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XI.—*Field Notes on the Birds of Macedonia. With special reference to the Struma Plain.* By F. N. CHASEN, Castle Museum, Norwich.

Introduction.

THE present paper is offered as a small contribution to our knowledge of the ornithology of a comparatively unknown part of Europe. In spite of the existence of more than forty original papers dealing with the birds of the Balkan Peninsula, the Struma plain still remains *terra incognita* to the ornithologist. The earlier publications contain little more than scattered references to the birds of this very interesting district, and more recent investigators have, like myself, carried out their work whilst subject to military discipline.

Dr. Erwin Stresemann's new book, 'Avifauna Macedonica,' for the loan of a copy of which I have to thank Mr. W. L. Sclater, is exhaustive in its way, but as it was compiled largely from material accumulated during the war it—naturally enough—does not deal at any length with the Struma plain, which was either in Allied occupation or

well within the sphere of hostilities for the greater part of the war.

There is no need to dwell on the geographical nature of the country, its vegetation or other issues likely to affect its ornithology, for all this information is available—in a concise form—in a paper by Capt. Alan G. Ogilvie, O.B.E., published in the 'Geographical Journal' (vol. lv. no. 1, Jan. 1920).

The observations from which the following notes were compiled were made during a period extending over a little more than eighteen months spent with the Allied Army in Macedonia. The writer was stationed for the greater part of this period on the Struma plain, but the long excursions that ordinarily fall to the lot of a mounted soldier, gave ample chances for bird-watching in the hill district that lies between the swiftly flowing river and the coast.

The area with which we are concerned in this paper may be said to form a crude triangle with its base along the line Lake Doiran-Seres and its apex at Salonica.

Opportunities for detailed or continuous observation are of necessity very limited when on active service and all dates given are inclusive, that is to say, they do not necessarily imply the absence of a species at other times. Most of the birds mentioned below are very familiar species, and only those are included the identification of which was certain. I was not in a position to collect skins, although I skinned quite a number of birds simply through inability to let a good specimen waste. What few I did get together were lost—with a mule—during the blizzard at Lahana, in March 1918. For this reason I have made no attempt to discriminate subspecies, and all doubtful records—however interesting—have been ignored.

I have to thank my very kind correspondent, Major Alex. G. L. Sladen, for the infinite amount of trouble he has taken in reading through my paper. In some cases we worked over the same ground, and Major Sladen has let me have some most interesting notes which have come to hand since the publication of his own papers.

The bird-life of Macedonia is varied and plentiful. The Struma plain abounds with large Accipitres; Vultures, Eagles, Buzzards, Kites, and Harriers may be seen. In the winter there are good numbers of Ducks and Geese. On the Struma itself are Grebes, Cormorants, and Coots, and in the summer, Terns. The level ground is haunted by Crested Larks and their kindred, the thickets by Warblers, and Buntings of several species are common everywhere and at all seasons. In the autumn there are flocks of Wagtails, Finches, and Pipits, and hordes of Redstarts and Flycatchers appear in their season. Late in the year huge assemblies of Crows can be seen near the Struma. In the spring handsome species from the south arrive and prepare to nest, including the Hoopoe, Roller, Bee-eater, Black-headed Bunting, and White Stork. The Magpie, Little Owl, and Tree-Sparrow are characteristic resident birds.

There are very pronounced local movements at nearly all seasons, and these complicate the real migratory events. These local movements are caused mainly by the withdrawal of resident species from their winter quarters to their breeding grounds, by severe weather compelling the birds on the hills and high ground to descend to the level of the river and some species to the coast, and by the gregarious habits of young birds of the year and attendant shifting from the locality of birth. In the case of the Jackdaw and Hooded Crow there was always the difficulty of distinguishing between residents and their broods, and migrants. Isolated pairs of Wagtails and Finches seen throughout the summer in selected localities were also confusing. I think, however, that the main features of migration as seen in the concerned area could be summarized as follows :—

(1) The arrival of breeding species in the spring accompanied by a “through” passage of other birds on their way to the north. It was not easy to distinguish migrants during the vernal movement, but there was a stream of Martins, Swifts, and Whinchats at any rate. The return journey in autumn is more pronounced—Redstarts, Spotted Flycatchers,

Warblers (especially of the genus *Phylloscopus*), Whinchats, Hirundines, and Wagtails passing in large numbers.

(2) The departure of wintering birds to the north in early spring. The Chiffchaff and Rook may be taken as examples. There is also a withdrawal of Geese, Ducks, wintering Thrushes and Finches. It would appear that—in the case of the Chiffchaff at least—this movement was completed before birds of the same species arrived in the country as spring migrants from the south.

(3) The autumn influx of birds seen throughout the next winter, *e. g.*, Siskin, Serin, other Finches, Meadow Pipit, Woodlark, Skylark, Goldcrest, Great Grey Shrike, Robin, Merlin, Sparrow-Hawk, Ducks, Geese, Rooks, and Woodcock. The movements of the Brambling and Fieldfare were very spasmodic.

The undermentioned migrants were first seen on the dates given :—

Black-headed Bunting.....	28 April.
Red-backed Shrike	8 May.
Whitethroat	12 April.
Lesser Whitethroat	7 April.
Black-throated Wheatear.....	13 April.
Wheatear	29 March.
Nightingale	7 April.
Swallow.....	21 March.
House-Martin	1 April.
Bee-eater	4 May.
Hoopoe	3 April.
Roller	17 April.
Cuckoo	6 April.
Lesser Kestrel	8 March.
White Stork	13 March.

The following species were found breeding :—Jackdaw, Magpie, Hooded Crow, Starling, House-Sparrow, Tree-Sparrow, Rock-Sparrow, Corn-Bunting, Gird Bunting, Black-headed Bunting, Calandra Lark, Crested Lark, Lesser Grey Shrike, Woodchat, Whitethroat, Lesser Whitethroat,

Cetti's Warbler, Blackbird, Nightingale, Wheatear, Nightjar, Roller, Little Owl, Kestrel, Lesser Kestrel, White Stork, Turtle-Dove, Collared Dove, Stone-Curlew, and Little Ringed Plover. To these Major Sladen has added Spanish Sparrow (Karasuli and Hirsova), Short-toed Lark, Nuthatch, Bee-eater, Hoopoe, Black Tern, Osprey and Kingfisher, as well as a few more species included in his own papers.

Other species were seen continually throughout the breeding-season or showed other signs of having nests, *e. g.*, Raven, Chaffinch, Ortolan, White Wagtail, Grey Wagtail, Red-backed Shrike, Stonechat, Kite, Common Buzzard, and Common Snipe. Some of these have been recorded as breeding in Macedonia, but as localities are not mentioned—and the occupied territory was so vast—the nests may have been a great distance from the area with which we are concerned—anywhere, in fact, between the Adriatic and Black Seas.

