

REVIEWS

Botany of the Canadian Eastern Arctic. Part III: Vegetation and Ecology. National Museum of Canada, Bulletin No. 104. NICHOLAS POLUNIN. Pp. vii + 304, 2 maps, 107 plates in the text. Ottawa: King's Printer, 1948; 75 cents.

The book here noticed is the third part of this very comprehensive account of the plants of North-Eastern Canada. The first part, dealing with the individual flowering plants and Pteridophytes, was reviewed in the *B.E.C. 1939-40 Report*, pp. 391-392.

The present volume describes the plant communities of that part of the region lying north of the 60th parallel of latitude. These are dealt with under the ten major districts adopted in Part I, and this enables comparisons to be made more readily between the two volumes. In each major district a general account of the habitat and plant communities is given, and this is supplemented by (or in some cases chiefly based on) detailed accounts of the vegetation of limited areas visited personally by the author.

The area studied lies between the 60th and 83rd parallels of latitude (about 1600 miles altogether from north to south) and thus experiences a wide range of climatic conditions—though all of an arctic nature—from the severe high-arctic conditions of Ellesmere to the almost sub-arctic climate of northernmost Quebec. There is also a gradation, though less striking, between the relatively oceanic climates of the eastern seaboard along Davis Strait and the more continental conditions farther west, this being more noticeable in the south.

In spite of these differences it must be remembered that the climate everywhere is very severe in comparison with that of any part of the British Isles, the most southerly districts having only four months (June-September) with a mean temperature above freezing point, while in the extreme north no month is free from frost. This severity may be summed up in the statement that the whole of the region lies north of the tree-line, the tallest vegetation being of willow-scrub, which is said to reach a height of 7-8 feet in favourable places.

Another important factor in the differentiation of the vegetation is the nature of the underlying rock, the two chief divisions being acid granites and gneisses on the one hand, and limestone on the other. Curiously enough, in contrast to Britain, the richest vegetation occurs on the acid rocks, the weathering of the limestone tending to form unsuitable substrata. Much of the ground is covered by glacial deposits, usually derived from one or other (or sometimes a mixture) of the rock types mentioned.

As might be expected, there is a gradual increase in the luxuriance and variety of the vegetation as one passes from north to south, though

the higher areas in the south support much the same vegetation as that of the lowlands farther north. There is also another interesting change in the vegetation as regards the constituent species. In the north nearly all the species are found also in arctic Europe, while many are inhabitants of this country. As one progresses southwards one finds an increasing proportion of American species which there fill the same ecological niches as are filled in Europe by their European counterparts. This is particularly noticeable in the willows, *Carices*, *Eriophora*, etc.

In all districts the most unfavourable localities are occupied by open vegetation ("barrens"), consisting of isolated tufts of various species. These include especially *Saxifraga oppositifolia*, *Cerastium alpinum*, *Papaver radicatum*, *Luzula confusa*, and, except in the extreme north, *Dryas integrifolia*, which throughout the area replaces the European *D. octopetala*, but appears to have almost identical ecological preferences. The dwarf willow *Salix arctica* replaces the European *S. polaris*, but both *S. herbacea* and *S. reticulata* occur.

Where conditions are more favourable "heath" of varying degrees of luxuriance occurs, including such species as *Cassiope tetragona*, *Vaccinium uliginosum*, *V. vitis-idaea*, *Empetrum hermaphroditum*, *Ledum palustre* and other ericaceous plants. This is developed especially on the acid rocks and covers very extensive areas in the southern districts, usually associated with dwarf willows and birches of various species. These heaths are also very rich in Cryptogams, particularly lichens, which are always a striking feature of arctic vegetation.

In especially sheltered valleys, particularly in the southern half of the region, willow-scrub of limited extent is found, while on slopes where the exposure, drainage and nature of snow cover are combined in an exceptionally favourable manner one finds "flower slopes" containing a remarkably rich assemblage of flowering herbs and grasses.

Where the drainage is poor, or in the immediate vicinity of the numerous lakes, extensive marshes are formed, which are dominated by grass-like vegetation. This consists of the widespread grasses *Arctagrostis latifolia*, *Alopecurus alpinus*, and *Dupontia Fisheri*, numerous species of *Carex*, in particular *C. aquatilis* var. *stans*, and species of *Eriophorum*, especially *E. angustifolium* and *E. Scheuchzeri*. In the south, American species of the above groups become increasingly important. Mosses are also very abundant, but *Sphagna* occur in quantity only in the extreme south of the region. Truly aquatic vegetation is found only in the more southern regions, where *Hippuris* and aquatic species of *Ranunculus* are present.

The volume gives a very clear and graphic picture of this region, so unlike our own country in general features and yet with a flora including so many species native to these Islands.

Recherches écologiques sur le littoral de la Manche. Dr JEAN JACQUET.
Pp. 374 with 42 line drawing figs. and 27 photogravure plates.
Paris: Paul Lechevalier, 1949; Fr. 2500. [25 × 16 cm.; paper.]

Attention should first be drawn to the general title of the book which, if taken literally, somewhat overshadows the most important subject; also to the fact that "Manche" is to be taken in its double meaning: the Channel, in a general sense, and, more particularly as the French department of that name, the littoral of which the author has thoroughly studied.

As a matter of fact, the work primarily centres on *Spartina Townsendii*, and is the practical development of a doctorate thesis on this Anglo-French invader of mud-flats on both sides of the Channel.

A great many notes have been written about the plant and related problems, but most of them have been spread over numerous more or less accessible publications, and no comprehensive work had yet dealt fully with the matter. This long-felt need has now been excellently fulfilled; the author has done much more than bring together the scattered information and has reported many previously unpublished observations.

While *Spartina Townsendii* and its problems in connection with its peculiar habitat, its chemical composition, and hence its possible uses, serve as the central theme of the work, many other matters pertaining to tidal lands and salt-marshes have been studied, e.g., their flora and fauna, their reclamation, the oceanography of estuaries and bays, the little known fluvio-marine deposits such as the "tangué" (i.e., the sort of mud in the Mont-Saint-Michel bay, where *Spartina* thrives), the biology of halophytes, etc. Special emphasis is placed upon some methods of soil and other analysis.

Contents.—Introduction: botanical status of European *Spartina* (13 pp.). 1st Part: comparative anatomy; descriptive anatomy; histology (32 pp.). 2nd Part: geographical distribution; mode of dispersal of *S. Townsendii* (40 pp.). 3rd Part: Chapter I: ecology; bionomical aspect of *S. Townsendii* stations in the department of the Manche; associations; the notion of *slikke* and *schorre* (47 pp.). Chapter II: environmental conditions; climate; waters; soil, chemical composition and physical properties (pp. 91). Chapter III: *S. Townsendii* in its habitat; adaptation; xerophytes *v.* halophytes; influence of salt; resistance to immersion (65 pp.). Conclusions. Bibliography (some 1350 references).

As far as species and hybrids growing in Europe are concerned, the genus is divided into two subgenera, viz.—*Euspartina* (incl. *S. stricta*, *alterniflora*, *Townsendii*, *Neyrauti*) and *Fremya* (incl. only *Spartina juncea* Willd.).

The interest of the book extends far beyond *S. Townsendii*, however fascinating this grass may be, and, therefore, should prove invaluable to all botanists—British and French alike—studying these matters.

The illustrations are a valuable part of the book and the photographs have been adequately selected.

P. SENAY.