THE OOLOGISTS' RECORD

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EDITED BY KENNETH L. SKINNER.

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NOTES ON THE BREEDING HABITS OF SOUTH AFRICAN SANDPLOVERS.

By H. W. James.

Only three species of the genus Charadrius are known to breed in Cape Colony: these are *C. tricollaris*, Vieill, *C. varius*, Vieill, and *C. marginatus*, Vieill. C. *tricollaris* is the commonest of the three, and is abundant every where withthe exception of the seashore, where it is rarely seen, but inland I do not suppose there is a single river pool, dam or any inland piece of water without a few of this plover. Most of the South African rivers are dry for the best part of the year, with exception of pools here and there, and it is on these pools that *C. tricollaris* is most abundant, for there it finds a plentiful supply of the aquatic insects that form its food.

The reverse is the case with *C. varius*, this plover being more abundant at the coast than it is inland where, as far as my observations go, it is very local in its distribution. I found it very abundant on Bird Island, Algoa Bay. Its haunts inland are confined to dams and pans; the pools in the rivers, so much favoured by *C. tricollaris*, being entirely avoided by the present species. This is the only one of the three species that congregates into small flocks when not breeding, and these flocks are often met with feeding at a considerable distance from water.

C. marginatus I have never met with anywhere but on the seashore, although Layard states that it is met with on inland water. If it does occur inland it must be very rare. Although plentiful all along the mainland of Algoa Bay, I did not meet with a single specimen on Bird Island.

My observations on the breeding habits of the three species are detailed below:—

C. marginatus—White-fronted Sandplover.—The nest of this species is generally placed on the beach just beyond high-water

mark and consists of a hollow in the sand or shingle. This is sometimes lined with small pebbles and, if placed amongst dried sea grass or rubbish, with small chopped material. The eggs are very difficult to discover as the bird usually leaves the nest long before one has spotted it, its pale colour harmonising so well with the sea sand that detection, as it slips off the nest, is no easy matter. The clutch of eggs is invariably two, and in shape they are pointed ovals, true pyriform eggs being rare. The ground colour is pale creamy-buff, and this is marked with delicate spots and scribblings of dark brown and lavender-grey. The markings are very evenly dispersed over the whole shell and in no eggs are the markings dense. The eggs on the whole are very like delicately marked eggs of *Aegialitis nivosa, Cass.* The average measurements of a small series is 1·28 inches × ·93 inches. The breeding season commences early in September and continues to about the middle of December.

C. tricollaris—Three-banded Plover.—In the last four years it has been my good fortune to have had exceptional opportunities of studying the breeding habits of this plover. During that period I have examined about 200 nests and 98 per cent. of those have been on shingle beds. Very rarely indeed was a nest found away from shingle. The principal breeding grounds are the beds and banks of rivers such as the Tarka and Fish Rivers, which may be taken as typical examples of South African rivers. They are really nothing but huge sluits with banks 10 to 20 feet high. In the beds are numerous water holes and shallow pools which never dry up, being fed by small fountains. Along the banks and in the beds one finds innumerable patches of shingle, and it is to these patches that *C. tricollaris* resorts for breeding. A stony patch near a dam will generally yield a nest or two, but I am quite convinced that the majority of birds resort to the rivers for breeding. A long series of records of nests found along the two rivers mentioned above show that 75 per cent. were found in the river bed. It has always been a puzzle to me why the birds should so persistently stick to the river bed, as a great number of nests get destroyed annually when these rivers come down in flood. Each pair of birds takes command of its own shingle bank, driving all others away, so that it is a very rare occurrence to find two nests on the same bank. I have frequently observed that only certain shingle patches will contain nests and that year after year the nests will

be in almost the same spot on those patches. I have further noticed that the eggs from any particular shingle bed, when compared with eggs from the same bed taken in any other year, prove to resemble one another closely, and I think this supports my theory that the birds remain and breed in the same spot for many years.

In choosing a site for the nest, the birds show a decided preference for the edge of a shingle bed and more often than not a place where there are a few biggish stones. The nest varies considerably; sometimes it is merely an unlined hollow, but as a rule the hollow is lined with small stones, pieces of shell and small bits of debris. In some nests the amount of material used is considerable. I remember one such nest on a stony patch on the river bank. The birds had carried together enough small stones and shell to make a mound about 7 inches in diameter and 2 inches high. It was quite easily seen at a distance, but such a large nest is quite the exception. The nests, on the average, are by no means easy to find. The sitting bird is very wary, slipping off the nest on the first sign of danger. It either runs a short distance before taking to flight or flies straight from the eggs, requiring a keen eyesight to catch a glimpse of it as it glides away. By the time one reaches the spot it will be feeding in a water pool, showing no concern whatever for its eggs, as if it realised their protective colouring. The only way to find a nest is thoroughly to search a likely spot. Once only did I come across a bird that behaved differently. I was on horseback, riding along the river bank. On a patch of stones I found a nest betrayed by the bird jumping up right under my horse's feet. I dismounted and was surprised to find that the bird remained close to its eggs. I sat down by the nest and remained there five minutes. The whole of that time the bird remained near the nest, often coming so close that I could almost touch it.

Should this plover have young it becomes quite a different bird, showing the greatest emotion and endeavouring to draw the intruder away by the old ruse of pretending to be disabled.

The nesting season is an extended one, March and May being the only months of the year in which I have no records of nests. The best time for eggs, however, is from August 6th to the end of November. Right through August the birds breed freely, slackening off somewhat in September but nesting very freely again in October with a gradual slackening off in November. After November my

records for a number of years show, 3 nests in December, 1 in January, 2 in February, 2 in April, 1 in June and 1 in July.

The number of eggs is normally two. I have never found less, and only once three. In that instance there was little doubt that the third egg had been laid by another bird. It differed in colour to the other two and was quite fresh, whereas the other two were in a very advanced stage of incubation.

In shape, the eggs are pyriform, but only slightly so, many eggs being almost regular ovals. The ground colour varies little, being either pale or dark cream. There are three distinct types of markings :—

(1) Shell covered with an intricate and beautiful tracery consisting of fine hair-like lines of dark brown and dark greenish-brown with underlying conspicuous blotches of light purplish-grey.

(2) Shell covered with similar tracery of fine and coarse lines of several shades of brown, some almost black, with underlying markings of blotches of light purplish-grey.

(3) In this type the markings consist of coarse, short lines, blotches and spots of dark brown to dark purplish-brown, evenly, but not very densely, scattered over the whole shell. The underlying markings, consisting of blotches of purplish-grey, are very bold and distinct.

I have one egg which is marked, in addition to the lines, with large confluent blotches of very dark brown, almost black, on the broader end. In nearly all eggs of this species the markings are crowded together at places forming a series of ill-defined zones round the egg, generally the middle, but sometimes round the top. When round the top the zones are always very dark and conspicuous. These zones are quite peculiar to the eggs of the present species, and by them they can be easily distinguished from the eggs of *C. varius*, which they resemble somewhat.

The average measurements of a large series is 1·18 inches × ·85 inches.

C. Varius.—Kittlitz Plover.—This bird has always been of great interest to me, chiefly on account of its interesting breeding habits, which are so different to the other two species. The sitting bird, when disturbed, invariably covers its eggs with the loose material lying round the nest before leaving them. The first nests I ever found were all in loose sandy soil, and for a long

time I was under the impression that such places were invariably chosen, being in fact necessary to enable the bird to rapidly cover its eggs when disturbed, but in the last two years I have found many nests in hard ground, and it was quite evident from their appearance that these nests had been carefully prepared, but it was not until this year that I was fortunate enough to get an opportunity of watching the birds at work. I was in my cattle kraal one evening watching the natives milking. Looking over the wall, I noticed two Kittlitz Plovers running about twenty yards from the kraal. I stood watching them, and every now and then one would run to a certain spot, sit down and commence turning round, at the same time kicking with its leg. Something frightened the birds away and I took the opportunity of quickly investigating. I found that they had commenced to excavate a hollow. They kept at work every morning and evening for three days each bird taking its turn at excavating the hollow which, by the end of the third day, measured 3½ inches in diameter and 1¼ inches deep. I never saw them working during the heat of the day. On the morning of the fourth day they commenced filling the hollow up with very small pieces of earth and dry dung. Standing a little way from the hollow, one bird would pick up the material required and with a dexterous flick of its head throw it into the hollow. While doing this it worked very rapidly. The other bird meanwhile was picking small stones which it would bring and drop into the hollow. By the evening of the fifth day the hollow was completely filled, and a plentiful supply of earth, small pieces of dung, and very small stones placed round its edge. On the morning of the eighth day the nest contained its full complement of two eggs and the bird commenced sitting. It ran off as I approached, leaving the eggs completely covered. I was watching it one day with glasses, when a donkey approached. It waited until the donkey was close to the nest, then stood up, faced it with wings outstretched and hissed. The donkey strolled away and the bird sat down again. Shortly after this a calf came along. It spotted the sitting bird, and with a mischievous look in its face walked straight up to it. The bird jumped off the nest and ran a short distance, pretending to be disabled, the calf following. In this way it led the calf some distance from its precious eggs. Suddenly it stood up, shook itself and ran back to the eggs, leaving the calf bewildered. I got a native to approach the nest, and it was quite evident that the bird did not trust a

human being. As soon as it spotted the native it stood up and, with legs wide apart over the eggs, commenced turning round rapidly, scratching the loose material from all sides over the eggs. To cover the eggs and run off was a matter of only a few seconds and was accomplished long before the native was anywhere near the nest. After the native went away the bird returned to its eggs. It first uncovered them, scratching the material away with its feet. It then sat on them, and for some time was employed re-arranging the loose stuff round the hollow with its beak. The eggs are always half buried in the loose material of the nest, so that a few rapid kicks are sufficient to cover them completely over. I once found a nest containing two young birds a few hours old, and these the old birds had covered, leaving only the heads exposed.

I have never found a nest anywhere but in the vicinity of dams, generally about 50 to 100 yards from the water and never in shingle.

My records for inland nests are from August 29th to November 5th, with one nest in January. At the coast it apparently breeds much earlier, as there were a good many birds breeding on Bird Island when I visited it on July 10th. One nest found on that date contained eggs in an advanced stage of incubation. The clutch of eggs is invariably two. In shape they are usually pointed ovals, pyriform eggs being rare. The ground colour varies from a pale-creamy buff to a darkish-buff. This is thickly marked with streaks, short twisted lines and spots of very dark brown, evenly scattered over the whole shell. The underlying markings consist of small blotches of pale purple and are almost obsolete. The eggs of this species resemble those of *C. tricollaris* somewhat but are easily distinguished from them by the entire absence of zones and the greenish colour of the skin lining the shell.

The measurements in inches of seven clutches in my collection are as follows :—

Five clutches taken inland.—(1) 1·25 × ·87, 1·25 × ·89; (2) 1·2 × ·84, 1·15 × ·81; (3) 1·21 × ·85, 1·2 × ·89; (4) 1·2 × ·86, 1·25 × 87; (5) 1·29 × ·80, 1·27 × ·9.

Two clutches taken on Bird Island, Algoa Bay :—

(1) 1·3 × ·91, 1·3 × ·9. (2) 1·3 × ·9, 1·35 × ·9.

It will be noticed that the Bird Island eggs are larger than the inland eggs. The eggs of clutch 5 of the inland eggs are abnormally large and the only eggs of this size I have ever taken. No others have measured more than 1·25.

A NEST OF THE AMERICAN PEREGRINE FALCON.

By H. Arden Edwards, C.O.C., M.C.O.

As an introduction I wish to say that while the Duck Hawk, *Falco peregrinus anatum*, as it is commonly called throughout the United States, is nowhere common, it is even less so in Southern California, so that collecting the eggs of this species is of sufficient rarity to thrill even the most blasé of oologists.

Of the two sets of this noble species collected by me this past season, the second was of unusual interest, both having regard to the late nesting date, 23rd April, and to the site chosen for the nest, which was among the wild semi-desert country of the San Antonio Mountains, some 120 miles from the coast where, in Southern California, these birds are usually found. Not always do they nest upon the sea cliffs proper, except upon the coastal islands of California and Mexico, but are quite frequently found to have made their eyrie in some wild cañon contiguous to the ocean.

The few sets taken are usually in one of the above-mentioned localities, so it was with considerable surprise that I perused a hastily written note from my friend and fellow-collector, Mr. Pierce, informing me that a friend and he had seen one of these birds in a lonely cañon on the desert slope of the Coast Range. This was just at dusk, and darkness prevented an extended search for the nesting site, but as the bird was later joined by its mate and both flew up and down the cañon screaming vociferously, it seemed a certainty that they were nesting or about to nest there.

In company with my friend I had worked over this very wild and extremely rugged section for a number of years, and had found the Prairie Falcon, *Falco mexicanus*, nesting among the rocky limestone cliffs in company with the American Raven, but never once had we seen so much as a glimpse of a Duck Hawk. Trusting fully in my friend's information, however, the following week-end I packed my kit and joined him at his home, where we loaded his car and were soon started on our way.

If space permitted I should like to describe this beautiful Land of the Golden West, as it unrolled itself before us that memorable day. The purple ranges of the Sierra Madres Mountains, with snow-capped Mt. San Antonio rearing its lofty head far above the lesser peaks, formed a barrier between the fertile valleys of the coast and the desert wastes of the Mojave Desert, and it was the

easternmost point of these pine-clad mountains which we had to round to get to our objective point. Mile after mile the groves of golden oranges vied in colour with the more golden poppies, those magnificent flowers which the Spaniards and Mexicans call "Capa de Oro," or literally "Mantle of Gold." Fields and groves were alive with various small birds, but we had eyes for only one thing and that was the distant pass between the ranges where we knew the road drew near to our desire.

All things come to an end sooner or later, and so this ride. We drew away from the main travelled road and took the motor as far in towards the hill as we were able, and parked it under the scanty shade of a small sycamore tree. From here it was a case of footing it, and this meant some real work as we were carrying over three hundred feet of rope and chain. The Dotted Cañon Wrens were calling on all sides, and various Sparrows, Bush-tits and Towhees were in evidence as we progressed. Ahead of us through a cut in the low-lying foot-hills we could catch glimpses of a mighty escarpment of white granite and limestone. These immense cliffs stood out in bold relief against the back slopes of the mountains behind, and looked like the creations of some past dim and distant prehistoric age. Grease wood and grey sage brush clothed the slopes at the base, interspersed here and there with the mahogany coloured branches of the manzanita and mountain holly. Closer approach showed the barren rocks to be figured here and there with patterns of grey and yellow lichens; a crimson blossom of the Indian paint-brush peeped from a crevice on the shaded side of a cliff, but beside this all was bare, hard uncompromising rock, with scarcely a foothold anywhere for man or beast. Now a patch of rubbish and sticks, high up in a pot-hole, proclaims this a feudal stronghold of the Ravens. Yes, there sails one of these sombre birds against the sky. Now he dips down behind the nearest cliff and I wait for the sharp "chee," "hee," "hee" of the Prairie Falcon, for these two are always at odds, but instead here comes a dark, blue-black bird, a living bullet, the quick wing beats almost defying the eye to follow them and with such a screaming that all my doubts were dissipated at once: it was a Duck Hawk.

My friend had worked his way farther ahead, our plan being for one man to watch the cliffs, while the other climbed a bit, and *vice versa*, for in this way we would be able to spot the nest as

the bird left it. Soon my companion shouted to me that he had the nest located, and I scrambled on and up to him. Most collectors will understand my feelings when I say they were of joy and fear. Joy that the nest was really there, and fear that it was unapproachable, for the cliff in front of me towered a sheer four hundred feet above me and the cranny from which the bird had flown was midway, with a sheer wall above and below. Difficult, almost impossible, as our task appeared, we gathered our traps and started to work our way round the cliffs and get to the top by some means or other. Before we left we saw a Barn Owl fly across the face of the cliff, making for a small cleft below the Falcon's nest. It had nearly gained the entrance when, with a rush of wings which was clearly audible to us where we stood, one of the Falcons dropped from out of the sky like a flash of lightning and all but knocked the bird of wisdom end over end. I think this was just pure spite on our account for, under ordinary circumstances, I think these birds do not particularly bother their immediate neighbours. This I know to be true of the Prairie Falcon.

When we gained the top of the ridge, of which these cliffs formed the face, we were amply repaid for the climb by the wonderful panorama of mountains and desert country stretched out before us. A stiff wind was blowing which was almost strong enough, on the exposed top of the cliff, to carry us off our feet. A bit of reconnoitring showed us there was only one half way practicable as a means of approach. Growing in a cleft some twenty feet back from the edge were several stunted and bushy trees, and we attached our rope securely to these and I approached the edge and looked over. I said the cliff was four hundred feet high but, looking down, it seemed more than four times that. There seemed a bare possibility that I could reach a part of the cleft to the right of me when I got to the level of the nest, but the main difficulty lay in the fact that the only place where the ropes could be let down was too far to one side.

To make a long story short, I tied the end of the rope to my belt and, throwing the hand line down, I put my face to the wall and began the descent. We had with us one span of braided cotton rope, one-half inch thick, and a hundred and ten feet long, another of the same, one hundred and twenty feet long and, in addition, fifty feet of half-inch wire chain. I had put the latter at the bottom as it is the easiest to climb on. It needed the 230 feet to reach

the narrow cleft above the nest. It needed an acrobatic feat to swing myself over far enough to get my outstretched foot on the ledge and so pull myself over, and before doing this I rested myself for some minutes, keeping my eyes and my mind off the space below. Then I had to fasten the chain to a point of the rock and cast loose from my safety line. I fastened the end of the chain to my belt and, after a deep breath, threw it over the ledge and slid down it. I swung free in the air but maintained my position by keeping one foot against the wall as best I could. One has not time to be frightened on these occasions—that comes after—but I was concerned about the swift swoops of the female falcon as she dashed at my head. I was glad that I had my heavy sombrero on, but I forgot bird, hat, cliff and all when, at the uttermost link of my chain, I was able to barely touch the prize: three wonderful eggs which lay on their bed of sandy rock in a small pot-hole in a sloping hollow below the edge. I lifted the eggs very carefully and packed them for the ascent. I took one quick glance below me before starting back up the chain, and the memory of that sight haunts me yet. When I had regained the edge I sat and rested for awhile and noted the actions of the birds, and saw where they had eaten many a meal, for a small shrub growing in a cranny was covered with the feathers of small birds, chiefly those of the Red-shafted Flicker, Mountain Partridge, and others I could not identify for certain. I gained the top again without further incident, and now in my cabinet these three eggs lie, mementoes of a great climb.

BIRD LIFE BY LAKE ONTARIO.

By Rev. C. J. Young, B.A., A.O.U.

I have lived for many years in Eastern Ontario; up to 1914 in the village of Madoc, Hastings County, since at Brighton in the adjoining county, close to the shore of Lake Ontario. Since childhood I have watched the birds, and year by year have taken an interest in them and their surroundings. Now through advancing years I cannot follow them as I used to, but am still anxious as before to watch their returning flight each spring, and note their departure as the summer closes.

Most of the birds we meet with in this locality are met with

in Western Ontario, and New York State. Only occasionally do we come across some straggler. Of these I will first mention the Orange-crowned Warbler, a rare bird, whose breeding has not been previously recorded in this district. Some of my friends seem sceptical about this, but having watched the birds more persistently and for a longer period than most of them, I can certify the presence of this rare species.

Near the road leading from Belleville through Madoc to North Hastings lies a cedar and tamarac swamp, close beside a height of land a thousand feet above the sea level. This is a unique spot for warblers; its centre being the dried or drained bed of a small lake, grown up around its edges with cedar, black spruce, and tamarac, and surrounded by a hardwood bush growing amongst the granite rocks. I used to visit this spot several times each spring, and noted the Nashville Warbler as quite common; a pair or two of the Orange-crowned Warbler seen in the year 1907, a cold and backward season; and, in 1908, the Bay-breasted Warbler migrating as late as the 10th June; the Mourning, Chestnut-sided, Black-throated Blue Warbler, and several others.

Besides the birds, the swamp is an interesting place for the botanist, for some rare orchids flourish there. I found four of the five varieties of the Ontario *cypripediums*, including the "Ramshead," which few have found growing in its native habitat, among the tamaracs; also the Coral Root (*Corallariza striata*); *Orchis rotundifolia*; several *Habenarias*; and others.

To return to the Orange-crowned Warbler. In 1907, on the 2nd of June, I was walking through the small tamaracs. The ground there is damp and springy, with hummocks of moss and marsh fern, and in places bunches of the *Osmunda*, its new shoots just showing. A small bird started up near me, and threshed its way, mouse-like, amongst the undergrowth of ferns and moss. After a brief search I found the nest well concealed in the side of one of these hummocks. It contained four eggs, and incubation had commenced. These eggs are quite distinguishable from those of the Nashville Warbler. They are creamy white, with a wreath of faint reddish specks around the larger end. The rest of the egg is almost unmarked and is slightly larger than that of the Nashville Warbler, though the nests of both birds have a similar appearance. After a while the bird I flushed from its nest was joined by its mate, and they hopped about in the tamaracs. In spite of mosquitoes

I watched these birds for nearly two hours so as to make sure of the species.

The following year I visited the swamp at an earlier date—the 25th May. Within a few feet of the place where I had found the nest the previous season, I flushed a bird that proved to be of the same species, possibly one of the same pair, or maybe their descendant. There was a nest in the same situation, the only difference being that this nest, besides the dried grass, contained some rabbit's fur for its lining, and there were five instead of four eggs as on the previous occasion, at this date quite fresh. I found another nest at the end of May with four eggs, which I fancied belonged to the same species, but unfortunately I could not get a good view of the bird. Since the year 1913, however, I have neither seen nor found a nest of this warbler; nor, for that matter, of any other warbler within the limits of the swamp. They seem to have abandoned it, or perchance have died out in the general diminution of many of our Canadian birds. In the year 1914 there was not a warbler of any kind to be seen, and when, in 1919, in company with Mr. E. Beaupre, of Kingston—an ardent student of bird life—I again visited the swamp, with the exception of a Mourning Warbler, we failed to see any others.

* * * * *

The Nashville Warbler breeds commonly in this swamp. In the year 1907 I found no less than four nests, not far from each other. I had with me a small net—a kind of butterfly net—with which to capture and have one of these birds in hand. I succeeded in doing so, for it was not a difficult matter, and this device left no possible doubt of the species. The bright yellow underparts, along with the ashy-coloured head, at once identified the species. The bird thus caught acted strangely; I shall never forget the circumstance. When I released her she flew round and finally alighted upon my shoulder. I held out my hand and presently she flew on to it and remained there for a few seconds, then she perched upon my head, ultimately flying away into a near-by shrub. The last time I visited the swamp in 1919 all we found was the nest of a Blue Jay with well-fledged young.

Until recent years the Prairie Warbler had not been detected as far east as Toronto. It is due to Mr. W. E. Saunders, of London, Ontario, that a knowledge of its range has been extended. In the year 1918, along with him and Mr. E. Beaupre, I visited the

Georgian Bay of Lake Huron, and at Snug Island, where we stayed, we saw several specimens and heard the cock bird singing. To clear up all doubt one of these birds was secured. Mr. Saunders is certain that they breed in South-West Ontario, but those we saw appeared to be migrating.

The Orchard Oriole is a common bird in the fruit belt of the Niagara Peninsula, but I had not heard of it east of Toronto until we observed it twice in the vicinity of Trenton, at the head of the Bay of Quinte, frequenting an apple orchard, where a pair commenced nesting in an apple-tree, 15th of June, 1915, but did not succeed in raising a brood. Wilson's Phalarope has been shot several times at Weller's Bay, Lake Ontario, about five miles from Trenton. Flocks of sandpipers and waders congregate there in late summer and early fall, though I am sorry to say in decreasing numbers.

