

ANTARCTIC SOILS AND SOIL FORMING PROCESSES. Edited by J. C. F. Tedrow. *Antarctic Research Series, Volume 8. Washington: American Geophysical Union of the National Academy of Sciences-National Research Council. Publication No. 1418, 1966. 8 x 11 inches. ix + 177 pages, graphs, charts. \$10.00.*

The volume *Antarctic Soils and Soil Forming Processes* consists of six papers covering the subjects of antarctic geomorphology, climate, patterned ground, terrestrial vegetation, soil microbiology, and soils. The 177 pages of text are well illustrated with an abundance of photographs and diagrams, and contain many tables of data collected during the early 1960's. Each paper is complete in itself, but all bear, in various degrees, upon the volume's theme of antarctic pedology.

The first paper, by R. L. Nichols, is entitled "Geomorphology of Antarctica." It is a well-documented and well-illustrated review of the literature and the author's own observations up to 1964. The major subjects discussed include Paleozoic and Tertiary glaciations, Quaternary multiple glaciations, interglacial and glacial features, deglaciation, glacial and subglacial topography, the continental shelf, dry valleys, elevated marine surfaces, periglacial features, the influence of wind and running water, lakes, and thermal data. This comprehensive presentation is a functional introduction to the geological understanding of antarctic soil materials. The second paper, "The Antarctic climate," by W. S. Weyant, discusses: (1) the general climate of the continent, including the radiation and water budgets, temperature regimes, storm tracks, and climatological zones; and (2) local climatology of ice-free areas, with particular reference to soil thermal regimes. The next paper, "Preliminary measurements of growth of nonsorted polygons, Victoria Land, Antarctica," by T. E. Berg and R. F. Black, provides a detailed account of the application of patterned ground to the dating of recent geomorphic surfaces. Included in this significant report are discussions on nonsorted polygons, types of wedges, evaluation of the technique of wedge-growth measurements, and site descriptions.

The next two papers are on biological subjects. E. D. Rudolph in his paper,

"Terrestrial vegetation of Antarctica," describes the predominance of lichens, algae, mosses, and fungi and the lack of seed-producing plants, the differences between micro- and macro-climate, and experiments in growing flowering seed plants. In the paper by W. L. Boyd, J. T. Staley, and J. W. Boyd, "Ecology of soil microorganisms of Antarctica," an extensive survey is made of the microbial types in soil habitats. Included in the paper are discussions of food chains, occurrence of bacteria and molds in various environments, results of experiments on factors limiting microbial growth, physiological groupings, and studies on transmission and viability of microorganisms.

The last paper, "Antarctic soils," by J. C. F. Tedrow and F. C. Ugolini, briefly reviews the climate, geology, and weathering processes of Antarctica and discusses soil formation and classification of soil conditions encountered in the ice-free areas of the continent.

The papers included in this volume are all important contributions to their respective disciplines. Although the book was published in 1966, most references are dated before 1964. Therefore, some two to five years of additional data are now available by the same authors and others on the subjects covered. The title may be somewhat misleading, although students of pedology will recognize that the first five papers contain many elements on the concepts of soil genesis: time, parent material, vegetation, climate, and relief. The final paper, although brief, introduces the concept of antarctic pedology, a subject which has since received additional attention by investigators in various disciplines.

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ATLAS ANTARKTIKI (ATLAS OF ANTARCTICA). *Volume I. Moscow-Leningrad: Main Administration of Geodesy and Cartography, 1966. 15 x 23 inches, 16-3/4 lbs. xxiii + 225 pages. 30 roubles.*

The first volume of this atlas contains maps, diagrams, tables, graphs, and air-

photographs; the second volume, when published, will contain a history of discoveries and descriptions of the natural environment.

The present volume includes the results of scientific investigations carried out in Antarctica up to 1963, principally by scientists of the U.S.S.R. and of twelve other countries that participated in the International Geophysical Year and the International Quiet Sun Year.

