

BREEDING HABITS OF THE CRESTED WATTLED PLOVER
(*SARCIOPHORUS TECTUS LATIFRONS*)

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HAUNTS, DISTRIBUTION, AND FIELD CHARACTERS.

From September 1935 till August 1936 I was District Officer at Garisa (Northern Frontier District). Here I discovered that the Crested Wattled Plover¹ (*Sarciophorus tectus latifrons*) was a common breeding species, although it had not previously been reported as nesting in East Africa. So I was given the chance to make a careful study of its breeding habits, and found them both interesting and unusual.

The notes that follow can be taken as a supplement to Dr. V. G. L. van Someren's article on this species in his "Birds of Kenya and Uganda" in the Journal of this Society² for October 1933, page 21. This deals with plumage, distribution, and habits other than breeding. van Someren records two forms of this species as present in Kenya—*Sarciophorus tectus tectus* and *Sarciophorus tectus latifrons*. He states that the former ranges from Turkana and South Rudolf across to the Northern Frontier District, and the latter from the Juba River to the Tana and to South Ukambani. As Garisa is on the Tana (39° 45' E. 0° 30' S.) I expected to find *Latifrons* there. Since all the birds that I saw had the broad white patch on the forehead that distinguishes *Latifrons* from *Tectus* I was almost certain that the race at Garisa was *Latifrons*, and therefore collected only a couple of specimens. These van Someren has kindly compared with his own large series, and he is satisfied that my specimens are *Latifrons*.

I was able to obtain only a rough idea of the distribution of the bird in the 25,000 square miles of Garisa district. The north-west limit seems to be at Saka, where the Tana makes its great bend from east to south. Above here, though the country seems suitable, I have not seen a single bird, nor have I noted any on the Galana Gof at Benane or Muddo Gashi, or intermediately between these places and the Tana. North and east of Saka, however—between the Tana and the Uaso—the bird is to be found, and I have seen it east and south-east of Garisa in the Kurde and Rama areas near the Italian boundary. Along the Tana from Saka south to Garisa (35 miles), it is plentiful, as from Garisa to Bura. Bura is 50 miles south of Garisa, and is where the main road leaves the Tana and bears south-east to Lamu (120 miles). I have not been beyond Bura.

¹Called the "Smaller Blackhead Plover" in the *Systema Avium Aethiopicarum*.

²Subsequently referred to as "Journal."

Garisa district is, I think, typical country for the Crested Wattled Plover. It is part of the huge low-lying plain of the Northern Frontier, never more than a few hundred feet above sea level, perfectly flat, and covered with thorn-scrub. The rainfall is both irregular and patchy, the seasons when rain is expected (though by no means always obtained) being April and November. The climate is warm, mid-day shade temperatures varying from 75° F. in the cool season to about 100° in the hot, the average being well over 80°. The river Tana cuts south through the desert, its forested banks proving a welcome relief from the monotony of the thorn-scrub. The Tana, the Uaso, and a few water-holes on the Galana Gof are the only places in the district where permanent water may be relied on, although in the desert there are numerous pools which may or may not be filled in the rains. In the dry season all but a few of these will certainly be empty. After good rains both water and grazing are to be found all over the desert, and the Somali with his herds of cattle and goats, the wild game, and many species of birds such as duck, waders, and herons all go out and colonize these areas until the grass withers and the pools dry up, and it becomes necessary to return to the safety of the permanent waters. Thus a marked seasonal migration is a normal feature of human, animal and bird life in the district.

As a bird of the dry sandy country, the Crested Wattled Plover is not, however, particularly subjected to these rain-induced movements. It may usually be found in an open sandy place in the bush with scattered grassy patches. Often a river or water-hole is not far away, and the birds seem to be partial to the vicinity of human dwellings. I have never seen them frequenting the actual muddy margins of swamps like other waders do; they are always on the hard ground a little distance off. The haunts of this bird thus correspond with those of the race *Tectus* in Nigeria and Gambia described in Mr. D. A. Bannerman's "Birds of West Africa," Vol. II, page 120. At Garisa it feeds in the sandy patches or among the short grass, and the stomachs of the specimens I shot contained numbers of tiny, whitish, hard-shelled insects. I have seen the bird right out in the bush, at least twenty miles from open water. Usually, however, it is in green surroundings, e.g. near a dried-up swamp. The really arid places do not seem to be patronised.

The field characters of this plover are shown to a certain extent in the photographs. It is about eleven inches in length, with a short compact body and long red legs, and a conspicuous black crest. Encircling the neck and running down the centre of the breast is a wide black band, like a muffler. This is separated from the black on the head by a white band, widest at the chin and at the nape. The forehead is white, but the lower part is obscured by two red wattles which grow in front of each eye and together make a continuous red band across. The back is brown, and the underparts mainly white. In

flight the wings (which are pointed) show longitudinal bands of brown, white and black, and the black tail with white coverts is conspicuous. I was not able to distinguish between the sexes in the field, though it might be possible to do so with more experience. All the birds were very much alike, but some had longer crests than others. These may be males. My two skins are male and female. There is not much difference in size, but the crest of the male is much the longer, and the bill longer and heavier (σ 28 mm., ♀ 25). There may be a difference in the calls, but again I am uncertain.

I have little to add to the notes made by other observers on the habits of this bird in the non-breeding season (e.g. by Mr. G. L. Bates in his "Handbook of the Birds of West Africa," page 42, and by Rear-Admiral H. Lynes in the *Ibis* for 1925, page 568; and particularly the descriptions in Bannerman's and van Someren's works already mentioned).

