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February / février 2010

THE BIRDS OF SOKOTO

Part 3: Breeding Data

by

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We discuss here only those species whose eggs and/or chicks we have found; presumed breeding seasons, courtship and aggression of other birds are detailed under the appropriate species in parts 1 and 2. For several of the 33 species described below we have found very few nests. Breeding statistics of 24 of them are more fully compiled in an important paper by Morel and Morel (1962) for an area in Senegal around 16°N and within Sahel savanna. Our data should be compared against theirs continually, but for the most part we do not specifically mention their work unless our observations fall outside the ranges given by them.

Sokoto town is at 13°02'N. 5°16'E and well within the Sudan savanna vegetation belt. Monthly rainfall for 1970 and 1971 was as follows (figures by courtesy of the Meteorological Office, Sokoto Airport):-

mms. rain.	Jan	Feb	Mar	Apr	May	Jne	July	Aug	Sept	Oct	Nov	Dec	Total
1970	0.0	0.0	0.0	0.0	11 7	33·8	306 8	173 9	99·8	3·6	0.0	0.0	629·6 (24·8")
1971	0.0	0.0	0.0	0.0	35·6	17·1	132·8	222·0	65·5	0.0	0.0	0.0	473·0 (18·6")

African Little Grebe Podiceps ruficollis: At least 1 pair and probably 2 pairs nesting at Marmaru in late October, with 2 groups of 5 young together with adults, seen on 17th November. The young have striped heads (like a bunting) and orange bills. 8 juveniles still remained at our last visit on 15th March. By then the pond had shrunk to a diameter of 20 yards.

Pink-backed Pelican Pelecanus rufescens: In our first season 1969/70 they nested in a Silk Cotton tree Ceiba pentandra within Sokoto town; in 1970/71 they changed to another Silk Cotton in the town; in 1971/72 they nested in at least 3 trees - the same Silk Cotton as the previous year, a nearby Neem Azadirachta indica and a Tamarind Tamarindus indica. They were also said to nest near the Sultan's Palace in 1971/72.

All nests were at a height of between 35ft and 45ft. They arrived in 1971 about 1st August, and nest building began almost immediately; the birds seem always to arrive about the same date. At the end of August there were 3 nests in the Silk Cotton, 3 in the Neem and about 20 in the Tamarind, and this total changed very little. Nests are small and flimsy for such a large bird, averaging 45cm. diameter and 10cm. thick; they often merge with the next, as noted by Serle (1943). Those we examined were made almost entirely of Neem sticks, with a few acacia twigs, and lined with Neem fronds.

The first egg was laid about 14th August and by 31st August from 30 nests we counted 62 eggs, with 11 clutches of 3 eggs. The average measurements of 16 eggs were 80 x 53 mm., ranges 73-85 mm. and 49-55 mm., the average weight of 8 fresh eggs was 126 gm., range 103-140 gm. Shape and colour were as noted by Serle (op.cit.). The incubation period was more than 30 days (33-35 days recorded by Burke & Brown, 1970).

Pelicans sit very closely, but September to November is a time of violent storms and these cause great damage within the colony (cf.Hill, 1964). From 4 remaining nests in the Neem tree, for example, containing at least 9 eggs, all were lost by early October.

Chicks hatch asynchronously; they are brick-red tinged with green in colour, their eyes are open and they "rasp" and cheep. A newly hatched chick weighed 80 gm.; a brood of 3 aged 1 - 2 weeks weighed 490, 405 and 230 gm. Unfortunately, by the end of September we had to

stop climbing the Tamarind tree as nestlings of age 2 weeks and more would scramble about from nest to nest.

A fallen chick was brought to us on 17th October weighing 1730 gm. It was covered in tight white dowa (and lice) and the primary vanes were 1 cm. long and blue-black in colour; the tarsus measured 73 mm. and the bill 84 mm. (from down of "forehead"). It was fed on 170 gm. fresh fish daily but died one week later, weighing 1300 gm., though wings and bill showed a slight increase and the primary vanes were 2·5 cm. long. A post-mortem revealed nothing but a small puncture in one lung (as we would expect).

Of 14 fish found either in nests or under the trees, 13 were of a black cat-fish. The lakes and rivers around Sokoto support up to 200 recorded species, of which about 50 are regarded as common, e.g. Clarias, Synodontis, Tilapia, Barbus, Polypterus, Hemichromis, Alestes. Our "hand-reared" chick could easily swallow a Cat-fish Clariae lazera of 9 in. length, and was able to digest every part of it.

By 15th November there remained at least 12 Pelican chicks, 5 being in the Silk Cotton tree (from 3 nests and 7 eggs). These 5 had completely deserted their nesting tree by the beginning of January, i.e. approximately 100 days after hatching (cf. 60 days in Hill, op. cit.). By 10th February the main nesting tree was abandoned and the Pelicans left the neighbourhood entirely. This means that the last egg to produce a fledged chick must have been laid by 30th September; hence by "design or default" this season, the colony was synchronous to the extent that all effective eggs were laid in a 7-week period, 14th August to 30th September. From a total of 30 nests and approximately 70 eggs laid, at least 12 chicks were fledged; the breeding success is therefore 0·17 chicks fledged per egg laid and 0·40 chicks fledged per adult pair (cf. 0·28 and 0·57 respectively in Burke & Brown, op.cit.).

We wish to thank Mr.J.Oderinde, outside whose house the Tamarind grew, for his interest and for bringing us the chick; and Mr.R.Coutts for naming the fish species.

