

The Ferns of Southern Chile

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(Conclusion)

Even at the extreme south of Tierra del Fuego well-developed forests of Fagaceae, Magnoliaceae, etc., are not lacking and certainly do not suggest polar conditions. And at present considerable wheat is grown along the Straits of Magellan. Nor is the situation much improved by the term subantarctic. The best proof that the southern regions are not Antarctic is the long list of pteridophytes from the Straits—all the more that, as is well known, few groups of plants avoid really cold climates as do the ferns.

The forests of southern Chile consist of tall, thick-trunked trees of *Nothofagus Dombeyi* (Mirb.) Blume, *N. obliqua* (Mirb.) Blume, and *N. betuloides* (Mirb.) Blume (Fagaceae), *Laurelia sempervirens* (R. & P.) Tul. and *L. Philippiana* Loos. (*L. serrata* Phil. non Bert.) (Monimiaceae), abundant Myrtaceae, *Lomatia hirsuta* (Lam.) Diels [*L. obliqua* (R. & P.) R. Br.], *L. ferruginea* (Cav.) R. Br., and *Embothrium coccineum* Forst. (Proteaceae), *Crinodendron Hookerianum* Gay (Elaeocarpaceae), and the beautiful tree *Eucryphia cordifolia* Cav., which in its season is covered with thousands of white flowers. It belongs to the small family Eucryphiaceae, related to Rosaceae; there are species in Australia as well. Other forest trees are the conifers *Saxegothea conspicua* Lindl., *Fitzroya patagonica* Hook., and *Pilgerodendron uvifera* (Don) Florin. For the most part these are more scattered.

The forest is moist and most of its trees are evergreen. Vines are not lacking and at least one of them, *Hydrangea integerrima* (Hook. & Arn.) Engl. (*H. scandens* Poepp. ex DC.), might well be called a liana. Its trunk is often

as thick as a man's thigh. In all these characteristics these forests are very different from the usual types in temperate climates (which are deciduous or of evergreen conifers with needle-like leaves) and, of course with due allowances, recall tropical forests. To make this comparison more apt, epiphytes abound; the trunks and branches are covered, often to a great height, with a carpet of mosses, hepatics, and lichens. There are also phanerogamic epiphytes, such as *Mitraria coccinea* Cav. (Gesneriaceae), with thick orbicular leaves and red flowers, and the splendid bromeliad, *Fascicularia bicolor* (R. & P.) Mez. The latter grows astride the branches and often also on rocks. Its pale blue, crowded flowers are not very conspicuous, but by way of compensation the bases of the leaves which form the rosette are a brilliant scarlet-red, visible afar off. Another species of the same family is *Ochagavia Lindleyana* (Lem.) Mez. These bromeliads are found toward the north of the Valdivian forest; in all the south they are lacking.

The south of Chile, principally the provinces from Valdivia to the south of Aysén, has one of the notable fern-floras of the temperate zone. I believe that, in extra-tropical regions, New Zealand alone surpasses it, and that only because it possesses real tree-ferns, which southern Chile lacks, though *Lophosoria quadripinnata* often has fronds 6 or 7 meters long, borne on a short trunk. *Blechnum chilense* develops trunks 1 meter or a little more in height, and *B. magellanicum* often equals or even surpasses these dimensions and in general aspect and in its lustrous fronds greatly resembles cultivated cycads. These three species are very common and often cover clearings in the forest.

