Book Reviews

The Scientific Side of an Exploration

Lewis and Clark. Pioneering Naturalists. PAUL RUSSELL CUTRIGHT. University of Illinois Press, Urbana, 1969. xvi + 510 pp. + plates. $12.50.

Until the Apollo 11 moon shot, probably no American exploring expedition has gripped the imagination of the Western world more than the Lewis and Clark expedition, a "moon shot" into the unexplored wilderness between the Mandan villages of the Dakota plains and the rolling waters of the Pacific Ocean, a region as unknown to civilized man as the far side of the moon was before the beginning of space exploration. From the publication of Nicholas Biddle's *History of the Expedition under Captains Lewis and Clark* in 1814 to the present day, the story of this heroic exploit has been told and retold as new pieces of evidence have come to light. It has woven itself into the fabric of American history and folklore. Meanwhile botanists, zoologists, geographers, and ethnographers have pored over the records of the journey and retraced the steps of the explorers, seeking to recapture the excitement of discovery and to identify every plant and animal, every stream and mountain, every Indian tribe and language mentioned in those records. Not until the present book, however, has anyone attempted to view the expedition's contribution to natural history synoptically, bringing together all that is known about the aims, observations, and achievements of the explorers in the various fields of natural history, about the fate of the seeds, plants, animals, skins, Indian artifacts, and the like that they brought or sent back to the eastern United States, about the writing up and publication of these scientific data by various naturalists, and about the total impact of all this activity on the development of natural history in the United States.

This is the task which Paul Cutright undertook, and he has accomplished it admirably. Like others before him, Cutright has followed the footsteps of Lewis and Clark as closely as possible, and he retells the story of their adventures, sufferings, and triumphs with brief but vivid quotations from their own journals. But although he tells the story well, he never loses sight of the main theme of his book, the contributions of the expedition to natural history. In the opening chapter he makes it plain that these contributions were fully intended by President Jefferson, who chose Captain Lewis as leader of the expedition partly because Lewis was sufficiently familiar with the plants and animals of the eastern United States not to waste time in describing what was already known. During Lewis's two years as private secretary to the President, he had Jefferson himself as his mentor in science, after which he was sent to Philadelphia for further training and advice from the scientific community there. As Cutright points out, trained naturalists were very few in the United States in those days, and those few were either unavailable or ineligible for an expedition of the kind Jefferson had in mind. Lewis had to be his own naturalist, and Cutright shows that his talents in this line were far greater than has generally been realized. Although not given to using Linnaean binomials, Lewis was familiar with technical botanical terms and frequently made good use of them. Above all, he had an eye for detail. His descriptions of plants and animals were usually sufficient to enable naturalists to determine the species described, and he was diligent in collecting specimens, including some living specimens. Likewise, the ethnographic and linguistic information concerning the Indian tribes encountered on the expedition proved invaluable. "In one sense at least," writes Cutright, "Lewis's ethnological studies must be regarded as even more important than his biological. The plants and animals he described at such painstaking length are, by and large, still with us, whereas the Indians are not. . . . In less than a generation the once flourishing Chinookan family, for all practical purposes, had ceased to exist."

The virtues of this book, like those of the "pioneer naturalists" the author commemorates, are many. Besides being well written, it contains a "Summary of Discoveries" at the end of each chapter, listing the plants and animals new to science at the time of the expedition, the Indian tribes discovered, and the topographic features discovered or named. Chapter 23 gives a succinct summary of the ethnological, botanical, zoological, and geographical achievements of the expedition, and the first two appendices provide a systematic catalog of the plants and animals discovered, listed alphabetically by their Linnaean binomials, with page references to Reuben Thwaites's edition of the journals of the expedition and to Elliott Coues's *History of the Expedition.* A third appendix gives the locations of the maps, journals, specimens, and other material relating to the expedition scattered in libraries and museums from Philadelphia to St. Louis. Of especial interest to the student of early American science is chapter 22, "The fate of the Lewis and Clark booty." Here we learn what happened to the journals, seeds, plants, animals, skins, Indian artifacts, and the like brought back from the western country. In particular we get a picture of the scientific community in Philadelphia and of the contributions made by Alexander Wilson, Frederick Pursh, George Ord, Charles Willson Peale, Constantine Rafinesque, and others to the preservation and publication of the scientific results of the expedition. As Cutright observes, the Lewis and Clark expedition gave a powerful stimulus to American natural history.

With all these virtues the book has one major defect. It contains only one small map delineating only a small section of the expedition's route. Since the author gives a day-by-day account of the progress of the expedition, this is a serious omission. The reader must resort to other books to follow the course of exploration. This in spite of the author's high praise of Clark's carto-

graphic talents! All in all, however, the author has done excellently what he set out to do. He has described the expedition's aims and achievements in the domain of natural history and its impact on the development of American science. It is to be hoped that someone will undertake the equally fascinating and demanding task of tracing the influence of the Lewis and Clark expedition on European cartography and natural history.

