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NORTHERN NOMADIC HUNTER-GATHERERS: A HUMANISTIC APPROACH. By DAVID RICHES. London and New York: Academic Press, 1982. 225 p. + bib., index. US\$24.50.

At the outset Riches outlines his theoretical orientation, contrasting what he calls the "humanistic" approach which he proposes to follow, with the "scientific" which is presented as that used by most northern scholars. A disclaimer is made of any attempt at ethnographic completeness, together with a denial of the value of native mythological and cosmological knowledge, and an admission of the extinct nature of most of the societies considered. We are left with an approach that is based on what plausibly must have been native conceptions of environment and their societies together with assumed decision-making processes which shaped their societies. Given the highly subjective and speculative nature of this approach, I cannot see that the terms humanistic and emic (which are used synonymously) are appropriate.

Stripped of these questionable epithets, Riches' method involves examination of statements about northern hunters on the basis of some premises which are built from a preliminary examination of ethnography. In short, he seems to be making a case for the deductive approach as an alternative to the largely inductive stance of most scholars of the North.

The premises which he evolves are overwhelmingly ecological in nature, as the author admits in his final chapter. However, he cautions that he is departing from the "use of the language of scientific ecology" as conventional ecological studies "are plainly of no explanatory relevance in this study, since they are quite outside... Eskimo and Indian perceptions of the arctic and subarctic environment." I do not feel that he can adequately represent Inuit and Indian perceptions without making greater use than he does of the ethnography which attempts to portray such perceptions.

In the last analysis the reader is left to judge whether the interpretations of previous studies of northern hunters, based largely on empirical data but involving as well some speculations, present more cogent arguments than those of Riches, which are more intuitive but whose validity must ultimately rest in the ethnography. I believe that while the informed and objective reader will concede that at times Riches does offer pithy criticisms, for the most part his interpretations will not achieve greater acceptance than those given previously.

I want to devote the remainder of the review to what I consider to be some of the major problems of the volume, realizing that because of the great range of questions considered I can touch on only the most obvious faults.

In the second chapter the author addresses himself to the question of determinants of group size among northern hunters. His awarding primacy to ecological determinants seems to be based on our ability to objectify them more easily than the more elusive social factors, but this quality does not justify assigning ecological factors primacy and disallowing efficacy for social factors.

As an ethnographer of the group in question I was shocked to find Riches using the Iglulik Eskimo as "the exemplar Eskimo society" when I have stressed their aberration. I am also uncomfortable about his using the same group as the type case for Eskimo marriage practices in contrast to the cousin-

marriage systems of the Subarctic. Published accounts of Eskimo exogamic-endogamic ideals and practices are simply too few and too incomplete to allow setting up such a dichotomy as he does. Also in the third chapter, his argument for social-organization differences between Copper and Netsilik being based on different levels of subsistence remains unconvincing to me.

In the fourth chapter Riches presents a new scheme of types of groupings which pose some interesting possibilities. However, when he uses ethnographic examples to illustrate his types he is not always convincing. I am thinking in particular of his identification of the Inuit-*miut* designation with his "locational band". This identification ignores the analyses of Stefansson, Jenness, Birket-Smith and Burch who have pointed out the elusiveness of, and especially the relativity of, the *-miut* postbase as applied to actual groupings of people. In addition to failing to refer to these authors in that context, omission of mention of other authors seems inexcusable. How can one discuss the problems of the band or of motives for aggregations in the Subarctic, as does Riches, without citing the relevant works of Slobodin and of J.G.E. Smith? How can one claim to represent the emic approach to subarctic ethnology when the writings of Hallowell and Preston (to give only two appropriate names) are not mentioned?

In Chapter Five Riches concludes that "hunter-gatherer leadership is in fact exercised rather less often in respect of matters of production" than one might expect, yet his analysis of Inuit leadership rests almost entirely on premises related to production. His out-of-hand rejection of the importance of kinship factors related to leadership prevents him from exploring the subtle interactions that exist between the ideal and the actual, the nominal and the operational apparent in several Inuit societies.

Those ethnologists who specialize in the Subarctic are better qualified than I to comment on Chapter Six, where the question of family hunting territories is examined. In the seventh chapter attempts to analyze problems of contact-caused changes are particularly inchoate in the confusion of time levels and in the attempt to solve too many problems in too short a space. Riches' struggles with the unfortunate concept of materialism are not successful and his speculations regarding the probable changes which occurred in fifteenth- and sixteenth-century Netsilik institutions fall well outside the realm of historical conjecture that will be acceptable to either social anthropologists or ethnologists.

If his refutation of Sahlins's concept of the original affluent society in the final chapter is addressed to students of northern hunters, he is preaching to the converted, for this notion has met with wide-scale rejection beginning with the 1966 Man The Hunter Conference where Sahlins rather facetiously introduced it.

