

Relic Of The Ice Age —

WEST VIRGINIA'S BALSAM FIR

RAY R. HICKS Jr. & KENNETH L. CARVELL

ALTHOUGH BALSAM FIR is known to most West Virginians only as a Christmas tree, shipped in from the northlands, isolated colonies of balsam do occur at the highest elevations along the main axis of the Appalachians in this state. Today, balsam fir persists in Blister Swamp, Pocahontas County; on Blister Run, Randolph County; along the headwaters of the Blackwater River in Canaan Valley; and at Stoney River Dam, Grant County. These isolated patches were probably more common prior to the heavy logging and fires in the spruce country at the turn of the century.

The term "blister" in the names of the run and swamp is derived from the old local name given to balsam, "blister pine." This name stems from the presence of resin pockets or "blisters" found in the rich brown bark of fir trees. In fact, the most frequently used common name for this species, "balsam," is derived from the liquid resin (Canada balsam) extracted from these pockets. This material was used for many years as a cement for lenses in optical equipment.

The oldest balsam fir trees in present-day stands probably date back to the early 1900s, the heyday of logging in West Virginia. Trees are straight, conspicuously rigid, single-stemmed, and range upward to 80 feet tall and 15 to 20 inches in diameter at breast height—these, however, are only a shadow of the patriarchs that existed in the primeval forest. In his work "Virginia Illustrated," David H. Strother wrote of his visit to the Canaan Valley area and said:

"The gloom of the forest around was intense; the fire blazed in the centre of a group of four lofty firs, whose straight and mast-like trunks were illuminated by its light for a hundred feet without interruption of a limb, and whose tops interlaced and formed a lofty and almost impervious covering."

An unusual aspect of virgin red spruce stands in our state, in contrast to those farther north, is that the primary companion species was eastern hemlock, not balsam fir. As recently as 1920, however, a few virgin stands of spruce and balsam fir could be found at higher elevations in this state. At one time red spruce (with hemlock or fir) domi-

nated approximately half a million acres in West Virginia. Although fir is not as valuable for lumber and pulp as spruce, it was cut especially for pulpwood at the same time due to its proximity and relative similarity to the more valuable species.

Forest industries sprang up overnight to utilize the valuable spruce resource. The then West Virginia Pulp and Paper Company (now Westvaco) operated both pulp and sawmills in West Virginia spruce country, along with several other notable forest industries, Meadow River Lumber Company, Mower Lumber Company, Babcock Lumber and Boom Company and Parsons Pulp and Paper Company.

Spruce stands were almost completely logged out by the late 1920s, and with them the fir. Many logged areas seeded-in to more aggressive hardwoods such as fire cherry, yellow-poplar, maples and aspen. Other areas, where logging debris was abundant, were ravaged by repeated wildfires, resulting in a reversion to heath-like meadows such as exist today in some areas of Canaan Valley and Dolly Sods.

Today our balsam fir is generally not managed for pulpwood or timber production, principally due to its scarcity but also because the wood properties of fir are less desirable than those of the companion species, red spruce. Conversely, spruce is managed by the U.S. Forest Service in some of the second-growth natural stands that have reseeded high elevation land, although these stands are seldom cut due to the high aesthetic value of these spire-like conifers on our ridgetops.

Fir has, however, achieved a great popularity among local Christmas tree growers, and some wild fir are cut annually at Christmas time. Fir has a beautiful narrow conical shape with needles blue-green above and silvery beneath. These are retained well after cutting, and perhaps best of all, fir needles give off the pleasant "piney" aroma which evokes that "feeling of Yuletide."

Balsam appears to grow best in poorly-drained or swampy areas and can form pure stands on these sites since most competing species cannot tolerate the exces-

sive moisture. Names like "Blister Swamp" testify to the ability of balsam to grow on wet soils. On drier sites, fir is occasionally found in mixture with red spruce, although in West Virginia such mixtures are predominantly spruce and hemlock.

Spruce-fir is a climax forest throughout much of Canada and in northern and high elevation zones of the United States, meaning that such forests, containing a mixture of younger and older trees, are capable of self perpetuation. The primary property of balsam that allows this tree to persist is its relative shade tolerance. Seedlings become established in the understory and persist with relatively little growth awaiting the death or removal of overstory trees. With increased light, fir seedlings shoot up rapidly and mature in 90 to 150 years, repeating the cycle.

Balsam is an abundant seed producer with good seed crops every 2 to 4 years. The winged seeds are released, when the cones dry out, from the unusual upright, dark-purple cones, (those of most conifers hang down). Unlike other evergreens, fir cones completely disintegrate leaving only a central stalk. Seeds fall in late summer and remain on the forest floor over winter. A moist seedbed such as decaying needle litter or rotten wood is best for germination, another adaptation that allows this species to perpetuate itself, since these seedbeds occur under existing fir and spruce-fir stands.

Balsam fir has two botanical varieties. The typical form is distributed from Labrador to Alberta and into the northern United States. At the highest elevations in the southern Appalachians, in western Virginia, Tennessee and North Carolina, a different species of fir occurs, Frazer fir, which is characterized by the presence of long bracts extending from between the cone scales. The balsam firs of West Virginia represent an intermediate form with less prominent bracts than Frazer fir.

The presence of isolated populations of fir along the highest elevations of the Appalachians suggests that firs once existed over a broader area. It seems likely that during the Ice Age when the climate in the southeastern United States resembled that of Canada today, balsam fir may have had a large continuous range in that area. Studies of fossil pollen extracted from acidic swamps of the South have identified pollen of many Canadian species, including firs, that existed there during the Ice Age. The recession of the glaciers was accompanied by a northward migration of cool climate species such as balsam. However, in areas of higher elevation (4,000-5,000 feet) in the southern Appalachians, a climate sufficiently cool to sustain isolated pockets of fir persisted. Perhaps a single species existed with a continuum of bract length from north to south. With the interruption of that continuum, the southernmost populations look distinctly different enough for botanists to consider them separate species and varieties. Although the full story may never be known, it seems likely that our Canadian visitor, balsam fir, is truly a "relic of the Ice Age."

A lonely balsam reflects on the water.

Arnout Hyde Jr.

