

I SUBFAMILY ANSERINAE

1. TRIBE ANSERINI. SWANS AND GEESE

The birds commonly known as swans and geese agree so closely in structure, in pattern of downy plumage, in general behavior and courtship, and in living and nesting habits, that they cannot be separated as two distinct tribes. Swans differ from geese only in their larger size, shorter legs, longer necks, and greater number of vertebrae; none of these characters is taxonomically important, not even the number of vertebrae, since this varies considerably from species to species.

The Anserini differ sharply from most of the other waterfowl. The two sexes are always similar in plumage, and nearly so in voice, the voice of the female being merely a little higher pitched. They never have any metallic colors, and the downy young never have a strongly marked pattern. The nuptial display and mating antics are all simple and vary little among the species; the only courtship consists of stretching the neck and of "dipping." They apparently pair for life, and both male and female always participate in the care of the young. Usually it is the female which incubates, while the male guards the nest. In the exceptional case of the Black Swan ("*Chenopsis atratus*"), the male shares to some extent the duty of incubation. Sexual maturity is not attained until the second or third year. Swans and geese have only one annual molt and consequently have no eclipse plumage. They nest on the ground; a few species nest occasionally on ledges or in old nests. Their food is mostly vegetable, obtained by grazing and dipping. Their syrinx is symmetrical and has no bulla.

We consider all swans as congeneric, the fact that some have black in the plumage being of little importance. The most primitive swans are arranged in two pairs of forms: *bewicki* (Old World) and *columbianus* (New World); *cygnus* (Old World) and *buccinator* (New World). As Hartert has already suggested, these are best considered two Holarctic species (*C. columbianus* and *C. cygnus*). The four forms are alike in behavior patterns. Each of the three other species of the genus stands rather alone, although the Mute Swan (*C. olor*) and the Australian Black Swan (*C. atratus*) show certain similarities. The threat behavior of lifting the wings, which is so typical of the Mute Swan and occurs in a less pronounced way in the Black Swan, is absent in the Black-necked Swan (*C. melanocoryphus*) as well as in the four primitive forms.

Pair formation, which occurs in the fall in all temperate-zone swans, takes place without elaborate displays. According to Heinroth (1911), birds that are in the process of pairing swim in close proximity,

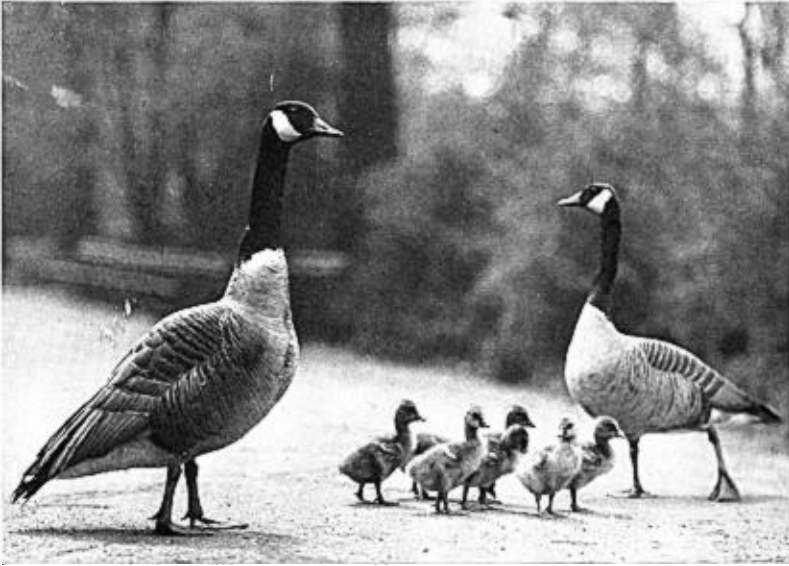


Figure 2. Canada Goose (*Branta canadensis*) with young.

