The Young Naturalist

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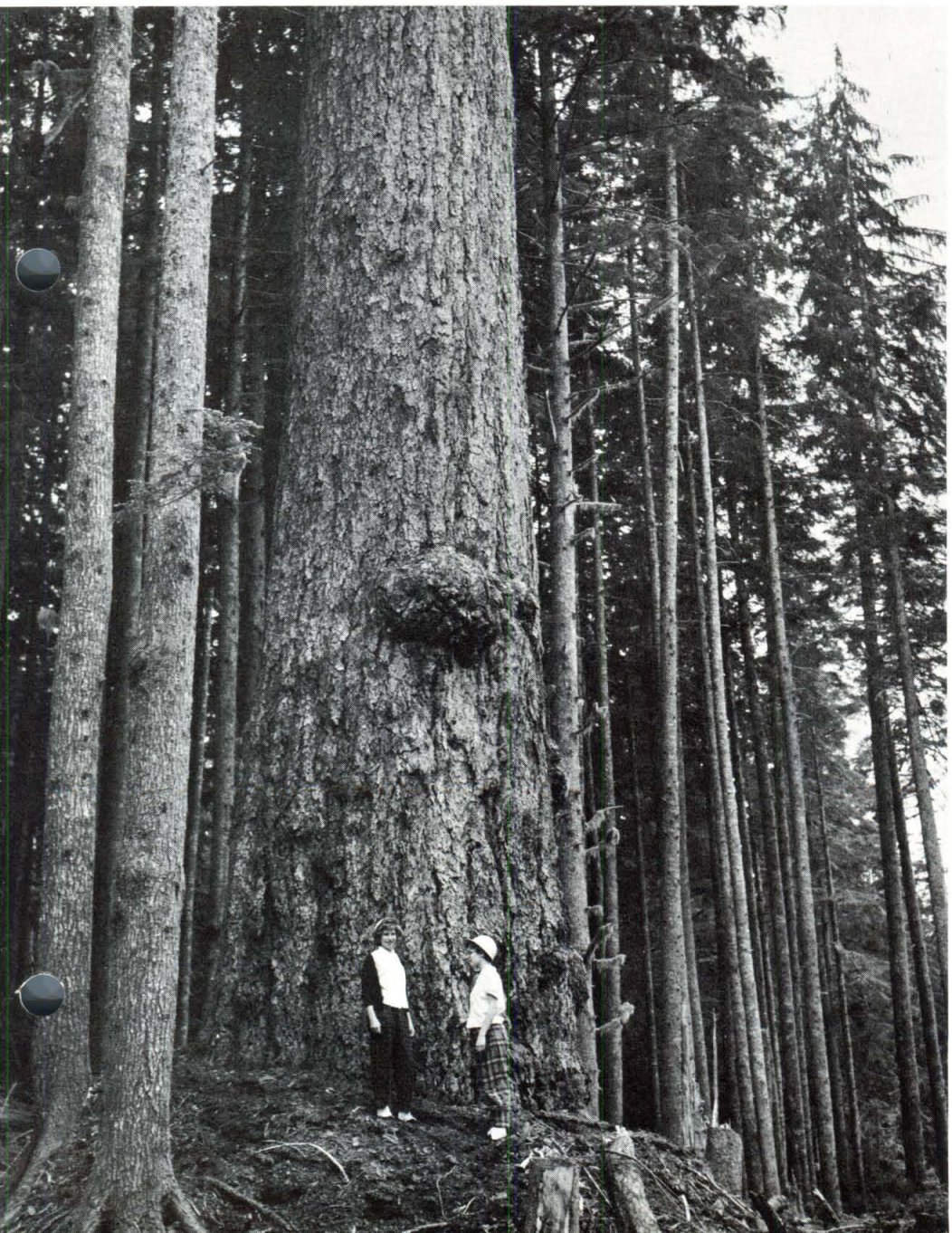
Timber Giants of the West

Part I — The Douglas Fir



The big trees of British Columbia grow in the Coast Forest Zone where the rainfall may be over 100 inches per year. The largest of these timber giants is the Douglas Fir, the subject of this article. Some other species will be discussed in future issues of *The Young Naturalist*.

Range

Over most of southern British Columbia, growing to its greatest height on the coast, where its range is up to 2,800 feet, in the southern interior to 3,500 feet, and in the Rockies to 6,000 feet.

Form

Very large tree, with dark-brown fissured (cracked) bark.

Leaves

Flat, specially arranged around the stem, about 1 inch long, not prickly like spruce.

Fruit

Cones ripen in one season, hang down, 2-3 inches long. Pick up a cone and notice the three-pronged bracts protruding between the scales.