[CORVIDÆ.—Vast flocks of Jackdaws, Rooks, and Hooded Crows frequent the Struma plain during the winter months. From December 1916 to January 1917 the numbers were truly terrific, but the comparatively milder winter of 1917–1918 did not witness such large congregations. During the summer months very different conditions were in force, some Ravens, scattered pairs of Hooded Crows, and a number of Jackdaws representing the Corvidæ.

Generally speaking, there was a withdrawal of Crows in the very early spring. The numbers diminished before March, during which month a marked movement of Rooks to the W. and N.W. took place. After this Rooks were not seen at all—although some may have bred beyond the area of observation. (There are nests by the side of the Orient railway line between Salonica and Larissa.)

A daily increase in the number of Hooded Crows and Jackdaws in September and October may have been due to the gregarious habits of young birds bred in the preceding months. A large influx of "foreign" Jackdaws and Hooded Crows occurred in late autumn, and with these

came the flights of Rooks that were to populate the dirty acres of the plain for the winter. My diaries contain frequent notes concerning the entire absence of Crows from sundry localities during the period April to August. One of the largest Corvine movements was during the first few days of October 1917, when immense flocks of high-flying birds (sp.?) passed over Orljak; but from such varied points that I could not name the general trend of the movement by the compass.

A point worthy of notice was the unsuspectingness of the wintering Crows in Macedonia. In the winter of 1916 my duties frequently caused me long rides across the plain, and I often walked my horse quite through flocks of Rooks, flocks that on occasions could almost be measured by the acre, without disturbing any but those birds in the direct path. They were certainly far more approachable than the Crows in Western Europe.]

Corvus corax. Raven.

Often seen on the hills, but not evenly distributed. It is resident and usually met with in pairs, although small flocks of anything up to fourteen individuals were noted. The road leading from Orljak to Kohcan-Mah wends through several good places for Ravens. Several seen at Paprat in autumn. In the case of unsavoury meals the Ravens would often be at the feast before the Vultures had them located.

Corvus cornix Hooded Crow.

Abundant in winter, but less numerous than the Jackdaws or Rooks. During the spring odd birds were seen about the hills, where I located a few nests. On 13 January a Goose was shot from the bank of the Struma. It fell in a very awkward position, just on the edge of some ice piled up against the opposite bank. It was scarcely an hour before this Goose was retrieved, but when I did get it, it was completely spoiled by the Hooded Crows, who had pulled it about most audaciously. I was within thirty yards of the Goose from beginning to end, but in spite of this no amount of stone-throwing or shouting would shift the birds. The

cranium had been broken open and the brain-cavity completely cleared. After this a large hole had been made in the region of the clavicles, and finally the Crows had devoted themselves to the large and fleshy pectoral muscles. On 7 April I found three pairs breeding at Aracli. One nest had certainly been built in the same spring. The nests were about fourteen feet from the ground, in the forks of slender oak-trees, and two of them were quite accessible to a fairly active man. The new nest, to which I paid particular attention, appeared to be finished by 12 April. During the time that building-operations were taking place, the birds roosted at night in a tall fruit-tree (in full blossom), about two hundred yards away from the nest. On 18 April there was one egg in the nest. Both parents were very demonstrative when I was getting up the tree, flying round and cawing loudly, but later they showed great cunning in not loitering in the vicinity of the nest when I was about. The hen bird always slipped away at the first sign of danger. The nest itself was very conspicuous, composed of twigs, and neatly lined with horse-hair and a few feathers.

Corvus corone. Carrion-Crow.

I found a dead bird in December, but could not be sure of further occurrences.

Corvus frugilegus. Rook.

Large flocks about the plain during the winter of 1916-17. Especially numerous in December, 1916. On 19 March, 1916, a steady stream of Rooks was seen flying across the plain in a westerly direction at mid-day. Some of them (I am sure very weary birds) stopped for a rest in a clump of trees, and resumed their journey at dusk. The majority of the birds left their winter quarters at the end of February or beginning of March. The general direction of the movement seemed to be towards the N. and N.W., in which case it may be assumed that the flocks seen on 19 March were birds from a region to the S.E. of my area, following a line similar to that taken by the Macedonian Rooks. As

near as I could judge, this line crossed the mountains somewhere to the W. of Rupel. There was a complete absence of Rooks in spring and summer—at any rate from the places visited. The evening flights of Rooks on the Struma plain are sometimes of stupendous size and easily mistaken for genuine migratory movements. An immense flock passed overhead on the 2nd of March, and the number of birds was so great that for several minutes there was a noise like the whirr of a sharp breeze. The movements of some flocks observed in early spring would lead one to believe that there is some justification for the old saying that Rooks go mad in the spring. Thirty or more would separate themselves from a larger flying flock and swoop towards the earth, performing the most wonderful antics for a short time. They would twist about, and on occasions topple over in most extraordinary style. When the whole crowd suddenly dropped to the earth, the noise was not unlike that of an approaching shell.

***Corvus monedula.* Jackdaw.**

This is one of the most common birds in the country, and large numbers breed. Some of them paired as early as the middle of February, but there were flocks about several weeks later. A great deal of competition took place in Macedonia for available nesting-sites. This was due to the large number of Jackdaws inhabiting the country. Some of them did not breed at all, and flocks composed of from six to ten birds were roaming over the country, without showing signs of pairing, all through the spring and summer. The Jackdaws showed great adaptability in their choice of nesting-sites, and within a short radius from where I was living there were nests in the following sites:—In the minaret of a mosque and also somewhere in the ruinous roof of the same building, under the eaves of native houses (otherwise unoccupied), and in holes in a steep bank. The most interesting nest of all was placed in the lower branches of a Stork's nest. The Storks and Jackdaws seemed to be on the most amicable terms, but the advantages of this

strange union are rather hard to divine. One thing is certain, however, and that is the Storks must have been indebted to the Jackdaws for one thing, because the latter birds were constantly bringing sticks and re-arranging the twigs about their own nest. Storks do but little nest-building on their own account, and the Jackdaws' efforts undoubtedly made the home of this particular pair more substantial, as it was in a precarious state after weathering the previous winter. When both Storks were away from home, and then only, the Jackdaws would sit on the edge of the cup-like mass, *i. e.*, in the larger birds' domain. Some interesting possibilities presented themselves, but I never got any further into the matter. The Jackdaws surely had to restrain themselves where the Stork's eggs were concerned; but then, again, supposing this difficulty to have been overcome, I should imagine that the Storks would have found newly hatched Jackdaws a nice change from frogs. I noticed the act of mating on 29 March. Eggs 23 May. Newly hatched young at the latter end of April and 23 May. Young were being fed in the nest at the beginning of June. A bird of the year was flying on 1 June, and several broods flying about in the neighbourhood of their home by the end of the month. By the 1st of September flocks of sixty or more birds were common, and these had already associated themselves with their companions for the coming winter—the Hooded Crows.