BREEDING HABITS.

Outside East Africa the nest of *Sarciophorus* has been found occasionally, e.g. by Lynes in bare open country in Darfur (Sudan), and by Mr. J. B. Welman on the polo ground at Maidugari in Nigeria (Bannerman, page 121). Bannerman mentions a clutch in the Nehrkhorn collection, the two eggs measuring 35 x 25 and 37 x 25 mm. These records however are all for the race *Tectus*; I think that the eggs of *Latifrons* have never been described. They are not represented at the Coryndon Museum, nor, I believe, at South Kensington, nor (according to articles in the *Oologist* some years ago) in the Nehrkhorn collection or in those of certain other collectors who have specialized on the *Charadriidae*. I cannot find any reference to them in the *Ibis* or in other journals or papers. So when I found that *Latifrons* was a common breeding species at Garisa I resolved to avail myself fully of the opportunity thus offered. Photographs had to be taken of the bird itself and of its nest, eggs, and young; sufficient clutches of eggs had to be collected for the Museums, and a few skins of breeding birds obtained to verify their identification; observations had to be recorded on the various stages of breeding. In the achievement of the first two objectives I was fairly successful; in the third I did as much as circumstances would allow. Where desirable I have shortly referred to similar or comparable habits in other members of the *Charadriidae* which have been noted by other observers.

I do not think for one minute that the nesting of this bird is new in the sense that it has not previously bred here; no doubt it has done so for many years, escaping notice merely because the fact was not reported. Mr. R. G. Darroch, District Commissioner at Garisa, tells me that he found young when at Bura in 1930, and that the bird has been common as long as he has known this area.

The place where I knew the bird best was in the immediate vicinity of the station itself. This is situated on the east side of the Tana, at a point where the banks are high and the belt of forest very narrow. The officers' houses are within a few yards of the river. For a short distance from the bank there is alluvial soil, the product of big floods in the past, and here there are gardens and large forest trees. Almost at once, however, the alluvium yields to sand, and the vegetation changes to the thorn bushes and acacias which cover so much of the district. The office and guard room are on the fringe of the hard soil, and so is the village, a couple of hundred yards away from the river. From the village the main road runs north, parallel with the Tana but some distance from it. Two miles away there is a large cleared space—the landing ground—which is the main breeding haunt of this plover. It is a circle eight hundred yards in diameter, all on hard sand except for the very lowest end which touches the belt of alluvium. The latter is much wider here than at Garisa, as is the belt of forest, which, with its Dom Palms, Tana Poplars, Wild Figs and other large trees, rises like a wall in the distance. The thorn-scrub entirely encircles the landing ground, which is an exceptionally large open space for this part of the district.

The breeding season in 1936 was after the April rains. There were five nests with eggs on April 28th, and many others were discovered during the first half of May. This would seem to have been the height of the season. More were found at the end of the month, and one as late as June 25th. The first nest with young was found on May 6th.

The nest is a scrape in the sand, in which two eggs are laid. The most popular nesting area was a portion of the landing ground where there was hard firm sand in places, and short grass and debris in others. Here at one period there were seven nests within three hundred yards. The favoured locality happened to be just where the road crossed the landing ground; anywhere else the birds would have led a much quieter life. However they did not seem to object to disturbance, as was made clear by the number of nests found in the most unexpected places in and around the station itself. One was beside a much-frequented path and within a hundred yards of the guard room. Another was on alluvial soil near the garden, and yet another hidden in short grass within a stone's throw of the dressing station. Perhaps the most remarkable of all was at Saka, near the rest hut. This is perched on a bluff above the river, sufficient forest having been cut away for the building and its sandy compound, and no more. Yet a bird chose to nest there, within thirty yards of the hut, and in full view of myself when conferring with the local headmen! What I imagined to be the normal type of breeding area was in the vicinity of a large Somali man-yatta near Garisa. Here the birds nested in the thorn bush, in which an opening ten yards square seemed quite sufficient. In most of the

district they would be obliged to use this type of country. Of twenty nests discovered, ten were out in the open, and ten in more enclosed country. Eighteen were on hard sand and two on the river loam¹.

All through the breeding season some birds near my house at Garisa had the peculiar habit of mobbing me every time I passed, although I knew they had not got eggs or young. As I approached, they would watch me nervously, uttering their harsh cry, "Kwairr . . . kwairr." When I was near the noise would get shriller, "Kiarr . . . kiarr," then the birds would take to flight with a piercing "Kir . . . kir . . . kir," racing over my head and diving at me furiously. Then suddenly their wrath would evaporate, and they would alight only a few yards away, modifying their call again to the first note, "Kwairr . . . kwairr." I have seen these birds wheeling, diving, and tearing along close to the ground in a manner very similar to the Lapwing (*Vanellus vanellus*). Generally speaking, in a place where some birds have eggs and others have not, it is the latter who perform the sentry duties. Mobbing intruders is, however, by no means confined to the breeding season; birds may do so at any time of year. Capt. C. D. Priest has noted the same aggressive characteristics in the South African Wattled Plover (*Afribyx senegallus lateralis*; "Birds of Southern Rhodesia," Vol. II, page 98).

