

The brilliant results attained by vaccination led to attempts to prophylaxis on similar lines in other diseases.

Willems in 1850 attempted to produce protection against bovine pleuro-pneumonia with inoculation of the virus, but with indifferent success.

In 1890, Pasteur, working with pure cultures of the microbes of chicken cholera and anthrax, placed the matter on a scientific basis. In the case of rabies, also, he was able to elaborate an efficient system of prophylactic inoculations, although the virus of this disease still remains undetermined. In all cases the material used for inoculation was an attenuated virus.

In 1887 it was shown by Salmon and Smith, and others, that specific immunity can be induced by the inoculation of a virus killed by heat, chemicals, etc., and thus all risks of increase of virulence, and resulting fatal infection were abolished, and so the method became applicable to mankind.

The important discovery of antitoxin by Behring and Kitasato in 1890 led to the belief that in immune serum a panacea had been found against all infections, a belief *not* justified by subsequent investigation. In recent years therefore a return has been made to active rather than passive immunization. The method was first applied to man by Herran and Haffkine in 1892 in Asiatic Cholera. Later, protective inoculation with killed cultures was carried out in the case of enteric fever by Pfeiffer and Kolle, and by Wright and Sample with good results. The possibility of protective inoculation against Bubonic Plague has been worked on by Haffkine and others, with results that promise success in the future.

The first attempt to extend the scope of vaccination to those cases where infection was already established was made by Koch. Taking into consideration the great chronicity of many localised tuberculous lesions, he conceived that it might be possible from cultures of the tubercle bacillus to prepare a vaccine which would so raise the resistance of the inoculated subjects that they might not only gain an acquired immunity against infection, but might even, when an infection was already present, be enabled to overcome that infection. In October, 1890, at the Berlin Medical Congress, he made the announcement that he had prepared a substance which had a curative effect when injected into the subcutaneous tissues of man and animals infected with tuberculosis.