

adds "Sedermæra upptagen i Linn. Faun. Svec. nya edit. under n. o. 149, med nama Colymbus troille." It is strange that this piece of information should have remained unknown till 1881, and that it should have been overlooked even by Swedish writers up to the present time.

To summarize the above: As Messrs. Mathews and Iredale have already pointed out (Austral. Avian Record, v. pp. 49-50), Friderich Martens described and figured Brünnich's Guillemot. A. R. Martin also described the same species and supplied the material to Linnæus, on which he based *C. troille*. The name *Uria troille* (L.) therefore becomes a synonym of *U. lomvia* (L.). The next oldest name appears to be *Colymbus aalge* of Pontoppidan (Danske Atlas, 1763), which is earlier than either *U. ringvia* or *U. alga* of Brünnich (1764) (*cf.* Austr. Avian Rec. *l. c.*), so that the name by which the Common Guillemot must be known in future is *Uria aalge* (Pontoppidan).

XXIX.—*The Birds of Sind.* (Part V.) By CLAUD B. TICEHURST, M.D., M.A., M.B.O.U., late Capt. R.A.M.C.\*

*Phœnicopterus ruber antiquorum* Temm. "Lükkä" or "Lakke Jani."

On the extensive mud-flats of the coast-line, the tidal creeks and shores of Karachi Harbour, the Flamingo may be seen in numbers in every month of the year, though I know of no breeding colony nearer than that in the Rann of Cutch at Khadir, not far from the Sind boundary. It is also very abundant on all the larger inland waters of the Province. In few places, I should think, can these birds be seen so commonly and easily as in Sind. I have read of ardent ornithologists who have made special and arduous journeys to see Flamingos, but at Karachi one only has to ride down the main street which runs to Keamari, the Port, to see plenty on the mud-flat which borders the road, and probably

\* Part i. Ibis, 1922, pp. 526-572; pt. ii. pp. 605-662; pt. iii. Ibis, 1923, pp. 1-43; pt. iv. pp. 235-275. Map, Ibis, 1923, pl. i.

because they become used to the mass of traffic, trams, motors, and people, they are tamer than in most places.

The stately walk like soldiers at drill, the incomparable effect of a large flock rising on the wing, and peculiar mode of feeding have been so often described that I will not attempt a reiteration. I have noted that they are particularly fond of feeding on the edge of the incoming tide, whether on the shore, harbour, or creeks, at which time they probably get small crustaceans, and also in salt pools long left by spring tides, where I found they were feeding on small mullet-fry. On another occasion I took out of the gullet of one shot what looked like seeds; these were sent to the Professor of Botany at St. Xavier's College, Bombay (Father Blatter), for identification, and he kindly reported that from them (for they were seeds) he grew the Common Lucerne (*Medicago lupulina*) and a Sedge (*Cyperus* sp. ?); these seeds had certainly been swept down from cultivation a mile or two off by flood water. I do not think the Flamingo has been recorded as a seed-eater before.

The Flamingo swims well and fast when obliged to, faster than one can wade, and it keeps its neck quite straight up at right angles to the body. When a flock is met with on a mud-flat or edge of a creek, an approach within shot was usually feasible (so different to other places where I have seen them) by walking on the wind side of them in a semi-circle and not directly at them. The flock begins to move away when one is about a hundred and twenty yards off, and by a little manœuvring one can usually cut off some which must rise to wind towards one. I obtained a bird always in this way when I wanted one, and found that, unlike geese, it took little to bring them down. They are most excellent eating, and a welcome change when no other game-birds are available; occasionally one was only fairly good. The flesh tastes much like wild goose.

I am afraid it would take a large series of these birds to work out their moults and plumages in detail, and I can only give such notes on this subject as I could make out, and which appear to throw a little light on so complex a question.

It seems to me quite certain from those I shot (June to November) that this species takes at least three years to become adult. It breeds in November in the Rann. Some birds I shot in June appeared to me to be birds of the previous year; these have the bill pale sage-green with a black end, iris brown, legs greeny grey; there is no pink tinge in the plumage, except on the lesser under wing-coverts and axillaries. Besides this they differ from birds probably a year older in having the greater under wing-coverts brown and white, not black; all the upper wing-coverts, outer scapulars, and tertials are white with brown tips, and the primaries are dark brown. During the summer months they appear to do a leisurely moult; the new feathers on the wing-coverts and upper parts are white tinged with pink, the bill and legs also become whitish tinged with pink, and the iris turns grey. Another bird, shot the same day as the one described above, is, I think, a year older, but by no means adult; the plumage lacks the brown-ended feathers seen in the last, the upper wing-coverts being pink, the rest of the upper parts are white (new feathers coming are pink), and the primaries and greater under wing-coverts are black. Iris pale straw, legs pink, basal part of bill whitish. The down of the neck, as in the first year bird also, is grey. A third bird, shot about the same time as the last two, is, I believe, an adult, though not a very bright or very old one. It has some pink wash on the body, head, and neck; wing-coverts scarlet; down of neck white; iris golden yellow with a pink tinge; legs dark pink; basal half of bill "strawberry-ice" colour. Thus we may find three distinct (worn) plumages about the same time of year, and the inference is that this species takes at least three years to become adult. When the wings are moulted I could never make out; birds shot in June to November were always moulting—a little, never heavily—their body, wing-coverts, and odd tail-feathers. They are said to cast all the flight-feathers at once, like the Ducks; I never saw any flightless Flamingoes in any month of the year at Karachi, but quite possibly they may retire to remote sand-banks when moulting their wings.

Flamingoes vary in size in the same sex to an extraordinary degree. Two males shot the same day measured: wing 413 and 423; tarsus 226 and 333; bill, length 115 and 123, depth at angle 33 and 39 mm.; and the smaller of the two birds was certainly the older.

*Phœnicopterus minor* Geoffr.

On 19 May, I saw four immature birds of this species with a flock of Common Flamingoes in Ghizeree creek. Barnes stated that it occasionally occurred in Sind, and that he had a "dropped" egg brought him from the Indus. A specimen of this bird from Jhangshahi is in the Karachi Museum. The status of this species in India is somewhat mysterious; it has been recorded from January to July on the Sambhar Lake in Rajputana and elsewhere, but is not known to breed in India.

*Cygnus olor* (Gm.).

On 12 February, 1878, Watson obtained three Mute Swans out of a herd of five in the Sehwan district, and in January had seen a flock on the Manchar. 1900 was a "Swan year" in Sind and Baluchistan, probably due to excessive cold farther north, and the first herd was seen on 10 January at the Habb River. From then onwards several were seen and specimens obtained at various places: eight at Kotri on 13 January; one, middle of March, on the Manchar; ten at Laki, end of March; one at Meting, near Kotri, 27 April.

*Cygnus cygnus* (L.).

Mr. Crerar shot a single Whooper on 31 January, 1904, at Kambar, Larkhana district; the skin is in the Bombay Museum.

*Cygnus bewickii* Yarrell.

On 2 December, 1907, Mr. McCulloch shot a Bewick's Swan near Jacobabad; it was a single bird, and had been in the vicinity some ten days. This is the only record of this bird in India proper.

*Anser anser* (L.). "Lauj" or "Hauj."

The Grey Lag is common enough, and, wherever there are inundations or jheels of any size with green crops near, huge flocks may be met with, in some cases hundreds strong. Comparatively few are bagged, for they are always wary, but in places where they have not been fired at before, a few always come to hand, and I heard of sixteen being killed at a Christmas shoot in the Larkhana district. The best method for obtaining them no doubt would be to flight them as they go to and from their feeding-grounds (which are often wheat-fields), but those who can only go for one day's shooting at a time can hardly expect to procure them in this way, as it entails a certain amount of previous study of their habits, so that in the ordinary way they are shot in the course of a duck drive, and one takes one's chance whether a flock comes over within range or not.