A battle that took place at noon on a sunny day in February seems fairly typical of the methods adopted by this species when fighting. One bird was lying on its back on the ground with its beak directed at its opponent's head. It fought primarily with its feet, which were entangled in the feathers of the abdomen of the uppermost bird. The second bird stood bodily on the under bird, and balancing itself on out-stretched wings, it repeatedly pecked at its opponent's head. These two birds fought in a methodical manner. They wrestled for a few moments and then, as if by mutual agreement, separated and flew up to a low bough hanging over the chosen arena. On this occasion there were five distinct "rounds." The same bird was undermost each

time, and, indeed, it seemed as if it preferred to adopt this tactic throughout the fight, because each time the strife commenced anew it voluntarily assumed the position described. It was, however, a bad choice, because the uppermost Jackdaw was undoubtedly the conqueror.

Another point worthy of mention, although it has been remarked upon many times before, is connected with the feeding of the young. When the parent birds are returning from a long foraging expedition, their mouths are frequently so full of food that the space between the rami of the lower mandible is distended to form a very visible pouch, which is conspicuous enough to be noticed when the bird is flying past. This fact did not prevent the Jackdaws from making as much noise as usual. The only differences were, firstly, that the call was produced with the beak closed instead of gaping, as it usually is, and secondly, that the note was, in consequence, rather throaty in tune. The Jackdaws at Orljak used horsehair, grass, native cotton, and string (among other materials), for their nests. At Ormanli twigs were collected with great energy for repairing purposes, and human hair (found under the tiles in native houses) was a favourite building material.

Regarding the identity of Macedonian Jackdaws, many birds were certainly very light on the neck, but others appeared quite normal, and as near as I could say from observation alone, they were typical examples of *Corvus monedula monedula*. Major Sladen, however, has much better grounds to work upon, for he shot a number and writes:—"All that I examined appeared to belong to the subspecies *C. monedula collaris* Drummond, and all of them had more white above the neck than the typical bird. I found that it was not unusual to come across individuals which had a rusty red tinge all over. I remember an instance of one in a flock near Snevce, which was almost mahogany colour, but I was unable to secure it. I noticed the same thing to a lesser degree in individuals of *Corvus cornix*."

Pica pica. Magpie.

A very common bird and rarely out of one's sight, being found pretty well everywhere. In Macedonia it certainly does not show any preference for the wooded districts. Magpies were numerous at most of the places visited, and only occasionally scarce or absent, as at Baisili, in August. The large numbers that frequent the plain in winter, often feeding in the company of Jackdaws and Rooks, do not stop to breed in their winter quarters, although quite a number do nest in the country. There was a decline in numbers during the summer months, and an influx in the autumn. During cold weather in December there were chattering flocks of Magpies in nearly every leafless tree near the river. On the hills in the autumn, flocks of from twelve to twenty birds could be seen leading the life of true Crows, foraging for food on the stony ground. A good many kept in pairs throughout the winter. Nests were fairly common but often well hidden, some in trees, others in tall dense bushes. Several pairs bred in the neighbourhood of Ormanli; none actually in the village. Young birds were seen in the nest during the first week in May. Broods flying 19 May. The peculiar habit that the Magpie has of jerking its tail upwards when alighting served the species in good stead on the muddy Struma levels. I feel sure that the movement is accentuated when the bird alights on wet or dirty ground, and possibly there is a clue to the origin of the habit to be found here. The Magpies in Macedonia were fond of roosting in old nests, and a stone flung into an old Stork's nest in the evening would often cause as many as eight birds to leave in single file. A partiality for selected roosting-places was a noticeable habit, and a regular flight to these places, often groups of trees of a good height, in the evening reminded one of the Rooks' evening flights. The Magpies would settle down to rest with many chuckles, but once settled they sat close. I witnessed a good demonstration of this habit on 16 June at Kopriva. At sunset a large number of Magpies passed over the village from the direction of the hills. They went towards a clump of trees half-way across the plain, and

I judged them to be birds that had spent the day wandering about at the foot of the hills and banded together in the late afternoon. Later, I saw several flocks leave the ground and mount high into the air—they always fly high on these occasions—and take a straight line for the roosting-place, exactly like a mob of Rooks. Small flocks of about a dozen birds followed at intervals, from various points, for some time. I rarely saw more than thirty Magpies in one compact flock. Several times during the latter end of May—when some of the young were beginning to fly—I saw cases of what appeared to be lack of parental affection in this species.

Garrulus glandarius. Jay.

Seen in the wooded districts which are few and restricted in area. A local bird, not straying over the country like the Magpie. After severe weather and snow on the hills, odd birds appeared on the Struma plain, especially in December.

Sturnus vulgaris. Starling.

A common resident. Flocks on the open ground in winter and also other birds in the villages. The Starlings diminished in numbers in July and August, when I noticed a complete absence from certain haunts. They breed mainly in the villages. There were evening flights to roosting-places near the Struma—usually large clumps of reeds—which reminded one of the Starling's habits on the Norfolk Broads. Starlings breeding in Elisian had purple heads.

Oriolus oriolus. Golden Oriole.

Several seen in June.

[FRINGILLIDÆ.—Very few Finches of any species were seen in the spring, and I found no nests other than those of Sparrows.]

Coccothraustes coccothraustes. Hawfinch.

One record only. 23 January, near Lozista.

Chloris chloris. Greenfinch.

Small flocks common from October to February, but this was by no means a conspicuously abundant species. A few seen in the spring.

Carduelis carduelis. Goldfinch.

Not seen during the breeding-season, but very common for the rest of the year. The small villages situated at the foot of the hills were strongholds for this bird. The once cultivated patches of tobacco, cotton, and vegetables, but now only patches of weeds with a remnant of the original crop showing through here and there, always attracted the Goldfinches in winter. They drank regularly, even in the most severe weather, and had quite a novel method of doing so. Small parties would fly to the reed-beds, and the birds would cling to the bases of the reeds about two inches above the water and drink by bending over to the surface. After this they would often alight on the snowy flotsam and flutter in the water to their content. A Marsh-Harrier attended one of these particular watering-places day after day, and levied a regular toll on the birds as they came to drink.

Spinus spinus. Siskin.

Several seen in sheltered corners of the plain from December to March. One pair frequented a small patch of reeds near a pond for at least nine consecutive weeks in the cold weather. I took some pains to find out the nature of the food, and found that it consisted of the seeds of half rotten "blackberries" which were still hanging on the bushes. The Siskin's confiding habits were most pronounced.

"To-day a pair of Siskins were feeding in some pink ground-nettles only a yard or so from my feet. Another little hen sat on a small bush, beside the stream. I stood quite by the side of the bush but she was not in the least disturbed. I seized a twig and gently pulled it until the whole bush was swaying, but still the bird remained. At last I took a step nearer and stretched out a hand to seize her, upon which she fluttered away." (Diary, 17 March.)

