# Book Reviews

**Zoogeography.** Publication No. 51. Carl L. Hubbs, Ed. American Association for the Advancement of Science, Washington, D.C., 1958. x + 509 pp. Illus. $12; prepaid, to members, $10.50.

The title of this book, which will appear in book lists and some bibliographies, is simply *Zoogeography,* and the first paragraph of the preface says that the book is the product of symposia that "encompassed the field of zoogeography, with due attention to the underlying data of geomorphology, paleoclimatology, paleontology, and physiology." But the book is really concerned mainly with special aspects of animal distribution in western North America; it includes a little additional material but not enough to change the book's focus. Some simplification is (I hope) excusable in titling a book, but to publish this book as *Zoogeography* without immediately indicating its limits is seriously misleading and is likely to make unnecessary trouble and annoyance—especially for foreign buyers.

The book is also inadequately indexed. There are indices of authors and of scientific names and an "Index to subject coverage" (pages 474–475), but the last is not an index but a second, complicated table of contents. There is no subject index—no way to look up directly such subjects as (for example) "Bering bridge," "Continental drift," "Evolution," "Extinction," "Holarctic region," or "Tropics." All these criticisms concern the presentation of the book as a whole and not the individual papers in it.

The body of the book consists of 17 separate papers which were originally presented as two symposia. One symposium (14 papers) was on "The Origins and Affinities of the Land and Freshwater Fauna of Western North America" and was held under the prime auspices of the Pacific Section of the Society of Systematic Zoology, at Stanford University, in August 1957. The other (3 papers) was on "Geographic Distribution of Contemporary Organisms [chiefly in North America]" and was a feature of the annual meeting of the American Association for the Advancement of Science at Indianapolis, in December 1957.

The first paper in the book, by Philip B. King, "Evolution of modern surface features of western North America," is a concise summary of the geological history of the area in question, and it sets a very high standard both in content and in clarity of presentation. Several of the other papers are equally outstanding. The book is, therefore, a notable contribution to the zoogeography of western North America. I can do little more here than list the papers and indicate their contents very briefly. Paper number two, by H. D. MacGinitie, on "Climate since the late Cretaceous," traces climatic changes (chiefly in North America), with emphasis on fossil floras and on contraction and expansion of climatic and biotic zones around a fixed north pole. Number three, by George A. Bartholomew, "The role of physiology in the distribution of terrestrial vertebrates," stresses the complexity of the factors that limit species' distributions and warns that, although physiology helps to explain how vertebrates can live where they do, it rarely explains the exact limits of their distributions.

Number four is the first of several papers on the origins and affinities of particular groups of animals in western North America. It is by Donald E. Savage and is concerned with fossil land mammals. It treats well, and in some detail, the nature of the fossil record (especially in North America) and the apparent histories of orders, families, and minor groups that occur or have occurred in North America (but I think Savage makes too little allowance for the huge gaps in the fossil record in some parts of the world). Number five, by William H. Burt, treats Recent land mammals, analyzing the relationships that now exist between North American mammals and those of Asia and South America. The Bering land bridge is specially discussed, and it is clearly shown that ecological conditions, soil, and vegetation were more important than temperature in preventing some north temperate mammals from crossing the bridge (but temperature was presumably the primary factor that kept tropical animals from crossing). Numbers six and seven, by Alden H. Miller and Robert C. Stebbins, on birds and on reptiles and amphibians, respectively, are printed only as abstracts. Number eight, by Frank E. Peabody and Jay M. Savage, discusses the "Coast range corridor" that developed in California in the Pliocene and Pleistocene and that became a small-scale land bridge, which permitted north-south movements of amphibians and reptiles and explains their present distributions and the high incidence of sympatric species in southern California.

Number nine, by Robert Rush Miller, is a thorough and important treatment of the distribution and history of the freshwater fishes of western North America. Number ten, by Robert W. Pennak, briefly treats fresh-water invertebrates (except insects) of the western United States, pointing out among other things that their distribution is confusing and poorly known and that man is further confusing it by introductions.