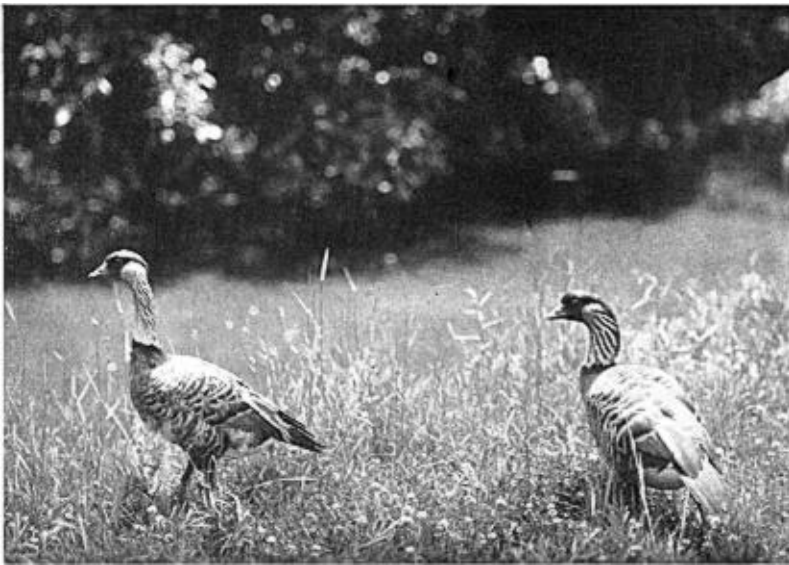


Figure 3. Hawaiian Goose (*Branta sandwicensis*).

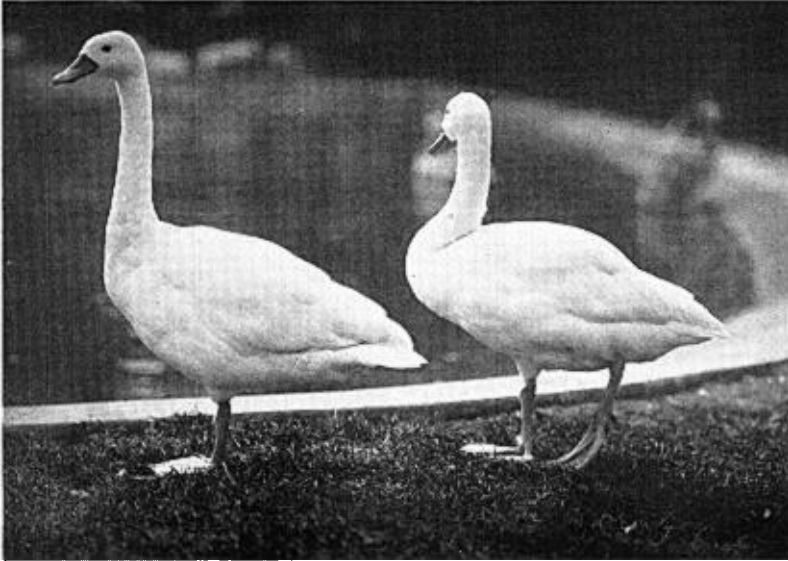


Figure 4. *Coscoroba coscoroba*. Compare with Whistling Duck, Figure 5.



Figure 5. White-faced Whistling Duck (*Dendrocygna viduata*).



Figure 6. Plumed Whistling Duck (*Dendrocygna eytoni*). Compare body posture with that of Canada Goose in Figure 2.



Figure 7. Cape Barren Goose (*Cereopsis novae-hollandiae*) with young. Compare posture of adults with that of Magellan Goose in Figure 8 and pattern of young with young in Figure 9.

