BOOK REVIEWS

The Clovis Question

The First Americans. Search and Research. TOM D. DILLEHAY and DAVID J. MELTZER, Eds. CRC Press, Boca Raton, FL, 1991. x, 310 pp., illus. $49.95.

Clovis. Origins and Adaptations. ROBSON BONNICHSEN and KAREN L. TURNMIRE, Eds. Center for the Study of the First Americans, Corvallis, OR, 1992. viii, 344 pp., illus. $38. Peopling of the Americas. From a symposium, Toronto, 1987.

Discoveries in the 1920s and 1930s at sites such as Folsom and Clovis in New Mexico demonstrated that people were in the Americas by Late Pleistocene times. Yet since the 1950s two general viewpoints have existed concerning the first New World inhabitants. Many scholars argue that the earliest occupants south of the Wisconsinan Ice Sheets can be equated with "Classic" Clovis of the High Plains and southwestern United States, dated to about 11,200 to 10,900 years ago. This Clovis is known from a relatively large number of sites characterized by standardized, well-made tools, of which the stone spear point with short grooving or fluting of the base is most characteristic. A contrasting viewpoint is presented by researchers who, drawing upon a series of widely scattered localities throughout the Americas yielding largely what are argued to be simple cobble or flake tools, claim evidence of earlier Pre-Clovis occupations. Such localities are extremely rare given that they have been assigned ages ranging from 13,000 to more than 100,000 years.

With *The First Americans*, Dillehay and Meltzer take a major departure from previous works on this controversy. Recognizing that debate has raged for some time with no clear consensus emerging, they argue that it is time to develop new and more explicit theoretical frameworks and tools. These new frameworks must pay more attention to how and why the New World was peopled instead of solely when and to theorizing within a broader framework than has been traditionally used. This new construct would encompass explicit interdisciplinary research, draw on lessons from the past history of the debate, and be informed by a wider sphere of accumulated anthropological and other knowledge. It would also include modeling, within this expanded knowledge base and especially that concerning human colonization of the globe and forager adaptations, what kinds of archeological records may be produced under different colonization processes.

The volume consists of 12 chapters organized into three sections, excluding commentary papers by Thomas Lynch and Lewis Binford. The volume opens with a paper by Meltzer addressing the historical background of the controversy and especially debates over the first inhabitants prior to the Folsom discovery in 1927. Modern Pre-Clovis advocates argue that real evidence of glacial occupation was known prior to and after the Folsom discovery but was rejected because of "paradigm bias," and they suggest that similar biases lead to their claims' being rejected. Meltzer refutes such arguments and shows that the glacial barrier was breached at Folsom by "undeniable artifacts in indisputable contexts" and not by the development of a new paradigm.

In section 2, several authors review "tools" for resolving the controversy. Included are papers on criteria for recognizing assemblages produced by human rather than natural processes and on the Wisconsinan environmental context of migration. R. E. Taylor's review of the use of certain dating methods to document the timing of human activity is a major contribution. A basic theme is that physical scientists, relying on experimental and unproven techniques, have often advocated Pre-Clovis age assignments for sites over "mere" geological and archeological objections. That such age assignments were subsequently deemed incorrect implies a need for more interdisciplinary research and suggests that a great deal of time, energy, research funding, and publication space has not been efficiently used. Taylor's discussions of the relationship between sidereal and ^{14}C years in the Late Pleistocene also have important implications with regard to the actual rapidity with which Clovis-related peoples or technology spread throughout large areas of the Americas.

The final chapters in this section draw upon the Old World archeological record. For example, Karl Butzer uses this record to suggest where Mid-Wisconsinan occupations of the Americas might occur. After noting contrasts between the Mid-Wisconsinan Old World record and subsequent developments in foraging strategies during the Upper Paleolithic, Butzer argues that a comparable Mid-Wisconsinan New World record should exhibit site locations very different from the subsequent Upper Paleolithic–like Clovis development. He specifically recommends searching for Pre-Clovis evidence in areas that had topographic constraints on game, very predictable resources, and a high standing animal biomass. Butzer argues that the few North American areas with such features have not been thoroughly searched.

Section 3 addresses the general topic of migration. Dillehay discusses a long-neglected but potentially important factor in migration into new areas, namely the role of diseases in influencing the success, failure, and nature of those migrations. Two other papers discuss colonization as it is represented in the Old World. John M. Beaton's paper on Australia is especially enlightening. Since the 1960s, colonization dates for that continent have been pushed back from 10,000 to 40,000 years ago. Beaton stresses that this earlier record was found without an active search and that the artifacts are easily recognized as such—a situation that does not bode well for the intractability of Pre-Clovis claims. Beaton also develops two contrasting models of how areas might be colonized and discusses the archeological signatures that would result from each model.

Though it is true that several of the volume's themes have been touched on previously, nowhere else have these themes been considered in such a comprehensive, systematic, and thought-provoking manner. This groundbreaking book is essential reading for anyone concerned with the first inhabitants of the Americas or with colonization scenarios in general, and papers such as those of Taylor and Dillehay deserve an even wider audience. One hopes that future researchers will build on this foundation by integrating information from other disciplines such as demography, genetics, and linguistics and by expanding comparative coverage to include other colonizing events such as the Paleo-Eskimo spread through the Arctic. In addition, one can echo Binford's comment that expanded consideration of ethnographic data on foragers could be of immense aid in modeling forager behaviors in colonization contexts. To date, such information has been used haphazardly. Criteria useful in developing and evaluating models, particularly constructs documenting and explaining systematic relationships between variables such as population density, food storage strategies, mobility patterns, presence or absence of tool-making specialists, and environmental variability frequently have been ignored in Clovis debates.