The Carolina Wren has only been recorded a few times from Western Ontario. This bird has been seen at Point Pelee, Lake Erie ; and a pair of them at St. Thomas, where they remained in a ravine close to the city. The male was frequently heard singing morning and evening. On the 9th of October, 1918, I chanced to walk to a little swamp and shrubbery below the mill-pond at Brighton, and there heard a strange note. Presently I sighted the author of it, which happened to be a Carolina Wren. As chance would have it I had with me my field-glasses, and so got a good view of this bird. I at once identified it by the pronounced sharp note ; more particularly by the white line over the eye—this mark being very conspicuous. Its creamy white throat and breast further impressed me, and though heretofore I had not been familiar with this bird, such a rarity in our locality, there was no mistaking its characteristic wren-like motions as it hopped about amid a rank growth of wild asters and cat-tails, and finally made off into an alder bush, keeping up its sharp "chick chick" and jerking its tail with every movement of its body. Though I visited the same spot during the next two days I caught no further glimpse of the bird. But I believe the above incident to be the most eastern record in Canada for this species.

The Short-billed Marsh Wren is another bird that has rarely been recorded in Eastern Ontario. A pair were met with and one captured at Mere Bleu, a large swampy tract near Ottawa, in June, 1897. It has also been seen near Lancaster, Ontario, at the extreme east end of the province. But I have not met with

any other records except those of Mr. C. W. Nash from near Toronto. I believe it is everywhere a rare bird, though of somewhat wide distribution. In July, 1912, in company with Mr. W. E. Saunders, I saw several of these birds in a damp meadow near London, Ontario. Mr. Saunders had previously observed them there, and I had the pleasure of visiting the place with him. However, we found no signs of any nest, though the birds were undoubtedly breeding. Since that time I have not seen the species until the year 1919, coming across it most unexpectedly. In company with Mr. W. H. Lunn, of Trenton, this event happened. We were trying to locate the Field Plover in the large pastures of the Mohawk Reserve, township of Tyendinaga, adjacent to the Bay of Quinte. It had bred there two years before. Whilst trying to find the Field Plover again, we saw the Short-billed Marsh Wren. The location was a dry corner of a hay meadow overgrown with coarse quack grass, with sweet clover just coming up, and a number of last year's dry stalks scattered about. Here we found the wren hopping about in these stalks. We knew no House Wren could be in such a place and were certain it was not the Long-billed Marsh Wren. So we were both satisfied of its identity, although the bird was quite new to my companion and almost so to myself. We were much interested, yet in spite of diligent search we failed to find a nest on this occasion. I again visited the place on the 16th, 23rd and 30th June, and 12th July. On the first of these dates, the pair of birds were hopping about in the sweet clover stalks, and repeatedly dropping into the long grass. After searching for some time, I found a nest commenced, but nothing further. The 23rd June brought me better success, for I found three nests built in the long grass, from four to six inches above the ground. Each pair of birds builds several nests. In this case there was but one pair of birds, so that the nests belonged to them. Only one of these nests contained eggs, two in number, white in colour, and deserted. The contents were dried up and the eggs more or less broken. On the 30th June the birds were still there, but beyond finding an empty nest I saw nothing further. On the 12th of July no signs of the birds appeared. It is to be hoped they hatched in the vicinity and departed to the adjoining marsh with their brood.

* * * * *

Some other species, fast disappearing, that I am able to report from this neighbourhood are the Hudsonian Godwit, which was

shot in November, 1918, near Presqu'île Point, Lake Ontario. This bird I saw shortly after it was shot, and at once recognised the species from its resemblance to the European Black-tailed Godwit. It is now extremely rare and, like the Esquimaux Curlew, in danger of becoming altogether extinct. Other records for the east of Lake Ontario are one shot by Mr. E. Beaupre, of Kingston, October, 1895, and another in 1898.

The Rough-winged Swallow is a bird that is extending its range eastwards. There are but few records of its appearance east of Toronto, although recently it has been met with as far as Ottawa. I first noticed two pairs breeding in a sandy bank at Weller's Bay in the summer of 1916. The following year I found a pair breeding in an abandoned Kingfisher's hole in the bank of the creek at Brighton. The habits of this bird are dissimilar to those of the Sand Swallow. They mostly keep in pairs, and here at any rate they are not gregarious. The nest is lined not with feathers, but with dried grass, dead as well as green leaves, and small twigs are present. In the nest I examined in 1917 was a dead bird which I forwarded to Mr. Saunders, knowing he was perfectly familiar with the species. The indentification was complete. Since the above date I have failed to identify any Rough-winged Swallows in this neighbourhood ; and for that matter even the Sand Swallows have been scarcer than formerly.

OOLOGICAL RESEARCH.

By The Editor.

We are so familiar with all the facts and data that have been recorded about the common, and even the rare, birds of our own countryside that we take them for granted. To those oologists, however, who find themselves in a country of which the oology is a closed book, a very wide field of research is open. Random notes are of little use, and in order to aid and direct attention to the points that should be noted we have thought it worth while to prepare a schedule of these points in such a form as to be readily available for the use of working oologists everywhere. Our printers will have a number of these schedules printed on good quality paper, and they will be available for the use of our readers at the prices printed on the inside of the back cover. We do not propose to

print too many as there can be no doubt but that improvements will be made in the form from time to time. We would like to say at the start that we do not consider the scope of the form nearly complete, but further information can always be noted on the back of the sheets, or follow-on sheets can be used. The forms will be punched for filing in a foolscap loose-leaf binding case, and the prices of the binding cases will also be found on the inside of the back cover. We would add that the form is copyright.

Works on oology are far too few and frequently omit mention of the chief points in regard to some of the most interesting species. Speaking for ourselves, we shall be almost as pleased to receive one of these forms fully, or partially, filled up with regard to species in which we are particularly interested, as to receive a set of the eggs with data. The system opens up a new era in nature study—the collection of oological notes. Had such a system existed in the past, very much valuable autographic material would now be available to the present generation. Oologists who had ample opportunity to record all there was to record about a few rare species, might have been induced to set them down. They could have waited till they had enough for publication or, if they decided not to publish them, they could have handed them over to some institution or society of standing so that they should not be lost.

It is suggested that all sheets should be filled in in the handwriting of the investigator, who should also sign and date them, but the date might be altered from time to time, thus : " revised, or added to, 27th June, 1923." In making a reference by date, the name of the month should always be given, as in the U.S.A. they put things differently. In the States, 5/6, 1921, very often means not 5th June, but 6th May. Nothing should be left ambiguous, and if a matter is recorded that the investigator has not himself seen or observed, he should state whence comes the information. Many old errors in natural history were passed on from one to another without the last man taking the trouble to investigate for himself. In the future, let us know who started them.

Mr. Chance's wonderful investigations into the life-history of the Cuckoo have shown what a tissue of fables did duty for recorded fact and, if we were all to start filling in these forms about the birds that we have round us, we should soon see how little we knew from our own observation and to what an extent we relied upon facts recorded by others.

OOLOGICAL RESEARCH FORM.

Original notes and observations made by .....
of .....
regarding the .....
.....
Locality or localities .....
.....
Is it resident, a summer visitor or a winter visitor ? .....
.....
Is it gregarious ? ..... How abundant ? .....
Type of country it frequents.....Altitude .....
Its chief food.....
How many nests have come under your observation and form the basis of information now given ? .....
.....
Do they rear 2 broods in a season ? ..... If so, on what evidence ? .....
Breeding period : Earliest date of laying .....
Latest date of laying ..... Average date of laying.....
Usual site of nest .....
If above ground—height.....
Description of nest :—
Shape .....
Materials used.....
External diameter.....inches. Internal diameter.....inches.
Depth of cup, if any,.....inches. Diameter of entrance, if any, ...inches.
Most usual number of eggs in a clutch.....
Maximum number..... Minimum number.....
At what intervals does the bird lay ?.....hours.
Eggs :—
Average dimensions* of eggs = ... × .....
My smallest egg is ..... × ..... and my largest ..... × .....
Shape.....Texture.....Weight.....
Colour (describe, if possible, by comparison with some other well-known egg, if it resembles any other).
.....
.....

Signature .....
Date completed .....
or date of last observation recorded herein.

* Dimensions of eggs should be in millimetres wherever possible.

This form is issued by the *Oologists' Record*, and published by Harrison and Sons, Ltd., 45, St. Martin's Lane, London, W.C. 2.

NOTE.—It is impossible to show here the space provided for the various items. The forms will be foolscap in size and spaced out to the best advantage.

SOME NOTES ON EUROPEAN AND AFRICAN VULTURES.

By Charles B. Horsbrugh.

To many people the word "vulture" conveys the idea of a huge carrion-feeding loathsome bird, unworthy of close study. Yet there are many interesting details to be discovered concerning it. Those who condemn these valuable scavengers are apt to ignore the useful services they perform in the rapid clearance of rotting animal flesh. It is a wise provision of Nature which permits many species of birds, as well as of animals and insects, to carry out the duties of undertakers, consequently mitigating the spread of noxious diseases, which would undoubtedly increase were carrion and rubbish not so disposed of. This fact is nowadays becoming more generally recognised, and many countries have legislated for the protection of such scavengers—particularly the various species of vultures and their relations—the larger and even smaller eagles and hawks.

The examination of a vulture's nest and the possession of an egg for scientific purposes, if possible secured by myself, had long been one of my cherished desires, which was fulfilled during a residence of over five years in South Africa. I visited many out-of-the-way places in various parts of that country, where human habitations are rare, and succeeded in obtaining a single egg of two varieties of vulture.

The Common or Kolb's Vulture (*Gyps kolbi*) is by no means scarce in South Africa and may be observed, more usually in flight, any day and at any season of the year, but its nest is generally built in inaccessible situations such as difficult precipices, or high, very thorny and often ant-haunted trees.

The chance I had long been awaiting occurred unexpectedly whilst driving over the veldt on a fine June afternoon in 1906, changing from one shooting ground to another, some thirty odd miles outside Potchefstroom. Three of us in a Cape cart saw at a considerable distance what we at once suspected were vultures, nests crowning the upper branches of some low, but fairly substantial, mimosa trees. These latter consisted of a small group, scattered about within a few yards of one another on slightly elevated ground. The presence of some half-dozen vultures, circling high above the trees, added certainty to our suspicions. On lessening our distance a few others, perched close to their nests, were also observed. We found these nests numbered about five bulky, evil smelling structures.

The conglomeration of sticks of different sizes and small twigs rested securely amongst the flat-topped branches, forming a nest not too plentifully lined with coarse dry grass, with a cast feather or two, which the builders evidently deemed sufficiently comfortable for nidification purposes. These details I discovered after slowly and painfully climbing the lowest tree, all the vultures meanwhile being mere specks in the sky or on the far horizon. The nest contained no prize, being unready for the dull, dirty white egg laid by this species. My brother, encouraging my progress from below, strolled across to another tree, the nest in which seemed to contain what he took to be a well-fledged youngster, and was rather astonished when an adult bird rose reluctantly and suddenly hurled itself with much flapping of huge wings into the air. A charge of buckshot from his 12-bore speedily ended its career, and I straightway emphatically remarked that I had no hankering for any work regarding the removal and preservation of its skin. The mules, scenting the presence of the bird near the Cape cart, towards which we dragged it, almost stampeded when the body, enveloped in a sack, was placed therein. On our return to Potchefstroom, the vulture was at once despatched by train to the Director of the Pretoria Museum, together with the hope that the gift might prove of value to that Institution. His delight on emptying the sack was keen, as this specimen was the first he had ever seen, and he at once wrote to inform us it was the White-backed Vulture (*Pseudogyps africanus*), a sub-species of the Kolb's Vulture lately determined by Mr. W. L. Sclater, at that time Director of the Cape Town Museum, whose authority on South African ornithology and mammalia is well known and widely acknowledged. The principal difference between the two birds exists in the number of tail-feathers, which in the former numbers twelve, whereas the latter possesses fourteen, and various other points may be observed which justify the constitution of a valid sub-species.

The apparent reluctance of this bird to quit the nest was due to the presence of an egg, which, after casting lots as to who should secure it, fell to the third member of our party. This was successfully secured, but it was not a very easy undertaking, owing to the crowded growth of the upper branches, though the use of a small hand-axe eased matters considerably. After carefully packing the egg, and when about to proceed on our way, we viewed another nest

far away across the open veldt, the tree containing it standing on the edge of some sparsely growing low scrub. This tree offered no difficulty in climbing, a slow "leg up" being sufficient—as it was an ancient and stunted one, having few branches to impede my ascent.

The nest was similar to those previously examined, though not quite so bulky, and contained a single white egg, but this without doubt belonged to the common Kolb's Vulture. Why this particular pair of birds chose such an extraordinarily low situation I find it hard to conceive, and can but presume that they were young and inexperienced in site-selecting.

The larger raptores, as remarked above, usually evince great care as to the safety of their nesting-sites, and several members of this group of birds are gregarious in their habits. This is also the case with certain of the lesser members, which usually, like their larger relatives, nest within the circumscribed area of a precipice, ruined building or group of kopjes. The remainder of this family prefer the solitude of mountain, plain, marsh or forest, and hustle off avian intruders, such as crows, etc., from within a considerable distance of their nesting quarters. Many birds, including the above species, frequently show a decided preference for certain localities or rather nesting sites which, after being plundered or disturbed, are deserted for safer ones, although they may return should persecution cease. A similar colony of Common Vultures to that which I have already described existed, and may perhaps still continue to do so, within no great distance from Pretoria, and one enormous nest with the bough containing it is exhibited in the Museum there, together with its tenant—a well-fledged young vulture almost ready to fly.

Natives find no great difficulty in capturing them alive should any carrion, in the shape of a dead mule or ox, etc., be lying about not too close to a kraal or village. These great birds, so ungainly-looking on the ground, will unsuspectingly place their feet within the noose of a stout cord cunningly fixed close to, or even inside, the carcase.

They may be captured, also, after a heavy gorge of offal, when many find it impossible to rise from the earth.

In captivity they do well, but are undoubtedly more interesting to the ordinary bird-observer or naturalist to observe in a wild state than as savage pets. Anyone who carefully notes the flight of a vulture, as it sails round in wide circles high in the air, will observe that the first two primaries of each wing act slightly and indepen-

dently of the remainder, and it is possible that the attachment of these feathers to the bone permits of their use as a brake against the wind. It appears to me that these birds, by elevation of these feathers above the plane of the rest of the primaries, avoid too much pressure against the wind, which might otherwise upset their balance.

My surmise may be open to argument, but I do not know how otherwise to account for this peculiarity. I have many times watched the soaring and also straight flight of eagles, buzzards, ravens and other large birds, and frequently seen the slight but distinctly upward curve of *all* the main primaries, but none of the above species betrayed the independent action of two first primaries which the vulture possesses.

The South African vultures lay their eggs in late May or early June, which is of course winter-time in that part of the continent, and after a period of about thirty days' incubation the young are hatched. Both parents attend the wants of their offspring, which remains under their care for several weeks before flying is attempted. It is a common sight to see numbers of vultures tearing up and hastily disposing of carrion, and this disgusting spectacle has presented itself to me many times. They squabble and fight over the remains with beak and wing, emitting a curious hissing sound, and a noise which is strangely similar to the yapping of a small puppy. Suddenly in the midst of an orgie all noise and scufflings cease, as a huge Black Vulture (*Otogyps auricularis*) descends towards the struggling group, and, until he has completed his fill, the others remain almost silent and motionless spectators only.

In the Island of Cyprus, where I have lately lived, I found two types of vultures; also a third which, until my arrival, had been unrecorded. As in South Africa the Eared Vulture was accustomed to spoil the feasts of its relatives, the Kolb's, so in Cyprus, did the Black Vulture (*Vultur monachus*) cause the Common or Griffon Vulture (*Gyps fulvus*) to "come to attention" when any spoil fell to the latter.

An animal about to die, or recently defunct, is usually discovered in the first instance by the ravens, crows and magpies, to be shortly followed by the larger scavengers. These latter quickly disperse the lesser robbers, which, when opportunity offers, actively dodge round about snatching what morsels they can. I found that the vultures did not come immediately to fresh carcases, as these, provided they are untouched by the pariah dogs, are hard to tear up.

A day or two's exposure in the sun causes the body to become soft, and after receiving attention from a flock of hungry vultures very little remains, except well-picked bones, hoofs and other hard parts. I remember on one occasion, in the interior of the island, being much amused at the antics and pluck of a magpie, which persisted in hopping on to the broad back of a vulture and attempting to snatch pieces of flesh the creature was bolting with unseemly haste. No civilised person would readily destroy a vulture, except occasionally for scientific purposes, but natives in many countries find their long flight-feathers useful for a variety of purposes. Cypriote villagers utilise these feathers, dipped in water, for brushing off bees from their faces and hands, when collecting honey from the hives, and also play their guitars with the quill-shaft as a plectrum. West African natives, I believe, carry gold-dust within the interior of the quill, and others make use of vulture feathers in various and curious ways.

After leaving South Africa I did not meet with any vultures, although I travelled widely, until I visited Cyprus, where I was greatly interested to find the European species, but I did not discover any striking differences in their life-history between the birds of the two continents. The Common or Griffon Vulture exists in considerable numbers in the island, and the Black Vulture, although far less abundant, is not a rare species there. I often wondered how they secured sufficient food, as much of the carrion is consumed by the native dogs. On a certain day, about the middle of March, a party of friends took me with them to visit an ancient castle perched on one of the highest peaks of the northern range of mountains, which is named Buffavento (the wind defier), and informed me that there might be a chance of finding a Griffon's nest. After a few miles' ride on mules we came to the picturesque monastery of Chrisostomos, where we were most hospitably entertained by the newly arrived Abbot, who, however, was no naturalist and could give us no information about any birds, beyond the fact, which we already knew, that vultures frequented the height. Fortunately, we procured a guide, reputed to be one of the finest climbers in the district, and leaving our animals at the monastery, we shortly afterwards reached the highest ridge of the mountains. From this altitude, about 2,000 feet, a magnificent panorama spread itself before us. Far away to the north, across a glassy sea, we could just discern the Anatolian coast, with the snow-crowned summits of the Taurus

range well behind it. South, stretched the Messouria, a wide plain intersecting the island, whilst east and west the numerous spurs of the range on which we stood showed clear and distinct for many miles.

Our guide, having had our mission explained to him, left us admiring the wonders surrounding us and disappeared over a precipice near by, when, after half-an-hour's absence, he returned with a vulture's egg. This, he informed us, had been difficult to obtain and dissuaded me from accompanying him, as the climb could not be attempted in boots, his own being slung around his neck. It happened a year afterwards that I met this same man and made him take me to the vulture's eyrie from which he had got his egg and, except for a nasty bit of rock about 40 feet high, I found the climb a very simple one, but I attacked it from below.

The nest was composed of a few small twigs, also a single fir-branch with cone attached and lined with a little coarse grass. This latter we watched the birds bringing in, which they did with their feet only, on a previous occasion when we misjudged the date for the nest being ready for the egg. Lying quietly below the eyrie, we had a splendid opportunity to witness the behaviour of the vultures circling above the mountain and constantly descending with long vol-planes, bringing small quantities of nesting material. After depositing it in the nest they would stand close together and rub noses, or rather beaks, at the same time gurgling and chattering in a very weird manner.

I photographed a general view of the mountain, the eyrie lying within the huge cleft slightly to the right of the monastery below. I was lately shown two eggs of this vulture, taken in season 1913, from *one nest* on the same range of mountains, and did not doubt the accuracy of this statement. I have seen as many as three eggs from a nest of the White-tailed Eagle, *Haliaetus albicilla*, more than once, and am aware that many other species of birds often add to the number of eggs usually laid in a normal sitting. On another day, whilst in the same locality but a few miles further westwards, I had a close view of a Bearded Vulture or Lammergeier, *Ossifragus barbatus*, as it flew over a pass to a valley below, and was thus enabled to record an interesting species, new to the Ornithology of Cyprus. Although I subsequently searched for this bird in other likely parts of the island I did not succeed in finding it again, and I conclude this specimen must have returned to the Taurus mountains from whence it probably came. I hope I may meet with this

handsome vulture again in the wild state, as I have only had a fleeting view so far, and can add no original observations concerning it, but it is being rapidly exterminated by means of poison throughout Europe, and its African prototype is exceedingly scarce.

Having succeeded in my quest for a Griffon's nest, I next turned my attention towards finding that of its near relative, the Black Vulture, *Vultur monachus*, and during the month of early June, whilst travelling through numerous hills and valleys in the southern part of the island, I obtained another guide who took me to a nest of which he knew. This was built close to an asbestos mine in full working progress and placed in a pine-tree at about thirty-five feet from the ground and something like five thousand feet above sea level. Great numbers of the pine-trees on these mountains are flat-topped, due to the weight of snow during the winter months. Unfortunately, the egg had hatched, and the young one taken by some of the mine's employees, but its ultimate fate I was unable to discover.

Another nest we found within a mile of the first was also empty, but I fancy this had not lately been used. The egg of this species is often remarkably handsome, the white ground colour being hidden by minute and also heavy dullish red spots, or else heavily smudged by slatey or brownish blotches, and certain types bear a resemblance to the egg of the Bearded Vulture.

I possess a photograph of a mounted specimen of the former which well shows the great expanse of wing these birds have, and it was obtained by my friend, Mr. F. R. S. Baxendale, Commissioner of the Famagusta district, who, for the sum of half-a-crown, persuaded a Greek cook to undertake the disgusting and troublesone task of skinning it. The Neophron, or Egyptian Vulture *Neophron percnopterus*, is a smaller type than the above species, and differing in colour, which is white with black primaries. It has not yet been recorded from Cyprus, but I fully expect to hear of its presence there, as an accidental visitor—like the Bearded Vulture,—at any date.

I have seen many Neophrons at Aden and in Somaliland, but my time was too limited to permit of close and easy study. When in the latter country I found several bulky nests, situated in unclimbable trees and precipices, and I much regretted these circumstances prevented fuller investigations on my part.

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NYASALAND NOTES—II.

In the issue of this journal for December, 1921, I tried to give a general idea of how Nyasaland strikes the ornithological observer: the present notes, and those which I hope will follow, will deal with the nidification of particular species. The nomenclature used is that of Reichenow's "Birds of Africa." It would be more systematic to take the families in order as he gives them, but on reflection I recognised that my experiences of many groups, and those, too, coming at the head of the list, have been so limited as to be hardly worth recording, though I hope to fill up such *lacunae* later: on the other hand, ten months' residence near Blantyre has given me a very fair acquaintance with the nesting of the Passerines and other land-birds inhabiting the better-wooded parts of the Shiré Highlands. I begin, therefore, with some of these families at once: for to wait till knowledge is complete is a counsel of perfection, and in tropical Africa one does not lay personal plans far ahead. Priority is given in these notes to those families in respect to which, relatively, fortune has chiefly favoured me. The Editor, I feel sure, will raise no objection if I begin with the Fringillidae.

Family Fringillidae.

Of the true Finches, ten species have been recorded for the Protectorate. Two of these, *Poliospiza whytei* (Shell.) and *P. reichardi* (Rchw.), occur only on the Nyika plateau, which it has not been my good fortune to visit, but the other eight all breed in the Highlands.

Passer griseus (Vieill.).—The Grey-headed Sparrow, which closely resembles *P. domesticus* in general habits and in its chirping notes, is nowhere common. In neither Zomba nor Blantyre are there more than a few pairs, but it is not so rare on the Lake Nyasa stations, especially Karonga. I never saw any in the bush proper. On February 13th, 1921, I was staying with a planter at Mpimbi on

the Shiré River, and, noticing a pair chattering about the roof, I presently found the nest between the galvanized iron of the roof and the boards on which it rested. The nest was a lot of loose grass and feathers, out of which, with some difficulty, owing to the confined position, we extracted four beautifully fresh eggs. So far as my recollection serves, these are larger than Uganda specimens (*P. griseus ugandae*). An average one measures 22 mm. × 16 mm. Three have the ground colour obscured by a heavy uniform mottling of dark brown; the fourth, which is 17 mm. broad, is entirely different, showing a greenish-white ground with markings, chiefly longitudinal, of grey, lavender, and light brown.

The Nyasaland race of this Sparrow appears to be the typical *P. griseus griseus*.