A bird breeding in such exposed places either has to run off the eggs as soon as danger is sighted, or to sit tight and trust to its inconspicuous colouring. *Latifrons* adopts the first course, and it is so much on the alert that one has to come on a nest very suddenly to catch the bird unawares. It then departs abruptly, but does not go far—walking a little, stooping to pick up a morsel of food, looking anxious, walking again, picking up more food, and so forth. Nothing could be more undemonstrative. This form of behaviour is reserved for human beings; with regard to stock very different tactics are adopted. When a flock of sheep or goats passes near the nest, the bird stands firm and shrieks defiance at them, pecking at the legs of animals venturing too close. I regret to say that I missed the chance of seeing this for myself, but Somalis regard it as the normal procedure. As corroborative evidence I was shown a nest where I was told that the bird had behaved in this way. The site was a hard sandy patch on a route along which a flock of goats passed daily. In front

¹The concentration of large numbers of breeding pairs in the immediate vicinity of Garisa is a matter of interest. The two likeliest explanations I can suggest are that (a) the Somali herds of sheep and cattle create favourable conditions for the reproduction of insects upon which the bird feeds; (b) the most favoured nesting habitat is an open space with hard sandy soil, which (unless artificially cleared as at Garisa) is not often encountered, since it is on just such sandy patches that the bush usually grows thickest. Speculations of this nature are, however, entirely unprofitable unless supported by the evidence of a detailed ecological survey.

of the nest the whole surface was mottled by their tracks, but about a yard away these diverged and passed at a distance of about two feet on either side, re-joining immediately afterwards. In this instance the bird later deserted, though curiously enough the egg remained unbroken until I removed it a week later. I saw one nest that had been trodden on, showing either that the defence had not been effective, or that the parents were absent when the animals passed.

A Somali, who used to find nests for me, would drive a flock of goats past the likely places in the hope that the parents might betray the whereabouts of their eggs. Usually they did so. When searching for nests myself, I found a useful method was to dash at top speed on a bicycle to the place where I suspected that there was a nest; this gave the bird no time to retire unobtrusively, and the act of rising off the eggs could clearly be seen. Another method was by tracking. One day I was walking in the bush, and saw a bird running away as if it had a nest, but I had no idea exactly where this might be. I went to the place where I had seen the bird, and noticed that its tracks showed clearly in the sand. So I traced them backwards, and, after following them for a few yards, suddenly came on the eggs. Of course the orthodox method of watching the birds return to their nest was not neglected; it was most effective at mid-day when the parents were particularly anxious not to leave their eggs uncovered.*

Aggressive behaviour when stock approach the nest is not confined to this species. According to Mr. W. Krienke, it is a characteristic of both the Crowned Lapwing (*Stephanibyx coronatus*) and the South African Wattled Plover (*Afribyx senegallus lateralis*). He writes: "I have found that if a flock of sheep is handy and turned to graze over the ground where nests are suspected, the eggs are easily located, as the birds sit close till the animals are almost on them, when they will stand up with outspread wings, flapping excitedly in an endeavour to drive off the sheep." (Quoted in Priest, page 87.) In Kenya van Someren found that a dog was useful for discovering the nests of the Three-banded Plover (*Charadrius t. tricollaris*) as the birds would rush at it and try to drive it away. (*Journal* for April 1933, page 189.)

Methods of brooding vary. If it is cool, *Latifrons* broods in the usual way, but in the heat of the day it squats on the long tarsus, hardly touching the eggs, and shields them from the fierce rays of the sun. At such times the feathers of the back are fluffed out and the wings slightly extended, so that the bird looks twice its normal size. It is usually seen to be gasping in the heat. I was able to observe this characteristic very closely when watching the bird at Saka. The disengaged parent often finds shelter a little distance away. I believe that both birds brood.

* I found that natives of the Malakote tribe were particularly expert at this method.

I found a nest of the Spur-winged Plover (*Hoplopterus spinosus*) in arid country not far from Garisa on March 6th, 1936—the hottest time of the year—and the birds behaved in much the same way. They were so confiding that I was able to watch them for several hours from a distance of thirty yards. The brooding bird fluffed out its feathers in the sunshine while its mate sheltered beneath a bush near by. The female sat on an empty nest for two hours, then the male took a turn for a few moments, with the female standing beside him. Soon she intimated that she wanted to return; accordingly the male got up, but before leaving the nest removed a piece of earth from the lining. The female then began brooding again, and an hour later I found an egg. This was three-quarters buried in the lining of the nest, presumably in the hole that the male had made.

Mr. and Mrs. R. E. Moreau have recently published some interesting notes on the Masai Two-banded Courser (*Rhinoptilus africanus gracilis*) at Mkomasi in Tanganyika (*Ibis* for January 1937, page 161). The brooding habits of this species seem to correspond very closely with those already described for *Latifrons* and *Hoplopterus*. A nest with one egg was found on November 19th 1934, on a bare patch of ground. "The birds shaded their egg, practically without intermission, for at least ten of the daylight hours, sitting on their tarsi, and bending over the egg so that their breast feathers did not touch it. . . . the 'sitting' bird crouched, with bill open, facing the breeze, and with feathers ruffled so as to allow free passage of air through them. . . . the off-duty bird always sought the shade of a nearby *Suaeda* bush after sunset one of them brooded in the ordinary way." One is led to wonder whether this is the usual habit of the *Charadriidae* when brooding under conditions of great heat. Whether it facilitates the hatching of the egg seems to me uncertain; perhaps the main result is increased comfort for the bird. On Garisa landing ground I had opportunities of observing Sandgrouse (*Pteroclididae*) nesting in the open under exactly similar conditions to *Latifrons*, and at the same time of year. The birds always seemed to brood their eggs very closely and never ruffled their feathers like the plovers did. Yet the young appeared to hatch just as successfully.

DESCRIPTION OF THE NEST AND EGGS.