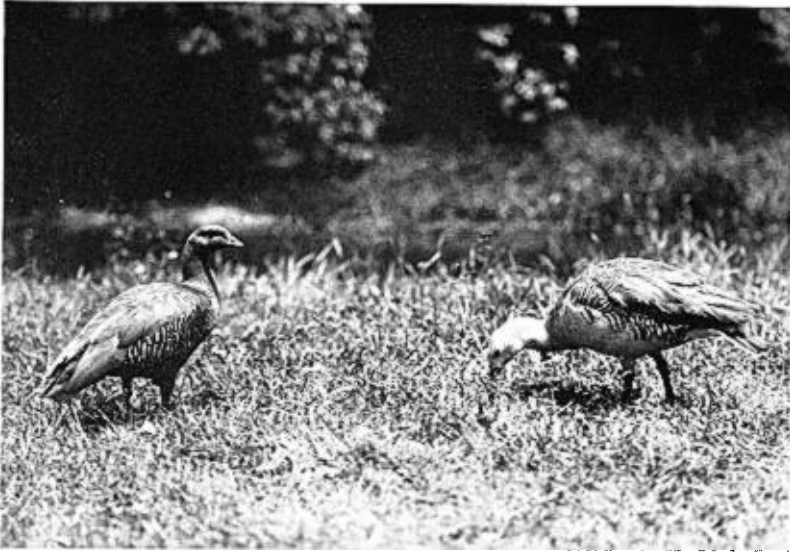


Figure 8. Magellan Goose (*Chloephaga picta*) walking and feeding. Male on right.

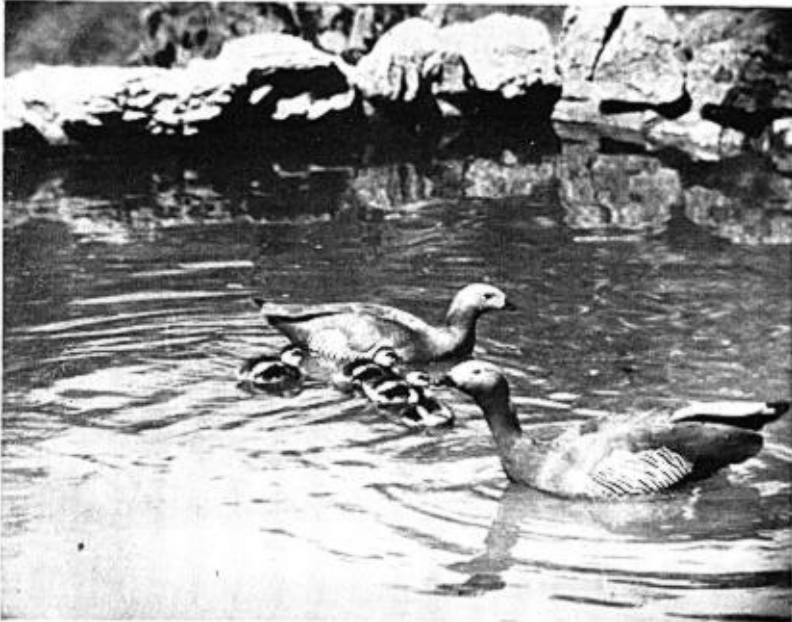


Figure 9. Ashy-headed Goose (*Chloephaga poliocephala*), pair with young.



Figure 10. Orinoco Goose (*Neochen jubatus*) with young. Bold pattern of downy young typical for tribe Tadornini.