Petronia superciliaris ([Hay] Blyth).—The Diamond Sparrow defeated me, so far as the taking of its eggs was concerned. The bird was rare at Zomba, but in the Masuku Woods which lie at the base of Nyambadwe, near Blantyre, it was very numerous, and its sharp call-note, sometimes double, sometimes triple, became a very familiar element in the waxing spring chorus of October. At that time of year everything seems to be nesting at once, and in a new country the excitement of a "general search" is apt to seize one to the exclusion of more concentrated and sustained efforts directed to one species. How, I ask, are you to watch indefinitely what seem to be a mated pair of Sparrows which refuse to move from their respective positions in the top of a tall bare tree, when at one moment *Eremomela flaviventris abdominalis* raises hopes of a type clutch by flitting past with obvious nest-material in her tiny bill, and at the next an Augur Buzzard sails screaming from the top of a wooded gully? Be the excuses good or bad, all I found of *Petronia* was a "building nest" on October 9th, and one with young a few weeks later. The former was in a small dead bough about 15 feet from the ground. I saw the birds at it a week before, but cut it down too soon. There was the pad of grass and feathers, but they had not laid, and if this pair built again I did not find the place. The second nest was in the main stem, at about the same height as the first. The parents were feeding the young, but I had to move nearly a hundred yards away before they would go to the nest. The entrance to this second nest was an accidental break in the wood: I think a barbet was responsible for the first. The country inhabited by this species is what would be called

in Australia open bushland. I never saw them in primeval forest or in very lightly timbered areas.

Serinus sharpei (Neum.).—Sharpe's Serin was observed at Zomba, Luchenza, and Blantyre. It is a bird of fairly open country, and you are most likely to meet with it in small plantations of conifers, such as the Mlanje cedar, about European homesteads. I could see no difference in appearance, song, or nidification between these birds and those of the Uganda and East African form *S. shelleyi* : but *S. sulphuratus* of the Cape is much larger and differs also in its nesting. The first nests I found in Nyasaland were two empty ones in low bushes in grassy country at Luchenza : like Uganda nests, they were loosely-built of rootlets and lined or rather padded with fids of raw cotton. This was on May 7th, and on the 30th of the same month I took a clutch of three fresh eggs in a small cypress near my house at Nyambadwe. The nest was at about 9 feet easily visible, and placed where a bough joined the main stem. On the evening of the day on which I took the eggs the nest had disappeared. Another clutch of two was found on August 13th. This nest was built near the end of an upward-projecting branch of a Mlanje cedar, at about 25 feet. This nest, outwardly composed as usual of rootlets, was lined with soft, dead, downy seedheads of some plant I did not recognise, with one piece of medicated cotton-wool from the house. I have never seen nests during the summer months, October—April, when most birds are breeding. An average egg measures 20 mm. × 13·5 mm. The ground colour is very pale green ; a few small roundish, dark brown, almost black, spots and freckles are disposed irregularly about the larger end. They are so much larger than eggs of *S. icterus*, and so unlike any other local bird's egg that there would be no difficulty in identifying them, even apart from the nest. I have never seen more than three eggs, which I think is the normal clutch.

Serinus icterus.—From Reichenow it would appear that the local race of the Mozambique Serin is *S. i. madaraszi*. It is plentifully distributed all over the Protectorate, inhabiting for preference open country with a good growth of small bushes. Natives often catch these birds to sell to Indians and others : they are excellent songsters. The Chinyanja name is Kansire, which is probably generic and applied to *S. sharpei* as well. I find that natives rarely distinguish between species of the same genus ; it is well also to remember that the European habit of needless inquiry

into the names of things which are not obviously good to eat, bores Africans almost to tears, and leads to their saying the first name that comes into their heads. I well remember the surprise of a man, who gave me as the name of a kite what I knew to be the proper appellation of *Neophron monachus*, when I corrected him. I am sure he thought it was not playing the game. That by the way: *revenons à nos sérins*. I have taken perhaps half a dozen clutches. The nests are usually built in a slender fork of a small shrub near the extremity of a bough and well hidden by leaves, at not more than five or six feet from the ground; they are compactly made of plant stems with generally some cocoon binding, and look much neater than those of *S. sharpei*. The lining is always fine grass or shredded vegetable fibres; I have never seen feathers or hair. Three is here the normal clutch: in Uganda, I found four on several occasions, but that was the northern form, *S. i. barbatus*. The eggs are darker green in ground colour than those of *S. sharpei*, and much more profusely spotted, though the spots are smaller. There are usually present sub-surface markings also, and quite frequently the distribution takes the form of a regular cap, less often that of a ring. 16½ mm. × 12½ mm. are average measurements. Dates I have noted are April 25th, May 7th, December 26th and 28th. They are late breeders: I do not remember ever finding eggs before Christmas; and they do not finish before the rains are well over in May.

Spinus citrinelloides (Rüpp.).—The Black-faced Siskin, in the form *S. c. hypostictus* (Rchw.), is not at all uncommon on the higher levels, particularly on Zomba Mountain. One is likely to confuse this bird at first with the Mozambique Serin, but the dusky face is soon made out as a distinguishing mark, and if the bird is flying away it may be noted that the rump of this species is much duller than the bright patch of yellow displayed by the Serin. The note of the Siskin is entirely different from the Serin's song, being a clear low whistle of three or four notes. This is often heard about Zomba township in January and February, which I have no doubt is the breeding season, though so far I have not found a nest. Eggs shown me in 1921 were almost spotless pale green and rather larger than the Serins', and were said to have been taken from a nest built in an ear of maize on a tall standing stalk.

Emberiza major (Cab.).—The Greater Bunting inhabits scrubby country at about 3,000–4,000 feet and spends a good deal of its

time on the ground, where I at first sought diligently for its nest. This bird, though larger, has a strong general likeness to the Golden-breasted Bunting, and one must be close at hand to distinguish the single white superciliary stripe of the Greater Bunting from the double streaks of the smaller bird. The call, I find I have recorded as a "pleasant low trill ending on a rather higher note." My first nest was on the side of Zomba Mountain, on November 14th, 1920. I blundered accidentally on the nest, on which the ♀ was sitting. It was in a small stunted tree about 8 feet high, with a few leaves about the bottom and top in tufts, one of a belt of similar dwarf trees and scrub, interspersed with rocks, sloping to the south: and the nest-tree was 30 yards from the high bank of a stream. Exteriorly it measured 3½ inches across, and was in form a deep cup (nearly 2 inches). It was built outwardly of dead grasses (the outermost ones being whole lengths) and strips of grass sheathing: there was a distinct inner lining of a much finer, yellower grass (the outer being grey). The nest was at 5½ feet from the ground and looked very like a large rough nest of *Serinus icterus*. The three eggs (a selected one measures 20½ mm. × 15 mm.) are typical and very beautiful examples of those of the genus Emberiza. They are of a light-green ground colour, with a ring of greyish-lilac subsurface markings on which are superimposed scrawls of umber and blackish-brown. The cap is free from markings, but there are isolated marks towards the smaller end away from the zone. Subsequent experience proved that in all respects this nest and eggs were normal, though I never afterwards took quite such a beautiful clutch. The next season (1921) I took, at Blantyre, where the birds were more numerous, six sets, three of three and three of two. Two of these sets were of a totally different type of marking, and had I not seen the bird building the nest from which I took one of them, I should never have believed them to be Buntings' eggs. One of these abnormal sets (of two) is clouded equally all over with a very light brownish-grey mottling, without scrawls or other marks; these are small eggs, measuring 20 mm. × 14½ mm. (I had taken previously a similar set of three, too hard-set to blow.) The other set (of three), while exhibiting the same cloudy ground, shows some superimposed darker spots but no scrawls. The eggs of this set are large, measuring 22 mm. × 16½ mm. Almost all nests were within reach, the highest being at about 11 feet. Dates of the sets now in my collection are 6th, 14th, and 28th November,

and 6th, 8th, 11th, and 15th December: this period coinciding with that of the advanced growth of new leaves on the scrub after the fires had passed through it. It will be seen that these birds begin nesting later than *E. flaviventris*. Three is clearly the normal clutch.

Emberiza flaviventris (Steph.).—The Golden-breasted Bunting is distinctly a commoner bird than its larger congener, and inhabits the same class of scrubby country, but I have seen it at lower levels than the Greater Bunting is ever found at, particularly at the foot of Zomba Mountain, which is well below 3,000 feet. The bright colours of both these Buntings render them very conspicuous when the earth is blackened from the "fires of spring," and at that time there is no more pleasing sight in the Masuku Woods than this really beautiful little bird, as it picks about on a charred patch of soil or flies up at one's approach to a low branch of which the extremities are bursting into shoots of red and green. I doubt whether there is any migration, even local, of this species, and it is probably the absence of cover and the fact that they are pairing that brings them so much in evidence in early October. Dates of sets in my collection, usually of the normal three eggs, are:—October 26th and 28th, November 3rd and 7th, December 5th, 9th and 12th, and January 13th. The last-mentioned was the first nest I found. A lad from Rhodesia was spending his school holidays in Zomba, and as we were exploring together an old Ceará plantation for Sunbirds' nests I noticed what seemed like the very ragged remains of an old Weaver-finch's nest, quite exposed in a leafless fork at about 14 feet from the ground. I should not have given it any further thought, but the boy insisted on climbing to it, and to my amazement came down with a pair of very obvious Bunting's eggs. We waited a long time, but no bird came near the nest, and at last we left without being sure of what they were. However, this wood was full of Golden-breasted Buntings, and such little doubts as I had of the identity of the eggs were dispelled in the following spring, when I found a number of nests near Blantyre. The nest is smaller than that of *E. major* and of darker-coloured materials. It is a frail, loose cup of dead grasses or fine twigs, with many projecting ends, and is lined either with rootlets or, more commonly, ox-hair. The usual site is at about 6 feet from the ground, in a fork of a particular kind of straggly shrub which grows among the Masuku trees. Nests found in October and early

November, are quite exposed, but later I found them better hidden among tufts of leaves, and at greater heights. One or two were at nearly 20 feet. Nineteen eggs in my collection exhibit very little difference in type. They are of a lighter green ground colour than those of *E. major*. All exhibit near the larger end a well-defined zone of almost black hieroglyphic markings above greyish sub-surface ones, and on many there are rounded black spots as well. The small end is freer of markings than the corresponding part in eggs of the Greater Bunting. An egg, selected at random, measures 19½ mm. × 14 mm., but the eggs appear, in comparison with those of *E. major*, smaller than these measurements suggest, and there is no likelihood of confusion between them.

Fringillaria tahapisi (A. Sm.).—The African Rock Bunting is plentiful, at least in the winter, in the hilly broken country just north of Blantyre, but in Zomba I only saw it once. Whether there is any local movement I am uncertain; however, I went to Blantyre early in March and do not remember seeing these Buntings till the middle of April, when the males were already beginning to sing. On April 19th, I watched one pair for over an hour without result. The male had two stations, on trees about 60 yards apart, one on top of a small stony "bult," the other near the bottom of a similar hillock. He called, with exactly the same strain of seven or eight notes, every ten seconds, and the female answered him each time with a shorter strophe from flatter ground 100 yards away. My observation post was a small bush half-way between the bults. The male would sometimes fly down to earth and seemed very busy there, but always returned to one or the other tree. When I changed my position to the second bult both birds came quite close to me, and made themselves very busy on the ground, singing all the time. I found nothing, however, and it was not till a month later that, chancing to re-pass the spot, I put up the female from her nest containing three newly hatched young. It was built just where I had seen both birds on the ground together, a few yards away from the bottom of the hill, at the side of a big stone. Afterwards, I found that at least twenty pairs were breeding in this area (Chirimba, old coffee fields), which covers perhaps 500 acres, and contains several small dry streambeds with rocky sides, and, away from these, many knolls where large boulders lie embedded and piled up. In the winter few birds are singing, and the notes of these little Buntings fill the windless air. I found altogether

four nests containing each three eggs, on June 18th, July 3rd and 9th, and August 1st, and three or four with young. The nests with eggs were all found by happening to see the bird as she flew off, generally twenty yards or more ahead of one. I tried many times without success to watch the birds to their nests. When eggs or young are in the nest, and danger threatens, one or both birds utter a harsh alarm note which I thought sounded rather like "be-ware."

By the middle of August the birds are silent, and in October there seems a tendency for old and young to form flocks. I should say that two broods were ordinarily hatched, one early in May and one in July, but this is conjecture. At all events the breeding season falls entirely in the cold dry months when the grass is dry. Two nests I saw were at the foot of tufts of vegetation, the rest were sheltered by stones. They are small frail structures of grass, lined with rootlets, and there is often something in the nature of a small "ramp" of twigs on the front lip. The birds apparently scrape a shallow hole before building. The largest of twelve eggs measures 19½ mm. × 14 mm., the smallest 17 mm. × 13½ mm., so there is a good deal of variation in size, as also is there in markings. The ground colour is a very pale bluish-white, thickly covered, in some cases with fine spots, in others with larger blotches, of various shades of brown. It is noteworthy that no species of *Fringillaria* lays Bunting-like eggs, in spite of the fact that the only generic character relied upon to mark this genus from *Emberiza* is the absence of white outermost tail-feathers. One is aware that, according to the highest journalistic authority, the markings on birds' eggs have no teleological significance, so I dare not suggest that the circumstance referred to is anything more than another addition to the phenomenally long list of similar coincidences due (as a corollary) solely to chance.

C. F. B.

NOTES FROM NYASALAND—III.

Family Laniidae.

Reichenow gives no fewer than one hundred and forty-one Shrikes for Africa, a figure which, however, includes, as units, many more geographical variations within a species. Of this total, there are found in Nyasaland sixteen good species, comprising one

migrant (the Red-backed Shrike) and fifteen residents. Those of which I have, as yet, no information as to their breeding are *Nilaus nigritemporalis*, Rchw., *Tschagra anchietae*, Boc., *Nicator gularis*, Finsch. Hartl., *Chlorophoneus bertrandi*, Shell., and *Laniarius fülleborni*, Rchw. I proceed to deal with the other ten, as to some of which, however, I do not yet know quite as much as I hope to one day.

Prionops talacoma (A. Sm.).—The South African Helmet Shrike I first met with in comparatively low country—about 2,000 feet—ten miles east of Zomba, but later on I found it quite common in the second-growth woods (Masuku) near Blantyre, at 3,500 feet. In other parts of the Highlands it is rare. I have seen it in Angoniland, but never in the Shiré Valley. This is one of the birds (there are many in different parts of the world) whose fate it is to be called by English people "Seven Sisters" or "Happy Family." The natives of Chiromo call them Alendo (the travellers), and in the Highlands they are known to the Anyanja as Menyamenya. In small flocks of, say, from five to fifteen, they move ceaselessly through the scrubby trees, descending often to the ground and chattering in an undertone. They get really noisy as the breeding season approaches, but even then the flock never quite breaks up, as one soon learns when a nest is discovered. On September 4th, 1921, I found my first. I had gone to a recently discovered and very likely looking patch of scrub about a mile from my house, growing on rocky hills and shallow intervening valleys, the timber being chiefly original Albizzia (not second growth), and I was watching the very trying performances of a pair of Falkenstein's Chats, when two Prionops flew towards and past me, the foremost with something in its beak. They went into a tree about 30 yards behind me in which I could just make out what looked like a grey lump in the fork about which they settled. When they departed I went up and saw the nest, a compact close woven cup, rather like that of *Bias musicus*, grey in colour and so harmonising with the tree as to be very difficult to find, did not one know just where to look. The birds visited the nest three times in half an hour, both together each time, and it was clear from the actions of one which settled in the nest and worked its breast round it that they had not finished it. However a week or so later it had disappeared, as so often is one's disappointing experience with a building nest in Africa. On October 4th I was more lucky. Returning from an early morning

stroll, through a wood of small trees, I saw a bird fly out just over my head, and I was able by pulling down the bough to reach the nest from the ground. It rested on a double horizontal fork at about ten feet, and was quite exposed. It proved to be a compact, well-finished cup, whitish-grey in colour from the external binding of insect webs. Composed of long fine shreds of smooth bark, the fabric was lined with what were either finer bits of the same, or perhaps split lengths of broad dead grass. The internal measurements are 2½ inches diameter and about ¾ inch depth. I found many nests afterwards, and there was never any variation worth mentioning. I wrote above of a likeness to the nest of *Bias musicus*, but what struck me on further acquaintance was the resemblance to the nest of the Australian Black-and-White Flycatcher (*Saulo-procta motacilloides*), except that there is never any hair or feathers in the lining. Full clutches of eggs I took were 3, 4, and 5. Nests with eggs were found on October 4th, 9th, 14th, 19th, 23rd and 29th; December 10th and 15th. I was away during most of November. The size, shape, colour and markings of the eggs vary very little: they are of a fairly deep blue-green ground colour, with a ring of reddish brown and lilac (subsurface) spots towards the larger end. Sometimes the spots are larger and blotchy, and sometimes they extend over the lower part of the egg, which, however, is far more usually free of markings. I select an average-looking egg for measurement and find it gives 22 mm. × 16½ mm. One which appears conspicuously smaller than the rest measures 21 mm. × 16 mm. In the case of one clutch of five, it seemed from the types of egg that two females had laid in the nest, and one always finds that half a dozen birds at least come round the nest to scold a human intruder.

Sigmodus retzii (Wahlb.).—In the form *tricolor* (*G.R. Gr.*) which is that distributed over East Africa, the Black Helmet Shrike is occasionally met with in the Highlands: I have seen small flocks three or four times, on each occasion on the lower slopes of Zomba Mountain. Their habits seem to be the same as those of Prionops, both species haunting well-wooded areas away from dense waterside vegetation, but the present bird affects higher timber than its grey relative. Against the light, it is hard to tell one from the other; but otherwise the black-and-white of this species is readily enough distinguishable from the grey-and-white of Prionops. I never found a nest myself, but I recently saw a set of three eggs which were

taken near Zomba on December 12th, 1921. They were larger, and blunter at the small end, than those of Prionops, and were very pale blue with a quantity of small dark spots chiefly disposed about the middle. The nest seemed larger and shallower and less neat than that of Prionops : there was some greyish web around the sides. It had been badly collected and I have no details of site. I should put the eggs of this bird as among the rarest of our Nyasaland Shrikes'.

Tschagra australis (Smith).—The local form of the Three-streaked Bush-shrike is *congener* (Rchw.), which is found from the Zambezi north to Iringa in Tanganyika. I found it rare about Blantyre, but it seems commoner near Zomba. It is not at all easy, despite its smaller size, to distinguish without glasses from the next species ; and the clear whistling notes are much alike. Both species love the ground and bushes with long grass growing about them. The native name at Chiromo on the Shiré is Nkudanchoncho : what the Anyanja call it I never found out, as I had no boy with me the only time I saw one close at hand. This was on November 5th, 1921, and I saw, as sometimes happens, the sitting bird before I noticed the nest. This was set in a fork of a prickly acacia at about five feet from the ground, just outside a belt of dense scrub fringing a small stream. The two eggs were noticeably less in size than those of *T. senegalus*, but otherwise like those of that bird. They are roundish, white, with a quantity of streaky Bunting-like markings of pinkish-brown on the top half of the egg. One measures 20 mm. × 16 mm. The nest was also very like a small one of the Senegal Shrike, being a small shallow saucer of twigs with a little web-binding on the edge I should be disposed to say, from the fact that I never saw it away from stream-valleys, that those are its natural habitat in these parts. In Uganda it was not so with *T. australis minor*, which bred plentifully in the dry scrub in the high country above the Victoria Hill near Jinja.

Tschagra senegalus (Linn.).—I wrote a note in Vol. I, at p. 6, on the Black-crowned Bush Shrike at Mombasa. Since then I have seen much of this species and its nidification about Blantyre. Comparing three East African sets of eggs with over a dozen from Nyasaland, I find that, contrary to the general rule, the Northern eggs are slightly larger, in one instance considerably so. Every Nyasaland egg exhibits in greater or less degree the Bunting-scrawls which are conspicuously absent from Mombasa eggs. In no case

in Nyasaland have I found more than two eggs in a nest : a clutch of three was quite usual in East Africa. For the rest, the song, general habits, and nidification do not differ. The birds inhabit well-grassed and wooded country, but not forest. A favourite nesting locality is a clump of bushes by the dry bed of a stream. The nest is seldom hidden, and may be placed at any height from the ground between two feet and twenty, but more often than not it is well within reach. It is a broad but deepish cup, and " transparent," always with some insect-cocoon binding round the rim. On more than one occasion, I noticed that if a nest was looked at and the eggs left, they were gone the next day. This is a common African experience with many birds, my own view being that the birds themselves do it, though there are lizards and other marauders enough which may be culpable. I find that my dates for nests of this species range from October 17th to December 23rd, but the height of the season undoubtedly fell in 1921 during the last week in October and the first in November. The nests are not unlike those of the Bulbul *Pycnonotus layardi* ; and, like those, one finds them rather accidentally than by particular search, though in the right country, at the right season, there is no difficulty in coming across them. I consider this by far the commonest, though not the most conspicuous, local Shrike. Selecting three eggs of different appearance, I find they measure 25½ mm. × 18½ mm., 24 mm. × 18 mm., 22½ mm. × 18 mm. respectively. They are very like those of *T. australis*, but the greater size distinguishes them at once, and they are not like the eggs of any other genus that I am acquainted with. They are well splashed and streaked with light reddish-brown on a pure white ground. There is sometimes a well-defined cap (never a central zone), and quite a frequent feature is a broad smear as of dried blood.

Chlorophoneus sulfureopectus (Less.).—The Nyasaland form of the Yellow-breasted Bush Shrike, a small but beautiful bird with green back, grey head, and bright yellow underparts, is *chrysogaster* (Sw.), which extends on the Eastern side of Africa from Abyssinia to the Shiré Highlands. I have not yet taken the nest in Nyasaland but have seen two clutches each of two eggs taken at Zomba and Chiromo respectively. The eggs are small, ovate in shape, and resemble those of an Australian Cuckoo-shrike, *Lalage tricolor*, having the whitish ground colour nearly obscured by heavy olive-brown streaks and blotches ; 21 mm. × 16 mm. would appear

to be an average measurement. The nest, as I met with it several times in Uganda, is a frail shallow cup, built entirely of dry tendrils and placed in an exposed fork, usually of an acacia, at about ten feet from the ground. The bird itself haunts dense thickets, but, as with *Tschagra*, the nest is always in a more open site in the vicinity. This is a bird which is far more often heard than seen, and it may be, therefore, worth recording that familiar as I was in Uganda with its thin mournful whistle of four or five notes, the last lower than the rest, it was not till I came to Nyasaland that one morning, in my compound, I succeeded in tracing it to its source. Before that I imagined it came from some much smaller bird, a warbler perhaps. In Nyasaland this species is, as one would expect, of a bush-loving bird, commoner in the Shiré Valley than in the Highlands proper, where indeed I have only met with it close to Zomba.

Laniarius major (Hartl.).—The local form of the Large Puff-back Shrike (I never saw one puff its back yet) is *mossambicus* (Rchw.). It is a little difficult to know what Reichenow considers a sufficient basis for a species, and it is my personal opinion that as further material is available we shall see *L. sublacteus* (Cass.), *L. turatii* (Verr.), *L. aethiopicus* (Gm.), *L. a. bicolor* ([Verr.] Hartl.), and the three subspecies of *L. major* (Hartl.) which Reichenow enumerates, all lumped into one as subspecies of *L. aethiopicus* (Gm.), the first one to be named. Wherever you go in the central and northern parts of the Ethiopian region you will meet with this black-backed, white-breasted Shrike, with more or less white in the wings; provided the locality be suitable, that is to say, well-watered and scrubby. The note is always the same, a fluty whistle of volume and sweetness, with sometimes an interpolated harsh scold, and one bird of a pair seems to answer the other. It is very seldom seen in the open, preferring to watch a stranger from the recesses of a bush in which it hops from bough to bough, showing but rarely the gleaming white of its under-parts. I know no Shrike whose nest involves more labour in the finding. It is not much use looking for it except when the birds are in very good voice, and then it takes time and determination to locate the pair, while the nest is more often than not in the midst of a thorny patch of bramble-like shrub on the steep side of a wooded gully. I saw one last November at Deep Bay, Lake Nyasa, which was so thorn-protected as to be absolutely impossible to get at without an axe

(which I had not), though it was only ten feet from the ground and the pair of eggs showed clearly and provokingly through the loosely woven cup of tendrils. The birds are common enough throughout Nyasaland, but I have only taken here one clutch, a pair found in a nest sheltered by a mass of creepers growing over the top of a small tree, one of a cluster about a spring, on the lower slopes of Ndirande. That was on November 6th, 1921. The egg measures 22½ mm. × 17 mm., and ovate in shape, bluish-green in ground-colour, well covered, though more thickly at the larger end (where they form a cap), with small spots and freckles of light brown. The surface is highly glossy. Another egg from a nest in a lemon tree near Shupanga on the Zambesi is the same in colour but smaller, 21½ mm. × 16½ mm. I have cause to remember that nest: I was going up the river on a dreadfully hot day (September 21st, 1920), and the Captain of the s.w. "Centipede" (now lying on the bottom at Chinde, since the hurricane of February 24th, 1922) had invited us to follow him round one of his cotton estates at a rate of about 5 miles an hour. I collapsed quite early, and made for the grateful shade of these lemon trees. Perceiving a small nest just within reach of my stick, I poked at it idly, thinking it old. To my surprise, out toppled two eggs, and to my greater surprise, I almost involuntarily caught one in my hand. Simultaneously, the whistle of the Shrike came from the next tree. Two is the usual clutch, but I have been shown one of three. The native name on the Lower Shiré is Mulichire.

