

destroyed the health he had gained in the Arctic.

He was too prostrated to accede to Lady Franklin's plea to command a new search venture, but he did travel to England to consult with her in October 1856. He was already a doomed man, and never reached Switzerland where his enfeebled body might have reacted to mountain air. Instead he sailed back across the Atlantic to Cuba, and there a series of strokes finished him off at 37 years of age.

Kane's writing, as Corner points out, inspired Jules Verne in his Polar scientific fiction, the young Peary who was to follow his poleward route, and indeed the author of this biography who says, "memories of the icy scenes in *Arctic Explorations*" lingered in his mind until in his young manhood he responded to a call, not indeed to the farthest north, but to hospital work in Labrador.

P. D. Baird

THE SNIPES: A STUDY OF THE GENUS *CAPELLA*. BY LESLIE M. TUCK. *Canadian Wildlife Service, Monograph Series Number 5*, 1972. 6¼ x 9¼ inches, 429 pages, illustrated, tables. \$7.25.

This book is devoted primarily to a comprehensive account of the common snipe of North America, *Capella gallinago delicata*, although it treats in a comparative way other subspecies of this bird and other snipe-like species in other parts of the world. The author divides the species into three groups which he calls the "semi-snipers", the "aberrant snipers" and the "true snipers".

Dr. Tuck has had an extraordinary amount of first-hand experience studying one of the true snipers, the common snipe, in the field, particularly on its breeding grounds in his home Province of Newfoundland, Canada. He has also followed these birds to their winter quarters on the Gulf Coast of the United States and in various places in Latin America. He has reviewed extensively the literature on the snipers of the world and incorporates comparative information on all species in the various subjects discussed in 15 chapters. These chapters are grouped in three main parts of the book entitled: 1) "The Genus", 2) "The Species", and 3) "Populations and Man".

Tuck goes into each chapter subject in detail, not only with respect to snipe, but also in regard to background: he gives elementary details of characteristics of birds in general, the characteristics and functions of bird plumage, and the zoogeographical features of the world.

There is considerable repetition of the same information in different chapters. The purpose

of this, obviously, is to provide clarifying background information for the subject of a particular chapter, but in some cases the amount of repetition seems excessive when a mere reference to a previous chapter might suffice.

Our interest is captured in the first chapter by the description of the common snipe's peculiar habits and adaptation to its environment. Apparently, it is an aberrant "shorebird" with an excessively long bill that nests primarily in northern bogs. These birds have special features in the skull and long flexible bills with sensitive tips which are adaptations for probing in soft soils and ingesting food without removing the bill from the soil.

Snipes are well known in the folklore of northern countries because of imaginative interpretations of the curious quavering sound they make while circling above their nesting areas, particularly at dusk. The sound, frequently described as "bleating" or "winnowing", has been thought to portend changes in the weather. Its resemblance to the bleating of a goat has resulted in snipes being associated with these animals in a number of countries. The sound is produced by the vibration of the widely spread, specially constructed outer tail feathers as the air rushes past them during "power dives" by the circling snipe. The main purpose of this display is thought to be related to breeding activities, particularly territory delineation. There are considerable variations in the winnowing sounds produced by the various species of snipes correlated with variations in the structure of their tail feathers. The author discusses the taxonomy of the snipe group which has been based chiefly on morphology, and particularly of tail feather structure, and suggests some modification of views of previous investigators based on behaviour.

All of the true snipes, except the Himalayan *Capella memoricola*, occur in the Palaearctic region, so it is there that the primary radiation of this group must have taken place. The Nearctic region has only one species — the common snipe which is also widespread in the Palaearctic. The Ethiopian and Oriental regions both have endemic snipes as well as migrants from other regions. The Neotropical region has several mountain-inhabiting species of aberrant snipes.

The principal breeding habitat of the common snipe is the extensive areas of wet organic soil dominated by sedges and bog shrubs in the Boreal Zone, particularly in the Hudson Bay lowlands of Canada. Tuck does not mention the somewhat different nesting habitat of this species in the Western United States where a few snipe nest in wet meadows.

Aerial winnowing or bleating displays are usually an indication of defended male ter-

ritories and, therefore, are a good indication of the number of breeding males. However, this applies to a relatively short period including pair formation and about the first ten days of incubation. All incubation is performed by the female. After that males become involved in the care of chicks, and late arriving males may usurp the vacated air space for aerial displays.

The male normally leads away the first two chicks hatched and takes care of them; he leaves the care of the last two hatchlings to the female. During the first week after hatching, a chick obtains nearly all its food from its parents, but the adults continue to feed the young sporadically for a much longer time. By the time the chicks are six weeks old, the parents are beginning to moult and tend to remain solitary. At that time the chicks begin to associate more and more with others of their own age.

The winter habitat of the common snipe is usually in marshes and meadows with wet mineral and mucky soils and therefore differs from the characteristic breeding habitat in northern bogs with less decomposed organic soils. The bulk of the North American snipe population winters in the rice fields, wet cattle pastures, and the coastal marshes of Louisiana. The author believes that the present agricultural practices of irrigation for rice culture and reclamation of marshes for pasture have opened up considerably more wintering range for snipe than was available a century ago.

Snipe are subject to the usual types of avian diseases and parasites, including feather mites. Botulism caused by a bacterial infection, and one of the greatest killers of waterfowl, may be a more frequent cause of mortality in snipe than the limited evidence suggests because of the wet organic substratum of their habitat. Peregrine falcons, merlins, and kestrels prey on snipe, but the author believes the marsh hawk is their principal avian predator. There is no evidence that infrequent protracted periods of

very cold weather on the wintering grounds cause mortality of snipe. It appears that the birds move out of such areas.

Survival and mortality information is based on the recovery of 185 of 5,282 banded common snipe. Only 1.1 per cent of the recoveries were of birds shot by hunters, indicating relatively low hunting pressure in consideration of the total annual mortality of about 50 per cent of the population. The author suggests that the population of common snipe in North America may not be affected much by hunting or winter weather, but chiefly by the extent of available breeding habitat which varies with soil moisture from year to year and at critical periods of the breeding season.

In considering management for the benefit of snipe, Tuck believes that not much can be done in North America to enhance nesting success because of the scattered nature of nesting pairs in remote areas largely unaffected by man. He points out that on wintering grounds "eat-outs" of marsh vegetation by muskrats and snow geese, creating open mucky areas, are advantageous to feeding snipe. Cultivation of rice more than any other agricultural crop provides feeding habitat for snipe. Wet cattle pastures reclaimed from coastal marshes in Louisiana are very extensive and provide the best wintering areas for these birds in North America. Thus, the present normal agricultural practices on its primary wintering grounds in North America are favourable for survival of the common snipe.

Five appendices, including no. 5 on methods of capturing, marking, weighing, measuring, food analysis, collection of parasites, retaining live snipe in captivity, and censusing, are informative. A lengthy list of references (over 17 pages) and an index complete this comprehensive monograph on a highly specialized and particularly interesting group of birds.

John W. Aldrich