The earliest arrive in the first week of October (when the heat is often at its greatest); I have witnessed the arrival in Lower Sind on several occasions. On 6 October, I saw some large skeins flying south towards the Indus mouth (a great resort for geese and ducks of all sorts). I saw another large wedge-shaped skein going in the same direction on 27 October at sunset, and another on 3 November soon after sunrise; they were all travelling high over the desert, and must have done so for at least 180 miles. They are still common in mid-March, and I have seen them still here on 30 March and 7 April, by which time, however, most have gone; however, I saw one, probably a pricked bird, on Jhimpir jheel on 10 June.

I have always found geese unapproachable either on foot or in a boat. I once met with three on an open maidan near the swamp at Karachi; on attempting to walk near them they rose two hundred yards or more away, but soon settled again. Having my bicycle with me, I wondered whether I could approach nearer to them on it; so, having mounted, I rode at them as hard as I could, and succeeded in getting within forty yards of them ere they took wing. The birds, which were watching me all the time, seemed utterly to misjudge

the pace of my approach. Under such circumstances one could probably easily get near them from behind a camel.

Specimens which I handled did not appear to me to differ in any way from European ones; the bills when quite fresh are very pale rosy pink or flesh-pink, which very quickly fades to livid pink and twenty-four hours later changes to reddish. The size of the bills and number of "teeth", are as in the European bird. *A. a. rubrirostris* is not a good race.

*Anser albifrons albifrons* (Scop.).

A few White-fronted Geese probably visit the Manchar Lake every year, whence I have handled two specimens. Hume saw two on the Indus in that district, and I know of no other records in Sind. My birds were typical *albifrons*.

*Anser indicus* (Lath.). "Raj Hans."

The Bar-headed Goose is numerically far less abundant than the Grey Lag, yet in some parts of the Manchar Lake it predominates, while in other parts the Grey Lag does so. Mr. Hotson considers that the Bar-head is far more a river bird, and that on the sand-banks of the Indus it is the commoner of the two. Like the Grey Lag, it feeds on the wheat-fields in the vicinity of the Manchar, which district may be said to be its headquarters; indeed, in many jheels in other parts it is not met with.

*Sarkidiornis melanonotus melanonotus* (Penn.). "Karo Hang."

The Nukta only occurs in the south and eastern portions of the Province, nearly all the records being from the Sujawal district. Thus Butler recorded one shot at Badin on 18 January, 1879, and added the remark that none of the sportsmen that shot there regularly had ever met with it before. Mr. Webb (Journ. Bombay Nat. Hist. Soc. xxi. p. 685) records that a couple were shot and six more seen on the Khahi Dhand at Sujawal on 27 December, 1911, and adds that he thinks he saw some there two years previously; the local fishermen seemed to be acquainted with the bird.

In the same district Mr. McCullock obtained one on 12 February, 1912, and Mr. Gordon tells me he has also obtained one there; the Sindhis called it "Karo Hang" (=Black Goose). One in the Bombay Museum was obtained by Mr. Baskerville at Umarmkot, further east still, on 26 December, 1917.

In other parts of India the Nukta appears to be resident, and is probably found in Sind in small numbers in the south, east of the Indus; it occurs in Cutch.

The Pink-headed Duck (*Rh. caryophyllacea*) has been somewhat doubtfully recorded in Sind (Baker, *Indian Ducks*, 1st ed. 1908, p. 43).

*Nettapus coromandelianus* (Gm.). "Baher," "Kararhi."

The Cotton-Teal is very local and rather rare; its exact status is not known. At the Sujawal jheels (east of the Indus below Hyderabad) it has been noted more frequently than elsewhere: seven or eight seen, one shot 27 December, 1908 (Gibson); one shot, of a pair, 15 February (Ludlow); one shot (McCullock). Thornhill informed me that he saw it on the Jhangshahi jheels in February 1918. Mr. McCullock has obtained it at Budapur, north of Hyderabad; also at Kambar in Larkhana district, in which district Mr. Hotson shot one on 7 November, 1915.

*Casarca ferruginea* (Pall.). "Kwancha," "Kathiun" (Manchar), "Lalo," "Mung."

The Brahminy Duck is, I think, much commoner in Upper than in Lower Sind, where I saw comparatively few, the jheels in the northern part being no doubt more suitable to its requirements. I have no accurate date of its migratory movements; I have seen it on 29 October. The popular belief that it is a foul feeder and therefore unfit for food is very largely exaggerated if not entirely false—at any rate, as regards Sind and the Punjab. Its chief food appeared to be grass, and I have found it quite eatable, though not as good as other ducks. It has a variety of Sindhi names, according to the district.

*Tadorna tadorna* (L.). "Thar-jo-niraji."

The Sheldrake is a fairly rare bird in Sind and only affects the largest sheets of water; at the Manchar Lake Hume saw numbers, and I have seen birds thence taken in flight-nets. Capt. Campbell obtained one at the great Khinjur jheel at Jhimpir on 2 March, 1919, where he informs me there were several. I have single records from Karachi and Lahari in the Larkhana district. The Sindhi name suggests that this bird is commoner in the Thar: it may be so, but more likely perhaps "Thar" is here used by the Mohanas of the Manchar to indicate a "foreign" origin.

*Anas platyrhynchos platyrhynchos* L. "Nearge or Nirage," ♂; "Niragiani," ♀.

On the inland waters of Sind the Mallard is present in somewhat variable numbers; in some jheels it is common enough, and in others hardly one will figure in the bag. So far as I could make out it likes large jheels, especially those with plenty of cover in the way of tamarisk and reeds growing in water. On the smaller and barer jheels where other species may abound it is scarce; so, too, on parts of the Manchar Lake one might be out for a day's shooting and find the Mallard the commonest duck, while perhaps another party on the same day in another part of the lake would find it the rarest. In these peculiarities of distribution the question of food-supply doubtless plays an important part. Wherever found it can well take care of itself, and the days are gone when one could, as Hume did in 1872, float down the Indus and shoot them off the water or on jheels as they rose out of cover close to the boat. Many more guns are out nowadays, and the Mallard has all his western character of alertness.

Though quite likely some arrive earlier, I think the main body come at the end of October; the earliest I have seen it is 24 October, and these were newly arrived. Most have gone by the second week in March, earlier than most of the ducks; the latest I have seen it is 16 March, though a flock which annually take up its winter-quarters on the duck-ponds in the Karachi Zoological Gardens and become very tame do



not leave till the end of the month. I once saw one at Hilaya jheel, near Jerruck, on 8 June.

How ducks must come to fresh water was well exemplified at Karachi; here there is practically no fresh water at all, and if no monsoon rain has fallen there is absolutely none in the district save one little artificial swamp almost in the town itself, and thence every night a few Mallard and other ducks used to flight in from the mangrove-swamps, where a certain number spend the winter, to feed and wash unsuspected by anyone except myself, who profited to no small extent from the knowledge of this habit! But fighting in India is not a very successful business as a rule; the twilight is very short, ducks mostly feed where they spend the day, and so there is little real flight, and in the few places where from force of circumstances fighting proper does take place, the ducks often do not come till it is quite dark.

I once saw an Eagle strike down a pricked bird which was lagging behind a flock, and by a chase across the desert on my bicycle I was able to make the Eagle give up its prey. The force of the strike had taken some feathers off the rump and dislocated the Mallard's thigh; a clean nip with the beak had severed a vessel near the chin, and the bird was nearly dead in the short time it took me to reach it. Mr. Ludlow records that a pair caught in the Karachi Gardens in February 1914 were pinioned, and in June the same year successfully nested and brought out six young, the only instance of any duck nesting there. A good many wild fowl are kept pinioned in the Gardens, but no attempt is made to pair them up, and they are too heavily fed.