Dryoscopus cubla (Shaw).—The genus *Dryoscopus* (Lesser Puff-back Shrikes) is another to which a good deal of species-lumping might with advantage be applied. The local form is *hamatus* (Hartl.), which ranges down the East Coast from Witu to Quilimane and across into South-west Africa. It is common enough in this Protectorate, and is always on the move in the leafy tops of trees where it may easily be mistaken for *Nilaus nigritemporalis*, a rarer bird. Its note is loud and rasping. I never had the good fortune to find the nest, though from October to the end of the year they were clearly breeding in the scrub country north of Blantyre where I often saw the male extending the white patch of dorsal feathers, a sexual adornment. It was well described by a young friend who recently passed through Chinde, and wrote to me of a bird new to him seen there, which "seemed to have a lump of raw cotton on its back." I had no

difficulty in fixing identity from such an apt and African description. I should say this species was equally well distributed in high and low areas. I can give no details of its nesting habits, but Dr. Van Someren ("Ibis," July, 1916, pp. 393–4) states of the nests of closely allied congeners that they are built of rootlets and fibres and usually placed in a low bush, though he took one at fifty feet. An egg sent me from Chiromo (taken December 12th, 1921) was sub-ovate in shape, white, with a good sprinkling of small brown and grey spots tending to form a ring round the larger end. I did not measure this egg, but from E. C. Chubb's catalogue of the Millar Collection, Durban, the millimetre measurements would be about 22 × 16. There is an excellent coloured figure in that catalogue from which the egg may at once be recognised—more than one can say of a good many coloured figures. The native name of this bird in the Ruo District is Mwekire.

Malaconotus olivaceus (Vieill.).—The form of the Grey-headed Shrike found in Nyasaland is *starki* (*W. Scl.*), distributed from Pangani to the Cape. It is easily the most beautiful of our Shrikes, and the largest, its grey head, green back and yellow underparts making it, as it were, a large edition of Chlorophoneus. During the winter months it appears to undertake local, perhaps merely individual, migrations ; one sees it then among the trees in township compounds. I first saw it, and heard its single flute-like note, in Zomba in October, 1920, and speculated greatly as to where it might nest. Probably, thought I, it retires to some secluded mountain gully. In fact, it does nothing of the kind. A year later, on October 15th, 1921, I was returning to my house at Blantyre through comparatively open woodlands, when I saw in a most exposed and central position, in a lightly leaved small tree at about 12 feet, a rough flattish nest which I should at once have put down as a dove's had it not had a distinct "cup." It was empty. Returning two days later, I had the pleasure of seeing a Grey-headed Shrike fly from it. One egg was visible through the bottom of the nest, and on the 19th I found the female sitting on what I think is the full normal clutch of two eggs. I afterwards found two more nests with eggs in similar positions. No other African Shrike's nest I know is so conspicuous, but to an Australian there suggests itself at once a nest of the Butcher-bird (Cracticus), and, in a quite unrelated family, that of the Wattle-bird, *Acanthochaera carunculata*. The nest is roughly built of coarse twigs, with a

lining of finer ones or tendrils. My three clutches of eggs are dated October 19th and 29th, and November 28th. An average egg measures 27 mm. × 20 mm. The ground colour is deep greenish cream, and the medium-sized rounded rail-like spots which are well sprinkled over the egg are light purplish-brown and lilac. They form more or less of a cap at the blunt end. The shape of the egg may be called elongate-ovate. I may add that in the early spring I heard these birds utter, besides the flute-note (which is very like that of *Laniarius*), a sort of screech and yet a third sound, a clinking note like an exaggeration of a Stonechat's. On that occasion there were three birds together: two males pursuing a female, or, of course, it may have been *vice versa*. This species seems to inhabit both the Highlands and the Shiré Valley, as eggs have been taken at Chiromo.

Lanius collaris, L.—Probably there is no better-known African bird than the Fiscal, Butcher-bird, Bull-head, call it what you will. For some reason it is rare in Nyasaland as compared with the south generally, and with Kenya in the plains. You may always be sure of finding a pair in its special domain, held to all through the year, but you may travel a long way before you come to the next pair, and, in all, I do not suppose I have seen more than a dozen pairs in the parts of the Protectorate I have travelled over. I have found but one nest. Coming down Lake Nyasa in H.M.S. "Gwendolen," I landed one evening (November 21st, 1921) at a spot of peculiar desolation called Bana, given over to reeds, deep sand, biting flies, and a few intensely melancholy borassus palms. I made for the only spot of any promise, where a few scrubby bushes grew, and, as I approached, a Fiscal Shrike flew up from somewhere and perched rather anxiously near the top of a palm. There was not much choice of sites, and at the third or fourth try I came on the nest, at about 8 feet from the ground, well in towards the centre of a bush. It was a deep compact cup, of flexible twigs and all kinds of mixed dry vegetation, with a few insect cocoons, and was lined with strips of fine borassus fibre. The three fresh eggs it contained were the finest clutch of this bird I ever saw; and even now, after the fading to which the Fiscal's eggs are subject more than any other Shrikes, they are still very beautiful. They measure 25½ mm. × 18 mm., and have an irregular zone of large brown and purple blotches on a creamy ground. Speaking from memory they are a good deal larger than Uganda eggs of this species. The Uganda

form is *humeralis* (Stanl.), but the differences are certainly not more than subspecific.

Lanius souzae (Boc.).—Sharpe records Souza's Shrike from the Bua River in Angoniland, but I was surprised to meet with it so far south as Blantyre, to which district I imagine it to be a spring migrant from the north. For I did not see it between the beginning of March and the end of September in what I was later to learn were its breeding haunts. I first saw one in the Masuku scrub near Nyambadwe Hill on October 9th, and at a hurried glance took it for a Red-backed Shrike. On the 29th of the same month one of my garden boys took me to see a nest in the fork of a Masuku about 15 feet from the ground, which I did not doubt was a Kurrichane Thrush's (*Turdus libonyanus*) until he brought it down with three eggs, obviously not Thrush's and yet somehow familiar in type. The nest was Shrike-like. Suddenly I remembered: the eggs were exactly like those of *Lanius mackinnoni* of Uganda. The boy put back the nest as best he could, and I waited for perhaps twenty minutes, when along came an undoubted *Lanius souzae* and flew up to the nest. Later in the year this pair of birds hatched young in this neighbourhood. On December 18th, when I thought the season would be well over, I shot a specimen which, to my disappointment, turned out on skinning to be a female in breeding condition: I returned to where I had shot it and found a half-built nest in a tree close by. The nest first-taken is of an irregular shape, to fit the perpendicular triple fork in which it was built. It measured 5 inches over all across, and 2 inches deep, the inside cup being 2½ inches wide by nearly an inch deep. It is composed of all manner of small twigs, insect cocoons, and a little lichen, and lined with long pieces of fine grass. It is exactly like that of *Lanius mackinnoni*, and so are the eggs, which are of a greenish white ground-colour, sprinkled all over with very fine freckles of light brown and light purple tending to form a zone near the top end. They measure 21½ mm. × 10½ mm. This bird inhabits actual woodlands, while *L. collaris* prefers open country with scattered bushes and scrubby trees. The only note I heard from it was low and scraping, but that was when the adults were flying about with newly fledged young.

C. F. B.

DESCRIPTION OF THE NEST AND EGGS OF *Spizaëtus bellicosus* (*Daud.*) AND *Stenostira scita* (*Vieill.*).

By H. W. James.

Spizaëtus bellicosus (Daud.).—Equalling the magnificent and powerful *Aquila verreauxi* (Less.), in size, the Martial Hawk Eagle is one of the finest of all our larger South African Eagles. Like many other large birds of prey, it is yearly becoming scarcer. Whenever opportunity offers, it takes such heavy toll of the farmers' kids and lambs that it is, as far as South Africa is concerned, becoming slowly exterminated. The day is not far distant when these magnificent birds will live but as a memory.

I have one egg in my collection, taken in April, 1908, in the Barkly West district. It agrees well with the single egg in the British Museum collection, taken in the Orange Free State. My egg is, in shape, a broad rounded oval. The texture of the shell is very rough and quite devoid of any gloss. In colour it is dull white, sparingly spotted and blotched with pale reddish-brown. The markings are heavier and denser on the top, where, in addition to the blotches, there are a number of short, thick, streaks of dark purplish-brown. It measures 3·18 inches in length by 2·66 inches in breadth.

The nest, built of stout sticks and grass, was placed on the top of a large mimosa tree, about 25 feet from the ground.

Stenostira scita (Vieill.).—In the mimosa scrub, found along all the periodical watercourses of the Cradock and Tarkastad district, the Fairy Flycatcher is fairly plentiful but the nest is a rare one: so rare that I know of no other collector in South Africa who has taken the eggs. I have collected for fifteen years in those districts, and in that time have recorded only six nests. The rarity of the nest is due to the clever way in which the small, beautiful structure is hidden and the skill displayed in making it harmonise with its surroundings.

The nest is built of dry leaves, dead grass and cobwebs; the inside well lined with feathers; the walls thick and compact and the whole neatly and beautifully finished. All nests found measured the same, 1½ inches in diameter by 1½ inches deep.

In shape the eggs are broad ovals and have a fair amount of gloss. In one clutch, the ground-colour is pale greenish-buff;

round the broad end is a very indistinct zone of slightly darker shade of the same colour. In another clutch, the ground-colour is pale drab with a distinct zone round the broad end of the eggs of darkish-buff. In another clutch, the ground-colour is creamy-buff. Round the middle of the eggs, in this clutch, is a very distinct zone consisting of confluent blotches of brown. The eggs of this clutch differ from those of the other clutches in having the whole shell covered with small, almost obsolete, spots of greenish-brown. The measurements of a small series of six eggs are, ·55 inches to ·65 inches long by ·43 inches to ·46 inches broad. All nests were found during the months of October and November.

[Mr. James sent the above in response to our request for descriptions of very rare eggs. We shall be glad to receive similar contributions from other subscribers. It is best to give detailed and average measurements of eggs, which should be in millimetres.—EDITOR.]

THE CUCKOO'S SECRET.

By EDGAR CHANCE, M.B.O.U.

(Sidgwick & Jackson, Ltd., 7*s*. 6*d*. nett.)

The complete record of Mr. Chance's epoch-making investigations of the breeding habits of the Cuckoo is now available to all. His book must surely be the most concise and exact record of specialised nature study ever published, but the pains he has taken in recording the details are only proportionate to the importance of the results he has achieved. At every stage the reader is furnished with the fullest possible data accompanied by plans, diagrams and photographs, and when the author leaves the realms of fact for those of theory his arguments are sound and supported by logical deductions.

We have not the space to quote lengthily from the book, which most of our readers will wish to get for themselves. Perhaps the most important part of the work from the oological point of view, is the last chapter. Here we find that Mr. Chance considers it likely that a hen Cuckoo, fostered by a certain species, will, in its turn, victimise the same species. He writes: "If we postulate the truth of the theory, which for my part, I confidently hold, that a female Cuckoo bred in (say) a Robin's nest is not only herself

the descendant on the maternal side of generations of Robin Cuckoos, but has an inherited instinct to seek out Robins' nests and make Robins, so to speak, her preferential victims, it ceases to surprise us that the respective eggs of Robin and Robin Cuckoo should exhibit a marked similarity. What has been the law of the survival of the fittest, from the Cuckoo's point of view, throughout the ages of evolution, is thus dovetailed with the line of least resistance on the part of the Robin." But the followers of Mendel will be appeased by the next paragraph, for the author continues :—

" But I frankly admit that this theory must fall to the ground, if it is a fact that the influence of the male parent bird is at least as potent, if not more so, as that of the female parent on the offspring—and even on the eggs—produced by their daughter. Yet again, it may prove to be the fact that the male Cuckoo tends to associate only with female Cuckoos of his own type, *i.e.*, those reared by the same species of fosterer. This idea may some day turn out to be less fanciful than it sounds—that there is, at present, an unknown but nevertheless definite distinction between the different types of Cuckoo, according to the foster-parents by which they were bred and to which they are attracted."

These theories open up a wide field for further investigation, but one that is not easy to pursue. After the flood of light shed on the habits of the Cuckoo by the author it would not seem improbable that some of these points may be lifted out of the theoretical stage in the near future.

Perhaps the main result of Mr. Chance's investigations is the recording of enough indisputable evidence to support his theory that " a dominant hen Cuckoo, by a process of watching and searching, discovers, some days in advance, the nests of those dupes in which she intends subsequently to deposit an egg." He contends " that the watching of her dupes engaged in building stimulates her own reproductive organs and the resulting egg is ready for extrusion about five or six days afterwards. It follows that within reasonable limits the number of eggs she lays is regulated by the number of suitable nests discovered, though of course, in cases of emergency, a Cuckoo will sometimes make use of what are, to her, unnatural fosterers."

His theory that the building of a nest by a prospective acceptable fosterer is likely to stimulate the reproductive organs of the Cuckoo may not be generally endorsed ; but the author does prove, without

any shadow of doubt, that the Cuckoos under his observation did find the nests of their victims two or three days before the laying of the eggs in such nests, and also that they were able to retain their eggs for a considerable time if there were no suitable nests ready to receive them.

It is well known that at certain seasons a domestic hen will be found to have a string of little immature eggs forming and that, given the favourable conditions required for their maturity, the laying of them follows as a matter of course. It might be supposed, therefore, that a female Cuckoo has her eggs forming in the same way, possibly before her arrival in this country, and that, favoured with certain climatic and dietetic conditions, she will have them ready for extrusion at a certain time and deposit them in the nests of her favourite fosterers or, failing such, in other nests, without being stimulated in the manner suggested.

But Mr. Chance has worked in such a mass of data in support of his theories that it is hardly fair to criticise any of them without quoting the context more fully, and we feel sure that the bulk of our readers will read the book for themselves and, having done so, communicate to Mr. Chance any data they possess which helps to clear up any point in the problem, and in future avail themselves of every opportunity of securing more. Any one of them may, unwittingly, stumble on facts which will help him in his studies.

Mr. Chance does not, as so many of his predecessors in this field have done, suggest any reason why the Cuckoo is a parasite; and this led us to turn to "The Evolution of Sex," by Professors Geddes and Thomson. After dealing with the Cuckoo question very fully, the authors come to the conclusion that the habit "is a deliberate expression of the whole constitution of the bird." But among the many characteristics which they attribute to the species, we suggest that the real reason may be found in the fact that, as the authors point out, " . . . even among greedy birds, the Cuckoos hold a very high rank. They are remarkably insatiable, hungry, gluttonous. Even the anatomical conditions asserted by some to be important, the swollen low-set stomach, may have their influence in the Cuckoo, which has certain other peculiarities, though the same conditions may be overcome in other birds, which remain perfectly natural. It might almost be suggested, that the habit of feeding so largely, as Cuckoos do, on hairy caterpillars, whose indigestible hairs form a fretwork in the gizzard, may also have its

irritant, gizzard-fretting, dyspeptic influence. But the main point is, that in a bird with so strong nutritive impulses, it is little wonder the reproductive emotions are degenerate. There is too much hunger and gluttony for the higher development of love."

[After reading the above we set to wondering whether the Cuckoo would be able to incubate its eggs, even if it were so minded. To secure enough food both to satisfy its appetite and to maintain its body-warmth sufficiently for the function of incubation, and handicapped already by its diminished blood-supply,* would it not have to leave its eggs so long and so often as to frustrate their incubation? Perhaps some of our readers will tell us if in some allied genera, which share some of our Cuckoo's disabilities and appetites but which are not parasitic, the males have to feed the sitting females.—THE EDITOR.]

NATURELAND.

Dr. Graham Renshaw commenced in January last, the publication of "Natureland," a quarterly journal of natural history, which should make a strong appeal to the all-round naturalist. Already it has contained a great deal of matter of interest to the ornithologist, and as it is produced in a most artistic style, we have no doubt but that it will grow and prosper. The subscription is 10*s.* 6*d.* per annum. Prospectus may be had from Dr. Graham Renshaw, Bridge House, Sale, Manchester.

SMALL BIRD SANCTUARIES.

Fortunate in the possession of a terrier which will only tolerate a dead cat, and surrounded on all sides by woods, we have been able, with some success, to make our small wild garden a miniature bird sanctuary, and have been able to get intimate peeps into bird life which we might otherwise have missed altogether. We cannot pretend to claim anything like the numbers of breeding birds mentioned by Mr. Gilbert Grosvenor in "The Book of Birds" (O.R., Vol. I, page 70), but we think a brief record of what has been done may stimulate others to see what they can do.

An absence of cats is, we feel sure, the main desiderata, but

* "The Evolution of Sex," p. 277.

perhaps equally important, is the provision of nesting sites adapted for the use of the species one hopes to attract. Commander Vaughan very kindly brought Mr. Hiesemann's book to our notice when we told him how we pruned our silver birch trees to ensure the requisite "shrubbiness," but this book does not suggest anything more than we had already attempted.

Our nesting boxes are crude home-made affairs, and the proof of their worth is in the using. We find that the Tits like a box with an entrance only just sufficient to admit them, and that it is very important to see that the rain is not allowed to drip into them.

Our boxes have been tenanted by Great and Blue Tits time and again, by Robins and once by Redstarts which are by no means common here. A Tree Creeper is now sitting on her eggs in a nest built behind a piece of bark we had attached to the trunk of a Scotch fir quite near the house. We rather feared we had made the cavity too small, and indeed there seems only just room for the bird to sit on the nest.

Mr. J. Warren Jacobs, of Waynesburg, Pennsylvania, an old correspondent of ours, and now one of the foremost exponents of "bird-architecture" in the States, was good enough to promise us some eggs of the Chickadee, *Parus atricapillus*, which we wished to foist on one of our Tits here. Meantime we have sent him five fresh Blue Tit's eggs for a similar purpose. In order that the Blue Tit's nest should be easily accessible, we placed a nest box on the window-sill of an upstairs window quite early in the season, and were surprised to see a pair of Cole Tits seriously viewing the premises on more than one occasion. They did not, however, do more than this; and, having stopped up about fifteen cavities in a series of iron posts, many of which have been used before by Blue Tits, we thought we should be sure of getting a pair to use this box. When nine eggs were laid, we took five for Mr. Jacobs, hoping that this would not upset matters: but it did. The Blue Tit seemed to forsake the nest, but after two days added more material to it, and laid more eggs, upon which she is now sitting. We do not know just how many more as we feared to disturb her too much.

In the case of this nest we noticed that, like the Great Tit, the eggs were covered during the day with a pad of soft material, and that, even when the nest only contained a single egg, it was brooded on at night.

For the third year in succession, we have had a Chaffinch's

nest built right against the house wall; first in a clematis, then in a pear, and now in a rose bush, trained on the wall.

Willow Warblers we have every year, and though we do not get the Chiffchaff in the garden—not having enough rough tangle for it—we have them just outside, and to-day, almost when writing these notes, we heard a cock Wood Warbler's joyous song in the garden. We are hoping he and his mate will stay. A Blackcap, too, has been singing there this week, but we think the nest is just outside the fence.

Robins and Hedge-Sparrows nest every year, and occasionally we get Wrens, and once a Garden Warbler. There are Greenfinches and Bullfinches nesting closeby, and we think that when our birches are dense enough we may have them actually in the garden.

Every evening, lately, we have heard Nightingales and Nightjars from two sides, and we are never without the call of the Cuckoo in the Spring and early Summer. Quite often we get the gurgling note of the female, but I have yet to learn the particular species most victimised by the Cuckoos here. Just below the house is a "rough," half grass, half wood, where Tree Pipits successfully conceal their nests from sight. Perhaps the Cuckoos find them.

We have no Woodpeckers nesting in the garden—the trees are all sound; but the call of the Green Woodpecker is heard almost daily, and the Greater Spotted often heard, but seldom seen. No doubt if boxes were provided for them they would prefer the sites they can excavate for themselves at a safer distance from the ground. Jays we do not like, for they play havoc with the garden peas. Last year there was a Sparrow Hawk's nest in a tall pine behind the kitchen garden, but this we did not "attract."

By the way, we noticed this year that a hole we had scraped in a bank, ready for Robins, was greatly enlarged by them before the nest was made. This nest got full of drifted snow; so early was it made, or so late did it snow, that it was abandoned: and we are ashamed to say that the terrier scratched out a nest further down the bank, made, doubtless, by the same bird.

K. L. S.

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THE OOLOGISTS' RECORD.

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OOLOGICAL NOTES ON SOME OF THE BREEDING BIRDS OF PALESTINE.

By Capt. C. R. S. Pitman, D.S.O., M.C., M.B.O.U.

(*Continued from p.* 91, *Vol. I.*)

Emberiza calandra. Corn Bunting.

The group which interested me most in Palestine was that of the *Emberizinae ;* consequently it is hardly surprising to chronicle that I had very little success in finding the nests and eggs of the three types of Buntings which breed in those parts. The most common species, *E. calandra,* is a resident, though vast flocks of winter visitors which are probably racially different haunt the coastal plains during the winter months and early spring This large Bunting is a common breeder amongst the grass and scrubby cover at the edges of the marshes near the mouths of the Wady Rubin and R. Auja in the coastal plain, while I believe similar localities in the Kishon valley near Haifa are equally favoured. I was rather under the impression that they were not early breeders, but I found plenty of old empty nests in June, and saw young birds which were strong on the wing in May. In the latter part of June and in July the young birds joined up into large flocks, which disappeared a few weeks later and must have moved off elsewhere. As far as I know, only one brood is hatched in the year. I had not the time to spare to find nests by watching the parent birds, and my collectors were much too lazy to do this for me, so I did not obtain a single egg. The nests are very well concealed, and are similar to those of the Cirl Bunting. They are usually placed in bushy cover or in a tuft of grass, practically on the ground, and the eggs are apparently laid in March or April. The nests were easily found late in the season, after the crops had been cut and much of the herbage had died down. The harsh and monotonous reeling song of these birds, uttered from the top of a bramble or tall reeds, was quite one of the features of bird life in the marshes. Their peculiar aeroplane-like flight is quite unmistakable, and always

interested me. As the bird volplanes down to some selected perch with feet hanging down, the resemblance to aircraft with the landing wheels below is quite ridiculous.

I am unable to give any notes on the eggs, never having taken any myself nor seen any that had been obtained by others. As in the case of most Buntings, the parent birds, especially the cocks, are very obliging in the way in which they will disclose the position of their nests by their frequent visits, and a little patience in the breeding areas soon meets with the desired reward.

Emberiza melanocephala. Black-headed Bunting.