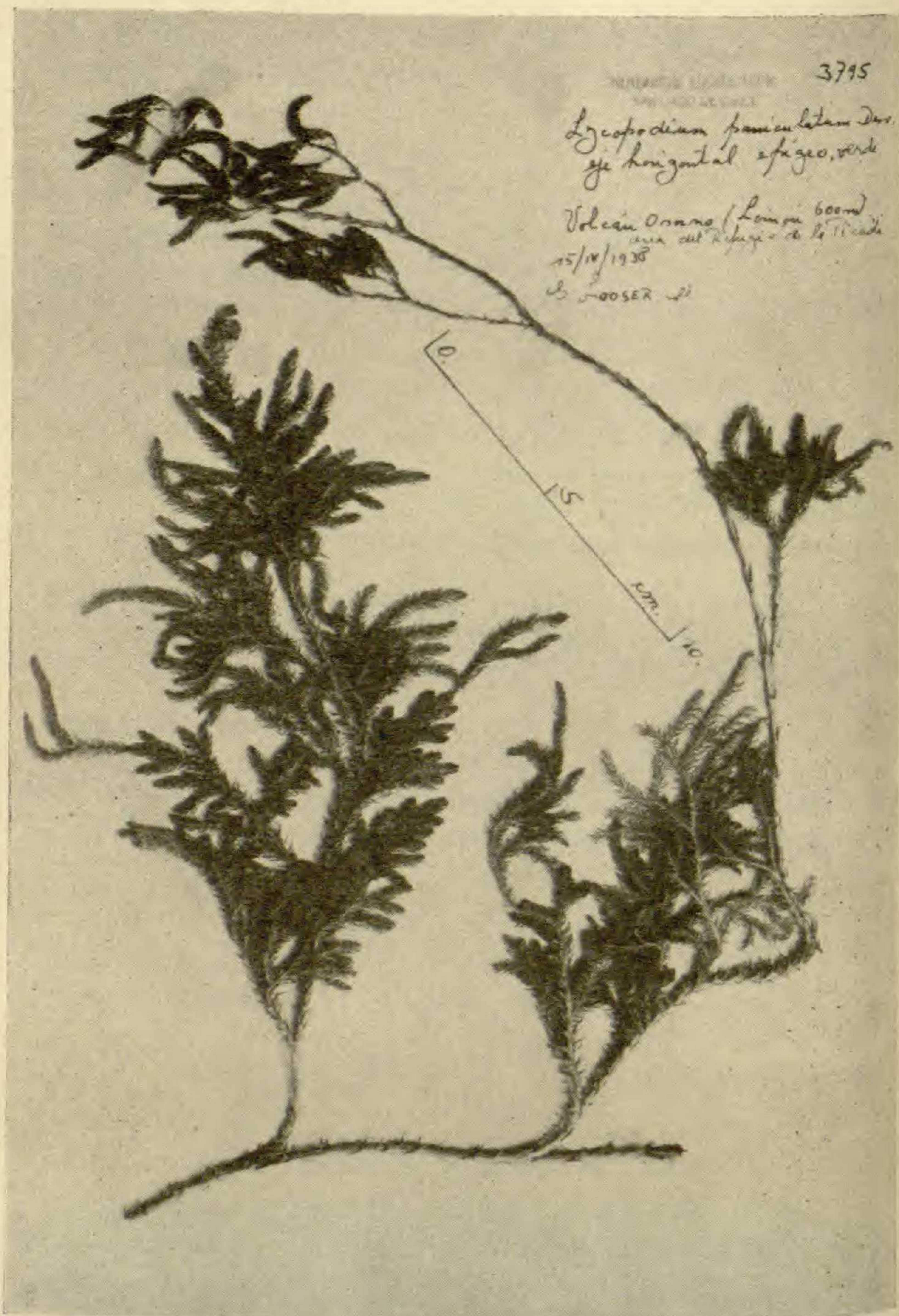
Lophosoria quadripinnata is a species of very wide range in America, from Mexico to southern Brazil, but its Chilean occurrence is completely isolated from the

rest of its range by the deserts of northern Chile, the Andes, and the Argentine pampas. In Chile, because of the great size and beauty of its finely divided fronds and the bluish color of the lower surface, it is prominent in the landscape, much more so, doubtless, than in the tropics, where there are many large and handsome ferns to compete with it. The fronds of *Lophosoria* are sent to the cities, to be used for decorative purposes, and their collection is a local industry of some importance.

In the dense forest from Concepción southward, ferns abound. Besides the *Blechnums* already mentioned there grow, on the ground or on the banks of rivulets, *B. blechnoides* (Bory) Keys. (*B. valdiviense* C. Chr.), *B. penna-marina* (Poir.) Kuhn, *B. Leyboldtianum* (Phil.) C. Chr., and *B. asperum* (Klotzsch) Sturm, which are sometimes difficult to distinguish. They are herbaceous plants, small or middle-sized, not more than 50 to 70 cm. in height, and they all belong to the subgenus *Lomaria*, with dimorphic fronds. *Blechnum blechnoides* strongly resembles *B. Spicant* (L.) Roth, of Eurasia and the Pacific coast of the United States and Canada.

Of the subgenus *Eublechnum*, with isomorphic fronds, there are *B. auriculatum* Cav., of wide range in temperate South America, and *B. arcuatum* Rémy & Fée, which has handsome narrow fronds up to 1.5 meters long, very like those of cultivated *Nephrolepis*. It often grows beside small waterfalls, with its fronds pendent. *Blechnum Gayanum* (Rémy & Fée) Sturm [*B. Germainii* (Hook.) Christ] is very like *B. penna-marina* and is often difficult to distinguish from it. It grows in drier soil in the mountains at a certain altitude, and ranges from the province of Valparaiso to that of Llanquihue and perhaps farther south.

