glish as *A History of Astronomy* in 1961), appears this bold new attempt to summarize five millennia of the science of the heavens. The decades since Pannekoek's volume have seen not only astonishing advances in astronomy but also the rise of the discipline of the history of science. In this new history of astronomy the author does much more than bring us up to date on trends through the launch of the Space Telescope; he also draws on 50 years of historical research to illuminate astronomy from antiquity to the present. The book appears as part of the Norton (Fontana in the United Kingdom) History of Science, a series whose express purpose is to bring the specialized interpretations and conclusions of history of science to a wider audience, specifically students and the educated general reader. Volumes on environmental science, chemistry, and technology have already been published, with six more volumes promised. None could be more challenging to write than this volume, which attempts to cover 5000 years of history and render it intelligible to a wide audience. Nevertheless, North succeeds to a considerable extent.

Unlike Pannekoek, North is a historian of science rather than an astronomer, but he is well schooled in the technical aspects of his subject. A professor of the history of the exact sciences at the University of Gröningen, past president of the history of astronomy Commission of the International Astronomical Union, and a prolific author whose scholarship in the history of astronomy has ranged broadly, North is well suited to the task. He proceeds chronologically, and on the crucial question of balance has chosen to devote half of the book to the period before Copernicus, a quarter to the four centuries from Copernicus through the 19th century, and the remainder to the 20th century. He not only treats the classical Western tradition but also includes chapters (albeit sometimes brief) on ancient Egypt, Mesopotamia, China and Japan, Pre-Columbian America, India and Persia, and Islam. At each end of the chronological spectrum are developments hardly dreamed of in Pannekoek's day, from archeoastronomy to the opening of the electromagnetic spectrum and the surprises of space astronomy.

For a synthetic volume such as this, many choices must be made, and not everyone will be happy with North's approach. Social historians, for example, will not be entirely pleased, for North has chosen to concentrate on the content of astronomy rather than on issues of patronage, politics, and the "social construction" of knowledge, even though all of these aspects occasionally appear. One might conceive a history proceeding thematically rather than chronologically, so that the developments internal to positional astronomy, descriptive astronomy, and cosmology could be better seen and the relationships among the three made clear. And others would undoubtedly have given different emphasis to different eras. But these alternatives serve only to highlight North's achievement: he has made his choices and consummated them, and the result is a lively history of astronomy that does credit to the approach chosen and lays the foundation for others who may wish to take other approaches from the diverse fields of history of science and science studies.

North has avoided what he calls "the clutter of footnotes," which may be an appropriate decision for the intended audience but which a century hence may also render the book less useful than, for example, Agnes Clerke's fully annotated *Popular History of Astronomy During the Nineteenth Century* (1908) is today. This is somewhat compensated by an extensive bibliographic essay that will point readers toward the modern scholarship. The illustrations, though not always of good quality, serve their purpose and allow the volume to sell at an affordable price. In other respects the book is well produced, and I found only one amusing error—a caption that referred to the "Fraunhofer reactor" rather than the "Fraunhofer refractor."

We may still look forward to much more specialized research in history of astronomy and to the volumes of the multi-authored *General History of Astronomy* slowly emerging from Cambridge University Press. But such a synthetic history as North's comes along only once a generation or two in its subject. This one will serve its purpose admirably.

"A Philosopher Giving a Lecture at the Orrery." Painting by Joseph Wright of Derby, 1734–1797. [From the dust jacket of *The Norton History of Astronomy and Cosmology*; Derby Museum and Art Gallery]

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Rites of Revitalization

Tombs for the Living. Andean Mortuary Practices. TOM D. DILLEHAY, Ed. Dumbarton Oaks Research Library and Collection, Washington, DC, 1995. viii, 425 pp., illus. $28. From a symposium, Washington, DC, Oct. 1991.