I find the greatest difficulty of this work to be its expansiveness. Too many problems are tackled, and the burden of both arctic and subarctic hunters is too great a weight to shoulder. The book is in fact an attempt at a *tour de force* of northern hunters as well as of a number of generalized hunter-gatherer problems. Had Riches limited the range of these problems and narrowed the scope of societies considered, and in doing so more adequately represented scholars whose works are relevant to the discussions, and taken into account more fully the nuances of their arguments as they differed or agreed with his own, he might have made a stronger case for the deductive approach and achieved a significant contribution to northern studies.

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AN EXAMINATION OF PREHISTORIC COPPER TECHNOLOGY AND COPPER SOURCES IN WESTERN ARCTIC AND SUBARCTIC NORTH AMERICA. By U.M. FRANKLIN, E. BADONE, R. GOTTHARDT and B. YORGA. Ottawa: National Museums of Canada, 1981. (National Museum of Man Mercury Series, Archaeological Survey of Canada Paper no. 101). 158 p. incl. bib., Mercury Series bib. No price indicated.

This important monograph summarizes the study of the technology, typology and distribution of 342 native copper artifacts from Canadian Eskimo and Athapaskan ethnographic and archaeological collections, with supplementary observations on several Alaskan Athapaskan archaeological collections. A uniform copper technology crosscut ethnic and temporal boundaries and produced finished artifacts which were all quite small. It was based on the folding of small sheets of native copper and the consolidation of these sheets by hammering into larger artifacts in a process clearly involving annealing and/or hot working.

The monograph begins with a skeletal overview of northern prehistory and a survey of the distribution of native copper artifacts in northern North America. Native copper was clearly significant during the last 1000 years in Eskimo and Athapaskan Indian technologies over a wide area. A few native copper implements apparently also occur in Arctic Small Tool tradition contexts (some problematical), but the relationship of these scattered finds to the much later flowering of the copper technology is not directly addressed. I doubt that extension of the roots of the sophisticated late prehistoric copper technology several millennia into the past as a minor and sporadically utilized element in Arctic Small Tool tradition technology is justified on present evidence.

Two major copper source areas are known, but unfortunately they are geologically similar and unambiguous differentiation is not possible by neutron activation analysis. X-ray fluorescence analysis was primarily helpful in differentiating smelted industrial copper from native copper.

Careful analysis of the copper-working technology is the major contribution of this monograph. Available ethnographic information on this topic is fragmentary and internally contradictory, highlighting the value of careful technological study using modern metallurgical techniques. Four "morpho-technological categories" are utilized: sheets, bars, tanged forms, and blanks. The first step in the reconstructed technology was the hammering of thin (usually less than 1 mm thick) copper sheets. Artifacts such as ulus and beads might be made directly from sheets. Other artifacts were made from bars. This study demonstrates that fabrication of bars from folded and hammered sheets required application of heat either through annealing (heating of a cold-worked piece to above 300° C) or actual hot forging. Tanged forms such as points and knives were created from sheets and bars by following one of four procedural sequences reconstructed in this report. A fourth category, the blank, seems usually to be large bar-like forms which have not been shaped into finished artifacts. This typology mixes the technology of shaping with the morphology of the finished product in a sometimes confusing manner. For example, tanged forms may be cut from sheets or created in various ways from blanks and bars. Thus tanged forms do not seem to be conceptually equivalent to the other three forms.

Folding and hammering with heat treatment are the primary techniques of this technology. Secondary techniques such as cutting, abrasion and perforation vary in frequency from collection to collection, as does the frequency of sheets, bars and blanks. More work with a larger sample is needed to clarify the significance of these differences.

The authors suggest that perhaps the absence of efficient tools for cutting large pieces explains the distinctive small size of the copper artifacts produced by the sheet technique. Comparative study of the technology which produced the more massive implements of the Old Copper culture in the Great Lakes region might throw interesting light on regional variation in native North American copper metallurgy.

This study effectively documents a homogeneous copper technology in northern North America in late prehistoric times. Most will agree that this shared technology indicates significant cultural contacts among the groups involved rather than a series of independent inventions or trade exclusively in finished products. Perhaps the weakest part of the monograph is the discussion of the origins of this technology. The implications of its possible presence in ancient Arctic Small Tool tradition contexts, raised on pages 2-3, are never really considered. There is little archaeological documentation for the metal-working Alaskan "Neo-Eskimos" of the first half of the First Millennium A.D. posited on page 41. The reader may well wonder if these hypothetical metallurgists are the same as the metal-working Norton related peoples alluded to on page 3. Also, in my opinion, equation of the occasional piece of trade iron found in First Millennium A.D. Alaskan sites with the diffusion of metal-working technology from Siberia is highly premature.

