

Secondly, one meets in the cool store with a class of disease known as "sting." This term appears to cover a number of different conditions. Strictly speaking, it bears reference only to such injury as succeeds the punctures of insects. Popularly, however, sting is seen to be some form of rot or decay. Blue mould (*Penicillium*), bitter-rot (*Glomerella*), or botrytis (a fungus that in the field may set up rot in the eye of the apple) may be the cause of the rot, but the real cause of sting is due primarily to some form of mechanical injury to the skin. In this case the fungi do not spread in the store like black-spot, for the skin must be injured before they can set up infection. This, then, is another trouble that is instituted in the apple prior to its arrival at the store.

Thirdly, we may take another type of disease—scald. This disease is very striking in its appearance. It may appear as small up to very large dark sunken patches in the surface of the apple. The fruit may be almost covered with the disease, only a small portion at the stalk and eye ends remaining undamaged. The disease does not spread through the fruit like a fungus, nor does it spread from one fruit to another. It is not caused by a fungus but by vapours. Certain American investigations have shown that these vapours, known as esters, are given off by the apple, and that if they accumulate in sufficient quantities they are liable to produce the effect known as scald. This type of disease is due more to storage conditions than any we have yet considered. It is worse among apples packed in barrels. Satisfactory ventilation will disperse the vapours and prevent injury. The investigators, however, suggested another remedy, that of wrapping the fruit in oiled paper. This method has been tried out with success by the Biology and Horticulture branches of the Department of Agriculture.

The fourth type of disease consists in those whose cause is still unknown. This brings me to a special form of injury to which I have given some attention.

FLESH-COLLAPSE DISEASE.

Recently cabled reports have appeared in our local papers referring to shipments of Tasmanian and Australian apples which have opened up in England in bad condition. The important feature of the trouble as reported was that while the outside of the fruit showed no sign of injury the inside was browned. Other reports have stated that "brown-heart" is very prevalent in the shipments.

I believe that these troubles will be found to be identical with an important disease affecting cool-stored apples in New Zealand. In the first place this local disease may be clearly distinguished from scald and all other surface injuries by the fact that the skin remains undamaged until the last stage of the disease. This, in fact, is one of its characteristic features. Beneath the skin it may appear in various degrees of severity. It may occur merely as a narrow band of pinkish-brown soft flesh running parallel with the skin. The brownish condition, however, may involve a much larger portion of the flesh; in fact, the whole of the interior may be thus damaged, while the skin shows little or no signs of injury. Microscopic examination of the flesh shows that the cells are collapsed. We in New Zealand have therefore come to know the disease as "flesh-collapse." Affected apples when squeezed in the hand are not firm, but abnormally