Number 11 is by Herbert H. Ross, on the northern and montane insects of western North America. He gives detailed evidence, but drawn (as he says) from a small fraction of the insect fauna, of three main periods of dispersal of cold-adapted insects, in the mid-Cretaceous, Paleocene, and Pleistocene. Number 12 is by James A. G. Rehn, on the Dermaptera and Orthoptera. The complex distribution and history of these insects in North America are well reviewed, and summarized on page 298. Their greatest evolutionary center (in North America) has been Sonoran. Number 13, by E. Gorton Linsley, on the cerambycid beetles, is another good, detailed review of the distribution of an important group of insects in North America. Linsley finds that "the North American cerambycid fauna is a complex of diverse elements of which five are rather readily identified: the Holarctic, Neotropical, Alleghenian, Vancouveran, and Sonoran."

In number 14, William Hovanitz summarizes and diagrams the distribution of butterflies in the New World in relation to climatic zones and altitude, ending with discussions of controlling factors, changing distributions, and geographical origins of American butterflies. Number 15, by Paul S. Martin, is a review of Pleistocene ecology and biogeography of North America, with emphasis on displacement of climatic zones, arrival of prehistoric man, and late Pleistocene extinction of large vertebrates, which Martin suggests was due mainly to man. Number 16, by Kenneth C. Parkes, is concerned with the Palearctic element in the New World avifauna. A detailed analysis of distributions and apparent histories leads to two important but unanswered questions: "Why have some birds and not others moved (in one direction or the other) between Eurasia and North America?" and "Why has most of the movement been in one direction, from Eurasia to America?" Finally, number 17, by W. Frank Blair, describes distributional pat-

terns of vertebrates in the southern United States and shows how the patterns are explained by Pleistocene climatic and ecological changes, especially by southward shifting of climatic belts which split populations of warmth-adapted vertebrates and resulted in speciation in separate refuges in Florida and Mexico.

Under "General conclusions," Carl L. Hubbs notes the diversity of the papers that compose the book, the "emphasis on background considerations and on evolutionary and systematic correlatives" (but only within a very limited part of the world), the "kinetic approach" (which in fact began with Darwin), and the refined methods and high quality of many of the contributions (the praise is deserved). The editor notes also that biogeography is still a propitious field of inquiry, and that biogeographers show a [healthy] lack of preoccupation with transoceanic land bridges. However, real general conclusions—significant zoogeographic principles—are few in this book. Criteria for determining places or origin and directions of dispersal of animals are discussed, but no general conclusion is reached, except that tracing past histories is a complex and difficult matter. Several papers are concerned with the shifting of climatic zones, which (in North America) gradually moved southward (not northward, as Hubbs says inadvertently on page 473) during much of the Tertiary as the climate cooled, then pulsated violently during successive glaciations, complexly modifying plant and animal distributions. (No mention is made of Barghoorn's important paper, "Evidence of climatic change in the geologic record of plant life" [in *Climatic Change,* Harlow Shapley, Ed. (Harvard University Press, 1953)], which presents the evidence of southward shifting of climatic zones in North America from the middle Eocene to the Pleistocene.) Several contributors relate speciation to present distributions and past events in local situations, but the emphasis is on divergence of species rather than on evolution itself.