Pages I-XII contain a foreword, a summary, and lists of the editorial staff, abbreviations, and contents. The body of the atlas (pages 1-225) is divided into three main parts: Introductory, General, and Regional. An index of geographical names is included at the end of the book (pages XIII-XXIII).

Instead of a discussion of the main chapters, it has been considered more useful to give translations of the subheadings.

PAGES 1-15 (INTRODUCTORY):

Introduction; Map of the southern hemisphere showing Antarctica; Morphometric characteristics of Antarctica; History of investigations from 1492 until the middle of the twentieth century (16 maps); Investigations of principal expeditions to Antarctica (4 historical periods are illustrated and routes, investigated regions, and stations are shown).

PAGES 16-225 (GENERAL AND REGIONAL):

General geographic maps (9 maps of Antarctica); Aeronomy and physics of the Earth; Ionosphere (32 maps and 16 diagrams); Polar auroras (different kinds of frequency are shown on 3 maps and 2 graphs); Cosmic rays (1 map and 3 graphs); Geomagnetism (19 maps and 6 graphs); Earth currents (numerous diagrams and graphs); Gravimetry (gravimetric characteristics and gravity anomalies of Antarctica, 10 maps); Seismology (seismicity of Antarctica, 1 map, index of earthquakes between 1910-60).

Geology and relief: Geology (tectonics, geology of Antarctica, etc., 7 maps); Relief and bottom sediments (hypsometry, subglacial relief of Antarctica, geomorphology, paleogeography, relief, and sediments of the South Ocean and some others, 10 maps).

Climate: Solar radiation (6 maps); Ground level temperature (in January, April, June, October, and overall of the year,

5 maps and 1 graph); Pressure, wind, barometric configuration, January (pressure at sea level, configuration of isobaric surfaces: 700 mb., 500 mb., 300 mb., 200 mb., 100 mb., and their temperatures, 12 maps); Pressure, wind, barometric configuration, June (as above); Pressure at sea level (pressure in April, October, and for whole year); Climatological regions of Antarctica (4 maps). Precipitation (amount during one year, probability of precipitation in January, April, October, and for one year, 6 maps); Tracks and periodicity of cyclones and anticyclones (6 maps); Distribution of temperature and wind by altitudes (graphs); Characteristic synoptic configurations (summer and winter synoptic configurations and others, 6 maps).

Glaciology: Morphology of the ice cover (thickness of the ice cover, ranges of glacier boundaries in different years, 8 maps and 20 profiles); Nourishment and physical characteristics of the ice cover (feeding by precipitation, thickness of the snow cover, its temperature, 4 maps and 2 profiles).

Waters of South Ocean: Boundaries and parts of the South Ocean (4 maps); Dynamics of water: Waves, Currents, Tide (22 maps); Physico-chemical characteristics of waters (temperature, salinity, pH, colour, and transparency of water, etc., 25 maps and 1 graph); Hydrological profiles (between Antarctica and Africa, India, New Zealand, South America, and others, 21 profiles and 1 map); Sea ice and icebergs (5 maps).

Biology: (Distributions of biomass, division into plant- and zoo-districts, distribution of whales, seals, birds, etc., 25 maps and 1 graph); Physico-geographical division into districts (kinds of landscapes, physico-geographical division, 2 maps).

Regions of Antarctica:

The mainland and islands: Queen Maud Land and Enderby Land (16 maps); MacRobertson Land (Coast) and princess Elizabeth Land (6 maps), Vestfold's Oasis (5 maps and 3 aeropictures); West Ice Shelf (6 maps, 2 photographs, and 1 profile); Pravda Coast, regions of the station Mirnyii, Drygalski Island, Pobeda Island, Shackleton and Denman Glaciers (24 maps, 9 photos, 3 profiles, and 2 pictures); Wilkes Land (10 maps, 4 photos); Adélie Land, Victoria Land, and Ross Ice Shelf (11 maps); Ellsworth Land and Antarctic Peninsula and

Islands (14 maps, 2 photographs, and 2 pictures); Ocean Islands (14 maps). South Ocean: Antarctic sector (5 maps); Weddell Sea (11 maps); Indian Ocean sector (23 maps); Davis Sea (17 maps and 2 pictures); Pacific Ocean sector; Ross Sea, Bellingshausen Sea (44 maps).

