

PYCRAFT, W. P.—The Courtship of Animals. London, Hutchinson & Co., 1913.

SELOUS, E.

('01.) An observational Diary of the Habits of the Great Crested Grebe (includes observations on the Peewit). Zoologist, 1901 and 1902.

('05¹) The Bird Watcher in the Shetlands. N. Y., Dutton, 1905.

('05²) *Bird Life Glimpses. London, Allen, 1905.

('09.) An Observational Diary on the Nuptial Habits of the Black-cock, etc. Zoologist, 1909 and 1910.

('13.) A Diary of Ornithological observation in Iceland. Zoologist, 1913.

WASHBURN, M. F.—The Animal Mind. Macmillan, New York, 1909.

WEISMANN, A.—The Evolution Theory.

* ZOOLOGIST, THE.—West, Newman & Co., London, monthly. (Many papers on Natural History).

ANATIDÆ OF SOUTH GEORGIA.

BY ROBERT CUSHMAN MURPHY.

Plate XIV.

THIS paper is the twelfth¹ dealing with the ornithological results of the South Georgia Expedition of the Brooklyn Museum and the American Museum of Natural History.

***Nettion georgicum* (Gmel.)**

Anas georgica, Gmelin, Syst. Nat., I, 2, 1788, 516.

Querquedula catoni, von den Steinen, Intern. Polarforsch., 1882-83, Deutsch. Exp. II, 1890, 219 and 273.

¹ A list of the preceding papers, not including several brief notes, follows: (1) Preliminary Description of a New Petrel, 'The Auk,' 1914, 12, 13; (2) A Flock of Tubinares, 'The Ibis,' 1914, 317-319; (3) Observations on Birds of the South Atlantic, 'The Auk,' 1914, 439-457; (4) A Review of the Genus *Phaethria*, 'The Auk,' 1914, 526-534; (5) Anatomical Notes on the Young of *Phalacrocorax atriceps georgianus*, Sci. Bull. Brooklyn Mus., II, 4, 1914, 95-102; (6) Birds of Fernando Noronha, 'The Auk,' 1915, 41-50; (7) The Atlantic Range of Leach's Petrel, 'The Auk,' 1915, 170-173; (8) The Bird Life of Trinidad Islet, 'The Auk,' 1915, 332-348; (9) The Penguins of South Georgia, Sci. Bull. Brooklyn Mus. II, 5, 1915, 103-133; (10) Notes on American Subantarctic Cormorants, Bull. A. M. N. H., XXXV 1916, 31-48; (11) Two New Diving Petrels, Bull. A. M. N. H., XXXV, 1916, 65-67.



1. SOUTH GEORGIA TEAL.

2. MAGELLANIC GOOSE.

Querquedula antarctica, Cabanis, Journ. f. Ornith., 1888, 118, pl. 1.
Nettion georgicum, Salvadori, Cat. Birds Brit. Mus., XXVII, 1895, 264;
Lönberg, Kungl. Svensk. Vet. Akad. Handl. XL, 5, 1906, 66.

Endemic Anatinae inhabit several of the subantarctic islands, the species peculiar to South Georgia being the southernmost of the whole group. This little teal was among the birds noted by Captain James Cook in January, 1775, on the occasion of the first recorded landing at South Georgia.

Eleven adults and one duckling were collected by the writer between November, 1912, and March, 1913. A single additional skin was received subsequently from Mr. José G. Correia, of New Bedford, Mass.

Under the new name *Querquedula antarctica*, Cabanis in 1888 published a colored plate of this teal. The figure is poor as regards both contour and coloration, and the bill is shown entirely black. Lönberg (*loc. cit.* Taf. 2) illustrates the head of a male, showing correctly the distribution of color on the bill, but here again the yellow of the lithograph is very unlike the hue of the living bird's bill. I had Lönberg's plate with me at South Georgia, and compared it with freshly killed teals.

