

THE WATER-HOLES AT IJARA
NORTHERN PROVINCE, KENYA.

by

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IN August 1951 the authors went to the Northern Province of Kenya, with the object of collecting birds and other small vertebrates. During this expedition they camped by the village of Ijara from August 21st to 28th. A few general observations on the water-holes in this area, although made over such a short time, may be of interest, especially to those who from time to time have access to the area and can take up the story for other times of the year.

Ijara, at 250 ft. above sea level, lies some 100 miles south of Garissa. The Tana River is about 30 miles to the west at its nearest point. The surrounding country lying in the Acacia-desert grass savannah belt (Edwards 1940) is flat and covered with bush; but 15 miles to the south east the vegetation gradually becomes thicker until country with considerable trees (Acacia-tall grass savannah) is reached. Records for mean annual rainfall are not available, but for Garissa the figure is 10.3 inches. The rain is extremely unevenly distributed, generally occurring in April and November-December and it is probable that this figure will be greater at Ijara because it lies nearer the coast. At times, however, the area is subject to severe drought. During the time spent at Ijara the temperature did not exceed 89° F in the shade. The figure for relative humidity, as might be expected, decreased with the height of the day to around 45%, but there was no extreme aridity and sometimes there was dew in the early morning. The bushes were in leaf and at that time formed a refreshing contrast to the arid, sometimes nearly leafless, bush to the north west.

The soil is light and sandy, but where rain water has accumulated in depressions or pans, a fine black mud is deposited which cracks on drying out. It was found that 2 inches below the sun-baked surface, the mud was damp and extremely sticky. Dead ostracods and gastropod shells showed that a temporary population of aquatic animals is developed in time of rain.

In such situations four somewhat more permanent water-holes have been dug out in the interest of a few Somalis who graze their stock at Ijara. In past periods of drought, the few traders comprising the village, with no business, either closed down or carried on for a while by selling imported drums of water. The water-holes are roughly circular or oblong in shape.

Water-hole 1 was 6-7 feet deep in the centre with a gradual slope to the sides where the depth varied from 2 ft. at one side to complete shallows in other places. It was dug near a temporary rain pool in 1930-31. Its sides were then more or less sheer to about 6 feet. Up to 1937 it is not known to have dried up, but in subsequent years it is said to have dried up during times of drought, and in the middle of February 1951 about five or six weeks before the rains broke, it is recorded that only a little water was left in a hole in the middle.

Water-hole 2 was about 9 feet deep at one end and at the other there were shallows. It was dug shortly after water-hole 1, and up to 1937 it never dried up, and has probably not done so since. It appears to be the most permanent water-hole and it is the only one of the four in which water-lilies *Nymphaea lotus* are growing. They appeared in 1933 and seem to be thriving.

Water-hole 3 had shallows all round the sides with a miniature swamp of rushes at the north end. The maximum depth at the centre was found to be about 7 feet. It seems to have been dug some time after water-holes 1 and 2. It was observed to be completely dry at the end of February 1951.

Water-hole 4 was very shallow round the sides and its maximum depth was 9 feet in the centre. Digging was begun in 1933-34.

The water-holes were surrounded by hedges or fences of cut thorn to prevent animals trampling the edges. In places these had been broken down. As a further measure of control concrete water troughs had been placed at each. Water-hole 2 did not appear to be much in use, probably because at that time there was plenty of water in the others which may have been more convenient. There was evidence that game drank at all of them except No. 1, which was nearest the village. Elephant's footprints were especially conspicuous at No. 4.

Some dozen measurements with a B.T.H. Capillator taken at various times on different days gave pH values of around 7.5 for water-holes 2, 3 and 4, and around 8 for water-hole 1. A maximum-minimum thermometer placed on an average $1\frac{1}{2}$ feet below the surface of the water and a few feet from the sides indicated that at that time variations of temperature of the magnitude of 10°F sometimes occurred in a 24 hour period. Temperatures from minimum 74 to maximum 84 were recorded. Water-hole 4 gave the greatest variation having an extensive area of shallows.

Invertebrates.

An abundant invertebrate fauna was present in and around the water-holes. At that time there was no drought, and when digging a hole about 10 ft. from the water's edge, even earthworms were found. Especially noticeable on the land were large millipedes, many butterflies, large orthopterous insects and empty shells of the giant African snail *Achatina fulica* Fer.

A few members of the more conspicuous aquatic component are recorded as being indicative of the kind of food supplies upon which the thriving fish population must directly depend.

As might be expected Diptera, Dragonflies and aquatic Hemiptera were abundant. Dragonflies recorded were:—

Philonomon luminans Kars. *Orthetrum chrysostigma* Burm.
Ceragrion glabrum Burm. *Diplacodes Lefebvrei* Ramb.
Ceragrion suave Rs. *Brachythemis leucosticta* Burm.
Orthetrum brachiale Beuv.

