In this condition they pass through the winter, and it is not until the following spring that the sexes are developed. Some of the scales will then be noticed to increase in size, and these are the females. Under the smaller scales the transformations of the males take place, and they are remarkably different from those of the females, for in this sex there is what is not found in any other member of this order, a complete metamorphosis. These males remain under the scales (their outer skins) from which they detach themselves, until they evolve as perfect insects. After the insects have paired, the body of the female dries up, the whole substance apparently being consumed by the enormous number of eggs she lays. Many of these insects are exceedingly injurious to vegetation, and are difficult to combat. We have several species in Canada, but there is little positive knowledge concerning them. It is a very curious thing how they migrate from one tree to another. They will appear suddenly on trees which have been without them for years. This year, and from the amount of downy material in which it envelops its eggs, a very conspicuous species has appeared for the first time on a Virginian creeper near my house. There were, perhaps, a dozen females this year, and on examining the young shoots a few days ago, I found them well stocked with the half-grown scales. This species seems to answer the description of one Harris mentions on page 256, a thorough investigation of which he was prevented from carrying out by its premature destruction by fire, together with the grape-vine upon which it was feeding.

The *Aspidiotus conchiformis*, oyster-shell bark louse, attacks many different trees, but chiefly the apple. It has also been found on the currant, plum, pear, cherry, and apricot. Fig. 91 represents a twig of an apple tree covered with these scales. This is becoming a very injurious pest in Ontario, and unluckily gardeners seem to have got an idea that nothing can be done to stop its ravages, so let it take its chance. I have been frequently told that it was useless to apply the soap wash, on account of the insect being protected by a scale. This of course is not the case. If a strong mixture of whale-oil soap, with tobacco in it, is syringed on the trees four times through the month of June, it can be kept well in hand, because then the young larvæ are unprotected by a scale.

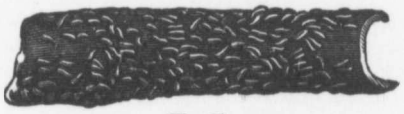

Fig. 91.

Although the greater number of the Coccidæ are so injurious, yet there are some among them which produce commodities of very great commercial value. It is from the female scales of *C. lacca*, a species of this family which attacks *Ficus indica*, that the Indian product lac is obtained. This substance has many uses in the economic arts; it is the chief ingredient in sealing wax and several varnishes, and is also the basis of French polish. In India it is mixed with sand to form grindstones; dissolved in water and mixed with ivory black it makes a good ink. It is also from this insect that the colouring matter called lac-lake is prepared, which has been used as a substitute for cochineal. The East India Company are said to have saved in a few months $70,000 in the purchase of scarlet cloth dyed with a mixture of this colour and cochineal conjointly, and this without any inferiority in the colour obtained. These scales are known as stick-lac when they are unseparated from the twigs upon which they formed; seed-lac when removed and pounded, and a part of their colouring matter extracted in water; lump-lac when melted down into cakes; and shellac when strained and allowed to harden in thin laminæ or flakes. But the most valuable of these insects is, perhaps, the Cochineal (*C. cacti*), which attacks a kind of indigenous cactus (Opuntia cochinillifera) found in Mexico where it is called nopal, and which is cultivated in plantations called nopalleiros, for the express purpose of feeding these insects. It is one of the most remunerative industries of the country. It has been calculated that 70,000 dried insects are required to make a pound of cochineal. In 1866 England imported 32,757cwt., valued at £594,818, and exported 21,238cwt., the annual consumption being about 12,000cwt. The price in 1870 was about 3*s.* a pound. In 1871 the imports into the United States were 1,849,842lb, valued at $1,184,255. Many attempts have been made to introduce this insect into other countries. The East India Company even offered a reward of £6,000 to anyone who would introduce it into India. It was introduced into the Canary Islands about 1830,