In the Andes ancestors—the dead—have been an important, even structuring, concern of society. *Tombs for the Living* is an effort to illuminate the nature of past and present Andean societies by bringing archeological, ethnohistorical, and ethnographic perspectives to bear on mortuary data from them. All the contributors have adequate, sometimes excellent databases. What varies is their success in postulating meaningful questions that mortuary data can help answer and in applying a fruitful theoretical perspective to the data. The contributions by Buikstra, Dillehay, Drennan, Rivera, and Salomon integrate sophisticated theory and empirical data so well they should interest all archeologists and other scholars concerned with mortuary questions.

Salomon's insightful reconstruction and discussion of late pre-Hispanic highland mortuary practices and beliefs offers probably the closest rapprochement archeologists will ever have with the *huacas*, *mallquis*, and *llactas* that formed the basis of Andean mortuary cults. The paper is particularly interesting for the insight it provides on ordinary, folk-level, shared practices—what was probably (in contrast to the state, or elite or priestly pattern typically picked up by archeologists who still favor excavations in monumental sites) the essence of Andean mortuary behavior. In contrast to Rowe, who sees culture normatively as a monolithic corpus of beliefs and behavior, Salomon presents a subtler reading of the ancestor

Statues in West Mound at the site Mesita A, dating from between A.D. 1 and 800, in Colombia's Alto Magdalena region. "This construction was evidently originally covered over completely by an earthen barrow. . . . The barrow had been so thoroughly wrecked by previous excavation that no trace of any goods that might have been included with the [associated] burial was identifiable." A nearby tomb structure of similar size, however, contained a sarcophagus and fragments of gold, beads, and pottery. [From Drennan's chapter in *Tombs for the Living*]

cult as a "theater of social structure" where "decisions involved in attaching people to the unchanging ancestral core, interpreting ancestral wishes, and regulating living people's access to ancestors, were freighted with unpredictable and mutable effects on group and *personal* interests" (p. 341, my emphasis). This view is particularly manifest in Dillehay's and Drennan's chapters.

Dillehay's ethnoarcheological treatment of burial patterns in the Araucanian culture area of south-central Chile is an anthropological tour de force that exemplifies the concept of the book's title by moving beyond the near platitudes about ancestor worship into the vital world of the survivors, particularly the political survivors who must weather the period of instability and stress that follows the demise of a leader. He considers "social death" and recognizes that there were postfunerary rites of social transformation and political alliance, and that death structures and is structured by time, space, and social, political, and economic relations. The time-reckoning and space-marking functions of Mapuche mortuary mounds Dillehay documents are resonant with other pre-Columbian phenomena such as the Nazca Lines and with the contemporary Peruvian highland practice (in Bourdieu's sense) of creating *chutas* (strips of social space).

On a smaller scale, Bastien's excellent study of the present-day Kallawaya of Bolivia shows that "rituals and metaphors animate the deceased to such an extent that ancestors are active forces within the ayllu [social group] and lives of the living" (p. 374). This theme of the intervention of the dead in the living world is manifested in various of the archeological contributions. Rivera interprets mummification as practiced in the Preceramic Chinchorro society of northern Chile as the revitalization of the dead in rituals of the living. His treatment of the relations between subsistence and settlement pattern and ritual, the comparisons he draws with other areas, and his marshaling of archeological data (including outstanding photographs) are superb. The Chinchorro data are complemented by Buikstra's information on the earliest mortuary rituals known from the Osmore drainage area in southern Peru, which were protracted and whose social role was played out more in the preparation and display of the body than in its final disposal (conceivably relevant to explanation of the mummy bundles found in the Paracas Necropolis, discussed by Rowe).