Maps, diagrams, profiles, and others are reproduced in colour, which makes the atlas clear and attractive in appearance. Only 3,000 copies have been published.

A major shortcoming of this otherwise excellent work is the absence of explanations in any language but Russian.*

Marian M. Kuc

*Since this review was written, complete translation of all the legends and explanatory text of Atlas Antarktiki has been published by the American Geographical Society as the May-June 1967 issue of their *SOVIET GEOGRAPHY: REVIEW AND TRANSLATION* (V. 8, No. 5-6; pp. 261-507). Copies can be purchased directly from the A.G.S. for \$3.00 (U.S.) each.

THE MAMMALS OF EASTERN CANADA. BY RANDOLPH L. PETERSON. Toronto: Oxford University Press, 1966. 10 x 7½ inches, xxxii + 465 pages, 233 line illustrations, 8 colour plates, 107 distribution maps. \$15.95.

Eastern Canada, here considered to include Ontario, Quebec, New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland, the Atlantic offshore waters, Eastern Hudson Bay, and the islands in James Bay, has a land area of about 1,215,600 square miles. In this vast area of varied topography and climate lying between the Torngats and Point Pelee, mammal habitats are numerous, and Dr. Peterson estimates that 122 species inhabit them. Of these species, 102 are native, 10 are domestic, 9 have been introduced, and 1 (the sea mink) has become extinct. One of the largest mammals, the wapiti or "elk," has been extirpated and reintroduced locally by man.

Dr. Peterson, Curator of the Department of Mammalogy at the Royal Ontario Museum in Toronto, spent ten years in preparing the book—a badly needed reference for mammalogists and those generally interested in Canadian natural history. He opens with several brief introductory essays describing the basic nature of mammals, their origin classification, and man-

mammal relationships. The last essay on the region of Eastern Canada is only a page long—certainly insufficient for a book of this type. Five pages with numbered diagrams provide the rudiments of mammalian skeletal anatomy.

Classically simple and clear introductions to the major categories—orders, suborders, and families—precede discussions of the species which belong to them. Peterson's comments on the bats (Order Chiroptera) and the deer (Family Cervidae) are particularly effective.

The core of the book consists of a series of pithy and interesting sections on each species of Eastern Canadian mammal from the small, southern opossum to the bulky bowhead whale, which ranges well north of the region considered. Species are described according to physical characteristics and appearance, size and weight ranges, distribution and variation, habitat, and habits (including reproductive, feeding, and social behaviour, and activity period). Subjects such as status, economic value, conservation, and research are dealt with under "Remarks." Fur production tables for the 1950-60 period are usually given for economically valuable species. Still, it seems rather arbitrary to tabulate the production of bobcat pelts in Eastern Canada while omitting similar data on seals—particularly the valuable harp seal. A few selected references follow each section.

With the excellent skull drawings of each species and the taxonomic keys, those using the text should have little trouble identifying good specimens. Distribution maps, with insert maps of the species' North American range, show where the various animals can be expected to occur in Eastern Canada. The book closes with a glossary of terms frequently encountered in mammalian literature, 38 pages of references (few more recent than 1960), and a useful index.

Considering the scope of Peterson's study, it would be surprising if it had no weaknesses. To begin with, his goal of making the book "useful to a wide audience without sacrificing accuracy and readability on the one hand and scientific detail and substantiating evidence on the other" is virtually impossible to achieve, for really two divergent goals are involved. Necessarily, some sacrifices have been made.