Lönberg's description of the species leaves little to be desired. It should be amended to this slight extent, *viz.*, mature females, as well as males, have the central velvety black stripe along the tertials, although on the average it is slightly more pronounced in male specimens. In general, the female is distinguishable only by the dull speculum and slightly smaller size. The entire speculum in each of my eight adult males has a green gloss when viewed obliquely. Birds in fresh plumage have conspicuously whitish breasts, due to wide colorless margins on the feathers which subsequently wear away, leaving only the brown central portions.

Flesh colors. Iris dark brown. Culmen, nail, and distal border of maxilla, black; remainder of tip of bill, slaty blue; sides of maxilla Naples-yellow, becoming greenish where it blends with the blue tip. Legs and feet olive-green, mottled with sooty-brown.

Measurements in millimeters.

Eight males, collected between November 30 and December 30. Length (skins), 418-445; wing, 211-222; tail, 93-104; culmen,

from frontal feathers, 32-36; width of bill at base, 12.5-16; tarsus, 35.5-39; middle toe and claw, 45-51.

Four females, collected between December 1 and March 3. Length (skins), 390-412; wing, 195-207; tail, 85-93; culmen, from frontal feathers, 31-34; width of bill at base, 12-15; tarsus, 35-36; middle toe and claw, 46-49.

	Length	Wing	Tail	Bill		Tarsus	Toe
				culmen	width		
Average of 8 males	432	217	100	34	14	37	48
“ “ 4 females	404	201	89	33	13	36-	48

The testes of a male shot on December 1, 1912 measured 38×19 millimeters.

The crop of a female collected January 2, 1913, contained marine amphipods.

Salvadori (*l. c.*, p. 264), without having seen a specimen of *Nettion georgicum*, concludes that its affinities are with the group of teals containing the South American species *N. flavirostre*, *N. oxypterum*, and *N. andium*. A comparison of my specimens with all of these, however, shows that the South Georgia bird is quite distinct. Its real relationship, hitherto unsuspected, is with the duck known as *Dafila spinicauda* (Vieill.), a widely distributed species, occurring, apparently in the form of several undescribed geographic races, from Brazil to the Straits of Magellan and the Falkland Islands. The South Georgian teal is, indeed, almost a facsimile of *Dafila spinicauda*, smaller, considerably darker (especially on the under surface), but with similar proportions, the same pattern and distribution of color over the whole body including the bill (*vide* R. H. Beck, label), the same wholly black speculum with a green sheen, the same black-striped tertials and pointed tail. Dr. Frank M. Chapman, who first called my attention to the striking resemblance between the South Georgia birds and skins of *Dafila spinicauda* in the magnificent Brewster-Sanford collection, remarked at the same time that the case furnished an excellent example of taxonomic relationship obscured by inaccurate nomenclature.

Considering the similarity of these two ducks, it is rather surprising to discover that *Dafila spinicauda* has only fourteen rectrices, whereas *Nettion georgicum* has sixteen. Usually, among the Anatidæ as well as other groups, the larger species have the greater number of tail feathers, but here the rule is reversed. *Dafila acuta* has sixteen rectrices, so that in this character it is no closer to *D. spinicauda* than the latter is to *Nettion georgicum*, while in all its other characters it is vastly further removed. In short, after comparing the color pattern, the proportionate dimensions of bill, wing, foot and tail, the shape of the central and outermost rectrices, and the graduation of the primaries, in these three species of ducks, I am forced to the conclusion that *Dafila spinicauda*, the closest known relative of *Nettion georgicum*, should likewise be relegated to the genus *Nettion*, or else a new genus, intermediate between *Dafila* and *Nettion*, should be erected to contain it.

Since the establishment of numerous whaling stations at South Georgia, the native teal has fared badly, the whalers losing no opportunity of bringing the toothsome birds to table. In the neighborhood of Cumberland Bay its numbers have been greatly reduced, although I saw six, all extremely wild, on November 28, 1912. Fortunately, the configuration of the land at South Georgia is of a character to prevent the extermination of the species, for the half dozen northern fiords to which the whaling stations are confined are for the most part separated from adjacent fiords by impassable glaciers and ice-capped ranges. Therefore the teals may be wiped out in one valley, and yet be abundant just beyond the next mountain. Judging from several accounts of South Georgia, particularly that of Klutschak (1881), these birds are not found at all on the southerly or Antarctic slope of the island.