The Douglas Fir is the top commercial tree of British Columbia. It was discovered in 1791 by the Scottish naturalist-surgeon, Dr. Archibald Menzies, at Nootka Sound, Vancouver Island. It is the largest tree not only of British Columbia but in the whole of Canada.

The oldest Douglas Fir ever felled stood on Vancouver Island. This tree was 1,266 years old in 1959, and meas-

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The large Douglas Fir shown here is ten feet in diameter.

British Columbia Forest Service Photograph

The Goldenrod Ball Gall

One of the most interesting items to look for on an outdoor field trip at this time of the year is the round ball growth on the goldenrod. It may easily be identified by its form, ball-like in shape, and by the plant upon which it is growing, the goldenrod. What makes this growth possible?

The goldenrod ball is a *gall,* caused by a fly. The round swellings are mature galls stimulated by the laying of the gall fly's eggs in the stem of the plant. The egg hatches and the larva is surrounded by a spongy tissue, which in turn is covered by a hard smooth surface. To see the larva or "grub", all one has to do is to take a knife and cut a gall in half length-wise to the stem of the plant. The larva will be seen feeding on the spongy interior. When the larva is ready to leave its home, it tunnels to the hard outside covering of the gall. Here it changes to a pupa and eventually develops into an adult fly. To work its way to freedom, the adult fly produces a small sac on the top of its head into which it pumps air in and out like a bellows. This is strong enough to crack the gall's tough outer shell and allow the gall fly to escape.

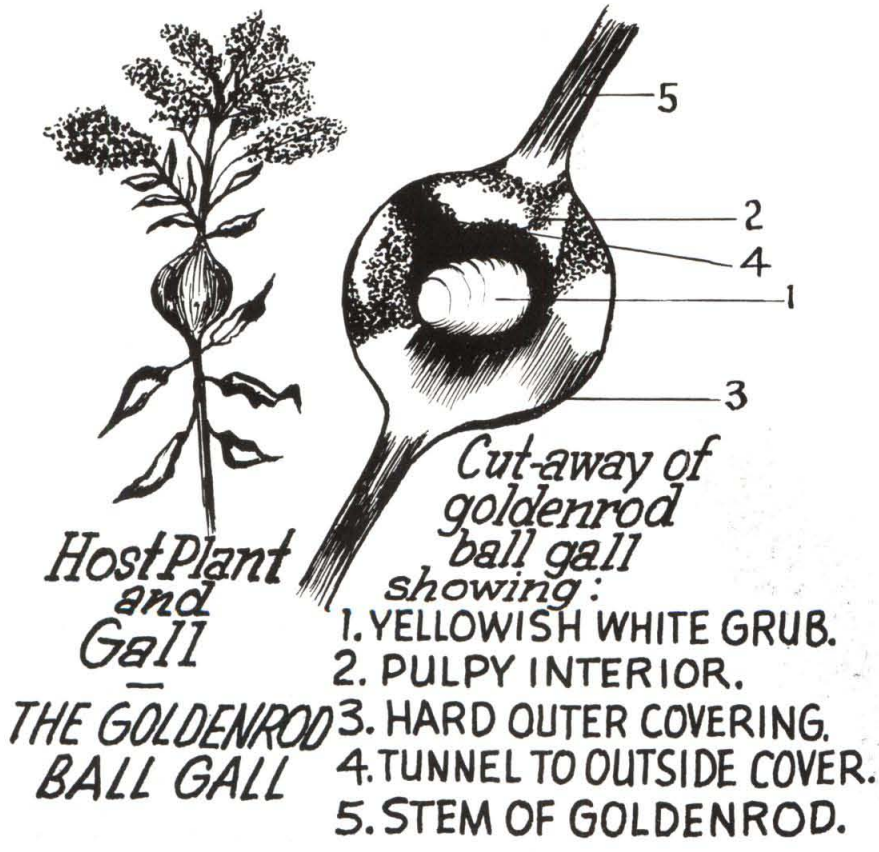
Galls can be caused by insects, viruses, fungi, or bacteria. The most elaborate kinds are caused by insects. Their shapes vary a great deal. However, in spite of their variety, gall insects are very specific in selecting host plants. About twelve families of plants are involved in three-quarters of the two thousand known galls in North America.

You may find goldenrod ball galls with small holes where the fly has escaped, or you may find a much larger, rougher hole that looks as if an animal has been drilling. If you see a small black and white woodpecker working in a field of goldenrod, you may be almost sure that it is a downy woodpecker, for this bird likes the "grub" of the goldenrod ball gall as part of its diet.