Other terrestrial ferns are the various *Polystichums* of the complex group of *P. aculeatum* (L.) Schott. They are very difficult to separate, but there are, no doubt,



LYCOPodium PANICULATUM. VOLCÁN ASORNO, PROVINCE OF LLANQUIHUE, 600 METERS.

some good species, such as *P. chilense* (Christ) Diels, *P. Brongniartianum* Rémy & Fée, and perhaps others. *P. multifidum* (Mett.) Moore, belonging to the same group, has much more conspicuous characters; it may be recognized by its finely divided fronds (up to quadripinnate) reaching 1 meter in length. In mountainous regions, principally among rocks at an altitude of 1,000 meters or more, one frequently meets with *P. mohrioides* (Bory) Presl. It is a very variable plant of somewhat fleshy consistency, a feature in which it differs from all the other *Polysticha*, which are rather strongly coriaceous. Its extreme forms, *P. mohrioides* var. *elegans* (Rémy & Fée) C. Chr. and var. *plicatum* (Kze.) C. Chr., differ so much that good botanists have considered them separate species. Some taxonomists treat *P. Lemmonii* Underw. and *P. scopulinum* (D. C. Eaton) Maxon of the western United States and Canada as additional varieties of *P. mohrioides*.

One of our handsomest ferns, frequent enough in the Valdivian forest, is the tall *Hypolepis rugulosa* (Labill.) J. Smith var. *Poepigii* (Kunze) C. Chr. It has a creeping rootstock, from which the stipes come up rather far apart; it sometimes forms large colonies of attractive appearance, because of its finely divided fronds of a somewhat reddish tint. This fern ranges only to the northern limit of the Magellanic forest. There are scarcely distinguishable forms in New Zealand and Australia, far across the ocean, and closely related species in the tropics.

The great genus *Pteris*, principally tropical, has only two representatives in southern Chile. Apparently they do not extend beyond 44° S. and are rare. *Pteris semiadnata* Phil. has only slightly divided fronds, recalling a *Marattia*—a feature which suggested one of its synonyms, *P. marattiaefolia* Hook. *Pteris chilensis* Desv. resembles *P. tremula* R. Br., often cultivated in hothouses and in

the open air. When well developed, these two pterids of southern Chile reach a height of 1 meter.

Other notable terrestrial ferns are: *Adiantum chilense* Kaulf., *Dryopteris spectabilis* (Kaulf.) Macl. & Dusén, and the species of Gleicheniaceae, especially *Dicranopteris squamulosa* (Desv.) Looser [*Gleichenia pedalis* (Kaulf.) Spreng.], which abounds as far as the Chonos Islands. Often it covers large areas or hangs like garlands on the sides of ravines. There is no lack of specimens, often large ones, of the most cosmopolitan of ferns, *Cystopteris fragilis* (L.) Bernh. I have seen material from the islands near Cape Horn, the "Land's End" of America. In marshy places, of which there are many, a tall form [var. *uliginosum* (Phil.) C. Chr.] of *Blechnum penna-marina*, *Dicranopteris cryptocarpa* (Hook.) Loos., and *D. quadripartita* (Poir.) Loos, which reaches the extreme south, are frequent. Much rarer, though covering nevertheless a wide range, is the little *Schizaea fistulosa* Labill., very like *S. pusilla* Pursh of eastern North America, known to many readers of the JOURNAL. It grows in marshes, forming scattered little colonies, and it is the only representative of its family in Chile.

