

NOTES ON THE GIANT COOT (*FULICA GIGANTEA*)

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The largest of the world's ten species of coots are found in the high, arid puna zone of the central Andes. The Giant Coot (*Fulica gigantea*) occurs from central Perú to northern Argentina, while the slightly smaller Horned Coot (*Fulica cornuta*) is found from Bolivia and northern Chile south into Argentina. The present distribution of both species is poorly known and it seems likely that their ranges have diminished in recent years.

One area of geographic overlap occurs among the freshwater habitats of the Province of Tarapacá, in northern Chile, where I had several opportunities for brief observations during April, August and November of 1972. The department of Arica is the northernmost political subdivision of Tarapacá, bordering both Perú and Bolivia. Here the Giant Coot is found on the two high lakes, Lago Chungará (4520 m) and Lago Cotacotani (4350 m), and in small ponds among the cushion-bogs at Parinacota and Laguna Paquisa. It formerly occurred further south in Tarapacá but in recent years has been observed only in Arica. The northernmost nesting record of the Horned Coot is also from Arica, at the small reservoir of Caritaya (3600 m), where three nests were found in 1957 (Behn et al. 1957). This locality is only 45 km southwest and 600 m lower than Laguna Paquisa, where small numbers of Giant Coots can be found nesting at present, but Caritaya has not been visited recently to determine if the Horned Coot still exists there.

The Horned Coot is the better known of the pair and several aspects of its biology have been reported in recent years (Ripley 1957a, b, Behn and Millie 1959, Johnson 1965a, b). The Giant Coot has received considerably less attention (Johnson 1964, 1965b, 1972) and this paper is intended to clarify some features of its breeding habits.

NESTS

Horned and Giant coots both build nest platforms that are strikingly different from those of other coots. They are large, bulky, non-floating structures of aquatic vegetation that are placed in full view at varying distances from the shore. No attempt at concealment is made and the nests are so conspicuous as

to be often the first indication of the presence of coots at any locality. Nests of the Horned Coot are frequently, but not invariably, constructed atop a mound of small stones, reportedly constructed by the birds. Nests of the Giant Coot have been described as floating platforms attached to submerged vegetation, but my observations indicate that most, if not all, rest directly on the bottom. The details of nest construction for both species warrant considerably more attention than the frigid water and frequently inclement weather of the habitat generally encourage.

These nest platforms depart from typical coot construction in two ways. Generally, *Fulica* nests are relatively small platforms well hidden amongst emergent vegetation, e.g. reeds or rushes (Gullion 1954). They are occasionally placed on the shore near the water's edge but almost invariably are close to open water. In addition, *Fulica* species normally construct several types of floating platforms which are used for displays, copulation, brooding and roosting, in addition to that which supports the actual nest. Coots usually have access to abundant vegetation, and utilize dead or dry plant material as well as fresh leaves and stems in their construction. All of these structures are relatively short-lived and frequent reconstruction does not pose any particular problem.

The nest platforms of *F. gigantea* and *F. cornuta* are usually, and perhaps always, found on lakes and ponds that lack emergent vegetation. Furthermore, the nests of *F. gigantea* are normally placed farther offshore than the aquatic plant beds which supply the construction material. At Lagos Chungará and Cotacotani the plants are found in narrow beds which parallel the shoreline and the coot platforms at times form a single line, farther offshore but parallel to the shoreline, for distances equal to the extent of the plant beds. It seems logical that, in the absence of concealing emergent vegetation, nest placement in deeper water should reduce predation from terrestrial animals. These lakes are subjected to strong afternoon winds and wave action throughout the year and any floating nest, even if anchored to submerged vegetation,

would seem destined to failure. A large platform, resting directly upon a solid substrate, should provide a more stable site. It is interesting to note that the smaller *F. leucoptera*, which prefers to nest amidst emergent vegetation wherever possible, constructs floating, offshore nests in aquatic plant beds in the absence of emergent reeds (Johnson 1965b).

Giant Coot platforms vary greatly in size, from approximately one meter in diameter to several meters in length at the waterline but much larger at their base. Large platforms tend to become elongate, paralleling the shore, rather than circular in form. When a platform harbors a nest, it may reach a height of 20–25 cm above the water and the nest cup is sufficiently deep as to prevent observation of its contents until an observer is very close or actually on the platform itself. The heat of decomposition from this vegetative mass should be considerable and may be important in the reproduction of this species.

Platform construction or maintenance apparently occurs throughout the year and I have never observed the birds without seeing at least a few carrying plant material to a platform. However, occasional platforms are obviously in a state of disrepair, becoming reduced in size and low above the water, and ignored by birds actively constructing other platforms nearby. It is my impression that these structures are not analogous to the auxiliary platforms of other *Fulica* species. The sheer bulk of a platform, and the distance which the materials must be transported in some instances, would seemingly discourage the maintenance of more than one structure. Whether a given breeding pair actively occupies a particular structure throughout the year is unknown.