Nests may be of two kinds, open and hidden. By "open" I mean the usual wader type; by "hidden" those in which the eggs are buried in the lining so that only the tops show. This makes them remarkably hard to see. The following is a description of a typical hidden nest. The nest is placed right out in the open, on a hard sandy patch where there is a scanty covering of small creeping plants, dead twigs, black debris of leaves, thorns, etc. The cup is a slight scrape in the sand about 6 inches in diameter, lined with tiny pebbles, pieces of earth, twigs, dung, and even with some prickly six-pointed grass-

PLATE 1.



Crested Wattled Plover (*Sarcipharus t. latifrons*) at nest, Garisa landing ground, May 12th, 1936. The nest is a scrape lined with fragments of whitewash. This form of lining is abnormal.

PLATE 2.



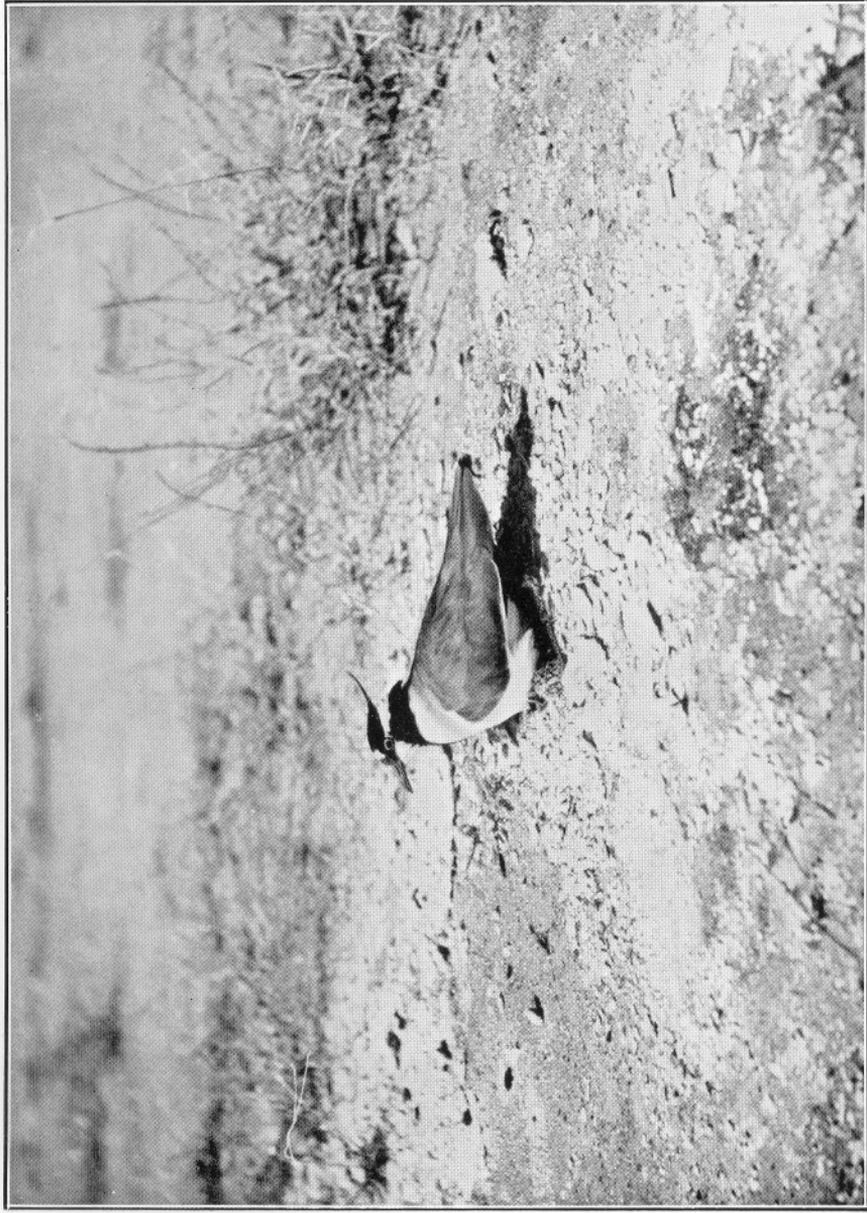
Same day and place; the bird returns to the nest.

PLATE 3.



Examines the egg and the newly-hatched chick.

PLATE 4.



Settles down to brood keeping a watchful eye on the camera. The chick peeps out from beneath her body.

PLATE 5.