Long Tailed Shag Phalacrocorax africanus: Three adults in breeding plumage (completely glossy greenish-black plumage, red eye, orange bill, reddish-orange mottled "face", short crest) were first noticed on 30th August sitting under the canopy of the Pelicans' Tamarind tree. Two were already sitting in a small nest, which became increasingly fouled by Pelican excreta from above. Over the next few days there was some fluttering around the nest and one or other Shag was generally sitting.

On 14th September both adults were sitting. We examined the nest, which was made of Desert Date tree Balamites aegyptiaca sticks and lined with fresh Neem fronds. There were 3 eggs, chalky white and slightly blotched with green. Measurements of the eggs were 43 x 29 mm., 43 x 28 mm., 41 x 29 mm. and their average weight was 21 gm. Unfortunately the birds abandoned after 17th September.

This appears to be the fifth breeding record of the Shag in West Africa and the second in Nigeria. Dekeyser (1955) found a colony on the river Niger at latitude 14°17'N; Bowen et al (1962) found a mixed colony in a reservoir at latitude 5°41'N; Morel & Morel (1962) noted colonies at latitude 16°N; and Hopson (1966) found a large mixed colony at Lake Chad latitude 14°N, with about 1500 nests of the Shag in December to January.

Cattle Egret Ardeola ibis: Birds in breeding plumage are first seen in early June. There is an enormous colony of hundreds of birds annually in Sokoto town in the grounds surrounding the Shehu's tomb. The majority of trees used are Desert Date Balamites aegyptiaca of average height 20 feet; nests are built all over them and crudely constructed of twigs. Most adults have orange bills and legs though

.a few are crimson.

Eggs are generally pale blue in colour with a few white. Their average measurements are 45 x 32 mm.

By 11th August there were no eggs (cf. Serle) but only broods, mainly of 2 chicks and occasionally of 1 or 3 chicks. Young chicks are very fluffy with streaked heads; older ones have black bills and legs and white eyes; occasionally a straw-coloured bill is seen. The young are well able to cling onto the branches of the trees, and one bird was even thrown up into a tree and yet it managed to cling on. This chick later fell out again and we removed it; it died during the night. Its stomach contained the remains of beetles and grasshoppers; its feathers were full of parasites. This chick's measurements were- wing 340 mm., tail 55 mm., tarsus 70 mm., bill 45 mm.

Adults have no hesitation in attacking stray chicks (cf. Skead 1966).

African Green Backed Heron Butorides striatus; One pair nested in a Mango tree that stood in the pond at Marmaru. At the time of egg laying in August 1970 the nest was 3 feet above the water surface, and in the lowest branches of the tree. It could not be seen from outside. The nest was crudely built of sticks rather in the fashion of a pigeon's, and did not have a lining.

On 26th August there were 4 eggs, pale blue with a green tinge, measuring 38 x 28 mm.(twice), 37½ x 29½mm., 37 x 29 mm. The eggs were still there on 9th September but had hatched by 24th September.

Marabou Stork Leptoptilus crumeniferus: Two nesting sites were found on 22nd March 1972, and we were told that the birds nested every year. One site was near the Waziri ward Primary School with 3 nests at a height of 30 feet, in a Ziziphus tree inside a family's compound. One of the nests held 2 downy-white chicks, another held 1 downy chick, and the third nest held a fully grown chick.

The second site was near the Waziri's house, 25 feet high in a Tamarind tree and there were 2 nests each with 2 large chicks.

Wood Ibis Ibis ibis: Not known to nest in 1969/70; a pair attempted in August, 1970 but soon deserted; several nested in 1971/72 in the same Tamarind tree as the Pelicans.

The Ibises arrived about 2 weeks after the Pelicans but very rapidly built nests and by 25th August egg laying had begun. By the end of August there were at least 20 nests. Nests seemed more untidy than those of Pelicans and were perhaps bulkier; they were also lined with Neem fronds. Some nest-building was still in progress on 14th October.

The clutch size was 2 or 3 eggs, and the measurements of one clutch were 68 x 46 mm., 65 x 45 mm., 65 x 44 mm., with average weight 77 gm. Shape and colour were as described by Serle (1943).

Unlike Pelicans, Ibises do not sit closely and they often stand, stretch, preen and turn around. They also suffered considerably in the stormy winds during September to November, but not so much it seemed as the Pelicans did, for on 15th November we counted 21 chicks (from the ground) with more, no doubt, too small to be seen over their nest edges. The young chicks' bills are black, slowly turning yellow. Parents were seen to regurgitate into the bottom of the nest and not once was an Ibis chick seen to thrust its own bill into its parent's mouth for food as older Pelican chicks do. Once, a large toad was found under the tree. Adult Ibises also differ from adult Pelicans in spending long periods shading their broods, with outstretched wings; Pelicans in fact are more likely to evict their chicks from the nest than to protect them.

By 10th February, and at the same time as the Pelicans, all the Ibises deserted their tree and the neighbourhood. There were at least 30 Ibis nests finally, holding possibly 75 eggs, and probably 30

chicks fledged. This produces a maximum breeding success of 0·40 chicks fledged per egg laid and 1·0 chicks fledged per adult pair.