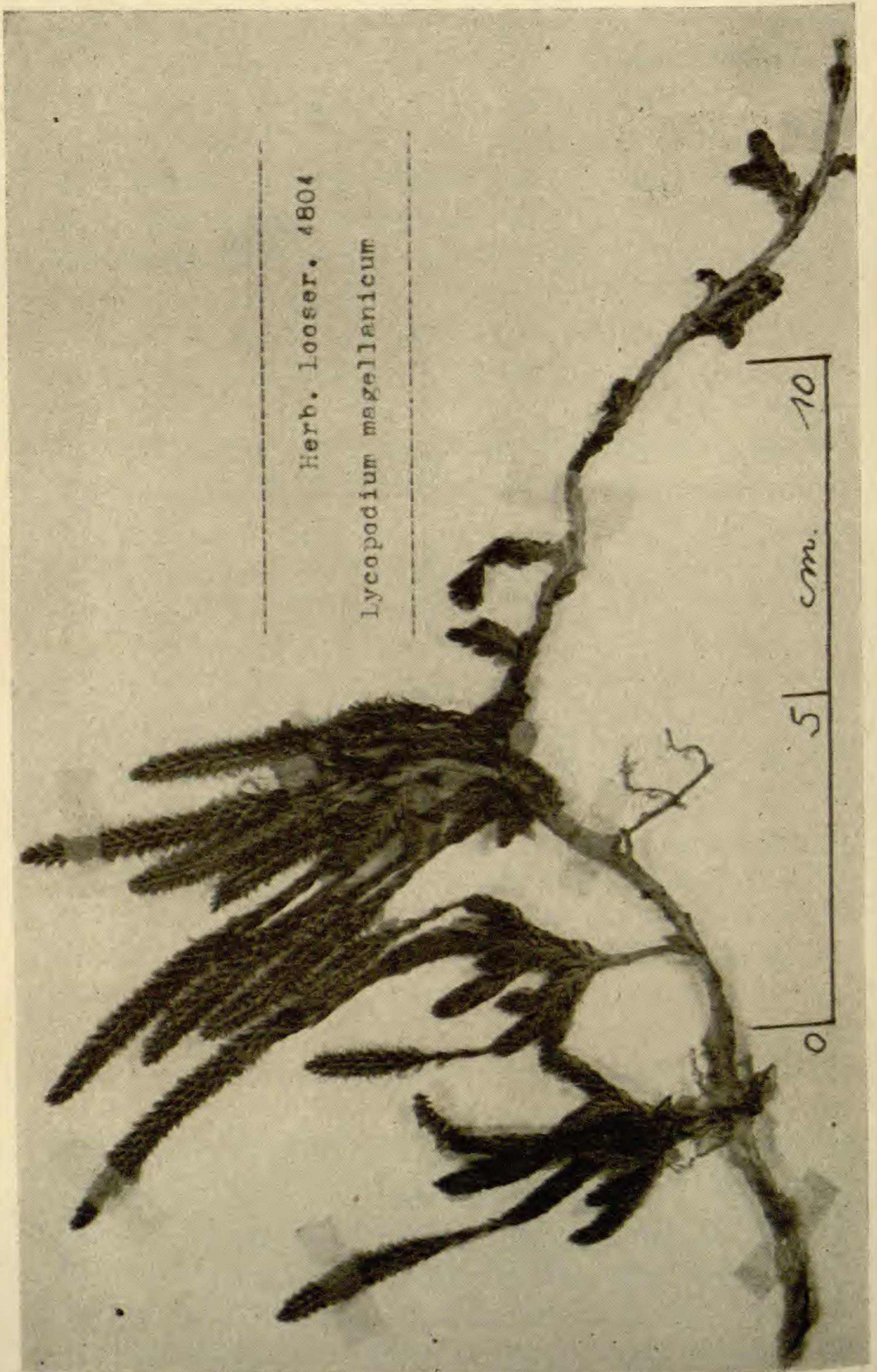
Adiantum chilense, mentioned above, is known as far south as Río Aysén (45° 30' S.) and, in addition, at an isolated station at Skyring (53°), a little north of the Straits of Magellan. Recently, Ilse von Rentzell found it east of the continental ice on the River León, a tributary of the large lake Buenos Aires, at about 47° S.,⁹ so one may suppose that this distributional gap, which so impressed Skottsberg, will gradually be filled. *Adiantum excisum* Kunze, very abundant in the region of Santiago and Valparaiso, reaches only to the basin of the Río Biobío (37–38° S.), that is, it hardly penetrates into the area here covered.

⁹ Federico Reichert e Ilse von Rentzell. Breve resumen de los resultados geográficos, geológicos y botánicos de la octava expedición patagónica. Darwiniana 7(1): 138–170. 2 maps, 4 pl. 1945.

Epiphytic ferns are abundant on the tree-trunks, principally *Polypodium Feuillei* Bert. [*P. Synammia* (Fée) C. Chr., *P. trilobum* Cav.], *P. Billardieri* (Willd.) C. Chr. var. *magellanicum* (Desv.) C. Chr., *Asplenium dareoides* Desv. (*A. magellanicum* Kaulf.), and *A. trilobum* Cav. Rarer in Chile is *Polypodium lanceolatum* L., with a wide range in both hemispheres. I have seen it in Concepción and the islands of Juan Fernandez and have specimens from the interior of the province of Valdivia (Puñire). Apparently it is not found in the southern part of our region.

I have referred to some species of *Asplenium*; it remains to mention others which live under very different conditions. *Asplenium obliquum* Forst. grows on rocks at the very margin of the ocean and is often lashed by the waves. It is definitely halophilous. It is also remarkable for its range; we find it again in Australia, New Zealand, and some of the Polynesian islands. It has apparently crossed the Pacific at its widest point. In Chile it is known from the province of Valparaiso to the northern half of western Patagonia (Isla Garza, 45° 55' S.). *Asplenium monanthes* L., with a vast range in Africa, America, and the Hawaiian Islands, is known from a few stations in rocky and sunny places in the provinces of Cautín and Osorno, completely isolated from its principal area. *Asplenium triphyllum* Presl has been collected once at Lago San Martín, in Argentine territory but near the Chilean boundary. Its presence there is the more remarkable in that its nearest known station is 2,400 kilometers to the north.