This particularly handsome bird breeds freely in the coastal plain, the birds arriving at the end of April and commencing breeding operations early in May. The brambles round the edges of the marshes are the most favoured nesting sites, but isolated bushes or groups of bushes are preferred, and the nests are never placed in very thick cover. I met with little success in obtaining the eggs of this species, not having much time to spare for bird-nesting—in fact I only secured a single clutch, and that was not a full one. In the Ramleh-Ludd-Bir Salem area I found no nests in the orange groves which I constantly searched, but during the months of July and August in 1918 I came across several old nests in the orange groves near the R. Auja in the Jaffa area. The principal breeding areas of this Bunting were the scrub lands in the vicinity of the marshes of the Wady Rubin, Jaffa Auja, and R. Kishon in the Plain of Esdraelon, though they undoubtedly bred in suitable localities by any of the small estuaries opening into the Mediterranean. The nests found in the orange groves were very curious, insomuch that they were composed of the flowering stems of a tiny yellow clover or trefoil, which gave the nests a very gay appearance. Those found in the brambles were constructed of dry and dead grasses, and as so often is noticeable in those of the Yellow Hammer, frequently had a straggling pathway of grasses leading into the nest, which serves nicely to reveal its position. They are well lined with horsehair.

Nests are rarely placed more than 2 or 3 feet above the ground, and I found many when it was too late, after the rank herbage had died down. They are usually fairly well concealed, but the cock birds are always ready to give away the positions by visiting them at frequent intervals, and his colouring and his flight are quite

unmistakable. In 1918, I managed to secure five stale eggs in the first week of July, which measured as follows :—

4.7.18	...	c/2	Stale	·89 × ·68	Average of 5 eggs = ·873 × ·653 (inches).
4.7.18	...	c/1	Stale	·86 × ·64	
6.7.18	...	c/2	Stale	·87 × ·64	

On May 16, 1920, I secured a clutch of four fresh eggs, but, unfortunately, I did not take their measurements.

Measurements of individual eggs are :—

Maximum length ·89 × ·69. Minimum length ·86 × ·64.
,, breadth ·89 × ·69. ,, breadth ·86 × ·64.

The principal breeding season is during May, after which month fresh eggs are only likely to be found in late nests, and only one brood is normally reared in the season.

The birds seemed to disappear in August or even earlier.

The eggs are fairly large for the size of the bird, and of a greyish or greenish-white ground colour with olive-brown, greyish-green and olive-green spots and streaks on the surface, and paler shell markings of slate-grey. In shape they are broad ovals and hardly pointed at all. The markings are not at all typical of those usually found on Buntings' eggs, and the curious pencillings are conspicuous by their absence.

Emberiza caesia. Cretzschmar's Bunting.

This is a very common summer visitor in the Judean hills, though its nests are by no means easy to find. I am not well enough acquainted with it to say whether it has two broods in the season, but in the summer of 1918, which was abnormal, as fighting was going on in the hills, the birds had undoubtedly nested in March and April, and were nesting again in June. In May, full-fledged young birds were found to be very numerous. The nest, such as it is, is exceedingly well concealed, and usually placed beneath a tussock of grass, a small bush or shrub, on the rocky hillside, and the brooding bird sits very tight. As in the case of all the Buntings, the cock bird is apt to give away the position of the nest very readily. Eggs taken in 1918 measured in inches are :—

2.6.18	c/2	Hatching out	·74 × ·60	Average of 8 eggs = ·789 × ·617.
8.6.18	c/2	Stale and bad	·815 × ·62	
14.6.18	c/4	Hatching out	·8125 × ·63	

Maximum length ·83 × ·63. Minimum length ·74 × ·60.
,, breadth ·83 × ·63. ,, breadth ·74 × ·60.

The nests are just a pad of dead grass, bents and rootlets, thickly lined with horsehair or other soft materials.

In colour the eggs are pale purplish white, stained purplish, and with sepia surface pencillings and shell spots of purple. Marked all over but more profusely at the larger end. The eggs are rather squat in shape.

Emberiza hortulana. Ortolan Bunting.

Passes through in great numbers on passage during the spring and autumn, but does not remain to breed.

Melanocorypha bimaculata gaza. Palestine Calandra Lark.

The Larks form an interesting group, providing as they do several breeding species, but the same old story of lack of time has prevented me from getting together a nice collection of their eggs. On arrival in Palestine in May, 1918, I was sent up to the front line to make a reconnaissance of conditions. On the way, motoring through the plain of Sharon, I was at once struck by the numerous Calandra Larks, which were evidently nesting ; but I had no opportunity of looking for eggs, and my regiment was forthwith moved into the hills. In the summer of 1920 I did have a few opportunities of becoming acquainted with their breeding habits, and found these birds very plentiful in an area a few miles east and south-east of Jaffa. I am not certain whether they are double-brooded in the season or not, but rather think they are. Although I rode all over their breeding area more than once, I only managed to find one nest, which contained four fresh eggs. In colour they seemed a dirty greenish, heavily spotted and speckled with olive-brown, greenish brown, and greenish olive surface spots, and with slate-grey and purplish-grey shell markings. They were broad for their length. The nest requires no description, being of the usual type of Lark's nest, and placed under the shelter of a tussock of grass. The normal clutch is four or five eggs. I ought to have been able to secure many nests from the local inhabitants when reaping the early crops, but they were far too apathetic to help me in any way

Calandrella brachydactyla longipennis. Short-toed Lark.

The Short-toed Lark of Palestine is a resident, but I found it none too plentiful in the same suitable localities where the Calandra Larks were breeding. I only once came across a nest, and that

was at the end of May, when I was out riding one day, and it was impossible for me to take away the four eggs whose incubation appeared to be advanced. The nest, of the usual type, was placed in a small hollow in open grass land. The eggs are very much smaller than those of the Calandra Lark, and the colouring is generally greyer. I fancy the main breeding season is in May, but cannot state what number of eggs constitutes a normal clutch.

Ammomanes deserti fraterculus. Desert Lark.

This is a common species on the nearly barren hills just west of the Jordan Valley near Jericho. It is resident, but I never had the good fortune to find any nests or eggs. It breeds in May. The birds utter a plaintive piping note which is quite unmistakable.

Galerida cristata brachyura, Crested Lark.

As I never collected any skins of Crested Larks either in the hills or plains, I cannot be absolutely certain that all my eggs belong to *brachyura*, as nests found in the Judean Hills, 12 miles and further north and north-west of Jerusalem, may well belong to the race *cinnamomea*. The Crested Lark is a resident and well distributed, whether in the hills or on the plains, and may be found breeding almost anywhere. I don't think there is any doubt of its being double-brooded, and the normal clutch of eggs is probably five, though it is not at all unusual to find only four eggs being incubated, while the set of six eggs I found is, I think, quite abnormal. In 1918, in the Judean Hills, I found the first nest, which contained five fully-fledged young, on May 22, and this bird starts nesting as early as the middle of March. The next nest was taken on June 9, and contained six eggs, which had been incubated for about a week. There was nothing unusual in the type of nest which was placed in the shelter of a bush and rock at the top of a hill 2,600 feet above sea-level. The nesting materials were very loosely put together, and just fell to pieces when picked up. The eggs are greyish-white in ground colour, thickly and finely speckled, as well as spotted all over with shell markings of various shades of grey, and more boldly marked all over with yellow-brown surface spots. Markings are often very profuse at the larger end, where there is frequently a ringed zone. Rings are occasionally found round the narrow and pointed end. These eggs are not unlike those of the Calandra Lark, but are a trifle smaller, very considerably

narrower, and more elongated and pointed. Measurements of eggs in inches are :—

9.6.18 ...	c/6	Inc. of a week	·84 × ·658	Average of 11 eggs = ·89 × ·67	
14.6.18 ...	c/4	A few days	·9025 × ·6875		
15.6.18 ...	c/2	Hatching out	·93 × ·67 (1 egg measured)		

Maximum length ·95 × ·66 Minimum length ·82 × ·64
,, breadth ·93 × ·67 ,, breadth ·82 × ·64

It will be seen that the eggs vary very considerably in size.

During 1920, in the plain of Sharon, near Ramleh, a few nests were found, but no measurements of eggs taken.

21.4.20 ...	c/3	Hard set	All found in open grass land near the Wady Rubin marshes.
27.4.20 ...	c/5	Several days	
14.5.20 ...	c/4	Very hard set	
18.5.20 ...	c/4	Inc. of over a week	

Anthus sordidus captus. Pipit.

This fine Pipit is a resident, but I am not quite sure when it breeds. When I was in the Judean Hills during June, 1918, I came across this bird on the tops of various hills. From its behaviour it was evidently breeding, and it was very noisy ; but try as I might I never found so much as a trace of a nest or young birds. I watched the birds for days, had scouts out watching them and searching for the nests, but all to no purpose.

Parus major terrae-sanctae. Palestine Great Tit.

This handsome little bird is a resident throughout the hills and plains, and is a fairly early breeder, being almost as prolific in the way of eggs as its English cousin. I came across two nests in 1920 both of which are worthy of description, while the eggs are similar to those of the British bird. A nest out of which six very hard set eggs were taken on April 11 was really in a very curious situation. A drain-pipe from the roof of our quarters had no proper drain below it, so the end of the pipe was protected by a metal sheeting cylinder to limit the splash during heavy rains. As the Palestine rains end about the end of March or early April at the latest, this cylinder was not a bad place for a Great Tit's nest, but building as early as it did, I knew that the sitting bird got one or two thorough drenchings. I had noticed the birds constantly about the pipes, and suddenly it dawned on me that they must have a nest, so that very night I looked down into the cylinder with the aid of an electric torch. There was the nest, and there was the hen bird with its

black, beady eyes looking up into the glare. The nest was on the ground level, the foundation consisting of grasses, straw and dead leaves, on top of which the cup for the eggs had been placed, composed of wool, hair, and other very soft materials. There were six eggs, which were too hard set to blow, the average measurement (in inches) being ·71 × ·55. This pipe formed part of a verandah which was in use all day and night, but the birds did not seem to worry about the constant traffic.

The other nest was found on April 26, and was placed in the centre of a loosely built stone wall. It was about 2 feet inside the wall and 3 feet above the ground. The nest was a thick pad of soft materials, such as lumps of cows' hair, wool, and sweepings off carpets, with a neat cup hollowed in the centre as a receptacle for the eggs. The nest contained seven fresh eggs which I had no difficulty in blowing. Many nested in the holes in olive trees, and young broods and young birds were plentiful in May and early June. One cannot lay down any rule about the normal clutch from only two sets of eggs, especially in a bird which, at any rate in Great Britain, often lays an exceptionally large number of eggs, but I should not be at all surprised to find that the normal clutch in Palestine is usually well below double figures.

Lanius senator niloticus. Woodchat Shrike.

This is a summer visitor which is quite a common breeder in the Judean Hills. Almost every valley and re-entrant from it, where there were a few olive trees, was inhabited by a pair of these birds, and once they had been detected it was usually not very difficult to find their nest. I was rather puzzled as to the principal breeding season, for, like *L. collurio* in Great Britain, I thought they were late breeders. Of course, the hill fighting in April and May, 1918, was sufficient to retard the nesting of many species and so give one false data. It is true that, at the end of May, I found a Woodchat's nest containing six eggs which were in too advanced a state of incubation to blow, as well as nests containing young ones, both in this month and in early June. Then, on the other hand, fresh clutches were taken as follows (measuring in inches) :—

4.6.18 ...	c/6	Fresh	2300′	·933 × ·683	Average of	
5.6.18 ...	c/6	Fresh	2400′	·973 × ·702	13 eggs =	
7.6.18 ...	c/1	New laid	2400′	·93 × ·67	·945 × ·685.	

Maximum length 1·00 × ·71. Minimum length ·92 × ·67.
,, breadth 1·00 × ·71. ,, breadth ·92 × ·67.

The longest egg has the greatest breadth, and the shortest egg had the narrowest breadth.

I find, on looking up my register, that I did measure the set found on May 30, 1918 :—

·92 × ·69, ·93 × ·71, ·91 × ·70, ·96 × ·71, ·90 × ·70, ·90 × ·69.—Average of 6 eggs = ·92 × ·70.

This makes the average of 19 eggs ·932 × ·692, and gives the minimum length ·90 × ·69.

Eggs varied very considerably in size, and the set taken on June 5 was distinctly on the large size :—

·96 × ·70, ·94 × ·68, ·98 × ·71, 1·00 × ·71, ·97 × ·70, ·99 × ·71.—Average of 6 eggs = ·973 × ·702.

Nests were invariably placed in olive trees several feet above the ground, the highest one being 9 feet. They were compact and solid, besides which they were neatly built. They were composed almost throughout of the dry stalks and stems of sweet-smelling aromatic herbs and flowering plants, with a little wool interwoven as a binding material. There was no lining except the soft dry leaves of such stems. The general outward appearance of the nest was a grey-green colour which assimilated well with its surroundings and tended towards concealment. Measurements of nest cups :—

3 × 3 × 1¾ inches. 3 × 3 × 1½ inches.

The normal clutch appears to be six eggs. In colour and markings they vary a good deal.

The ground colour varies from a greenish white to yellowish white and cream ; these colours become rather dead after the eggs are blown. The surface markings are of several shades of brown, and are chiefly confined to the larger end, which is frequently thickly marked and blotched as well as ringed. I have found eggs well marked all over. The shell spots are of various shades of grey, purplish grey and grey-blue, and are also chiefly found at the larger end, but are very apparent.

Lanius nubicus. Masked Shrike.

The Masked Shrike was found in the same localities as the Woodchat, but was not so common. The nests are not so easy to find, and are very similar to those of *L. collurio*, and usually placed

in patches of brambles or thorny shrubs. Neither of these Shrikes breeds in the coastal plain. I only came across a couple of nests, and as each contained five eggs, I think that this may probably be the normal set. They are late breeders.

2.6.18	...	c/5	Inc. of a week	2300′	·88	× ·674.
13.6.18	...	c/5	A few days	2400′	·9325	× ·705.

Average of 9 eggs = ·906 × ·689.

Maximum length	·95 × ·72.	Minimum length	·83 × ·65.
,, breadth	·95 × ·72.	,, breadth	·83 × ·65.

These two sets vary so very considerably in size that it is worth while giving the measurements of the eggs in detail :—

·83 × ·65	Average =	·94 × ·71	Average =
·86 × ·65		·92 × ·69	
·90 × ·69	·88 × ·674	·95 × ·72	·9325 × ·705
·91 × ·69		·92 × ·70	
·90 × ·69		One broken	

One nest made of rootlets and lined with wool and hair was placed in a bramble-bush a few feet above the ground, and was well concealed. The other was composed of dead grass, bents and rootlets, thickly lined with horsehair. It was very skilfully hidden in a bramble-bush growing against a rocky wall, and the nest was somewhat overhung. Young birds just able to fly were seen at the end of June.

There is not very much difference between the eggs of this species and those of the Woodchat, but in size they seem to be a trifle smaller. In colour one set was greenish-grey, heavily marked and ringed at the larger end with various shades of brown on the surface, and with shell spots of greenish grey, bluish grey, and purplish grey The other was creamy white, the eggs being blotched and spotted on the surface with umber brown and with shell markings of grey brown. The eggs were heavily ringed, though rather low down, at the larger end. If Shrikes' eggs are taken and the parent birds have not been seen, there can be no doubt at all as to the ownership of the eggs if the nests are taken or have been seen. The breeding sites are almost as dissimilar as the nests themselves.

WHAT EFFECT DOES THE ADVANCE OF CIVILIZATION HAVE ON THE BREEDING HABITS OF BIRDS?

By Capt. C. R. S. Pitman, D.S.O., M.C., M.B.O.U.

This is a very big subject, which I cannot hope to tackle except from a limited point of view, but a few of my observations and experiences will probably prove of interest. Generalizing, it appears that civilization attracts many species of the smaller passerines, and at the same time drives away a large percentage of the raptores, as well as some of the shyer game birds. Not only does it drive them away, but in many cases it brings them only too soon to the verge of extinction. But it is principally from a breeding point of view that I wish to discuss this question.

Take India, for instance, a country in which I did much egg collecting. In the small compound (garden) of one bungalow I have taken the following nests and eggs:—*Astur badius*, The Shikra; *Elanus cæruleus*, Black-winged Kite; *Milvus govinda*, Pariah Kite; *Buteo* , Buzzard; *Corvus splendens*, House Crow; *Palæornis torquatus*, Rose-ringed Paroquet; *Palæornis bengalensis*, Large Green Paroquet; *Coracias indicus*, Indian Roller; *Acridotheres tristis*, Common Mynah; *Streptopelia decaoito*, Indian Ring Dove; *Streptopelia cambaiensis*, Little Brown Dove; *Merops viridis*, Little Green Bee-Eater; *Argya caudata*, Common Babbler; *Argya earli*, Striated Babbler; *Pycnonotus leucotis*, White-cheeked Bulbul; *Arachnechthra asiatica*, Purple Sunbird. This is quite a collection in itself—and why do all these birds come into the haunts of man to breed, an operation which is usually regarded as bringing forth all the shyest characteristics in creatures? There must be a variety of answers, and among them I find: (*a*) Suitability of nesting sites, such as the great avenue trees for the Raptores and Crows, the mud-walls for the Bee-Eaters, the palm scrub for the Babblers, small trees and large shrubs for the Doves, the bungalows with their myriads of holes for the Mynahs and Paroquets, the ornamental shrubs for the Bulbuls and Sunbirds, and so forth. (*b*) Food in plenty and easy to obtain. First and foremost, if the smaller birds come in, they will naturally be followed by the larges ones that prey on them. Garbage and refuse attracts the Kites and Crows as well as in a lesser degree the Buzzards. The Paroquets find fruit and green food, seeds, etc., in unlimited quantities; insects swarm,

hence the Rollers and Bee-Eaters ; while all manner of sweet-scented flowers are an irresistible attraction to the Sunbirds by reason of the honey they contain. I have found as many as half a dozen nests of *Arachnechthra asiatica* within a few yards of each other in my compound. (*c*) I also have an idea that many birds come into the haunts of man for the sake of peace and quietness ; vermin is ruthlessly kept in check, so that to a great extent they are free from the fear of natural enemies.

In the jungles of the Central Provinces I was always very struck by the fact that, during the hundreds of miles I used to tramp during the breeding season I rarely came across many nests in the heart of the jungle ; but in the vicinity of villages several species of Doves, Munias, the Brown-backed Robin (*Thamnobia cambaiensis*), Raptores, Bulbuls, and others bred freely, while all manner of Waterfowl nested in the cover round the village tanks or up in the trees alongside them. The rare and shyer species were naturally only to be found far from the haunts of man.

Cultivation in Palestine has undoubtedly attracted large numbers of breeding birds, the principal kinds being Greenfinches, Goldfinches, Bulbuls, Doves, Spotted Flycatchers, Rufous Warblers, Spanish Sparrows and Warblers of the tribe Sylvia and Hippolais. But the most interesting of all is the little Sunbird, *Cinnyris osea*, which has been attracted to the country by the rich feeding to be had in the orange and lemon groves, and which is now said to breed in the Jordan Valley. It is only within comparatively recent years that the coastal plain has been planted out with orange and lemon groves, with almond groves and vineyards, and with large plantations of eucalyptus for firewood. All these localities nowadays are first-class hunting grounds for the egg-collector. The orange groves contain hundreds of nests of the Greenfinch, plenty of those of the Turtle Dove, and fewer of the Bulbul, Goldfinch, Olivaceous Warbler, Rufous Warbler, Sylviidae and Spotted Flycatcher. Lemon groves, where the foliage is not so thick as with the oranges, are equally favoured by the Greenfinches, but more freely resorted to by Goldfinches and Bulbuls. The eucalyptus plantations, more particularly those that have been chopped down once and are growing up again, seem to be the preserves of the Rufous Warbler, Olivaceous Warbler, and Spotted Flycatcher, while to a lesser extent Doves, Bulbuls, Goldfinches and Greenfinches breed in them. In the tall eucalyptus trees are often found huge colonies

of the Spanish Sparrow. Finally, the almond groves are the chief nesting sites of the Goldfinches, but are also much favoured by the Olivaceous Warbler. Pomegranate trees are an irresistible attraction to the Streaked Wren Warbler when he is looking for a suitable site to build his nest. Where were all these birds before civilization brought cultivation in its train? I am quite sure that few must have bred there in the olden days, as the olive trees are not a fruitful source to the egg-collector. Consequently it seems to me that the vast majority of the birds enumerated have only come to Palestine to breed within recent years. Lastly, I turn to Africa, to Kenya Colony, for still further instances. Just a year ago—I write in May—my partners and myself were commencing to clear a portion of one of our farms, 60 miles east of Elgon, preparatory to breaking the land and putting it under cultivation. Certain birds were here then, and certain of the commoner varieties were conspicuous by their absence. This May I have 70 acres under cultivation, and while preparing the land have come across many nests of our Common Pipit, *Anthus sp.*, and several of the larger Yellow-breasted Pipit, *Macronyx croceus*. These birds were entirely absent until we had cleared some of the scrub and started breaking the land, while now they are more than common, as we have provided them with suitable nesting sites and feeding grounds. The Glossy Starling, *Lamprocolius massaicus*, has also been attracted here, and was breeding freely in the holes of trees in March. Opening up the soil has evidently attracted and released large numbers of insects, as the two Long-tailed Rollers, *Coracias caudatus* and *Coracias abyssinicus*, which were formerly absent, are now quite common, and have been breeding this spring.

I have no doubt that when I have an extensive orchard going, trees planted, and ornamental gardens made, full of shrubs and all manner of flowers, that various other species will be attracted and will breed, more especially the numerous kinds of Sunbirds which are plentiful enough, but whose nests are uncommonly hard to find at present.

One has only to visit the gardens in our nearest township to see what a variety of small bird life has been attracted to them, and where, during the various breeding seasons, every bush and shrub seems to have an occupant. A bird which has not yet arrived to breed here, but which has paid us a few visits, and which is bound to come in the long run, is the African Pied Wagtail, *Motacilla vidua*.

It is probably the most homely bird out here, is very tame, likes to breed near houses or in the thatch, and has a very pleasing and sweet song, so it is quite an asset to the homestead.

OBSERVATIONS ON THE HOBBY, (*FALCO S. SUBBUTEO*).

By Norman Gilroy.

It has frequently been suggested by competent authorities that the Hobby as a nesting species in Great Britain is no doubt often overlooked. My own experience, extending over a considerable period, rather tends to disprove this than otherwise. No doubt the areas in which it is to be found have become more widely known in recent years, owing to the rapidly increasing numbers of those whose interest in wild life leads them farther afield than formerly; so that, to the casual observer, the Hobby would perhaps appear to be a commoner species than he had imagined.

But to one who has had close communion with the birds from summer to summer there is no such illusion.

In my opinion the Hobby is a species which has long affected certain areas, and from such, as is the case not only with most migratory birds, but with other Hawks, it is extremely difficult to dislodge entirely. It may disappear unaccountably for many seasons, only to reappear unexpectedly and mysteriously after perhaps a lapse of years. It is a well-known fact that certain ledges in the sea-cliffs have a nameless attraction for the Peregrine Falcon, certain spots on the hillside for the Merlin, and it is the same with the Hobby.

I have known a Crow's nest to be tenanted by a pair year by year until only the shell remained, when a move was made to a more substantial nest in a tree a few yards off.

The breeding range of the Hobby does not appear to extend, although the number of breeding pairs may increase in an established area, as was undoubtedly the case during the years of the war. From some districts, of course, the birds may be compulsorily driven—by the felling of trees, by the extinction of the Carrion Crow which provides in my estimation fully 98 per cent. of the necessary nesting accommodation, or by the wanton and useless destruction year after year of the birds themselves and their broods.

Generally speaking, the areas outlined by Saunders in his Manual

are admirably exact, although in many of them the Hobby is very rare as a breeding species and does not increase.

It is somewhat curious that in many instances where there are wide tracts of suitable country actually bordering on "inhabited" areas, one so seldom finds a nest outside a certain limit. There are also districts where such suitable country abounds for miles, and where the Carrion Crow breeds unmolested, but where no Hobby exists, or for that matter (as far at least as one can reasonably ascertain) ever has existed.

The Hobby is one of the last of our migratory birds to arrive, seldom reaching us much before the middle or even the end of May. It is generally reputed to leave in September, but I have on many occasions seen it in October and even November (possibly birds of the year), whilst it has been reported in January, so that I have no doubt odd birds remain with us throughout the winter.