The broader aspects of zoogeography are missing in this book or, when touched, are not well handled. Donald E. Savage (pages 102–104) and Hubbs (page 473) dismiss the theory of Old World tropical origins of dominant vertebrates on the ground that much of the North Temperate Zone was tropical or subtropical in the earlier Tertiary. That the northern parts of the world were warmer in the Tertiary than they are now has been known by every competent zoogeographer since Darwin deduced it in 1858 (see Darwin's letter to Asa Gray in his *Autobiography* [Sir Francis Darwin, Ed. (Schuman, New York, 1950), p. 218]), although just how far north fully tropical conditions extended at particular times is still uncertain. But the shape and motions of the earth must always have caused some zonation of climate. The zonation has been enough to limit the sorts of mammals that have crossed the Bering land bridge at least since the late Eocene [see Simpson, *Evolution* (1947), vol. 1, pp. 218–220], and the distribution of dinosaurs suggests zonation in the Cretaceous. Moreover, even warm-temperature floras and faunas and fully tropical ones differ in more ways than just in being composed of different species. The tropical biotas are very much larger and more complexly integrated, and the species in them have different, sparser population structures. All this gives zoogeographers an opportunity not only to try to find where dominant animals have evolved in relation to climate but also, possibly, to discover fundamental things about the evolutionary process, about the situations and population-structures that influence it. That contributors to a symposium on local zoogeographic problems have missed this opportunity is not greatly to their discredit, but it brings us back to the point I started with. This book is a very good collection of papers on animal distribution (and some related subjects) chiefly in western North America, but it is not a zoogeography.

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**American Voting Behavior.** Eugene Burdick and Arthur J. Brodbeck, Eds. Free Press, Glencoe, Ill., 1959. iv + 475 pp. $7.50.

*American Voting Behavior* is a collection of some 22 essays mostly selected from four books each of which, in the opinion of Peter Rossi of the University of Chicago, represents a landmark in the research on voting behavior.

The four books he selects are *Quantitative Methods in Politics,* by Stuart Rice (1928); *The People's Choice,* by Paul F. Lazarsfeld, Bernard Berelson, and Hazel Gaudet (1944); *Voting,* by Bernard Berelson, Paul F. Lazarsfeld, and William N. McPhee (1948); and *The Voter Decides,* by Angus Campbell, Gerald Gurin, and Warren E. Miller (1954).

Most of the papers are written by sociologists and psychologists for sociologists and psychologists. The lay reader should arm himself with a glossary of terms currently popular among social scientists to be able to translate these contributions into understandable English. Agnes Meyer, one of the truly great students of social forces, has aptly described this contrived language as "desperanto."

The book would have much greater value if it were broader in scope. The contributors often reveal an amazing ignorance about election results and polling data and in some instances display an incredible naivete in their observations of voting behavior.

The contributors usually conform to the current ritual of social scientists by assiduously avoiding all conclusions except the inevitable one—namely, that "more research is needed before conclusions can be drawn."

A remarkable chapter was contributed by Leslie A. Fiedler of Montana State University. Fiedler, who is neither a sociologist nor a psychologist but a humanist, chides social scientists for "cloaking platitudes with a clinical vocabulary." He cites this example from *The Voter Decides*: "The results of both studies may be said to conform to the basic psychological principle that when strong and opposing forces act on an individual the resultant behavior will demonstrate the characteristics of conflict."

Some of the most interesting observations in the book on voting and voting behavior are offered by Fiedler. He wonders if it would not make more sense to characterize people by taste than by education, and he makes the very proper objection that in all of these studies there is not "sufficient prior speculation on the social meaning of the act of voting as such, opposed to the act of choosing one or another candidate."

We need to know more about voting behavior, and although this book confines itself to a small segment of this field, nevertheless it does demonstrate how the election process can be approached from the point of view of sociologists and psychologists. In this sense it is an important contribution to the scholarly literature in the field.

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**History and Philosophy of Science.** An Introduction. L. W. H. Hull. Longmans, Green, New York, 1959. xi + 340 pp. Illus. $5.

This modest and well-written book deals, in a remarkably brief space, with the main lines of scientific thought from antiquity to the 20th century. As the title implies, theory rather than practice is emphasized. Hull's point of view, that "nearly all the most significant ideas behind modern science have their origin in [Greek science]," leads him to give a much more extended treatment of Greek science (altogether fuller than that of comparable general histories) than he gives of the science of later periods. His treatment of the 19th, and especially of the 20th, century is decidedly brief.