Hooded Vulture Neophron monachus: Nest building begins in late September or early October and continues over the area for the next 6 months. There is great variation in the speed of building and some pairs occupy a site for weeks before the female lays an egg. In fact our most recent evidence suggests that pairs may occupy their nest site continuously, though very sporadically in the wet season. Nests are mostly constructed from acacia sticks, and each stick seems haphazardly added to the growing structure; a platform is first built, generally on an old nest; a rim may be added, and then various materials are used for a lining. Many birds, though by no means all, bring leaves to add to the lining.

In a survey of 270 nests no evidence was seen for "louse colonies" (Mackworth-Praed & Grant 1970) or for tree species' preference; birds nested according to the presence of an old nest and the simple occurrence of any suitable trees. Hence, where suitable trees are clustered, e.g. the Mahoganies Khaya senegalensis in the Senior Service Club woodland, or the Borassus Palms Borassus aethiopum in the bend of the river near the Waterworks, nests are clustered; the presence of a pair already nesting does not add to the attraction of that small area. Of 268 trees used, 143 were Acacia albida (53%), 46 were Borassus Palm (16%), 28 were Neem (10%), 17 were Mahogany (6%), and 7 other tree species were used. These frequencies are probably a direct reflection of the tree species' frequency in the area around Sokoto of 40 sq.km. (15½ sq.miles).

More than 100 eggs were found in as many clutches; Serle (1943) noted all clutches as 1 egg from 64 samples. Only 1 clutch of 2 eggs is known to us (from Boughton-Leigh, Ibis 1932, p.458). Serle gives a good description of egg colours. The "reddish-brown" markings are no doubt blood stains, and in a few instances we found such a coloured

ring around the sharp end of the egg. A very few eggs are pointed at both ends.

The average size of 100 eggs was 73.2 x 53.9 mm. (cf. Serle's average from 64 eggs of 72.8 x 54.7 mm.), ranges 64-82 mm. and 48-59mm. The average weight of 26 fresh eggs was 108 gm., range 94-130 gm. (cf. 120 gm. from 20 eggs in Schonwelter, 1967).

The parents incubate continuously, and by using a maximum and minimum thermometer we determined that the minimum incubating temperature for 1 egg was 75°F (24°C), which was 20°F (11°C) above the ambient air temperature; the Harmattan wind during December and January causes temperatures to fall to 55°F (12½°C). The average incubation period for 9 eggs was 51 days, and this is several days longer than that recorded by van Someren (1956) for 1 egg in Kenya: 46 days. Possibly the cold winds of Northern Nigeria act as a brake on development.

Eleven pairs of birds were known to produce a second egg after the loss of their first egg, assuming that it was the same adult pair. On average the second egg was laid about 6 weeks after the disappearance of the first, and there was a striking similarity in the sizes of both eggs of a supposed pair; e.g. 66 x 53 mm. for both, 72 x 54 mm. and 74 x 55 mm., and 70 x 56mm. and 74 x 55 mm. (the least similar). Serle stated that adults relay, but oddly Brown & Amadon (1968) deny it, and so do Balsac & Balsac (1954). The fledgling period varies usually from 95 to 120 days, but one bird fledged at 89 days, and another was still in the nest and presumably unfledged at 130 days.

Ten clutches were experimentally augmented to 2 eggs each (2 such clutches are discussed in Mundy & Cook 1972). In 3 of these, both eggs hatched, but in only 1 did both chicks survive beyond 2 weeks' age; both of these latter chicks were successfully fledged

after a somewhat slower growth rate than normal (Mundy & Cook in prep).

A randomly chosen sample of 50 nests from the original 270 gave the following results:- 6 were not "seriously" used; 10 were finally abandoned after a shorter or longer period; and from 34 eggs laid between 11 and 15 chicks fledged. The breeding success then becomes 0·32-0·44 chicks fledged per egg laid and 0·25-0·34 chicks fledged per nesting attempt (from 44 rather than 50). This compares with a smaller manipulated group of 27 nests from the previous season, that produced 0·42 chicks fledged per egg laid and 0·39 chicks fledged per nesting attempt (Mundy & Cook 1971).

West African Black Kite Milvus migrans: Some birds adopt a potential nest site from the end of October, even though they do not lay eggs until much later. These sites are in tree-tops and not usually lower than 40ft., often in fact much higher.

Nests are compactly built of acacia sticks. We have not seen any Kite walking whilst collecting material; it is done in flight. An adult will swoop down and pick up a twig in beak or claws; on one occasion a bird had scooped up a lot of material with its claws, sifted through it and selected a piece wuth its beak, and then let the rest fall. Building seriously begins in January.

Courtship has been seen in late January, centred around a nest. One bird persistently called and chased after its partner, alternating this with visits to the nest where it would continue calling vigorously. The other bird visited the site twice. Copulation was seen in February and March, and a clutch of eggs in March (not measured). Kites do not like their nests being examined and they are one of the very few birds that have physically attacked us, swooping down and scratching our heads. They even followed us for a quarter of a mile and swooped again when we were not watching them.

During June, juveniles may be found easily as they whistle loudly

to their parents for food. At the foot of a tree holding a chick near to fledging we found a rat's skull and a pellet containing a lizard's tail, many fish scales and some beetle elytra.

Abyssinian Lanner Falco biarmicus: Two nests were found, one in an old Crows' nest at a height of 60ft. in a Mahogany in suburban Sokoto (February), and the other at the same height in a Mahogany inside the Neem plantation near Marmaru (March). This second nest was probably an old Black Kites'.

Both nests always had a sitting adult. Occasionally a second adult would be seen close to the nest. The Lanners in the old Crows' nest had brought a few brittle stems of the "Rattle Box" plant Crotalaria, which grows at the site in abundance, but apart from that no other material had been added. This nest was well fouled both around the rim and inside.

