nolic compounds was determined as salicylic acid (Rf-95) while the other phenolic compound has not yet been identified. Further information on this compound is given in Table 1. From these data, it is concluded that compound W is also a glycoside.

Glycoside W in 2% malt agar produced the lowest visible growth reduction at the dosage of 100 ppm and the LD_{50} was obtained at 3000 ppm. Similar results were obtained with glycoside R. In contrast, pyrocatechol gave a total inhibition at 640 ppm and salicylic acid at 552 ppm.

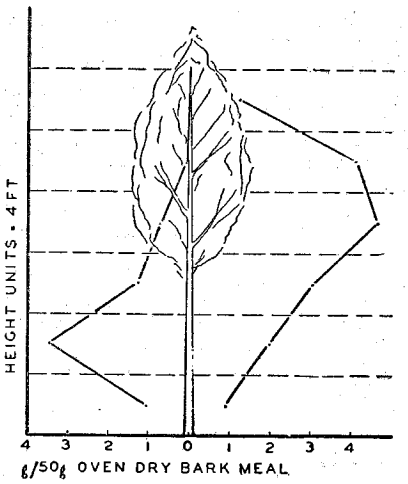

FIG. 3. Distribution of glycoside W (right) and glycoside R (left) in a 20-year-old tree from Chibougamau Provincial Park, Quebec.

Figure 3 shows the distribution of the two glycosides in the stem of a 20-year-old tree cut in July, 1961, in Chibougamau Provincial Park, Quebec. The highest concentration of glycoside W in the stem occurred between the base and the middle of the crown, while glycoside R was concentrated mainly at the middle of the branch-free portion of the stem. Further laboratory studies on this subject are in progress.—Martin Hubbes.

Severe Winter Browning of Red Spruce in Southeastern Quebec.—Early in June, 1962, a browning of needles of red spruce (*Picea rubens* Sarg.) was observed in the Appalachian Mountain Range in southeastern Quebec. A survey has shown that this condition was prevalent in the following counties: Missisquoi, Brome, Compton, Sherbrooke, Frontenac, Wolfe, Richmond, Arthabaska, Beauce, Mégantic, Lotbinière, Dorchester, Bellechasse, Montmagny, L'Islet, Kamouraska, and Témiscouata. A similar browning of red spruce foliage has been reported from the neighbouring states of Maine and New Hampshire (Northeastern Forest Disease Reporter No. 1, 1962).

Tall trees in close stands and in fields as well as small ones in open spaces were affected. Usually, the needles of the 1961 shoot were brown and had begun to fall in July. On less exposed branches, the needles frequently were partly brown or yellow but had not fallen. In many cases, shoots of less than 2 mm in diameter were killed outright and the new buds had not opened, while the larger twigs had produced new growth, although the 1961 needles were dead. On small open-grown trees, the buds on the larger leaders and shoots had frequently failed to open by June. In general, the browning of needles and killing of shoots were not observed on the 1960 and 1959 growth. It appeared that trees growing on southern and southwestern slopes were somewhat more affected than those on northern and eastern slopes, and this condition was more severe on trees at the edge of stands than inside the forest.

This injury was observed only on red spruce; white and black spruces and balsam fir did not exhibit the same symptoms even when their branches were close or intermingling with those of affected red spruces. Small open-grown white spruce and balsam fir trees were also unaffected, while young red spruce growing nearby exhibited browning and dead shoots although the needles on branches occurring within a foot or so of the ground remained green.

No known pathogens or insects were found associated with the needle and shoot dying, and the damage is attributed to adverse weather conditions because it occurred spontaneously over a large area, comprising at least 17 counties in Quebec and in adjacent areas in the United States. The affected needles and shoots had developed normally during the 1961 growing season as evidenced by microscopic examination of twigs, which did not reveal the existence of any injury that might have occurred before the end of the summer. This suggests that abnormal weather conditions from fall to early spring in southeastern Quebec may have been the cause of this foliage affection.

The winter weather in Quebec was normally cold and the snowfall abundant as usual, except in March which was exceptionally mild. This warm spell culminated on March 30 when temperature maxima reached 64 to 72°F. in the southeastern part of Quebec and the needle browning of red spruce may have been due to desiccation caused by this warm period. The fact that the foliage near the ground of trees growing in open fields was not affected, because it was still covered by snow at that time, supports this view. On the other hand, somewhat similar weather conditions prevailed during March in some other areas of the Province where severe needle browning of red spruce was not noticed except on the lower foliage above the snow line.

Although this needle browning was quite striking during May and June, it should not cause permanent and important damage to the trees because only the 1961 needles were affected and most of the buds opened normally.—René Pomerleau.

BRITISH COLUMBIA

A New Reforestation Problem Caused by a Weevil Steremnius carinatus Boh.—A weevil, *Steremnius carinatus*, has suddenly come into prominence as a potentially destructive insect pest of plantations in the coastal areas of British Columbia. Apparently the weevil is native to coastal forests and specimens have been received at the Victoria laboratory for a number of years.

Serious damage, however, was first reported in 1961 at Kennedy Lake, Vancouver Island, by foresters of MacMillan, Bloedel and Powell River Limited. This was in a newly established Douglas-fir plantation. Reports of weevil damage have since been received from industrial and government foresters from widely scattered points on the coast, including some natural spruce regeneration on the Queen Charlotte Islands. According to observations and reports received in 1962, in some plantations the weevils have killed or damaged over 40 per cent of Douglas-fir seedlings planted on recently logged and burned sites along the west coast of Vancouver Island.

Larvae of the weevil breed mostly in the stumps and roots of recently felled or killed trees, but it is the feeding of the resulting adults that causes the problem. The weevils damage and usually kill seedlings by chewing the bark from the stem at or near groundline. In the past the damage was often attributed to field mice. Other softwood species besides Douglas fir are attacked by the beetles, and they are also known to feed on other ground vegetation such as fireweed, salal, and blueberry.

The plantation problem seems to have been brought on by the rapid replanting of cut-over lands. Most reports of serious weevil damage have come from areas that have been logged, burned and planted within a two or three year period. This is a logical sequence of events for beating the brush to the site but unfortunately the newly emerged adult weevils and the freshly planted seedlings may arrive at the site at the same time. The reward for prompt planting may then be a seriously understocked stand. It would be a mistake, however, to consider that all naturally or artificially restocked lands will henceforth be in jeopardy from the weevil. On the contrary, probably relatively few situations will require remedial or preventive treatment, or modified planting schedules.

Nevertheless, it is clear from reports received that the problem demands further attention. On the basis of work done in other parts of North America and in Europe on similar species, and leads obtained from studies on Vancouver Island, there is hope that practical measures can be developed to minimize losses. One of the foremost problems is to identify high hazard situations. In this respect foresters can help by supplying information on damage to plantations under their care. As part of the effort to solve this problem, entomologists at the Victoria Laboratory are determining details of the life history of the insect, including breeding sites of the larvae, and longevity, migratory habits, and food preferences of the adults.

Beyond hazard identification several fruitful avenues of investigation are open that may provide practical solutions. Where compatible with fire prevention and brush control measures, indirect means such as delayed slash burning and planting may be a simple solution. More direct means may be the use of insecticides for preplanting dips, post-planting sprays, or poisoned baits. Still another approach is the use of nurse crops to divert the feeding beetles from the valuable planted seedlings, as preliminary observations have shown that the adults feed on a wide variety of plant materials.—R. R. Lejeune.