By mid-November the adult males are in full plumage, except for the curly tail-feathers, whereas birds of the year still show signs of the young dress. I thought that the Mallards we shot seemed larger than English birds, and this induced me to measure a number; they vary a good deal in size, however, as can be seen by the following:—

Thirteen males: wing 270–294; tarsus 44–47; bill from feather-edge 50–60·5 (mostly 54–58), from the frontal angle 61–69·5; width of bill 21·5–24·5 mm.

Seven females: wing 263-280; tarsus 42-46; bill 47-55 and 55-64; width of bill 21.5-22.5 mm.

*Anas pœcilorhyncha pœcilorhyncha* Forst. "Hanghar."

The Spotbill is common on all the larger as well as on smaller jheels where there is plenty of cover, such as tamarisk, reeds, and rush; it particularly delights in quiet shady backwaters away from the throng of other fowl. Its numbers in most places are outweighed by both Mallard and Gadwall, and so it forms only a small proportion of the bag in a day's shooting. Moreover, in some waters it is hardly seen at all, owing to some local peculiarity, doubtless connected with food; and on open sheets of water with little cover, which may be swarming with other fowl, the Spotbill, I have often noticed, is scarce or not present at all.

It is resident and breeds, according to Doig, in May and September; nests which he found were on the ground in long grass on small islands. Mr. Culbertson has caught young ones in August, and there are eggs in the British Museum from the east Narra taken on 7 June. I have seen it paired on 31 March and on 2 June and in flocks on 15 September. Whether it is really double-brooded I doubt, as every species has in a country like Sind many accidents with its nests, and times vary much with requisite inundation.

Ducks soon get to learn in what jheels crocodiles abound, and in one such place, which looked a perfect paradise for ducks but which was swarming with crocodiles, I very seldom saw any ducks at all, and if any settled there the part where water-lilies were thickest was always chosen. This precaution, however, was not a perfect safeguard, as I found a whole Spotbill, well chewed, in the stomach of a crocodile I shot there. To shoot, the Spotbill is the most deceptive duck of any; from his large size he looks to be flying in a slow, leisurely fashion well within range, whereas he is in reality going a big pace and quite far enough off, as one's two inefficient barrels soon testify. It does not occur, so far as I know, west of the Indus valley.

**Anas acuta acuta** L. "Drighosh," "Kokarali."

The Pintail is very common on all the larger jheels, and in some places or on some days it comes next in numbers to Gadwall. The adult males keep together in separate flocks always and fly at a good height; females and young birds, flying lower, figure more largely in the bag. The earliest I have seen it is 22 October, a date when most ducks begin to arrive in numbers; it leaves between 10 and 31 March. By mid-November young males are well on in change, and adults have mostly lost all trace of eclipse; by mid-February the young birds are almost in full plumage, the long scapulars and long central tail-feathers being the last to be acquired. The lead-blue markings on the bill are wonderfully clear-cut and constant in extent; faint light edges to the wing-coverts will differentiate the young male from the adult.

Nine adult males measure: wing 261-293; bill 50-54.5 mm.

**Anas strepera** L. "Burd," "Buári," "Buhar."

Taking Sind as a whole the Gadwall is out-and-out the commonest duck; Hume noted that on the Indus River itself the Mallard was commoner. There are a few places where Pochards, both Common and White-eye, outnumber all else, such as at Sujawal in the Tata district, which, probably from depth of water and peculiarities of feeding, favour the habits of the diving species; on certain parts of the Manchar Lake at certain times Wigeon, too, may outnumber Gadwall, but the latter is not so particular as to extent of water as the Wigeon is, and so one may find them on quite small jheels or pools. The numbers of Gadwall in Sind alone are incredible, and to see the masses of ducks rise up off a good jheel when shooting begins must be seen to be believed. Duck-shooting is carried on entirely by driving the birds either naturally by the repeated firing, the guns being dotted round the jheel behind ready-made hides of reeds or boughs, or, as is more usual on the larger sheets of water, by driving-boats, the guns standing in water behind the hides, over which some of the ducks at any rate must fly, though

masses will be wide or too high. Some very large bags are made in the best jheels in Upper Sind; for instance, at Ber, in Larkhana district, nine guns got 648 duck on 1 February, but bags of 150 to 200 ducks in a day for five or six guns are nothing out of the way. Much of the charm to the ornithologist is the variety of ducks figuring in the bag, and on no occasion on which I have been out for a shoot have less than ten species come to hand, sometimes even twelve; in addition one sees all day a perfect host of other "lesser fry," such as various Storks, Herons, Spoonbills, Ibises, Pelicans, Cormorants, etc.

After a good monsoon rain or high inundation the Indus valley is full of jheels or "canal-spills" of varying sizes, and all these may hold ducks; consequently it is when no rain has fallen in Sind and the inundation from the canals is not too great that the best duck-shooting may be looked for, for then the ducks are more concentrated, less likely to move right away on being disturbed, and, moreover, the water will not be too deep for wading and the cover higher.

The Gadwall probably arrives with the rest in the third and fourth weeks of October; it is numerous by 9 November, but duck-shooting does not commence because of the heat till the third week in November and lasts till the end of February; however, the best shooting perhaps is obtainable early in March, as the winter birds are then reinforced by migrants from elsewhere and ducks are in their best condition. By the end of March few Gadwall are left, but I have still seen some on 7 April. By the third week in November the adults are in full dress and young birds have begun to get their full plumage, but up to Christmas these last can always be distinguished by retaining some yellow on the lower mandible, and having pale edges to the median wing-coverts even when otherwise in full dress. Young females have little or no chestnut on the wings; old females and young males have some, but less than in the adult male. The dark pectoral band in the male varies very much individually; some are so dark that the white crescentic mark hardly shows without raising the feathers. The females vary,

too, very much on the underparts; some, the majority, have the belly nearly white, while in others it is heavily spotted.

Fourteen adult males: wing 263–281 (4 juv. 251–266); bill 40–46 mm.

Thirteen females: wing 243–265; bill 38–42 mm.

**Anas penelope** L. “Phàraó.”

There are few jheels on which some Wigeon cannot be met with, but on the Manchar Lake this duck swarms in thousands, and in December 1919 it was by far the commonest species. As a rule, I think the larger the jheel the greater the proportional number of Wigeon.

The earliest I have note of is 26 October, and all are gone by the end of March. Wigeon love the open water, especially round the lake's edge, and they usually come over higher in a drive than most ducks, and so comparatively few are shot. A few flocks are to be seen in the salt-water creeks and mangrove-swamps of the coast.

Young birds in mid-November have only just begun to change, whilst adults have then but little left of the eclipse.

**Anas angustirostris** Méné. “Chöi.”

The Marbled Teal is pretty common in those jheels which are fringed by a sea of sedge and rush growing in shallow water such as are found at Dost Allee, Guybee Dehra in Larkhana, Hamal in Mehur, and Manchar Lake in Sehwan districts; in Lower Sind it is far less abundant, but is found in the Pithoro jheels, and odd birds may be met with in many other jheels. It is not so often seen out on open water, but I have seen it on the Manchar in open places, where a matting of weed grows so thick that Jacanas and Wagtails can run on it with ease. At Karachi odd birds on passage may be seen every year in August.

This duck breeds in at least two places in Beluchistan, and Mr. Ludlow informs me that the fishermen at the Manchar volunteered the information that a few breed round that lake in some years; these fishermen are well

acquainted with all the species of duck on the lake, and I think their information is probably correct. Though Hume did not consider this duck first-class eating, I could not detect any difference between it and the Teal.

I can find no sexual difference in this species; juveniles lack the large creamy spots on the upper parts, which have only the tips of the feathers pale, and the dark barring on the "shield" is absent. Some young birds are in full plumage by the end of November, while others early in March are still moulting the juvenile dress.

