Book Reviews

The Flora of Bic and the Gaspé Peninsula, Quebec. H. J. Scoggan. Ottawa, Canada: National Museum of Canada, 1950. 399 pp. $1.00.

Following in the footsteps of Fernald and Wynne-Edwards, H. J. Scoggan has devoted himself for a decade to investigation of an area which has been much in controversy from the standpoints of glacial geology and plant geography. His findings are presented in this commendably complete and critical monograph.

Because of its endemics and the peculiar pattern of distribution shown by some of the plants of limestone and serpentine areas, the Gaspé flora is an exceptionally interesting one to students of plant geography. It was first studied in detail by the late M. L. Fernald, whose characteristically intensive field work early in the century resulted in the discovery of most of the unusual plants of the region. Fernald and his co-workers discovered and described 143 new systematic entities (species, varieties, and forms) which had their type localities in the Gaspé peninsula, and, although the ranges of many of them have subsequently been found to be more extensive, others are still regarded as endemics. Their systematic relations, however, are often with western American (Cordilleran) types. Likewise the flora contains a considerable number of plants of disjunct distribution, Laurentian and Cordilleran, although the results of late explorations in hitherto neglected mid-continental areas have tended to close the gaps. Scoggan himself has supplied many new distributional records through a botanical survey made in central Manitoba during the summer of 1948 under the auspices of the National Museum of Canada.

Fernald interpreted the earlier floristic findings in accordance with his well-known hypothesis that the high plateau of central Gaspé was a large nunatak, or nonglaciated refuge, on which a remnant of the flora that preceded Pleistocene glaciation persisted, surrounded by glacial lobes in the St. Lawrence channel to the northward and in the Matapedia Valley and Chaleur Bay to the southward. The consensus now seems to be that the whole region was overridden by the Wisconsin ice sheet, since erratic boulders of distant origin have been found on the highest summits, even though it has not been satisfactorily shown when, in glacial history, they were left there. The conclusion has nevertheless been drawn by Alcock, Wynne-Edwards, and most geologists that the evidence of complete Wisconsin glaciation of the entire peninsula is so great that Fernald's nunatak hypothesis must be abandoned. Even so, it must be borne in mind that the evidence is not too strong that the erratic boulders of the Gaspé mountains were transported during the Wisconsin glaciation and not earlier. The nunatak hypothesis in its most generalized form, as applying to the whole of the period of Pleistocene glaciation, may indeed have been overthrown. Some part of it, however, may still be found useful, for it is scarcely possible that the ice receded uniformly from the south without the appearance of temporary "islands" surrounded by ice and of ice-free coastal strips.

It is conceivable that, even if the Gaspé region were not continuously a refuge for a preglacial eastward outlier of the Cordilleran flora throughout the Pleistocene glaciation, it became such during the period of melting and recession of the ice. On account of its varied altitude and diversified, unoccupied, specialized limestone and serpentine habitats, it may have provided for the establishment and persistence of pioneer plants reaching it by way of the morainic belt, before it became open to general invasion of plants from the widespread eastern continental flora to the south.

Mid-continental disappearance of certain isolated plants of Gaspé, at the same latitude as Gaspé, is accounted for by Scoggan (in agreement with evidence cited by Wynne-Edwards, as well as with new data obtained by Rousseau and Scoggan himself) on the ground that pioneer habitats of the flat central forest country have been swallowed up by the aggressive advance of a more generalized flora from the south, whereas pioneer habitats have persisted along the Gaspé cliffs.

Botanists will find themselves generally in accordance with the ideas of Scoggan, Wynne-Edwards, Cain, and others that the broad morainic belt south of the continental ice sheet "would have served as an ideal refugium for those rare plants that even today are confined chiefly to the unstable sea cliff and river gravel habitats, free from invasion by the forest species that have crowded them out elsewhere." It is indeed significant that the endemics and species of unusual distribution are not those of acid soils and extreme arctic-alpine distribution which might be presumed to have been hardy enough to survive for millennia on a frigid nunatak. On the contrary, they are mostly plants of isolated and lithologically extreme, basic, low-altitude habitats and are more boreal and temperate than arctic in distribution. Moreover, similar calcareous habitats do not all have the same assemblage of rarities, from which it has been argued that we are dealing with new endemism, and that the apparent genetic stability of the types may result from the populations having descended from highly selected, relatively homozygous sources. The idea is not at all unreasonable that the population of certain rare species on habitats made newly available by the retreat of the ice may have been derived from single seeds! Thus genetic stability and population uniformity need not necessarily have come about through ages of rigorous natural selection im-

posed upon genetically diverse populations by habitats gradually approaching limiting conditions for survival, as the situation was interpreted by Fernald. Rather, the chance invasion of unoccupied habitats by the dispersal of accidentally homozygous, initially small and genetically uniform populations has given the aspect of "ancient" endemism and disjunct distribution of long-inbred vestigial types.

