But it may be a long while before anyone succeeds in organizing such an enormous amount of relevant information into such a useful and compact volume.

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Recognition Behavior

Comparative Social Recognition. PATRICK COLGAN. Wiley-Interscience, New York, 1983. xvi, 282 pp., illus. $37.50.

"Social recognition" refers to an individual's ability to discriminate important social attributes of other individuals or groups: species identity, social group membership, sex, genetic relatedness, and social and reproductive status, among other traits. Research on these abilities has a long and checkered history that reflects the importance of the topic and its multidisciplinary attraction. With the publication of *Comparative Social Recognition*, there is now available an encyclopedic description of the literature (largely animal studies) on social recognition.

This book poses the general question, "What processes are operative in what species to produce what recognition behavior?" (p. vii). In grappling with answers, Colgan considers (i) the role of different sensory systems, (ii) how discrimination abilities (based on learning, including habituation and imprinting) develop, and (iii) the relationship of social recognition to central issues in evolutionary biology. Some of these issues include the genetic basis of recognition, intra- and interspecific communication, living in social groups, competition and dominance, and aspects of reproductive behavior such as assessing and choosing mates. The book is "comparative" in that each chapter is taxonomically organized, reviewing the capabilities of various groups (invertebrates, amphibians, reptiles, birds, and so on) to make social discriminations.

The importance of Colgan's subject to both proximal (immediate causation) and ultimate (evolutionary adaptation) studies of behavior is revealed by some exemplary questions: What is the role of crickets' songs in species identification and speciation? Although kin might be identified as familiar rearing associates (siblings = nestmates, for example), are relatives encountering one another for the first time recognizable? What sensory systems are used by different taxa to distinguish sex, reproductive condition, and competitive and individual identity? How do phenotypes experienced by individuals during development affect their later preferences for social partners, including mates? If ecological factors have been critical in the evolution of social systems, how might these factors also account for the evolution of different recognition systems?

Clearly, the major strength of the book is that it surveys and summarizes an enormous body of widely scattered research (there are approximately 1400 reference citations in the 188 pages of text). Because of the vastness of the topic, most readers will find some omission that perplexes them (for me it was M. Leon's work on dam-offspring recognition in rats), but no single source provides as thorough a review as this book. Unfortunately, however, Colgan rarely goes beyond cataloguing studies to critique them, to analyze theoretical issues, to consider methodologies, or to develop a comprehensive framework within which research might proceed.

Let me suggest some sample topics that beg to be treated in a book such as this one. First, the meaning of "recognition" must be faced squarely (Colgan treats this matter in one paragraph), given that some investigators eschew the term completely whereas others use it regularly and interchangeably with "identification" and "discrimination" (as I have for convenience). Although most behavioral scientists infer recognition (substitute some other term if you like) on the basis of observable differential responses to stimuli, the word has a variety of different connotations. Also worthy of treatment are the experimental designs and techniques used to study recognition. For example, when a subject exhibits discrimination by showing a preference for one of two stimulus animals (a commonly used paradigm), might not all three individuals actually be subjects? When the primary sensory system mediating recognition is investigated by ablating that system, what control group or groups can be tested to distinguish the specific impairment of one system from a more widespread, systemic effect? Finally, what kind of data distinguish the identification of classes of individuals (siblings versus cousins, for example) from true individual identification (sib A versus cousin B)?

The comparative analysis of recognition abilities and mechanisms, the study of the physiological and sensory bases of these mechanisms, and deciphering the relationship of phylogeny, ontogeny, and social organization to recognition collectively highlight the importance of social recognition to behavioral analyses. This book gives us an easy-to-read overview of the diverse and voluminous research that deals with recognition. In doing so, it also lives up to its label supplied by Colgan, an "aperitif volume." What we need now is for an intrepid soul to present a theoretical infrastructure that will foster more interdisciplinary thinking, generate testable hypotheses, and uncover some generalizations that have not yet emerged.

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A Cultural Chronology

Ceramics, Chronology, and Community Patterns. An Archaeological Study of Moundville. VINCAS P. STEPONAITIS. Academic Press, New York, 1983. xxii, 378 pp., illus. $46. Studies in Archaeology.

It has been almost 20 years since the cultural process clarion was sounded in New World archeology, calling most of a whole generation of archeologists to join in the search for explanations of cultural evolution. Outfitted with righteous fervor, the scientific method, and modern multicausal negative and positive feedback loops, they turned away from the pathways of culture history. Their goal was not mere description of temporal change in prehistoric material culture and lifeways but rigorous and convincing explication of how and why human cultural systems, in general and in particular, evolved more complex organizational structures.

Two decades of intense focused research in various parts of the world, from Iran to Hawaii, have clarified a number of relevant variables in cultural evolution (among them population growth and aggregation, administrative centralization, increasing energy input, environmental and cultural circumscription, specialization of production, and exchange), which have in turn been tied together in different cause-and-effect networks in a number of quite elegant processual models.

It has proven quite difficult, however, to determine how closely these theoretical models reflect prehistoric reality. To test them archeologically requires the ability to measure accurately sometimes subtle changes in variables through time and to establish which variables change first in rapidly responding cultural systems. The establishment of temporal pre-