

In summary, *Museum Cataloging in the Computer Age* is highly recommended.

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Lithic Technology: Making and Using Stone Tools.

EARL SWANSON, editor. World Anthropology, Mouton, The Hague; Aldine, Chicago, 1975. x + 252 pp., illus. \$27.50.

This volume contains a collection of papers presented in a symposium on lithic technology in Chicago in 1973, on the occasion of the IXth International Congress of Anthropological and Ethnological Sciences.

The book treats a wide and somewhat disparate range of topics. One paper provides a brief, but useful overview of some of the major problem areas of lithic technology (Crabtree). Two papers address themselves to the description of probable reduction stages in the manufacture of flaked stone tools (Bradley, Collins). Several articles discuss the results of more specific methodological and experimental studies. These include the use of laser diffraction techniques to aid in identifying the work of individual flintknappers (Gunn), graph theoretic methods of classifying artifacts (Johnson), variability in the morphology of flakes produced by bipolar percussion (Kobayashi), the fracture patterns produced in siliceous materials by thermal alteration (Purdy), probable functions of tools from preceramic sites in Panama (Ranere), problems in identifying the actual technique used prehistorically to manufacture so-called "punch" blades of the Upper Paleolithic (Newcomer), and probable causes of certain peculiar transverse breakage patterns (*languettes* fractures) observed on prehistoric flakes and blades (Lenoir). The remaining papers in the volume deal with such diverse topics as natural patterns of bone breakage due to weathering and disturbance by scavengers (Miller), possible pre-Clovis horizons in the New World and their antecedents in Asia (Dragoo), and problems of projectile point typology in the northern Great Basin (Green). The book closes with comments on the papers (Coe, Epstein) and brief replies by several of the contributors.

The most interesting and useful papers in the volume are those that are directed toward specific, clearly identified problems, that employ methodologies demonstrably relevant to the solution of those problems, and that deal with an actual body of data, be it archaeological or experimental. For reasons of space, only two examples will be discussed here. Gunn utilizes a novel technique (laser diffraction) to characterize quantitatively the variability in flake scar orientation on lithic specimens manufactured by contemporary flintknappers. He then discusses the suitability of various statistical techniques for discriminating the work of each knapper. And finally, he considers, all too briefly, a few of the more general anthropological implications of his results. To his list of possible applications of the methodology, which are aimed largely at the reconstruction of past "lifeways," one may add others that are of more general evolu-

tionary significance (e.g., the detection in early hominid assemblages of developing handedness, an issue of interest to anthropologists concerned with the evolution of language; the recognition of increasing manual dexterity and control in early industries).

Purdy provides a brief, but interesting summary of the characteristic fracture patterns that developed in specimens of Florida chert subjected to heat treatment. Her experiments considered several important variables, including the rate of heating and cooling, the maximum temperatures attained, the total time the specimens remained at these temperatures, and so forth. Her paper would have benefited from a more detailed discussion of the experimental design and of the nature of the specimens used, and in particular from a more quantitative presentation (graphic or tabular) of her results. Archaeologists concerned with thermal alteration of siliceous materials should find of considerable interest the vast and often complimentary engineering literature dealing with thermal and chemical testing of concrete and concrete aggregates. Civil engineers, for example, have long been concerned with fractures in aggregates that result from extended periods of freezing and thawing, fractures that in many respects resemble those produced by the application of heat.

Two general criticisms should be made about many of the papers in the volume. First, very few early studies are cited, a problem noted by one of the discussants (Coe). A more important criticism, aimed especially at the American contributors, concerns the "provincialism" of their citations. The overwhelming majority of the references are to works in English and published in North American or British publications. The remaining few are in French. Central and Eastern European, Asian, African, Australian, and Latin American sources are almost entirely ignored, even when their contents are in English. It should also be recognized that the English version of Semenov's *Prehistoric Technology* is nearly 20 years out of date, and that his own work has progressed considerably in the last two decades.

Although the volume is probably too expensive and somewhat too diverse in content to be used as a classroom text, it is certainly a worthwhile scholarly contribution to the study of prehistoric lithic technology.

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Soil Science and Archaeology. SUSAN LIMBREY. Academic Press, New York and London, 1975. xv + 384 pp., illus. \$21.75.

"Soil" means different things to different people. Informal, archaeological field usage frequently equates soil with sediment or even with the mineral matrix of an occupation residue. Many archaeologists correctly restrict the use of "soil" to paleosol horizons or to zones of post-depositional weathering. Limbrey's book instead works from the orthodox, agricultural premise, and deals mainly with the overall soil environment. In fact, 11 of the 16 chapters could pass for a standard treatise on soil systematics, much like B. H. Bunting's

The Geography of Soil (Hutchinson University Library and Aldine, 1965). It is also not intended to serve as an introduction to laboratory analyses. Instead the author argues that soil fertility and management are important for prehistoric subsistence on the one hand, and that past land use has been critical for the evolution of the soil mantle on the other.

