

The artifacts recovered from the Nelson River site are discussed under the functional categories of hunting and fishing tools, transportation, manufacturing and processing tools, personal adornment and art. Photographs and line drawings are used to illustrate the artifacts and clearly demonstrate the manner in which each tool was used.

The bones of the animals eaten by the Thule people were also analyzed and the methods for deriving information on Thule economy and hunting practices from these remains are documented. The faunal remains and the artifactual evidence allow the archaeologist to reconstruct the prehistoric economy and hunting strategies of the Thule people who lived at the Nelson River site.

In discussing how the site is dated, Arnold succeeds in clearly explaining the technique of radiocarbon dating cultural material and the use of cross-dating artifacts as an alternative dating technique. The story of Thule lifeways as reconstructed from the Nelson River site remains is fleshed out by an imaginative fictional account of a Thule hunter's thoughts as he and his family prepare to leave their winter home. In a brief epilogue to the story of Thule history, the development of Thule culture into the distinctive tribes of the Arctic is traced.

The second article follows the steps involved in preparing a museum exhibit to tell the story of the Thule culture pioneers in the western Canadian Arctic. This article is an excellent introduction to the behind-the-scenes workings of a museum and the prodigious amount of work involved in researching, designing, producing and assembling a museum exhibit. In this way, the excitement of archaeology and the rich cultural heritage of northern peoples can be shared with hundreds of museum visitors.

The papers in this volume are clearly written and well illustrated and should have a broad appeal to laypersons, students and also to professional archaeologists, particularly those involved in teaching at the introductory level. Northern high schools could also make good use of this volume in their history classes. In conclusion, I echo Red Pedersen's hope expressed in the Foreword that similar papers on the various Dene cultures of the North will soon be forthcoming.

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REMOTE SENSING OF ICE AND SNOW. By DOROTHY K. HALL and JAROSLAV MARTINEC. New York: Chapman and Hall, 1985. vii + 189 p., maps, figs., coloured plates, tables, refs., index. Hardbound. US\$39.95.

Owing to its immense storage of freshwater and intensive heat exchange with the atmosphere, the cryosphere, that part of the Earth covered by ice and snow, plays an important role in the Earth's hydrological and climatic cycles. However, our knowledge of this important part of the Earth is limited by the remote location and severe environment of the cryosphere. Remote sensing techniques are thus most useful for exploring and monitoring the cryosphere of the Earth by allowing fast and global observations of its ice and snow covers. This book presents a description of the utility of remote sensing for identifying, mapping and analyzing surface and subsurface properties of worldwide ice and snow features.

The book begins with two short chapters intended to provide the reader with some background on (1) the optical, thermal and electrical properties of ice and snow and (2) the sensors and observation platforms referred to later in the book. The remaining chapters provide descriptions of the science, application and observation techniques

associated with snow, lake and river ice, permafrost, glaciers and sea ice.

In general the book has achieved its objective in emphasizing "the use of remote sensing for developing an improved understanding of the physical properties of ice and snow and understanding the interrelationships of cryospheric processes with atmospheric, hydrospheric and oceanic processes." However, the scope and style of the book is lacking a coherent and balanced approach. The first two chapters are simply too short and sketchy to be reasonably useful. The two chapters on snow were written mostly from a snow forecaster's point of view, and thus are heavily biased toward that application with unjustified details. The remaining chapters, on the other hand, can be characterized as a series of short review articles that attempt to provide a somewhat comprehensive summary of recent progress in a particular field.

The book in general is well illustrated with high-quality photos and figures. Unfortunately, some of the illustrations are not well enough explained to allow the reader to fully appreciate their meaning. The overall coverage of bibliography is adequate, providing reasonably updated information on this rapidly developing field.

Some erroneous information and misleading nomenclature have been noted. The NASA GEOS-3 altimeter has been mistakenly quoted as "the NOAA GOES-3 altimeter" many times in the book. In addition, it is misstated that the primary application of radar altimeters is for ocean wave height determination; actually, radar altimeters are used primarily for measuring sea surface topography.