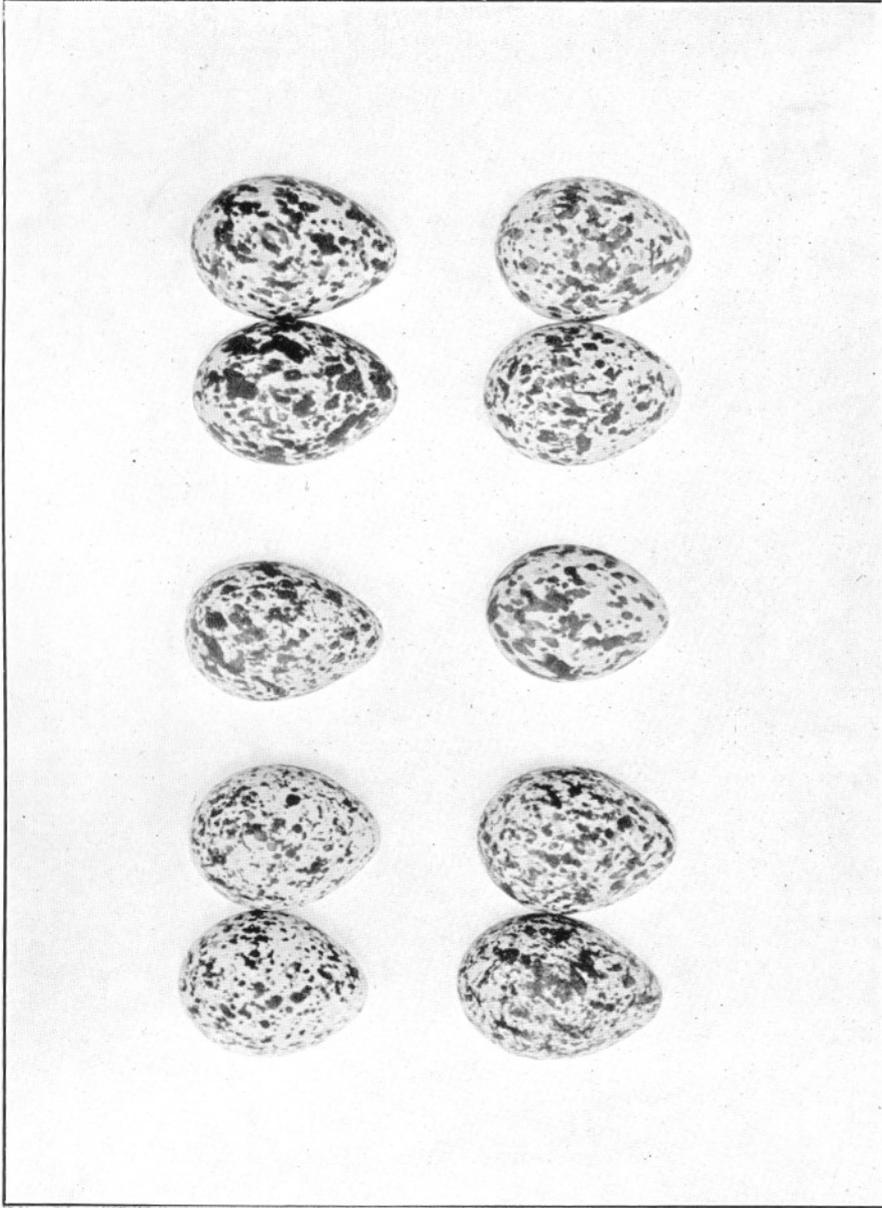
A typical hidden nest, landing ground, May 13th.

PLATE 6.



A typical open nest, same place, June 25th.

PLATE 7.



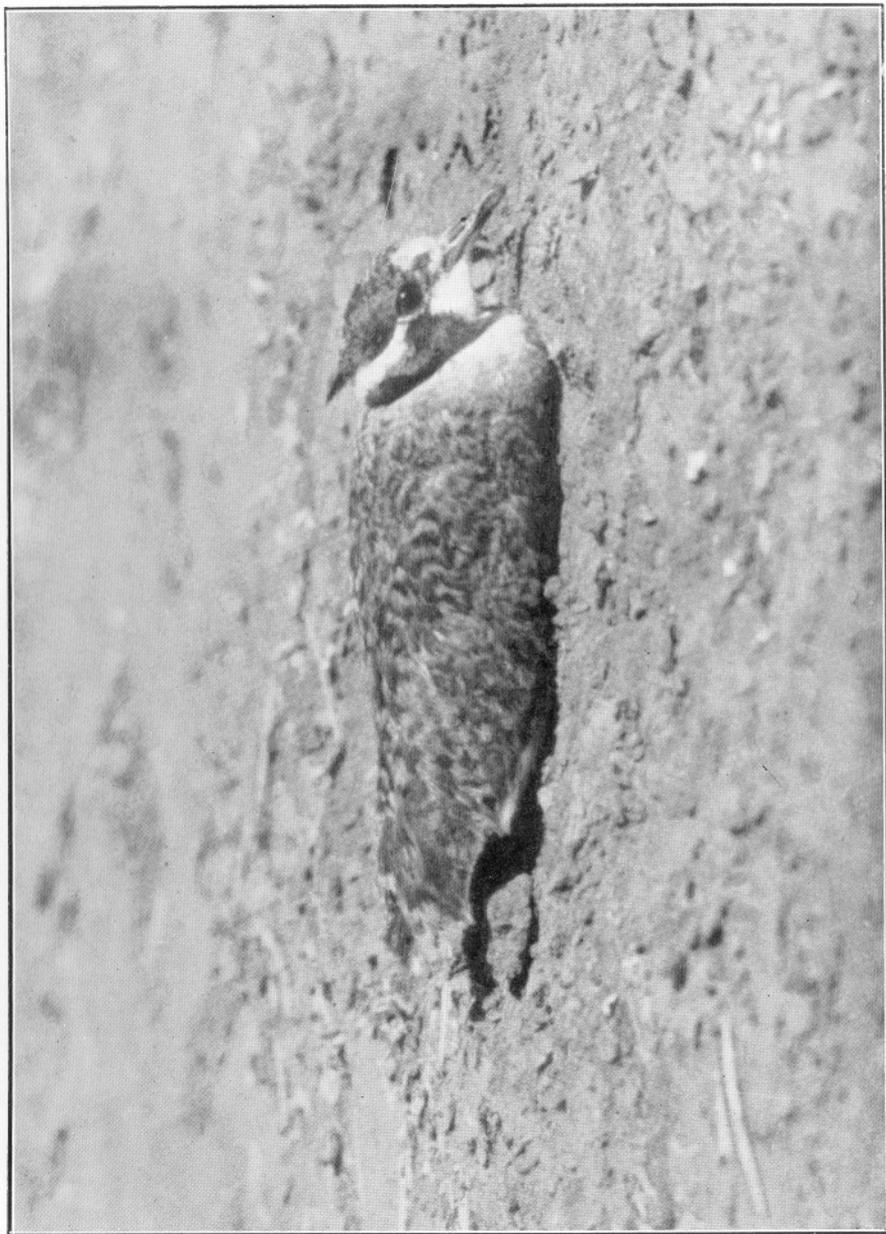
Six clutches of eggs showing variations in size, shape and colouring.