Johnson (1964) reported that coots were feeding on the same plant (*Ruppia filifolia*) that they used for platform construction on Lago Cotacotani and I was able to verify this. Birds on Lago Chungará apparently exploit at least two kinds of aquatic plants. While I was observing a pair carrying plant material to a platform about 25 m offshore, one bird swam to the far edge of the plant bed lying closer inshore. Here it dove (by arching up and over, grebe fashion) and remained underwater about five seconds. It surfaced with a beakful of plant material which appeared much smaller in diameter and quite distinct in form from the larger plants visible in the plant bed. After eating this fine material, the bird swam over to the plant bed and grasped two stems in its beak. Reversing direction, it churned the water with considerable force

until the plants pulled free from the bed. It then proceeded to tow this material to its platform, where it climbed to the top and deposited the plants. All plant material transported to or lying untrampled atop the platforms was green and appeared to have been either uprooted or torn from a main stem.

CLUTCH SIZE

Significant clutch size data from the Fulicinae are generally lacking. Tropical species have smaller clutches than temperate species but there is no evidence for a reduction in clutch size at low latitudes among species of broad distribution. The North American *Fulica americana* has the largest clutch among coots, averaging 9 eggs (normal range 7–12, extremes 4–17) with smaller clutches late in the nesting season (Fredrickson 1970), but there is no information for its tropical populations. The Palearctic *F. atra* normally lays 6–10 eggs in India (extremes 5–12, Ali and Ripley 1969) and 6–9 in Great Britain (Bannerman 1963). The Ethiopian *F. cristata* averages 6 (range 3–11, Winterbottom 1966). The Neotropical coots have smaller clutches: *F. caribaea* 4–7 (Bond 1961), *F. armillata* and *F. rufifrons* 4–8, *F. leucoptera* 4–9, and *F. cornuta* 3–5 (Johnson 1965b).

Johnson (1964) investigated 36 platforms of *F. gigantea* and found only two with eggs, sets of 3 and 4, which may have been incomplete clutches. Some indication of clutch size can be inferred from the number of small, black downy chicks observed in family groups, although such data fail to account for unhatched eggs or early mortality. I observed ten sets of chicks and another was reported by Rottman and Kuschel (1970). These averaged 3.5 chicks per family (2 families with 2 chicks, 5 with 3, 4 with 5). Three other families with much older chicks had either two or three young birds in each. It thus appears that the largest coot in the world also produces the smallest clutch of eggs.

PLUMAGES

The various plumages, other than basic, have not been described for the Giant Coot. The comments which follow are based upon color transparencies and observations with binoculars or telescope, not on birds in hand.

Hatchlings are covered with black natal down, typical of all coots, but I have not seen chicks close enough to determine if brightly colored plumes or bare skin are present. This is replaced by a dark gray juvenal plumage. Initially the lores, cheeks, throat and upper

breast are very pale gray or white. The forehead, crown and ocular region are blackish gray, which grades into medium gray on the nape and hindneck. The rest of the body is a dark gray, somewhat lighter on the ventral surface. The bill is entirely black and the legs appear to be dark gray. With time the white face and neck are lost, perhaps resulting from wear of feather tips. The entire head and neck are dark to blackish gray. The body is dark gray, with dorsum and wings darkest and the ventral surface lighter. The bill is no longer black but appears white or pale yellow, at least dorsally. The legs are no longer dark but the exact color has not been determined.

The basic adult plumage is a dark gray body with the head and neck black. Some individuals are entirely black, although the body may be a shade paler than the head and neck when viewed in excellent light. Both forms have been observed with young birds, with the bright red legs characteristic of adults, and at the same season of the year.

One feature of the adults that seems to have escaped notice is the pair of feathered knobs on the crown, at the apex of the frontal shield and above the eyes. The effect of these knobs can undoubtedly be enhanced by feather erection but they may result from a morphological protuberance of the skull as well. They are visible from most angles, although more prominent from the front, are apparent during all behavioral activities, and appear equally developed in both sexes.

The legs and feet of adults are bright red, but paler legs have been noted on birds with chicks as well. Published descriptions of bill and frontal shield coloration are quite variable and perhaps this differs with individuals, age, reproductive state or geographic location. Without specimens of known age and breeding condition in hand, I can but add my own observations of several birds seen at close range.