The Hemiptera included an abundance of Notonectidae, Ranatridae and Corixidae and the belostamatid *Sphaerodema nepoides* Fab. Waterbeetles

belonging to several species were numerous. Identified were Dytiscids, *Rhantaticus congestus* Klug and *Cybister senegalensis* Aube. Gyrinid or whirligig beetles *Dineutes subspinosus* Klug could nearly always be seen on the surface of the water. Aquatic spiders and freshwater crabs *Deckenia imitatrix* Hilgendorf, the latter living by day in holes in the mud, were also present. Aquatic molluscs were not found in any numbers *Pila ovata* Olivier was present and was more abundant in water-hole 3 than elsewhere. Two shells of *Pila speciosa* Philippi were also found. Though the authors had little time to search for them, the apparent paucity of molluscs may perhaps be attributed to the large lung-fish population.

Fishes.

Twenty-one specimens of the lung-fish *Protopterus amphibius* (Peters)* were captured at three out of four water-holes. The number of larvae collected, together with the large number of fish seen surfacing, indicated that there was a thriving lung-fish population. Seven larger specimens between 330 and 405 mm were caught on a hook baited with meat; but the remainder being much smaller, were caught in a hand net from the water weed *Lagerosiphon* sp.

As in *P. annectens* Owen, where it is not unusual, (cf. Goodrich 1930), but in marked contrast to certain specimens of *P. ethiopicus* Haeckel from Lake Victoria, with which they were compared by the authors, the larger specimens retained considerable vestiges of the external gills of the larvae. A specimen measuring 384 mm overall length had a most dorsal external gill element on the right side of 36 mm and on the left of 31 mm. This specimen and another of 330 mm were full of spawn.

In the spiral valves of three of the larger specimens abundant remains of food were found. Insects appeared to play a large part in their diet. Especially pronounced were the crushed remains of beetle elytra. Also present were the opercula of freshwater snails, the remains of crabs, frogs and the little fish *Nothobranchius* (see below). In addition, a little plant material was present; but whether this had been taken in accidentally or not was uncertain.

The changes in form and growth rate of this species are not known in detail and the length of the tail filament was found to be extremely variable often having been broken. The 14 smaller specimens showed a fair gradation in length from 18 mm to 110mm, which suggested that the breeding season may have been a prolonged one that year. If the rate of growth of this species is broadly comparable with that of the specimens of *P. annectens* described under natural conditions in Gambia (cf. Budgett 1901), the smallest specimens collected would compare with a specimen figured by him which was about a month old and which had left the nest only a few days before.

Footnote: *This species requires redescription and will be the subject of a further publication.

In 1925 and 1934 large numbers of small lung-fish were observed in the slowly-moving flood water formed by heavy rain right out in the desert country. (H. B. Sharpe in litt.) The Africans sometimes say that they fall with the rain. As is well known, these lung-fishes can survive drought by forming so-called cocoons in the mud; and they are sometimes dug up in this state for food by men, and sometimes even by animals. Larger numbers of small fish must be derived either from the spill-over from populations occupying, except in flood-time, stretches of permanent water, which seems to be the usual method, or from individuals recently emerged from cocoons. It seems that the latter method may apply in desert country far from permanent water. How soon these fish can breed after coming out of their cocoons is unknown, as is the minimum size for successful cocooning. In any case it may be fairly inferred that floodwater, charged with fry, must be an important factor in the distribution of this species. This would account for the occurrence of fishes in the water-holes. In the opinion of the authors, Ijara would be an especially suitable place to make observations on the breeding habits of these fish, as owing to their abundance, and the limited extent of the habitat, growth stages can be readily obtained. Nests were not found, and digging in a dry pan was of necessity very limited and produced no cocoons.

Nothobranchius guentheri (Pfeffer). Five specimens of his little cyprinodont were captured in a hand net from the water weed. There were females and one male in breeding colours. It may be significant that, unlike the lung-fishes, they were only found in water-hole 2, which is the most permanent.

Amphibians and Reptiles.

The extremely common and agile frog, *Rana mascareniensis*, D.&B. was present in great abundance around the water-holes. It was as usual difficult to catch, and when pursued would more often seek refuge in dense vegetation, or, in the case of water-hole 4, in the holes of a termitarium, than in the water. Large numbers of this species, accompanied by *Arthroleptis minutus* Blgr. were also found during the heat of the day in cracks in the sunbaked surface of the mud in a dried-up pan 200 yds. south east of water-hole 1. Tadpoles of both genera, together with those of *Phrynobatrachus* sp. were present in the water. Spawn was found in water-hole 2.

Pelusios (Sternotherus) nigricans (Dondorff). An adult male Black Water Tortoise was caught on a hook baited with meat from water-hole 2. A large number of leeches were found attached to it. These tortoises are said to be common in water-holes in the Northern Province.

Mabuya striata (Peters). Of lacertilians this striped skink was by far the most abundant. Although seldom seen on the ground, striped skinks could be found in many of the larger bushes. In the heat of the day they were most noticeable basking in the sun. When frightened they would take refuge in holes in the trunks and branches, and one bush might contain several individuals. They could sometimes be induced to bolt by placing a piece of

lighted tow in a lower hole and watching at the upper exit. Some specimens contained embryos and an inspection of the gut contents of several individuals suggested that they were purely insectivorous.

Also recorded were the skink *Mabuya brevicollis* (Wiegman) and the common gecko *Hemidactylus mabouia* Mor.

No snakes were seen except for one specimen of the White-lipped or Herald snake *Crotophopeltis hotamboeia* (Laur.) In the past a python is said to have frequented water-hole 2.