Galls may be hatched indoors. Collect them with enough of the host plant to allow for identification. Place them in a glass or plastic container with some damp soil. The top should be covered with cheesecloth and water added as needed to keep the soil moist. Right now I have some goldenrod ball galls in a glass container covered with a fine wire mesh reposing on a windowsill, awaiting the emergence of a gall fly! One could experiment with many ways of keeping the galls by varying temperatures, lighting conditions or moisture content.

Next time you are afield collect some goldenrod ball galls for study purposes. Also keep your eyes open for other kinds of galls; you will find them all interesting.

W. G. Girling



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ured 12 feet in diameter at the stump. Just imagine: when Christopher Columbus discovered America in 1492, this tree was already 799 years old.

The record for the greatest height also comes from Vancouver Island. A specimen was 80-90 inches in diameter, 305 feet tall and 385 years old.

We must go to Vancouver, on the mainland, to find the record for the greatest in diameter. In 1886 a giant Douglas Fir was felled at the corner of Granville Street and Georgia Street, now in the heart of the city, measuring 14 feet 4 inches at the butt end of the first log.

You will notice that the records are all from the coastal area where rainfall and soil are the most suitable to grow the giants. Comparing growth in other areas of British Columbia, in the Cariboo a big Douglas Fir would be only 30 inches in diameter at 300 years. Further north, at Stuart Lake, it would be 22 inches in diameter and 120 feet in height at 180 years of age.

There is a large export market for Douglas Fir as lumber. In addition, there is an extensive market for their use as Christmas trees. The latter come from the interior of the Province where, as I have pointed out, the trees are slow growers. In 1966, over 1½ million trees were exported to the United States.

We must not forget that the Douglas Fir has also provided some very tall flag poles. To mention a few, Kew Gardens, London, England, has a pole 225 feet high; Parliament Buildings, Victoria, 177 feet. In your own Province, look at the 185-foot pole which stands at the Canadian National Exhibition.

E. K. Lemon

Club News

Twenty-seven Young Naturalists in Miss Audrey Wilson's class at Burnham School in Cobourg, Ontario, wrote to "Club News" to describe their many activities this year. Brian Tomaso reports that in September they "went on an insect field trip and the class caught 12 butterflies, 4 grasshoppers, 9 crickets, 96 bees and wasps and 37 others. At the end of the day we tagged the butterflies". Jim Nairn adds that they found some Monarch caterpillars, kept them until they made their chrysalises and watched them turn into butterflies. The group has grown an amaryllis, made suet logs, and built bluebird boxes. A young Robin was a temporary guest in the Fall, and guppies, snails, goldfish and a catfish occupy an aquarium. Best of all, they have looked after a Saw-whet owl all winter. Rescued by some boys from a Great Horned Owl and brought in on October 13, the owl was christened "Wee Willy". It eats mice, House Sparrows and occasionally dog food with hair added, which, say Susan Gallagher, it does not like! Wee Willy had an injured wing, but is recovering.

The Chippawa Naturalists Club has published the first of its monthly bulletins, reporting on the proceedings of the February meeting and describing some of the club's projects. In addition to weekly outings in the Chippawa area, trips will be made occasionally to museums and sanctuaries, and guest speakers will be invited to meetings.

BARBARA WILKINS

Many boys and girls have organized a natural science club in their school or classroom. If you have such a club, you are invited to share your experiences with others by reporting your activities in this column. We would be pleased to have pictures of your outings and projects. Be sure to describe your activities fully, giving the names of the leaders and assistants. Write to Mrs. Barbara Wilkins, Editor of Club News, 213 Rosedale Heights Drive, Toronto 7, Ontario.

The Pleides star cluster. The irregular appearance of some of the bright stars is due to the presence of clouds of nearby gas and dust.

HOW OLD IS A STAR?

The photograph shows the stars that are members of the star cluster known as the *Pleiades,* a well-known group whose position in the sky was illustrated in the December, 1967 issue. There are about 250 stars in this cluster which is approximately 490 light years (= three thousand million million miles) distant.

From the photograph it is clear that there are both bright and faint stars in the cluster. If we had a colour photograph, we would see that the stars have colours ranging from red through yellow to blue. The colour of a star is an indicator of its temperature so that in the Pleiades we find both hot and cool stars.

In the study of star clusters astronomers frequently make a graph in which they plot the brightness (or magnitude) of a star against its colour or temperature. Here you see such a colour-magnitude diagram for the Pleiades. We see that most of the stars are rather faint and red while only a few are hot and blue. The important aspect of this graph is its shape. Notice that most of the points lie within a nearly straight, narrow band but, near the upper-left corner of the graph, the band of points bends toward the right. The point at which this bend (indicated by an arrow) occurs is very important because it tells us the "age" of the Pleiades.

