Flood Plain Archeology

Prehistory of the Nile Valley. FRED WENDORF and ROMUALD SCHILD. With sections by Bahay Issawi. Academic Press, New York, 1976. xxiv, 404 pp., illus. $25. Studies in Archeology.

Early Hydraulic Civilization in Egypt. A Study in Cultural Ecology. KARL W. BUTZER. University of Chicago Press, Chicago, 1976. xvi, 134 pp., illus. Cloth, $8; paper, $2.45. Prehistoric Archeology and Ecology.

These very different books are both outgrowths of the renewed archeological activity in Egypt stimulated by the construction of the Aswan Dam.

Prehistory of the Nile Valley is the comprehensive report of excavations carried out in the Nile Valley and the Fayum Depression between 1967 and 1969. The basic data are presented in part 1 and in 11 brief appendixes by collaborating specialists. Of critical importance are the inferred relationships between flood-plain silts, dune sands, and "seepage pond deposits" near Isna. A new regional stratigraphic framework is developed in part 2. Principal artifactual complexes are characterized and illustrated after their stratigraphic positions have been established.

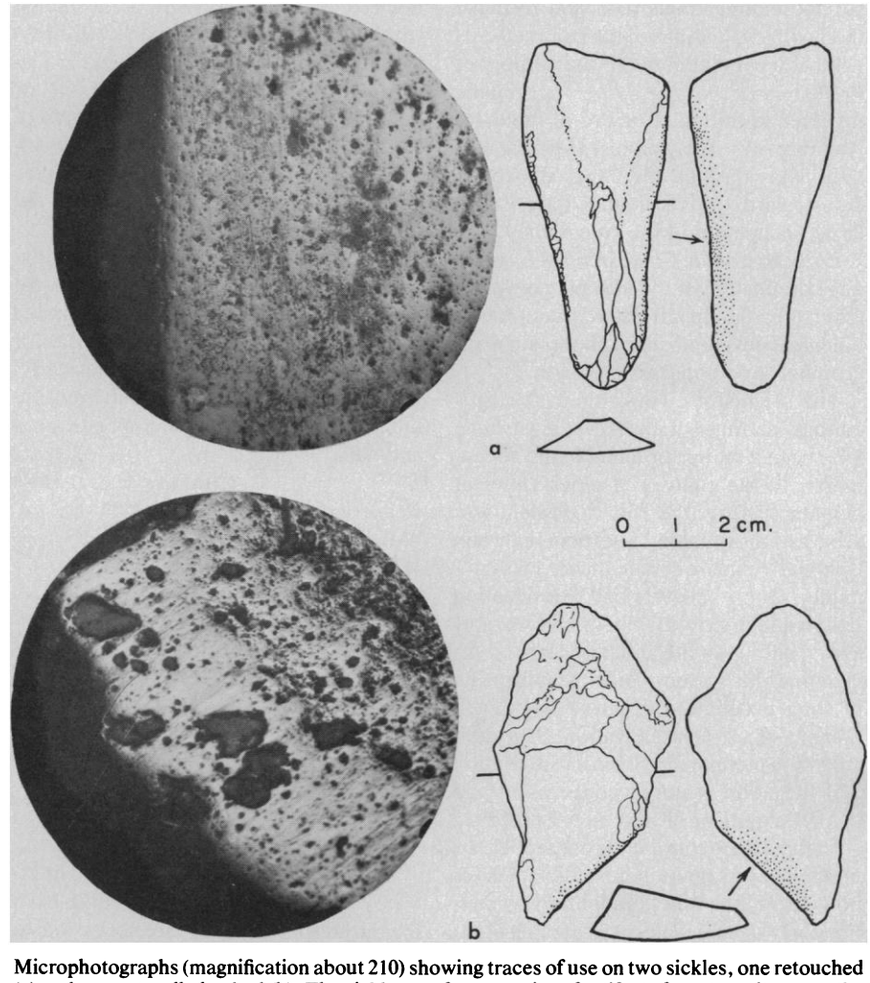
Attempts to extend a stratigraphic framework established in the Wadi Halfa area of Nubia promptly ran into unexpected difficulties. The "Nilotic" Dandara silts near Luxor yielded late Acheulean artifacts as well as a radiocarbon date of >39,000 years ago, suggesting (as, indeed, had some "controversial" radiocarbon dates from Nubia) that the Debeira-Jer silts of Nubia are not a single "young" unit. There are at least two older "Nilotic" units near Luxor. Full stratigraphy of the older deposits and firm connections with Nubia will be established only when new bases for age assignment of isolated remnants are developed.