Birds.

The Avifauna of the Ijara region does not appreciably differ from that of large areas of similar country in the Northern Province. A week's observation gave the impression that the population was at that time of the year distinctly higher than that of the Tana River area some 100 miles to the north west. This abundance was more in numbers of individuals than of species, but passerine birds were definitely more numerous than had been found and several species were met with that had not previously been seen by us in Kenya. This was presumably accounted for by the comparatively less arid conditions at Ijara and, to a limited extent, by the immediate proximity of the water-holes.

It was possible to divide the birds seen at Ijara into several groups. The first group includes those species which are typical of semi-desert conditions and which are found more or less all over the Northern Province. Their presence at Ijara is thus in no way directly connected with the four water-holes. Examples belonging to this group are Vulturine Guinea-Fowl, Golden Pipit (also seen in very arid country near Garissa), Black-faced Sand-Grouse, Black-head Plover, Buff-crested Florican, Crested and Yellow-throated Francolin, Bateleur and Dikkop.

This group of birds is chiefly composed of seed eaters, and all are capable of travelling long distances to water.

The second group is typical of the surrounding bush and is directly dependant on it for its food. The bush consists of thickets of small euphorbias and aloes with scattered shrubs of *Thespesia danis* Oliv. and *Salvadora persica* L. The former of these was much the commonest. Between the clumps, there was often bare ground. This group was composed mainly of passerine birds, and it is here that the numbers seen were higher than previously noted in other areas. These birds do not seem to wander far from water, and thus the water-holes are of importance to them. They are chiefly insect eaters. Examples are:— Magpie and Superb Starlings, Von der Decken's and Grey Hornbills, Turtle Doves, Buffalo Weavers, Nightjars, Bee-eaters, Mousebirds, Fork-tailed Drongos, and Waxbills.

Naturally these two groups are not separable with any certainty; but a third group, the water birds, includes all those species which are commonly dependent on water for their living. It is due to the water-holes that they are present. It was found possible to make an estimate of

the entire population at that time, as the four water-holes were close enough to be visited in one hour. The population was not very high because at that time there was probably water elsewhere in the neighbourhood.

It is probable that permanent water elsewhere would at any rate be well within range of such birds as ducks and herons, as our residents were often not to be seen for a day or two. We did not explore far from the village except down the road to the south east.

The population of water birds is as follows:—

- 3 Black-headed Herons
- 3 African Great White Egrets
- 2 Yellow-billed Egrets (on one occasion only)
- 1 Squacco Heron
- 1 Juvenile Night Heron
- 1 African Dwarf Bittern (possibly 2)
- 1 Green-backed Heron
- 8 Common Sandpipers (number approximate)
- 1 Wood Sandpiper
- 1 Green Sandpiper
- 1 Painted Snipe (male)
- 13 White-faced Tree-Ducks (2 adult, 11 juvenile)
- 3 Spurwing Geese
- 3 Lesser Waterhens (juvenile)
- 2 Crakes (small, sp. indet.)

Although the above list is not complete, it probably covers most of the regular inhabitants and gives some idea of the diversity and comparative richness of the group.

It is probable that observations over a longer period would indicate that a further group of birds should be mentioned. Those more typical of the wooded country to the east, such as Fischer's Red-necked Francolin, Madagascar Bee-eater and East Coast Red-cheeked Cordon-bleu.

Food.

Evidence as to diet was obtained chiefly from the examination of gut contents. A Night Heron contained the remains of *Nothobranchius*; and the South African Stone Curlew contained the remains of a frog. As frogs were exceedingly numerous it might be presumed that the herons depend on them for the majority of their food; but a Great White Egret, shot about 8 a.m., contained only a little plant material and the remains of insects. A Green-backed Heron was watched one evening clambering about in the topmost branches of a small tree, trying to catch moths, at which it was not very successful.

Lesser Waterhens had been feeding chiefly on the seeds of a rice *Oryza eichingeri* Peter, water beetle larvae and crabs. The remainder of the water birds examined contained the remains of unidentified insects.

Around the water-holes, in the long grass, bushes and rushes at the edge

of the water, insect life was noticeably abundant. The taller bushes provided useful look-outs for such birds as Shrikes and Drongos; while White-browed Coucals, Red-tailed Ant Thrushes, and Ground Barbets were also often seen. In contrast, the Striped Kingfishers preferred to watch from the numerous large termitaria and were not seen near any of the water-holes. A specimen of this species contained a large cricket and an even larger grasshopper.

At dusk large numbers of nightjars assembled over the water-holes and hawked for insects in the fading light. They appeared to find the air over the water holes very rich in insect life, as they seldom travelled far from their vicinity. Stomachs examined contained a large variety of insects. As well as Neuroptera and Orthoptera, the following families of insects could be recognised: Chrysomelidae, Copridae, Aphodiinae, Pentatomidae, Lygaeidae, Lestidae, Coenagriidae. It is worthy of note that these remains were such that specific identifications would have been possible in many cases.

Other insect-eating birds examined included the Juba Little Purple-banded Sunbird and Kenya Ashy Grass Warbler. Three specimens of the former contained remains of small spiders obtained from the topmost branches of the *Thespesia* trees. One specimen of the latter, a tiny bird, contained a caterpillar over an inch long.