#### *Anas falcata* Georgi.

Mr. Comber records (Journ. Bombay Nat. Hist. Soc. xiv. p. 149) that Mr. L. Robertson, I.C.S., shot a Falcated Teal in a jheel in the east Narra district, twenty miles from Mirpurkhas, on 10 January, 1901. The bird was an adult male, and was sent to the Bombay Natural History Society. This is the only record for Sind of this species, which has a far more easterly distribution.

#### *Querquedula formosa* (Georgi).

One record of this Teal is referred to in the 'Fauna' (iv. p. 443) as being got by Mr. (Sir Evan) James in Sind; in S. F. viii. p. 324 the latter states that it was shot by Col. Le Messurier. The specimen was painted, and there is no doubt that it was correctly identified. This far eastern Teal can only be an exceptional wanderer to the province.

#### *Querquedula crecca crecca* (L.).

Abundant throughout the Province, the Common Teal frequents almost any kind of fresh-water jheels, both large and small, but on the deeper waters it keeps to the shallow and swampy edges; some, too, may often be seen in the salt-water creeks among the mangrove-forests. They first arrive in Lower Sind in the second week of October; on the 9th I shot what was evidently a newcomer out of a dry field of lucerne at Karachi, but new arrivals I have found to be not worth shooting, so poor in condition are they. Most have departed by the end of March.

In some jheels Teal are very numerous and form into large packs, but like other ducks they have their peculiar preferences, and generally I found them most abundant on smaller, well-sheltered, shallow jheels with plenty of cover. On open lakes such as the Manchar, where ducks are obtained by driving, Teal do not figure so largely in the bags, as they frequent the shallow swamps round the edge. As Teal sweep in flying low to some favourite feeding-ground at dusk they are easily taken in flight-nets, a mode of capture resorted to by the Sindhi in some places. When pursued by a Peregrine they travel at a surprising pace; at a swamp at Karachi a Peregrine used to "wait on" every evening for the Teal as they flighted in; however, if the Teal reached the water first they were safe, the whole flock scattering and splashing down into the water.

By the time duck-shooting commences (mid-November), the adult males are nearly in full plumage with but a trace of eclipse, whereas the young have hardly changed from their juvenile dress; these moult gradually and are in full dress by February.

*Querquedula querquedula* (L.). "Kararo."

The Garganey Teal is to a very large extent a passage migrant through Sind; it is one of the earliest ducks to arrive in autumn and one of the last to leave in spring. The first may be looked for in the first fortnight of September, when small trips may drop in anywhere where there is even a splash of fresh water. However, in the shooting-season, say from mid-November onwards, very few figure in the bag in a big duck-shoot, yet here and there in favoured jheels a flock or two do spend the cold weather, and perhaps more on the Manchar Lake than elsewhere; indeed, Becher in December 1885 found it very common there, though that was not my experience during the three seasons I was in Sind, and Hume never saw it at all during his tour of Upper Sind.

By mid-February, I think, some begin to come back, while by mid-March there are numbers, and from then

onwards it may well be the commonest duck of all. On 31 March at Jhangshahi it outnumbered all the other ducks put together, as a great many of the other species had by then gone ; I saw a good many there still on 5 May.

*Spatula clypeata* (L.). "Gino," "Lāngho" (drummer), "Alipāt" (in Thar).

The Shoveler is an excessively common duck in the cold weather ; it affects nearly every kind of fresh water, the Indus, jheels large and small, and even village puddles. and for the latter reason it is a bird of bad repute for the table, and few ever waste cartridges on it. However, when shot from clean lakes, such as the Manchar and Jhangshahi, it can be quite good eating, though elsewhere they may be nasty enough ; their musty odour, too, tends to deter some from making use of them. The earliest I have seen it is 15 September (a male in eclipse), but most come in about the end of October ; they stop rather late in spring. It is still numerous even at the end of March, and I saw some in pairs on 5 May.

*Netta rufina* (Pall.). "Rutabo."

The Red-crested Pochard occurs on the larger inland waters of Sind in considerable flocks ; on the lesser jheels one may meet with a few, provided the water is of sufficient depth ; avoiding the rushes and reeds they always keep to the open water and fly fairly high. I think this species perhaps comes a little later than the others and leaves somewhat earlier, but few remaining by the middle of March. By the time shooting begins the adults are in full dress and the young ones well on that way. Though a few figure in every bag, I have never heard of great numbers being obtained in a shoot, probably owing to their patchy distribution and high-flying propensity ; but to me one of the thrills of a duck-shoot is a right and left at these handsome birds. When freshly shot the flanks and lesser coverts have a most beautiful salmon-pink tinge, which, however, quickly fades. Like all Pochards it is excellent eating. In full



dress the young birds have the black shield tipped with tawny.

***Nyroca ferina ferina* (L.).** "Torando."

The Common Pochard is one of the commonest ducks, and it especially likes large open sheets of water of sufficient depth, and there it occurs in vast flocks; in Mado jheel in Upper Sind, Hume remarked that they outnumbered all the other water-fowl put together, while on the Manchar and Jhangshahi jheels I have found them in masses. When the ducks are fairly on the wing one may see the Pochards, and often with them the Tufted and White-eye, in compact flocks, large and small, gradually getting higher and higher as the shooting proceeds, as they fly from one end to the other up and down the lake, only to settle again well out in the open water when the firing has quieted down; and so it usually is in the first few minutes of each drive that any number of Pochards come to the bag.

Numbers are in by mid-November, and the earliest I have seen them was on the 7th; they leave again towards the end of March, but a few may be seen early in April. By mid-November the adults are in full dress, but the young are still in heavy moult.

***Nyroca nyroca nyroca* (Güldenst.).** "Burnu," "Burino."

Hume notes that the White-eye was met with on every inland piece of water both large and small, but not on the river, and it especially delighted in the same rush-covered parts that the Marbled Duck frequents. This I can fully confirm, and I have generally found it one of the most universally distributed and numerically abundant species, and I do not think I have shot in any jheel where it has been absent. Though where rushes abound it seeks these in preference, yet on other jheels where there is no cover it may be seen in large flocks in the open water. They soon fly high out of shot, and so they do not figure so relatively largely in the bags; where they frequent rushes, however, they scatter more for feeding, and then rise singly one after the other, usually

just out of shot, though every now and again one may be able to get one or two; under these circumstances they do not fly far, and seem, like the Marbled Teal, loth to leave the cover. At Sujawal the White-eye probably outnumbered all other species of ducks. Hume was informed by the boatmen in Upper Sind that the White-eye bred there, but I know of nothing to support this statement.

As I have pointed out already, the iris of the female is not white, but brown, quite brown in young females; in very old females it may be greyish brown, but I have never seen one which could be called white. Hume gives the note of this species, when it is flushed, as a harsh "Kirr-kere kirr," and further adds that it is indifferent eating—an opinion I cannot confirm, as I found it as good eating as Pochard and that other sportsmen looked on it as excellent food. I have found its food to consist of seeds of rush and sedge. An adept in the art of concealment beyond all others, a winged bird is, unless the water be very shallow, a lost one; on hitting the water it goes straight under and usually never comes up again, at least visibly.

***Nyroca fuligula* (L.). "Runharo."**

The Tufted, unlike the White-eye, likes large expanses of open, fairly deep water, and so on many jheels which yet supply abundant sport no Tufted will figure in the bag; and on those lakes where it is pretty common, as on the Manchar, it seems to the sportsman rarer than it really is, as it keeps usually in large flocks and flies very high.

I have no accurate date of arrival of this species, but I have seen them abundant by 16 November; common early in March, most have gone by the end of the month, but I have seen a few on 7 April. The Tufted gets his plumage very late; young birds in January still hold part of the juvenile dress with the brown head and short crest and ragged tail-feathers with new feathers coming through. When the moult is completed, it may be known from the adult by the less pure black breast-shield, often, but not always, widely tipped with white. Old birds in January

have not always lost their eclipse plumage. This duck is almost invariably known to those sportsmen who try to differentiate the species they have shot, as the "Golden-eye."