There is no unequivocal evidence of floodplain aggradation between 25,000 B.C. (Korosko formation) and 17,000 B.C. ("Ballana-Masmas"), that is, during the time of maximum glacial expansion in northern Europe and America. Slopewash near Luxor, which may belong to this interval (see p. 231), carries the first record of Late Paleolithic occupation.

At least some dune and "seepage pond" deposits in upper Egypt proved to be contemporaneous with floodplain aggradation, rather than with floodplain dissection, as had been believed in Nubia. The authors thus propose that most of their sites can be assigned to one or the other of two principal aggradational episodes, identifiable down valley from the Wadi Halfa (Nubia) to Luxor by clusterings of radiocarbon dates in the intervals 17,000 to 15,000 B.C. ("Ballana-Masmas") and 12,500 to 9600 B.C. ("Sahaba-Darau"). This hypothesis is not an easy one to establish, for a formidable array of conflicting and, in part, "controversial" dates must be taken into account. The ratio of accepted to unacceptable dates is only about 2 : 1. The hypothesis is eminently reasonable, and it is important; but it is a working hypothesis.

Granting the stratigraphic coherence of the "Ballana-Masmas" aggradation, Late Paleolithic artifacts of at least two complexes (Idfuan and Fakhurian) can be assigned to it with some confidence. Those of two others are retained in a succeeding "Deir El-Fakhuri" episode of Nile incision, an assignment (p. 226) that may reflect ambiguity as much as clarity of evidence. If one accepts the stratigraphic coherence of the "Sahaba-Darau" aggradation, at least four complexes—Afian, Isnan, Sebilian, and Silsilian—can be assigned to it. Typological diversity in similar environmental settings at essentially the same time is demonstrated. Afian is the oldest complex in which microburins are important. Isnan, Sebelian, and Silsilian all contain lustrous-edged blades (sickles?) and, in some localities, grinding stones.

Later episodes of Nile aggradation



Microphotographs (magnification about 210) showing traces of use on two sickles, one retouched (a) and one naturally backed (b). The sickles are from a series of artifacts from two sites near the abandoned Coptic monastery of Deir El-Fakhuri, near the town of Isna on the west bank of the Nile, that show lustrous edges of the type known as sickle sheen. Under a metallographic microscope "the naturally backed flakes show damage that resembles a lunar landscape, with larger and smaller craters located close to the working edge and never extending beyond the range of the sheen. . . . This is typical for Neolithic sickles in Europe. . . . The working edge is blunted, and there is a delicate striation developed approximately 90° toward the edge. . . . The retouched pieces have this sheen developed along one entire edge. . . . The striation . . . is parallel with the edge, and the lunar-like landscape is less obvious. . . . From these observations it is obvious that the naturally backed pieces were used in the hand without hafting and with a forceful cutting motion at a right angle and without a sawing motion. The pieces with parallel striation and the sheen developed along the entire edge were possibly mounted in a handle that permitted their use in a saw-like manner and with less force." [From *Prehistory of the Nile Valley*. Photography by K. K. Pollesh]

have been identified in Nubia. Their Egyptian records may be best displayed in the Fayum Depression. Setting aside Pleistocene gravels of uncertain origin, the first unambiguous record of a Nile-fed lake (Paleomoeris) may be contemporaneous with Arkin aggradation in the valley. A succeeding series of lake stages may reflect younger episodes of high flood stages on the Nile. Associated archeological sites allow the inference, based on radiocarbon dating, that the shift from Terminal Paleolithic (Qarunian) to Neolithic (Fayum A) occurred between 5200 and 4000 B.C. The magnitude of the change and the short span of time argue for introduction of the Neolithic by outsiders.

Those specialists who are competent to sift the compendious data and to make their own evaluations of the central thesis will be deeply indebted to the authors of *Prehistory of the Nile Valley* for bringing together so faithful a record of the data. And they will surely admire them for cutting vistas through the dense thicket of data toward an overview of Late Paleolithic occupation in the Nile Valley.

Early Hydraulic Civilization in Egypt is a reexamination of the interplay between a dynamic floodplain environment, technological development in floodplain management, and population growth.