At the isolated Bay of Isles, I found the teals common about the middle of December, which corresponds to our June. They were more numerous on the islets in the bay than on the mainland, and were remarkably unsophisticated, allowing bands of men to walk right up to them as they fished for amphipods from the rocks in the kelp fields at low tide, or dabbled in the fresh water ponds that filled every hollow of the grassy islands. As they fed, they quacked softly from time to time.

On December 29, Mr. Correia and I came across a pair of these birds, whose photograph is here reproduced, while they were feeding in a tiny glacial streamlet on the mainland south of the Bay of Isles. They were well hidden by tall tussock (*Poa flabelata*), and we did not see them until we had almost stumbled over them. They seemed unconcerned, however, and continued prodding about in the mud. When I stepped within six feet, they raised their heads and waddled farther off among the hummocks, from where they peered out through a screen of drooping grass. All but their bright eyes and yellow bills blended completely with the surroundings. Much against our sentiment, Mr. Correia shot the female; as up to that time I had been able to collect only two of this sex. The drake flew off whistling, with a teal's characteristic speed. Two or three of the duck-hunting Norwegian whalers informed me that if, on the other hand, we had shot the drake, his mate would have refused to leave the spot. If this be true, does it indicate peculiar fidelity, or merely dependence and lack of initiative?

Certainly the female teals as well as the males show plenty of courage and resourcefulness when it comes to the protection of their young. The ever-present enemy at South Georgia is the skua (*Catharacta*), and when a teal and its brood of ducklings are surprised the parent feigns lameness in a manner which needs no description, while the downy young disappear like magic in the tussock grass. I have hunted on hands and knees for half an hour, but, like my predecessors, I failed to locate even one of the silent, practically invisible youngsters. Our ship's fox terrier, however, was more successful. On February 6, 1913, after the dog had been called back from a "wild goose chase," that is from following a mother teal which had been duping him, he sniffed about the spot where the family had been flushed, and at length caught one tiny duckling. It had evidently been recently hatched, and was a pretty, brown, long-tailed, confident little bird. It sat on my hand in the ship's cabin and preened itself, stroking its back with its bill, and scratching its head with its foot. It could also jump lightly from considerable heights to the floor without being injured in the least.

During the last few days of February, we found the teals abun-

dant and exceedingly tame on the east shore of Possession Bay, several miles back from the ocean front. Here they fed in the ponds and in the bare, wet runways between tussock hummocks. Many times pairs came whizzing toward me down the wind, wheeling to face it just before they settled on the ground or water, generally within a few yards of me. I often startled parents with their broods, and heard the sharp note of alarm as the ducklings scampered to cover. Once a misguided skua pounced down upon a female as she was fluttering lamely around me, but the duck flew away with a bound and easily distanced her enemy. On other occasions skuas carried off in their bills teals which the mate of our vessel had just shot. Many previous collectors have likewise been exasperated by this bold trick of the skua.

On February 28, I discovered a teal's nest on top of a hummock, close beside a pond and two hundred yards from the shore of Possession Bay. It was covered by dead, standing blades of grass which completely arched it over. The sitting duck peeped out when I approached, but did not leave until I touched the hummock. The nest was lined with dead grass and a very few feathers, and held five eggs which lay with their small ends together in the deep bowl. The eggs were rounded-ovate, and cream colored, with a highly polished surface. Believing them to be heavily incubated, I did not disturb them.

Members of the German expedition of 1882-83 observed the first pairing of the teals on November 19, the first eggs on December 8, and the first young on December 18. The majority of the young, according to von den Steinen, were nearly full-grown by the end of January; but newly hatched ducklings were seen again in the middle of February, and one still in the down was noted as late as March 15. Possibly the birds normally rear two broods, or it may be that a second laying is often forced through the destruction of the first eggs by skuas.