The monograph concludes with a 231-item annotated bibliography which is itself a major contribution. This significant volume is not without flaws. Careful editing should have caught more of the fairly frequent typographical errors and bibliographic inconsistencies. Provenience of illustrated specimens is not given. A number of references, especially to archaeological reports, lack specific page numbers. This is always annoying when very specific points are in question. Nevertheless, all workers interested in the later prehistory of northern North America or in native American metallurgy will need to consult this important study. One hopes that it is the first of many fruitful collaborations between metallurgists and archaeologists in the north.

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HIGH ALTITUDE GEOECOLOGY. Edited by PATRICK J. WEBBER.
Boulder: Westview Press, 1977 for the American Association for the Advancement of Science, Washington, D.C. AAAS Selected Symposium Series No. 12. xviii + 188 p., maps, illus. Hardbound. US\$20.00.

This book is a collection of papers dealing with the ecology and occupation of mountain areas, presented at an AAAS symposium on High Altitude Geocology. Geocology can be equated with landscape ecology; because humans are an inevitable part of the modern landscape, their role is implicit in the definition. The symposium reflected the efforts of the international program concerning man and mountains, part of the Man and the Biosphere Programme (MAB) sponsored and promoted by UNESCO, and related specifically to Project 6, the impact of human activities on mountain and tundra ecosystems. The papers, all written by experts, present reviews and discussions of their fields of specialization. As with any such selection, not all facets of the theme were addressed, and treatment of them differs, some being overviews while others are more in-depth. The writing differs as well: although most are lucidly written, one is couched in bafflegab. Even though the papers date from 1977, the ideas are as cogent today as they were then. The identified problems remain the same, but their severity has increased.

Ives' paper is an apt call to action by scientists, governments, and all those who use mountain lands, to help preserve their environments. Using three contrasting areas as sample case studies to illustrate the problems confronting mountain environments, he outlines the processes which need to be understood to help solve them. His case studies — the problems of overpopulation and outmigration in the Andes and the Himalayas, the impact of tourism in the Austrian Alps, and construction of resorts in areas of natural hazards in Colorado's Rocky Mountains — lend credence to his convincing argument. I believe that the correctness of his thesis is unassailable, for without the scientific and political action for which he argues, all other contributions, however important in their own right, can very well come to nought.

Monitoring and mapping mountain environments by means of remote sensing is the theme of Knepper's paper. Despite its brevity, this selection calls attention to the complexities involved in inventorying inaccessible and remote areas. The volume's editor correctly suggests that readers who wish more information should turn elsewhere to become knowledgeable about this technique.

The broad overview of high altitude climates presented by Barry is probably as scholarly and comprehensive as can be achieved in a short paper. He summarizes what is currently known about climatic elements in these environments, identifies critical gaps in our understanding of mountain climates, and points out the value of high-level meteorological stations for monitoring air quality, for studies of wind energy and for answering more basic scientific questions. Those interested further in this topic should obtain his recent book, *Mountain Weather and Climate*.

In contrast to the other papers, Mellor's treats a single topic in depth: snow and ice in a particular environment. He considers not only the basic properties of snow and ice, but also their more obscure thermal, optical, and electrical ones. The movement and deformation of snow and ice, their compressibility, and a number of other topics are also included.

Billing's selection on the evolution, structure, operation, and maintenance of high mountain ecosystems deals expertly with the contributions of both plants and animals. During his discussion of the sensitivity of these ecosystems to environmental changes, he documents the changes caused by man and his domesticated hoofed animals. He ends with the unarguable conclusion: "Since high mountain ecosystems and their biota are particularly vulnerable to the presence of people, one must conclude . . . that there is a high degree of incompatibility between use by people and the maintenance of the integrity of these systems."

Grover's overview of high altitude physiology is sound without being overly technical, covering the major physiological consequences and mechanisms associated with movements to high elevations. Of major importance is the reduction of individuals' capacity for physical work, requiring them to do everything more slowly, something which, as Grover points out, most of us are willing to accept as a small price for the aesthetic values of mountain life.

Since the last selection, by Thomas, on human adaptation to living in mountain regions, deals with what is perhaps the most serious problem of high altitude geocology, it is unfortunate that it is so heavy with jargon. To cite but one example, "Humans living in heterogeneous and unpredictable mountainous environments serve as particularly rich examples since they provide insights into how an adaptive system based on phenotype plasticity adjusts to extreme spatial and temporal diversity." In addition, this long selection contains irrelevant information, e.g. a definition of *predictability*; much unnecessary material, e.g., "I am not aware of any study which examines the highland household possessions both in terms of their portability and how this affects [sic] their design and function but one would expect principles of cross adapta-