It must not be forgotten that newly exposed unleached glacial till at the edge of the receding ice sheet would have contained so much pulverized limestone that it would have provided a temporary habitat for calciphile species.

Anyone interested in the plant geographical problems of the glaciated region will find all the data that pertain to Gaspé admirably assembled in Scoggan's book. As a regional flora it is extremely satisfactory, for the keys will enable the local or visiting botanist to determine most collections without recourse to other books. Space limitations prevent discussion of any systematic details, but in general it appears that Scoggan has found himself botanically in agreement with the conclusions of Fernald and his associates. We are indebted to him and the National Museum of Canada for a fascinating account of an important local flora.

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Antennas. John D. Kraus. New York: McGraw-Hill, 1950. 553 pp. $8.00.

The day when the antenna for a radio receiver was just any old piece of wire has passed. The philosophy behind this has, however, taken a long time to die. It required the advent of ultra short waves to bring antenna design into true perspective, and to set the subject alongside other aspects of radio engineering as one worth studying for its own merits.

In many present-day radio applications the antenna is the most vital part of the equipment and that on which its whole accuracy depends, the transmitter and receiver being merely a source and detector of power. This is particularly true of radar applications, which have probably done more than anything else to stimulate modern interest in antenna design.

Accordingly, there has arisen a need for a textbook that deals comprehensively with the subject at a level which can be understood by a student in the final years of his university course. The present text, written by one who has by his own research added considerably to our knowledge of the subject, goes far toward meeting this need. The student using the book requires a good grounding in the fundamentals of electromagnetic theory, and some knowledge of physical optics is an advantage, but at no stage is a very advanced mathematical treatment involved.

Antennas covers all aspects of the subject, starting with the properties of point sources and simple linear elements and dealing with combinations of these to form arrays of various types. In order to do this the self and mutual impedances of the elements of the arrays are fully dealt with. Some consideration is given to the fundamental theory of the biconical and cylindrical dipole, but the complex mathematics usually associated with this subject has been omitted. This aspect might have received a fuller treatment, in view of the recent important theoretical advances in this field, but it must be admitted that most of the mathematics involved is beyond the average student.

The theory of antennas acting as sources with a continuous distribution across their aperture is also treated, and many applications to microwave antennas are discussed. It is not surprising that the helical antenna should be treated in some detail in view of the author's important contributions to this subject. One or two subjects of importance receive, however, rather scanty treatment, the most notable being the Yagi aerial, which is now widely used.

References to published work given throughout the text are most useful. These are largely confined to American research and do not include much of the work carried out in England during the war. Recent British publications, however, cover this work rather fully.

The number of textbooks on antennas is not great, and some err by being either so full of engineering details as to obscure the fundamental principles, or so full of mathematics as to leave no room for practical considerations. The author has struck a happy compromise between these viewpoints. *Antennas* can be confidently recommended as a textbook for students of radio engineering and as a reference book for those engaged in research or in engineering practice.

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Thoracic Surgery. Richard H. Sweet. Philadelphia: Saunders, 1950. 345 pp. $10.00.

This new book on the techniques of thoracic surgery has been written by one of the recognized leaders in this field in American surgery, and it adds luster to his reputation. The book is "based upon the concept that any properly qualified surgeon can acquire with relative ease a satisfactory proficiency in thoracic surgery by employing the techniques herein described." With this as a starting point Dr. Sweet has written a thoroughly inclusive volume which will lead the interested reader through a rather abbreviated section on the surgical anatomy of the thorax, general considerations of thoracic operations, and finally the techniques of specific operations for specific disorders.

The author's experience in thoracic surgery and his wide knowledge of past and present literature have