A pair of coots was observed on 3 August 1972 while they gathered and transported vegetation to a nest platform in a small pond at Laguna Paquisá. The lower mandible was entirely dark red, almost black, with a tiny white tip. The upper mandible had a white tip, a dark red band, about one-half the length of the culmen white, and finally a yellow base. The frontal shield was entirely yellow. On 23 November 1972 another pair was observed, again transporting platform material but on a different pond at the same locality. The mandibles of these birds lacked the white tip or dark red coloration. The lower mandible and the tip and entire tomium of the upper

mandible were black, the basal half of the culmen was white, and the frontal shield was yellow with a bright red spot on the culmen at the base of the shield. At Lago Chungará on 29 November 1972, two pairs were seen at close range during a territorial interaction (see below). All four had upper mandibles which were black distally and white basally, with yellow frontal shields, but none had the red spot at the base of the culmen. The fact that paired birds have identical bill coloration may indicate that age or seasonal differences are responsible for the variations observed.

BEHAVIOR

Several characteristics were noted during my brief observations. Most activity centers around the nest platform, the most prominent topographic feature, and both sexes defend the surrounding territory. The territory extends from the platform to the shoreline but includes only a small zone of open water towards the center of the lake.

A pair of coots, which had been transporting material to a platform about 25 m offshore, swam ashore and began to preen while standing near the water's edge. Another pair of coots were swimming along the shoreline and apparently entered the territory of the preening birds. The resident pair immediately entered the water and rapidly proceeded directly towards the intruders, heads held low and outstretched with legs and wings noisily churning up the water. The ensuing fight was quite vicious and the chase continued along the shore, and deeper into the territory, for about 30 meters. At one point the presumed males faced one another, kicking out with their feet, at times with toes interlocked and bodies so upright as to topple over backwards. The two intruders broke off contact and were momentarily chased onshore before fleeing towards the center of the lake. They rose out of the water and flapped their wings while churning the water with their feet but apparently did not attempt to fly. The pursuers remained low in the water with heads outstretched and were rapidly outdistanced.

The birds are gregarious when in the center of the lake but I saw no indication that they are colonial. Platforms tend to be evenly dispersed in single file along the shoreline and groups of platforms seem to relate only to limited aquatic plant resources.

Only one other coot was found on the lake, *Fulica americana peruviana* (= *F. a. ardesiaca* of Gill 1964) and this species tended to remain in open water away from shore. Both immature and adult Giant Coots freely inter-

mingled with this species in large groups of several hundred birds. I did not observe any interspecific aggression between the two species although such activity has been recorded for other coots (Cody 1970).

I did see one brief encounter between a Giant Coot and an Andean Gull, *Larus seranus*. These gulls occasionally utilize old coot platforms as nest sites. In this instance the gull attempted to occupy a platform but reluctantly gave way after several forceful charges by the territorial coot. The platform was located in the center of a tiny bog pond and the coot had two large downy young just beginning to fledge. A pair of Puna Teal, *Anas puna*, with one half-grown fledgling also occupied the same pond, apparently without difficulty with the coots.

NESTING SEASON

Johnson (1972) suggested that the Giant Coot may nest twice a year, in August and late November–December. Observations of the birds in Arica have been limited to the months of September–December and April–May. We have no accurate knowledge of the incubation period, the time required for young birds to achieve “apparent” adult size, or the duration of the various down and plumage stages.

We do know that this coot is the largest of the *Fulica* species, lays the largest eggs, and has similar down and plumages. We should be able to predict several features of its breeding biology by extrapolation of data derived from other species. As a general rule, we can expect that, within a given family, large eggs will require a slightly longer incubation and that developmental stages will at least equal, if not exceed, equivalent development in smaller species. Based upon the reproductive cycle of *F. americana* (Gullion 1954), incubation should require 25 days, the black down should persist for three weeks, full juvenal plumage should be acquired in eight weeks, and immatures may be indistinguishable from adults (except for bill and leg coloration) in twelve weeks. Thus the period from initiation of egg deposition to acquisition of basic plumage requires a minimum of sixteen weeks.

Observations indicate extreme dates for eggs of 9 September and 20 April, with large young by 10 November and small chicks on 31 May. Extrapolation of incubation and development periods for all observations indicate that young birds may be seen throughout the year and egg-laying occurs for at least nine months, being greatest in October and November.

Thus, some reproduction may occur throughout the year although most is concentrated in the austral spring.

SUMMARY

In northern Chile the Giant Coot is found in various freshwater habitats above 4200 m which lack emergent vegetation. It constructs large, conspicuous non-floating nest platforms of aquatic vegetation and aggressively defends a territory extending from the platform to the shoreline. The nesting season persists for nine months, perhaps throughout the year, and the clutch consists of five or fewer eggs. The down and juvenal plumages are similar to those of other *Fulica* species. Adults have two conspicuous feathered knobs above the frontal shield and eyes.

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