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Early Inhabitants of the Arctic

Eskimo Prehistory. HANS-GEORG BANDI. Translated from the German edition by Ann E. Keep. University of Alaska Press, College, 1969 (distributed by University of Washington Press, Seattle). xii + 228 pp., illus. $6.50. Studies of Northern Peoples, No. 2.

Many North American arctic scholars, aware of the existence of Bandi's *Urgeschichte der Eskimo* and of its enthusiastic reception by reviewers, have eagerly awaited the promised English edition, which after considerable delay has finally appeared. The book is no mere translation of the original but embodies the results of subsequent research and takes into account comments and criticisms by other authorities in the field. It will be the indispensable handbook on the subject for some time to come.

Since they were first discovered by Europeans, the Eskimo have been an object of unfailing interest not only to scholars all over the world but to the general reading public. The ingenuity with which this distinctive ethnic group —the only non-Indian population in the New World—has exploited the world's most difficult and forbidding environment with a bare minimum of resources holds an inherent fascination for us all. It is not surprising that from the beginning scholars have speculated about the origin of the Eskimo and their unique way of life, and have theorized about the history of their conquest of the American arctic. But until recent years such inquiry remained in the realm of speculation and theory. Today, now that archeology has begun to provide factual information, the prehistory of the Eskimo is proving to be far more complex than would have been suspected a few decades ago—but all the more fascinating for that reason. Bandi provides us with a timely and masterly synthesis and interpretation of the accumulated data. From his background in studies of the Paleolithic of Europe he brings to the subject a body of relevant knowledge and experience not possessed by most Eskimo specialists, and in this makes a particular contribution.

An introductory sketch of the recent Eskimo and of early (prior to the days of archeology in the Arctic) theories of their origin is followed by a chapter on "The first discoverers of America" which, although it has little to do with the Eskimo, provides useful background. The author here draws heavily on the views of Müller-Beck, though he coins the term "Gravettoid" to replace the latter's "Aurignacoid," which still appears on the accompanying maps, to the possible confusion of the reader. After a brief but comprehensive historical sketch of archeological work in the American arctic, the main body of the book is occupied by a survey of the results of this work, region by region—a masterpiece of condensation of a vast body of complex material. The concluding chapter offers a concise summary of Eskimo prehistory as seen by the author, who warns that he may have made it appear to have been more simple than was actually the case. Contrasting views are set forth in an appended series of diagrams which show the origin, development, spread, and chronology of Eskimo culture as reconstructed by other leading authorities. There are useful chapter bibliographies, and a supplement includes titles as late as 1968. Illustrations remain the same as in the original German edition, although reproduction of photographs is generally not as good. The maps have been redrawn and expanded.

Eskimo Prehistory is both a survey of present knowledge for the general reader and an invaluable reference for the scholar. We may hope that the author will favor us with periodic revisions in future years as he and his fellow workers shed further light on this remarkable story of human adaptation.

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Another Continent

Geological History of Southern Africa. S. H. HAUGHTON. Published for the South African Chamber of Mines by the Geological Society of South Africa, Johannesburg, 1969. viii + 536 pp. + plates. R10.50.

Southern Africa, the area lying south of the Zambezi to the east and the Cunene to the west, is remarkable for the number of unique and excellently preserved geological features it contains. The Bushveldt Igneous Complex, best exposed but least understood of the world's great layered intrusives; the Great Dyke of Rhodesia, an extraordinary linear feature 400 miles in length but only 3 to 7 miles wide and comprised of four overlapping funnel-shaped layered intrusives; hundreds of kimberlite pipes, depositories both of diamonds and unique rock fragments brought up from the upper mantle; the Fig Tree sediments in the Barberton Mountain region, the world's oldest known fossiliferous rocks; the highly auriferous Witwatersrand Basin; these are but a few examples. But what is the geologic framework into which these and numerous other features fit? Their importance to our fragmentary understanding of earth's history cannot be overestimated, yet it is unfortunately true that the geology of southern Africa is hardly known, let alone appreciated, by most geologists.

In large part the provincialism of attitude reflects the difficulty one faces in trying, as an outsider, to obtain an overall picture of the geology of another continent. It can hardly be done, even by an expert, from the flood of papers on local and specialized topics. In the case of South Africa, we have turned to A. L. duToit's monumental, but unfortunately tedious, *Geology of South Africa*, most recently published in 1954. Haughton has not only provided a worthy successor to duToit's volume, he has prepared a more useful and readable book for students outside Africa by passing over topics such as the pedological, mineral-deposit, and detailed paleontological data included by duToit. The book is written for students in southern Africa, however, and though its style is engaging, it nevertheless stresses many details of stratigraphic terminology and correlation that are of little but local interest. Considering his intended audience, Haughton wisely avoids overemphasis of controversial theories of