

Firs and Their Relatives.

Two other trees are closely related to the firs. These are the larch (*Larix Americana*), called also tamarack, and the Arbor Vitæ (*Thuja occidentalis*). The larch is one of the stately trees, grows to nearly a hundred feet in height, and the trunk carries few limbs. The fruit is a cone, but the tree differs from most of the cone-bearers, in shedding its leaves in the fall. The wood is very strong and is used for timber where strength is essential, but it is somewhat difficult to work.

The Arbor Vitæ is a rather small tree and carries branches to its very base. Its fruit consists of small, open cones that stand on the upper side of the limb. The leaves are set so close together as almost to overlap. The tree grows on rocky banks, and it grows somewhat farther south than the firs.

Firs range entirely across the continent. The spruces extend very far north, but they diminish in size towards their upper limit. Northern New England and Southern Canada may be considered the line of their centre. They also abound in certain sections of the Rocky Mountains. The fir balsam grows in special localities, but scattered over a considerable territory. It thrives best in narrow valleys between hills. The Arbor Vitæ is mainly confined to New England, but grows in patches along the entire southern border of the fir belt. The larch is essentially a New England tree, where it grows in scattered swamps. "Tamarack swamps" are also found in some other sections of the country, notably in Michigan.

The larch is used almost entirely for the tall poles used to carry telegraph and electric-light wires. While not the best timber for this use, yet, as it furnishes strong, stiff poles, with sufficient elasticity to withstand gusts of wind, the larch

is well suited to this work. Formerly there was considerable demand for larch timber for strong frames.

Hemlock probably finds the most general use as timber of any of the firs. The wood is too coarse for fine work, and, besides, it splinters readily, a fatal objection to its use for general purposes. Yet, sawed into square timber, it furnishes a large proportion of the frames for houses, while studding and joists are made about equally of hemlock and spruce. Rough fences are built of hemlock boards almost exclusively and many rather cheap buildings, such as ice-houses, are boarded with hemlock. The bark of the hemlock is rich in tannin, so the lumber is commonly cut in June, when the growth of the new wood (the *cam-bium layer*) causes the bark to peel easily. This goes to the tanner, the lumber to the sawmill.

Spruces are at present in great demand. The largest and best trees find their way to the lumber yard; these smaller and poorer go to the paper mill. Black spruce is mainly sawed into studding or sheathing which is to be covered. White spruce is used for floors, for sheathing and, to some extent, for timbers in places requiring considerable spring. The ceiling and floors of cotton mills and other manufactories erected upon the "slow burning" plan are generally of spruce timber.

The largest demand for spruce timber comes from the paper mills. Indeed, did not spruce grow very rapidly, this use would quickly exhaust the supply. Other woods have been used for this purpose, but, practically, spruce furnishes our paper. Any species can be employed, but the dark wood finds only a limited use, save when it can be completely bleached.

For use in paper, the wood is either ground, or its gummy matter