

the probability of communicating it even at a second or third remove from the source is great. Fortunately, the evidence we have goes to show that smallpox germs are not effective through very great stretches of air. Leroy, bacteriologist to the State of Tennessee, says that "at a distance of 100 yards little or no danger may be apprehended." Sunlight and fresh air are rapidly fatal to the gerin. It is therefore difficult to estimate to what extent it may be effectively dust borne, but we must remember that it multiplies in the eruption and is found in the excretions and secretions of the body. The *opportunities* for its spread in dust must be very great.

Whilst then it cannot be held that police and sanitary measures will avail to control the spread of smallpox, it is well to call attention once more to the fact that isolation and limitation of the number of cases so far as possible, are useful not only as such, but as tending to restrain the severity of the type, in any spread the disease may make. It has been demonstrated experimentally that different forms of pathogenic organisms diminish rapidly in virulence—even to loss of pathogenicity—when cultivated from generation to generation outside of the animal body. It has also been proven that virulence may be gradually restored and increased in intensity by subsequent passage of the same organisms through the animal body. These facts have been established of various "pathogens," notably of the streptococcus pyogenes. Observations upon many epidemics of infectious diseases confirm these laboratory results. The returns of the smallpox epidemic amongst our own people already quoted above, show that the degree of mortality which has characterized the outbreak till the present time is sure to increase unless adequate measures of prevention be undertaken and carried out.*

Leaving the questions of police and sanitary measures in controlling smallpox, in the employment of which, at any rate, all are agreed, let us turn to that of protective vaccination. Here, strange to say, we do not find the same unanimity of opinion, even though the evidence as to good results attained be equally or more conclusive. It may seem unnecessary that we should define protective vaccination as *successful* inoculation with the virus of cowpox. Experience has shown, however, that in the attempt to discredit this method of protection it has been not uncommon to classify those upon whom vaccination has been *attempted*, as *vaccinated*, whether the result has been successful or not. This is specially true of revaccinations, and in this connexion it is well to note that when protection seems urgently called for, failure of successful inoculation at the first

* Smallpox epidemics increase in severity in cold climates, decrease in warm.