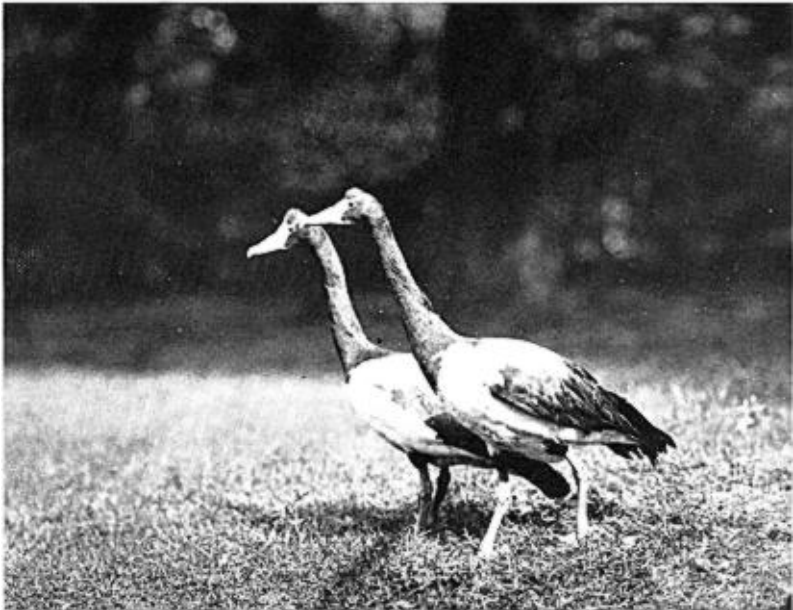


Figure 11. Pied Goose (*Anseranas semipalmata*).



Figure 12. African Spur-winged Goose (*Plectropterus gambensis*).



Figure 13. Comb Duck (*Sarkidiornis melanotos*). Note thick short neck, horizontal body posture, and long tail.

press the plumage close to the body, and hold the neck in a peculiar position, the head appearing thickened. Swans, geese, and whistling ducks (tree ducks) have essentially the same precopulatory display: both birds of a pair repeatedly dip the whole head and neck until finally the female flattens herself out on the water and sinks deeper with the neck half extended. But there are a number of variations; for example, in swans male and female frequently face each other and half rise out of the water, breast to breast. All swans, except the Mute Swan, have been observed diving, although rarely. They seem to be the only Anatidae which have the habit of taking their downy young on the back when the young are tired or cold. This is the usual practice with Mute and Black-necked Swans. It is exceptional in the other species.

Amongst the geese, there is no ground for retaining the genera *Chen*, *Cygnopsis*, *Eulabeia*, and *Philacte*, all the species referred to them being members of the genus *Anser*. All have more or less strong serrations on the sides of the bill. *Branta* is characterized by a more elaborate plumage pattern, a longer and thinner neck, and smaller and smoother bill (Figure 2). The Hawaiian Goose ("*Nesochen*") certainly belongs in this genus (Figure 3). Hybrids from crosses between species of *Anser* are usually fertile, and so are those between species of *Branta*, but hybrids from crosses between the two genera are sterile.

The Russian workers (for references and summary see Ernst Hartert and F. Steinbacher, 1936, "Die Vögel der paläarktischen Fauna", Erg.Bd., Heft 5:433-434) have shown that *brachyrhynchus* and *neglectus* are races of *fabalis*. The extensive breeding ranges of *Anser erythropus* (inland) and *A. albifrons* (coastal) run parallel along the north of Europe and Asia. No overlap of the ranges of the two species is known, and it has therefore been suggested (Witherby *et al.*, 1939) that the two forms be considered subspecies of *erythropus*. Further work may show that this view is correct.

The most characteristic feature of the geese is their closely knit family life. The family migrates as a unit, and the young apparently remain with their parents until the beginning of the new breeding season.

The "triumph ceremony," which is characteristic of the geese, has been described as follows: "After driving off intruder all geese behave similarly; gander hurries back to mate with special 'triumph-note' . . . in which she joins, uttered with neck stretched out and head close to ground. Even downy young take part, assuming same attitudes as parents" (Witherby *et al.*, 1939:182, *after Heinroth*). The same "triumph ceremony" is an important part of the pair-formation display. The courting gander drives away weaker birds and then returns to the chosen goose with the "triumph note." At first, she may not pay much attention to his behavior, but if she

answers his call and joins in the display, the pair formation may be considered completed. The gander swims in a peculiarly proud, erect position in the water during this courtship period and may indulge in "dipping displays" even before pair formation. The pre-copulatory display is the same as in the swans.

Geese are highly social, as are most grazing animals. Manifestations of social rank seem to be absent in the wild, but develop in confinement when the source of food is localized. Geese mature in the second year, and pair formation takes place in the second winter. The habits of the various species of *Branta* seem to be essentially the same as those of *Anser*, except that the smaller species feed to a greater extent on water plants.