I have found that newly-arrived birds do not always go direct to their breeding haunt, but often a pair will take up a temporary residence in a wood some distance off; here they will remain until a day or two before the actual nesting. For this reason their sudden disappearance is sometimes an unconscious cause of safety, the nesting site being perhaps three or four miles away.

It is during this transition period between arrival and nesting that the Hobbies may be seen at their best; after the eggs are laid they become much more cautious, except in rare individual cases. They are not unreasonably shy, and may be seen sweeping and diving through the air, sometimes at an immense height, chasing one another playfully and occasionally uttering the rather weak, Wryneck-like cry. The long sickle-wings, comparatively short tail, and "high" shoulders (which gave to the species the old name of "gibbosus," or hunchbacked), are an easy mark for the skilled observer. And if the sun be shining, the white cheeks, jet "moustache," and blue-black back can be discerned at a considerable distance. When in search of prey close to the ground, the flight and motion of the wings are curiously "swinging."

Although a great proportion of the food consists of dragon-flies and the larger beetles and moths, the Hobby is a terror to the Skylark, which it captures with extraordinary skill and velocity. There is no chase as with the Sparrow Hawk or Merlin—one or two swift stoops, a slight turn upwards, and a "click" which can almost be heard!

The Hobby almost invariably chooses for its eyrie the disused nest of a Carrion Crow—preferably one of the year from which either the eggs have been removed earlier in the season or the young have flown. No alteration or preparation whatever is made in such nest, although it has been confidently asserted by some observers that the lining of wool is entirely removed. In the event of an older nest being occupied, from which the wool from various causes has disappeared, the hollow may be slightly rounded, but no addition of any kind is made.

I have on three occasions found the nest of the Hobby in an inhabited rookery.

The site chosen is nearly always one which commands a wide outlook over open country, and a clump or belt of trees is preferred to a large wood. When in the latter, the nest is usually on or close to the edge or in a clearing. I have never personally found one in the middle of a wood, although I am aware that such have very occasionally been recorded, and I know a district in Gloucestershire where the single pair of Hobbies almost invariably occupy a nest in a hedgerow elm or oak in a quiet valley.

The Hobby seldom has a full set of eggs before June 19—often not until June 30, or even the first few days of July. I have, however, once found a set on June 12, but I consider this to be exceptional.

Should the first eggs be taken, the Hobby will very exceptionally lay a second time. I have indisputable evidence of this; but careful observations taken over a number of years have tended to make me a little sceptical as regards the percentage of birds which do so.

In England the normal clutch of eggs is three. I have once seen four, and I am informed that another well-known authority has had a like experience; these are the only recorded instances. Clutches of two, however, are not infrequent. The eggs vary considerably in size; they are generally larger than those of the Kestrel, but often smaller. There is an appreciable variety in the colouration of individual clutches, but as a general rule eggs of the Hobby are unmistakable, notwithstanding anything that may have been stated to the contrary.

The behaviour of individual pairs of Hobbies at the nest varies. At certain times of the day the cock is generally to be found at rest in a tree close to the nest, leaving when an intruder is some distance

away. His departure frequently warns the sitting hen, which slips off quietly, and both birds disappear. Sometimes the hen sits very closely, even when she has only one egg, and will not leave the nest until the tree is struck violently. Occasionally one or both of the birds is aggressive or noisy, but such instances are rare. Generally they either soar overhead or fly right away out of sight, although they will return with almost uncanny speed should a marauding Crow appear on the scene.

It would, I think, be against the best interests not only of this charming and attractive little Falcon, but also of those to whom our rarer species mean so much, to particularise the areas in which most of my notes have been taken; but I may perhaps conclude by observing that, given reasonable treatment, the Hobby is in no immediate danger of extinction.

MORE LIGHT ON THE HABITS OF THE CUCKOO.

By The Editor.

Mr. Geo. J. Scholey has again made some far-reaching observations with regard to his "Wagtail-Cuckoo," and the results were fully described and illustrated with most excellent photographs in the "Graphic" of 5th and 12th August last. As perhaps many of our readers missed seeing them we propose to quote at length, but no doubt the back numbers of the "Graphic" could be ordered through newsagents if required.

Mr. Scholey's Cuckoo has rather out-heroded other Cuckoos in her desire to secure nests for her eggs at the right periods. Of her Mr. Scholey says: "To provide nests for her subsequent use the "Cuckoo at once proceeded to destroy the nest containing the in-"cubated eggs, but unfortunately for herself the entrance hole to "this nest was too small to admit her. She remained at the "entrance and kept the Wagtails from entering, with the result "that the eggs got cold and the Wagtails deserted.

"For observation purposes, I removed the stone blocking the "entrance, and she at once availed herself of the opportunity, "entered the hole and raided the nest. She broke all the eggs it "contained.

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"The particular pair of birds (Wagtails) set to work and rebuilt "another nest—for what?—only to receive the Cuckoo's egg eight

"days after she had plundered the first nest! Exactly the same "thing happened with the pair of Wagtails with the nest of young. "The evening after she (the Cuckoo) had destroyed the nest of "incubated eggs, she came over, went straight to the nest of young "Wagtails, pulled them from the nest, and left them to die on the "cold stones in which the nest was built. The Wagtails immediately "commenced building, and had a completed nest with one egg in "a week, only to receive the egg of the Cuckoo at this stage."

Mr. Scholey satisfied himself that "when the Cuckoo could "squeeze herself into a Wagtail's nesting hole she would sit on the "nest and lay her egg in normal fashion, but where she could not "do this the egg was deposited by the bill."

This particular Cuckoo took an extra egg from a nest when she wished the Wagtail to continue laying and postpone the commencement of incubation, and thus have the nest ready for her egg at the right time. "Once," says Mr. Scholey "the male ate an egg and "removed another, which he swallowed, to a near bank in occupation "of the female."

Mr. Scholey contends that, "It is a fact that a female Cuckoo "will dominate a certain territory, driving away any others that may "require the territory for egg-laying purposes. On several occasions "this female Cuckoo received visits from her mother who had used "the same territory in previous years, and when these visits were "made, there was a battle royal. The old mother did, in fact, outwit "her on three occasions and deposit her egg in or near the quarry."

Another interesting sidelight on this game of hide-and-seek:—"It was very noticeable towards the end of the season to see how "completely the Wagtails were sick of the continued attentions of "the Cuckoo. As soon as they commenced to build, the Cuckoo "found the nests, with the result that the Wagtails left them and "restarted to build. Two pairs of birds each made three attempts "to nest before finally settling down, and then they received the "eggs of the Cuckoo in spite of their endeavours to outwit her."

The particular Cuckoo under Mr. Scholey's observation this year laid 14 eggs in the chalk quarry, and his work was so thorough that we must believe that he accounted for all of them. He had made most of the nesting sites before the commencement of the season, and these were provided with both entrance and exit, for a Wagtail, he says, "loves a nesting site where it can enter and leave "by separate holes, if necessary."

CLIMATIC CONDITIONS IN THE ARCTIC AND NEW POSSIBILITIES OF ARCTIC TRAVEL.

By The Editor.

The Arctic has a great interest for all oologists and we propose to quote at length from an article by Vilhjalmur Stefansson in the August issue of the "National Geographic Magazine" (Washington). The object of Mr. Stefansson's article is to point out the great advantages of the transarctic route for inter-continental air travel in summer, and he looks to a time when it will be crossed in many directions by regular air routes, for which repair and supply stations will be established at convenient points. The opening up of the Arctic in this manner would be of great scientific interest to oologists and enable those with leisure to visit spots that are at present quite inaccessible except to an expedition specially equipped for the purpose. But many of our readers will be still more interested in what Mr. Stefansson says about the climatic conditions of the Arctic regions, and the accessibility of many spots of peculiar oological importance.

"The map of the Northern Hemisphere," writes Mr. Stefansson, "shows that the Arctic Ocean is a huge Mediterranean. It lies "between the continent somewhat as the Mediterranean lies "between Europe and Africa. In the past, it has been an impass- "able Mediterranean. In the near future, it will not only become "passable, but will become a favourite air route between the con- "tinents, at least at certain seasons—safer, more comfortable, and "consisting of much shorter "hops" than any other air route that "lies across the oceans that separate the present-day centres of "population."

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". . . in the summer season at least it will be thought an "absurdity for those in a hurry to go from England to Japan by "way of either New York on Montreal. They will fly by way of "the North Cape of Norway and Novaya Zemlya."

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"The airman may change his wind from fair to foul by raising "or lowering his craft. It is, therefore, impossible to say now "just where the transpolar air routes will lie, and indeed they will "probably always vary from day to day. But, wherever they lie, "they are sure to be advantageous commercially and popular with

"passengers, at least during the season corresponding to that in "which the tourist of to-day sails to Alaska or Norway or Spitz-"bergen to see the midnight sun."

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"The first advantage of the Polar route is its shortness. The "most practical route (from England to Japan) of the recent past "has led from England by way of ocean steamers to Montreal, "the Canadian railways to Vancouver, and then by the northerly "steamer route along the Aleutian Islands to Japan. This route is "approximately 11,000 miles from Liverpool to Yokohama. But "the distance from a railway terminus at the north of Great Britain "to the north end of Japan proper, where railway travel could be "again resumed, is by air route only 4,960 miles, or about half the "present regular route between the two countries."

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"Economy in hydrogen is the second important advantage "of the Polar route. . . Paint the bag silver or any colour "you will, the amount of heat locally generated by the sun's rays "striking the dirigible is great. The hydrogen expands, and there "is no practical way as yet conceived which can avoid the loss of "gas.

"You can avoid a bursting of the bag only by allowing the gas "to escape. This is the chief factor which limits the length of "balloon voyages. A certain amount of gas is lost each day and "reciprocally a certain amount of ballast has to be thrown out each "night to prevent the balloon from settling to earth.

"But the alternation of day and night, which seems a necessary "evil to those habituated to southern latitudes, is not a factor in "the Polar regions, whether in mid-winter, when it is always dark, "or in mid-summer, when it is always light. We shall, for the "present, consider only summer journeys."

Mr. Stefansson then enlarges upon the third great advantage of the route—the perpetual daylight. So often in a mishap at sea all efforts are rendered futile by the fact that all lights are extinguished when the disaster happens.

The fourth great advantage lies in the presence of the enormous ice-floes, seldom more than a few miles apart. A forced descent to open water would be robbed of the greatest perils attending such a thing in mid-Atlantic for "one effect of scattered floes is that "even in a gale there are no heavy seas. Indeed, if the ice is

" abundant, no swell is noticeable in the heaviest gale, and the " waves on the patches of open water are only such as one may " find on a pond or a small lake."

Mr. Stefansson points out, too, that an ice-floe is by no means such an inconvenient place of refuge as we might imagine.

" To people little acquainted with the Arctic, as most of us are, " and misinformed, as nearly all of us are, there appear to be many " arguments against the Polar route. Few of these rest on any " reality. Indeed, where we imagine positive difficulties there " may be positive advantages. Take, for instance, the matter of " summer temperature.

" We have all of us learned in school that, per square mile per " hour, there is more heat received from the sun at the earth's " Equator than anywhere else; but in the minds of most of us " this truth is only a half-truth, and therefore the most dangerous " sort of error, for we have commonly failed to grasp its inter- " pretative corollary, that while each hour of sunlight brings most " heat to the Equator, the hours of sunlight per day in summer " increase in number as we go north.

" This would give a perfect balance if the sunlight lengthened " proportionally as the heat per hour lessened. That is not the " case. As you go north, the length of day in midsummer increases " more rapidly than the amount of heat per hour decreases; so " that, although the heat per hour received at Winnipeg is less than " it is in New Orleans, the amount of heat received per day is greater. " That is one reason why Winnipeg is frequently hotter than New " Orleans in July.

" For something like five weeks every summer, more heat per " day is received from the sun on a square mile in the Arctic than at " the Equator. If the North Pole were located on an extensive " low land, remote from high mountains or any large bodies of water, " it would be about as hot as the Equator on the fourth of July. " There is, however, at the Pole, and in many places in the remote " north, a local refrigeration that tempers what otherwise would " be unbearable heat. The winters are long, and under certain " conditions a great deal of ' cold ' may be stored up.

" In the Polar basin we have an ocean thousands of miles across, " and thousands of feet deep, and all this water during the long " winter is chilled to the vicinity of 30° Fahr. above zero.

" There is also a certain amount of ice floating around on the

" surface. We have, therefore, a vast store of ' cold ' to neutralize " the terrific downpour of the summer sun's heat, and it is probable " that the air ten feet above the middle of the Polar ocean is seldom " warmer, even in July, than 50° or 55° Fahr. above zero. Higher " up it would be somewhat warmer.

" This means that conditions of flying, so far as temperature " is concerned, would be about the same over the Polar ocean in " July as they would be in France or England in late winter or early " spring.

" Greenland is peculiar among the Polar lands, in that its great " altitude enables it to store up a large amount of ' cold.' In a few " other northerly islands there are glaciers of moderate size (Franz " Josef Island, Spitzbergen, North Devon) and glaciers of inter- " mediate size (as in Ellesmere Island and Heiberg Island), but " there are vast areas of Polar lowlands where the little snow that " falls in winter (commonly much less than the snowfall of Vermont " or Scotland) disappears like magic in the early spring, and where " the sun beats down for month after month upon a soil clad with " vegetation.

" We can take it for certain that there is far less permanent " ice and snow in the lowland of North Siberia than there is in the " mountains of Mexico. It is even possible that tropical Africa, " with its one or two snow-clad mountains, contains more permanent " snow than do all the lowlands of Arctic Siberia.

" In Arctic Canada we have ice-free lowland everywhere except " in the Yukon.

" In Siberia and Canada there is, therefore, an aggregate area " much larger than the whole of the United States, where there is " no stored-up ' cold ' to moderate the heat of the Arctic daylight, " except the slight chill of the frozen sub-soil. This is kept from " having much effect on the air by the insulation over it of the cloak " of vegetation.

" Accordingly we find that at Fort Yukon, in Alaska, north " of the Arctic Circle, the United States Weather Bureau has " recorded the temperature of 100° in the shade. No thoughtful " person will, therefore, suppose that transpolar air journeys will " in summer be interfered with by low temperatures. Neither will " it be uncomfortable because of extreme heat, for that can be " regulated by the airship's rising high enough into a cooler air.

" It is true that parts of the Polar regions are given to summer

" fogs, but fogs lie low over the ocean and presumably, the dirigibles
" and airplanes would navigate in the clear sunlight above them.

* * * * * * *

" . . . base stations will be supplied by railways, by ocean
" steamers, or by river steamers. A glance at the map of the
" Polar air routes shows that they require few long jumps between
" places that are now reached with fair regularity by ocean or river
" steamers.

" How accessible are many of the seemingly remote fur-trading
" outposts of Arctic Canada and Siberia few of us realize.

" It would take only about 25 days to make the journey to-day
" from New York to the mouth of the Mackenzie, 200 miles north
" of the Arctic Circle in Canada, and regular railway and steamboat
" tickets could be bought, if not in New York, at least in Winnipeg
" or Edmonton.

" Under normal peace-time conditions a similar surprise would
" await those who desired to reach the north coast of Siberia, by
" journeying in steamers from the Trans-Siberian Railway down one
" or another of the great north-flowing Asiatic rivers.

" It goes without saying that where the air route touches the
" north of Norway or the north Pacific coast of Asia, the problem
" of supply is even simpler.

" The islands that dot the Polar ocean will, obviously, become
" important relay stations on the various transpolar routes.

"It may be said about them in general, and about the north
" coasts of Asia and America, that they are now far more easily
" accessible by steamer than the public realizes. This accessibility
" will be doubled by improvements in our ice ships, and by the
" increase of skill and decrease of fear on the part of our sailors.
" It will be doubled again by the location at difficult points of
" wireless stations to give captains advance news of ice conditions
" and by pilot airplanes to pick out ice-free routes that ships may
" follow.

" It will be so easy for ships to supply the strategic points in the
" polar regions that few of the Polar airways will have to be far
" diverted from the theoretically preferred short routes to seek out-
" of-the-way places to get petroleum or other supplies.

" As the cereal belts of middle Canada and middle Siberia are
" increasingly cultivated, great cities will grow up nearer and nearer
" the Arctic. Thirty years ago Edmonton, for instance, was a

"village supposed to be too far north ever to become anything but "what it was, a fur-trading post; to-day it is a city of 60,000 "inhabitants. The oil-fields of the lower Mackenzie, where the "Standard Oil Company has extensive operations, and the copper "district, north of Great Bear Lake, already hold a definite promise "as commercial centres.

"It may be of little beyond academic interest this year that the "air route from the northern railway terminus on the Athabasca "River north of Edmonton to Archangel, in northern Russia, is "only 3,946 miles; but as the railway continues to push its way "northward through Canada this route between railheads on oppo-"site continents will gain in importance as it becomes short, and as "the communities that depend upon it grow.

"Steamers have been running to the mouth of the Mackenzie "for several decades already. The journey from the present "railhead to the mouth of the Mackenzie can even now be made in "fifteen days. It is significant, therefore, that from the mouth "of the Mackenzie the air route by which one may penetrate the "interior of north-eastern Siberia through the great rivers of the "Kolyma system is only 1,541 miles by way of Point Barrow and "Wrangel Island, and that the longest hop, from Point Barrow "to Wrangel Island, is only 450 miles.

"By branching off at Wrangel, you can reach the mouth of "the Lena, one of the world's greatest rivers, in a total distance "from the Mackenzie's mouth of 2,208 miles, and with the longest "single hop, from Wrangel Island to Holy Cape, of about 750 "miles.

After discussing the advantages of other routes, the writer continues: "To get a greater benefit from the perpetual daylight "of the Arctic summer, a route might be laid from Scotland to "the east tip of Iceland; thence by way of Jan Mayen Island, "the summer hotel already established in Spitzbergen; then "Franz Josef Land, Emperor Nicholas II Land, or Cape Chelyus-"kin, and thence overland to Japan.

"This route is only a few hours' flying longer than the shortest "possible route."

* * * * * * *

"As the centres of population continue to move north in Canada "and Siberia, the importance of the transpolar air routes will "correspondingly increase.

"Whoever grasps at all the vast natural resources of the Polar "lands and seas, and understands the conditions under which "they are already beginning to be developed, will have fascinating "dreams about any number of transarctic air routes destined to "come into everyday use whenever air travel in general becomes "a commonplace on the more dangerous and difficult, but already "speculatively accepted, routes between Liverpool and New York, "San Francisco, Hawaii, and Japan."

We hope our readers will not consider that we have strayed too far from oological matters, but we have seldom seen a more interesting and at the same time authoritative article on the future possibilities of travel in the Polar regions, and of the climatic and other conditions which obtain there generally.

Those who desire to read the article in its entirety should remit 54 cents by Money Order to the National Geographic Society, Hubbard Memorial Hall, Washington, D.C., U.S.A., for the August number of the Society's Magazine. The subscription for the year is 4 dollars. Though the circulation of the magazine is certified at 750,000 it is little known in this country.

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ORNITHOLOGICAL WORK IN THE ARCTIC REGION.

By the Rev. F. C. R. Jourdain, M.A., M.B.O.U., H.F.A.O.U.

The conditions under which ornithological work must be carried on in the high north are so different from those prevailing in the temperate zone, that a few words based on personal experience may be of interest at any rate to those who contemplate work in the Arctic at some future time. There are many collectors whose wanderings have hitherto extended only to the more or less civilized European countries, where they have worked with some measure of success. In such cases it is possible to map out a tour with tolerable accuracy a month or two beforehand, and one can form a very fair idea of the species one is likely to meet with, and the probable results of the trip. Knowing the approximate breeding dates of each species, and where it is likely to be met with, one can go further and arrange one's time-table to coincide with nesting season of the birds in which one is most interested. There is also a natural tendency to visit any well-known bird haunt, and to avoid the less productive districts, so that often a regular succession of visitors work over the same field year after year. While the actual collections made by each man are probably larger than would be the case if each worked out his own line, the net gain to ornithological knowledge is considerably less, and the worker who strikes out a new field of exploration must be prepared for possible temporary failure as regards tangible results.

In the Arctic, however, the first thing which forces itself on one is the utter impossibility of attempting to adhere to a cut-and-dried programme. Climatic and weather conditions vary so much from season to season, and even from day to day, that the first condition of success is the power to adapt one's plans to circumstances, and to take advantage of opportunity. This is the case even when the explorer is in the happy position of having his own base in the form of a vessel of some sort at his disposal. If, on the other hand, he has to rely on others, he must be prepared for

innumerable disappointments and heart-breaking delays, and may find his whole season wrecked through no fault of his own. Needless to say, it is an enormous advantage to know exactly what every one has seen and done before one, and this can never be done satisfactorily by the study of English works alone. Scandinavian, German, and, in many cases, Russian literature must be carefully digested and stored up for future use, and in practice one frequently finds that little items of knowledge which appeared to be utterly valueless at the time they were acquired, suddenly become deeply significant, in view of new facts which gradually fill up the gaps and lead to fresh discoveries.

There are two factors in all work in the far north which tend greatly to simplify the work of the pioneer, namely, the shortness of the period during which it is possible for birds to breed, and the restricted amount of possible nesting ground. In temperate Europe the normal breeding season lasts for about seven months of the year, and there is no month in the year in which some species of bird has not been known to breed. One can open the season by marking down nests of Bearded Vulture in December or January, and go on steadily up to July, while late broods may be found through August and occasionally even later. But in the far north winter does not relax its grip till late in May, and few birds venture to lay before the end of May or early June, while by mid-July, the egg season is practically over. Then the interior, at any rate on the higher ground, is often covered by snow throughout the year, and it is only along the coastline, and in the lower and more sheltered valleys, and on islands, that any animal life can exist. As practically everything depends on the sea for food, the nesting sites are usually not far away. Other characteristics of the northern fauna are the tendency to breed in colonies or in close association with other species, and the very pronounced preference shown by breeders on low-lying ground for islands or peninsulas as a protection from the depredations of carnivorous mammals, such as the Arctic Fox. The paucity of species also greatly tends to simplify the work of the ornithologist and oologist, as one soon grows familiar with the appearance and notes of the very few birds which are really common.

All these circumstances favour the explorer, but there are many others which weigh heavily in the scales on the other side. Cold is not as a rule severe during the summer months, but when com-

bined, as it occasionally is, with wet it forms a very serious handicap to field work. Luckily precipitation is light except at certain definite points, where cold and warm currents meet. Roads, of course, are unknown, and the going may be tolerable, but is more frequently execrable. Every river (and their name is legion) has to be waded, and even if one's boots do not take in water at first, sooner or later it is sure to find its way in over the tops. Wading in marshy ground for hours together, especially in a biting wind, is also an over-rated amusement. If an expedition is made to any distance from one's base, besides the usual impedimenta in the form of collecting-boxes, field-glasses, cameras and at times ropes, ice-axes, etc., a sufficient supply of food must also be carried, as generally there is no possibility of replenishing one's stores. The innumerable glaciers form a very serious obstacle to a small party attempting to follow the coastline, and even when working from a ship there are many places where the lack of anchorage may render it necessary for her to seek shelter on a sudden change of wind. Meantime a shore-going party may thus find themselves completely isolated, perhaps for a day or two, and, unless a reserve store of provisions and sleeping-kit has been taken, may be reduced to great straits for a time. Navigation in the neighbourhood of the pack requires the supervision of an ice-pilot, and also necessitates a type of ship specially built to stand ice pressure, and the ordinary iron ship would be quite useless under these conditions. In working along little-known coasts where there is much ice there is also the possibility of getting hemmed in by ice, and forced to winter there—an experience few people would care to go through without ample previous preparation.

There is also a great tendency for the bird-life to be concentrated in certain spots, and it is rather a depressing experience to walk for miles up some wide valley, fairly free from snow and apparently offering plenty of possible nesting sites, and yet scarcely to see a bird of any kind, except perhaps the distant speck of white on some scree which marks the presence of the ubiquitous Snow Bunting, or a Purple Sandpiper, inconspicuous and indifferent to one's presence, quietly feeding among the lichen-covered stones.