We did not examine crop contents of many vegetarian birds. Hornbills, Starlings and Turtle-doves, which were very numerous, were feeding chiefly on *Commiphora*-like fruit; and the Waxbills contained the seeds of the grass *Echinochloa haploclada* Stapf. This also made up for the bulk of the crop contents of Guinea-fowl shot for our own stomachs. These birds had also been feeding on the following seeds:— *Eragrostis* sp., *Dactyloctenium aegyptiacum*, *Portulaca* sp., *Glinus* sp., *Talinum* sp., *Ocimum* sp., and *Ruellia* sp.

Drinking.

In the early morning all species of Starlings recorded and a few black-faced Sand-grouse were seen drinking at every water-hole. Several different kinds of doves (laughing, red-eyed and turtle) were almost always present in the bushes around the water-holes. They and the magpie starlings do not appear to go far for their food, and pay frequent visits to the water. It appears that the water-holes have an appreciable effect on the local population of such birds. Francolins and Guinea-fowls were also seen to drink at times, but most of the other species were not actually observed at the water's edge. It was not possible to keep a sufficiently strict watch to throw any light on the drinking habits of other species.

Breeding.

Only a few birds were breeding at the time of our visit. Some were accompanied by fully fledged young. This would be expected, judging by the state of the vegetation which suggested that the rains were not long past. The most interesting bird nesting was the Juba Little Purple-banded

Sunbird. The nest of this bird has not been described before. It was quite common near Ijara, and three nests were found on August 24-27th, two with eggs, and one destroyed. All the nests were found on the outer branches of small bushes about 3 or 4 feet off the ground, and were made of grass and dead leaves. The eggs, spotted all over with dark brown, measure (two clutches of two eggs) — 15.4 x 11.1, and 16.5 x 11.3.

Other nests found included those of the following species:— Crested Francolin c/4, White-browed Coucal, White-headed Buffalo Weavers, and Kenya Violet-backed Sunbird.

The following species were seen with newly-fledged young:— Buff-crested Florican, Yellow-throated Francolin, Lesser Waterhen, White-faced Tree-Duck, Ground Barbet, and Melba. It was somewhat surprising to find Woodpeckers in areas so devoid of all but the smallest trees, but there were holes in many of them, especially the *Thespesia* trees.

*Systematic list of all birds seen or collected at
Ijara, August 1951.*

Ardea melanocephala Vigors and Children. Black-headed Heron. Three birds seen.

Casmerodius albus melanorhynchus (Wagler). African Great White Egret. Three birds seen. (One juvenile).

Mesophoyx intermedius brachyrhynchus (Brehm). African Yellow-billed Egret. Two birds on one occasion.

Ardeola r. ralloides (Scopoli). Squacco Heron. One at water-hole 3.

Butorides striatus atricapillus (Afzelius). Green-backed Heron One seen.

Nycticorax n. nycticorax (L.) Night Heron. One juvenile. Water-hole 3.

Ardeirallus sturmii (Wagler). African Dwarf Bittern. One seen.

Scopus umbretta bannermani C. Grant Hammerkop. One seen.

Leptoptilos crumeniferus (Lesson). Marabou. Two scavenging in village.

Dendrocygna viduata (L.) White-faced Tree-Duck. 13 seen.

Plectropterus g. gambensis (L.) Spurwing Goose. 3 seen once.

Gyps ruppellii erlangeri Salvadori. Abyssinian Griffon. 2 seen.

Pseudogyps africanus (Salvadori). White-backed Griffon. 3 or 4 seen.

Necrosyrtes monachus pileatus (Burchell). Hooded Vulture. Common.

Milvus migrans sub, sp. African Kite. Common.

Terathopius ecaudatus (Daudin) Bateleur. Seen occasionally.

Melierax poliopterus Cabanis. Chanting Goshawk. 1 obtained.

Francolinus sephaena grantii Hartlb. Colonel Grant's Crested Francolin. Numerous and breeding.

Pternistis cranchii leucoparaeus Fischer and Reichenow. Fischer's Red-necked Francolin. Seen commonly on edge of wooded country to the south east of Ijara.

Pternistis leucoscepus infuscatus Cabanis. Yellow-throated Francolin. Common. Juveniles seen.

Acryllium vulturinum (Hardwicke). Vulturine Guinea-Fowl. Very common in large flocks.