The glory of the Chilean epiphytic ferns is its Hymenophyllaceae, a family represented chiefly by the genus *Hymenophyllum* with some 15 or 20 species, for the most part endemic in the southern forests. These delicate little plants, mingled with bryophytes and lichens, cover



Herb. Looser. 4804

Lycopodium magellanicum

LYCOPODIUM MAGELLANICUM. LAGUNA SAN RAFAEL,
PROVINCE OF AYSÉN

the trunks and branches of trees. Their fronds, which rarely are more than 20 cm. long and often no more than 4 to 8 cm., are usually several times divided. The blade consists of a single layer of cells, rather large and easily seen by transmitted light with a lens of moderate power. In some species the fronds are erect, in others pendent like bits of delicate lace in the dampness and shade of the forest; but let the humidity diminish or a ray of direct sunlight strike them and they dry up, blacken, and lose all their attractiveness. Some, like *H. falklandicum* Baker and *H. tunbridgense* (L.) J. E. Smith, grow on the ground as well as epiphytically. Compared with these, *H. caudiculatum* Mart. and *H. fuciforme* Swartz are veritable giants,¹⁰ attaining 40 cm. in height. These large species have fronds much alike, but they are readily distinguished, since in the latter the fronds are clustered, whereas in *H. caudiculatum* they are scattered on a long, creeping rhizome.

Polymorphism in the Chilean Hymenophyllums is considerable. I have said that most of them have finely divided fronds, but there are exceptions. In *H. dicranotrichum* (Presl) Sadeb. the triangular blades, about 5 cm. long, are barely pinnatifid. In *H. cruentum* Cav. they are quite entire, a character which, with others, in my opinion justifies the placing of this fern in a genus of its own—*Hymenoglossum* Presl [*H. cruentum* (Cav.) Presl]. Another species has blades pinnate on one side only—very regularly, like a comb—hence its name *H. pectinatum* Cav. Similar, but less symmetrical, is *H. secundum* Hook. & Grev. Most of the species are glabrous, but in *H. ferrugineum* Colla, which occurs also on the islands of Juan Fernandez and in New Zealand, the blade is covered with silky hairs of a rusty color.

¹⁰ Christ writes of the latter species, "wohl die grösste Art des Genus." Geogr. Farne 326. 1910.

Nowhere else in temperate South America does *Hymenophyllum* reach so high a development as in the southern part of Chile.¹¹ On the other hand, *Trichomanes*, the other great genus of the family, is represented in our region by only a single species, *T. exsectum* Kunze, known from Valdivia to Chiloé and also on Juan Fernandez. Very common also in southern Chile down to Tierra del Fuego is *Serpyllopsis caespitosa* (Gaudich.) C. Chr., a little plant with pinnate blades, which one would hardly take for a fern at all but rather for an hepatic such as *Plagiochila*. Its peculiar characters are reflected in its nomenclature; it was placed variously under either *Hymenophyllum* and *Trichomanes* until van den Bosch, the distinguished Dutch pteridologist of the middle of the last century, set up for it the genus *Serpyllopsis*, monotypic, and endemic in southern Chile, adjacent Argentina, and Juan Fernandez.

Other pteridophyta in southern Chile are as follows. The genus *Elaphoglossum* is represented by three species, which I know only from the provinces of Valdivia, Osorno, and Llanquihue, that is, from the northern part of our area. They are: *E. Gayanum* (Fée) Moore, *E. Mathewsii* (Fée) Moore, and *E. Porteri* Hicken. The first two are found also outside of Chile.

The Lycopodiums are all terrestrial. In some parts of the provinces of Cautín and Valdivia the tall *L. paniculatum* Desv., which attains a height of 1 meter, is common. In the more southern part of our region *L. magellanicum* Sw. is found, in many forms, but more

¹¹ Winkler's statement (in Verdoorn, Man. Pterid. 472. 1936), referring to southern Chile that "nirgends in Südamerika ist die Gattung *Hymenophyllum* so vielfältig" seems unjustifiable. It was perhaps taken from a passage in Christ (l. c. 326). But in a restricted area about Cuzco in southern Peru (13° S.), Herrera (Syn. Fl. Cuzco 1: 93-96. 1941) could record 21 species of *Hymenophyllum* and it seems likely that there are a considerably larger number in Peru. Many years ago Sodiro (Crypt. Vasc. Quit. 16-21. 1893) could cite for Ecuador the same number of species as did Herrera for the Cuzco region.

rare. It may be considered a species corresponding to *L. clavatum* L., of circumboreal regions. I have specimens which show an extraordinary resemblance to that species, but in the South American plant the leaves are never bristle-tipped. *Lycopodium magellanicum* not only extends to Cape Horn but, according to Skottsberg,¹² is found also on some islands along the margin of the Antarctic, such as South Georgia, Falkland Islands, Kerguelen, and Tristan d'Acunha. Other Chilean ferns which are found on South Georgia are, according to the same author,¹³ *Hymenophyllum falklandicum*, *Cystopteris fragilis*, and *Polystichum mohrioides* (as *P. andinum*). Almost all the pteridophytes of the Falkland Islands (Malvinas) occur in southern Chile; at least from a pteridological point of view, these islands—and South Georgia also—may be considered as extensions, much impoverished, of the south-Chilean flora.

