one pear tree to another by introducing a little of the exudation from a diseased part, and in the same way could be communicated to the apple and quince. How the disease under ordinary circumstances is communicated was, however, for a time a matter for doubt. The yellow disease of hyacinths has been proven recently to be similarly due to microphytes.

In 1884 experiments were carried on at the New York Agricultural Experimental Station, with a view to determining further the facts regarding this disease. In an orchard free from the blight 120 inoculations were made by removing a small amount of the sticky exudation from a freshly blighted pear branch and inserting it in the tissue to be infected by using the point of a pin in 17 cases: but in the remainder the inoculations were from an infusion made with slices from a diseased branch, a drop of it being placed in the pin puncture. These inoculations were made in the afternoon, and when convenient on a damp day. The source of the infection was from *pear*, *apple* and *quince* trees. The average period of incubation from time of inoculation until some external indication showed that the disease had taken hold of healthy tissue was about a week, and it was soon found that the location of the inoculation was a matter of importance. Although it took hold on thrifty parts yet in order to get best results it was found necessary to use green or immature parts which were still elongating. Thus in shoots of this year's growth, but which had reached their growth at the point chosen, the infection would succeed only after a long period, but in yet older wood it invariably failed.

In tender, elongating shoots, the arrest of growth at the point of inoculation often tends to a curvature, owing to an extension of the opposite tissues. In the case of leaves its failure to infect is directly traceable to the age of the leaf, and as they have been known to appear green for two or three weeks after the death of the branch, they are proven in every way fairly suited to the growth of bacteria. Similarly fruit about two-thirds grown takes the infection with astonishing virulence, while inoculations in fruit of full size take it but slowly. Another element affecting its virulence is the succulency of the fruit. Thus a Bartlett pear inoculated on July 24, and examined on July 30, showed a wholly unexpected form of malady. A circular spot three-fourths of an inch across had taken on the brown color of rotting fruit. At the centre of this spot, and immediately surrounding the wound made by the inoculation, the tissues had sunken somewhat, while from the slightly enlarged wound there flowed an abundant yellowish pus that ran down the surface of the pear and dropped on the ground. It was an ulcer of quite as sickening appearance as if on animal flesh. Upon opening the pears three days afterwards, having in the meantime been kept under a bell-jar, their interiors were found almost wholly diseased and brown. The disease was found capable of attacking the June-berry and Crataegus, with tolerably successful results. In peach trees it did not produce the blight, but led to a genuine gummosis. The variability in the time taken to pass through incubation and become outwardly visible was evidently due to a number of influences. The most obvious were the maturity and succulency of the tissues. The influence of the vigor of the tree, aside from the succulency of the part inoculated, the lateness of the season, the weather, and particularly the temperature and moisture of the air, all combined to vary the progress of the disease. The outward progress was always commensurate with the progress within.

Regarding the microphytic nature of the disease, the experiment was readily made by taking a thin slice of diseased pear wood, at an active stage of the disease, and placing it in a drop of water. A white cloud will be seen to emanate from it and spread through the water. At 400 diameters bacteria are seen in inconceivable numbers. They have been found to be a constant accompaniment of the disease. They vary in size, being smaller than *bacterium termo*; neither can the latter be substituted for them, as inoculation with it invariably failed. With regard to the mode of propagation, Prof. Burrell failed to inoculate by bringing diseased branches into contact with healthy ones. Prof. Arthur found contact by smearing with virus a very young shoot enough to produce the disease. It was done by keeping the cut end of the shoot in water.

On the whole, evidence as to methods of ordinary infection is deficient. Arthur suggests that, as bacteria escape from the tissues in the slimy drops that ooze out, especially in damp weather, they are washed off and freed from viscid part by rain, and on becoming dry are taken up by winds. Being now suspended in air, a damp day, dewy night, or light