

explain. The hard-rock geology and the qualities of the lake water, temperatures, and currents are amply treated. Maps of the bottom topography of each lake are furnished, with a contour interval of 100 feet.

Most of the book is devoted to glacial and postglacial history, interpreted against a background of four glacial stages and relatively much longer interglacial ages. The duration of time since the Ice Age and of successive intervals thereafter is critically discussed in the light of carbon-14 dating. The author confesses an attempt "to present a review which proceeds from the more probably correct interpretations to inferences that are less well founded, and to indicate the degree of doubt or certainty existing in the conclusions."

His more controversial points include a Two Creeks low-water stage; the concept of Valdres and Cochrane deposits as tills resulting from ice readvances rather than deep-water deposits of ice-berg drift; a claim that Lake Algonquin evidence is lacking in the Superior basin; and a return to consideration of supposed marine waters (Gilbert Gulf) in the Ontario basin. Hough considers the name *Champlain* no longer appropriate and suggests "St. Lawrence Sea" to replace it. This may create difficulties of nomenclature with respect to a classic time unit now being recognized in the Hudson Bay area and on the Pacific Coast.

Such incidents furnish problems for research in the future, and this research will be given stimulus by this interesting treatise.

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Climatology and Microclimatology. Proceedings of the Canberra Symposium. UNESCO, Paris, 1958 (order from Columbia University Press, New York). 355 pp. Illus. \$11.

In October 1956 the Advisory Committee on Arid Zone Research of UNESCO sponsored a technical meeting in Australia. The theme was arid-zone climatology. This volume contains 50 papers which were presented at the meeting. It is a companion to an earlier UNESCO publication, *Arid Zone Research X* (Paris, 1958). This preceding volume contained the eight introductory addresses on the major phases of arid-zone climatology and microclimatology which opened the eight sessions of the symposium.

As one might expect, a wide compass of topics is covered. The session titles indicate this: "Evaporation and water

balance"; "Radiation and thermal balance"; "Interrelationships of climate and flora"; "Interrelationships of climatic elements and fauna"; "Microclimate of man and domestic animals"; "Modification of microclimate"; "Salting and chemistry of rainwater"; "Climatological observational requirements in arid zones."

The papers and the brief summaries of the ensuing discussions are very useful contributions to the subject of arid climates. This shares with other symposium volumes the problem of wide variety in scope and quality. In this case the variation is, fortunately, more in the size of the contributions than in the contents. Some papers are merely extended abstracts. A great many new data are presented. This is partially due to the fact that 31 papers were contributed by Australians and deal with the arid lands on their continent. Much of this material summarizes original research of the authors. Other areas of the globe were represented by—among others—such well-known experts as Thornthwaite, Geiger, Emberger, and Ramdas, so that a high standard of presentation was assured. A discourse by the U.S.S.R. academician Dzerdzeevskii gives a useful survey of aridity indices and defines an evaporation deficit concept which has been useful in the synoptic climatic analysis of dryness in Russia.

Most encouraging is the physical and quantitative approach now being taken in dealing with problems of arid climates that is apparent throughout the volume. This approach permits a clear assessment of the risks of land utilization in arid lands. It also leads to rational attempts at adaptation and amelioration. This symposium brings together the viewpoints of many minds and disciplines. It will stimulate thinking and new basic and applied research into the climatic problems of arid zones. The wisdom of UNESCO in promoting studies along this line is obvious if one considers, in frustration, the presently unusable dry lands of the earth that might help to relieve the increasing population pressure.

This volume on climatology is a worthy addition to the list of earlier UNESCO arid-zone symposia publications, such as those on human and animal ecology and on wind and solar energy. I regret that the anonymity of the editor of this volume prevents me from giving personal credit for excellent bilingual printing and beautiful make-up. The book can be highly recommended to meteorologists, agronomists, ecologists, geographers, and conservationists.

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The Physical Theory of Neutron Chain Reactors. Alvin M. Weinberg and Eugene P. Wigner. University of Chicago Press, Chicago, Ill., 1958. xii + 801 pp. Illus. \$15.

Research in the neutron physics of reactors is preponderantly done in large laboratories which generally issue their own reports. Since few of these reports are published in journals, even in abbreviated form, it has not been easy to infer from the readily accessible literature just what are the principle problems of the moment, and what methods are being used on them.

Weinberg and Wigner have now given us a work which goes far toward filling the partial void. This is a book which begins properly with a selective review of relevant parts of the theory of nuclear reactions, which proceeds to a thorough treatment of the transport of neutrons interacting with matter, and which then applies these subjects to the theory of neutron chain reacting systems. To this extent the book resembles others which have appeared in the past. The features which most distinguish this work from earlier ones are its thoroughness, its careful consideration of fundamental concepts, and the modern character of the treatment. For instance, this is the first general book on reactor theory to take into account the wide use of high-speed computing machines in dealing with reactor calculations, and to discuss the methods used.

These features, as well as the clear and precise language used, elevate the book into a class by itself. It will without doubt now become the standard work on reactor theory, both for reference and for teaching. As a text, some will probably choose to use it in advanced courses. It need by no means be used only at this level, however, because *The Physical Theory of Neutron Chain Reactors* presupposes no required prior knowledge of reactor theory. A good course in nuclear physics is, however, a prerequisite.

It is a pleasure to recommend this book, with no essential reservations, to all concerned in the field.

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The Pulse of Radar: The Autobiography of Sir Robert Watson-Watt. Dial Press, New York, 1959. x + 438 pp. \$6.

In 1925 King George V asked scientists of the British Admiralty whether they could not detect aircraft by radio echo ranging in a fashion similar to the detection of submarines acoustically. His Majesty's scientists did not think the