

"champs maudits." He washed some of this in water, allowed the poured-off supernatant water to deposit the finer particles held in suspension, decanted off the water and heated the fine deposit in order to kill off all the ordinary microbes of the soil, leaving only the resistant spores alive; inoculated a series of animals with the material so gained, and of these a certain number died of veritable anthrax. Thus he was enabled to show that the earth of the affected meadows contained anthrax spores. The proof was absolute. The theory of plethora fell to pieces before the results of experiment.

It is unnecessary here to describe in full how Pasteur demonstrated that the meadows had become "accursed" by the previous burial in them of animals that had died of the disease, or how years before Darwin brought out his admirable monograph upon the earthworm, Pasteur proved that it was this great fertilizer that, peculiarly frequent in the rich pastures, brings up to the surface the spores from round the carcasses of the buried animals. Time forbids. I must pass on to the more direct researches of this keenest of observers into the production of immunity.

When Pasteur and Chamberland inoculated a number of cows with pure growths of anthrax they found that some died and some simply suffered from a transient malaise and survived, and, what is of special importance, that the survivors were immune to further attacks of the induced disease. And now the question arose: could the virus be so attenuated that all the cattle could be given a mild form of anthrax, and so be rendered refractory.

But here a great difficulty presented itself: the bacilli, as I have said, form resistant germs, or spores, and so long as such spores are developed, so long is there a succession of bacilli possessing a virulence equal to that of the spores from which they sprang. So long, therefore, as there are spores, so long is it impossible to gain attenuation. To gain attenuation the first step must be to prevent the development of these resistant germs. This was accomplished by keeping growths of the bacilli at a temperature so high—42-43°C.—that their development is hin-