book should make it excellent as a textbook. Its integration of chapters, overview of the subject, and, in some cases, novel developments should also make it most useful to established researchers of animal foraging.

GRAHAM H. PYKE
Department of Vertebrate Ecology, Australian Museum, Sydney, N.S.W. 2000, Australia

Sign Language and the Brain

What the Hands Reveal about the Brain. HOWARD POIZNER, EDWARD S. KLIMA, and URSULA BELLUGI. MIT Press, Cambridge, MA, 1987. xx, 236 pp., illus. $25. MIT Press Series on Issues in the Biology of Language and Cognition. A Bradford Book.

One approach that has been frequently used by researchers in neurolinguistics is to examine the linguistic functioning of individuals who have suffered various kinds of brain damage. This is the approach taken by the authors of this book, but the six subjects they chose for their investigation of brain-language relations are special: they are users of sign language, not oral language.

Although the linguistic functioning of brain-damaged deaf signers has been studied before, no previous study has so carefully selected subjects, so thoroughly documented the site and extent of their brain lesions, or so extensively examined their language functioning. Three of these subjects had left- and three had right-hemisphere lesions. All had used American Sign Language (ASL) for most of their lives and were fluent in it before they suffered brain damage. They had deaf spouses and associated with other deaf persons in the community. Their acquisition and use of language were therefore similar to those of oral-language users who suffer brain damage.

The central issue addressed by the research is whether or not language is organized in the brains of signers in the same way as it is for oral-language users. The authors begin by describing in detail the similarities and differences between the visual-motor system used by signers and oral-language systems. Signs are made up of the features of shape, movement, and place, which are roughly comparable to the phonetic features of sounds in words. Like oral language, sign language has a morphological system that marks, for example, word class, aspect, and tense; but, say the authors, whereas oral language marks such notions sequentially, "ASL tends to transmit structural information in a simultaneously layered fashion" (p. 107). Word combinations in sign are primarily spatially organized, whereas in oral language they are temporally organized. (One might argue about the extent to which oral language is temporally sequential given co-articulation effects, intonation, and multiple representations for words that must be processed by the listener, but this does not take away from the essential argument.)

The data from these six subjects make clear that sign language, despite its visual and spatial nature, is, like oral language for most people, represented in the left hemisphere: the three subjects with left-hemisphere damage all have linguistic problems, whereas those with right-hemisphere damage do not, though they have severe visual problems. A further finding is that those with left-hemisphere damage suffer particular difficulties depending on the site and extent of the lesion: one subject is agrammatical and nonfluent, similar to a Broca's aphasic, another has difficulty with the features of signed words and with pronominal referencing, and the third has difficulty, in particular, with morphology. Not all of these difficulties are identical to those suffered by speaking aphasic subjects with lesions in corresponding sites. The authors conclude that as deaf individuals acquire and use sign they use the potential structures in the left hemisphere to organize and represent aspects of their language, just as hearing persons do. However, the modality of the language may determine which structures are recruited in that hemisphere.

What the Hands Reveal about the Brain is sometimes repetitive, perhaps because some of the chapters are based on previously published papers. However, the book holds one's attention. Its authors pose important and fascinating questions and pursue the answers in a manner that indicates a deep knowledge of language.

PAULA MENYUK
Language Behavior Program, Boston University, Boston, MA 02215

Zooarcheology

The Archaeology of Animals. SIMON J. M. DAVIS. Yale University Press, New Haven, CT, 1987. 224 pp., illus. $27.50.

Zooarcheology, the study of animal remains from archeological sites, is a relatively new field, and the development of a consistent methodology is still under way. This is partly because animal remains come from many different kinds of sites, which present the zooarcheologist with varied problems, such as the separation of scavenging from hunting in early sites and of herding from hunting in much later ones. The quality of preservation also varies widely and requires methodological accommodation. Individual zooarcheologists tend to develop methodologies based on their own orientation and experience, and this is reflected in the divergent perspectives of many recent books on faunal analysis. In this book, Davis attempts first to explain some of the methods he thinks are important in zooarcheology and second to summarize the history of human-animal interactions, from the Plio-Pleistocene to historic times.

The text closely reflects Davis's own interests and background, especially his extensive research on late Pleistocene and Holocene faunas from the Near East. Understandably, it is strongest where his experience is greatest. However, it also draws upon examples from other parts of the world, supported by numerous fine illustrations. The emphasis is mainly on mammal bones, again reflecting Davis's own expertise, but mollusc and fish remains are also considered, particularly in a chapter on seasonality of site occupation.

Perhaps the book's weakest aspect is its treatment of quantification, a subject that concerns all zooarcheologists. The use of bone measurements to distinguish domestic animals from their wild precursors, to construct age profiles and sex ratios, and to infer mean individual size is adequately covered, but the more complex question of measuring taxonomic abundance is hardly addressed. Davis mentions some of the more important abundance measures, such as the number of specimens identified to a species (the NISP) and the minimum number of individuals (the MNI), but he does not discuss their respective merits and deficiencies. This is a serious shortcoming in a book designed to introduce readers to modern zooarcheology.

The second part of the book, a survey of human-animal relationships through time, is more successful. To summarize "our hunting past," Davis focuses on several major topics, such as hunting versus scavenging in very early sites, Quaternary extinctions, and the peopling of new worlds, including Australia, the Americas, Madagascar, and New Zealand. Partly on the basis of his own analyses of fossil faunas from Cyprus, he provides a particularly fascinating account of how Neolithic colonization of the Mediterranean islands probably contributed to the extinction of many endemic species, including a small antelope (the "mouse-goat"), pygmy elephants and hippopotami, dwarf deer, and giant mice and dormice.

The high point of the book is probably its treatment of animal domestication. Davis recognizes three major domestication cen-