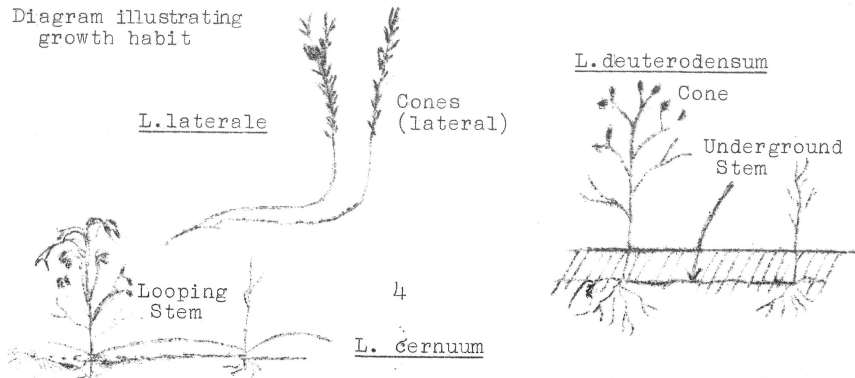


In previous numbers of the News Letter we have discussed mosses, ferns and the fern allies Tmesipteris and Psilotum. Now we will say a few words about that attractive group the Clubmosses, members of the genus Lycopodium L. First, are they really mosses? No they are not though Linnaeus, the father of modern Botany who named the genus on information then available believed that they were. Actually they are much more closely related to the ferns. Unlike the ferns however, they do not have their spore bearing parts grouped together so that they usually form differing types of sori. The sporangia of our New Zealand Lycopods as a rule form neat little cones or stobili as botanists call them. These little cones consist of closely packed leaves each one bearing a sproangium in its axil. Club mosses are not hard to recognise at any rate when fertile. New Zealand has eleven species of which six are to be found about Auckland. A very common one is the Lycopodium deuterodensum Herter - members may know this under its old name of L. densum Labill.. It is hard to visit any sizable piece of manuka scrub without coming across masses of this vigorous plant colonising considerable areas. It has branching rhizomes up to about ten feet long. Its erect branches are usually about twelve inches or more long though they may reach three feet. Each aerial branch looks like a miniature tree. Its leaves are not more than about 3 mm. long and are sharply pointed. They vary considerably, in one form being up to only 2½ mm. long, erect and closely overlapping. in the other the tips are incurved and the leaves less close together. There is a third leaf type midway between the two first. Each leaf type is almost invariably confined to one aerial branching system. The little cones grow singly terminating each branchlet and are erect and up to about 3 cm. long.

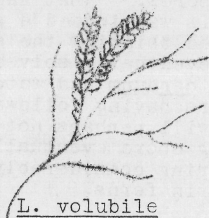
A similar but more beautiful local species is L. cernuum L. It has a more mossy look than deuterodensum, its leaves are characteristically 3 mm long, they are much brighter green and all of one kind. The cone though similarly placed is about half as long as that of deuterodensum.

Diagram illustrating growth habit

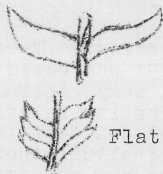


The spotting point? The long creeping leafy stem which loops along above ground between the erect branches. I have found it in places on roadside cuttings and in scrub on the Waitakeres, but it is also to be found in lowland and montane bogs and on moors. It has a special penchant for the heated soil of hot springs,

Probably the best known of our club mosses is the waeuae koukou (L. volubile Forst.f.). This species, common in scrubland and on forest margins is much in demand for decorative purposes. Its long wiry stems often over ten feet long and its dainty flattened leaves make it extremely useful where anything of a trailing nature is required. Its leaves are of two kinds - see diagram. The cones are from nearly an inch to approaching four inches in length and grow terminally on the brachlets.



L. volubile



Stem leaves

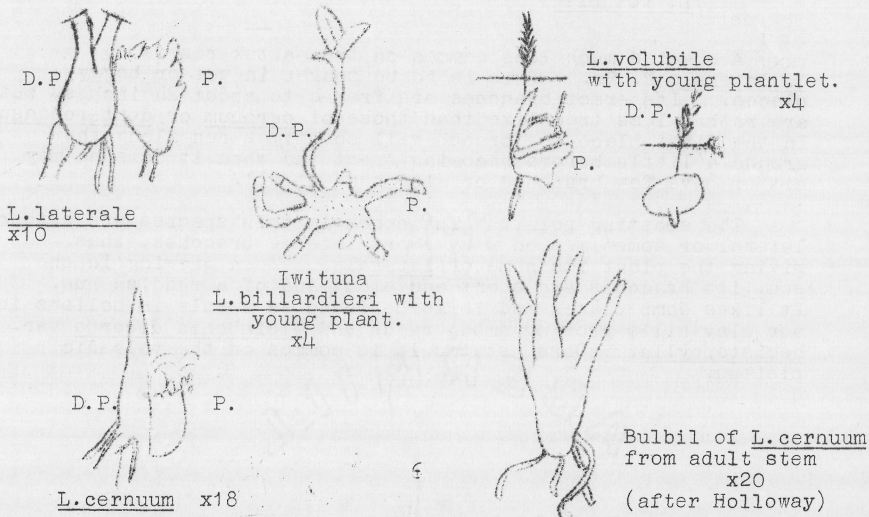
Flattened leaves.