There was a clutch of 4 eggs, white and covered in reddish-brown spots. They measured 53 x 38 mm., 51 x 38 mm.(twice), 50 x 37 mm., and their average weight was 32 gm. The first 3 eggs sounded addled. A tight pellet was collected from the nest, comprising of small feathers and quills.

The second nest held at least 2 large fluffy-white chicks on 9th March. Whereas this sitting adult attempted to flatten itself into its nest, the adult in the other nest flew off at the first opportunity.

Spur-winged Plover Vanellus spinosus: Two nests were found on 1st April, both shallow depressions, about 10cm. diameter by 2·5cm. deep, on the muddy sandbank of the river. Both contained a few small pieces of grass and 4 eggs each coloured as described by Bannerman (1953). On 5th April they had disappeared without leaving any traces of eggshell, and had presumably been stolen.

Birds are in pairs at least from March and they momotonously call to each other. In April a pair were courting, with one bird standing

rigidly upright and spreading its tail.

Speckled Pigeon Columba guinea: We have seen courting males in January, June and November, and copulation in August. A pair were seen carrying nest material in October. Nests have been found in January, February and September.

On 19th September, a clutch of 2 white eggs was found, both measuring 38 x 28mm. and were thought to have been laid on 16/17th September. Both parents had built the nest on a ledge of a house. On 5th October, 2 young were found, about 2 and 3 days old.

On 5th January, a nest was found in the air-conditioner hole of a house, holding a nestling, and an egg 36 x 28mm. with weight 14gm.

Niger Mourning Dove Streptopelia decipiens: Courting males have been seen in January, March and November, and copulation in February and August. One nest was found in October, another in February; this latter nest was built onto a low branch of a Neem tree at a height of 12ft. It was very flimsy with no lining and held 2 chicks with eyes closed, dark grey skin and sparse yellow down. Two birds seen in November lacked the collar.

Laughing Dove Streptopelia senegalensis: Courting males have been seen in January, March, June and October, copulation in June and October, and nests with eggs in February, March and November. In a pair of birds, one appears larger. Both will approach each other, rub and tap bills for a few seconds until the female lowers herself into the mating position and the male walks stiffly around and mounts. On other occasions one of a pair, with ruffled plumage, chases the other for 1-2yd. like rodents; mating does not follow such chasing.

Three nests contained 2 white eggs each, average size 25 x 19mm. Nests were at heights of 8-12ft. in trees and consisted of flimsy platforms of roots and leaf stems about 11cm. diameter & 3·5cm. thick.

Namaqua Dove Oena capensis: Nesting activities were seen in October and November. During courtship the male follows the female and makes little circular flights in the air, and upon alighting lifts his tail.

One pair were building their nest at a height of 2ft. in a low bush, and whilst the female was twisting around and shaping the platform the male suddenly flew up to her and mated. This female was later seen sitting on 2 cream-coloured eggs. A second nest was found at a height of 5ft. in a bush and was built entirely of small roots. It was 10cm. diameter and very flimsy. Between 26th October and 3rd November 2 eggs were laid, both 20 x 15mm., and weighing 2gm. each. Over a period of 2 hours, only the male was seen incubating; Serle (1943) noted only the female incubating and found eggs in March and April here; and van Someren (1956) found the male incubating only once. However Vincent (1946) stated that the parents "take it in turns to brood".

On 11th November no adults were in sight around this nest, but both eggs had hatched and there was still half an eggshell below the nest. The 2 chicks were dissimilar in size and weighed 5gm. and 3gm.; the eyes were opening in the larger but closed in the smaller. They had black skin and sparse white down. Their crops were full.

On 18th November the male was sitting near the nest, which had been smashed and very many feathers littered the ground below, including 2 tail feathers, length 138mm. Probably the resident Abyssinian Lanners had robbed the nest and caught the female (brooding at the time?).

Grey Plantain-eater Crinifer piscator: A well-grown nestling had fallen out of a high Mahogany tree in the Senior Service Club woodland on 19th November, and when placed on the trunk it climbed up easily and rapidly. Its measurements were:- wing 135mm., tail 85mm., tarsus 30mm., bill 17mm. Morel & Morel (1962) found one nest in April.

Great Spotted Cuckoo Clamator glandarius: As noted in this Bulletin before (Mundy & Cook 1971) we found 5 cuckolded Crows' nests in 1971 around Sokoto. During that season from May to September we sighted adult Cuckoos only 10 times: 3 pairs and 4 singles. One was loudly calling on 29th May; on 10th July, a pair were softly calling to each other whilst perched side by side; frequently they touched bills.

During the second week of September a Cuckoo called every evening from the same piece of farmland on the town edge. On 16th September 2 were seen in this area perched in a Guava tree that was infested with hairy caterpillars. On 2 occasions one of the birds, a silvery-crowned adult, caught a caterpillar, vigorously shook it and fed it to the second bird, which had a dark crown and back and was probably a juvenile.

Two eggs were found on 5th June and the seventh and last egg on 12th July. All eggs exactly resembled Crows' eggs in colouring, i.e. a light blue ground profusely speckled and spotted with greenish-brown. As Serle notes, the ends are more rounded and symmetrical than the ends of Crows' eggs. The average size of 7 eggs was 30·5 x 24mm., ranges 27-32mm. and 23·5-24 5mm.; average weight was 10gm., no range (cf. the average weight of 9·3gm. for this Cuckoo's egg in Spain, Raventos 1968). The incubation period of 2 eggs was 14-15 days (cf. 13½ in von Frisch, 1969, and 14 in Mountfort & Ferguson-Lees, 1961).