The very peculiar *Coscoroba coscoroba*, from South America, occupies a special place. It reminds one of a swan by its white color and some of its habits. Particularly, it raises its wings in anger as the Mute and the Black Swan do. At the same time, its voice (a not very loud, trumpeting *cos-córoba*) and its display are entirely peculiar. In some other features (in shape of head, for example) it resembles the whistling ducks, it has their long legs and large feet, their comparatively rounded wings (Figures 4 and 5). The downy young, extremely rare in collections, is, like a cygnet, whitish-gray, but it shows in darker gray, distinctly if weakly, the very special markings of the downy whistling duck, notably the light band across the nape. As in swans, the syrinx is without a bulla, even in the male.

Coscoroba, in fact, seems to be an intermediate, linking the swan-goose group to the whistling ducks, and on that account is of very great interest. On the basis of the scanty information available, the genus *Coscoroba* could be placed in either group. A thorough study of its anatomical features, of its pair formation, and of the participation of the male in incubation and raising of the young is needed before the species can be classified with confidence.

2. TRIBE DENDROCYGNINI. WHISTLING DUCKS ("TREE DUCKS")

Whistling ducks are among the least known of all the ducks. There is not a single good life history of any of the species, nor is there an anatomical comparison of the tribe with other Anserinae. The tribe is composed of a single genus (*Dendrocygna*) with eight species. Whistling ducks have no close relatives except *Coscoroba*. Their high-pitched, squeaking voice and a number of their habits are peculiar to the tribe.

They have a number of features in common with the other Anserinae. Both sexes take care of the young. The male shares (?always) in the duties of incubation, as in the Black Swan; in fact, in *viduata* and *bicolor* the male seems to have the greater share. The two sexes are alike in coloration and similar in voice; they seem to

pair for life. There is no metallic color in the plumage. Whistling ducks resemble geese in postures (Figure 6) and display. Their food consists mostly of vegetable material and is obtained by grazing, dipping, or diving. They are expert divers and gather much of their food under water. They nest usually on the ground, in reeds or tall grass, where they build an elaborate nest, well concealed by bent-over stalks; they nest occasionally in holes in trees or in abandoned nests of other birds. Their eggs are white and rather round. The pre- and post-copulatory displays are the same as those of swans and geese, different from those of the Anatinae: male and female face each other, lift the breast out of the water, and slightly raise their wings.

Their syrinx has symmetrical bullae, slightly larger in the male than in the female. The plumage patterns of adults and downy young are peculiar, different from those of all other Anatidae (excepting only *Coscoroba* as noted above). The fully adult plumage is attained the first year. The species of whistling ducks show very little geographical variation.

In spite of their common name these ducks seldom perch in trees. Some species never do, while others perch only occasionally—not nearly so regularly as the members of the tribe Cairinini. Hence “whistling ducks” is a much more appropriate name for this group than “tree ducks.”

The eight species of *Dendrocygna* can be divided into three groups: a primitive group (perhaps only one superspecies) consisting of *arborea* (West Indies) and *guttata* (East Indies); secondly the somewhat isolated species *autumnalis* (America); and finally a group of five closely related species, *javanica* (southeast Asia, Malaysia), the superspecies *bicolor* (America, Africa, India) and *arcuata* (Malaysia, Papua, Australia), *eytoni* (Australia), and the specialized *viduata* (America, Africa, Madagascar).

II SUBFAMILY ANATINAE

1. TRIBE TADORNINI. SHELDRAKES

The sheldrakes, a name under which we include the related genera *Chloëphaga*, *Cyanochen*, *Neochen*, *Alopochen*, “*Casarca*,” and *Tadorna*, form a group of ducks which are not far from the river ducks. The resemblance to the geese, which has led to names like Egyptian Goose, Orinoco Goose, and Blue-winged Goose, is entirely superficial. The South American Crested Duck (*Lophonetta*) is related to the sheldrakes, as are probably also the primitive Australian Cape Barren Goose (*Cereopsis*) and the South American steamer ducks (*Tachyeres*).

Members of this tribe are characterized as follows: bill comparatively short and thick; legs long; neck short; coloration in the two