*Nyroca marila* (L.).

This is another rather unsatisfactory record of Murray's, though Blanford accepted it (F. B. I. iv. p. 462). Murray (Vert. Zool. Sind, p. 316) says a female was obtained in 1879 at One Tree Tank near Karachi, and that he thought he also had had the male, but could not then find it. Murray had labelled it a White-eye until he identified it by a plate of Hume's as a Scaup; he evidently did not know the species, and his identification can hardly be considered certain. Barnes, in his 'Birds of Bombay Presidency,' I think, elaborated on this record when he said "the Scaup occurs in Sind, and is usually passed over as a White-eye." There are no other records of this species in Sind.

*Glaucion clangula* (L.).

The claim of the Golden-eye as a Sind bird rests on a bird obtained by Sir A. Burnes on the Indus and figured amongst his drawings in the possession of the Asiatic Society. I know not whether there is any proof that this bird was obtained actually in Sind, though it is said to have been; Burnes traversed the Indus outside as well as inside the Province. It has been obtained since several times at Attock, very much higher up the river. On 6 November, 1917, I saw five ducks flying in from the sea at Karachi which in the distance I took to be the Golden-eye, but I will not vouch for them.

*Dendrocygna fulva* (Gm.). "Wādūro."

The Large Whistling Teal is a very local bird in Sind, so far as I could ascertain. James says he noticed it on several occasions on the dhands in 1872, and sent Hume specimens. He was told it occurred in the E. Narra district during the rains; Doig knew of it there and thought it bred in

June and July, while Barnes records finding a nest in a babul in the centre of a jheel near Hyderabad. According to Butler and Becher it occurs in the cold weather on the Manchar Lake. I did not meet with this species for certain, and there are no records of it from Upper Sind; it probably affects well-wooded jheels such as are found in the Narra and down the Indus; it is less common in Kutch also than the next species.

*Dendrocygna javanica* (Horsf.). "Chiku."

This is by far the commoner of the two Tree-Ducks; like the last it is a permanent resident and, though local, is more widely distributed. It appears to be rare in Upper Sind; Hume only met with it once, and Mr. Hotson has noted it on two occasions when duck-shooting at Drigh and Khaipur Nathanshah in the Larkhana district. Round Hyderabad, the E. Narra district, and down the Indus below Hyderabad would seem to be its headquarters, and, like the larger species, it likes well-wooded jheels; on many jheels I never saw it.

Doig (*Nests & Eggs*, iii. p. 285) records finding a clutch of ten fresh eggs on 22 June in the E. Narra district; this and other nests he found in June and July were placed in creeper-covered tamarisks three to eight feet above water. Mr. Ludlow has eggs from the Pithoro jheels, and Barnes found nests in the Hyderabad district from June to August. I found this species abundant on the Hilaya jheel between Jherruck and Tatta on 8 June; they were more or less paired, and were constantly flying off into the neighbouring tamarisk-forest, which is here several hundred yards wide and lines the inundated banks of the Indus with trees which grow to a mighty size. Nesting had probably only just began, as though I searched many likely holes I failed to flush a bird.

*Mergus merganser* L.

Butler (*S. F.* v. p. 323) recorded that a female Merganser was shot off Karachi Harbour by Capt. Bishop and was in

the Frere Hall. This specimen now no longer exists. In the same note he says another had lately been captured there at the end of June ! I saw a fine adult pair in a backwater of Halijee jheel at Jhangshahi on 7 January, 1918 ; they kept quite apart from the other ducks. It is evidently quite a rare bird in Sind.

***Mergus serrator* L.**

The Red-breasted Merganser recorded as shot by Capt. Bishop at Manora (Karachi) on 24 November, 1875, in reality was obtained at Charbar on the Mekran coast, where this species is not very uncommon ; one, however, was obtained in Karachi Harbour by Yerbury, and the wings are in the British Museum.

***Mergus albellus* L. "Jhāli."**

The Smew is not a common duck ; Hume met with it on the Manchar Lake and on the Indus at Kashmir, and these would seem to be the favourite localities ; odd ones or small flocks, however, may be met with in any suitable jheel, though one may shoot all the season and not come across it. I only saw it twice in three seasons.

***Phalacrocorax carbo sinensis* (Shaw & Nodder).**

On the large inland waters, the Indus, and shores of the Sind coast the Cormorant is abundant. In the E. Narra district, at all events, it is abundant and breeds in huge colonies ; one which Doig visited was a mile long and eighty yards wide ; the nests, placed on old withered tamarisks, mostly held eggs (4-6, once 7) in mid-November. On the coast it is a winter visitor ; I have seen great wedge-shaped flocks coming in from the north, high up over the desert, on 30 October ; they leave again about the end of March, and so these must come from a part where the nesting-season is more in accordance with that of the European bird, since they are common at Karachi during the Sind nesting-season. They spend most of the day out at sea, coming ashore at low water to preen and digest on the Clifton sands.

I have examined all the *carbo* group in the British and Tring Museums :—

10 adults, Continental Europe and W. Asia : wing 322–355, bill exp. 60–70 mm.; including type of *subcormoranus*.

16, China and Japan : wing 322–363, bill exp. 58–73 mm.

29, India and Muscat : wing 319–364, bill exp. 57–72 mm.

I can see no colour-differences in these three series, and therefore conclude that this bird extends from Holland to China and Japan, and Brehm's *subcormoranus* is a synonym, as also is Mathews' *indicus*.

### *Phalacrocorax javanicus* (Horsf.). "Kambu."

The Little Indian Cormorant is very common in all the inland inundations, and is resident. In winter it spreads out to jheels, where it is not found in the breeding-season and remains till June ; and I think some also come to Karachi Harbour during the cold weather, but I could not be sure, as I found it difficult to distinguish in the distance from *P. fuscicollis*, which is common there. In the E. Narra district and other suitable jheels east of the Indus it breeds ; Doig found large colonies in dense tamarisk-thickets intermixed with *P. fuscicollis* and Darters, and fresh eggs were obtained on 24 July.

### *Phalacrocorax fuscicollis* Steph.

The Indian Shag is a permanent resident, but its distribution, owing to its similarity in the distance to *P. javanicus*, is not easy to determine. Hume did not record it from Upper Sind, and I have no records thence, though it probably occurs. Small Cormorants are numerous on the jheels of Central and Lower Sind, and probably both species are common. This species, however, I ascertained to be abundant in Karachi Harbour at certain times of the year ; I noticed them there more especially from April to June, though I think they were also present all the cold weather. I could never make out that they nested there, though I suspected that they did so, but I was unable to examine all the enormous area of mangrove-forest that fringes the

southern shore ; thus I saw numbers sitting about on the tops of the mangroves on 8 June, and one secured was moulting from juvenile to adult plumage and had the organs fairly, but not fully, enlarged. It breeds in the E. Narra district in July.

One that I shot had two soles, five inches long, neatly folded up in its oesophagus.

#### *Anhinga melanogaster* Penn.

The Darter is confined to the larger jheels, and is not uncommon throughout the Province. In winter it spreads out to temporary inundations, but otherwise it is resident. Most sportsmen will know these birds, which may frequently be seen sitting together with several Pigmy Cormorants on the boughs of an old dead tamarisk standing in water, all "hanging their wings out to dry" and craning their necks at the intruder, till too near an approach sends the whole lot off into the water with mighty flappings and splashings. Hume records meeting with one in a pool in the Nurree Nai, just inside the hills, but otherwise it does not occur west of the Indus valley.

According to Doig this species breeds on the E. Narra from June to December ; this latter month is perhaps exceptional, as in November and December I have seen no signs of Darters breeding there.