Acanthis cannabina. Linnet.

Small flocks in autumn and winter.

Serinus serinus. Serin.

Flocks in early October at Cakirli. A few remained (actually in the village) at Orljak through the winter. Severe weather always had the effect of bringing more into the village, where they found shelter and food.

Pyrrhula pyrrhula. Bullfinch.

A few seen in the winter, usually alone or in pairs. A curious feeding habit was noticed on 7 February. A male plucked a berry from a slender twig overhanging the water, while it was on the wing. The bird remained for a few seconds fluttering, or rather hovering, by the side of the berry before snatching it. The twig would have been scarcely stout enough to bear the weight of the bird.

Fringilla cœlebs. Chaffinch.

Extremely numerous in winter. The common Finch of many districts, in some cases outnumbering the Tree-Sparrow. Most of the Chaffinches withdrew from their winter haunts in March. The nest was not found, but a few birds, obviously paired, were seen through the spring. An influx in October.

Fringilla montifringilla. Brambling.

On 4 January a number were mixed with the Chaffinches in Orljak. The weather was severe and there was snow on the ground. There were also some independent flocks of considerable size near the river. These birds went as suddenly as they had appeared, and a few days later not one was to be seen. One or two others identified at odd times during the winter.

Passer domesticus. House-Sparrow.**Passer montanus.** Tree-Sparrow.

Both species common almost everywhere. *P. montanus* predominates in a large number of districts, and I should say is numerically superior in most parts of Macedonia. Both species breed freely. Although both kinds could be seen in mixed flocks during the day, there was a strong tendency to roost in specific bands. *P. montanus* preferred willow-trees for this purpose.

Passer hispaniolensis. Spanish Sparrow.

Seen occasionally with other Sparrows, but apparently very local in distribution. Several could usually be found in Elisan.

Petronia petronia. Rock-Sparrow.

I have only one record and that concerns a pair breeding at Orljak. I found a nest with young in a high bank. The nest was in a hole about fifteen feet from the ground, and there is but little doubt that the hole was found ready made. The behaviour of the female and the loud wheezy chirruping of the young made the detection of this nest inevitable by every person who passed by. Otherwise it would have been difficult to locate on account of the many similar but unoccupied holes in the same bank. Whenever I approached both parents were somewhere near the hole. The male would fly off to a wire fence about 15 yards away and remain watching. It would call incessantly using a double note, but nevertheless this parent would not excite itself unduly. The female, however, would hopelessly betray the nest. It would remain at the hole till the last moment in a very agitated state. It would also return to the brood at the earliest possible moment, and more often than not fly straight into the hole.

Emberiza calandra. Corn-Bunting.

Very common. Abundant in winter, and twittering little flocks were seen everywhere. The gregarious habits continued well into March, but when I went along the Orljak-Kopriva road on the 14th of April they seemed to have settled down a bit. At Karamatli they nest side by side with the Shrikes and *E. melanocephala*. Nests were also plentiful at Gramatna, at which place I found eggs up to the end of June. Young birds at the beginning of July. A favourite site for the nest was in a low bramble-bush growing near the headland of a poor wheat or barley crop. In February mixed flocks of Corn-Buntings and Goldfinches were seen.

Emberiza citrinella. Yellow Bunting.

Two records only, and, curiously enough, both on 12 January (1917 and 1918). The former a small number near the Struma, the latter a single bird.

Emberiza cirrus. Cirl Bunting.

Common. Found in flocks all the winter, and in some districts the predominating species as at Cakirli in October. Small flocks could be seen along the road from this place quite up the hills to Sivri, over a scrubby broken area, where the ascent was very rough, and few other birds could be seen. I found some nests at Karamatli and eggs during the latter half of April. Flocks were seen again on the 1st of September, although broods were still being fed on that date.

Emberiza hortulana. Ortolan.

Seen in summer. Common at Aracli and Karamatli in April. Mixes freely with *E. cirrus*.

Emberiza cia. Meadow-Bunting.

Seen commonly in winter and spring.

(*E. schoeniclus*, a bird at Ormanli in February, was almost certainly a female.)

Emberiza melanocephala. Black-headed Bunting.

A common summer bird. Seen 28 April, but I think there were earlier arrivals. It was usually found frequenting the cultivated or more or less open stretches of ground. Its chosen haunts were usually where fruit was growing, a patch of currant-bushes, a group of fig-trees, or a vineyard, for instance. The pleasant little song has more music in it than that of most other Buntings. It commences with a "*Chit-chit-chit*," which is followed by a short musical bar, nicely warbled and repeated twice or, perhaps, three times. The introductory notes may be faltering with a good pause between each note, but the final part of the song comes out with a rush. The introductory notes were omitted by many males heard singing in June.

I found nests at Mirova, Kurkut, Karamatli, and

Gramatna. The rolling hills between the two last-named places were especially good breeding-grounds. These hills are very bare. The ground is stony and clothed with short grass, with uneven clumps of brambles here and there which are in some places so dense that they constitute a thicket. There is only an occasional group of trees or anything that resembles a hedge. It is, in fact, ideal country for Shrikes, Buntings, and Whitethroats. I was not in time for early eggs, but on the 1st of July there were five nests each containing four eggs, and in all cases well incubated. Young birds seen in the nest at the end of June and beginning of July. The nests were fairly well made, not models of neatness exactly, and usually placed in the thickest part of an individual spray on a low bush. None of the nests were down in the centre of the bushes, and they were all easy enough to find. The male would sit on a top twig near the nest, singing. The hen would dart off the nest when you had started to poke the bush about with a stick, and rarely before. The bushes chosen were mostly below the waist in height.

Lullula arborea. Wood-Lark.

Seen from September onwards. A few in August. Small parties of from four to six birds at Baisili in autumn.

Alauda arvensis. Sky-Lark.

Frequent, but not found breeding. The level ground between Orljak and the river was a good place to find them in winter.

Melanocorypha calandra. Calandra Lark.

Common, but not nearly so numerous on the Struma plain as *Galerida cristata*. Eggs at intervals in April.

Calandrella brachydactyla. Short-toed Lark.

A pair near the Struma on 26 May were probably breeding, but I could not find the eggs. Other pairs seen in June on the hills (Mirova and Kurkut). Found breeding at Kara-suli and Dudular (a camp quite near to Salonica) by Major Sladen.

Galerida cristata. Crested Lark.

The commonest Lark of the districts I visited and a resident bird. No pronounced migration was noticed, but a good deal of local movement took place. In one case this local movement was very decided—namely, the withdrawal of the birds from their winter quarters (*e.g.*, the interior of the villages) in the early spring to the vicinity of their breeding-grounds. In the winter small parties of from six to twelve birds were met with in a variety of places. Unlike many other species of birds they showed no extreme gregarious habits in severe weather, and rarely more than a dozen were seen together. Immediately the weather improved the small flocks broke up, and signs of pairing were evident at an early date. Indeed, a fair percentage of birds had remained in pairs all the winter. As early as 13 February, one of these Larks was making a laudable attempt to sing. It was a sunny day and the blue sky was quite spring-like, but there was a bitter wind blowing that ruffled the songster's plumage to confusion as it sat on an old mud wall. In the villages they are fond of running about the rough roads and rolling about in "sand-baths," their vigorous actions in these raising little clouds of dust.

