have the tree cut down and replaced with a younger one. It requires considerable hard and tedious work to gouge out decayed areas and fill the resulting cavity with asphalt or cement. These operations are, therefore, expensive and one can readily spend one hundred dollars or more on a single tree. There might be no objection to this cost if one could be absolutely certain that the tree would thereby be restored to permanent health and vigor. Unfortunately, however, no matter how conscientiously the work may have been done, one cannot always be certain of the results until some years have passed. It is not always possible to be absolutely sure that all traces of infection has been removed from areas difficult to reach, particularly since there is seldom a definite line of demarcation between sound and diseased wood. Small cavities in healthy trees can be treated and filled with a certainty of success, but it is in the cases of large complex cavities, particularly those in the upper part of the trunk involving split and decayed crotches, that we can not be certain of securing a permanent water-tight job.

It is not the intention of the writer to discourage the reader and give him the impression that all tree repairing is useless. That is not the case. Many trees with extensive repairs have undoubtedly benefited by the treatment they have received and their life has certainly been prolonged. What it is desired to emphasize is the fact that we cannot always be certain that cld trees requiring extensive and complex cavity repairs will be permanently restored to vigor and health when the work is completed and the owner should, therefore, understand that he is taking more or less of a chance before he spends a large sum of money.

## Structure of a Tree.

To avoid making serious mistakes in repair work, it is necessary to have some general knowledge of a tree structure and the manner of growth. Upon looking at the cross-section of a tree trunk as the oak for instance, we may be able to distinguish four concentric circles. The dark centre area is the heart-wood with the lighter coloured sap-wood lying immediately outside it. Between the sapwood and the darker outer circle of bark lies a very thin and less well defined cambium layer. This thin layer is inconspicuous and can best be observed in a freshly cut cross-section made in the spring or early summer. Those of us who have made basswood or willow whistles in our childhood days, will recognize this cambium as that most slippery layer which made it possible to separate the bark from the twig. This is the most important part of the tree. When it dies the tree dies. It alone has the power to produce new wood and bark. During the growing season this tissue is constantly forming new wood next the



Few readers of the Canadian Forestry Magazine who have not lived in certain sections of the prairie west can realize the seriousness of the soil-drift menace. Expert opinion is more and more accepting the conclusion that the most natural and most effective remedy can come only through the extensive planting of thick belts of trees to break the power of prairie winds. Our photographs show the plague of soil drift in action. Enormous damage has been wrought and each year witnesses no diminution of the evil.



sapwood and new bark under the old bark. Thus each year a more or less distinct ring of wood and bark is added to the tree. These layers of wood are the annual rings we see upon looking at the cross-section of a log or stump or branch. They are layed out throughout the whole length of the tree from the end of the tiniest roots to the tips of the smallest twigs. The cambium, it will therefore be seen, is the most active part of the tree and the remaining parts of the trunk or boughs may, in a sense, be considered dead. The chief function of the heart wood is to support the tree and give it rigidity. The sapwood also assists to support the tree but it also has the important function of conducting the raw mineral food dissolved in water up from the roots to the leaves. As the tree increases in diameter the sapwood nearest the centre gradually develops into the less active heartwood.

The outer bark of the tree merely acts as a protection to the cambium layer and wood within.

It will now be understood why it is

possible to remove the centre or heartwood of a tree without causing serious injury except to destroy its rigidity. Old trees are frequently seen growing in which the centre of the trunk has largely decayed away, leaving little more than a shell. When new wood is formed at about the same rate the decay takes place, the condition may last for years. Sooner or later, however, the trunk becomes so seriously weakened that the first heavy wind twists it off.

## Cause of Decay.

Decayed wood is the result of the growth of parasitic fungi. Discolored wood, hollow wood, jelly-like or leathery masses, toadstools or shelf-like projections frequently found attached to trees are an indication of the presence of such fungi. These fungi are plants of a very low order that send their mass of microscopic thread-like growths throughout the wood and feed on the contents of the wood cells or the wood itself. The part of the wood material that is left is discolored, fragile and broken. It is what is known as punky or rotten wood.