

record, but Simpson's reluctance to dwell upon them is understandable and in good taste. Students of the causation of scientific achievement may ponder his great productivity both under the stress of personal difficulties and under far more agreeable circumstances, as in his various collaborative efforts with his wife, the psychologist Anne Roe.

A final chapter defends some of the theories and principles underlying his work that have been attacked by younger students. In summary he writes, "It is as if for each of these questions . . . I had entered the ring, fought my best, delivered and received many a hard blow, and achieved a tie." Most of his contemporaries would give him a higher score.

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Plains Archeology

Prehistoric Hunters of the High Plains. GEORGE C. FRISON. Academic Press, New York, 1978. xiv, 458 pp., illus. \$29.50. New World Archaeological Record.

Before the advent of the barbed wire fence and the steel plow the only way to make a living in the rigorous environment of the northwestern High Plains centering on Wyoming was by hunting and gathering. American Indian men and women cooperated in these endeavors for at least 12 millennia before the first Europeans hastily crossed the region on their way to more promising lands on the Pacific slopes. Eventually some of these newcomers adapted themselves to the region, mainly by cattle ranching, but only after the mainstay of the aboriginal economy—the bison—had been essentially exterminated by gunpowder and greed.

George Frison, the author of *Prehistoric Hunters of the High Plains*, is a member of one of the pioneer ranching families who learned to cope with the sometimes devastating, sometimes highly productive weather conditions that sweep through this land at regular intervals. Perhaps only a native of this often bitter region could fully appreciate the difficulties of surviving in it without the advantages of modern technology. Frison has gathered together in this volume a well-organized, clearly written, and beautifully illustrated set of insights into the subsistence systems of the aboriginal inhabitants. This constitutes a solid, down-to-earth attempt at an ethnography

of the many human groups who successfully lived in this region from the Clovis mammoth hunters until the final heyday of the Plains buffalo.

The study paints a clear picture of human adaptation to this region by exploring how its inhabitants tackled the ever-present problem of how to obtain and process meat. Much of the time they had to resort to small mammals as well as plants gathered by the women to supplement their diet, but most of the known archeological sites are monuments to their prowess and ingenuity as hunters. Although methods for procuring antelope, sheep, deer, and elk, as well as mammoth, are discussed, most of the book concerns techniques for hunting bison, always the most abundant Plains herd animal. Especially valuable interpretations of the archeological evidence concerning butchering techniques are based upon Frison's experiments using replicated stone and bone tools made from local materials.

After an initial survey of the long cultural sequence of the Northwestern Plains, Frison interprets the field evidence he has accumulated over the last 20 years. After presenting the evidence that the Colby mammoth kill was used during winter as a deep freeze where butchered elephant cuts were stacked, he discusses the Hanson site, one of three known Folsom occupation sites on the Plains. As examples of later Paleo-Indian bison procurement methods he compares his recent reexcavation at the Agate Basin kill site with findings from the Casper site, a full account of which he has already published. The Early Plains Archaic is introduced by a discussion of the Hawken site, whose occupants still hunted giant bison (*Bison occidentalis*) with large, side-notched points in arroyo traps as late as 6400 years ago. About 4500 years ago, after a hiatus when the hunters evidently retreated to the mountains because the high Plains became too arid to support large bison herds, the Middle Archaic hunters readapted themselves to hunting bison in arroyo traps and bison pounds. Buffalo jumps with long drive lines became a major means of procurement during the Late Prehistoric Period, during which time, to judge from the abundance of sites, both the bison and their human hunters were most abundant.

Any Plains archeologist must have this book, and any professional or non-professional person interested in the history of man the hunter will find it fascinating reading. Any archeologist who teaches an introductory course in the field by stressing the scientific thinking

processes that an archeologist should use in tackling a problem will find it invaluable as supplementary reading. As extra gems for the specialist there are appendixes by John Albanese on the archeology of the region, by Cary Madden on mammoth taxonomy, and by Frison on rock art and human osteology.

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Transport Physiology

Transport of Ions and Water in Animals. B. L. GUPTA, R. B. MORETON, J. L. OSCHMAN, and B. J. WALL, Eds. Academic Press, New York, 1977. xx, 818 pp., illus. \$62.50.

Comparative Physiology. Water, Ions and Fluid Mechanics. Papers from a conference, Crans-sur-Sierre, Switzerland, Sept. 1976. K. SCHMIDT-NIELSEN, L. BOLIS, and S. H. P. MADDRELL, Eds. Cambridge University Press, New York, 1978. xii, 360 pp., illus. \$42.50.

Since August Krogh wrote the first monograph on osmotic regulation in aquatic animals in 1939, the study of ion and water transport and regulation has expanded beyond the capacity of a single person. The two books under review help to overcome the resulting difficulties of communication.

The 30 essays in *Transport of Ions and Water in Animals* are dedicated to J. A. Ramsay, to commemorate his retirement from the chair of comparative physiology at the University of Cambridge. Ramsay has made fundamental contributions to the elucidation of osmoregulatory mechanisms in invertebrates, especially insects. To study the function of the excretory organs in these small animals he developed microtechniques that permitted analyses of nanoliter samples. Most appropriately, therefore, the introductory essays in the book review recent progress made in the use of microtechniques, from microperfusions of tubules of kidney and other excretory organs to electron probe x-ray analysis for the determination of ion concentrations in subcellular compartments. Several essays deal with general and theoretical aspects of transport mechanisms and transport models. The remaining 22 essays cover the subject at levels ranging from transport across cell membranes to osmoregulatory adaptations of whole organisms to their environments. All larger groups of animals are represented, but half the papers deal, exclusively or partly, with transport processes in insects,