One point still remains to be mentioned—to my mind the greatest attraction of the Arctic—the never-ending day. The feeling that time has ceased, and that day and night are purely arbitrary terms, combined with the exhilarating effect of the pure

air, inspire one to exertion which would be impossible at home. While the memory of the endless tramps, footsore and weary, over snowfield and sodden tundra or sharp screes becomes more and more dim, the recollection of the Arctic sunshine flooding the snow-capped hills and glaciers, with the still waters of the fjord at their feet, forms a mental picture which is unforgettable

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OBSERVATIONS ON THE COMMON CROSSBILL (*Loxia c. curvirostra*).

By Norman Gilroy.

It was in what is known as the " Breck " district of East Anglia, —the wide area of sandy flint-strewn warrens on the Norfolk and Suffolk borders, through which the Little Ouse winds lazily, and of which the endless belts of Scotch firs, not only bordering the roads but binding the fields and woods themselves, are so prominent a feature—that I first came into somewhat mysterious touch with the Crossbill. Up to that time—I think it was 1901—the Crossbill was a species to which I had given only a passing thought. I had looked upon it as a bird which was little more than a casual visitor, breeding no doubt from time to time in odd localities at extraordinary times of the year, and I had relegated it to the extreme background as far as my own observations were concerned.

Then, on a visit to Norfolk in late April, 1901, I saw two young birds being fed by their parents in the middle of the road. They were nearly fully fledged, but I managed to catch one of them, and the distress of the parent birds was unbounded. The cock actually pitched on my arm, and I knew then that I had stumbled unwittingly on a species that was almost outside my scheme of things.

There was an intelligent shepherd whose acquaintance I had made, and I determined to consult him on the matter. To my astonishment he informed me that, to his own knowledge, the Crossbill had always bred in the district, and that a year never passed but he either found the nests or saw the young of at least two or three pairs, generally in February or March ; in fact, that the Crossbill, like the Stone Curlew and the Woodlark, was one of the typical birds of the countryside. My main object in making

these preliminary observations is really to suggest an undoubted continuity of the Crossbill as a breeding species in a particular area, and to deprecate the opinion expressed by some writers that it is sporadic as regards its nesting distribution.

I met with fully-grown broods of Crossbills in the district every spring until 1910—the year of the great irruption—but I was never there early enough to find the nest. In 1905 I found several nests of *Loxia c. scotica* in Inverness-shire, but it was not until 1910 that I actually found my first nests in East Anglia; then, from 1916 until the present year 1922, I found them annually, sometimes as many as ten in a season.

One has only to know the Crossbill—to meet with it on a sunny day in February in these fir-belts of nameless attraction—to appreciate its charm. There are few birds so calm and confiding, and at the same time so excitable and so joyous. From May or June onwards the Crossbills may be met with in small parties of old and young, although throughout the year there are always a few isolated pairs which keep strictly and curiously to themselves, seldom seeming to wander far from a remarkably restricted area. The little parties—in my experience seldom more than 10 to 13 strong—are restless and often noisy, feeding rapidly and moving swiftly from place to place. The isolated pairs, on the other hand, seldom betray their presence, and only the initiated may become aware of it. It is true that at all seasons of the year the cock will occasionally break into song; but this song is of so peculiar a timbre that, except in the spring when it is very much louder, it is very easy to overlook. For the last few years I have generally made a practice of visiting the Crossbill country about the second week of January, and continuing my observations until the early part of April. The birds are extremely difficult to see, and their presence is most easily located by listening either for the crackling sound produced by the extraction of the seeds from the fir cones, or by the dropping of the cones themselves to the ground. The Crossbill nearly always feeds near the tops of lofty trees, but I have frequently met with them in plantings of young firs, and they are so ridiculously tame that they can be watched with ease and at leisure. I have found that they seldom feed in the immediate neighbourhood of the nest, although I have no doubt that in the red-letter year 1910 this peculiarity was not so apparent on account of their great numbers.

On sunny days in the late winter and very early spring the cocks sing in a particularly bright and lively fashion, generally from the extreme top of a very tall tree, but often from a dead branch within a few feet of the ground. The song, which is sometimes accompanied by a passionate shaking or even flapping of the wings after the fashion of a Starling, is a little difficult to describe, but at once proclaims itself to the practised ear. It has a number of curious, soft, at times almost inaudible phrases, reminiscent of the Bullfinch or the Starling, into which from time to time a few loud and not unmusical notes are somewhat oddly interjected, the effect of the whole being curiously pleasing and attractive.

The alarm note, which is absolutely unique and unmistakable, is extraordinarily penetrating, and can be heard from an immense distance. It consists of a clear, metallic and insistent "Chip-chip-chip," rapidly and frequently uttered, and at the nest deeper and more intense. Once heard, this note of the Crossbill can never be mistaken or forgotten.

The Crossbill is extremely fond of water in every sense of the term; it drinks continually, and even on the bitter January days, when only the tiniest spaces are free from ice, will wash vigorously and with obvious enjoyment over and over again.

Although I have on two occasions seen young just out of the nest, and on a third young almost fully fledged before January 20, I have never personally found a nest in that month. The earliest nest I have ever found was on February 10, 1910, which contained four considerably incubated eggs. On February 16 in the same year I found a second nest with five eggs—a very rare clutch—these eggs being quite fresh. On February 23, 1919, I found three nests containing two, one and three eggs respectively, the last-mentioned being on the point of hatching. On February 19, 1921, I found a nest with three eggs which were chipped for hatching, and on the same day watched a hen Crossbill building, the nest being about half-finished. On February 24, 1922, I had a message from a keeper that he had found a nest with four eggs on which the bird was sitting hard, but on visiting this nest on the following day I found that the young were hatched. Later in the day, however, I found a second nest with four eggs very slightly incubated.

These are my earliest records of the nesting of the Crossbill; by far the greater number of birds under my observation have

nested between March 1 and 21. Early nests often appear to take a very long time to construct, especially in the initial stages. One may come across a pair of birds apparently feeding quietly, when, quite suddenly, the hen will creep to the end of a branch, clip off a dead twig with her strong bill and fly off with it, the motion of her wings being extraordinarily loud and rustling. She can be easily followed to the nest, and the operation watched perhaps half a dozen times, when she will just as suddenly stop and do nothing more for the rest of the day. After the foundation and the outer rim of dead twigs are put together, building proceeds a little more quickly. Moss and grass are collected from the ground, often from the same spot; repeated journeys are made, the hen being invariably accompanied by the male, who takes no part, however, in the actual building of the nest. Most nests, too, contain as a portion of the lining thin strips of the outer bark of the elder, and it is interesting to watch the hen Crossbill peeling the elder twigs with a considerable amount of care, and quite oblivious even of the near presence of an intruder. Occasionally feathers are added, but not many; and the nest when complete, although somewhat loosely put together, is singularly compact and even imposing. The nest of the Crossbill is quite unmistakable even in May, when many Greenfinches are nesting in similar situations.

To refer again to the time taken in the construction of the first nest: In 1922 I found a nest absolutely ready for eggs on March 1; on March 8 it had apparently been deserted, but late in the afternoon I saw the hen enter it with a single feather in her bill. A fortnight afterwards the eggs were laid.

I have generally found that in East Anglia the nest of the Crossbill was built at a great height from the ground, frequently from 40 to 60 feet, and was often inaccessible even with ladders. On the other hand, I have on many occasions found nests within easy reach, even when far out on the branches. The nest is usually placed on a horizontal branch, sometimes at the extreme end and nearly always well away from the trunk of the tree. Sometimes, however, it is right against the stem, and occasionally at the extreme top. As a rule it is very easy to find, the cock giving away the secret either by feeding his sitting mate, by singing constantly in its immediate neighbourhood, or by becoming quite unnecessarily alarmed and "chipping" without reason. The nest

is seldom intentionally concealed, and the female sits so remarkably closely—her large head and forked tail being generally plainly visible—that it cannot possibly be mistaken for an old one. The most conspicuous feature about the nest of the Crossbill, however, is the invariable presence of white patches of excrement on the rim. This may be found even when the eggs are quite fresh, and I do not recollect having seen the matter referred to before.

The normal clutch of eggs of the Crossbill is four, but sets of three are not uncommon, especially in early nests. Clutches of five are exceedingly rare.

I have referred above to the extraordinary way in which the Crossbill will sit. It is sometimes quite impossible to get her to move, and I have over and over again lifted a bird off her eggs.

In these notes I have made only a passing reference to the great irruption of the Crossbill in 1910. Unfortunately in early March of that year I had to go over to the United States, so that I lost what was probably a unique opportunity of studying that wonderful visit. Such irruptions, however, are periodical, not only with the Crossbill but with other species, and I hope that should another such take place in our time I shall be here to observe it.

I think that probably East Anglia is one of the very few areas in which the Crossbill is a resident in England, and I shall be grateful for any information which may cause me to alter my opinion. Of course, in many counties of Ireland it is resident and not uncommon, but as far as the southern half of Great Britain is concerned I don't think we have a great deal to learn.

A MULTIPLE-UNIT EGG CABINET.

A very interesting and ingenious cabinet has been designed by one of our subscribers, Major A. G. L. Sladen, and executed by J. Hill and Sons, of Yewfield Road, Willesden, N. The accompanying illustration gives some idea of its construction. It is, in fact, a multiple-unit system which can be expanded or interchanged at the will and convenience of the collector. It is built up of—

(1) A body section so arranged that it will take any drawers

in multiples of ½-inch sizes from 2 inches to a total depth of 21 inches.

(2) A moulded top to go on top of the body section.

(3) A plinth for the section or sections to stand upon.

(4) Glazed drawers, from 2 inches to 5 inches deep over all, in graduations of ½ inch. The actual space for eggs in each drawer is about ⅝ inch less than the total depth over all.

It will be seen that to a collector who is beginning to form a collection a cabinet of this type is an invaluable accessory. How many of us have, with a growing collection, had to scrap our first cabinets to gain uniformity when the collection has outgrown them? How often, too, the second lot have had to be replaced by a third, with all the attendant work of rearrangement. Finally, how many collections are there that can boast of uniformity and systematic arrangement *throughout*? We think they could almost be counted on the fingers. But with the multiple-unit system all these difficulties disappear, and the man of moderate means need not wait until he can afford to buy sufficient for his total requirements. He can begin with one body section, a top and a plinth; and he can buy his drawers one by one to fill it if he so desires. The makers aim at keeping a stock of these standard drawers, and at maintaining always a minimum price which will be kept as near as possible to what they hope will be the falling cost of production.

The accompanying photographs show a single body section complete with top and plinth, and with the front shutter and some of the drawers removed; and two body sections also with top and plinth, and with both front shutters in position. It will be seen that three or more body sections can be superimposed if so desired, or a new cabinet can be begun to stand next to the first. The cabinet shown is flush-sided, but a complete end panel can be fixed on the outside cabinet of a row. The carcase work is of oak, and the drawers are of mahogany with an inside lipping to allow of the cotton-wool being tucked in around the edge. This lipping also allows for the stringing system of divisions inside the drawer. This system was originally thought out and invented by Major Sladen, and has since been adopted by other collectors. It consists of stringing the drawer into the required size of square very much like a tennis racquet, the string being brought higher or lower towards the glass, according to the size of the eggs.

A jeweller's sheet of cotton-wool is then placed over the string and tucked in at the edges. When the clutches are placed in the squares they are, as it were, slung in a spring hammock, with a wide and uninterrupted air space underneath, and owing to the action of the string each fresh clutch that is added balances the pressure on the other clutches throughout the drawer. It is significant, too, that no single case of mildew has been reported from a strung drawer, although it has occurred in wool-filled drawers in the same collection. This is undoubtedly due to air circulation below the eggs.

Of course, much of the success of a system such as this depends upon the ability of the makers to ensure absolute uniformity, but from what we have seen of their work we think there is nothing to fear on this score. They anticipate, moreover, that if the cabinet becomes at all generally adopted, the demand for drawers will enable them to turn out considerable quantities of each size at a time thereby very materially reducing the price.

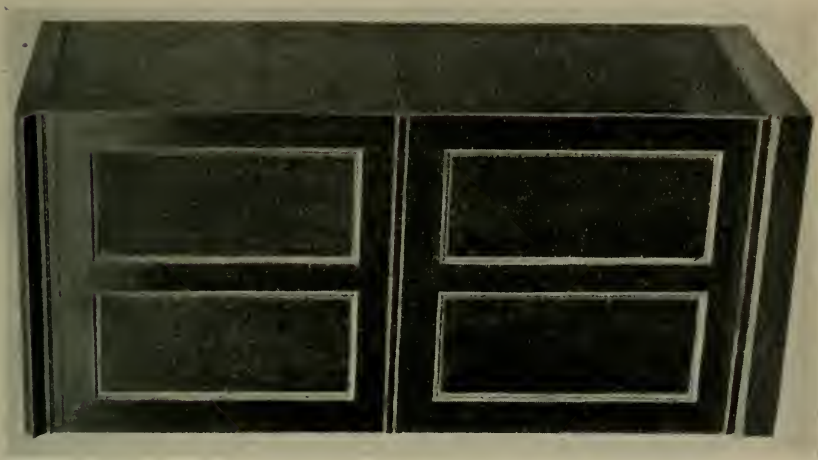
THE NUCLEUS OF A COLLECTION OF THE EGGS OF THE *FRINGILLIDAE.*

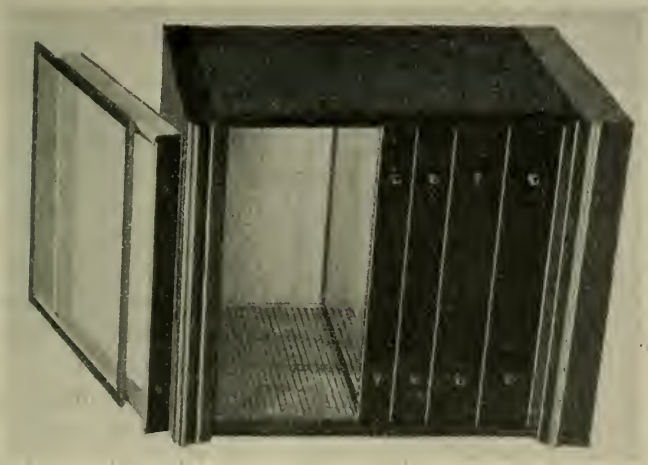
By K. L. S.

Some time ago I referred to the advantage of specialisation in Oology, as opposed to the accumulation and study of the eggs of many different groups, and having made some progress on the lines indicated, I propose to enumerate the 280 species, comprised in 80 genera, now represented in my collection of the eggs of the *Fringillidæ.*

The late Dr. Nehrkorn, who bequeathed his collection to the Berlin Museum, had eggs of 412 species of this family, but it must be remembered that he was satisfied, in almost every case, with one single specimen.

When I commenced the collection, about the year 1913, I thought to confine it to the Buntings, but I found it difficult to draw a line dividing them off, and also was loth to exclude many other interesting genera. I was early able to secure the large series of the various Japanese Buntings from the collection of the late Alan Owston, but the major portion of the rest of the collection have reached me direct from the actual collectors in all parts of the world, and





A Multiple-Unit Egg Cabinet (*see page* 80).

I need not enlarge on the scientific value of specimens so secured. I have made considerable sacrifices of valuable palaearctic and nearctic specimens in exchange for some of the rarer North American species, but at the same time I have to thank many correspondents for humouring me in my desire to enrich this collection.

There are some notable blanks, chief among which is the total lack of any of the species breeding in the Galapagos Islands. There is a great weakness too in South American species, and it is in this connection that I hope to increase the collection in the near future. Comparatively "easy" species, such as the Trumpeter Bullfinch (*E. githaginea*), Scotch Crossbill, Afghan Sparrow (*Passer rutilans*) and many Madeiran, Canarian and Mauretanian local varieties, will no doubt be added also in the near future.

With the exception, perhaps, of Harris Sparrow and some few other very interesting species, North America is pretty well represented in the collection. The most welcome additions in the future would without doubt be some of the rare species from the high Himalayan regions and from Central Asia.

The arrangement is based on Sharpe's Hand List, in which about 1,200 species of *Fringillidae* are enumerated. No doubt over 100 species should now be added to this total.

The collection is housed in a 44-drawer series of teak cabinets, with drawers approximately 24 inches square, each drawer having a glazed lid. Data are attached to foolscap sheets bound in "clutch" files.

I have not given dimensions, and limited space permits of only a brief description of some of the more interesting species, but I shall be happy to give details to any reader interested in any particular species.

Ligurinus chloris (*Linn.*). Greenfinch. A series.
,, *aurantiiventris* (*Cab.*). Southern Greenfinch. 4 sets.
,, *chloroticus* (*Bp.*). Palestine Greenfinch. A fine series.
,, *sinicus* (*Linn.*). Chinese Greenfinch. c/2.
,, *minor* (*Temm. and Schl.*). Japanese Greenfinch. A series.
,, ————? South Russian Greenfinch. c/4.

The eggs of the various species of Greenfinch run through pretty much the same types, but the British eggs stand out as the largest. The South Russian set was obtained by Capt. Kennedy in the Crimea during the War. The Palestine series are all from Capt. Pitman.

Eophona melanura (*Gm.*). Black-headed Hawfinch. 1 single.

This is a very pretty egg, the markings recalling those of the European Hawfinch and of Perissospiza. The ground colour is greenish and the markings are almost entirely in the form of a ring round the large end. Mr. Bickerton found this egg some years ago near Shanghai.

Hesperiphona montana (*Ridg.*). Western Evening Grosbeak. c/2.

This rare egg is best described as being like some types of the Hawfinch, but with the ground colour more green and with less of the wriggly lines, though the markings are by no means numerous and they are almost confined to the larger end.

Coccothraustes coccothraustes (*Linn.*). Hawfinch. A fine series.

,, *japonicus* (*Temm. and Sch.*). Japanese Hawfinch. c/3.

The very interesting set of the Japanese species was laid in Mr. Shore Baily's aviaries. Rather elongated, two of them closely resemble eggs of the Yellow Hammer (*Emberiza citrinella*), being marked almost all over with wriggly lines, while the third egg has, in addition to such lines, a few Hawfinch-like markings also.

Pheucticus aureiventris (*D'Orb. and Lafr.*). c/2.

These might be described as very much like the eggs of the Black-headed Grosbeak of California, but with a few purplish markings overlaid on the large end in the form of a cap.

Zamelodia ludoviciana (*Linn.*). Rose-breasted Grosbeak. Series.

,, *melanocephala* (*Swains.*). Black-headed Grosbeak. Series.

Guiraca caerulea (*Linn.*). Blue Grosbeak. c/4.

,, *lazula* (*Less.*). Western Blue Grosbeak. c/3.

Cyanocompsa argentina (*Sharpe*). 5/2.

* As in so many South American species of finch, two seems to be the full clutch. These eggs are somewhat varied as between set and set, but the two eggs in each set are very similar. Some are marked all over with reddish, like the eggs of the common Towhee, others are marked with larger, distinct spots of reddish, which form a cap at the larger end, and others, again, with large blotches of two shades like some eggs of the Fox Sparrows but without much, if any, green in the ground colour.

Oryzoborus torridus (*Scop.*). Curio (Brazil). 2/2.

These few eggs make one long for a series, for they are most

* Unless the context indicates otherwise, the notes refer always to the previously named species.

interesting. I had them from a correspondent in the Province of Minas Geraes and hope to get more. They resemble eggs of *Rhyacornis fuliginosa*, but the rich vandyke markings are in the form of a dense zone in one pair, and the effect is most handsome.

Sporophila melanocephala (*Vieill.*). 1 single.
,, *sharpei* (*Lawrence*). Sharpe's Seed Eater. 2/3.
,, *caerulescens* (*Vieill.*). Olive Finch (of Argentina). 1/2.
,, *ornata* (*Licht.*). Papa-capim (Brazil). 3/2, 1.

Fifty-seven species of Sporophila are enumerated in the Hand List, so that a description of four seems rather inadequate. The two sets of the Texan species differ very much, one set having warm brown markings and the other purple and grey marks, chiefly at the large end.

Melopyrrha nigra (*Linn.*). Black Seed Finch. 1/4.

These eggs are more like some of the common types of lightly marbled House Sparrows.

Euethia olivacea (*Linn.*). Olive Finch. 1/4.
,, *canora* (*Gm.*). Cuban Finch. 2/4, 1/2.

The first are rather lightly marked with reddish brown which inclines to a zone, and the second resemble eggs of some of the Titmice but lack the brightness of colour seen in the latter ; some have slight zones.

Volatinia jacarini (*Linn.*). Serra-serra (Brazil). 2/2, 1.

This interesting little species, of which I hope soon to secure a series, shows an almost pure white ground with dark red markings forming zones almost at the extremity of the large ends.

Pyrrhuloxia sinuata (*Bp.*). Arizona Pyrrhuloxia. 1/4.
,, *texana* (*Ridg.*). Texan Pyrrhuloxia. 1/2.
Cardinalis cardinalis (*Linn.*). Cardinal. Series.
,, *canicauda* (*Chapman*). Grey-tailed Cardinal. 1/4.
,, *floridanus* (*Ridg.*). Florida Cardinal. 2/3.
,, *superbus* (*Ridg.*). Arizona Cardinal. 2/4, 1/3.
,, *igneus* (*Baird*). San Lucas Cardinal. 1 single.

The eggs of the various species of Cardinal and Pyrrhuloxia do not, to the superficial observer, present much variety. Indeed, the various sets of the Common Cardinal are as varied as those of all the other species as a whole.

Saltator similis, Lafr. and D'Orb. Trinca-ferro (Brazil). 1/3.
,, *grandis* (*Licht.*). 1 single.
,, *caerulescens, Vieill.* 3/2.
,, *aurantiirostris, Vieill.* 1/2.

There are 25 species in the Hand List and Nehrkorn says they are all similar. Of the above, *S. caerulescens* are the most handsome. They have a light blue ground and a multitude of fine black hair lines are twisted and wreathed into beautiful zones at the extreme tip of the large end. In *S. aurantiirostris* the markings are much bolder, less numerous, and do not make a clearly defined zone. *S. similis* is very lightly marked with short scrawly marks and ragged spots. Two of my sets of *S. caerulescens* contain an egg of *Molothrus bonariensis.*

Fringilla teydea (*Webb and Berth.*). Teydean Chaffinch. 1/2.
,, *coelebs* (*Linn.*). Chaffinch. Fine series.
,, *spodiogenys* (*Bp.*). Algerian Chaffinch. 1/2, 1/3, 1/4.
,, *montifringilla* (*Linn.*). Brambling. Good series.
,, *solomkoi, Menz. and S.* South Russian Chaffinch. 1/4.

My set of *F. teydea* came direct to me from Herr Rudolf von Thänner-Tschusi, and the set of *F. solomkoi* was taken by Capt. Kennedy in the Crimea during the war. Many local races, notably from the Canaries, Madeira and Morocco, are still wanting here.

Carduelis carduelis (*Linn.*). Continental Goldfinch. Series.
,, *britannica* (*Hartert*). British Goldfinch. Series.
,, *tschusii* (*Arr.*). Corsican Goldfinch. 2/4.
,, *africana* (*Hartert*). N. African Goldfinch. 1/3.
,, *caniceps* (*Vig.*). Himalayan Goldfinch. 1/4, 1/5.
,, *niedecki* (*Reichenow*). Palestine Goldfinch. Series.
Spinus spinus (*Linn.*). Siskin. 2/4.
,, *citrinellus* (*Linn.*). Citril Finch. 1/4.
,, *tottus* (*Sparrm.*). South African Siskin. 1 single.
,, *ictericus* (*Licht.*). Black-headed Siskin. 1/4.
,, *tibetanus* (*Hume*). Sikhim Siskin. 1/3 and 1 single.
,, *pinus* (*Wils.*). Pine Siskin. 3/4.
Hypacanthis spinoides (*Vig.*). Himalayan Greenfinch. 1/2, 1/3, 1/4.
Astragalinus tristis (*Linn.*). American Goldfinch. 1/5.
,, *salicamans* (*Grinnell*). Willow Goldfinch. 1/5.
,, *psaltria* (*Say*). Arkansas Goldfinch. 1/5.