Some bred on the level ground near the river. During the breeding-season they were very tame, running about in the long grass about twelve feet away and only reluctantly taking wing. Far more, however, nest on the hills, and in favoured places a good many nests may be found in a small area. There were plenty of nests between Mirova and Kurkut in June, but the most prolific district seems to have been the country included by a radius of, say, four kilometres from Karamatli. I saw eggs during the third and fourth week in June and first week in July, but lack of observation is responsible for absence of earlier dates. Most of these were placed in the middle of a tussock of grass and stumbled upon when hunting for the eggs of Black-headed Buntings. Five nests found in one day each contained three eggs, but these may have been incomplete clutches.

Some of the nests situated on the hillsides had very little cover. The young birds enjoyed themselves in the tobacco patches after leaving the nest and kept in broods even when full-grown. The high-pitched voice (*i. e.* the call-note) was heard never so commonly as when the snow was deep. In the winter the species established very intimate relations with the troops, and we had regular visitors to our bivouacs and huts for the table-scrap.

Like *Alauda arvensis* this bird mounts into the air and sings aloft, but its performance on these occasions differs a good deal from that of the better-known bird. The Crested Lark does not soar in a steadfast manner, nor does it remain for a long period poised on quivering wings. It appears to wander into the air rather aimlessly and does not attain the altitude usual to the Skylark. It does not remain in the air for any length of time, nor does it mount with any great frequency. In one point, however, the two species are almost alike, for both birds drop abruptly when nearing the ground—cutting the song short. In the hot weather these Larks run about with dragging wings and gaping beaks. The heaps of mule dung and associated clouds of insects attract large numbers. A word as to the usual tactics employed in battle. First, the two birds face each other and make sundry “feints” in a manner that is good to see. Both then jump upwards and meet in the air with a slight collision. A short chase follows. Some of the combats last a considerable time and take the principals a long way from the starting-point. The voice is very Lark-like with a specific note easily detected. The syllables used and the tone of the voice are not unlike those of the Skylark, but when compared with this bird the Crested Lark is very unmusical. There is no persistence or quality in the song. When the bitter Vardar winds were blowing across the plain and the passing skeins of Geese were the only other signs of bird-life, the Crested Lark could always be seen running along the snowy parapet searching for our table scraps ; at times the little bird would squat right down on its tarsi, and with crest erected to its fullest extent

and beak pointed almost vertically to the sky, would chatter its cheery little bar so near to us that we could see its throat bubbling with every note.

Motacilla boarula. Grey Wagtail.

Seen throughout the year, but most plentiful in autumn and winter. In the latter season they were observed in the evacuated villages running about the roofs and mud-brick walls, searching under tiles where possible and commonly entering houses. The Grey Wagtails fell an easy prey to the troops with their primitive bird-traps, but were so unsuspicious that it was considered bad sport to catch them. The same bird would walk into the most obvious trap time after time.

Motacilla alba. White Wagtail.

Very common in October and seen throughout the winter. Much less plentiful in spring, and very few seen in summer. Some young birds on 5 July and a pair of adults at Baisili, 5 August.

Motacilla flava flava. Blue-headed Wagtail.

Several adults at Cakirli 24 September (*circa*). They came with crowds of Redstarts and Spotted Flycatchers.

Motacilla flava rayi. Yellow Wagtail.

Large numbers in flocks of from thirty to sixty birds, or even more, appeared in the vicinity of Karamatli during the last few days in August and beginning of September. Some of them loitered about for several days. These flocks were largely composed of immature birds, *i. e.* birds of the year. Adults of the present race were seen, and for this reason I have included all these Yellow Wagtails under the heading of *M. f. rayi*. Further discrimination of species without skins would be impossible. I could not identify the adult of *M. melanocephala* to my satisfaction, but Major Sladen has skins obtained at the mouth of the Vardar.

Anthus campestris. Tawny Pipit.

Some noticed simultaneously with the increase of Wagtails in the autumn.

Anthus trivialis. Tree-Pipit.

Arachi, 6 April.

Anthus pratensis. Meadow-Pipit.

Struma plain in winter. When the snow fell these Pipits came to our tents for food, mixing with the White Wagtails and Crested Larks.

Sitta europæa. Nuthatch.

Common on the hills, but local in distribution. In spring at Arachi. Particularly plentiful in small woods near Lahana in October.

Regulus regulus. Goldcrest.

Some on the hills in October. One at Gumisdere, 7 November; another at Kopriva, 24 December.

Parus major. Great Titmouse.

The commonest Titmouse. Found on the hills wherever there is a trace of cultivation, and often in the scrub in quite desolate places. Most frequent from October to January, but numerous in April.

Parus cæruleus. Blue Titmouse.

Practically as *P. major*, but not so common.

Parus lugubris. Sombre Titmouse.

Two records. A pair haunted some pear-trees on which the fruit was rotten, in October and November at Paprat. Another pair at Arachi in April.

Ægithalus caudatus. Long-tailed Titmouse.

A few on the hills in autumn. Common in April and May.

Lanius excubitor. Great Grey Shrike.

Seen near the Struma in winter, especially in January. I remember one bird of a pair keeping in front of my horse for more than a mile, darting from its perch and skimming low over the ground, a short distance ahead, and then suddenly rising and perching on the top of a bush again.

Lanius minor. Lesser Grey Shrike.

Plentiful enough in June and July. Breeds freely. A number of nests in the Gramatna area.

Lanius senator. Woodchat.

A numerous summer bird to be seen in most localities — the Struma plain, the hills near Lake Doiran, and the woods at Mirova alike. Not so abundant as the next species. The dapper black and white plumage with rich sienna cap that glows brick-red when the sun hits the bird's poll, renders this Shrike very conspicuous. When they first arrive in the country and prior to nesting (I have no dates likely to be first arrivals), they roam about in pairs, flying from one bramble bush to another, keeping close to the ground in their short flights. The Woodchat is by no means a restless bird. A pair will take up their position on a clump of tall, woody and thorny undergrowth, post themselves about ten yards apart, and wait for coming events with great patience. They will crouch on a bough with their white breasts towards you and remain inactive for as long as six minutes by the watch. I say "inactive," but really the birds are very alert. The head is constantly moved, being cocked at every conceivable angle as the bird looks for passing insects. If an insect is caught by one of the pair, the less fortunate bird will flit over to its mate to watch the process of thrashing the insect to death against a small twig, and then return to its own "look-out" and resume the same seemingly indolent but really alert position. The short note is pleasing, but the call-notes are harsh. The white rump is very conspicuous in flight. Nests between Karamatli and Gramatna.