A species much less common on the Waitakeres is L. laterale R. Br. This is to be sought in wet or boggy places. Its erect branches are from 4 to about 24 inches, but are rather less tree-like than those of cernuum or deuterodensum. In the first place the branch will sometimes run along the ground a little before becoming erect and when it does so may either have few branches or else none at all.

The spotting point? The cones in this species are either lateral or sometimes on very short lateral branches, thus giving the plant its name of laterale. When growing in the sun, its branches are short and stout and of a reddish hue. It likes damp places and is to be found as a rule in hollows in our clay hills growing among reeds and Gleichenia dicarpa var. heciistophylla. Carse states it is common on the volcanic plateau.

I must say our perching club moss Lycopodium billardieri Spring, is one of my favourites. It is quite common in the bush, and perching on trees will send down beautiful green tassels sometimes five feet long. The lower leaves are up to three quarters of an inch long, but as we travel down the stem, which branches copiously, they become shorter and closer together. The long slender branched four angled cones terminate the branches with the fertile leaves closely packed. On Rangitoto it grows on patches of humus among the scoria. In Southland and Stewart Island it frequents dry forest floor. L. varium R. Br. which has also been reported from the Auckland area is rather like L. billardieri. It was found on rocks.

It is hoped that these few notes should enable members to identify our local species of Clubmoss, but having identified them some will probably like to study them a little more closely. First consider the little cones. If you find a ripe one and examine it with your lens, you will see a yellow kidney-shaped rather flattened sporangium on the upper surface of the fertile leaf. If you get it when fully ripe you will notice that it splits longitudinally to release its spores. What happens to these spores when they germinate? This was indeed a puzzle to the early botanists, some of them indeed thinking the spores were pollen grains. The problem was eventually solved by Lindsay in 1792 who sowed spores of L. cernuum and watched what happened when they germinated. Members having followed the life history of its relative the fern will perhaps not be surprised to learn that the germinating spore eventually gives rise to a prothallus, though one differing considerably from the plate-like one more commonly found in ferns.



"The Lycopodium prothallus" says Holloway, "is a most variable one." Even the form characteristic of a particular species is by no means always the same. The prothalli may be above or below ground, green or not and long or short lived. "The prothalli of L. cernuum, L. ramulosum and L. laterale are delicate, minute, short lived...and surface growing." They mature in a single season. But the species electing dry places, L. volubile, fastigatum and scariosum need a long period of favourable conditions to produce young plants from spore. Holloway gives reasons for thinking that spores of L. fastigatum took fifteen years to germinate and produce mature prothalli. What about that hardy coloniser of dry places deuterodensum? In spite of indefatigable searching Holloway never unearthed a single prothallus, but once discovered a plantlet recently developed from one. From the evidence he concluded it to be "large firm and long lived and more or less completely buried." Prothalli of iwituna (billardieri) develop readily in the damp humus in which the plant grows and neither Holloway nor Edgerley had difficulty in finding them. The fungal habits of these prothalli are most interesting, those wishing to follow them must consult Holloway's accounts in the Transactions (1920).

In view of the hazards attendant upon sexual reproduction, it is not surprising that "the chief mode of propagation of the Lycopodiums is no doubt a vegetative one". Many species have long creeping stems, and these will die off behind branches and new plants will develop. But in addition to this, young plants may be produced vegetatively from stems or leaves. These plantlets are not often readily found or interpreted when they are. Holloway remarks "While searching for young plants of L. cernuum near Henderson, Auckland...I found on a damp mossy bank... plantlets...which had obviously been reproduced vegetatively..." He was unable to discover from what part of the plants growing above they had been produced. It is to be hoped that sharp-eyed members will keep alert for plantlets of Lycopodium spp. (Remember they must be sought in damp places.) It is always possible that someone will have the luck to discover something that will add to our understanding of these fascinating plants.

A genus closely allied to Lycopodium is Selaginella which includes more than 700 species as against the 150 odd found in Lycopodium. It produces spores of two kinds and differs in other important ways from its sister genus. There are no species native to New Zealand and it would not be mentioned here were it not for a very common naturalised weed which most gardeners know only too well. This is the charming little Selaginella kraussiana Braun., a delicate little bright green creeping plant which flourishes in damp places in the garden and is now found penetrating into the bush. It hails from South Africa.