drawn for echinoderms.

One minor criticism: the author's curious practice of citing his authorities in reverse chronological order seems to attribute to northern geophysicists findings actually made much earlier by Australian and New Zealand biologists, as for example the late Miocene coolings evident in New Zealand, but strangely attributed to an English student of geomagnetism and hard-rock geology.

H. Barraclough Fell

FIELD WORK OF A MUSEUM NATURALIST: ALASKA – SOUTHEAST; ALASKA – FAR NORTH; 1919-1922. By ALFRED M. BAILEY. *Colorado: Denver Museum of Natural History, 1971. 6 x 9 inches, 192 pages, illustrated. $2.50 U.S. postpaid.*

This genuine and engaging little book, dedicated by the author to his wife, is a narrative of about three years' collecting in Alaska, without the detailed observations on natural history of Bailey's formerly published accounts. It will be of interest to Alaska hands, with its accounts of settlements, vessels, natives, old-timers and officials; and to modern naturalists and travellers who enjoy reading the recollections of their tougher precursors. It is illustrated by no less than ninety-five fine full and half-page period photographs, plus two maps, and embellished by a stream of anecdote involving Alfred and Muriel Bailey, Bailey's associate Russell Hendee, their numerous acquaintances and the Airedale "Jerry". Though written with the immediacy of dates, times and distances, the accounts of the great bird flocks, the pods of sea mammals, the free collecting forays by Americans to the Siberian shore, the determined and strong personalities of the settlers and their native friends, evoke nostalgia and heighten one's awareness of the precarious existence of man's cultural and natural resources.

A. H. Macpherson

INTERNATIONAL BIOLOGICAL PROGRAMME, TUNDRA BIOME: PROCEEDINGS IV. INTERNATIONAL MEETING ON THE BIOLOGICAL PRODUCTIVITY OF TUNDRA, LENINGRAD, USSR, OCTOBER, 1971. Edited by F. E. WIELGOLASKI and TH. ROSSWALL. *Stockholm: Swedish IBP Committee, 1972. 6½ x 9½ inches, 320 pages, illustrated. $4.00.*

Synthesis of research carried out in the International Biological Program is now occurring. The collaborative aspects of research have been a strong element in the tundra biome and a distinct contribution of IBP. Exchanges among circumpolar scientists have, in the past, been usually limited to formal papers, a few international conferences or the fortunate travels of a very few professional scientists.

Thus the publication of the third and fourth proceedings of IBP tundra workshops is a significant manifestation of changes within the scientific community. The fourth meeting occurred in Leningrad, October 25 to 29 1971. The most exciting portion of the resulting publication is the availability of summary descriptions and data from tundra research in USSR.

The Proceedings consist of three distinct parts: Part 1, comprising one third of the volume, is a set of ten articles on general problems of accounting for biological productivity in tundra regions. Dr. F. E. Wielgolaski of Norway presents a discussion of vegetation types by species composition and morphologic structure across the circumpolar tundra together with tabulated mean values of standing crop and apparent annual production by country and vegetation type. Initial attempts at simulation modelling of biomass production are described by H. E. Jones and A. J. P. Gore of the United Kingdom. Both a biomass balance method and an energy flux approach were compared for three sites at Moor House, United Kingdom; Barrow, Alaska; and Hardangervidda, Norway. Agreement between the two independent estimates for three sites was within the limits of the range of efficiency of solar energy conversion (1 per cent $\pm$ 0.2 per cent) used in the energy flux model. L. L. Tieszen describes the primary producer research in the U.S. tundra program which is focused on canopy structure, photosynthetic fixation and allocation of CO_2. This emphasis on plant physiological processes appears to address specifically the gap encountered by the U.K. model in accounting for seasonal variations in biomass increment. V. N. Andreev *et al.* summarize methods and values of estimating seasonal changes in above-ground phytomass employed in the Institute of Biology in Yakutia field station on the Kolyma River. The objective was to predict seasonal productivity by individual species, and most of the species analysed were circumpolar monocots. Initial multiple regression analyses of tundra decomposition processes by O. W. Heal, soil microbiological studies by T. V. Aristovskaya and O. M. Parinkina indicate that real progress is beginning to emerge on this

important but difficult aspect of tundra ecology.