The origins of civilization in the agricultural settings of the Near East have long been a matter of interest and speculation. In the context of older views of climatic history, the Nile floodplain was seen as inhospitable to settlement when "pluvial" climates made the deserts habitable. Only "postpluvial" desiccation led people first to the floodplain margins and, finally, to the difficult task of reclaiming the bottom lands. Stabilization of food production required the development of artificial irrigation. The difficulty and complexity of both reclamation and irrigation required cooperation and the development of new social orders.

In fact, the natural environment of the floodplain was never inhospitable. As we now know, the Nile floodplain was continuously occupied during Late Paleolithic time. Intensive gathering activities are documented as early as 12,500 B.C., and indigenous domestication may well have begun before 5000 B.C. The "Neolithic revolution" was introduced by outsiders to an environment occupied by peoples who had long experimented with the necessary elements. The question may be why it was so long delayed.

Agriculture in Egypt began in an environment already suited to its practice. Extensive "reclamation" was not necessary. Artificial irrigation, or flood basin management, was practiced by the first dynasty. The existence of monumental architecture indeed suggests an already stratified society. Nevertheless, irrigation probably long continued to be administered through continuing local traditions, by a predynastic organization of nomes (floodplain districts) rather than by a centralized bureaucratic authority. That authority arose for reasons other than floodplain management.

Even though traditional views of the origins of civilization may be simplistic, the influence of environmental factors in the development of Pharaonic Egypt need not be depreciated. Development of central authority may have made it possible to expand from the smaller, more easily managed flood basins of the early nomes into the larger basins of the middle reaches of the valley and northward into the delta. An ability to modulate the disastrous effects of excessive floods or flood failures led to gradual extension of central authority. Maximum development and peak population were achieved only after introduction of the waterwheel in the first century A.D.

Butzer's rich and provocative discussion of these phenomena holds reward for a broad spectrum of readers interested in man and his environment, as well as for Egyptologists. It is a pioneering study. May studies of other floodplain environments be done with such sophistication and skill.

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Archeological Inference

Spatial Analysis in Archaeology. IAN HODDER and CLIVE ORTON. Cambridge University Press, New York, 1976. x, 270 pp., illus. $19.50. New Studies in Archaeology.

How can we make trustworthy inferences about past human activities from the durable remains that are accessible to us? This is the central problem of archeological method, and the possibilities for creating and testing archeological theory depend on our success in dealing with it. Hodder and Orton have produced an intelligent, reasonable, and timely book addressed to a major aspect of the key problem. Their concern is with deducing spatial processes, such as colonization movements or modes of exchange, from the evidence provided by spatial distributions of artifacts, settlements, or other archeological data.

The chapters deal systematically with methods of objectively assessing departures from random distribution in point patterns, settlement pattern studies, the distribution of single artifact types, associations between distributions of two or more types, and relationships between sites and other features. The kinds of techniques discussed include quadrat and nearest-neighbor methods of point pattern analysis, regression analysis (including single-log and double-log distance decay functions), random walk simulations of artifact dispersal, trend surface analysis, spatial autocorrelation, central place theory, gravity models, and techniques for expressing associations between spatial distributions.

A number of difficulties are discussed. These include uneven survival of evidence, sketchy or spotty research coverage of most parts of the world, and doubts that can be raised about the applicability of statistical significance tests in many commonly encountered archeological situations. I believe that although these difficulties are troublesome they are conceptually straightforward. We should (as Hodder and Orton urge) take account of regional factors that affect data survival, we should plot locations where there is clear evidence that phenomena are absent as well as locations where they are present, we should make much greater (and more costly) efforts to study whole regions in a thorough and uniform way, and statistical naïveté must be avoided.

But the more fundamental problem is, as Hodder and Orton put it (p. 239), "that different spatial processes may produce the same spatial form." Therefore, even a very good fit between archeological data and the spatial pattern that would be produced by a specific postulated process is not in itself strong evidence that something close to that process actually took place. It is necessary also to compare the fit of the data to patterns implied by alternative processes, and it is vital to identify (if possible) minor differences in superficially similar patterns, where these minor differences are diagnostic of different generating processes.

For example (pp. 86–97), a negative binomial distribution is generated by a "contagious" process of settlement spread, in which each occurrence increases the probability of further occurrences nearby. But a negative binomial distribution can also be generated if settlements are located by a random process with random variations in the local probability density of occurrences. This "spurious contagion" process may be distinguishable from true contagion by