Astragalinus hesperophilus (*Oberh.*). Green-backed Goldfinch. 1/4, 1/5.
,, *lawrencei* (*Cass.*). Lawrence's Goldfinch. 1/5.

All the above are very light blue, except the last which is pure white, and quite unspotted.

Linaria flavirostris (*Linn.*). Twite. Series.
,, *rufostrigata* (*Walton*). 1/3, 1/5.
,, *cannabina* (*Linn.*). Linnet. Series.
,, *mediterranea* (*Tschusi*). Mediterranean Linnet. 1/4.
,, *fringillirostris* (*Bp. and Schl.*). Eastern Linnet. 1 single.
,, *linaria* (*Linn.*). Mealy Redpoll. Series.
,, *rufescens* (*Vieill.*). Lesser Redpoll. Series.
,, *exilipes* (*Coues*). Coues' Redpoll. 1 single.

There are many so-called eggs of the Coues' Redpoll in collections, but the authenticity of many of them is very doubtful. My single specimen was taken by Col. Meiklejohn at Kem, on the Karelian Coast, and he sent the birds home for identification. It is a rather brighter green than most Redpoll eggs and is very faintly marked, though I have Mealy Redpoll eggs from Labrador quite as sparingly marked.

Montifringilla nivalis (*Linn.*). European Snowfinch.
,, *griseinucha* (*Brandt*). Aleutian Rosy Finch. 1/3.
Rhodospiza obsoleta (*Licht.*). 1 single.
Erythrospiza zedlitzi (*Neumann*). Algerian Desert Bullfinch. 1/3.
,, *amantum* (*Hartert*). Canary Is. Desert Finch. 2/5.

The eggs of *E. zedlitzi* are smaller and I think the markings are more generally distributed than in the case of *E. amantum* or the typical species, which, strangely enough, I have not yet been able to secure.

Petronia petronia (*Linn.*). Rock Sparrow. 1/4, 1/5.
,, *maderensis* (*Erlanger*). Madeiran Rock Sparrow. 1/3.
,, *dentata* (*Sundev.*). Grey-headed Sparrow. 1/5.
,, *superciliaris* (*Blyth*). Diamond Sparrow. 2/3.

My *P. dentata* eggs are from Mr. Baily's aviary. They seem to be almost unspotted and to present a uniform dirty grey appearance. The two sets of Diamond Sparrow, from the same source, are pretty little eggs, almost spherical, with rather large dark greenish-grey spots all over the surface.

Gymnorhis flavicollis (*Frankl.*). Yellow-throated Sparrow (of India). 2/4.

Carpospiza brachydactyla (*Bp.*). Short-toed Desert Sparrow. 1/3, 1/4.

I am indebted to Mr. Stuart Baker for this interesting species from Persia. The eggs have a creamy-white ground upon which there are a very few large and small dark red spots. They are much like eggs of some of the Vireos of North America.

Passer montanus (*Linn.*). Tree-Sparrow (of Europe). Series.
,, *saturatus* (*Stejn*). 2/5.
,, *malaccensis* (*Dubois*). Malacca Sparrow. 2/4, 1/5.
,, *domesticus* (*Linn.*). House-Sparrow. Series.
,, *biblicus* (*Hartert*). Palestine Sparrow. Series.
,, *niloticus*. Egyptian Sparrow. 1/2, 1/3.
,, *indicus* (*Jard. and Selby*). Indian House-Sparrow. 2/3.
,, *italiae* (*Vieill.*). Italian Sparrow. 1/4.
,, *hispaniolensis* (*Temm.*). Spanish Sparrow. 2/5.
,, *maltae* (*Hartert*). Maltese Sparrow. 1/5.
,, *cinnamomeus* (*Gould*). Cinnamon Tree-Sparrow. 2/3.
,, *flaveolus* (*Blyth*). Pegu House-Sparrow. 1/3, 1/4.
,, *melanurus* (*P. L. S. Müll*). Cape Sparrow. Series.
,, *moabiticus* (*Tristr.*). Tristram's Sparrow. 1/5.
,, *motitensis* (*Smith*). Greater South African Sparrow. 1/4.
,, *griseus* (*Vieill.*). 1/4.
,, *diffusus* (*Smith*). Grey-headed Sparrow. 2 singles.

Though size and shade vary a lot, all the above look like Sparrows' eggs.

Alario alario (*Linn.*). Mountain Canary. Series.

Auripasser luteus (*Licht.*). Yellow Sparrow. 1/2.

Poliospiza albigularis (*Smith*). White-throated Seed-eater. Series,
,, *angolensis* (*Gm.*). Black-throated Seed-eater. 2/3.
,, *leucopygia* (*Sundev.*). 1/3.
,, *striolata* (*Rüpp.*). Streaked Serin Finch. 1/2.
,, *gularis* (*Smith*). Streaky-headed Seed-eater. 2/3.
,, *canicapilla* (*Du Bus*). 1/3.

Serinus canicollis (*Swains*). Cape Canary. 1/3.
,, *sulphuratus* (*Linn.*). Bully Seed-eater. 2/3.
,, *icterus* (*Vieill.*). Golden-rump Canary. 1/3.
,, *serinus* (*Linn.*). Serin Finch. 3/4, 1/5.

Serinus canarius (*Linn.*). Wild canary. 1/4.
,, *pusillus* (*Pall.*). Gold-fronted Finch. 1/3.
Sycalis flaveola (*Linn.*). Canario da terra (Brazil). 2/4.
,, *pelzelni* (*Scl.*). 1/3.
,, *arvensis* (*Kittl.*). Misti Seed Finch. 1/4.
,, *luteiventris* (*Meyer*). 1/5, 1/4.
Carpodacus erythrinus (*Pall.*). Scarlet Grosbeak. 2/5, 1/4, 1/3.
,, *severtzovi* (*Sharpe*). Severtzov's Rose Finch. 1/3, 1/4, 1/5.
,, *purpureus* (*Gm.*). Purple Finch. 2/4, 1/5.
,, *californicus* (*Baird*). Californian Purple Finch. 2/4.
,, *cassini* (*Baird*). Cassin's Purple Finch. 1/5, 2/4.
,, *ruberrimus* (*Ridg.*). San Lucas House Finch. 1 single.
,, *frontalis* (*Say*). House Finch. 2/5, 1/4.
,, *clementis* (*Mearns*). San Clemente House Finch. 1/4.
,, *amplus* (*Ridg.*). Gaudalupe House Finch. 1/3.
Propasser pulcherrimus (*Hodgs.*). Beautiful Rose Finch. 1/5, 2/4.
,, *waltoni* (*Sharpe*). 1/3, 1/5.
,, *rhodochrous* (*Vig.*). Pink-browed Rose Finch. 2/4 and 1 single.
Loxia curvirostra (*Linn.*). Continental Crossbill. 1/5, 1/4.
,, *anglica* (*Hartert*). British Crossbill. 1/4.
,, *minor* (*Brehm*). American Crossbill. 1/4.
,, *pityopsittacus* (*Borkh.*). Parrot Crossbill. 1 single.

The best thing here, of course, is the American species. The four eggs are very sparsely marked and much resemble faintly marked Greenfinch eggs. The single egg of the Parrot Crossbill was bought from Monsieur Cavro's collection and came from Cholm, in Poland. It is the largest *Loxia* egg I have ever seen and much larger than the eggs usually attributed to this species.

Pyrrhula pyrrhula (*Linn.*). Greater Bullfinch. 2/5.
,, *europaea* (*Vieill.*). Continental Bullfinch. 1/4.
,, *pileata* (*Macgill.*). British Bullfinch. Good series.
Pinicola enucleator (*Linn.*). Pine Grosbeak. 8/4.

These eggs do not differ much. My collector-correspondent in North Finland assures me they do not lay five eggs*; yet dealers—!

Pyrrhulorhyncha pyrrhuloides (*Pall.*). Large-billed Reed Bunting. 1/5.
,, *palustris* (*Savi*). Intermediate Reed Bunting. 1/2.

* *Pinicola enucleator* hat niemals mehr als 4 Eier—oft nur 3. Ich habe mehr als 100 Gelege gehabt und alle von 3–4 Eier.

Emberiza schoeniclus (*Linn.*). Reed Bunting. Fine series.
,, *pyrrhulinus* (*Swinh.*). Japanese Reed Bunting. 1/3.

Mr. Gordon was good enough to let me have this set collected by a relative of his in Japan. He first sent them to me for my opinion. As there is only one type of *E. schoeniclus* in Japan, these eggs, which are very similar to *E. schoeniclus*, must, I think, be referable to *E. pyrrhulinus*.

Emberiza yessöensis (*Swinh.*). Yessö Bunting. Series.

I secured this fine series from the collection of the late Mr. Alan Owston. The eggs are very distinct from those of any other Bunting and some of the types are very beautiful, richly marked as they are with dark brown.

Emberiza pusilla (*Pall.*). Little Bunting. 2 singles.
,, *rustica* (*Pall.*). Rustic Bunting. Series.
,, *fucata* (*Pall.*). Grey-headed Bunting. Fine series.
,, *chrysophrys* (*Pall.*). Yellow-browed Bunting. 1/2.
,, *flaviventris* (*Steph.*). Golden-breasted Bunting. 6/2.

One of the most beautiful eggs in the Bunting Group. Almost all eggs are devoid of marks with the exception of a delicate wreath or zone at the large end. One set only is capped instead of zoned.

Emberiza melanocephala (*Scop.*). Black-headed Bunting. 1/4, 1/5.
,, *luteola* (*Sparrm.*). Red-headed Bunting. 3/4.
,, *aureola* (*Pall.*). Yellow-breasted Bunting. 1/4.
,, *citrinella* (*Linn.*). Yellow Bunting. Very fine series.
,, *erythrogenys* (*Brehm.*). 1/4.
,, *sulphurata* (*Temm. and Schl.*). Fine series.
,, *personata* (*Temm.*). Fine series.
,, *cirlus* (*Linn.*). Cirl Bunting. Series.
,, *nigrostriata* (*Schiebel*). Corsican Cirl Bunting. 1/3, 1/4.
,, *hortulana* (*Linn.*). Ortolan Bunting. Series.
,, *buchanani* (*Blyth*). Grey-necked Bunting. 1/4.
,, *caesia* (*Cretz.*). Cretzschmar's Bunting. 1/4.
,, *stewarti* (*Blyth*). White-capped Bunting. 1/5.
,, *cia* (*Linn.*). Meadow Bunting. Fine series.
,, *stracheyi* (*Moore*). Eastern Meadow Bunting. Series.
,, *par* (*Hartert*). Hartert's Bunting. 1/3.
,, *cioides* (*Brandt*). Siberian Meadow Bunting. 1/5.
,, *ciopsis* (*Bp.*). Fine series.
,, *leucocephala* (*Gm.*). Pine Bunting. 1/5.

Miliaria miliaria (*Linn.*). Corn Bunting. Series.
Fringillaria capensis (*Linn.*). Cape Bunting. 1/2, 1/3.
,, *tahapisi* (*Smith*). Rock Bunting. 1/3.
,, *saharae* (*Levaill.*). Saharan House Bunting. 1/2, 1/3.
,, *impetuani* (*Smith*). Lark Bunting (of S. Africa). Series.
Tisa variabilis (*Temm.*). 2/3, 1/2.
Melophus melanicterus (*Gm.*). Crested Bunting. 1/4.
Plectrophenax nivalis (*Linn.*). Snow Bunting. Series.
,, *townsendi* (*Ridg.*). Prybilof Snow Bunting. 1/5.
Calcarius lapponicus (*Linn.*). Lapland Bunting. Series.
,, *alascensis* (*Ridg.*). Alaskan Longspur. 1/5.
,, *pictus* (*Swains.*). Smith's Longspur. 1/5.
,, *ornatus* (*Towns.*). Chestnut-collared Longspur. 1/3, 1/4.
Rhynchophanes maccowni (*Lawr.*). McCown's Longspur. 1/3.
Calamospiza melanocorys (*Stejn*). Lark Bunting (of N. A.). 1/5.
Spiza americana (*Gm.*). Dickcissel. 1/4.
Chondestes grammacus (*Say*). Lark Sparrow. 2/5.
,, *strigatus* (*Swains.*). Western Lark Sparrow. 1/3, 2/5, 1/4.
Pooecetes gramineus (*Gm.*). Vesper Sparrow. Series.
,, *confinis* (*Baird*). Western Vesper Sparrow. 3/4.
,, *affinis* (*Miller*). Oregon Vesper Sparrow. 1/3, 1/4.
Passerculus savanna (*Wilson*). Savannah Sparrow. 2/4.
,, *alaudinus* (*Bp.*). Western Savannah Sparrow. 1/3, 1/5.
,, *bryanti* (*Ridg.*). Bryant's Sparrow. 1/4.
,, *beldingi* (*Ridg.*). Belding's Sparrow. 2/3.
Centronyx bairdi (*Audubon*). Baird's Sparrow. 1/4.

A very rare egg and a very pretty one. A creamy ground colour is suffused with reddish-pink blotches and markings which are more intense at the large end, like one type of *Erithacus rubecula*. The bird, of course, is not rare on the western prairies, but the nest is difficult to find, and consequently the eggs are seldom seen in collections.

Coturniculus passerinus (*Wilson*). Grasshopper Sparrow. 2/4.
,, *bimaculatus* (*Swains.*). Western Grasshopper Sparrow. 1/3.
Ammodromus maritimus (*Wils.*). Seaside Sparrow. 2/4.
,, *caudacutus* (*Gm.*). Sharp-tailed Sparrow. 1/5.
,, *nelsoni* (*Allen*). Nelson's Sparrow. 1/4.

Ammodromus lecontei (*Audub.*). Leconte's Sparrow. 1/4.
,, *henslowi* (*Audub.*). Henslow's Sparrow. 1/5.
,, *occidentalis* (*Brewster*). Western Henslow's Sparrow. 1/4.
Myiospiza manimbe (*Licht.*). 1 single.
Haemophila carpalis (*Coues*). Rufous-winged Sparrow. 1/3.
,, *ruficeps* (*Cass.*). Rufous-crowned Sparrow. 1/4.
,, *scotti* (*Sennett*). Scott's Sparrow. 1/3.
,, *eremoeca* (*Brown*). Rock Sparrow (of N. A.). 1/4.
,, *cassini* (*Woodh.*). Cassin's Sparrow. 1/3.
,, *bachmanni* (*Aud.*). Bachmann's Sparrow. 1/4.
Amphispiza bilineata (*Cass.*). Black-throated Sparrow. 1/4.
,, *deserticola* (*Ridg.*). Desert Sparrow. 1/3.
,, *belli* (*Cass.*). Bell's Sparrow. 2/4, 1/3.
,, *nevadensis* (*Ridg.*). Sage Sparrow. 1/4, 3/3.

I am not sure whether or not three of my sets of Sage Sparrow, which came from the Bend country, are not of a separate subspecies.

Poospiza melanoleuca (*D'Orb. and Lafr.*). White-breasted Warbling Finch. 1/2.
,, *whitei* (*Scl.*). 1 single.
,, *erythrophrys* (*Scl.*). Red-browed Warbling Finch. 1 single.
,, *torquata* (*D'Orb. and Lafr.*). 1/4.
Junco hyemalis (*Linn.*). Slate-coloured Junco. 1/4.
,, *carolinensis* (*Brewster*). Carolina Junco. 1/3.
,, *shufeldti* (*Coale*). Shufeldt's Junco. 1/3, 2/4.
,, *thurberi* (*Anthony*). Thurber's Junco. 1/3, 1/2.
,, *pinosus* (*Loomis*). Point Pinos Junco. 1/4.
,, *mearnsi* (*Ridg.*). Pink-sided Junco. 1/4.
,, *caniceps* (*Woodh.*). Grey-headed Junco. 1/4.
Spizella monticola (*Gm.*). Tree Sparrow (of N. America). 3/5.

These are three very fine sets selected from a number that I used to get from a collector in Labrador.

Spizella socialis (*Wils.*). Chipping Sparrow. Series.
,, *arizonae* (*Coues*). Western Chipping Sparrow. 1/3, 2/4.
,, *pusilla* (*Wilson*). Field Sparrow. Series.

I have yet to see a set of five Field Sparrow.

Spizella arenacea (*Chadbourne*). Western Field Sparrow. 1/3, 1/4.
,, *atrogularis* (*Cab.*). Black-throated Sparrow. 2/3.

One of these is the unspotted type.

Spizella pallida (*Swains.*). Clay-coloured Sparrow. 2/4, 1/2.
The 2 set has a Cowbird's egg with it.

Spizella breweri (*Cass*). Brewer's Sparrow. 3/4.
Zonotrichia leucophrys (*Forst.*). White-crowned Sparrow. Series.
From both Labrador and the west.

Zonotrichia nuttalli (*Ridg.*). Nuttall's Sparrow. Series.
,, *albicollis* (*Gm.*). White-throated Sparrow. 2/4.
Brachyspiza pileata (*Bodd.*). Tico-tico (Brazil). 1/3, 1/4.
,, *canicapilla* (*Gould*). 1/1, 1/2, 1/3.
Melospiza melodia (*Wils.*). Song Sparrow. Series.
,, *montana* (*Henshaw*). Mountain Song Sparrow. 1/3.
,, *santacrucis* (*Grinnell*). Santa Cruz Song Sparrow. 1/3, 1/4.
,, *merrilli* (*Brewster*). Merrill's Song Sparrow. 1/3, 1/4.
,, *fallax* (*Baird*). Desert Song Sparrow. 1/4, 1/5.
,, *heermanni* (*Baird*). Heermann's Song Sparrow. 1/3, 1/5.
,, *cooperi* (*Ridg.*). San Diego Song Sparrow. Series.
,, *clementae* (*Towns.*). San Clementae Song Sparrow. 1/4, 1/5.
,, *graminea* (*Towns.*). Santa Barbara Song Sparrow. 1/4, 1/5.
,, *samuelis* (*Baird*). Samuel's Song Sparrow. 2/3, 1/4.
,, *pusillula* (*Ridg.*). Alameda Song Sparrow. 1/4.
,, *cleonensis* (*McGregor*). Mendocino Song Sparrow. 1/3.
,, *morphna* (*Oberh.*). Rusty Song Sparrow. 2/4.
,, *lincolni* (*Audubon*). Lincoln's Sparrow. 1/4.
,, *georgiana* (*Lath.*). Swamp Sparrow. Series.
,, *fisherella*. Fisher's Song Sparrow. 1/5.
,, *juddi*. Dakota Song Sparrow. 1/5.
,, *gouldi*. Marin Song Sparrow. 2/4.
Passerella iliaca (*Merrem*). Fox Sparrow. 1/4.
,, *townsendi* (*Aud.*). Townsend's Fox Sparrow. 1/3.
,, *schistacea* (*Baird*). Slate-coloured Fox Sparrow. 2/4.
,, *megarhyncha* (*Baird*). Thick-billed Fox Sparrow. 1/3.
,, *stephensi* (*Anthony*). Stephens' Fox Sparrow. 1/2.
Passerina cyanea (*Linn.*). Indigo Bunting. 1/4, 1/5.
,, *amoena* (*Say*). Lazuli Bunting. 1/3, 1/4.
,, *ciris* (*Linn.*). Painted Bunting. Series.

Oreospiza chlorura (*Towns.*). Green-tailed Towhee. 1/4.
Pipilo megalonyx (*Baird*). San Diego Towhee. 2/3, 1/4.
,, *oregonus* (*Bell*). Oregon Towhee. 2/3.
,, *erythrophthalmus* (*Linn.*). Towhee. Series.
,, *alleni* (*Coues*). White-eyed Towhee. 1/4.
,, *aberti* (*Baird*). Abert's Towhee. 3/3.
,, *mesoleucus* (*Baird*). Cañon Towhee. 1/4, 2/3.
,, *crissalis* (*Vig.*). Californian Towhee. 1/3, 1/4.
,, *senicula* (*Anthony*). Anthony's Towhee. Series.
Saltatricula multicolor (*Burm.*). 1/2.
Arremonops rufivirgatus (*Lawr.*). Texan Sparrow. 1/5.
Embernagra olivascens (*D'Orb. and Lafr.*). 1/3.
Coryphospiza albifrons (*Vieill.*). 1 single.
Phrygilus gayi (*Eyd. and Gerv.*). 2/3.

Beautiful eggs these, like very small types of *Zamelodia* but with ground colour and markings a more vivid green.

Phrygilus melanoderus (*Q. and Gaim.*). Falkland Is. "Sparrow." 1/2.
,, *fruticeti* (*Kittl.*). Mourning Finch. 2/3, 2/2.
Diuca diuca (*Mol.*). Diuca Finch. 1 single.
,, *minor* (*Bp.*). Lesser Diuca Finch. 4/3, 1/2.
Coryphospingus cristatus (*Gm.*). Red-crested Finch. 2/2.
Paroaria cucullata (*Lath.*). Red-crested Cardinal. 2/2.
,, *larvata* (*Bodd.*). Dominican Cardinal. 2/2.

Both species are like very handsome eggs of our Skylark. In both sets of *P. larvata* one egg is very lightly marked with a greenish-white ground showing.

Gubernatrix cristata (*Vieill.*). Green Cardinal. 1/4.
Arremon orbignii (*Scl.*). 1/3.
Buarremon citrinellus (*Cab.*). 3/2, 1/2.

BIRD HAUNTS AND NATURE MEMORIES.

By T. A. Coward, M.Sc., F.Z.S., etc. Warne and Co., 7*s.* 6*d.*

Those of our readers who possess Mr. Coward's work on "The Birds of the British Isles," which we have not ceased to recommend, will welcome his new work, for it is penned in a still more delightful vein. It is not, like the former, an encyclopædia of information with regard to each species, but a racy account of numerous visits to out-of-the-way spots, with intimate peeps into the bird and other life seen. The reader can in imagination accompany the author on his wanderings, almost hearing the twigs break beneath his feet as he goes.

Perhaps the most interesting chapter is that on "The Home Life of the Shearwater," and, if the eggs were not so utterly wanting in variation as to limit the cupidity of the most callous collector, we should doubt the wisdom of betraying the exact locality. "There are not," he writes, "rabbit-burrows enough for the Shearwater colony, and by far the greater number of the birds lay their single white egg in some deep crack or hole amongst the rocks." The author relates curious things about the behaviour of the Shearwaters during a heavy rainfall or in fog. "As the birds came flying swiftly round the hill, passing unseen in the darkness, within a few yards of the house—'in the doorway,' our host expressed it—we heard what sounded like an emphatic 'it-y-corka,' the emphasis on the third syllable, and other loud remarks — 'kitty-coo-roo,' 'kok-a-kok,' sharply repeated, and 'kok-a-go-go,' all uttered with a vehemence which was perfectly astonishing. The birds flew swiftly, following one another; at times there was a moment's silence, then a babel of voices."

Mr. Coward's chapters on the struggle for existence in the bird world, and the effect of importations such as that of the Little Owl and the Grey Squirrel, are full of interesting facts and conjectures. He makes us wonder if the Grey Squirrels, but recently arrived in our home woods, should be allowed to establish themselves, for from such causes, as he explains, come profound changes in the distribution and number of our birds.

The author grudges and misjudges the interest of the oologist; but, closely in touch as we are with oologists in all parts of the world, we would like to assure him that they are, on the whole, active agents for the preservation of species. Nor is this the interest of the Oyster-catcher for the oyster. Ornithologists and oologists alone know and appreciate the existence of the rare species, while to the great mass of people bird-life connotes merely the songsters of their shrubberies, fields and hedgerows. The ignorance of many protectionists proves this. We commend to them a scheme for the licensing and control of domestic cats, which would do more to foster bird-life than all they have ever done or will do, while the greatest efforts of the most greedy collector in a lifetime will not exceed what a pair of Jays or Magpies will accomplish in one season. But the author's views on these matters, relegated to the end of the volume, do not detract one iota from the very great pleasure it has afforded us.

Harrison & Sons, Ltd., Printers in Ordinary to His Majesty, St. Martin's Lane, W.C. 2.

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