

posing influences on such characteristics as fecundity, body size, growth rate, the number of species present, and ecosystem complexity, and the condition of any polar community represents a compromise or balance between them. Although Dunbar maintains that adaptation to the fluctuating environment has played a considerably greater role in the development of high latitude ecosystems than has evolution towards greater stability, he devotes a chapter to documenting the occurrence of extensive polymorphism at these latitudes and suggests that the accompanying diversification is a step towards increased stability and maturity.

In the final chapter, consideration is given to climatic stability, habitat variety, high productivity, large standing crop, predation, competition, and time as the major factors which encourage an increase in species diversity. Of these, the last is held primarily responsible for the present state of development of polar communities: under Pleistocene conditions, these ecosystems have not had time to develop the complexity, stability and maturity that are held to exist in such other systems as the coral reef and the tropical rain forest.

Dunbar has chosen to refrain from speculation as to possible mechanisms for the selection of ecosystem properties, and while this may be disappointing to many readers I believe he is sensible in doing so. I think it entirely possible that in time an explanation for the evolution of these properties will be found that is not at variance with the neo-Darwinian point of view, and it does not seem to me that Dunbar has closed the door to such a possibility. In any case the book stands up well on its other merits and should hardly be faulted for what it does not attempt to do. It is well written, clearly illustrated, virtually free of typographical errors, and is reasonably priced. It should have a wide appeal and deserves a correspondingly broad circulation.

F. C. Evans

THE FLORA OF GREENLAND. BY TYGE W. BÖCHER, KJELD HOLMEN, AND KNUD JACOBSEN, ILLUSTRATED BY INGBORG FREDERIKSEN. *Copenhagen: P. Haase & Søn's Forlag, 1968. 8 x 5 inches, 312 pages, 66 figures, 2 colour plates and a map. 90 Danish kroner; £5 (bound).*

In these columns, eleven years ago, this reviewer greeted the publication of the first edition of "Grønlands Flora", noting that

the urgent and long-felt need had now been met for a modern pocket guide to the flowering plants and ferns native to Greenland. In 1966 appeared a second and revised edition, also in Danish, of this now popular manual. Besides several new illustrations, the new edition recorded chromosome numbers for nearly all species, most of them based on Greenland material. Because the first and second editions of "Grønlands Flora" were also intended to be used in Greenlandic schools, both provided a brief introduction to botanical terminology, besides a short direction in Greenlandic, in the use of the manual. Throughout the text vernacular plant names in Danish and Greenlandic were added when they were available.

In the present English translation by T. T. Elkington and M. C. Lewis, of the 1966 edition of "Grønlands Flora", professional botanists outside the Scandinavian countries now will find a convenient and well illustrated guide to the vascular flora of Greenland. As with the earlier editions, the typography and printing are of high standard as is the reproduction of Miss Frederiksen's excellent drawings.

A. E. Porsild

FRONTIER ALASKA: A STUDY IN HISTORICAL INTERPRETATION AND OPPORTUNITY. EDITED BY ROBERT A. FREDERICK. *Anchorage: Alaska Methodist University Press, 1968. 9 x 6 inches. 172 pages, illustrated. \$2.00.*

This volume consists of the proceedings of a Conference on Alaskan History held at Alaska Methodist University in June 1967. Perhaps the greatest tribute I can pay is to say that having read the proceedings I regret very much having missed the actual meeting. Such feelings are rare.

The opportunity seems unlikely to recur. It was a brilliant idea by Morgan Sherwood which brought together such respected historians as Jeannette Paddock Nichols, Stuart Ramsay Tompkins, Ernest Gruening and George Rogers, among others, and set them talking to an audience composed mainly of high school teachers from all over the state. It was also an idea which could have misfired, but the generation gap and the interest gap were bridged successfully and with humour. The result may not have been a major advance in Alaskan historiography, but it must surely have kindled enthusiasms for the future.