#### *Sula cyanops* (Sund.).

Butler states that he saw two or three Boobies off the Sind coast in March. On 9 July one was brought to Murray by fishermen, who stated that they had seen three flocks of thirty birds about three miles off the coast ; this is probably the bird still in the Karachi Museum. It is, of course, common enough out at sea, and though I never actually saw any off the Sind coast, I saw several off the Mekran coast at Ormara Head and elsewhere. It must rarely come close enough in shore to be seen from land. This and other marine species probably breed on the Haski, one of the Kuriya Muria islands, off the Oman coast, which is white with guano.

**Phaëthon ætherius indicus** Hume.

This Bo's'un or Tropic-bird is fairly common at times off the Sind coast, but perhaps more particularly off the Mekran coast, where Hume saw a number during February. Butler noticed three or four between Karachi and the Gulf of Kutch in March. I have only seen this bird off Ormara Head on the Mekran coast (about 160 miles west of Karachi), also in March. It very seldom comes, I fancy, within sight from the shore. I think it may possibly breed on the headland at Ormara; no European has been on it.

**Pelecanus onocrotalus roseus** Gm. "Pian" (both species).

This Pelican is found commonly on the larger inland waters as a winter visitant, as well as on the tidal creeks of the coast. Sometimes very large flocks are to be seen.

**Pelecanus crispus** Bruch.

The Dalmatian Pelican is also numerous on the inland waters and coast-line. Tethered birds are kept as decoys by the Mohanas, who also use the skin stretched over a frame as a helmet for approaching the decoyed wild fowl (see under Coot). Pelican oil is highly esteemed by the Sindhi for medicinal purposes. I have no exact dates of arrival and departure for either species, 30 November and 5 March being my extremes. For the determination of Pelicans from Sind in the British Museum I am indebted to Mr. Selater.

**Oceanites oceanicus** (Kuhl).

Wilson's Petrel is probably not very uncommon out at sea off the Sind coast, since it occurs off the Mekran coast, where Butler and Mr. Cumming have both met with it. Butler states that Bishop, who was with him at the time, subsequently saw several along the coast during a trip between Karachi and the mouths of the Indus. It breeds in the South Polar regions, and so visits Sind in the hot weather.

**Puffinus persicus** Hume.

Although I have seen great numbers of this Shearwater further up along the Mekran coast and in the Straits of



Ormuz, where it swarmed, I never actually saw any off the Sind coast, but my opportunities for doing so were not great; probably it does not occur in such great numbers off the latter coast, as, so far as we know, it does not breed in Sind nor is it likely to do so. Hume observed it in very small numbers between Karachi and the mouth of the Indus out at sea about 2 March.

*Podiceps cristatus cristatus* (L.).

Hume records but one specimen in Sind—on the Manchar Lake on 28 January, but at sea along the Sind and Mekran coasts he found it common, where I too have seen it. I never met with it inland in Sind, where it is apparently rare.

*Podiceps nigricollis nigricollis* Brehm.

Hume met with the Black-necked Grebe only off Karachi at the Oyster Rocks, though he saw it on the Mekran coast. On 25 December, 1919, I secured two adults on the Manchar Lake and saw another. These kept quite to themselves, not associating with the masses of Little Grebes present, and at once attracted attention by the silvery white of their flanks flashing in the sun-light; considering the vast extent of this lake, they may well be not uncommon there, but this is the first record from the plains of India. Colonel R. Meinertzhagen has found it breeding in northern Beluchistan. My birds had been feeding on large freshwater shrimps.

*Podiceps ruficollis capensis* Salvad. "Tubino" (=diver).

On the larger lakes this Little Grebe is very common, and in winter on many temporary jheels of smaller size, backwaters, and inundations some may always be seen; I never saw it on salt water. In winter on the Manchar Lake this bird swarms beyond belief, enormous flocks hundreds strong being met with in every bay. Doig records finding eggs on 8 July, but I think a good many are winter visitors, though doubtless it breeds commonly enough in suitable places. I have seen it in summer dress as early as February, while a flock at Jhangshahi on 2 June were all in summer dress, but showed no sign of nesting.

Sind birds are typical *capensis*, and have constantly more white on the primaries and secondaries than western birds from Europe.

***Columba livia neglecta* Hume.**

It is very difficult if not impossible to say what Rock-Pigeons in Sind are wild birds; every town and village of any size contains great numbers, and these stray away into the surrounding country and come to lead a feral existence, and one may find Pigeons well away in the desert or cultivation inhabiting railway bridges or wells. However, in the Sind hills, far removed from any habitation, it is common in places, and is there I believe truly wild. In cliffs, in some of the hills such as those bordering the Gaj, Barun, and Habb rivers, it is numerous, inhabiting caves, wider crevices, and ledges. As elsewhere, the Pigeon breeds more or less all the year.

The Rock-Pigeons of north-west India have been a source of considerable confusion in the past; various writers—Hume, Barnes, Stuart Baker—have been much puzzled as to whether both *livia* and *intermedia* occur there; the truth is neither do so. In determining what race of Pigeon inhabits Sind, I have had before me a very large series from all parts—India, Beluchistan, Afghanistan, Turkestan, Persia, Mesopotamia, Palestine, and the British Isles. *C. l. intermedia* is a very dark bird with a dark grey rump, and comes from the peninsula of India; no north-west Indian bird that I have seen could be assigned to this race. Now all the birds from Sind, Punjab, North-west Frontier Province, Beluchistan, Kashmir, Turkestan, and Afghanistan are the same, and are paler than *intermedia*; the rump varies from nearly white, white tinged with pale blue-grey, to quite pale blue-grey, and all such individual varieties may be found in one locality; thus in two from Ladak one has the rump white, the other tinged with pale blue-grey, so that the coloration of the rump is a very variable character. Sind birds are quite inseparable from those from Ladak, whence came the type of *C. neglecta* Hume.

**Columba evermanni Bonap.**

The Indian Stock-Dove is a visitor, in some years in considerable numbers, to Upper Sind, where it chiefly affects rice-fields; there are no records of it south of the Larkhana district. Common in Lower Punjab.

**Columba palumbus casiotis (Bonap.).**

Butler records that in a swamp near Sukkur on 19 January he saw an undoubted Wood-Pigeon; he had good opportunities for examining it with glasses, and there can be no doubt about his identification. There was a specimen in the Karachi Museum which Swinhoe identified, but, although it was said to have come from Sind, there was never any certainty in the matter. Mr. Cumming informs me that he saw one in a compound in Karachi on 25 January, 1886, and that from its tameness he had no doubt that it was an escape, brought down by troops from Afghanistan. The occasional occurrence of this bird in Upper Sind would not be surprising, as it is common in parts of north Beluchistan and an altitudinal migrant.

Murray records that his native collector obtained the Fruit-Pigeon (*Crocopus p. chlorigaster*) in November 1877 near Jacobabad. This specimen is in the British Museum, but, as Murray was very careless over localities and labels, there is always an uncertainty as to whether this, and other birds which have not occurred since, were really obtained in Sind. Its nearest habitat is eastern Rajputana and the Hissar district of Punjab.

**Streptopelia decaocto decaocto (Friv.). "Ghero."**

The Indian Ring-Dove is exceedingly common throughout the Province except in desert scrub-jungle, and rather less common in gardens and thick forest. It starts breeding in February and, according to Doig, nests may be found up to September; I am very doubtful, however, whether any one pair goes on breeding continuously all the time, as I have shot moulting adults in June which were not breeding; either the late nests are those of early-hatched young ones, or else there is an interval for moulting between the breeding-periods. This Dove moves about locally; all the cold weather

at the Karachi Sewage Farm there were hundreds in flocks which about 15 May dispersed, leaving a residuum of breeding pairs; possibly some are true migrants from a colder habitat.

Their food consists of seeds of weeds and grasses, such as *Penisetum ramosum* and *Digera arvensis*.

The note of this Dove may be represented "hōw-dō-dō; hōw-dō-dō." Butler records one nest of albinistic young taken at Jhimpir, the male being pure white, the female pale fawn-buff. Sind birds are quite typical.

