rococcus, a minute rounded or lance-head shaped organism that hunts, if I may so express it, like the Northwest Mounted Police of the old days, or the Irish Constabulary, in pairs—hence we often speak of it as the diplococcus of pneumonia. You all know that the disease develops very rapidly. That rapid development is associated with an extraordinarily rapid multiplication of the diplococci so that these which, under ordinary circumstances, are not present in the lung, come to be present in teeming millions in the air sacs of the same, and there by their poisons, they set up so much irritation that all the air sacs of one or more lobes of the lung become solid through the intense inflammatory exudate that is poured out into them from the blood vessels, displacing the air that should be there. And so it is that in a very few hours the affected part of the lung comes to look more like a piece of liver than like a sponge with abundant air in its cavities.

And then you know that if all goes well, in four, or eight, or ten days, suddenly, in the course of a few hours, the crisis comes, the fever drops sharply, the patient feels better, and I may tell you that after this crisis we find the diplococci for the most part dead, or if not dead so weakened that they can have little effect on small animals.

This has always seemed to me as something approaching the miraculous, that bacteria grow abundantly in one of the tissues of the body for a few days, then as suddenly they are killed off and disappear. If they grow at first why do they not continue to grow—if eventually killed, why not killed at the start? Years ago we found out that this was not because they have exhausted the food supply. I do not know if this has been tried in connexion with pneumonia, but it has been repeatedly tested in the lower animals in connexion with one or other of the diseases from which these may suffer; it has been found that the tissues will afford abundant nutriment for the bacteria. It is not, again, that they are poisoned by the products of their own growth,—this occurs it is true when we grow them on broth in a closed test tube outside the body,—but we can make an emulsion of a pneumonic lung and while, if we add the diplococci to this, some will be killed (for as I shall point out, there are substances poisonous to the bacteria in such a lung), yet when a certain number have been killed the rest will grow freely. If the poisons were produced by the diplococci themselves then the greater the number of bacteria destroyed the more these poisons would be liberated into the lung emulsion and still less the chance would be for any to remain alive and multiply.

Neither of these explanations will suffice. The only adequate explanation for this eventual destruction of the bacteria is that of adapta-