

they must be used with a definite object and for a definite purpose. What is that object, and what is that purpose? I recollect in my student days our chemical lecturer, to whom alone was deputed the duty of dealing with disinfectants, told us that the usual object of such was to make so much stink in the house that you were obliged to open the windows and ventilate the place for the purpose of getting rid of your agent. He thought as much good might be done by ventilation without the stink as with it, and advised accordingly. Indeed, in those days, the first and only use of disinfecting agents was to get rid of nasty smells; and in the eyes and noses of the vulgar and ignorant that is still thought to be the main duty which inspectors of nuisances have to perform. It is, however, the least important part of your duty. A very powerful stink is seldom of serious consequence beyond the fact of its being a nuisance. The very nauseousness of it prevents it doing much harm.

Some pleasant agents may be used to destroy smell, to which I will allude later on; but now I may say that disinfecting agents, by checking putrefaction, remove the cause of the smell by preventing the production of the gases upon which the smell depends. These gases may have their origin in a purely chemical action, or in the changes produced by living creatures, such as bacteria and other kacozymes, whose province appears to be to break up organic matter into its simpler elements. These bacteria or kacozymes are most active agents in the work; and if your disinfectant is to be of any use it must destroy the life of these creatures, and of the perverted protoplasm in which their germs or eggs may continue to preserve their vitality.

THE EGGS OF BACTERIA.

Here is the great difficulty of correct disinfection. You may destroy the bacteria, you may destroy the living creatures, but they are full of eggs, as a herring may be full of roe; they are so minute as to be out of the field of vision; and if you leave these germs untouched you only postpone to a future day the mischief which is now so manifest. For, unlike the roe of the herring, they may retain their vitality in a dormant state for long periods of time. Indeed it has, and does daily happen that the very measures you are taking for the destruction of bacterial life are at the same time preserving their ova from destruction, and wrapping them up in material which prevents their decay, so that in due course the disease breaks out again as soon as your disinfecting agent is itself changed and conditions arise by means of which the vitality of the ova is preserved, and they pass from a dormant to an active stage, and new forcing beds are provided for your preserved germs. This is one of the problems we have to solve, and it is a difficult nut to crack. For I have seen such ova covered by carbolic acid which has arrested further change, and when the carbolic acid was peeled off, the preserved ova threw off their dormant nature and set to work again in the production of a new outbreak of disease.

NATURE OF THE INFECTIVE GERMS.

Let me show you your difficulties in a simple case of small-pox. First, there is your case in its feverish stage. It has been produced always by a germ, derived, at least in historic times, from some previous one. . . .

The germs or living protoplasm in which this power to infect resides are excessively minute. I am accustomed