- Gallinula angulata* Sundevall. Lesser Moorhen. 3 seen.
- Lophotis g. gindiana* (Oustalet). Buff-crested Florican. A few seen, one bird accompanied by a juvenile.
- Sarciophorus tectus latifrons* Reichenow. Blackhead Plover. Common and often seen in threes.
- Rostratula benghalensis* (L.) Painted Snipe. One seen.
- Actitis hypoleucos* (L.) Common Sandpiper. Numerous.
- Tringa ochropus* L. Green Sandpiper. One
- Tringa glareola* L. Wood Sandpiper. One.
- Burhinus c. capensis* (H. Lichtenstein) Cape Dikkop. A few only seen.
- Pterocles d. decoratus* (Cabanis). Black-faced Sand-grouse. Not numerous, but a few came to drink every morning.
- Streptopelia s. semitorquata* (Ruppell). Red-eyed Dove. not uncommon.
- Streptopelia capicola tropica* (Reichenow). Ring-necked Dove. Probably the most common bird at Ijara.
- Stigmatopelia senegalensis aequatorialis* (Erlanger). Laughing Dove. Common
- Oena c. capensis* (L.) Namaqua Dove. Although very common to the west, we saw only one bird at Ijara.
- Turtur c. chalcospilos* (Wagler). Emerald-spotted Dove. Not common.
- Centropus s. superciliosus* Hemprich and Ehrenberg. White-browed Coucal. Fairly numerous. Two nests found.
- Coracias caudatus lortii* Shelley. Somali Roller. One seen.
- Halcyon c. chelicuti* (Stanley). Striped Kingfisher. Abundant.
- Merops superciliosus* L. Madagascar Bee-eater. Seen mostly in wooded country to the East.
- Melittophagus pusillus cyanostictus* (Cabanis). Little Bee-eater. Two seen.
- Lophoceros n. nasutus* (L.) Grey Hornbill. Although we did not see this bird in the rest of our travels through the Northern Province, it was quite common at Ijara. On three occasions in the wooded country to the East it was seen to accompany troupes of baboons; but we cannot say if this has any significance.
- Lophoceros deckeni* (Cabanis). Von der Decken's Hornbill. Apart from the previous species, this was the only Hornbill we saw, and it was quite common.
- Scotornis climacurus clarus* (Reichenow). Long-tailed Nightjar. Very abundant, especially at dusk.
- Colius striatus mombassicus* van Someren. Mombasa Speckled Mousebird. Common.
- Trachyphonus darnaudii boehmi* Fischer and Reichenow. Black-capped Ground Barbet. Common.
- Campethera nubica pallida* (Sharpe). Nubian Woodpecker. Few seen.
- Mirafra p. poecilosterna* (Reichenow). Pink-breasted Singing Lark Common
Seen always singly. •
- Tmetothylacus tenellus* (Cabanis). Golden Pipit. This beautiful bird was very abundant, always in flocks, which were very wary. It flew to the trees when disturbed.

- Macronyx aurantiigula* Reichenow. Orange-throated Long-claw. One seen near one of the water-holes in the evening.
- Pycnonotus dodsoni* Sharpe. White-eared Geelgat. Common.
- Erythropygia l. leucoptera* (Rüppell) White-winged Scrub-Robin. Common. Keeping always to the thickest bush, and uttering loud protests if disturbed.
- Neocossyphus r. rufus* (Fisher and Reichenow). Red-tailed Ant Thrush. Found in the thickest herbage around the ponds and very skulking.
- Calamonastes s. simplex* (Cabanis). Grey Wren-Warbler. Very common.
- Cisticola cinereola schillingsi* Reichenow. Kenya Ashy Grass Warbler. Common.
- Hirundo abyssinica unitatis* Sclater and Mackworth-Praed. Striped Swallow. The only swallow we saw was almost certainly of this species.
- Dicrurus adsimilis divaricatus* (Lichtenstein). Fork-tailed Drongo.
- Eurocephalus r. rueppelli* Bonaparte. White-crowned Shrike. Common.
- Lanius cabanisi* Hartert. Long-tailed Fiscal One or two seen.
- Anthoscopus* sp. indet. Penduline Tit. Some birds seen, but we did not get any specimens, and the species was not determined.
- Oriolus larvatus rolleti* Salvadori. Black-headed Oriole. Only two seen.
- Creatophora cinerea* (Meuschen). Wattled Starling. A few were associating with the next species.
- Speculipastor bicolor* Reichenow. Magpie Starling. Very common. The large and noisy flocks were seen everywhere.
- Lamprotornis p. purpuropterus* Ruppell. Ruppell's Long-tailed Glossy Starling. Rare.
- Spreo fischeri* (Reichenow). Fischer's Starling. Rare, associating with the other species of the genus.
- Spreo superbus* (Ruppell). Superb Starling. Very common everywhere.
- Spreo shelleyi* (Sharpe). Shelley's Starling. A few seen among the last species.
- Buphagus e. erythrorhynchus* (Stanley). Red-billed Oxpecker. Small numbers on the native flocks.
- Cinnyris chalcomelas* Reichenow. Juba Little Purple-breasted Sunbird. we found this rare Sunbird abundant, and apart from the next species, it was the only Sunbird seen. The males were very noisy and much in evidence.
- Anthreptes o. orientalis* Hartlb. Kenya Violet-backed Sunbird. One nest of this species was found in a small bush in the village. It contained two newly-hatched young and the male was seen to feed the female on the nest.
- Dinemellia d. dinemelli* (Ruppell). White-headed Buffalo Weaver. Common.
- Bubalornis albirostris intermedius* (Cabanis). Buffalo Weaver. Some seen.
- Ploceus i. intermedius* Ruppell. Abessinian Masked Weaver. A few seen.
- Pytilia melba* sub sp. Melba. Common.
- Uraeginthus bengalus ugogoensis* Reichenow. East Coast Red-cheeked Cordon bleu. Seen to the East of Ijara only, on the edge of the wooded country.

Mammals.

