REVIEWS

NORTH AMERICAN MOOSE

By RANDOLPH L. PETERSON. *Toronto: Univ. Press, 1955. 9 x 6 inches; xi + 280 pages and 25 unnumbered plates. $12.50.*

Dr. Peterson can be congratulated on this useful book which is both well documented and well organized. The nineteen chapters and two appendices cover all major aspects of the biology of the moose, including taxonomy, paleontology, and postglacial dispersal of the species in North America. Most chapters are divided into sections, the titles of which are given in the table of contents. Some sections are further divided under italicized sub-titles, so that there are rarely more than two pages without a titled division. These headings, coupled with a good index, provide a means of quick and easy reference.

In the Introduction Dr. Peterson states that since 1946 he has devoted a major part of his time and effort to the study of the moose. This has evidently included considerable field work, mostly in Ontario. A few introductory paragraphs describing the areas covered by field work and the periods spent in them would have given the reader added interest and background. In the body of the book the author has rightly refrained from emphasizing his own work unduly, and, except for one chapter on the distribution and status of the moose in Ontario, he has drawn on the available information from all parts of North America, including northern Canada and Alaska. References are also made to European works.

Readers of *Arctic* who are not zoologists will be most interested in the short chapter on the postglacial dispersal of the moose in North America. It is there suggested that while range expansion in southern Canada probably resulted from habitat changes wrought by man, the northward spread of the species since 1875 may have been caused either by recent climatic amelioration or by a continuation of the pattern set by the retreat of the ice and tundra at the close of the glacial period. However, there must be some doubt whether the northward extension of the range towards and beyond the tree-line between Churchill and the mouth of the Mackenzie is a real advance or merely the result of the greater information now available. Also, the possibility of periodic expansion and contraction of the range needs more consideration. The possibly erroneous record of three moose seen by a seaman near Prince Albert Sound, Victoria Island, in mid-May 1851[1] is not mentioned. If the subspecies *Alces alces andersoni* and *A. a. americana* evolved during the glacial period respectively to the southwest and southeast of the great lakes, the far greater northward expansion of the former needs further explanation. Can the difference be due entirely to the late retreat of the ice from Ungava?

Since Dr. Peterson has dealt with the taxonomy of the genus *Alces* in an earlier paper,[2] only a synopsis is given in the present volume. The chapters on food habits and habitat studies are, with a few additions and changes, taken from his 'Studies of the food habits and the habitat of moose in Ontario',[3] which deals more specifically and fully with Ontario. The two appendices, to which R. C. Passmore and A. T. Cringan have contributed, discuss methods of aging by mandibular tooth wear and antler development. Attention is drawn (Fig. 18) to

[1] Armstrong, Alex. 1857. 'A personal narrative of the discovery of the North-West Passage'. p. 335.

[2] 1952. 'A review of the living representatives of the genus *Alces*'. *Contrib. Roy. Ont. Mus. Zool. and Palaeontol.* No. 34, 30 pp.

[3] 1953. *Contrib. Roy. Ont. Mus. Zool. and Palaeontol.* No. 36, 49 pp.

the reduced size of the pulp cavities in old animals, but the possible existence of annually deposited rings or ridges was apparently not checked. It is noted (p. 92) that the antler pedicle increases in diameter with age, and here again there is a possibility that stained sections might disclose annual rings.

The illustrations, binding, and format are suitable and adequate for a book of this kind, but it is by no means the luxury volume which the price would indicate. It is unfortunate that such a useful work, which should be in the hands of all moose hunters as well as zoologists working within the range of the moose in Canada, Alaska, the United States, and even Europe, has been published at a price which is double that of comparable volumes. It is strange that the publishers failed completely to realize the demand which adequate advertisement and a reasonable price might have created for this book.

T. H. MANNING

ATLAS DER EISVERHALTNISSE DES NORDATLANTISCHEN OZEANS UND UBERSICHTS-KARTEN DER EISVERHALTNISSE DES NORD- UND SUDPOLAR-GEBIETES

DEUTSCHES HYDROGRAPHISCHES INSTITUT. *Hamburg: 1950. 19¼ x 13½ inches; 18 pages text; bibliography; 34 charts.*

The 1955 shipping season was particularly difficult in the Arctic, and reports of unusually poor weather and heavy ice were widespread. As surface traffic increases it is becoming obvious that our knowledge of average and extreme ice conditions must be improved, and that any studies that contribute to this knowledge are of great value. The German ice atlas, published in 1950, is not well known in North America. It is an enlarged edition of the publication produced during the last years of the Second World War by Dr. Julius Büdel of Deutsche Seewarte. Most of the first edition and the plates were destroyed in an air raid in 1944, but some charts were salvaged; they have been revised by Deutsches Hydrographisches Institut and are used in this atlas.

The atlas is divided into two parts. The first part contains the text and a bibliography on sea ice with 37 titles, while the second part contains 34 charts. In spite of the date of publication no reference is made to 'Ice atlas of the northern hemisphere' published in 1946 by the Hydrographic Office, United States Navy, which contains an exhaustive bibliography on sea ice with no less than 1,700 titles.

Part I begins with a paragraph on sea ice in which the author states that the physical structure of winter ice in the seas distant from the north pole does not differ from that of the semi-permanent ice of the inner Polar Basin except in thickness "the one-year old winter ice seldom exceeds 1 metre, while the older polar ice on the average measures 2–3 metres in summer, and 3–4 metres in winter. Only in the case of exceptionally strong pressure and rafting can the ice occasionally reach a thickness of 25 metres. Normally the ice in the Polar Basin is 2–3 years old. Ice as old as 5–6 years is rare, and an age of 8 years is hardly ever exceeded". Nothing is said about the age of ice governing its salt content.

The author writes that the ice conditions of the inner Polar Basin and the neighbouring parts of the Canadian Archipelago are, even today, "almost unknown". He says that here there is "an ice cover that is uniform over vast distances, and of a permanent character; the lack of observations from this region is therefore not important for the geographical investigation of sea ice". This is a somewhat surprising statement. The manuscript for the text of the atlas was finished in 1947, and the maps, for the most part, show mean values for the period 1919–43; with a publishing date of 1950 one feels that the text, at least, might have been brought up to date. Although these areas can still be called "almost unknown" considerable study of the sea ice has been carried out in the North American Arctic since the Second World War. As the "lack of observa-