Confronting Cultural Remains

Living Archaeology. R. A. GOULD. Cambridge University Press, New York, 1980. xvi, 270 pp., illus. Cloth, $27.50; paper, $9.95. New Studies in Archaeology.

Archeology is currently suffering one of its periodic crises of confidence concerning its status as a social science. The discipline has become increasingly uncomfortable with its passive reliance upon ethnographic and historical documents for observations of behavior that created material residues similar to those found at archeological sites. In this crisp and forthright book, Gould crafts a persuasive alternative to explanation by direct analogy. In so doing, he renounces several propositions fundamental to modern archeology.

This book is not designed to make the author popular with a number of the field's luminaries. It is, however, a superbly written book that penetrates much of the frail reasoning and dogmatism that have accumulated over the past 15 years. Gould attempts nothing less than to reform the entire way in which archeologists look at cultural remains and to take the first step in a novel approach toward confronting issues common to all the social sciences through the perspective on change and material culture exclusive to archeology.

Dissatisfaction with the method of direct analogy in archeology goes beyond the annoyance of having to cope with ethnographies that offer no information on the material correlates of behaviors under discussion. It recognizes that 2 million years of human prehistory probably involve more than minor variations on behavior and adaptations observable in the historic present. Perhaps the most exciting contribution in recent years has been the identification of human adaptations in the past that contradict expectations created by our ethnographic knowledge of existing societies. For example, in most parts of the world today, pastoralism is a marginal-lands complement of agricultural systems, generating the expectation among archeologists that pastoralism first developed as a nomadic offshoot of agriculture. However, in the mid-Holocene Sahara, characterized by large permanent lakes and grasslands, semisedentary pastoralism appears to have developed several millennia before the appearance of agriculture. Ethnographic analogy has failed to identify such situations.

Before Gould can present his alternative to argument by direct analogy, several other propositions must be challenged. These propositions are not trivial and are fundamental to the thinking of several prominent archeologists. Gould develops a well-considered critique of the reasoning behind the propositions, not of the personalities of their most vocal adherents, providing a welcome contrast to the ad hominem style of attack favored by some of these same persons. He cautions against the uncritical application of the principle of uniformitarianism, which is more appropriate to the physical sciences than to archeology but which is a central assumption in the use of argument by direct analogy. He endorses the growing concern among archeologists with taphonomy, or the study of processes operating to alter or destroy archeological sites. So profound may be the effect of these processes that serious doubt is cast upon the pervasive assumption that archeological sites represent fossilized human behavior. Gould emphasizes the limited utility to archeology of concepts such as "culture as a normative package," which inhibits the consideration of behavioral variability and idiosyncrasy, and of covering laws, which similarly "necessitate exclusive recognition of regularities in past human activity." The latter in particular must be toppled from a position of explanatory primacy in favor of what Gould calls argument by anomaly.

Living archeology as Gould formulates it is based on firsthand field obser-

Roasting of a feral cat at Tikatika in the Western Desert of Australia. "Looking at procurement behavior . . . reveals variation that quantitative considerations alone might cause us to overlook. There is a low-level but steady intake of small game, mainly consisting of goanna lizards . . . , 'bush turkeys' . . . , various small marsupials and birds, and feral cats and rabbits . . . . Rarely does a day go by that one does not see at least a few of the above-mentioned animals brought into camp . . . . Although individual portions tend to be small . . . everyone in camp gets a share. . . . Given the fluctuating and undependable yields from hunting large macropods and emus, small game is more important as a source of essential protein, from day to day, than large game. Unlike staple foods, small game is collected by everyone, without regard for . . . sexual division of labor . . . . Even children contribute significantly." [From *Living Archaeology*]

vation of contemporary societies by archeologists or archeologically trained ethnographers. The object of such studies is to examine the material correlates of human behavior "as a means of discovering relationships within contemporary societies that allow the investigator to specify when and under what circumstances certain kinds of behavior may have been important in relation to overall processes of human adaptation." Using an ecosystemic framework, Gould stresses that the investigator should seek to observe "the flow of materials through the system, seeing what effects the human components of the system are having on the final disposal of these materials." Patterns of cultural residues may be identified in the ethnographic present, correlating with specific adaptations and utilitarian behavior. Using data from Australian Aborigine life and sites from both the desert and better-watered regions of the continent, Gould develops several such adaptive-behavior models (for example, risk minimization by extending kinship ties, stone-tool discard). From such models predictions can be generated concerning patterns of residues at archeological sites, and deviations from the predicted patterns can be identified. The real contribution of living archeology is as an approach to dealing with such anomalies. The observation of social and symbolic causes that is possible in ethnographic situations makes it possible to raise new questions concerning archeological remains.