After this digression, we return to *Lycopodium*. Other Chilean representatives are: *L. confertum* Willd., of which a few collections are known; *L. Gayanum* Rémy (*L. Jussieui* auctt.), more frequent and relatively common in the Valdivian forest; and, in Tierra del Fuego, a form (*L. fuegianum* Roiv.) difficult to separate from *L. Selago* L. of northern Eurasia and North America. *Lycopodium chonoticum* Phil. is a doubtful species, near *L. confertum*.

In all Chile there is not a single species of the great subcosmopolitan genus *Selaginella*. Neither has *Anogramma*, widely distributed in America and even in Asia, nor the cosmopolitan *Pteridium* been found there. The strange thing is that all three genera just mentioned occur in Argentina; they have not been able to cross the

¹² Carl Skottsberg, Die Gefässpflanzen Südgeorgiens. Stockholm. 1905.

¹³ Carl Skottsberg, A botanical survey of the Falkland Islands. Svensk Vet. Akad. Handl. 50 (3): 1-129. 1913.

Andes. This great mountain-chain, the deserts, and the Pacific Ocean give Chile an almost insular character and account for the peculiarities of its flora and fauna.

In certain lakes in southern Chile and Argentina *Isoëtes Savatieri* Franch. has been observed. It is the only *Isoëtes* in the region. *Azolla filiculoides* Lam. (Salviniaceae) is known from the extreme north of Chile to the Straits of Magellan. *Pilularia americana* A. Br. (Marsileaceae) occurs at Valdivia.

Some species of *Ophioglossum* and *Botrychium* have been collected in our area.¹⁴ *Equisetum bogotense* H. B. K., a small plant of wide range in South America and frequent in Chile, is known as far south as the region of Aysén. *Equisetum giganteum* L., which often attains a height of 4 meters, according to data at hand scarcely reaches the Río Biobío (Renaico, 37° 30' S.).¹⁵ Apparently the greater part of the region here treated lacks Equisetaceae. Further exploration may show, as in other cases, that this supposition is incorrect.

Even more unexpected than the presence of *Lycopodium Selago* in Tierra del Fuego, above referred to, since that species has been collected at intervening stations in Ecuador¹⁶ and Peru,¹⁷ are various collections in the Andes of Chile of the European *Cryptogramma crispa* (L.) R. Br., from the province of Colchagua (Tinguiririca, 34° 30' S.) to that of Biobío (Nitrito, 38° S.). Recently I have recorded its presence still farther south.

¹⁴ For these very difficult genera, still little collected in Chile and Argentina, see the excellent work of Juana S. de Lichtenstein, *Las Ofioglosáceas de la Argentina, Chile y Uruguay*. *Darwiniana* 6: 380-441. 14 fig. 1944.

¹⁵ According to Ada L. Pastore, *Physis* 15: 248, 1939, *E. giganteum* in Argentina reaches 40° S.

¹⁶ Sodiro, l. c. 561. Nessel (Die Bärlappgewächse [Lycopodiaceae], p. 34, 1939) doubts this, saying that he has seen no material from Ecuador.

¹⁷ Marie-Victorin, *Les Lycopodiniées du Québec*, p. 94, 1925: "et peut-être dans les Andes péruviennes."

in Nahuel-Huapi (41° S.), in Argentina,¹⁸ and I have little doubt that some day it will be found in the adjacent part of Chile. The typical phase of the species inhabits Europe and western Asia. We have here one of the most disjunct ranges imaginable, since this species has never been found elsewhere in tropical America. The plant of the southern Andes differs slightly from the European and may be given varietal designation (var. *chilensis* (Christ) Loos.). It differs much more markedly from *C. acrostichoides* R. Br. of temperate, boreal, and subarctic America. The distribution of *C. crispa* can be compared only with that of *Pleurosorus*.

Finally, I must not fail to record an important recent discovery. In November, 1944, Augusto Grosse found *Histiopteris incisa* (Thunb.) J. Smith on the island of Garza ($45^{\circ} 55'$ S.), in the Estero de los Elefantes, a little north of the Peninsula of Taitao. A year later he found it again in the same place; it may be expected at other localities in western Patagonia. This fern has an immense range, from southeastern Asia to New Zealand and South Africa, and over most of tropical America. In Chile it had previously been known only from Juan Fernandez, where it is frequent. There have been vague references in literature to its occurrence in southern Chile; but Skottsberg, who has made the most thorough studies of this region, does not mention it.

SANTIAGO, CHILE.

APPENDIX I

PTERIDOPHYTES OF THE REGION OF CORRAL, NIEBLA, AND THE CITY OF VALDIVIA

This region, bordering on the Pacific Ocean, lies at about $39^{\circ} 30'$ S. Lat. and has an elevation up to 400 meters.

Meteorological data from Punta Galera, a few kilometers south of Corral (according to Skottsberg): Average temperature, 11.4°

¹⁸ Looser, *Las Pteridofitas del Parque Nacional de Nahuel-Huapi*. *Physis* 15: 231. 1939.