A number of mammals sp. indet. were listed as seen or heard at Ijara. Elephants, though sometimes a nuisance at the water-holes, were not seen, but a skull, numerous droppings and footprints were most noticeable. The remaining larger mammals, Hyaena, Gerenuk, Dik-dik, Water-buck, Reticulated Giraffe and Zebra call for no special comment for they are typical of many areas in the Northern Province. A cat, taken to be a serval, was seen at night, and we had fleeting glimpses of a small mongoose and a squirrel that appeared to inhabit a termitarium.

Only one monkey was seen. We came upon it quite suddenly at water-hole 3. It was inferred to be the common *Cercopithecus aethiops*. It seemed to be about to drink but disappeared very quickly. It had probably come from the wooded country to the East, where numbers of monkeys were seen by the authors.

The following animals which have no special significance at Ijara were seen: the Ground Squirrel *Xerus rutilus rufifrons* Dollman, several specimens; a white-tailed Mongoose *Ichneumia albicauda ibeana* (Thomas); and a hare *Lepus capensis raineyi* Heller.

The Bats *Nycteris aurita* K. Anderson, and *Tadarida (Chaerephon) limbatus* Peters were common. Though some were brought in by the Africans, others were found in hollow trees so characteristic of the area.

Trapping for small mammals produced one shrew, one dormouse, and two species of spiny mouse. The shrew, *Crocidura macarthurii* St. Leger, seems to be a very little known species. The type is described from Merafano, Tana River, in 1932. The authors can give no estimate of its relative abundance or adaptations. The dormouse was identified as *Claviglis parvus* True. The spiny mice were *Acomys ignitus kempii* Dollman, three specimens, and *Acomys wilsoni ablutus* Dollman, two specimens. A further specimen sp. indet. was destroyed. It was found extremely important to visit the traps regularly as the ants tended, as so often in Africa, to damage the specimens left in the traps too long. Though estimates on such limited data are risky, the authors had the impression that spiny mice were relatively common at Ijara. From experiments in placing traps, it was inferred that these species were arboreal in habit. It seems probable therefore that further trapping in the area by an experienced naturalist would be of interest.

A further rodent recorded was the gerbil *Taterillus nubilus illustris* Dollman. This was quite common. No wild mammals were observed drinking.

Summary.

The water-holes at Ijara are described. Although severe drought occurs at times, the rains cause extensive flooding over the Ijara area. They present no special problems of isolation.

The species of vertebrates seen during a week at Ijara in August, 1951,

are recorded. Though inferred to be but a limited proportion of those present, they are indicative of an abundant fauna. Two groups of animals are of special interest, the fishes and the birds.

The little cyprinodont *Nothobranchius guentheri* was present, and the lung-fish *Protopterus amphibius* in abundance. No evidence was found that these fishes had been introduced by man. They are inferred to have arrived at some time in the flood water. A few aspects of this problem are discussed. Larval specimens of lung-fish were readily obtained. Further observations on their life history would be of general interest.

There is a typical Northern Province avifauna at Ijara, noticeably richer than in areas further West. Three groups of birds are distinguished, a semi-desert group, a group partly dependent on the proximity of water supplies and an aquatic group. Notes on the food of these birds are given where obtained, and the observed occurrences of drinking at the water-holes. A note is given on the breeding conditions of some of the species. together with a complete list of all the species seen or collected.