The fledging periods of 2 chicks were estimated at 28 days (cf. 26 days in von Frisch op.cit.), approximately 18 days shorter than that of their Crow hosts. In that time the Cuckoo chicks grow from about 8gm. at hatching to about 110 gm. at fledging. The inside of their mouths is a paler red than the Crows', but there are patches of papillae around the inside-mouth (good photographs can be found in von Frisch & von Frisch 1967, and Valverde 1971). In our only nest

holding successful Cuckoos, the growth rate of the 2 Crow chicks also in the nest continued normally until the time when the Cockoo nestlings began to fledge themselves. One Crow chick promptly disappeared (age 25 days) and the other lost weight rapidly and died (age 29 days). Clearly then, adult Crows are easily able to raise a mixed brood, but it is during the post-fledging dependence period of the young Cuckoos that the parent Crows are increasingly called away from the nest, allowing predators and hunger to strike at their own chicks.

Sonagrams made from tape recordings of the begging calls of Cuckoo and Crow chicks show a close resemblance, with the sound concentrated around 2-2½kHz.

From 9 eggs laid in the season, i.e. we found 7 eggs and 2 chicks, only 2 chicks were known to fledge, a breeding success of 0·22 chicks fledged per egg laid, and 0·4 chicks fledged per cuckolded nest. Both the successful Cuckoos were raised by a pair of Crows that impressed us by their downright aggression, and they were easily the most fiercesome pair we encountered. These same 2 Crows laid 5 eggs, 3 of which hatched but none of which survived.

We wish to thank Dr.R.B.Payne for suggesting that we record the begging calls, and Dr.J.D.Pye (of King's College, London) who allowed P.J.M. to use his sound analyser to produce the sonagrams.

White Faced Owl Otus leucotis: One nest was found in the collapsed part of an old vultures' nest at 35ft. height in an Acacia albida tree. The parents had not brought any other material. The clutch consisted of 2 round, white eggs, 38½ x 33mm. and 38 x 32mm., one being smeared with blood. There were still 2 eggs after 27 days (13th March), but on 20th March, 2 chicks had hatched, weighing 35 and 25gm. They had a pink skin, were covered in white down and their eyes were opening. The nest was later robbed.

An older nestling, acquired by one of us in February, maintained

an average weight of 150 gm. for 4 weeks.

Chestnut-backed Finch Lark Eremopterix leucotis: Courtship was seen in September, the male prancing after the female, with slightly outspread wings and puffing himself up. A nest was found in October and contained one chick, weighing 7gm., and measuring:- wing 22mm., tail 3mm., tarsus 13mm. and bill 5mm. The nest consisted of a little hollow under a small bush and was made of grass stalks and heads and sandy worm casts. The chick was black-skinned with some development of quills on the wings, and feather tracts on the body, these tracts having many tan-coloured plumes. Even from a distance of 10ft. the nest and nestling were very well camouflaged.

The chick had a black eye, a white gape, inside-mouth orange with papillae on the roof, and an orange tongue with 3 black spots on it. Both parents fed the nestling with insects. They would approach circumspectly to a distance of 1ft. and then dash in to feed and as quickly move away. Five days later the nest was empty. Morel & Morel found 8 nests in February and March.

Black-crowned Tchagra Tchagra senegala: "Love flights" (Bannerman, 1953) are seen and heard in June and July. Nest building was seen in July, and a nest found at a height of 3ft. in a low bush. One egg completed the clutch, white with dark red "spidery" markings, and size 25 x 16½mm. The nest was robbed a few days later.

Blue-eared Glossy Starling Lamprotornis chalybaeus: A nest was found in August at a height of 18ft. in a hole of a horizontal branch of an acacia tree. There was a lining of grass and feathers. There were 3 chicks weighing 60gm., 56gm., and 45gm.; their eyes were open, the primary vanes were metallic green, and the plumes of the feather tracts metallic turquoise. They had a red skin and the inside-mouth was mustard yellow and smooth. Their other measurements were (in the same order of size:- wing 60mm., 58mm (both with primary vanes of 1cm)

and 32mm.; tail 14mm., 15mm. and 5mm.; tarsus 32mm., 31mm., and 25mm; bill 12mm., 13mm. and 12mm.
These sizes indicate incubation from the laying of the second egg. The nest was later robbed.

Yellow-billed Oxpecker Buphagus africanus: One pair were found nesting in a hole of an acacia trunk in July at a height of 20ft., the nest hole being 2ft. deep. Two adults were seen in the same tree at the same time in the previous year, and probably nested then also.

Both adults were seen bringing nest material on 24th July, largely goats' and sheep hair to form a pad 5cm. thick. By cutting a "window" into the trunk and keeping it in place with wire, we could view the interior easily. By 31st July there was a clutch of 3 eggs, white with reddish-brown speckling, measuring 26 x 18mm. (thrice) and total weight 14gm. After we cut the window, the adults removed all the chippings and sawdust.

Only one adult was ever found sitting and it would hiss loudly when we examined the nest. By 11th August one chick had hatched and by 14th August all 3 had; hence the incubation period was 13-16 days. The chicks weighed about 3gm. on hatching; they had orange skin with silvery-grey plumes coming from the middle of the back, and the inside-mouth was deep orange and smooth. The parents removed the eggshells. By 26th August only one chick remained, well-feathered and weighing the same as an adult, 65gm., at about 14 days'age. The adults kept the nest scrupulously clean. At this time neither adult brooded during the day.

