scribes actual animal-man relationships and reveals problems of future wildlife management of this unique African animal heritage—for example, too many elephants in Murchison Falls National Park have resulted in basic damage to many trees there.

In Murchison Falls and in Queen Elizabeth Parks, both in Uganda, the tourist can watch wild animals in a leisurely and comfortable manner. As tourists glide around in a shady motorboat among the hippo, elephants and buffalo take their ease near the cool water, white-breasted sea eagles keep watch for fish from trees, and open-mouthed crocodiles lie along the banks. The explanations that accompany the pictures are not the usual captions, but are informative without wasting words—for example, when he mentions the white rhino, Grzimek refers to their rarity, where they still exist, and the fact that eight were recently released in Murchison Falls National Park.

The six chapters are written in popular style, and deal with such subjects as "What will become of the animals of the Congo" (this chapter cites problems that were faced with Congolese independence). Another deals with leopards, and still another with the problems of trying to save the game in the Ngorongoro Crater despite pressures of Masai cattle. This book will not only attract more visitors to the parts of Africa that are described, but should help to arouse worldwide interest in the urgent problems of conserving samples of the fast-vanishing African game species for the benefit of future mankind. The author has contributed in significant ways to strengthening several African national parks and, when requested, has advised governments on how to deal with some of their difficult management problems.

Let us urgently hope that recent plans for modifying the superb Murchison Falls National Park by constructing a power dam inside the park can be reconsidered and the dam located elsewhere so that the park can be maintained as it is described in this book. The message that the author conveys is a challenge to all concerned with endangered species, and is best stated in his own words: "If Africa's wild animals die out now this will be happening within one human generation with nothing at all left of them and nothing coming after them. We cannot unload the responsibility on the Africans. We Europeans and white man bear that responsibility; our descendants will not acquit us of it."

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Sourcebook for Nonspecialists

Sourcebook on the Space Sciences. Samuel Glasstone. Van Nostrand, Princeton, N.J., 1965. xviii + 937 pp. Illus. $9.75.

This book was written under the sponsorship of the National Aeronautics and Space Administration in support of its mandate to provide the widest practicable and appropriate dissemination of information concerning its activities and the results thereof. It deals with space science on a broad front and includes some other relevant material in addition, particularly material relating to spacecraft.

Mathematics has been used rather sparingly, as the presentation is aimed at readers with only an elementary knowledge of physics and chemistry. Further, there are no references, although the names of scientists are frequently mentioned in connection with their particular contributions. These circumstances will make the book somewhat less than satisfying to anyone with a serious interest in space science, but probably will not seriously disturb the audience for whom the book was intended. The book does include a good index.

The material covered includes the historical background of space science, orbits and trajectories, propulsion and power supplies, tracking and communication, satellite applications, the sun and solar system, the earth and moon, the other planets, the universe, and man in space. The chapter on the earth and its environment includes discussions of the upper atmosphere, the geomagnetic field, the radiation belts, and cosmic radiation. The subject matter is generally very well up to date. Only modest detail is included, because the extensive scope precludes anything more. Many workers in the field of space science will undoubtedly find points where they feel that the author's relative emphasis on different factors leaves something to be desired, but, on the whole, the emphasis on various aspects of the subject matter covered seems remarkably uniform. Another commendable feature is the lack of the sort of overlap that so often characterizes books to which groups of authors have contributed.

Errors must creep into any book that contains so many facts, but the number in this book appears to be modest —for example, we may note four successive figures that indicate the wrong sense of rotation for the sun, and the incorrect statement of the length of the year in sidereal days.

This book should prove useful to all those with even a modest background in science who are not well informed on the broad areas of space science and who wish to get a broad view of the subject.

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Selected Papers by F. A. Paneth

Chemistry and Beyond. A selection of papers from the writings of F. A. Paneth. Herbert Dingle and G. R. Martin, Eds. Interscience (Wiley), New York, 1965. xxii + 285 pp. Illus. $6.

Chemists with sufficient interest in the history of their science to do active research in it are rare but not unknown; those who combine philosophical insights with historical perception and who also rank near the top in their science can be counted on the fingers of one hand. Such a one was Professor F. A. Paneth, late of the University of Durham and the Max-Planck-Institut für Chemie in Mainz. This volume of his selected writings is the graceful tribute paid to his memory by his English friends.

The work is divided into four sections: History of Chemistry; Thomas Wright and Immanuel Kant; Meteorites; and Miscellaneous. Most of the articles deal with the historical aspects of their subjects and reveal Paneth's love of the historical way to explanation. He must have been a superb teacher, for these essays show the clarity with which he presented his subject matter and the richness of the historical setting in which he placed them. Yet, Paneth was not a historian of science but a chemist who used history as a teaching aid. He was not committed to re-creating what

was, but in using the historical record to illuminate what *is*. This is most clearly seen in the stimulating article "Chemical elements and primordial matter: Mendeleeff's view and the present position." Historians of chemistry can still read it with profit; it should be made required reading for every teacher of chemistry, especially those who think philosophy to be the natural enemy of science.