Lanius collurio. Red-backed Shrike.

A common summer bird. First seen 8 May. There were plenty near our camp during the second week in October. A diary note remarks their absence on 9 October, but I expect the last birds had gone before I appreciated the fact. Stagnant water near the river, the extensive beds of red poppies, and, above all, the high ground on the hillsides, where there were no hedges but acres of short thorny

vegetation, were their favourite haunts. I was singularly unfortunate with regard to nests, but had noted flying broods—in barred juvenile plumage—by the 1st of September. Quite a number frequented the country in the vicinity of our camp, and it was not surprising that their familiar habit of impaling insects on the thorns of bushes should be brought to notice quite commonly.

I fancy the Shrike's butchering habits have been pretty well worked out by now, but I should like to include a field-note that describes the whole performance :—

“12 September, noon and very hot. I was lying under a bivouac-sheet thrown over a short fig-tree, persuading myself that I was in the shade, when I noticed a Shrike operating only a few yards away. It was a young bird, but it had already learnt the dexterous manipulation of large insects and the family method of treating them. The bird caught a large grasshopper, on the wing. (The grasshopper was about $1\frac{1}{2}$ inches long and had bright red under-wings.) It was then carried in the beak—and it looked a large bundle compared with the size of the bird—to a tall bramble bush, where, seated on the topmost bough, the Shrike paused for a minute. Then descending to a twig about half-way down the bush and on the outside, it thrust the insect, back upwards, on a long slender thorn. A slight shuffling preceded the impaling, and was evidently the attempt to kill and to get the grasshopper into a convenient position. The thorn was pushed into the middle point of the under surface of the thorax. The point penetrated about one-third of an inch and thus did not protrude through the insect's back. When I examined it a little later the prey was apparently quite dead. There were no more insects on this particular bush, but a search of the neighbouring brambles revealed three more plentifully-stocked larders of which large grasshoppers formed a prominent part.”

[SYLVIIDÆ.—The geographical conditions of many parts of Macedonia are unsuited to the habits of Warblers, but nevertheless quite a goodly number do frequent the more likely

places, and in the autumn, when birds of passage are in the country, the vineyards and streamsides literally teem with little *Phylloscopine* birds. In June also there were plenty of Warblers in the vicinity of the villages, but, as I was not in a position to use a gun, I could only identify the more familiar species. I found the hillside vegetation well worthy of notice during the last week in August. The bushes were loaded with blackberries, and Warblers of a dozen species could be seen dodging about, little birds, yellow, grey, or brown in colour, all slipping through the undergrowth here and there and rarely giving a good chance of observation. *Phylloscopus* was usually the predominating genus. On 7 September Warblers were still common,—thronging of Whitethroats, Garden-Warblers, and Blackcaps (these last still in pairs) being found wherever there was a scanty hedgerow or wooded corner. On 12 September I made the following note:—“It would be difficult for any person who has not witnessed such a sight to credit the number of ‘Willow-wrens’—I used the word loosely—in the district where we are camped at present (Cakirli). The ground is very rough, there are no habitations, cultivated patches, or roads, but simply the hills, broken by gullies and rough tracks. The ground is covered with a kind of dwarf oak—at present bearing acorns, prickly bushes, and brambles. This scrub is haunted by scores of Warblers.” Without means of verification I shall not attempt to describe species, but the Chiffchaff and Willow-wren were certainly there. These were still common on 3 October. I have added a few notes on the species I could actually name.]

***Phylloscopus collybita.* Chiffchaff.**

The Chiffchaff winters in Macedonia, although in no great numbers, and no bird can be more reserved in its choice of winter quarters. The Struma plain is intersected by tiny waterways which follow a tortuous course, eventually finding their way into the river. These irregular waterways, together with many isolated ponds, are overgrown with

aquatic vegetation. Beds of reed-mace usually fill the centre of the ponds. In these thick masses of reeds and in the half-rotten and wind-bruised "flags" growing on the banks the Chiffchaffs spent the winter months. There was a certain place near Ormanli where I could always rely on finding one or more of these birds, even in the most severe weather in January and February. In windy weather they would be difficult to see and would spend the day creeping about the undergrowth near the ground or water. At the end of March they disappeared, but immigrants arrived very early. I infer that the birds wintering in Macedonia go north to breed and move before birds that winter farther to the south appear in their place, but as birds of passage only. Not seen in summer.

Phylloscopus trochilus. Willow-Warbler.

Cettia cetti. Cetti's Warbler.

Numerous in the summer. The nests were extremely difficult to find. I was unsuccessful in the breeding-season, but have no doubt that this Warbler breeds in suitable places between the Seres Road and Kopriva. A nest at Orljak was situated quite in the middle of a dense mass of brambles; another in a tall and very thick hedge corner. Both these were found in the autumn, long after the birds had gone and the leaves fallen, although I had searched diligently for them in the previous May.

Acrocephalus schœnobæus. Sedge-Warbler.

Sylvia borin. Garden Warbler.

Sylvia atricapilla. Blackcap.

Sylvia communis. Whitethroat.

Seen 12 April; heard singing the same evening. Found commonly over the country by 14 April. Breeds commonly. According to other observers my first date is a late one, but although there may have been Whitethroats in the country before 12 April I never saw them on the Struma plain.

Sylvia curruca. Lesser Whitethroat.

Seen 7 April. Still in pairs 20 September. On 3 August a brood spent the greater part of the day picking up ants a few yards from the door of my bivouac.

Turdus pilaris. Fieldfare.

Seen from the beginning of January to the middle of March, but never in very large numbers. A small movement, apparently to the south, in January, small flocks flying over Orljak in an intent manner. Single birds seen later were not at all shy. They spent their time grubbing about on the ground under cover of the bramble bushes and were loath to take wing. When poked out with a stick they would merely skim along the ground to the next cover.

Turdus philomelos. Song-Thrush.

Occasionally in February and March on the Struma plain.

Turdus merula. Blackbird.

Resident, but not very common. Several pairs bred near Karamatli. A nest with four eggs at Aracli, 14 April. This nest was in an extraordinary position. It was conspicuously placed on a projecting root on the side of a gully, which was about three feet deep, the nest being therefore really below ground-level. This nest was subsequently destroyed by reason of the gully assuming its original function of a waterway after some heavy rain.

Phoenicurus phoenicurus. Redstart.

Common in summer and especially numerous in September; 14 October and 1 November at Orljak.

Phoenicurus gibraltariensis. Black Redstart.

Frequent from November to March. At the beginning of December a number near the sea at Salonica (some tired Buzzards and a coasting-movement of Finches noted at the same time). November was the best month for them on the plain, but they rarely stayed in a given place for long and were usually met with alone or in pairs.

Erithacus rubecula. Redbreast.