The chick's bill now began changing to orange from its original yellow colour (and not blackish as stated in Pitman 1956); it had always been the same shape as an adult's. By 4th September the chick weighed 58gm. and was almost fledged; its eye was dark brown, tail feathers rufous and the bill retained its orange tint. The fledging

period was therefore 24-28 days.

Once we saw a third adult Oxpecker arrive in the nesting tree, but it was chased away by the parents. Dowsett (1965) recorded 4 adults feeding a brood of 3 that was about to fledge.

Pied Crow Corvus albus: At Sokoto, Crows breed from early May, and as we noted before their nests are difficult to find and reach (Mundy & Cook 1971). Possible courtship was noted in September and late December - one Crow with erect head and neck feathers approached and circled another; when their heads nearly touched, the first spread its wings obliquely to the ground, slightly crouched and uttered a strange rasping call. Often the first crow will preen the neck feathers of the second. From our own experience with hand-reared nestlings, Crows adore having their head and neck feathers preened, closing their eyes and going into a "hypnotized" daze. On one occasion in March, a Crow courted a black-and-white kitten, ruffling its feathers and rasping. After one minute or so the Crow moved away, repeating its actions "in vacuo".

Eggs are laid from May to mid-July, and we have records from 23 clutches, 21 of them complete; a clutch of 5 was the most common (12). Shape and colour of the eggs are as described by Bannerman (1953). The average size of 74 eggs was 45 x 30·7mm., ranges 40-50mm. and 28·5-33mm. The average weight of 48 fresh eggs was 23gm., range 22-24gm. The nests are tidily built of acacia sticks and the deep well is lined mostly with human and animal hair.

The incubation period is 18-19 days (cf. 18½ days in Lamm 1958), and is 4-5 days longer than the Cuckoos'. The chicks can fledge themselves from about 35 days' age if an emergency arises, but if unmolested they will remain in the nest for at least another 10 days; one of our hand-reared nestlings fledged at 48 days' age (cf. 45 days for one chick, Lamm op.cit.). Young may still be found in nests in

early September. Items of food found in nests or under trees were: pieces of chicken, lizards, skinks, lizard eggs, frogs and fish. The growth rate of chicks is fairly constant, averaging 20-25gm. weight increase per day.

About 100 eggs were laid in 23 nests and at least 16 chicks fledged and probably 18 did. Hence breeding success becomes 0·18 chicks fledged per egg laid and 0·78 chicks fledged per adult pair. This is a surprisingly low success rate for such an adaptable and belligerent bird, but Crows are susceptible to interference and they hold a high place in local beliefs. They suffered from the hot sun of June 1971 which was an unusual climatic factor, the rains coming very late in that year. The nest watched by Lamm produced at least 3 young of which only 1 fledged; that nest was not interfered with.

Ant Chat Myrmecocichla aethiops: Bannerman (1936) gives a fair account of the breeding behaviour of this species. Their whole life is centred around their tunnels, and throughout the year they can be seen digging them and displaying around them. In May their activities quicken - calling is louder and more frequent, hole visiting and inspecting and inter-individual encounters occur continuously. However it is true to say that their breeding behaviour represents a difference in degree and not kind over their non-breeding behaviour; unless of course one sees birds mating. After many hours watching them in the field, we have seen copulation once.

Their display is typically thrush-like. Two birds either run up to each other or find themselves near to each other, there is much calling and one or both lifts the head and tail high and completely drops the wings. The white primary patch is now seen. Chasing may then ensue and birds will even fly into the air in a "loop-the-loop".

Nesting tunnels average 6ft. long and are generally straight. The birds make a slight depression at the end of the tunnel and build

a small nest of fine roots and tendrils and shaped very much like a doves' platform. In 12 nests we never saw any grass (cf. Jackson 1938). Tunnels are begun anywhere on a bank's sheer face.

Egg laying begins in June and we found 6 clutches, 3 of 4 eggs, 2 of 3, and one complete of 2. The average size of these 20 eggs was 23·4 x 17·6mm., ranges 21-26mm. and 16·5-18mm. The average weight of 18 eggs was 4gm., no range. No eggs were dented (cf. Belcher, 1942), all were pure white and slightly glossed. In our experience the birds rarely incubated their eggs and were never found brooding their chicks. Even during the night, when the adults were roosting in their nest tunnels, we did not find them brooding.

The nestling period is 16-20 days (from 5 birds). The chicks are fed on arthropods, each parent visiting the nest about 3 to 5 times per hour. Chicks fledge at about the adult weight of 60gm., and at a little less than adult size. They have black plumage, which is still recognisably blacker than the adult plumage after 6 months, and a yellow gape which disappears over 3 or so months. The young may still be fed by their parents up to 2 weeks after fledging.

We saw, quite definitely, a third adult feeding a brood on a couple of occasions (a "helper"? Skutch 1961). Adults were still feeding nestlings in November.

Slender-billed Weaver Ploceus luteolus: Nesting takes place from June to October. One clutch of 2 eggs found in September measured 17·5 x 1 2·5mm., and were off-white in colour. The chicks hatched on consecutive days.