*Streptopelia orientalis meena* (Sykes).

Mr. McCulloch, late D. S. Police Karachi, kindly sent me a skin of this Dove; he informed me that he shot it from amongst Rock-Pigeons in a "jowari" field in Karachi Kohistan on 15 November, 1918. The Indian Turtle-Dove must be but a vagrant to Sind; it avoids the more desert portions of north-west India.

Malden informed Hume that *S. suratensis* was common in Upper Sind. There is no other record of this Dove in Sind, and its nearest habitat is Mt. Aboo. I believe Malden to have been mistaken on this and other birds.

*Streptopelia senegalensis cambayensis* (Gm.). "Tutan Gheri."

The Little Brown Dove is quite as common, if not more so, than the Indian Ring-Dove, since it is more widely distributed and is found in desert scrub-jungle and in town gardens—places not so usually inhabited by the latter—as well as pretty well everywhere else; in fact, one may say it is the commonest bird in Sind. From my own observations this bird nests from March to June and then moults; I think that in a good monsoon, at any rate, it must nest again, as I have found it breeding in July. Every sort of tree may be used for nesting in, and in the desert the nests are frequently placed in a *Euphorbia* ("cactus"). Mr. Bell says that often the nest is placed on the ground at the foot of a tree. The note of this bird may be represented as "crū dō-dō-dō-dō."

It was a great surprise to me to find that this bird is a migrant, and an overseas one at that! On 25 March, 1918, when about ten miles off Karachi, the morning being foggy, four or five of these Doves came aboard quite exhausted, and remained until we reached harbour. Ashore it was, of course, too common to detect any increase at that time, but I noticed that, as with the Ring-Dove, great numbers which had been about in the sewage-farm all the cold weather vanished early in May, suggestive that these were winter visitors from further north. It may be suggested that these over-sea migrants belonged to the Turkestan race *ermanni*, a slightly larger bird; unfortunately I was unable to procure any, but I may point out that it by no means follows, as birds from Muscat, Mesopotamia, and Beluchistan cannot be differentiated by wing-length from breeding birds from Sind and Lower Punjab, which measure 125–135 mm., Beluchistan (8) 126–131.5 mm., Muscat (2) 132, 134.5 mm., Mesopotamia 127.5, 130 mm., while the three from Kandahar measure ♀ 125, ♂ 135, 139 mm., the female being much too small for *ermanni*.

*Œnopopelia tranquebarica tranquebarica* (Herm.).

The Red Turtle-Dove, the most handsome and graceful of the three, is fairly common, though far outnumbered by the other two Doves. It is a bird of cultivation and the better-wooded parts, and does not much affect desert scrub-jungle. It is in part a summer visitor and apparently in part a resident, for some undoubtedly spend the cold weather in Sind. Butler says that it arrives in April in numbers round Hyderabad, and round Karachi, too, it certainly is commoner during the hot weather. Though it begins to arrive by mid-February, I think the bulk leave in October, but I have on several occasions seen it in November and December in Upper, Central, and Lower Sind, and Hume records it in Larkhana in December.

It nests from the beginning of April onwards; Butler says he has on several occasions found three eggs or young in a nest, but two seems the usual complement, and a thorny

tree is usually selected. Its food consists of cereals such as *Zea mays*, and seeds of weeds such as *Amaranthus gangeticus*. The notes of all three Sind Doves are distinct, and this bird's may be represented as "cru u-u-u-u," "cru u-u-u-u," repeated four or five times quickly without pause and with emphasis on the first syllable.

Such birds are not different to the typical race.

[*Psammœnas burnesii* (J. A. S. B. xiv. p. 860) seems to me to be indeterminable. It was described from a bird which was taken in Sind, and a new genus made for its reception. Needless to say, no such species exists, and the description possibly was founded on the immature dress of a Sand-Grouse.]

***Pterocles orientalis* (L.). "Chur."**

The Imperial Sand-Grouse is quite a local bird in Sind, but occurs in small numbers in winter as far south as Sehwan. Southwards, however, there are few records; Wise records (S. F. iv. p. 230) that he saw five, and shot one near Kotri. Barnes recorded that he obtained one on the Miani Plain, near Hyderabad, on 20 May, and that it had the ovary so much developed that he considered it would have bred in ten to twelve days. This is the only suggestion that it breeds within our boundaries. Butler's account of this bird is somewhat contradictory; in S. F. vii. he says it is occasional in Lower Sind, and in his 'Catalogue,' written the next year, he says it is not uncommon in most parts. This perhaps has led Mr. Stuart Baker (Journ. Bomb. Nat. Hist. Soc. xxii. p. 6) to say "it is very common in Sind."

I never met with it in Lower Sind, and though I was always enquiring of other sportsmen and shikaris, I could obtain little reliable information. Any Sand-Grouse but the Common is called "Imperial" by nearly everybody, and many of the supposed occurrences of this bird turned out to be the Spotted or Coronetted. The following records, however, I believe to be genuine. Major Burnett tells me that he shot three near Jhimpir some years ago—the only ones he ever met with in Sind,—and there was a bird from

the same locality in the Bombay Museum (Swinhoe Coll.). Mr. McCulloch informed me that he shot one out of a flock of Common Sand-Grouse at One Tree Tank, near Karachi, about eighteen years ago, and I heard of one at Malir in 1921. Blanford has also met with it in Thar and Parkar district.

***Pterocles alchata caudacutus* (Gm.).**

From the older records it appears that the Large Pintail Sand-Grouse winters in fair numbers round Jacobabad, and passage migrants for a few weeks in spring make it the commonest Sand-Grouse of the district. In the rest of Sind, however, it is practically unknown; Barnes says he has seen it at Jhimpir, where it must be quite an exceptional straggler, as I could never hear of one being obtained in this well-shot district, nor did I ever meet with it anywhere in Lower Sind. I have no knowledge that it breeds at Jacobabad; Barnes has recorded an egg which Hume identified as belonging to this species and which was taken at Jhimpir (probably by a shikari): it is in the British Museum, and bears the date 10 July, 1878; it measures  $43.5 \times 30.5$  mm., and is very much on the small size for *alchata* and is more like the type of *senegallus*, which I know breeds not uncommonly in that district.

***Pterocles senegallus* (L.). "Gutu."**

The Spotted Sand-Grouse, taking Sind as a whole, is not nearly so common as the Common Sand-Grouse, but is more abundant than the Coronetted and more widely distributed. So far as I could ascertain, it is quite resident. In places, however, it is *the* Sand-Grouse; I am assured that this is so round Jacobabad, and I think also in many places on the bare plains between the Khirthar foothills and the cultivation. In such places Hume found it at Guibee Dera, Madho, and Gul Mahommed in Mehur, and further south near the Manchar Lake; again, further south, at Manjhand and Gopang on the plains sloping to the Indus, it is *the* Sand-Grouse; in the former place Mr. McCulloch says he saw

some two thousand coming to water at 10.30 A.M., and sent me specimens; in the latter locality Mr. Ommancy tells me it is very common, and that he has seen it there in the hot weather. Where these hills turn in a south-west direction forming the Soorjana group, this Sand-Grouse again occurs, but not in very great numbers, and in most places from there along the Kotri-Karachi line, at well-known drinking-places, a few brace generally figure in a bag of Sand-Grouse. It is, however, not entirely a foothill bird; thus I have met it at Hillaya, near Jerruck, where several pairs were watering at 9 A.M. on 8 June. It is also found in the Rohri-Shikarpore districts, and Blanford met with it in Thar and Parkar. Whereas the Common Sand-Grouse is addicted to the desert scrub-jungle, this species, like the Coronetted, is a bird of bare open plain. I could not hear of it in the Sind hills; it is common in Kutch.