In separate brief articles, S. S. Schwartz, Yu. I. Chernov and B. A. Tikhomirov of the USSR discuss the structural components including animals, productivity and stability of various tundra ecosystems. Conservation, man, and manipulation of tundra are briefly analysed by L. C. Bliss of Canada.

Part 2 of the Proceedings comprises half of the volume and is dedicated to a series of Soviet authors for the description of progress and preliminary data from four tundra study sites. These sites are: Harp at the forest-tundra margin 35 km. northwest of Saleklard (polar Urals) and Ary-Mas, a northernmost forest tract, Tareya and Agapa on the Taimyr peninsula. The soils, vegetation, and various animal groups along with selected biological processes are reported for these four stations by 37 Soviet authors. Three additional reports summarize tundra research at other sites concerned with the nitrogen cycle, tree rings and meteorological correlations, and algae found in polar deserts.

The value of these brief reports, apart from the selected data values, is probably the collective insight provided into approaches to tundra research in the Soviet Union. For this purpose, the brevity and excellent translation are superb and unparalleled.

Part 3 of the Proceedings comprises only 10 per cent of the volume and consists of brief synopses of national tundra projects in Austria, Canada, Finland, Ireland, Norway, Sweden, United Kingdom, and USA. The principal value of these reports is the overview and scope of the international IBP Tundra activity. Five of the national reports reference more detailed accounts of their research.

Names and addresses of the 100 participants are included, but there is no index.

Thus the unique and valuable contribution of this report on international tundra research is the extended coverage of Soviet projects. The Proceedings will be a key reference to tundra workers and an important set of summary data, albeit preliminary, for those interested in biological productivity generally. Clearly, we can anticipate more complete future accounts of IBP tundra research as well as joint efforts to integrate and further interpret this international activity as a basis for management of man's activities in the Arctic. At this time, there are indeed few succinct accounts of biological productivity in any biome for the price of this volume.

Philip L. Johnson

A SUMMARY OF ARCHAEOLOGY IN THE KATMAI REGION, SOUTHWESTERN ALASKA. By D. E. Dumond. *University of Oregon Anthropological Papers No. 2, 1971. 8½ x 11 inches, 61 pages, 1 table, 2 maps, 10 plates, 2 diagrams. $2.00.*

Dumond's work at Katmai National Monument, Alaska Peninsula, between 1960 and 1967 represents six field seasons in an area which should be a key to understanding Eskimo cultural developments. The purpose of this progress report is twofold. First, Dumond wishes to make available information regarding the characteristic lithic materials of two sequences representing different ecological adaptations prior to publication of two more detailed monographs. Second, the relationships between the sequences is shown; Dumond's juxtaposition of phases simplifies comparison between sequences.

The first sequence, derived from sites along the Naknek Drainage on the northeast side of the Alaska Peninsula, spans 4500 years. This area represents a system of salmon-breeding waterways flowing into Bristol Bay in the region of the southernmost extension of the Bering Sea winter ice pack. A second sequence, from the Pacific side of the Alaska Peninsula at Takli Island and Kukak Bay, extends over 6000 years in an ice-free region of fiords on the southeastern portion of the peninsula where sea mammals are plentiful. Change in the relative importance of ground slate objects to chipped stone is noted throughout the two sequences. Dumond provides summary information on characteristic stone artifacts, the ratio of chipped to ground implements, other artifact categories, the type of occupation, and dating. Accompanying photographs of characteristic materials are good.

In the Naknek Drainage, materials are divided into eight phases which are further grouped into four periods. The Kittewick Period (2500 to 1900 B.C.) has considerable ground slate as well as flaked lithic materials. To Dumond, the side notched points in the collection suggest affinities with Security Cove implements. These latter resemble side notched points and knives from interior sites and Palasades material to the north. He suggests the Kittewick Period represents either a coastal group who took some interior artifact types or an interior group who adopted some Pacific coastal traits. Dumond assumes the latter, suggesting that Alaskan ethnographic evidence indicates ". . . that the assumption of coastal practices by interior peoples is the more common acculturative