Vitelline/Heuglin's Masked/Village Weavers Ploceus velatus/heuglini/cucullatus: Distinguishing between males of velatus and heuglini is possible on 6 points, detailed below in their decreasing order of usefulness:-

Vitelline Masked

(a) The nest is very tidy and beautifully wrapped up like a "ball of string." It is of an inverted heart shape with the small opening an integral part of the shell, and a high lip inside. It normally has one centre suspension and also nearby leaves are removed.

(b) Males have red eyes (incorrectly described as yellow by both Bannerman, 1953, and Hall & Moreau, 1970.

(c) The black of the throat is sharply terminated as a "cut-throat".

(d) Wings are markedly black and yellow, and somewhat similar to a Village Weaver's.

(e) There is strong chestnut on the chest, and almost forming a ring on the forehead.

(f) The forehead is chestnut, paling to yellow.

Heuglin's Masked

(a) The nest is untidy and a smaller version of the Village Weaver's. A wide opening on a short tunnel with a low lip inside is found. It is normally suspended at 2 points.

(b) Males have yellow eyes.

(c) The black of the throat extends onto the crop, but sometimes as a line. It is not easily seen.

(d) The wings are green with yellow-edged feathers.

(e) There is a slight chestnut tinge on the chest.

(f) The forehead is bright yellow, sometimes tinged with chestnut.

In Sokoto, we noticed cucullatus and velatus coming into breeding plumage at the end of May; heuglini was not seen until late June. Even so, it appears that eggs are not laid until at least 1 month later, in late July for all 3 species. Of the 3, cucullatus seems most attached to breeding over water (cf. Morel & Morel), with heuglini least. Heuglin's Weaver indicates (see part 2), as we would expect, that birds return to their old nesting sites every year; presumably the Village Weaver does too (see part 2), but it is an open question whether the more solitary nesting velatus does. As far

as the site is concerned, cucullatus is of enigmatic interest. It seems to breed quite happily in village compounds, as does our colony of heuglini, but when breeding over water it is clearly dependant on the amount of ground water - when that volume is large and the pond is wide and deep, then it may breed; if the water is much lower it may not. In 1970 the water level in the Palm woodland at Marmaru was high and 3in. deep under the colony. A large number of birds bred there from early August. In 1971 there was 160mm. (6¼in.) of rain less than in 1970 and it came much later. The Marmaru colony never bred at all and instead we saw 2 very hurried colonies begin on the Rima river fadama, with eggs in the second not being laid until 29th September; the combined breeding success of these 2 late colonies was 5% (i.e. 0·05 chicks fledged per egg laid).

By early November all males have returned to their eclipse plumage, and breeding has ceased.

These 3 species build their nests in much the same way as each other, with the final shape of cucullatus and heuglini nests being very similar, that of the latter being smaller with a shorter tunnel. The nest of velatus is quite differently shaped, and moreover it is suspended from one twig (both the others have 2 suspensions normally) and only velatus removes all nearby leaves within a radius of 1-2yds.

In exhaustive studies of weaver breeding ecology and sexual behaviour, Crook (1964) treated velatus and heuglini as a pair and separated them from cucullatus. The pair was classified as insectivorous and non-forest in ecology, and showing pair formation type IIIa in sexual behaviour; whereas cucullatus was graminivorous and non-forest, and showing type IIIb. As already noted, both species of the pair are very similar in physical appearance, and their greatest distinctive character in fact is the final shape of their nests, which are very different. Hall & Moreau (1970), incidentally, treat velatus

and heuglini as parts of a superspecies, and suggest that "there is no overlap in their breeding ranges".

How then do the females of velatus and heuglini find the right males? We suggest that the basic reason for the great difference in nest shape effects itself at this very juncture - in the need for species recognition as early as possible in the breeding season; the female chooses a male of the same species because of the shape of his nest, rather than by a fine discrimination of his plumage characteristics. Crook (1960) himself suggested that the nest shape of velatus "has evolved as an adaptation to wind...". We do not think this is a sufficient reason; one has only to think of the favourite positions of Village Weavers to build their nests (on the tips of Oil Palm fronds) to wonder how important a factor the wind is.

The egg sizes of the 3 species show a gradation:-

Species	No.of eggs measured	Average	Ranges
velatus	10	19·3x13·1mm	18·5-20·5mm & 12·0-14·5mm
heuglini	30	20·9x14·6mm	19·0-22·0mm & 13·3-15·0mm
cucullatus	30	23·3x15·5mm	21·5-25·0mm & 14 6-16·3mm

The average weight of 5 fresh heuglini eggs was 3gm. each.

Studies of varying intensity on the 3 species in Sokoto, 1971, produced the following statistics:-

Species	Laying Period	No.of Nests
velatus	15th August-25th September	29
heuglini	27th July-5th October	45
cucullatus (1)	4th September-17th September	27
cucullatus (2)	29th September-3rd October	28

Continued overleaf.

Species	Av.Clutch	Incubation	Fledging	%Success
velatus	2·4	12-13 days	14-16days	25
heuglini	2·2	12-13 days	14-18days	45
cucullatus (1)	2·52	-	-	5
cucullatus (2)	2·1	-	-	0

(Success is defined as the number of chicks fledged per egg laid).

Black-headed Weaver Ploceus melanocephalus: Two males in breeding plumage were first noticed near the Rima river bridge on 30th August, and they were both building in the same Mimosa bush, on a submerged mudbank of the river. Each male built 4 or 5 nests, very neatly constructed and much smaller than the nest of the P.heuglini and lacking a tunnel.