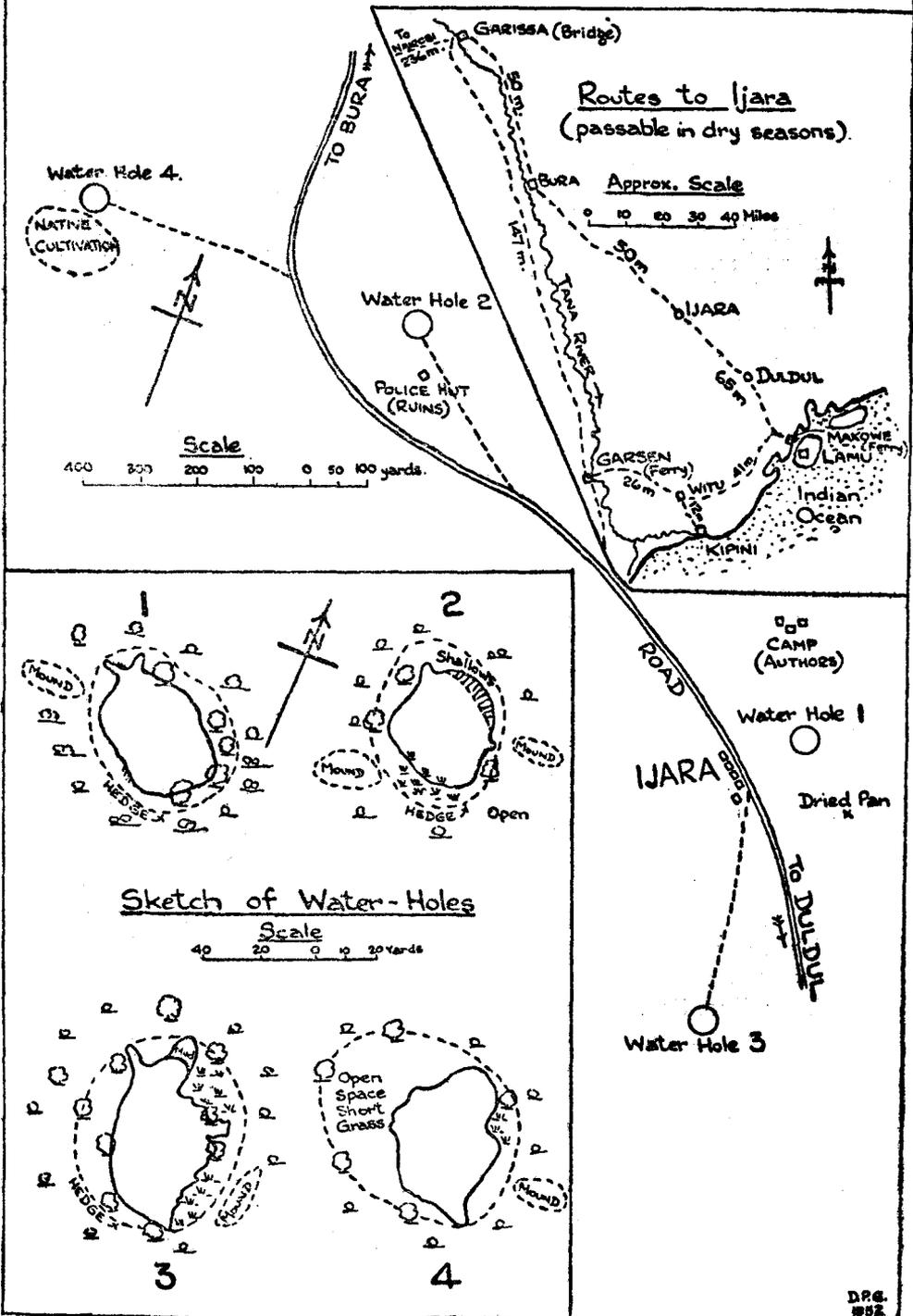
Acknowledgements.

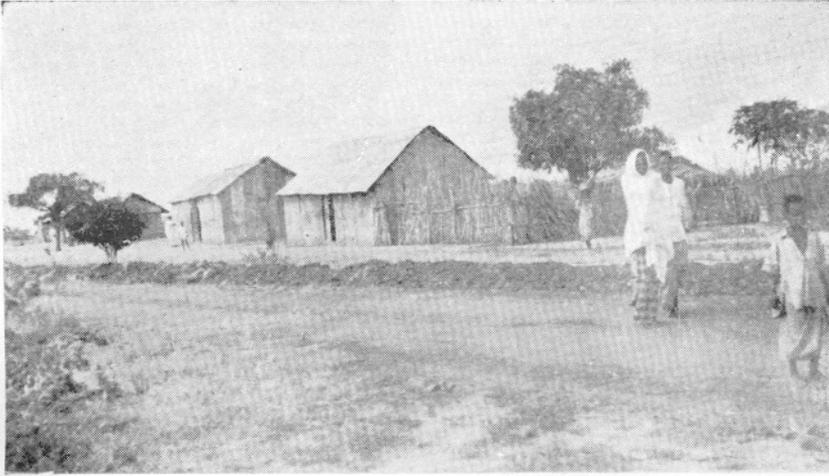
We tender sincere thanks to Lt-Col. C. H. Stockley, O. B. E., D. S. O., M. C., and Mr. C. Chevenix Trench for information concerning Ijara at the present time, also to Mr. H. B. Sharpe, whose interesting observations in the past, and knowledge of the area, have been freely incorporated in this article. We owe a special debt of gratitude to William Hale and the Kenya Game Department, and also to Mr. J. G. Williams of the Coryndon Museum, for his kind encouragement and help. In addition, this would have been impossible without the kind assistance of Mr. E. Pinhey, Mr. P. Bally, and other members of the Staff of the Museum. Sincere thanks are also tendered to Dr. H. W. Parker, Mr. J. C. Battersby, Dr. E. Trewavus, Captain C. H. B. Grant, Mr. T. C. S. Morrison-Scott, Mr R. W. Hayman, Miss A. G. C. Grandison and other members of the Staff of the British Museum (Natural History), who kindly identified the specimens collected. For drawing the map, sincere thanks are due to Mr. D. P. Graham.

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Sketch Map showing Water-Holes in relation to the Village of Ijara, August 1951.

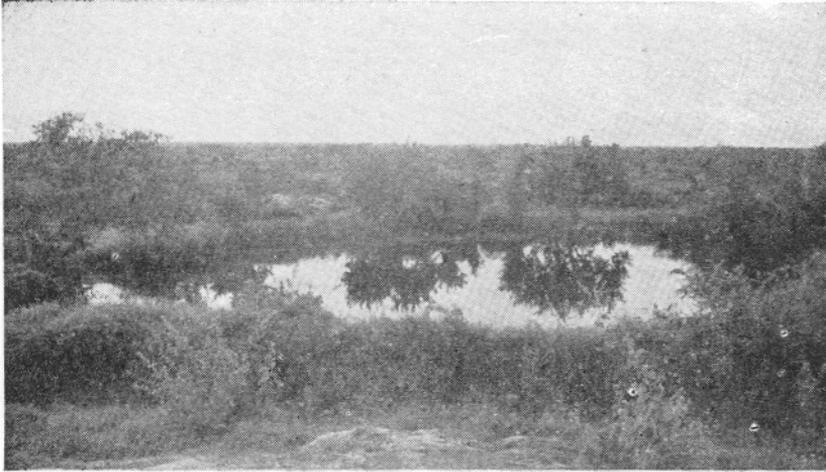




The Village of Ijara



Vegetation and Inhabitants.