Drennan masterfully integrates mortuary sites in the Alto Magdalena region of Colombia into another very complete settlement-pattern database. He concludes that survivors felt compelled to commemorate the leader and that leadership was personalized rather than highly institutionalized. On the basis of the paucity of non-perishable grave goods in comparison to the elaborateness of tombs, Drennan cogently argues that "while the individuals buried in the tombs clearly had great personal prestige, there is little to suggest that they possessed much wealth" (p. 96). He cautions that a traditional emphasis on monuments has led us to infer population decline and societal disorder when monuments cease to be built. But Alto Magdalena society became even more centralized after the demise of the permanent funerary monument tradition. Elaborate tombs were no longer needed to reinforce the institutionalized role of leaders. Rather, status was now manifested in chiefs' houses. A comparison with the so-called Classic Maya Collapse and Post-Classic Maya could have been drawn.

Part of a table arrangement (*left*) and baking of bread babies (*right*) for the annual Feast with the Dead, Kaata ayllu, southern Andes. The feast "symbolizes a concurrence of the journeys of sun, ancestors, ayllu, and community." It "coincides with All Souls' Day on the Roman Catholic calendar, but it also marks the end of the dry season." In preparation for the feast, "figurines of babies are made out of dough and baked in ovens. Bread babies are given to people who pray for ancestors and are eaten in commemoration of the dead." [From Bastien's chapter in *Tombs for the Living*]

Despite his cautions on the inherent biases in his sample of 326 Moche burials in northern Peru, Donnan has accumulated an extensive database for his state-of-the-art empirical analysis of Moche mortuary practice. He perceives a "remarkable consistency" over time and recognizes a shared tradition, from the highest to lowest societal stratum.

Carmichael studied a far smaller sample of burials for Nasca on the southern coast of Peru, none excavated by himself and some without the best of accompanying documentation. Carmichael is entrapped in the tired

chiefdom-state identification debate and a unilineal evolutionary framework. Furthermore, he has not contextualized the burial patterns he analyzes within a settlement pattern and larger cultural context as other contributors to the volume have done. Nevertheless, his contention that Nasca was a ranked society is substantiated, and his final paragraphs contemplate the theme of the volume in an interesting, ethnographically informed manner.

Several contributions indicate the usefulness of biological anthropological methods for the archeological study of death. Carmichael's innovative hair analysis determined that several individuals contributed to the human hair wigs found in particular Nasca graves. He posits that human hair was a symbolic link between the living and dead and that hair donors may have belonged to an immediate family or been members of the same lineage or ayllu. With DNA studies archeologists may soon be able to reconstruct these social groups, given sufficient samples. Verano applies his skills as a physical anthropologist to human sacrifice, body parts, and trophy heads. Among other interesting findings, he discovered that fully 85 percent of Nasca trophy heads came from young adult males, "not a random sampling of a living population." It remains for Andeanists to engage classic and new literature on sacrifice worldwide and develop a more complete framework within which to understand this practice in the Andes.

The identification and interpretation of social or ethnic groups is a recurrent theme in several contributions. Verano used stable-isotope analysis of bone collagen present in a Moche V mass burial at Pacatnamu and discovered that at least 6 of 14 victims of mutilation and sacrifice were foreigners. Carmichael correctly cautions against attribution of the generic term "Nasca" to all Early Intermediate Period south coast societies (though he should have excluded Nasca 8 from his own study, as it is largely outside the Nasca artistic and cultural tradition). Part of Buikstra's study concerns local-foreign interaction. She found that though distinctions in cranial form among the Omo group cemeteries indicate ethnic differentiation, material culture did not differ. She emphasizes the need for a multicontextual approach to mortuary studies and is concerned with "the dynamic relationship between social order and such archeologically discoverable phenomena as architectural forms and material culture," a topic of great currency among anthropologists and archeologists and in many other disciplines. Buikstra also considers the meaning of mortuary behavior (from modal to aberrant), emphasizing context and local traditions and advocating a three-pronged approach to the study of mortuary patterns: cemetery organization, grave contents, and human biology, all tested against and complemented by settlement-pattern data.

Tombs for the Living is a major contribution to the Andeanist literature. Indeed, the only glaring omission is lack of treatment of Ecuador's rich mortuary tradition, especially its shaft-tombs. The book should promote much new thinking and theoretically informed fieldwork on mortuary practices in the Andes and elsewhere.