Vignette: Innocents' Advisory

A few years ago I was part of a panel of researchers who were asked to describe our "work in progress" on gender in science and technology at one of the regular meetings of the MIT women faculty. I noticed that some of the assistant professors in science appeared to disapprove of what they were hearing. Eventually one stood up and said that the issues we wanted to investigate simply did not exist in the scientific community, that by the objective nature of the enterprise, issues of gender, which were issues of bias, simply did not exist. . . . Several of her friends nodded in agreement. . . .

As I hesitated in order to formulate a direct but polite response . . . a senior, influential, and powerful science professor intervened. She said that the junior faculty did not yet see gender as an issue in their work because they had not yet gotten to the career stage at which they would be defining fully independent research projects requiring their own command of significant resources. At that moment, she said, these women would realize that gender was an issue in science.

—*Sharon Traweek*, in *Science as Practice and Culture* (Andrew Pickering, Ed.; University of Chicago Press)

Clovis: Origins and Adaptations is the first book-length treatment of the Clovis phenomenon. With some exceptions, the 20 chapters are not overtly theoretical, and most largely synthesize early archeological evidence for various areas of the Americas and discuss how that evidence bears on the issues posed in the volume title. The book makes it clear that there is little consensus on these issues. For example, with regard to origins, some contributors argue there are no good precursors of Clovis in Alaska. Yet Ted Goebel *et al.* in a detailed analytical and comparative study argue that the "Nenana Complex" of Alaska is contemporary with and perhaps earlier than Clovis, is technologically identical except for the absence of fluted bifaces, and thus could be a Clovis precursor. Similarly, although some authors accept the long-held stereotype of Clovis and related peoples as primarily hunters, others argue for a more general, broader subsistence strategy or take a position somewhere between the two extremes.

Although some chapters deal with assemblages that in this reviewer's opinion postdate, and thus are of little relevance to, Clovis, and some of the information and ideas have been published elsewhere, the volume provides a detailed compendium of knowledge essential to our eventual understanding of the Clovis phenomenon. The volume also serves to isolate and make explicit several problems with past approaches to Clovis that have impeded progress. Perhaps the most basic problem, emphasized by contributors such as Willig, Lepper, Meltzer, and Bonnichsen, is a lack of attention to carefully documenting variation in "Clovis" and, consequently, substantial difficulties in giving the term a precise definition. Although there is a real need for innovative theoretical approaches, we must overcome the largely impressionistic, normative, and monolithic characterizations of Clovis that have been used in the past. A good beginning would be detailed attribute-based characterizations and comparisons of fluted-point assemblages. Until this is done, we cannot measure in a precise way the relationships between assemblages or meaningfully address questions concerning the sequence and processes by which fluted points and associated technologies spread throughout large areas of the Americas.

Christopher J. Ellis
Department of Anthropology, University of Western Ontario, London, Ontario, Canada N6A 5C2

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Auditory Developments

The Neurobiology of Hearing. The Central Auditory System. RICHARD A. ALTSCHULER, RICHARD P. BOBBIN, BEN M. CLOPTON, and DOUGLAS W. HOFFMAN, Eds. Raven, New York, 1991. xvi, 491 pp., illus. $150. Neurobiology of Hearing Series.

Almost all animals localize sound sources in their immediate environment, mostly by comparing inputs from the two ears. Studies of binaural processing not only provide information about sound source location but often reveal fundamental characteristics of the processing of sensory signals. Similar lessons have been learned from studies of how animals use vocal signals to communicate, although we know much less about perception of such complex signals in the central auditory system.

This second volume in the Neurobiology of Hearing Series comprises 18 chapters that examine the anatomy, physiology, and pharmacology of central auditory processing in mammals. The first two chapters provide an overview of the ascending and descending auditory pathways, and subsequent chapters examine physiology, anatomy, and pharmacology at different levels of the central auditory system. The final chapters offer a more general look at sound localization and at development. Most of the chapters are of high quality, and the book summarizes many significant increases in our understanding of auditory function.

Although we now know a great deal about the structure and function of the components of the central auditory system, including their connections and synaptic relationships, our understanding of the processing of complex auditory signals is still in its infancy. Indeed, many of the processes by which we encode and translate complex stimuli remain a mystery to researchers in all areas of sensory neurobiology. In this volume, Sachs, in a chapter on the neural processing of complex sounds in the cochlear nucleus, makes the point that the field might do well to focus on both the cellular and the systems level. At the cellular level, we strive to understand the mechanisms of signal processing in individual auditory nuclei. This may be achieved by measuring the structure, electrical properties, and connections of individual cells in order to construct models of their signal-processing function. This approach permits analysis of the components of the neural machinery responsible for auditory signal processing. The individual chapters on the cochlear nuclei, superior olive, auditory midbrain, thalamus, and cortex provide clear and thoughtful summaries of what we know about the cellular neurobiology of the central auditory nuclei.

Part of the effort should certainly focus on such mechanistic issues, but there is also reason to study stimulus representation at the systems level and to shift part of the focus to the processing of complex stimuli. This would move the field in the direction of higher auditory function, which is obviously important to anyone who has considered the problems of speech perception, for example. Unfortunately, the emphasis on the cellular basis of coding mechanisms has not yielded a good understanding of responses to complex stimuli. A number of