From a graph similar to the one shown here astronomers have determined the age of the Pleiades to be 160 million years. Hence, around the time that the earliest dinosaurs appeared on the Earth the stars we now see in the Pleiades were formed and began to shine. The oldest stars we can observe have ages of about 10 billion years, the youngest several hundred thousand years. The age of our own star, the Sun, is found to be 4½ billion years.

DOUGLAS P. HUBE

The art of decoy carving goes back almost a thousand years. Examples at least that old were unearthed in 1924 from the floor of a cave in Nevada. These were made by Indians who had bound reeds together and then covered them with actual feathers.

WOODLORE
FOR THE NATURALIST

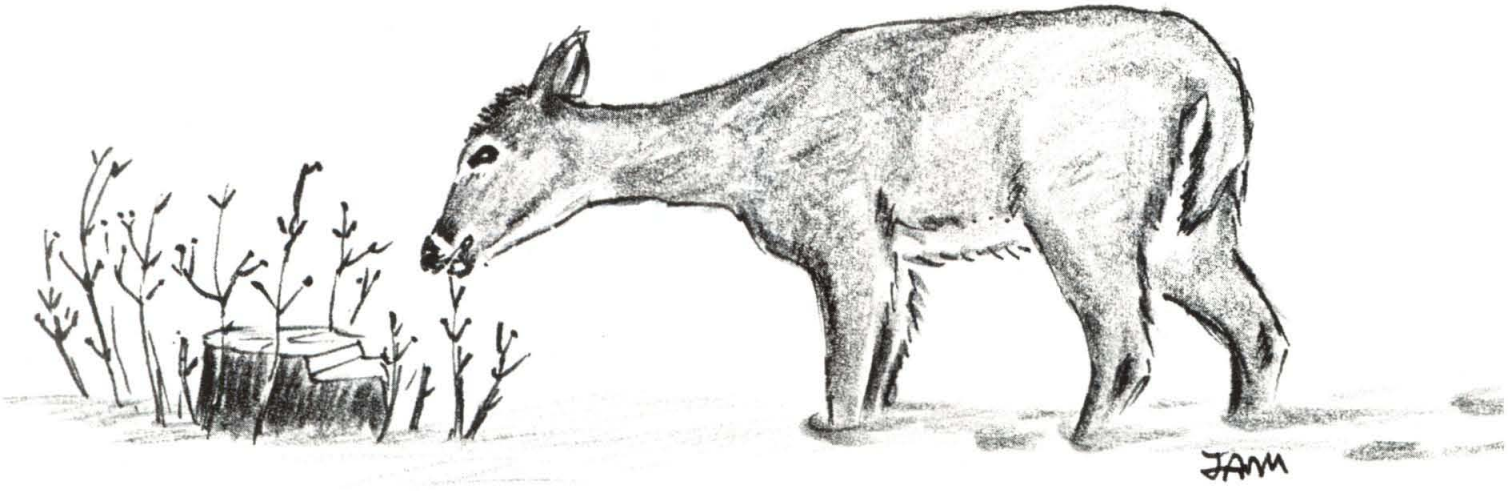
John Macfie

Growing Crops of Deer Food

Deer, which frequently go short of food in their crowded winter quarters can be helped by a feeding program. But direct feeding, by carrying hay or woody browse to the hungry animals is impracticable. Instead, wildlife managers treat the forest to stimulate natural growth of deer food.

Deer rely for winter food on the buds and shoots of shrubs and seedling trees. These grow in profusion where sunlight penetrates to the ground, but in an old forest, a dense canopy of leaves cuts off sunlight, and ground growth is sparse. Deer arriving in an overgrown wintering area find the cupboard more or less bare. If heavy snowfalls imprison them in their "yard", many may die of starvation before spring thaws release them.

To rejuvenate such a deer yard, wildlife managers make holes in the overstorey, to let in summer sunshine. They cut down trees in patches as large as a half-acre in size. These clearings are usually made in low-grade hardwood stands adjacent to evergreen groves. Thus the deer taking shelter under them will not have to wade far through deep snow to reach the food that grows there. Dense "sucker" growth rising from tree stumps will provide highly nourishing food the following winter. As seedlings fill in the spaces between felled trees, productivity of the patch will increase. Such deer "gardens" will benefit deer for ten winters or more before retreatment is necessary.



The sketch shows a deer browsing on sucker growth rising from the stump of a red maple felled in the previous winter.

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