PLATE 8.



Newly-hatched chick in open nest near Garisa guard room, May 6th.

PLATE 9.



Fully fledged young, near Garisa station, July 1st.

seeds. The eggs are two in number, lying side by side, half-buried in the lining, their brown-and-buff colouration blending perfectly with their surroundings (Plate 5). An open nest is very similar, usually about 6½ inches across, sometimes without a lining, but often lined with small pebbles or stones. No attempt is made to bury the eggs (Plate 6). Some open nests are very easy to find; quite the most conspicuous I can recall was that at which I photographed the bird (Plate 1). This was on the white-washed centre-mark of the landing ground, which at that time had been partly demolished by the rains. The nest was on a broken patch, and the eggs were enthroned upon a collection of some hundreds of small pieces of whitewash. Of twenty nests found, eleven were open and seven hidden, and two began by being hidden, then were altered to the open type. Both of the latter before being converted were seen to contain prickly grass seeds in the lining, which suggests that there was a practical reason for the change. Apart from these the tendency was to adhere to one or other type during the whole period of incubation. In two instances, however, I took the egg from a hidden nest, and subsequently the bird re-laid but changed to the open variety.* I found it impossible to say which type of nest was the more likely to be used in a given locality; the selection seemed to be indiscriminate, and to rest with the preferences of each individual bird. There was nothing to suggest the operation of a logical principle, such as that hidden nests should be constructed in the more frequented places (e.g. eight nests were found at the station, four open and four hidden).

Quite a number of the African waders bury their eggs, though their methods vary. Kittlitz's Sand-Plover (*Charadrius p. pecuarius*) habitually scratches sand or pebbles or caked mud over its eggs before leaving the nest. This has been noted by Priest in South Rhodesia (page 79), by Edelsten in the Orange Free State (quoted by Priest), by Belcher in Nyasaland (page 76), and by van Someren in Kenya (*Journal* for April 1933, page 187). In this species the habit therefore seems to be usual not only in the tropical but also in the comparatively temperate parts of its range. Mr. J. H. Vaughan (*Ibis* for 1930, page 2) gives a description of the nest of the Madagascar White-fronted Sand-Plover (*Charadrius marginatus tenellus*). He says that the eggs are laid in a depression in the sand, and at first are unconcealed. Gradually, however, sand is heaped round them making them all but invisible. In an accompanying photograph only the tops of the eggs can be seen. The Egyptian Plover (*Pluvianus aegyptius*) appears to be more thorough in this respect than any of the other species, as it buries its eggs completely and keeps them covered with sand even while incubating (Bannerman, page 205-6). From published

* In both cases the bird laid a single egg of distinctive shape and colouring, and the second clutch was found in the same place as the first.

accounts the Spur-winged Plover (*Hoplopterus spinosus*) does not normally possess this habit, though as already mentioned I have found a nest in which the single egg was buried. To summarise, as far as I can ascertain only five species have been observed to conceal their eggs in this way, all of them tropical nesters. In at least two of these (*Latifrons* and *Hoplopterus*) the habit is irregular; apparently the rest of the African waders can dispense with it without disadvantage. Thus the practice would seem to be of questionable utility.

The eggs have the typical wader colouring, but are less pyriform than many. In size they are about the same as a Kentish Plover's (*Charadrius a. alexandrinus*). Both in size, shape, and colouring they vary considerably; the six clutches shown in Plate 7 illustrate some of the varieties. Two eggs usually are laid, sometimes one; of fourteen clutches collected, nine are of two eggs, and five of one (and out of these latter two were almost certainly re-layings). The average size of twenty-three eggs is 34 x 25 millimetres; largest 37 x 25 (top right in the plate); smallest 32 x 24 (bottom centre). Even in the same clutch the size may vary, e.g. 37 x 25 and 35 x 25 (bottom left). The pair shown in the bottom right-hand corner are typical for size, shape, and colouring, although the stumpy type (bottom centre) is also common. Markings vary so much that it is often possible to tell a hen by the eggs she lays. The usual background is light stone-colour to warm buff; sometimes greeny-brown, sometimes pale yellowish buff. In a typical clutch (bottom right) there are irregular spots and patches of dark umber superimposed over chestnut, and numerous small light grey markings, all scattered freely over the stony-buff background. In one variety (top right) the umber patches are greatly increased in size, producing beautiful mottling; in another (bottom centre) the comparatively scarce markings make a bold pattern longitudinally with the egg; and in yet another (top left) the eggs are spotted after the manner of a Ringed Plover's (*Charadrius h. hiaticula*). I have one egg (not shown in the plate) which is scrawled rather than spotted. It is quite usual for the members of a clutch to be marked differently (bottom left). As regards incubation, in one instance only I found that the members of a clutch were unequally incubated; here one egg was slightly set and the other fresh. Mr. D. McInnes gives a similar instance for a Spur-winged Plover's nest with four eggs, but here the variation was much greater (*Journal* for October 1932, page 129).