Apparently the authors have failed to draw the distinction between a synthetic aperture radar and an ordinary side-looking radar. The former requires measurement of both amplitude and phase of a return pulse, whereas the latter measures only the amplitude.

The techniques of impulse radars and radio echo sounding are the same, whereas the authors have never mentioned any connection between them. Actually, the term radio echo sounding appears in the chapter on glaciers without any explanation.

Because of the unbalanced scope of the book, it is difficult to recommend it to a single group of readers. The chapters on snow are certainly useful to snow forecast practitioners in providing a perspective of the utility of remotely sensed data. For the chapters on ice and permafrost, the book can be used as a reference by graduate students interested in research opportunities on the subject.

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THE UPPER PALEOLITHIC OF THE CENTRAL RUSSIAN PLAIN.

By OLGA SOFFER. Orlando, Florida: Academic Press, 1985. xxiv + 539 p., figs., tables, refs., index. Hardbound, US\$98.50; soft-bound, US\$49.50.

Olga Soffer has produced a most valuable and novel addition to our knowledge of the Upper Paleolithic of the Central Russian Plain (European part of the U.S.S.R.) from an economic-ecological perspective. The Central Russian Plain is well studied in the Soviet Union, and some Western specialists are well acquainted with the topic. The monograph under review, however, is not simply a descriptive source of the 29 key Upper Paleolithic sites of the Russian Plain but is analytical as well. It discusses the most recent theoretical (procedural) approaches in contemporary archaeology, such as subsistence adaptive behavior and economic strategies of non-industrial populations in

different biophysical and sociocultural environments, microeconomic models and sociopolitical integration — all of which are corroborated by environmental-ecological data.

The introduction and conclusion are separated by six solidly based and well-illustrated chapters. Soffer focuses on five major analytical themes: (1) development and politics of the Paleolithic in the U.S.S.R., (2) environmental change during the last (Valday = Wisconsin) deglaciation and its effect on the adaptive behavior of early hunting groups, (3) chronology and radiometric dating, (4) subsistence practices and hunter-gatherer adaptations during the Valday-Early Holocene, and (5) land use, settlement system and social network analysis. In this review I am primarily concerned with issues 1 and 4.

1. Soffer divides the history of Prehistoric archaeology in the Soviet Union into three periods: Formative (1873-1928), Developmental (1928-50s) and the Period of Crisis (1950s-80s). In sum, Soffer concludes that the development of Soviet Paleolithic is similar to the development of the archaeological discipline in general and reflects socio-political attitudes in the country. Soffer correctly points out the lack of data and limited interest of Soviet Paleolithic archaeologists in the analytical aspects of research, suggesting various hypotheses about seasonal mammoth-procurement, local and regional utilization of resources, northern and southern areas of occupation, early and late settlement patterns, etc. Soviet researchers are familiar with western anthropological theories but they are very cautious in applying them. Soviet archaeologists, in general, are heavily field oriented and are very efficient and productive in collecting field data.

4. The relationship among environment, subsistence and society has been one of the constant and main concerns of the social sciences. Soffer applies various hypothetical models to explain subsistence practices of early man in the Russian Plain. She builds her models on a techno-environmental approach — i.e., the biophysical environment is a major factor influencing human adaptive strategies. Regarding the ecological-psychological approach, she states that "The emphasis on the individual as the unit of analysis of all ecologically based approaches to subsistence behavior is bound to lead to misinterpretation of the archaeological record" (p. 257). Those researchers, however, who believe in the significance of understanding the cognitive, decision-making process of man in an ecosystem as a theoretical basis, before they build a model of the real world, find it productive for interpretations of assumptions not in the archaeological record. In fact, Soffer's conclusions about seasonal mammoth-procurement strategy and its economic role (p. 194, 237, 280), utilization of abundant resources in a specific season (p. 290, 320, 340, 348), long-term storage strategy (p. 355), and rational economic behavior of early hunters and gatherers on the Russian Plain are based upon her understanding of an individual psychological behavior to maximize his/her gains and to minimize the risk.