The chapters of Part I ("Soil Materials and Processes") outline the mineral and organic components of soils, the cycles inherent to soil systems, and the effect of geomorphic agents on soil development. This treatment explicitly claims to be rigorous: it is difficult for the nonprofessional to follow, since illustrations are few and the style is parsimonious, but the level of information and interdigitation of facts is also unsatisfactory for the aspiring professional. Part II ("Soils of the Humid Temperate Zone") provides a classification of British soils, following the system of W. L. Kubiena (as utilized in I. W. Cornwall's *Soils for the Archaeologist*, Phoenix House, 1956). It is, however, much more than an inventory, providing a valuable synopsis of pedomorphologic trends from the original Pleistocene periglacial context through the variety of modifications that reflect human use and disturbance since Neolithic times. An earlier example of this British penchant for historical landscape evaluation was provided by S. R. Eyre's *Vegetation and Soils* (Edward Arnold and Aldine, 1963), as focused on the plant cover. Limbrey applies a range of more recent findings to elucidate the evolution of lowland heath, moor, and chalk soils. An archaeological perspective on similar problems can be found in J. G. Evans' *The Environment of Early Man in the British Isles* (University of California Press, 1975). These examples may help draw the attention of American researchers to the possible role of prehistoric peoples in modifying Holocene ecological trajectories in the Eastern Woodlands: the human factor has been essentially ignored in interpretation of the key pollen cores of this area, as well as in synoptic studies of vegetation through time, such as M. B. Davis' recent study of post-glacial successions (*Geoscience and Man*, 13:13-26, 1976).

A brief section (Part III: "Soils of Other Regions") deals with cool-continental, mediterranean, arid, and tropical environments, as well as with intrazonal and azonal soils. Limbrey modestly disclaims sufficient experience to deal with these external areas, but even her abbreviated discussion contains sufficient misstatements that one may question the wisdom of including these chapters without at least a better study of the literature.

The final section (Part IV) on "Soil and the Archaeologist" is of far broader interest. A chapter on archaeology and soil survey includes short sections on disturbed, truncated, and redeposited soils; eolian erosion and deposition; cave contexts; the interrelationships between soil distributions and archaeological sites; and soil maps and mapping. However the absence of any illustrations or explanatory examples reduces their usefulness. The chapter on soils and deposits uncovered during excavation includes description of basic properties (such as color, texture, structure, consistency, boundaries), of sample removal and section drawing, as well as a good discussion of sampling

strategy. So, for example, Limbrey argues that laboratory analysis of a profile is pointless if there is no problem-formulation or if archaeological associations are in doubt. The chapter dealing with soils and infillings related to archaeological features includes excellent data on tree holes, ancient ditches, pits, post holes, post-depositional alteration, mounds, occupation residues, and plow features. This section is exclusively British in orientation and would have profited from the author studying a good North American excavation manual or subjecting her manuscript to a critical reading by a North American excavator: the problems and most of the basic features are common to both sides of the Atlantic, so that it is unfortunate that different technical vocabularies should create barriers within a common language. The short, final chapter discusses man-made heath, bog, and estuarine soils.

Overall, Limbrey's book represents a useful addition to the small collection of reference works for geo-archaeology. It does, however, have major shortcomings. Whether it be from the excavator's or the environmental archaeologist's perspective, the author does not fully succeed in integrating soil science with archaeology, in the sense that over half the book duplicates existing soils texts. Those sections of unique archaeological interest (Part IV) are too brief, overgeneralized and, in the main part, poorly illustrated. They fail to develop usable methodology, and matters of interpretation are most commonly asserted rather than explained. The publisher's price, in view of the cheap format, is atrocious and will hardly help dissemination.

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Sociopolitical Aspects of Canal Irrigation in the Valley of Oaxaca. SUSAN H. LEES. *Memoirs of the Museum of Anthropology, University of Michigan*, Number 6, Ann Arbor, 1973, xi + 143 pp., illus. \$6.00.

What impact does irrigation technology have on society? Almost 40 years ago, Wittfogel pronounced that technological problems unique to controlling irrigation water led to a Despotic State. Since then, some of anthropology's best have contributed more research and debate to this issue than to any other hypothesized relation between technology and society. The host of discussants includes Adams, Armillas, Bennett, Geertz, Haury, the Hunts, Millon, Moseley, Neeley, Netting, Palerm, Price, Sanders, Spooner, Vivian, and many more. Such a distinguished cast forewarns the seriousness of the issues. Stripped of subtleties, at issue is a test of cultural materialism itself. For if it cannot be established, after all the research effort expended on this topic, that there are discernible boundaries to the interrelations between techno-environmental variables and social organization, then the strictly cultural materialist explanation of cultural change has suffered substantial damage to its theoretical foundation.

Wittfogel's initial proposition has stimulated work in archaeology and ethnography. Archaeologists have