Gould concludes by presenting several "Antipodean anomalies," or examples of potentially maladaptive practices. An example is "canine commensalism," in which the presence of dogs, which do not hunt and are not used for food or as beasts of burden, at Aborigine campsites appears to elude functional or adaptive explanation.

One of the impediments to Gould's approach is that it presumes an amount of paleoenvironmental information that is not always available. Even if one can find a member of that dying breed, the geomorphologist, to develop a detailed climatic and landform history for one's area, have evolutionary biologists the knowledge of changes in adaptive responses of plants and animals during the Pleistocene required for ecosystem modeling? But this is a practical matter. *Living Archaeology* is a first step only (although a major one), and Gould would be the first to insist that the procedures he advocates as well as specific principles presented in the book should be subject to a cumulative process of testing and refinement.

Living Archaeology is among the more profound statements on archeological theory and practice to appear in recent years. It is quite unlike some recently published compilations about ethnoarcheology that give the impression of being written by a group of the ordained preaching to one another. This is a theoretical book written clearly and sprinkled with expressive metaphors ranging from New York subway art to "black box" cognition. In the hard-fought war to keep archeology jargon-free, Gould does battle using an often jovial expository style. The organization of the book is highly effective: forthright statement of the archeological argument is followed by restatement in terms of concepts from other sciences or everyday life and then by illustrations drawn from Aborigine life. This book is essential for the practicing archeologist, for it has the makings of a classic. It would also be excellent for the student who has some background in archeological theory. In this reviewer's opinion, living archeology is, indeed, an idea whose time has come.

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A Peat Bog

Ecology of a Subarctic Mire. M. SONESSON, Ed. Swedish Natural Science Research Council, Stockholm, 1980. 316 pp., illus. $30. Ecological Bulletins, No. 30.

The Tundra Biome Project of the International Biological Program included a strange mixture of study sites representing habitats ranging from truly arctic tundra to temperate oceanic blanket bogs. The Swedish studies were carried out in a subarctic peat bog in Stordalen near the Abisko Research Station in Swedish Lapland. Permafrost is present in this peat bog, but the peat is shallow, and under most of the bog the active layer (the layer of annual freezing and thawing) reaches into the mineral soil. Nevertheless, the main part of the bog is ombrotrophic, receiving its nutrient and moisture supply exclusively from atmospheric sources.

The emphasis in the volume is on primary production, nutrient cycling, and decomposition. The description of the study site itself, its vegetation, soil, and climate, is very brief, and one should not expect to find much detail on these aspects of the site in the book. This information is readily available in publications on the numerous studies carried out at the Abisko Research Station, however. A chapter on the physical properties of the soil-water system by Rydén, Fors, and Kostov is included in the book. The chapter gives information on permafrost depth, documents the variability of the peat, and presents preliminary conclusions on water movement. In another chapter, Rydén and Kostov provide interesting details on the progression of freezing and thawing, the conditions controlling it, and the striking differences between microhabitats. The rooting zone in elevated sites is thawed out for only 12 of the 23 weeks of the vegetative season, whereas in depressions the active layer does not freeze completely in some winters. Sites that are snow-free early in spring start thawing out at temperatures below freezing if radiation is intensive. Most of the incoming radiation is consumed by processes other than melting; for example, evaporation requires twice as much energy as melting of the soil.

The most important chapters are those on nutrient cycling and energy flow. As have many of the IBP studies, the Stordalen project clearly shows the importance of the detritus pathway. Svensson and Rosswall in their excellent analysis of energy flow point out that only 1 percent of the net primary production flows through herbivores, whereas 99 percent is transferred directly to the decomposer cycle. In addition, herbivores involved are soil invertebrates, mainly nematodes. The absence in this volume of any studies dealing specifically with vertebrates is therefore understandable. Most of the biological activity in the soil is concentrated in the upper 20 centimeters of the peat. Of the total annual net primary production (156 grams per square meter), 69.3 grams, or 44 percent, is added to the peat. This corresponds to an annual increment of the peat layer of 0.7 millimeter.

Malmer and Nihlgård give a valuable account of the supply and cycling of mineral nutrients. Even in this remote area far north of the Arctic Circle the effects of pollution are obvious in the *p*H of the rainfall (mean *p*H = 4.6) and the chemical composition of the precipitation. The oceanic influence on the precipitation chemistry is much stronger in winter than in summer. This is most clearly shown by the concentrations of sodium, which are four times higher in winter. Most of the snowmelt drains from the bog when the peat is still frozen so that nutrients in the snow have little effect on the bog vegetation. The amounts of sodium, calcium, sulfur, and possibly mag-