C.; average maximum, 13.7°; average minimum, 8.7°; absolute maximum, 23.8°; absolute minimum, 0.8°. Average humidity, 82.2%. Annual rainfall, 2460.7 mm. Rainfall in the spring months, 8.8%.

Adiantum chilense Kaulf. Very common.

sulphureum Kaulf. Less common than the preceding.

Asplenium dareoides Desv. (*A. magellanicum* Kaulf.) Very common, almost always epiphytic.

obliquum Forst. Only on rocks on the seashore.

trilobum Cav. Common epiphyte.

Azolla filiculoides Lam. Floating in slow-flowing streams.

Blechnum arcuatum Rémy & Fée. In shaded and humid places.

asperum (Klotzsch) Sturm. Beneath trees and shrubs.

auriculatum Cav. Common.

blechnoides (Bory) Keys. (*B. valdiviense* C. Chr.). Very common.

corralense Espinosa. One of the smaller species of the genus, known only from the port of Corral; prefers small holes in the rocks.

chilense (Kaulf.) Mett. Very common and of physiognomic importance because of its large size.

Leyboldtianum (Phil.) C. Chr. Very like *B. blechnoides*.

magellanicum (Desv.) Mett. Frequent and very large. Sometimes with a trunk 1 m. or more tall.

penna-marina (Poir.) Kuhn. Abundant in wet, marshy places.

Cystopteris fragilis (L.) Bernh. Common.

Dicranopteris cryptocarpa (Hook.) Loos. Common.

litoralis (Phil.) Loos. Scarce.

quadripartita (Poir.) Loos. Scarce.

squamulosa (Desv.) Loos. [*Gleichenia pedalis* (Kaulf.) Spreng.] Very common.

Elaphoglossum Gayanum (Fée) Moore. Scarce.

Equisetum bogotense H.B.K. Common throughout.

Hymenoglossum cruentum (Cav.) Presl

Hymenophyllum caudiculatum Mart.

cuneatum Kunze (*H. terminale* Phil.).

dentatum Cav. Very common.

dicranotrichum (Presl) Sadeb. (*Trichomanes spinulosum* Phil.)

fuciforme Swartz. Apparently scarce in this region; plant 0.4 m. tall.

Krauseanum Phil.

magellanicum Willd.

pectinatum Cav. Very common.

plicatum Kaulf. (*H. dichotomum* auctt.). Very common.

tortuosum Hook. & Grev.

tunbridgense (L.) J. E. Smith. The same as the European type?

Hypolepis rugulosa (Labill.) J. Smith var. *Poepigii* (Kunze) C. Chr. The typical form is Australian.

Lophosoria quadripinnata (Gmel.) C. Chr. [*Alsophila pruinata* (Swartz) Kaulf.]. Very abundant and of great physiognomic importance because of its large size and beauty.

- Lycopodium Gayanum* Rémy (*L. Jussieui* auctt.)
magellanicum Swartz. (including *L. erectum* Phil.)
paniculatum Desv. Very common in some places and decorative; up to one meter tall.
- Ophioglossum crotalophoroides* Walt. Cited for Corral by Mettenius (Fil. Lechl. 27. 1856) as *O. bulbosum* Michx.
- Pilularia americana* A. Br.
- Polypodium Billardieri* (Willd.) C. Chr. var. *magellanicum* (Desv.) C. Chr. Frequent epiphyte: the type is from Australia.
Feuillei Bert. [*P. Synammia* (Fée) C. Chr.]. Very common epiphyte; also on walls.
lanceolatum L. Rare epiphyte; widespread tropical species.
- Polystichum adiantiforme* (Forst.) J. Smith. Rather common, its range very wide and not confined to America.
Brongniartianum Rémy & Fée [*P. aculeatum* (L.) Schott, pro parte].
chilense (Christ) Diels [*P. aculeatum* (L.) Schott, pro parte; *P. vestitum* auctt.]
- Pteris semiadnata* Phil. Handsome fern up to 1 meter; rare.
- Schizaea fistulosa* Labill. Rare, though of wide range. In Chile known from Corral (39° 30' S.) to the peninsula of Taitao (46°) and besides in Malvinas (Falkland Islands), Australia, New Zealand, New Caledonia and Auckland Islands.
- Serpyllopsis caespitosa* (Gaud.) C. Chr.
- Trichomanes exsectum* Kunze. Rare.

APPENDIX II

LIST OF THE PTERIDOPHYTES OF THE REGION OF THE PENINSULA OF TAITAO AND THE ISTHMUS OF OFQUI (46-47° S.)

(Compiled from publications of Espinosa, Franchet, Roivainen, Skottsberg, and the collections of the author.)

Pluviometric data from Cabo Raper, 40° 50' S., on the west coast of the peninsula of Taitao, according to Jefferson: Annual rainfall, 1933 mm.; in the winter months (April-Sept.), 49%; in the three spring months (Dec.-Feb.), 26%.