Sufficiently rare to be noted when seen. A few near the Butkova River, 23 January. Others at intervals in winter. One at Sivri, 2 October.

Luscinia megarhyncha. Nightingale.

Common summer bird. Noticed 5 April, 1916 at Kopriva. Singing well, 14 April. Several nests in June, a large proportion of the eggs being light in colour. By 4 July broods in spotted plumage were hopping about the thickets. In 1917 the first record was 7 April, on which date a bird was singing lustily in the evening. I was much impressed with the very sedentary habits of this species. In several cases a pair appeared in April in a small piece of cover, quite isolated from other vegetation, reared their young there, and could always be seen in the same small area until the time for departure arrived in the autumn. The Nightingales at Kopriva were still in their secluded corners on 15 September.

Saxicola rubetra. Whinchat.

Plentiful in autumn, especially the first week in September, when they outnumbered the Stonechats.

Saxicola rubicola. Stonechat.

A common resident, wintering in selected localities at intervals along the Seres Road and on the border of the plain. All the birds I saw in winter were quite adult and in pairs. I formed the opinion that birds of the year did not stay in the country. The parents of a brood seen on 5 August were very dark in colour and not in the least brown or reddish on the underparts. The voice was that of the present species.

Ænanthe œnanthe. Wheatear.

A common bird in Macedonia, where there are large tracts of country suited to its requirements. It spends the greater part of the year in the country, being seen from the end of March to October. In the blizzard of the 29th of March Wheat-ears were running about in the snow at Lahana.

Several nests were found. The number of adult birds was augmented in September, but by 9 October the species was absent from some places where it had been common during the preceding months.

***Enanthe hispanica*.** Black-eared Wheatear.

A pair at Orljak, 26 May. One—an adult male of the black-throated variation—at Aracli, 13 April. A few others throughout May.

***Accentor modularis*.** Hedge-Sparrow.

Only three records. Two seen in February and one in January, all on the Struma plain. All observers seem agreed as to the scarcity of the Hedge-Sparrow in southern Macedonia.

***Cinclus cinclus*.** Dipper.

Found in a few widely scattered localities, but the country is not at all suited to their requirements. In October heavy rains had the effect of changing the dry pebbly river-bed at Gumisdere into a torrent, and a few Dippers appeared. They stayed until the water ceased to rush down from the hills, which was only a matter of a few days.

***Troglodytes troglodytes*.** Wren.

Frequently seen, but not common. Noticed on the banks of the Struma in February and January, and at Aracli in April.

***Muscicapa striata*.** Spotted Flycatcher.

Common in spring and autumn, especially so at the latter season. Seen 16 April. For the last half of August and first few days of September they were very numerous, the increase in numbers corresponding to similar increases in the ranks of the Redstarts, etc. I have rarely seen so many as in the fruit-growing district of Sirt Dere on 8 September. In fact, a pair or more seemed a necessary adjunct to each fig-tree or vine. On 20 September they were still common, but there was a decrease by 3 October. These Flycatchers would ignore the butterflies swarming about them, but would dart at the largest of the Hymenoptera, giving each a sharp

nip before swallowing them. I saw one bird catch an insect which was far too large for it to treat with its accustomed neatness. The Flycatcher battered it against a twig with a great show of fury, fluttering from bush to bush with its burden, and was still working at the insect in terrier-fashion when it passed out of sight.

Muscicapa hypoleuca. Pied Flycatcher.

Karamatli in April (first date 12 April).

Hirundo rustica. Swallow.

The most common of the Hirundines. First dates 9 and 21 March (1917), 27 March (1918). Mating, 7 April; nest-building, 1 April. Eggs well incubated, 21 May. Breeds in most of the villages on the plain—if not all.

Delichon urbica. Martin.

Seen 1 April, but not in any numbers until the end of the season (19 September). Some passing flocks, 21 August.

Riparia riparia. Sand-Martin.

Abundant along the Struma. Crowds at Kopriva Bridge in May.

Picus viridis. Green Woodpecker.

Struma plain in January. Karamatli in September.

Dryobates major. Great Spotted Woodpecker.

Seen at all seasons of the year. Paprat was a good locality for them. Some would be met with on the open hills, making their way across country from one copse to another, the loud "*pic-pic-pic*" announcing when they settled. They were particularly attracted by the leafless fig-trees in winter. A pair seen at Aracli in April may have been nesting. I have no record of *D. medius*, although it is stated to be the common Woodpecker of Macedonia.

Cuculus canorus. Cuckoo.

Seen 6 April, and numerous through the spring of 1918. Very few seen in 1917, but from all accounts 1916 was a good year for Cuckoos.

Micropus apus. Swift.

Seven at Ormanli, 22 May. They stayed about two hours. Not seen again till August. On 21 August some flocks appeared in company with Martins and were evidently on passage.

Caprimulgus europæus. Nightjar.

28 May. On Struma plain in September. At Salonica in October. Two eggs found by a friend about last week in June on the hills near Gramatna.

Merops apiaster. Bee-eater.

Common in summer. Present 4 May in pairs, and 19 September. One of the commonest sounds on the Struma plain in summer is the strange cry of the Bee-eater. I was never fortunate enough to find a nest myself, but had eggs brought to me from a native cemetery. Major Sladen tells me that he has found them breeding near Janis and Dudular in holes in the ravines.

Upupa epops. Hoopoe.

Common in summer. In the spring of 1917 I was not in a favourable position to observe, and the first Hoopoe was not seen till 10 April. In 1918 six were seen, 3 April. Still numerous, 19 September. The Hoopoes were very shy birds, but their preference for particular localities offered opportunities for observation. One or two could usually be found in the dense foliage of a line of willows fringing a small stream near the Struma. It was quite useless to try to stalk these birds at midday. They were most vivacious, and would fly from tree to tree forbidding a close approach. They were seen under the most favourable conditions on the hills, but even there their solitary, shy habits were well marked. I usually contented myself with listening to their peculiar voice. The call of the Hoopoe is a clear "coo-coo," or "coo-coo-coo." In tone it is between the monotonous cooing of the Doves and the clear penetrating voice of the Cuckoo, and with both these it might be very well confused.

Unlike the note of the Dove, in which the last syllable is

accentuated and sometimes raised in tone, the Hoopoe's notes are quite uniform. The double or triple note—or perhaps bar is the best word to use—is repeated a varying number of times. There may be a short “song” of only a dozen or even less bars, and these may be all of the triple or double kind. In a spirited bird the song is long, and the bird may be said to “*coo*” continuously for ten minutes or so. At first I was inclined to think that there was some method or significance in the use of the double or triple call, but a mass of statistics—if I may use the word—compiled later, gave poor results. For instance, a song of 62 bars included 8 triples, another of 69 included 12 triples, another of 145 bars included 99 triples and these scattered spasmodically through the song. Some charts I prepared showed little except that the triple bar is more constantly used by some individuals than by others. A pair of Hoopoes love making at Arachli made quite a different noise. They were fluttering about like gaudy butterflies on the edge of a small clearing. The male chased his mate from tree to tree. Both birds were very active, their tails spread and their crests mobile. During their gambols a succession of low harsh notes were heard.