One result of Soffer's studies is a correlation between the site and surrounding resources that addresses why and how long-distance resources were utilized. This appears to be a by-product of non-biological human adaptive strategy, namely, that people plan ahead if they are expecting to utilize certain resources at a specific time. Activities of this kind produce distinctive material residues. Although, in intra-site analysis, Soffer predicts that seasonal subsistence practices will be reflected in the archaeological record, she is aware that some of her analyses are not in harmony with the above statement: e.g., "... mammoth is the most abundant species found in faunal assemblages" (p. 204), however, "... mammoth were not the major subsistence" (p. 280) of early man. In other words, it is impossible to derive seasonality of a settlement simply by analyzing the material remains in a site; the understanding of the individual behavior of man, based on rational maximization decision-making principles, should be used to suggest an explanation for prehistoric human adaptive behavior. Thus, one may suggest that the behavioral mechanism of hunters and gatherers in their habitat (i.e., the relationships between human subsistence regimes and environmental quality and the rationale for a man to choose a certain geographical location for living) should be subjected to conceptually and quantitatively designed ecological and psychological

analysis before analytical limits with respect to anthropological subjects are determined.

In sum, despite my disagreement with Olga Soffer on several methodological issues, I found her monograph an impressive work that will be used as a reference for a long time. It is the most complete research on Soviet Paleolithic ever produced in the West.

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THE FRANKLIN ERA IN CANADIAN ARCTIC HISTORY 1845-1859. Edited by PATRICIA D. SUTHERLAND. National Museum of Man Mercury Series, Archaeological Survey of Canada Paper No. 31. Ottawa: National Museums of Canada, 1985. 219 p., maps, illus. Softbound. Available without charge.

These papers are the result of a 1984 symposium organized by the editor of this volume, the purpose of which was to better understand the events that surrounded the disappearance of Franklin's third expedition and to examine the implications of that tragedy. In short, this volume is not only a remarkable testimony to the persistence of the desire to know Franklin's fate, but it is also an excellent demonstration of the need for multidisciplinary thinking in any problem solving. This latter point may, in fact, be a reflection of the editor's own perspective, as her archaeological research encompasses the earliest northern prehistory to the late 19th century in the High Arctic. This collection also makes another valuable contribution, and that is the directions for future research it offers to current and aspiring Franklin scholars. More importantly, the careful reader may also discern what *not* to do as the Franklin search continues, which it undoubtedly will. The mystery of it all remains simply overpowering — for the scholar, amateur and layperson alike. There is plenty of substance in this volume for all three appetites, thanks to the editor's sense of purpose and intellectual breadth.

As the abstract of the volume states, the 16 papers examine a wide range of topics, including art and literature of the period, climatic conditions at the time of the voyage, the role of private expeditions and whalers in the search, the man-hauled sledging tradition, the impact of exploration on 19th-century Inuit culture and recent archaeological and osteological studies of various sites associated with Franklin's disappearance and the prolonged search and rescue attempts that followed. There is no doubt that the volume achieves its purpose of better understanding the Franklin calamity, and there is no better way to convey this than highlighting some of the contributions and insights of the many articles. Perhaps this might encourage all those with an interest in the events to get a copy of the book.

Maurice Hodgson sets the stage from a literary point of view with the observation that much of the Franklin literature was akin to self-exploration and that Belcher's narrative, in particular, ranks with the best travel writers of his day. The second article, by Alan Cooke, provides a valuable service by guiding the reader through the published and archival literature related to Franklin and the search. This literature, including the popular, is immense, and Cooke has done his usual competent job. Constance Martin, an art historian, concludes in her paper that the watercolours and drawings of the Franklin era have a twofold value. They represent visual records of geographical knowledge, as well as revelations of individual explorers' personal perceptions of the Arctic. Her article is rich in interpretation and profusely illustrated.

The second main grouping of articles is primarily historical. Hugh Wallace chronicles the activities of the private expeditions, those not sponsored by the Royal Navy or the Hudson's Bay Company. In the process he makes a number of noteworthy observations, including the