All the clutches were taken in the immediate vicinity of Garisa, and by me personally. In each case I satisfied myself that the identification was correct; in two instances I collected the brooding birds, which appeared to be typical specimens. No other plover was breeding at the same time in the area from which the eggs were taken. The skins collected, together with a representative series of clutches, have been divided between the Coryndon and the British Museum.

MORTALITY FACTORS.

Mortality factors during the breeding period can be divided into two classes, animate and inanimate. On this subject the evidence I possess is distressingly inadequate; the notes that follow are therefore opinions rather than conclusions.

A. Animate.

(1) *Man*. The local Somali tribes do not appear to persecute the bird or to take its eggs. I think it is one of the numerous creatures that they refuse to eat.* On the other hand the river tribes (Malakote, Korokoro) catch a number of birds in snares. A small circle of sticks is erected round the eggs, with one entrance only, where the snare is concealed, and usually a capture is quickly effected.† As, however, the habitat of *Latifrons* is the "barra" or dry country that belongs to the Somalis rather than to the river tribes, I do not think that the breeding of the birds is intentionally affected by man to any great extent.

(2) *Other than Man*.—Of these I know practically nothing, though I suspect that they are by far the more important. A great many nests at the landing ground came to grief, through what agency I am uncertain. Possibly the ground squirrel or the small mongoose called in Swahili "Kitete" may have been responsible, or it may have been snakes. At the time that the plovers had eggs there was a hatching of caterpillars which attracted numbers of baboons and Marabou Storks (*Leptoptilos crumeniferus*), and in at least one instance I believe that a Marabou was responsible. This, however, I think was exceptional. The very real danger from stock has already been fully discussed. The Somalis told me that the birds use the same methods to drive off wild game.

B. Inanimate.

(1) *Rain and Floods*.—Practically all the nests that I saw were on hard sand and in situations unlikely to become waterlogged or flooded.

(2) *Sun*.—Nests are almost invariably constructed in the open, away from shelter, and the heat of the sun must be tremendous. A peculiar attitude assumed by the bird while brooding has already been described. Where nests are near human habitations, the birds are frequently obliged to leave their eggs for considerable periods. I remember three nests that were particularly liable to disturbance: one near the guard room, one at Saka, and one where the bird itself was photographed. Yet all hatched successfully; a striking example of the heat-resisting capabilities of a plover's egg. Such capabilities, however, must have their limits, and the birds (as already stated) are most unwilling to leave their eggs uncovered during the heat of the day. A

* The Somali name is Wir-wira—a good phonetic rendering of the call.

† The Malakote name is Darsalaga.

deserted egg I blew, which had been lying unprotected for a week, was practically soft-boiled! I fail to see what advantage the hidden type of nest may have as regards protection from the sun. The eggs are only half-buried, and the rays can strike down on them without hindrance if the brooding bird is absent. The three nests mentioned above were all open. §

DESCRIPTION OF THE YOUNG.

The newly-hatched chick in down (Plate 8) has the typical colouration of a young wader. The crown of the head is covered with black and golden spots, with a short black stripe on the crest, and a similar stripe extending from ear-covert to ear-covert around the nape of the neck. Round the neck itself there is a broad white collar which divides the spotted crown from the similarly spotted back and wings. The throat, cheeks and under-parts are white; bill dark grey; legs and feet grey; eye dark. When lying flat the bird is very hard to see, as the upper parts—which in colour strongly resemble the egg—blend perfectly with their surroundings, but when the chick is running or standing the white collar becomes most conspicuous. Mr. A. L. Butler (quoted in Bannerman) states that the young of the Egyptian Plover possess exactly the same characteristic; he suggests that the white patch enables a mother to keep her nimble little chicks in sight.

In the fledged young (Plate 9) the back is spotted with two shades of brown, as is the crown, and there is a slight crest. A black band extends from cheek to cheek round the back of the neck, terminating under the eye, where it widens to meet the lower eyelid, thus dividing the white nape from the white throat. The under-parts are white, except for some light brown on the breast; the central black band which is so conspicuous in the adult has not yet developed. I regret I cannot give the colours of the soft parts, as I stupidly forget to write them down when photographing the birds.

BEHAVIOUR OF BIRDS WITH YOUNG.

I have already said that birds with eggs are most undemonstrative when a human being approaches. But as soon as the young are hatched their behaviour changes, and the intruder is greeted with anxious cries which increase in intensity as he comes nearer. On May 7th I watched the pair near the guard-room; their chick (Plate 8), which I had photographed the day before, was no doubt hiding somewhere near. The parents kept on calling, and allowed me to approach within ten yards of them. They walked round with the head held low and

§ Note: The breeding habits of this plover seem to differ surprisingly little from those of a European wader such as the Lapwing (*Vanellus vanellus*). The differences that I noted were four in number: (1) a smaller clutch, (2) a modified method of brooding, (3) burying the eggs, (4) driving off stock approaching the nest.

the crest flat on the back; every few steps they would stop, pick up something out of the sand, and eat it. But in addition to this they would crouch down, with the bill almost touching the ground, in what I took to be the mating position. This assumption proved to be correct, because while one of the pair was lying thus, the other leaped suddenly on to its back. The act only lasted for an instant, then both birds resumed their anxious cries and their prowling. But it struck me as a very interesting piece of behaviour, because although mating is probably the most powerful impulse in a bird's life, there appears to be no logical connection between this and the main feelings of the birds at the moment, which were anger at my presence and anxiety for the sake of the young. Such anger might have found a natural outlet if the birds attacked me, but they did no such thing. Thus their emotion, which had to find expression somehow or other, was diverted into unnatural channels. To borrow a phrase from Mr. Eliot Howard ("The Nature of a Bird's World," page 19) if anger was their master reaction, pretending to mate was a false reaction attendant upon the anger.