Eggs were first laid about 10th September. One male had built 4 nests of which 2 were in use; the other male had built 5 nests of which 3 were in use. There were 3 clutches of 2 and 2 of 3 eggs. Two eggs measured 19 x 13⅓mm. and 19½ x 14mm., and were milk-chocolate brown in colour. All nests were subsequently robbed.

Orange Bishop Euplectes orix: One abandoned nest containing 2 blue eggs was found in October and was built at a height of 1⅓ft. in a bush. The river had never come near the bush.

Red-cheeked Cordon Bleu Estrilda bengala: A pair were seen sitting together on a branch of a tree in February. At frequent intervals the female vigorously pecked at the male's neck and on occasions directly at his red cheek patch. The male cocked his head away and closed the eye on that side, and his tail quivered rapidly. At rarer moments he reciprocally "preened" the female. After each such bout both birds touched beaks many times. Nothing further developed. Van Someren (1956) notes that pairs seem to remain together for life.

Eggs have been found in July and September; 3 clutches were found containing 3, 4 and 6 eggs all white to yellowish. The average

size of 10 eggs was 13·4 x 10 4mm., ranges 12·5-14·5mm. and 10-11mm.

Senegal Firefinch Lagonosticta senegala: Courtship was seen in October, males prancing up and down beside females, with grass or feathers in their beaks. Two clutches were found in September, both of 3 eggs, off-white to yellowish colour, average size 13 x 10mm. One pair built their nest against a fluorescent light tube.

Warbling Silverbill Lonchura malabarica: In two years' observations at Sokoto we have known this bird to build only 2 nests for itself, both of fine grasses and with a side opening, placed at a height of 12ft. in trees. These apart, from June to January we have seen single birds or pairs investigating old weavers' nests, and from late September to early January we easily found the Silverbill nesting in 37 such nests of Ploceus cucullatus, velatus and heuglini. Once we saw a pair examining a deserted nest of the Scaly-fronted Weaver Sporopipes frontalis. Van Someren (1956) found one grass-ball nest and 24 old weavers' nests used by the Silverbill whereas Morel & Morel (1962) recorded exactly the opposite proportion.

Courtship and copulation have been seen in June, July and September. One bird, presumably the male, fluffs itself up, both birds hop up and down on the branch where they are sitting side by side, and the male then mounts.

The first egg was found on 26th September and eggs were still being laid by January, when our study ceased (Morel & Morel found nests from November to March). The average size of 9 eggs was 15·5 x 11mm., ranges 14·5-18mm. and 10·5-12mm. The average weight of 11 eggs was 1gm. Eggs are white and glossless when freshly laid but become shiny like porcelain when well incubated. We have found up to 13 eggs in one nest, but the largest brood to hatch was of 7 chicks, and usually broods were in the range of 3 to 5. This supports the view that 2 females may lay in the same nest (van Someren, op.cit.). We found 11 nests in which 1 or 2 eggs had been laid and then no more;

perhaps these females had forgotten their own nests and continued to lay in other occupied nests. Van Someren suggests another reason, that males may be polygamous. In further support, we found 4 nests where it seemed that 2 eggs had been laid on the same day.

When Silverbills do take over an old weavers' nest, they line it copiously with feathers, mostly from chickens and Guinea Fowl Numida meleagris. They seem to bring feathers throughout the incubation and nestling periods so that some nests become very cosy. Adults incubate for long periods.

For several days after the young hatch the nest remains clean, but then slowly a ring of excreta builds up; parental behaviour is here the same as in the Bengalese Finch L.striata (Eisner 1961). For long periods during the day adults do not feed their young but instead cram them full in short bursts of 2 hours or so in the morning or evening. The very small seeds that are fed then become visible through the thin wall of the chicks' crops.

Incubation periods are in the range of 12 to 14 days and fledging periods 16 to 18 days (cf. 16 and 25 days average for L.striata, Eisner 1960). The Silverbill's total period in the nest is therefore at least 10 days less than for the Bengalese Finch; the reason may be in its choice of nest site. Old weavers' nests are vulnerable on 2 points: the weather may break them and the Harrier-Hawk Polyboroides radiatus ravages them. A contracted period in the nest would be of advantage.

When the chick hatches it weighs approximately 0·75gm. (Eisner 1961) and by the time it fledges it weighs about 12gm., the weight of an adult. Its body dimensions are less, especially so in the tail-

adult: wing 54mm.; tail 42mm.; tarsus 13mm.; bill 10mm.
fledgling: wing 48mm.; tail 25mm.; tarsus 13mm.; bill 8mm.

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BIRD NOTES FROM THE PLAINS SOUTH OF LAKE CHAD

WINTER 1971-1972 PART 3

by

D.A.Holmes

Crested Lark Galerida cristata: Common in cultivated areas and open scrub.

Chestnut-backed Finch-Lark Eremopterix leucotis: Common in cultivated areas and open scrub.

Short-toed Lark Calandrella brachydactyla: Abundant visitor, first seen on 24th November although it was not until February that I could satisfy myself completely with their identification. They avoid scrub and long grass, and favour especially the hard smooth ground with short dead grass after grazing that is found around many villages and scrub areas, moving into the sorghum fields after the harvest. They occur in loose flocks of up to 200-400 birds, but are wild and flighty and almost impossible to approach on foot to within identification distance. We eventually obtained satisfactory views from a cautious approach by car. The flocks became larger or more compact early in March, the birds acting more in unison (previously they would fly off and resettle singly or in little groups), and they were last seen on 17th March.