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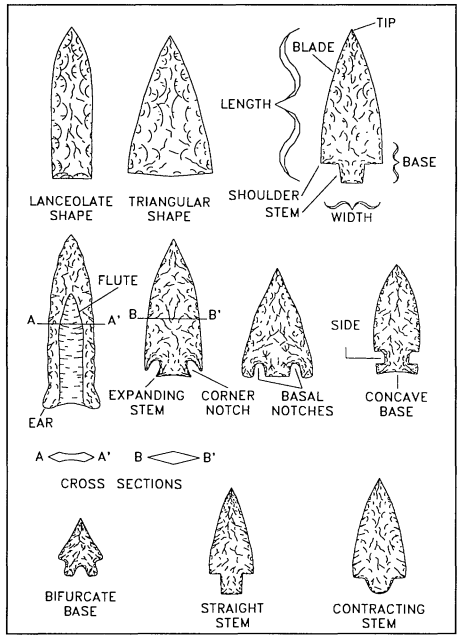
Part of North America

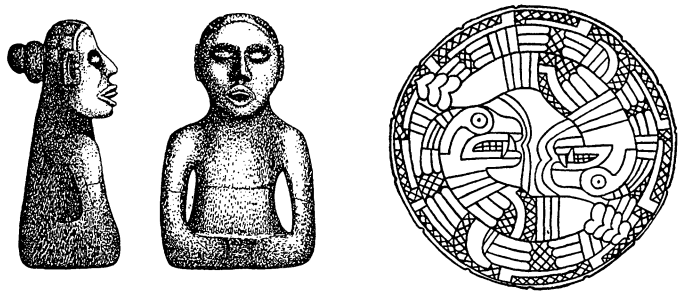
Archaeology of the Southeastern United States. Paleoindian to World War I. JUDITH H. BENSE. Academic Press, San Diego, CA, 1994. xviii, 388 pp., illus. $75 or £58; paper, $34.95 or £27.



"Chipped stone point morphology and attributes." The lanceolate point is "the most distinctive Paleoindian artifact . . . There is a strong similarity of these very complex and difficult-to-make points across large portions of North America" between 10,000 and 8000 B.C. [From *Archaeology of the Southeastern United States*]

During the Mississippi River floods in the summer of 1993, a general from the St. Louis District of the U.S. Army Corps of Engineers was asked on national television whether human modification of the river valley had made the floods worse. He replied that to understand the natural flood patterns one would have to look at the river before the early 1800s, "before there were any people" living in the Mississippi River valley. Actually, people have lived in the valley for over 11,000 years, and between A.D. 950 and 1250 the bottomland east of St. Louis was home to tens of thousands of Native American farmers. These farmers cleared fields for their maize crops, cut timbers for their houses, and built massive earthen mounds and multihectare leveled plazas in towns surrounded by defensive palisades. Bense's overview of southeastern archeology describes this and many other southeastern cultures, in language that even a Corps of Engineers general could understand.

The only previous book-length overview of the archeology of the region was J. B. Griffin's *Archaeology of Eastern United States*, published in 1952. Unlike the dense Griffin tome, Bense's book is aimed at "people who have a limited background in archaeology but are curious enough about archaeology in the Southeast to read a book or take a course on the subject." The book succeeds as an introductory text because it covers the region comprehensively and is comprehensible to nonprofessionals. There are minor deficiencies with respect to both of these virtues, however. Though the book's geographic limits are never pre-



Southeastern Ceremonial Complex artifacts. *Left*, Stone ancestor statue; *right*, stone palette with rattlesnake motif. "The Southeastern Ceremonial Complex reached its peak between ca. A.D. 1200–1400, when complex and paramount chiefdoms developed and the principal elites expressed much of their authority through elaborate rituals and ceremonies." [From *Archaeology of the Southeastern United States*; credited to W. K. Moorehead, 1932, and F. W. Hodge, 1912.]