- Asplenium dareoides* Desv.
obliquum Forst.
- Blechnum arcuatum* Rémy & Fée
magellanicum (Desv.) Mett.
penna-marina (Poir.) Kuhn
- Dicranopteris quadripartita* (Poir.) Loos.
- Histiopteris incisa* (Thunb.) J. Smith
- Hymenoglossum cruentum* (Cav.) Presl
- Hymenophyllum caudiculatum* Mart.
Darwinii Hook. f.
dentatum Cav.
dicranotrichum (Presl) Sadeb.
ferrugineum Colla
Krauseanum Phil.

- magellanicum* Willd.
pectinatum Cav.
plicatum Kaulf.
secundum Hook. & Grev.
tortuosum Hook. & Grev.
Hypolepis rugulosa (Labill.) J. Smith var. *Poeppigii* (Kunze) C. Chr.
Lophosoria quadripinnata (Gmel.) C. Chr.
Lycopodium magellanicum Swartz
paniculatum Desv.
Ophioglossum crotalophoroides Walt.
Polypodium Billardieri (Willd.) C. Chr. var. *magellanicum* (Desv.) C. Chr.
Polystichum multifidum (Mett.) Moore
Schizaea fistulosa Labill.
Serpyllopsis caespitosa (Gaud.) C. Chr.

APPENDIX III

LIST OF THE PTERIDOPHYTA OF THE CHILEAN PART OF TIERRA DEL FUEGO, THE SHORES OF THE STRAITS OF MAGELLAN, AND ADJACENT REGIONS¹⁹

Pluviometric data for the Straits of Magellan, according to Jefferson:

Islas Evangelistas, 52° 24' S., at the Pacific entrance to the Straits: Annual rainfall, 3078 mm.; in the six winter months, 49%; in the three spring months, 27%.

Punta Arenas, 53° 10' S., more or less at the center of the Straits: Annual rainfall, 470 mm.; in the six winter months, 61%; in the three spring months, 19%.

Punta Dungeness, 52° 24' S., at the outlet into the Atlantic: Annual rainfall, 219 mm.; in the six winter months, 58%; in the three spring months, 28%.

- Asplenium dareoides* Desv.
Azolla filiculoides Lam.
Blechnum magellanicum (Desv.) Mett.
penna-marina (Poir.) Kuhn
Botrychium Lunaria (L.) Swartz var. *Dusenii* Christ
matricariaefolium A. Br. ssp. *patagonicum* (Christ) Clausen.
 Cited by Sra. de Lichtenstein from Ultima Esperanza and Punta Arenas.
Cystopteris fragilis (L.) Bernh.
Dicranopteris cryptocarpa (Hook.) Loos.
quadripartita (Poir.) Loos.
Hymenophyllum Darwinii Hook. f. (*H. Skottsbergii* C. Chr.)
dentatum Cav.
falklandicum Baker
ferrugineum Colla

¹⁹ This list makes no claim to completeness, many parts of the territory being still unexplored.

- magellanicum* Willd.
pectinatum Cav.
peltatum (Poir.) Desv.
plicatum Kaulf.
secundum Hook. & Grev.
tortuosum Hook. & Grev.
Isoetes Savatieri Franchet
Lycopodium confertum Willd.
magellanicum Swartz
Selago L. (*L. fuegianum* Roiv.)
Polypodium Billardieri (Willd.) C. Chr. var. *magellanicum* (Desv.)
 C. Chr.
Polystichum adiantiforme (Forst.) J. Smith
mohrioides (Bory) Presl
multifidum (Mett.) Moore
Serpyllopsis caespitosa (Gaud.) C. Chr.

Two New Generic Names of Ferns

CLYDE F. REED

Among the new genera proposed by Copeland in his recent *Genera Filicum* is one which caught my attention, the genus *Polypodiopsis*. This generic name has already been used for a genus of plants in the family Taxaceae from New Caledonia. For the species segregated as the genus *Polypodiopsis* of Copeland, the following generic name may be used.

Polypodiopteris Reed, *nom. nov.*

Polypodiopsis Copeland, *Gen. Fil.* 210. 1947, *non*
 Carr. Conif., *ed.* 2, 710. 1867.

The type is *Polypodium proavatum* Copel. The three species are all Bornean:

Polypodiopteris proavita (Copel.) Reed, *comb. nov.*

Polypodium proavatum Copel., *Philip. Journ. Sci.* 3C:
 347. 1909.

Polypodiopteris colorata (Copel.) Reed, *comb. nov.*

Polypodium coloratum Copel., *Philip. Journ. Sci.* 3C:
 347, pl. 6. 1909.

Polypodiopteris brachypoda (Copel.) Reed, *comb. nov.*

Polypodium brachypodium Copel., *Philip. Journ. Sci.*
 12C: 62. 1917.