

# FOUL BROOD

BACTERIA AND THEIR RELATION TO DISEASES

We speak of bacteria as causing diseases, then, again, as preventing diseases, and sometimes as curing diseases. These opposite and apparently irreconcilable properties in objects that can only be seen in a microscope, have caused the bacteria to be looked upon as mythical bodies by many intelligent persons who have not made them a special study. In explanation of the ways in which bacteria act I propose adopting a method frequently used by lawyers in court, i.e., of stating a case, and I present the case of the boy learning to smoke. If a boy takes five or six whiffs of smoke from a tobacco pipe, he will in three or four minutes turn pale and have to lie down. He will be a very sick boy for half-an-hour when he will begin to recover, and in an hour he will be nearly well again. The nicotine poison in the tobacco acts quickly, and only for a short time. If the boy had taken one whiff the first day, two the second, and three the third, he could have gone on for a month, and, without being sick, have made himself an educated smoker—likely enough proud of his accomplishment. Men and women have educated themselves to take with impunity a dose of opium or morphine sufficient to kill a dozen persons, and men have been known to take, without any immediate ill effects, a quantity of arsenic sufficient to kill a score of men. They come off by taking small quantities. We will now suppose that there

are bacteria which secrete nicotine poison as their weapon in the battle of life. The poisons secreted by the bacteria are very similar to the poisons formed in the leaves and flowers of plants, and in the bark of trees, to protect them from their enemies, so that the nicotine bacteria are not impossible bacteria.—they may exist. If the smoking boy and another boy not educated to smoke should be infected with these bacteria at the same time, no effects would be noticeable for several days, the period of incubation, say, ten days, when the bacteria would begin producing nicotine. The smoking boy would not be affected by it, while the other boy would be killed very quickly—probably in an hour. Now, if we had taken this boy before he died, taken him on the day he was infected, or the day after, and had given him a whiff of tobacco smoke, the next day two, and so on, until the bacteria commenced secreting nicotine, he might have been sick from the larger dose, but he would have recovered to find himself as accomplished a smoker as the other boy, the bacteria having completed his education.

We would have saved the boy precisely in the same way as a person bitten by a rabid dog is saved in the Pasteur Institution, and the smoking boy's protection from the nicotine bacteria shows how immunity from smallpox, by vaccination, may be produced at will. It should be observed that it makes no difference