I have not commented on the pretended or actual picking-up of food when a bird is disturbed at the nest, although this is probably another "false reaction." It may, however, have practical value in convincing the inexperienced intruder that a bird which is so obviously feeding cannot possibly have eggs near by! In reality the peculiar attitude assumed by the bird while prowling round and picking up food is a patent admission of the vicinity of the nest. The habit is, I think, common to many plovers, both African and European. Krienke discussing the Crowned Lapwing (*Stephanibyx coronatus*) and the South African Wattled Plover (*Afribyx senegallus lateralis*) says that as soon as danger is apprehended the hen slips quietly off the nest in a crouching attitude and immediately makes a pretence of being engaged in feeding (quoted by Priest, page 87). Mr. T. A. Coward says of the Lapwing (*Vanellus vanellus*) in England: ". . . . the sitting bird leaves the nest silently, running for a few yards, and artlessly pretending to feed. . . . I have lain beside the chick and watched the old bird run towards me, stopping every few yards to pick up imaginary food." ("Birds of the British Isles," Vol. II, page 200.) No doubt such instances could be multiplied indefinitely. The observers quoted both say that there was only a "pretence" at feeding. While watching the Crested Wattled Plovers with young, however, I definitely saw a bird pick up something and eat it; this occurred several times and I am sure there was no pretence.

At Garisa I used to encourage a young Somali herd-boy to look for nests for me, and found him both reliable and observant. On May 11th he told me that he had seen a bird fly off with one of her young held between her legs. I note this in case the record may be confirmed later.

Owing to pressure of work during the first half of May I had to limit photography of the birds at the nest to one morning only. The hide was erected from sunrise to sunset for several days before I photographed—an unsatisfactory process, but I dared not leave it up at night for fear that it might be stolen. At 7-30 a.m. on May 12th I entered the hide, focussed my camera on the eggs five feet away, and told my assistants to depart. The birds, which had been watching from a distance, soon returned. They walked round the hide and tried to peer in, uttering loud angry cries that sounded to me like "Yah! Yah! I see you!"—from which I gathered that the measures taken to deceive them had not been at all successful. However, the call of the eggs was imperative; soon the bird I believed to be the female (Plate 1) was standing only a foot away from the nest, then she settled down to brood. A little later the sun came out, and I saw that the shadow of the hide cut directly across the nest, so that the bird, when brooding, was half in sunlight and half in shade. This was intolerable, and there was nothing for it but to summon my helpers and to move the hide a little to one side. While doing this I saw that one of the eggs had hatched. I feared that the change of position might upset the bird even more, but I misjudged her. Nothing could lessen her suspicions of the hide, but the time was too critical to allow her to stay away. So back she came, walking quickly in a crouching position (Plate 2), flopped down suddenly, wagged her tail, and began to brood. I noticed that she was squatting on the long tarsus in the manner previously described. Even while brooding she continually uttered warning cries. But in time she calmed down a little, and the chick peeped out from beneath her body (Plate 4), and I was able to take as many photographs as I liked. When I had finished, I removed the camera and looked out of the large hole in the front of the hide where the lens had been, expecting that she would fly off at once. She did retire for a few yards, but then to my surprise came back and proceeded to brood as before. After a few moments I emerged, dismantled the hide as quickly as possible, and left the birds in peace.

SUMMARY.

To summarise: *Sarciophorus tectus latifrons* was found breeding in 1936 at Garisa on the Tana River, in the Northern Frontier District of Kenya. *Sarciophorus tectus tectus* has been discovered nesting in West Africa and in the Sudan, but I believe this is the first time that the eggs of *Latifrons* have been described. The bird nests in numbers along the Tana between Saka and Bura, and is found in the desert to the east, but north and west of Saka it does not seem to occur. Its haunts, both for feeding and nesting, are hot, low-lying, sandy, scrub-covered plains, only three to five hundred feet above sea-level. It does not frequent the margins of pools. The breeding season was in May (after the April rains). No observations were made on courtship, and

the incubation and nestling periods were not discovered. Many nests were found near the houses and the Somali "manyattas" at Garisa, though the most favoured area was the landing ground, which is an abnormally large open space for a country chiefly scrub-covered. The brooding bird will slink off quietly if a human being appears, but on the approach of sheep or goats it will stay beside the eggs and attempt to drive the animals off. In the heat of the sun it fluffs out its feathers and squats on the long tarsus, shielding the eggs rather than brooding them. Sometimes the eggs are deposited in a scrape in the normal manner; sometimes they are to be found half-buried in the lining. It is impossible to say which method will be employed. The clutch is usually two, sometimes one. The egg is sub-pyriform, and has the usual wader markings. The average size of twenty-three eggs is 34 x 25 mm. Eggs vary considerably both in size and colour. Two skins of brooding birds were obtained to ensure correct identification. Little was discovered about mortality factors in the breeding season, but a summary is given of the evidence obtained. The chick and the fledged young are described. The peculiar behaviour of a pair of birds with young is discussed, as is the habit of "food-pecking." In conclusion a short account is given of the photography of the birds from a hide. Photographs are included illustrating the adult bird at the nest, the two types of nest used, the chick and the fledged young, and the variations in the markings of eggs.