The various contributions are highly eclectic

tic in approach. The longest paper, by D. E. Dumond, is a conventional but long-overdue synthesis of Alaskan prehistory. His attempt to separate fact from possibility in this crucial area will be appreciated far beyond Alaska. At the other extreme Rogers deliberately avoided any discussion of Alaskan economic history while urging his audience to develop its teaching and research. This was the main theme of the conference: the need to collect historical material and to write more and better Alaskan history. Thus Morgan Sherwood: "The literature is strewn with non-histories, irresponsible duplications, 'how-to' books and just plain sloppy and superficial research." In the same vein spoke the Director of the Washington University Press: "Too many of the manuscripts submitted to us are *provincial* — concerned only with local events and lacking in greater significance. Other works suffer essentially from being antiquarian in which the author is concerned with tracking down the origin of ultimately *meaningless* or trivial detail." Good rousing stuff (intended for a wider audience?) but the same theme pervades Tompkins' quieter piece. This appears at first as a straightforward recapitulation of the mainstream of Alaskan history, but at almost every stage he indicates the need for more detailed work and suggests ways in which it might be tackled.

A second theme which can be distinguished is one which Sherwood has advanced in the past: that the belief of Alaskans that they were neglected by the U.S.A. for almost a century after the Purchase may be true in an absolute sense, but in this respect Alaska did not differ from many other areas. Hinckley in the present volume dismisses some manifestations of this traditional belief in uniqueness as "balderdash" and he was followed more politely but equally vigorously by Dr. Nichols, despite interference from her eccentric alarm-clock. The same point was also taken up less explicitly by R. W. Paul, whose discussion of pioneer groups elsewhere in the American West showed several possible similarities with Alaskan experience.

In summary, this was clearly a conference with a difference. At two dollars, its proceedings are a bargain for anyone concerned with Alaskan history or historiography.

C. I. Jackson

PLEISTOCENE EXTINCTIONS: THE SEARCH FOR A CAUSE. EDITED BY P. S. MARTIN AND H. E. WRIGHT, JR. *Volume 6 of the Proceedings of the VII Congress of*

the International Association for Quaternary Research. New Haven: Yale University Press, 1967. 6½ x 9½ inches, 453 pages including subject index. \$15.00.

Superimposed on a background noise of many smaller extinction blips throughout the Pleistocene there is a dramatic spike at the close of the last glaciation. The extinction encompassed every continent and was felt in virtually every community of large terrestrial vertebrates. An understanding of its causes is important to biologists as well as to paleontologists and archaeologists because of its effect on the modern communities and the fact that it occurred such a very short time ago — at a time when men, much like ourselves, lived where Sydney, Paris, Dallas, and Nome stand today.

Community ecologists have not recognized or at least understood that modern large vertebrate communities are only a ragged remnant of the complexity that existed a few thousand years ago. Just out of reach of recorded history it was a different world, quite outside of our present frame of animal association. Lions were feeding on antelope in the tundra-steppes north of the Brooks Range in Alaska and camels were grazing along the muddy Yukon River. Horse and mammoth herds left their tracks over most of North America. A faunal list of the vertebrates living in the Great Plains, when the Paleoindians chatted by their campfires, reads like the African savannas. Nor were these species rare elements in the community; rather, if proportions in the fossil record can be taken at face value, they were the dominant members. Therefore, it may be wrong to think of modern communities as *balanced wholes*, as if they represented a delicate balance that has undergone precision adjustment and custom fitting for millions of years. From historical evidence we know that they represent various early stages of healing from the giant gash caused by the late Pleistocene extinction. This is especially true of the Arctic.

Despite the importance of this phenomenon to understanding modern organisms the questions of its causes went largely unexplored until the last decade. Mainly as a product of Paul Martin's article in 1958¹ and the controversy it generated, the discussions of late Pleistocene extinction are coming into full bloom. This symposium volume edited by Martin and Wright, taken together with a recent article by Axelrod², represents the present status of our knowledge about the extinction and provides an excellent review of the theories that attempt to explain it.