The value of the volume is greatly enhanced by a bibliography of Paneth's writings. It is regrettable that no index is provided.

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The Indians of North America

The Native Americans: Prehistory and Ethnology of the North American Indians. Robert F. Spencer and Jesse D. Jennings, Eds. Harper and Row, New York, 1965. xiv + 539 pp. Illus. $10.90.

This impressive book will be rated by many anthropologists as the best one-volume work on North American Indians. The total pagination fails to convey that it weighs 3 pounds and contains 400,000 words, achieved by using 8-point type and a double-columned page. The list price is a bargain for a hardback book that is almost twice as long as its competitors. The volume contains 90 pages of archeology by Jennings, 19 pages on language by Spencer and Charles Dibble, 371 pages of areal ethnography by six other authors, and a 17-page terminal chapter on acculturation by Kenneth Stewart, who also wrote one of the areal sections.

The most original and welcome part is that on archeology, for Jennings provides the best overview of the North American continent to date. In addition to describing the content area-by-area, he accounts for the similarities and differences by postulating diffusion, independent invention, migration, and other processes of culture change. This is also done in the archeological introductions to the chapters on the Southwest, the Southeast, and Meso-America, where one may read that certain aspects of culture originated in Meso-America and were spread by diffusion to other areas. Other chapters concerned with ethnography stay more within their own boundaries and have less to say about the origin of the cultural manifestations they describe.

Spencer's section on language is among the best treatments of the subject (of its length) for the nonlinguist, and Dibble's brief account of Aztec writing is excellent. Kenneth Stewart's chapter on acculturation is also a good summary, although it contains little that is news for the anthropologist.

The continent is divided into eight major culture areas with some minor subdivisions which bring the total areas to 12. Although this scheme differs from all previous ones in some respects, it is acceptable for the most part. The most glaring defect is the lumping of northeast Mexico with Meso-America. This apparently follows Kroeber and ignores a mountain of dissenting evidence from Swanton, Beals, Kirchoff, Massey, and Driver. Northeast Mexico was literally a cultural sink, no more complex than the Great Basin of Nevada and Utah. The boundary between the hand-to-mouth nomads of this area and the high sedentary cultures of Meso-America was one of the sharpest on the continent and should not be ignored in any areal scheme, no matter how simple.

The ethnographic sections describe from one to four typical societies for each area. On the whole the choice of tribes is good, but one may question why William Wallace chose the Hupa and Mohave for California when both fall outside the boundary of the California culture area as given on his own map (p. 230). The Penobscot are also a poor choice for the northeastern United States, because Speck, the author of the book condensed by Elden Johnson, places them in the eastern Sub-Arctic.

Most illustrations are carefully redrawn from previously published ones, as the acknowledgments say, but 12 in the ethnographic sections are original line drawings of full-page size with captions, not artistic gems, but packed with information.

Typographical and other petty errors can be found every few pages in some chapters, but few will change meaning for the general reader and fewer still for the anthropologist. Not even this one—"an average house could measure 40 feet in length by 30 ins. width" (p. 173)—is likely to confuse many readers. More serious is the following contradiction which involves two authors: (p. 285) the earliest date for maize is given as 5000 B.C. in Puebla, Mexico, and in the United States as 4000 B.C. at Bat Cave, New Mexico; (p. 487) "The earliest maize known is primitive pod-pop corn from Bat Cave, New Mexico, going back at least to 2000 B.C." MacNeish (1964), in an article that is not cited, gives 6500 B.C. in Mexico as the earliest find of maize.

Although I concede that nine anthropologists know more about Indians than one, this joint work suffers from too great a time lag between completion of many of the sections and actual publication. For instance, on page 285, in the chapter on the Southwest, there is no reference to work on domesticated plants published after 1958; and, on page 440, in the chapter on Meso-America, none to work later than 1960. A tabulation of the dates of all references cited in the ample terminal bibliography reveals that only 15 of the works cited were published in 1961, 14 in 1962, and none at all during 1963 or 1964.

Despite these caveats, and a too short index, this book will be widely used for text and reference and will take its place among the major syntheses of knowledge on North American Indians.

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On Cultivating the Sea

Maurice Aubert's *Cultiver l'Océan* (Presses Universitaires de France, Paris, 1965; 212 pp., F. 16), an optimistic treatment of the possibilities for cultivating the sea and its environs, is written in a purple variety of French that concludes as follows: "Que sur la moire obscure des mers s'allument les myriades de diamants des phosphorescentes noctiluques et l'homme dont la connaissance contemplative devient action, l'homme saura que, dans cette nuit océane, une richesse est née pour lui."

To be sure, the author is not unaware of the difficulties of cultivating the ocean and has assembled an interesting lot of information between his phosphorescent passages. But collecting man's birthright from the sea will not be an easy matter.

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