



FIG. 2218.

FIG. 2219.

FIG. 2220.

FIG. 2221.

FIG. 2218. — The healing of a torn wound, also cut too long.

FIG. 2219. — A well-healed wound, the result of a properly made cut.

FIG. 2220. — Result of leaving a stub.

FIG. 2221. — Result of removing scars from grafted limb before the cut has been entirely healed over.

a tree, or a large-sized branch or root be cut through, it would show the bark, the light colored sap-wood and the darker central portion, or heart wood. Just between the bark and the sap-wood, if we could see it, is a layer of very delicate tissue known as the cambium.

**CAMBium.** The cambium is the only tissue that retains the power of active growth. It can best be seen by removing the bark on some actively growing tree, and so sensitive is it that exposure to air will kill it in a few minutes. It appears as a soft slimy or doughy substance that can be scraped off with the thumb-nail. The cambium is a very delicate substance, easily affected by frost or wet, and may be easily crushed or torn. It is the giving away of the cambium that causes the bark to strip off from the wood. During the growing season, the cambium gives rise to a layer of wood on the inside and a layer of bark on the outside, and a thick layer of cambium is left between the new wood and bark to carry on the growth of the tree next year.

**THE BARK.** In bark, nature has formed a perfect covering for the delicate cambium beneath. Being corky on its outer surface, the bark of a waterproof covering to keep

in the sap and at the same time exclude external moisture from decaying the cambium. Bark being somewhat soft and spongy in its construction, contains considerable air, which, acting as a non-conductor of heat, serves the purpose as a dead air space in a building, and keeps the cambium from being frozen or dried out. From this it appears how careful nature is of the delicate parts of the tree, and in all our operations of pruning we should exercise similar care. The orchard should always receive the best thought and practice of its owner, and should never be left to the tender mercies of the hired man or the itinerant pruner.

**THE WOOD.** The light-colored portion of the stem is the sap-wood. It is through this that the sap containing its dissolved mineral elements, finds its way to the leaves. In the leaf the watery portion of the sap is evaporated, and the remainder, under the action of light, is combined with the carbon-dioxide of the air, and returns downward through the cambium to be used up in growth. The darker portion of the stem is the heart-wood, which is dead tissue, whose only use is to give support to the tree.

**THE ROOT.** The root presents the same appearance when cut across as the stem,