Five eggs and young is the number reported by Lönnberg, and the number that I noted invariably. The comparative smallness of the brood conforms to a general state of affairs among birds of the far south, where the struggle for existence may be considered as peculiarly severe. Thus the Antarctic terns, both *Sterna vittata* of South Georgia, and *Sterna hirundinacea* of the Powell

Islands (South Orkneys), lay but a single egg as against the larger sets of their northern congeners. It would seem, as a rule, that birds whose downy young are particularly liable to fall a prey to such enemies as predatory carnivores, fish, or turtles, *e. g.* many northern waterfowl, lay a large number of eggs; but that southern species, among which the chief source of danger lies in the destruction of the eggs before hatching, either by exposure to the perpetually chilly weather, or discovery by the skua, have uniformly small sets. Many northern water birds are known to cover their eggs with down or vegetation and to abandon them temporarily. At South Georgia, where the equalized, mean annual temperature is close to the freezing point, even brief exposure means certain death to the eggs, as I observed in the penguin colonies. Under these conditions, it is obvious that a small number of eggs can be more successfully incubated than a large number. It must be admitted, however, that the application of this rule to the one-egg sets of certain tropical birds, such as *Gygis* and *Anöus*, is rather obscure.

I seldom if ever saw more than two dozen South Georgia teals during one day, and I should say that although the species is common, and well distributed along the temperate coast of the island, it has never attained the abundance and relative dominance of its counterpart, *Dafla eatoni*, at the somewhat less polar region of Kerguelen Island in the southern Indian Ocean. At Kerguelen, British officers of the Transit of Venus Expedition are said to have shot more than two thousand teals within a radius of eight miles. Such a slaughter could not be duplicated at South Georgia, although both von den Steinen and Lönnberg report that in winter the teals gather in flocks of a hundred or more along the shores of the fiords. The latter writer says also that the males are more numerous than the females, a statement which my observations tend to confirm.

***Chloëphaga magellanica* (Gmel.).**

The upland goose is an introduced species at South Georgia, a few pairs having been imported from the Falkland Islands in 1910 or 1911 by Mr. J. Innes Wilson, British Magistrate at Cumberland

Bay. The immediate reason for the experiment, as Mr. Wilson informed me, was that the fine bird had become *persona non grata* to sheep ranchers in the Falklands, because it was designed by nature to feed upon grass, and hence was considered an impediment to the fattening of mutton. So the Falklanders had outlawed the goose, and placed a bounty upon its head.

Mr. Wilson freed the transported birds in the admirably adapted, grassy country about Westford, Cumberland Bay, where they increased and spread encouragingly, apparently assured of a future in a land in which they would be forever untroubled by the rivalry of sheep. I saw about a dozen adults in this region on December 9, 1912.

Unfortunately, some of the whalers from a neighboring station have persisted in hunting the geese in defiance of the law. A letter received from South Georgia during 1915 stated that the number had been reduced to six or seven birds which had a very slight chance of repleting the population.

During our stay in Cumberland Bay, the cabin boy of the *Daisy* came aboard one evening in high glee, bringing in his pockets five very young upland geese which he had captured in one of the Westford lakes. Ordinarily I should have been glad to receive specimens, but in the case of this species I felt constrained to carry the lively goslings back to their home, and, if the parents did not appear after a time, to attempt to rear the young in captivity. But the former experiment was a complete success. Arriving next morning at the lake, we saw several pairs of adults lurking on the far side. One of the goslings *peeped*, and immediately a guttural clucking came in answer from across the water and a barred goose began to swim straight toward us, followed at a discreet distance by the snow-white gander. I put the young brood in the lake, but each gosling attempted to scramble out, until it heard the call of the approaching mother, when all five turned their tails and swam bravely away. The parents joyfully received their family again, and the flotilla disappeared around a point of land with the youngsters well guarded, side by side between the goose and her pompous mate.