulty which was met with was that of finding for the other micro-organisms toxins comparable in their action with those of diphtheria and tetanus; it was naturally imagined that if in the case of cholera, for instance, the essential toxin could be found, it would not be a difficult problem following the same methods used in the diphtheria anti-toxin to discover an anti-toxin for cholera, and similarly for other diseases. But the first difficulty which was met with was the finding of this toxin. In the case of Asiatic cholera, although organisms of a high degree of virulence, that is infecting power, could be cultivated in the artificial media of the laboratory, yet in no instance was there found in these media a