The habits of this bird in winter at drinking-time are much like those of its commoner relative, and, as the flocks arrive, one may see several of these birds mingled with the others. Hume noted that when in flocks the two sexes are separate. On 22 June I saw a good many coming to drink at Jhimpir springs, mostly in pairs, but one or two lots of four to six were probably family parties; they arrived later than the other species, not coming before 9 A.M. At these times they are very noisy; their constantly uttered notes as they fly round are much louder than those of other species and, of course, are quite different. The Sindhi name for this bird—"Gutu"—expresses pretty well the note, though to my ear it sounded more liquid—"quiddle, quiddle."

The breeding-season begins very early; on 24 February I examined a female which had a yolked ovum, and from the appearance of the duct an egg had recently been passed; Blanford obtained an oviduct egg on 20th March at Shikarpore. Mr. Jourdain has eggs taken on 15 May near Kotri, and another clutch thence is in the Dresser collection. Mr. S. Baker has an oviduct egg taken as late as 14 August. Mr. Gordon has eggs from Jacobabad ( $42 \times 27$  mm.), and he sent me a breeding female from near Kashmir, and I



believe that wherever this bird occurs it is resident. Round Jacobabad this bird is called "Kara pat gutu," *i. e.* the black-bellied "Gutu," perhaps to distinguish it from the Coronetted.

I have examined the series of this species in the British and Tring Museums and in my own collection. Sind males are usually bluer on the back of the neck and less rich isabelline, more washed with grey on the mantle, and have the underparts paler compared with African birds. Females, too, have the ground-colour of the upperparts often but not always less isabelline and the underparts whiter; however, some Algerian birds are so near Sind ones, and African birds in general seem to vary so, that I agree with the last reviewers (Ibis, 1920, p. 837) that separation of the Indian bird is not justifiable.

#### *Pterocles coronatus atratus* Hart.

The Coronetted Sand-Grouse is in some places common; Hume first recorded it from the Jacobabad district, where he was informed it was not uncommon in parts of the cold weather. Later, Wise met with it under the Soorjana and Eerie Hills in the Karachi district, and Anderson found flocks of six to twenty in much the same part. In the plains this Sand-Grouse is only found in the immediate vicinity of the Khirthar foothills, and is in some places *the* Sand-Grouse of that district, though it is probably rather local. I visited the same places as Wise did, and as soon as I crossed the Barun River and entered the bare plain sloping gently up to the Soorjana, this Sand-Grouse was met with in flocks of twelve to fifteen, and was the only Sand-Grouse seen, except in some cultivation near the pass a few pairs of Common Sand-Grouse replaced it. The Coronetted were inhabiting the barest of bare desert, where a few old withered clumps of bare desert-grass provided them with the necessary seeds. Some twenty miles south-west at the base of the same hills near Jhimpir I also came across them on bare stony desert; here, although there was no trace of vegetation, the crops of birds shot soon after sunrise were full of seeds. Further

in the hills, in Karachi Kohistan, Mr. McCullick says it is not uncommon.

I always thought that this Sand-Grouse was but a winter visitor to Sind, and therefore it was rather a surprise to me to come across it in June. On 22 June, 1919, I was at Jhimpir, seventy miles up the line from Karachi, visiting the remnant of the great Khinjur jheel, which, with no rain for two years, had shrunk to a small pool not more than a quarter of a mile long. Just north of this and near the White Tomb the rocky desert ends in a tiny cliff, and here and there are freshwater springs coming from the cliff. The Khinjur River had not a drop of water in it, and these springs were the only fresh water between the hills and the Indus—a distance of thirty miles, the springs being halfway. Below the springs is a maidan, on to which a few tiny trickles flow, forming here and there small pools; on approaching this, I saw a flock of Sand-Grouse come in which I thought were Coronetted, so, hiding under a convenient bush, I waited, and before long they flew down, and I saw my suspicions were correct. From 8 to 9 A.M. others kept coming in, mostly in twos and threes, until there must have been hundreds round me sitting about on the maidan; unlike other species, these birds alighted some fifty to a hundred yards from the water, and picked about for some time before gradually working their way to the water; their walk is more upright and quicker than in other species. Hidden under the bush, I had splendid opportunities of watching these birds drinking, some not three yards off. They drink as chickens do, and some, but not all, get right into the water; one male I shot had its breast quite muddy and wet. The males far outnumbered the females, and probably many females were on the nest-ground with their broods. Although birds kept arriving till 10.30 A.M., males always greatly predominated. When on the maidan and at the pools each little lot keeps together. The males with their black face-markings have a most grotesque appearance; sideways the black coronal and throat-streaks catch the eye so much that one loses sight of the bill, and the head has a curious Puffin-like appearance. In

the air they look very white underneath, and their flight reminded me much of that of the Golden Plover. They are very noisy, and the note is quite different from that of other Sand-Grouse, and reminded me much of those curious notes one hears sometimes at night of migrating Waders. One female which I shot as it flew up from drinking had an egg, ready for laying, in the duct, but it was unfortunately badly smashed. It seems certain, from observations in captivity, that Sand-Grouse do water their young from the breast-soaked feathers, and certainly some males soaked their breasts and some did not (the latter probably had no young); but it is difficult to see the necessity of this method, as one bird examined after drinking had fully an ounce of water in its crop which could have been regurgitated for the young; moreover, one would think that in the scorching heat and after a flight of twenty miles little moisture would be left in the feathers. Drinking at the same pools were swarms of Common Sand-Grouse and a good many pairs of Spotted, but each species kept pretty much to themselves. Immediately each had finished drinking, it flew away to the hills, all taking the same line.

A week later I tried to find the breeding-ground, adopting the only possible plan as it seemed to me, and that was to trace the birds back after drinking. I had offered locally large rewards to any who could during the week find the breeding-grounds, but all the natives were far too lazy to try. But any chance I had was frustrated by not being able to get the camel-men to start early enough. Taking the line the Sand-Grouse took the previous week, I found it to be the bed of the Khinjur River; however, I had not gone six miles up it before the birds passed me *en route* to drink, and, of course, soon after repassed me again on their way back, going out of sight towards the hills. These I eventually reached—a trek of fifteen miles,—and spent the rest of the day quartering about the desert at the foothills, hoping to raise a bird; suffice it to say, I never saw another Sand-Grouse all day, and the heat and sand-storms were such as only the Sind desert can supply. I have not the slightest doubt the

breeding-grounds are in the foothills, and I give these details in case some enthusiast one day may like to try his hand—but he must be an enthusiast! I should suggest making Bula Khan's Thana headquarters and working down to where I left off, as Jhimpir is too far off, and the birds only water there when the monsoon has failed.

Both sexes incubate. The egg has the ground-colour almost white, the markings of pale brown and grey, small and thinly scattered. Mr. Stuart Baker has an egg from the Sind-Beluchi frontier, 15 May, 1890. Bill lavender-grey, feet white.

The Sindhi name has been given as "Katinga," but I found the natives did not know the bird at all, and certainly not under that name, which is Beluch for any small Sand-Grouse.

*Pterocles senegalensis senegalensis* Licht. (= *carustus* auct.).  
"Batitar."

Except in places referred to under the other species, the Common Sand-Grouse is the most universal and commonest of its tribe in Sind; it is much more a bird of thin desert scrub-jungle and old cultivation than perfectly bare plains. The times and places for drinking are very constant; in the hot weather they drink at 8 A.M., and some again between 2 and 4 P.M.; in September and October at 9 A.M., and in the cold weather at 10.15 A.M.; unless very harassed they come to drink at precisely the same spot every day. Just before drinking-time large flocks may be seen coming in high from every quarter, so that the sky is full of them; the first flocks invariably settle away on the open plain some half a mile from the drinking-place, and all the other flocks settle near them; after about fifteen minutes the first batch get up to fly for water, and the rest follow. The place selected is always either where firm dry mud or sloping rock abuts on to shallow water. In the hot weather they equally have regular times and places for dusting—about an hour before sunset.

April is the chief nesting-month, though odd pairs may