

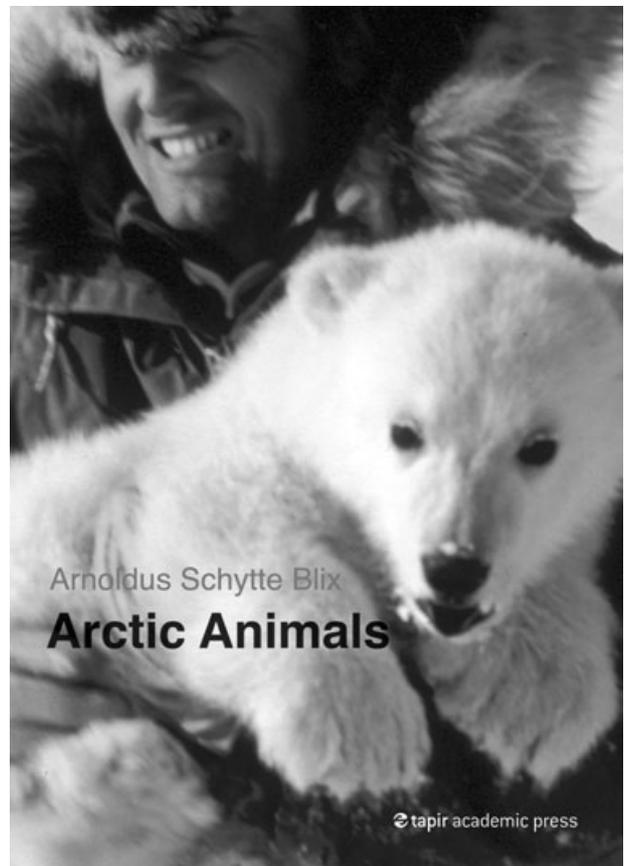
Book review

Review of Arctic animals and their adaptations to life on the edge, by Arnoldus Schytte Blix (2005). Trondheim: Tapir Academic Press. 296 pp. ISBN 82-519-2050-7.

Conceived in order to provide students and those interested in the Arctic with a comprehensive overview of Arctic ecosystems, processes and animal adaptations to life in the cold, this textbook of 10 chapters draws on the 30 year research experience of Dr Arnoldus Blix, an accomplished Arctic physiologist. Topics covered by the book range from the climate, oceanography and ecology of the Arctic region to the distribution, behaviour and life cycles of marine and terrestrial invertebrates and through to higher resident marine and terrestrial predators. The textbook begins with a poetic definition of the Arctic—describing it as the region under Arctos, the polar star—and thereby setting the scene for the rest of the text, which combines concise descriptions of Arctic processes and species distributions interspersed with accounts of the author’s research experience and almost 200 illustrations.

In the first chapter we are introduced to the physical characteristics of the Arctic. This cold, dry and windy polar region experiences large annual fluctuations in day length and temperature. Increasing ultraviolet light enters the Arctic atmosphere through a diminishing ozone layer. Sea ice fluctuates in thickness throughout the region, with the centre of the Arctic consisting of “interlocking ice floes slowly circulating with the ocean’s surface currents” (p. 27). Current flow, the position of the Polar Front and the extent of sea ice all influence primary production and the distribution of zooplankton and higher predators, such as seabirds and marine mammals, in the various Arctic seas. Ultimately, it is the high level of variability in physical conditions, notably the rapid change in photoperiod, which largely determines the adaptations of both animals and plants to life in the Arctic. Although this section provides a detailed backdrop to conditions encountered by life in the Arctic, there is little information on current climatic changes occurring in the region, such as the diminished extent and earlier break-up of sea ice.

Comprehensive descriptions of the ecology and distribution of marine organisms, terrestrial birds and mammals, and a brief section on the far-ranging summer migrant seabirds and mammals of the Arctic comprise the



following sections. Here we also gain many insights into the behaviour of Arctic animals, such as the extensive migrations of reindeer, the complex interactions between musk oxen and predatory wolves, and the building of ice lairs by ringed seals to provide protection from predators and weather. Each species description is accompanied by an informative distribution map.

The last portion of the book, taking up almost one-third of the volume, discusses the many and varied physiological adaptations that allow Arctic animals to cope with life on the edge. Adaptations evolved by Arctic animals to combat extremes in cold include: the seasonal deposition of fat stores in pinnipeds and whales; heat-producing brown fat layers in musk oxen and reindeer; and the increased insulating properties of long, thick polar bear fur. A profound tolerance to hypothermia is evident in newborn lemmings and snowy owl chicks, whereas young seals manage exposure to extreme cold at birth through a combination of large body size and/or brown

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fat reserves or thick blubber layers. Throughout this chapter, research conducted by the author and his colleagues provides many interesting examples of astounding adaptations ranging from the hibernation and starvation of polar bears and ground squirrels to the rapid changes in heart rate of diving seals. Complex concepts are clearly explained and are aided by the inclusion of well-described figures. In conclusion, this text summa-

rizes a plethora of historic and current Arctic information in a readable and often colourful writing style. It should be a welcome addition to the libraries of students, scientists and visitors to the Arctic alike.

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