

For many years Toumey's contention that a slime fungus, to which he gave the name *Dendrophagus globosus*, was the causal agency of root-knot was fully accepted by the majority of plant pathologists, with the exception of those of Europe, who still held that the condition was due to conditions of a non-parasitic origin. In 1906, however, on the publication of Dr. Erwin F. Smith's preliminary investigations, root-knot was shown to be of bacterial origin, and the organism that had for two decades been generally assumed to be the cause was relegated to a position of harmless insignificance. Since 1906 the further work of Dr. Smith and his associates has apparently put beyond all doubt that root-knot is a true bacterial disease, and the name *Bacterium tumefaciens* has been given to the causative organism.

GENERAL APPEARANCE.

The condition known as root-knot is characterized by the production of convoluted swellings of various sizes on the roots of many plants. On apple-trees the galls occur most frequently at the junction of a graft, and they are especially common on root-grafted nursery stock. The swellings vary in size from an inch or so in diameter to as large as a man's closed fist. At times the bark covering the gall is quite smooth, but generally the exterior is roughened and knobby. Two types of galls, soft and hard, appear to be formed. The soft type is generally quite white, and may after a certain length of time rot away; but, so far as my experience goes, it often appears to develop into the hard type of gall.

Until quite recently it was argued by nurserymen that these galls, irrespective of their size, represented when developed on apple-roots normal callus development, intensified at times perhaps by careless grafting exposing a certain amount of cut tissue, and that this callusing-over formed the knot. This view is no longer held by the majority of nurserymen, but it is a contention that even yet lingers amongst certain of our most practical members of the nursery trade. So far as apple-trees are concerned, the effect of root-knot is an extremely disputed point, many considering it to be perfectly harmless, while others are equally emphatic with regard to its dangerous nature.

DISTRIBUTION.

Root-knot has been recorded on nearly all our species of economic fruit-trees, and appears to be especially prevalent on peaches and apples. It is now considered to be virtually world-