Water-hole I.

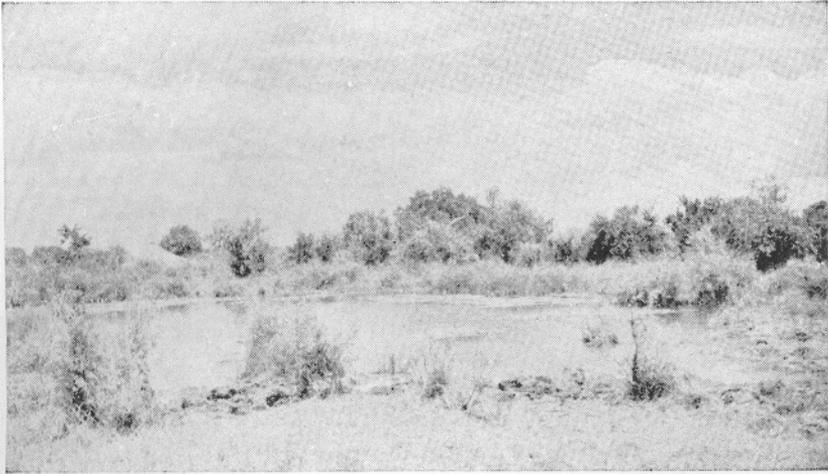


Water-hole II.

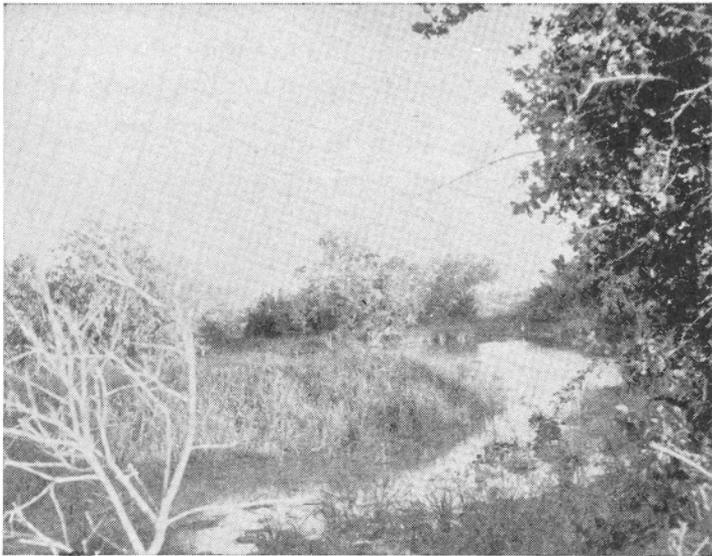
APRIL, 1953.

The Water-Holes at Ijara

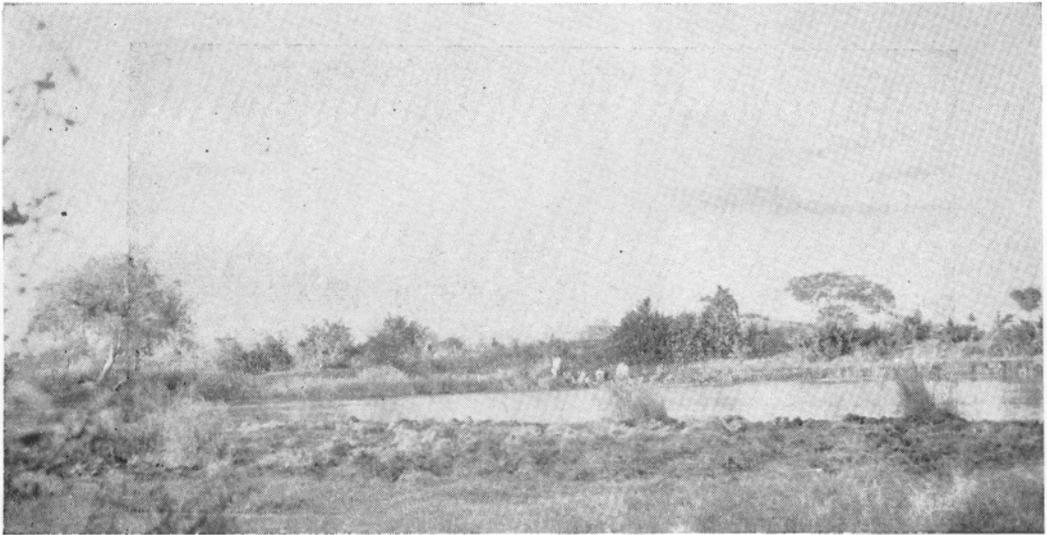
PLATE 3



Water-hole II.



Water hole III.



Water-hole IV.



Nest of Juba Little Purple-banded Sunbird.