DENNING HABITS OF THE POLAR BEAR (*URSUS MARITIMUS* PHIPPS). BY C. RICHARD HARINGTON. *Ottawa: Canadian Wildlife Service, Report Series No 5, 1968. 8½ x 11 inches, 30 pages, 12 figures, 9 tables. $0.50*

The decline in numbers of the polar bear has become a matter of international concern in recent years, but the lack of detailed biological information makes impossible both an adequate appraisal of the status of the species and the definition of appropriate protective measures. In this study, Harington has made a significant contribution to knowledge of the polar bear, and provides a basis for further investigations.

His report is mainly the result of field work undertaken by means of dog sled in three regions of arctic Canada during the period 1961-1964. Although an itinerary is not included, anyone who has attempted to carry out biological investigations during the arctic winter will appreciate the rigorous and physically demanding conditions under which the author worked. His recording of 113 bear dens represents a considerable accomplishment.

The distribution of denning areas, the characteristics of dens, and the activities of bears in such areas are discussed in detail. From his work in Canada and from a survey of the literature, Harington has defined 15 areas in the Arctic where polar bears commonly den, and where, consequently, many cubs are born. Most of these "core areas" are on arctic islands, all but three above lat. 70° N., and their locations are evidently related to factors such as wind, currents, and conditions of ice. Three types of shelters and dens are distinguished, for examples of which plans and dimensions are provided. The number of dens studied was sufficiently large to permit a definition of the factors (for example, exposure and qualities of snow) which appear to influence the choice of location within the "core areas." Bears arriving late in the denning areas were not influenced by the presence nearby of other bears in dens. The temperatures inside two occupied dens were found to be 7.8° C. and 21° C. higher than that of the ambient air. The bears evidently modify the temperatures of the dens by changing the size of the ventilative hole.

Harington found that the duration of denning by individuals is variable, influenced by age, physical condition, and in the case of adult females, reproductive status. Pregnant females seem to stay in longest, while adult males frequently remain active throughout the year. Harington's data on variation in the relative lengths of the annual periods of denning and activity seem to provide an explanation for the frequent absence of distinguishable annual layers in dental tissues of polar bears, as contrasted with the regular layering seen in such tissues of brown bears and black bears. Evidently, more complex techniques will have to be used in order to establish the age of individual polar bears.

The review of the literature was thorough, and I find only one other paper which might have been included (Parovshchikov, 1964, Věst. Československe Spol. Zool. 28: 167-177). The second volume of *Mlekopitaiushchie Sovetskogo Soiuza* by Heptner *et al.* (1967), which devotes 23 pages to the polar bear, probably was not yet available when Harington's work was completed.

The report is attractively produced, the photographs are of high quality, and the line drawings and graphs are clear and well executed. Through an error presumably at the press, two graphs and a line drawing appear as negative prints; consequently, in Fig. 3, locations designated by "black dots" are shown instead by white dots. Four outstanding photographs by Fred Bruemmer, portraying bears in their natural surroundings, are reproduced in colour on the cover of the report.

Harington suggested that further studies in the "core areas" would help to develop effective measures for the preservation of polar bears. Even before such studies, the protection of the bears in all of these localities, so important for the production of cubs, would seem to be an appropriate initial action.

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ICE EXTENT ON THE SOUTHERN OCEAN AND ITS RELATION TO WORLD CLIMATE. BY J. O. FLETCHER. *California: The Rand Corporation, 1969. 8½ x 11 inches, 108 pages.*

A great amount of information about energy budget and climatic change based on a study of the relevant literature, especially the Russian one, is presented by the author in his clear style, which makes the reading of this paper a pleasure.

It is however advisable when reading this paper to keep in mind, that it is meant as a memorandum, as stated in the preface. Accordingly, it is not a review giving opinions of different authors and weighing these as to their probability, or the influence of different possible assumptions on the conclusions. But it is the personal picture and opinions which the author obtained after a study of the relevant literature, without any attempt from the author's side to justify his choice of particular calculations or observations.