Alcedo ispida. Kingfisher.

Seen commonly during the winter. According to Major Sladen it breeds near Hirsova.

Coracias garrulus. Roller.

Common in the summer. Seen 17 April. Its marked characters are the hoarse voice, erratic flight, and quarrelsome disposition. The outstanding feature with regard to its pugnacity was the antipathy shown towards the Jackdaws. Early arrivals in the spring were mobbed incessantly by smaller birds, and it was interesting to note the long processions of Starlings and Sparrows moving from tree to tree in the wake of a Roller. Quite a feud existed between the Rollers and Jackdaws wherever the two species were found together. The Roller is very active and fierce in the chase, and its clamour is even great enough to overwhelm

the noise made by the Jackdaws, which is quite an achievement when one considers the latter bird's capabilities in this direction. The Roller was always dominant in these affairs and usually the aggressor. The Jackdaws showed great skill in their attempts to escape from the Rollers. They would dart and topple about in every possible manner, and often double back along their own line of flight. Sometimes they would dive headlong into thick grass or into the foliage of trees. Such doings, however, were of little avail. The pursuing Roller would keep about a yard behind and forestall each caprice of the Jackdaws—even to the precipitous downward swoops. Later in the season, when the Rollers had progressed further with their domestic arrangements, they were not so quarrelsome. It should be noted that the Jackdaws had paired and settled down by the time that the Rollers commenced their activities, and I think that the valiant Daw of early spring would show a more determined front to the intruder. I found two nests in the ravine at Orljak in June. The birds showed the greatest craftiness in concealing their movements to and from the nests, which were in holes near the top of a cliff, and about fifty yards from the bottom of the ravine.

Bubo bubo. Eagle-Owl.

One remained in the vicinity of the river at Orljak for several days, at the beginning of January. This is the only personal record I have, but from all accounts I have no doubt that this Owl is frequently met with near Lake Doiran.

Asio accipitrinus. Short-eared Owl.

Seen from December to March on the Struma plain.

Carine noctua. Little Owl.

A common resident, and one of the most noticeable of Macedonian birds. This Owl is distributed over the country in haunts that differ widely in character. It is common on the Struma plain, especially in or near the villages, on the hills, and in the woods. I saw plenty on the outskirts of Salonica, and, indeed, this is one of the first birds to attract

attention on landing in the country, for several are almost sure to be met with whilst wandering over the boulder strewn land in the vicinity of the coast. A nest at Elisan on 1 June contained young a few days old.

[HARRIERS.—Harriers were very abundant on the plain, but they are most perplexing birds to a field naturalist, and only in cases of adults or birds in very characteristic phases of plumage could there be sure identification. The adult female of *Circus cyaneus* "Ringtail," and the immature *C. æruginosus* in that phase of plumage once designated "Moor Buzzard," *i. e.* dark brown with light head, were the most commonly seen.]

Circus cyaneus. Hen-Harrier.

Salonica (on the Seres road), in October. At Cavdah Mah and other places on the plain in December, January, and February. A pair suspected of nesting seen through July.

Circus pygargus. Montagu's Harrier.

Several times in the winter.

Circus æruginosus. Marsh-Harrier.

Noticed in December, January, and March, but found breeding by Major Sladen.

Circus macrurus. Pallid Harrier.

An adult male shot at the end of October.

Accipiter nisus. Sparrow-Hawk.

Not uncommon in winter, and most frequently seen in December. The outskirts of deserted villages at the edge of the plain were good localities for this species.

Buteo buteo. Common Buzzard.

Numerous in winter, and seen at intervals during the spring. Observed in a variety of situations: scattered over the hills (pairs were frequenting the wooded country at Paprat in October), on the plain, round the town of Salonica itself, and on the coast to the east of the town in December.

Milvus milvus. Kite.

A common resident, and as numerous on the level ground near Salonica as anywhere in the country.

The Allied troops who occupied Macedonia during the war had a very different method of living to the former inhabitants. The roads, which were strewn with the carcasses of ponies and mules etc. when British troops arrived in the country, were speedily cleared up, and as all refuse was afterwards destroyed with military precision, the country rapidly became more clean. Such a state of affairs was not congenial to the Kites, and their numbers seemed to decrease as the campaign proceeded, but some could usually be seen near the villages retained by the inhabitants.

Falco peregrinus. Peregrine Falcon.

Seen several times on the Struma plain in January and February.

Falco subbuteo. Hobby.

Frequent in the summer.

Falco æsalon. Merlin.

Seen occasionally in winter (December and January).

Falco tinnunculus. Kestrel.

Resident and far from uncommon, but less numerous than the smaller *F. naumanni*. It is evenly distributed over the whole district, and could be seen on the plains, hills, and near the old walls of Salonica. Like other Accipitres, it was especially numerous in the Struma valley. A pair nested in the ravine at Orljak, the nest being placed on a receding ledge of the cliff, about fifty yards from the ground, and quite unapproachable from the top. It was my experience that this species did not breed in the villages and that the next species was the bird which bred commonly under the roofs of native houses.

Falco naumanni. Lesser Kestrel.

This is one of the most conspicuous of the Macedonian summer birds. It is quite common and breeds freely, is

confiding and so noisy that it can scarcely escape notice. It was not seen in the winter months. This species is very partial to the villages on the Struma plain for the purpose of breeding. As early as 8 March a pair showed signs of settling down in the mosque at Ormanli. Mating was first noticed during the first week in April, but most frequent about 19th of the month. One nest contained two eggs on 22 April.

Falco vespertinus. Red-footed Falcon.

Common in the summer, and much more numerous than *F. subbuteo*.

[EAGLES.—These birds were a prominent feature of the bird-life on the Struma plain—in winter especially. It was not unusual for every post or bare tree within vision to be occupied by a lumpy looking Eagle, whose head was for ever turned in the direction of the river, watching the Ducks flying uneasily up and down. In severe weather in January 1917, Eagles were particularly numerous along the banks of the Butkova river. I could not identify *A. chrysaëtus* to my satisfaction, although I examined scores of large Raptores through a good telescope.]

Aquila heliaca. Imperial Eagle.

The most numerous Eagle. Resident. Conspicuous white scapulars denoted a fair proportion of adult birds. I skinned one bird (killed with a service bullet) and found the remains of a Coot in the stomach.

Aquila clanga. Spotted Eagle.

Small Eagles seen commonly on the plain were no doubt of this species, but it cannot be stated with certainty. An immature bird seen at close range on the hills at Karamatli (22 July) could have been no other. On 4 May a Spotted Eagle was having a great deal of trouble with a writhing snake which it was carrying. The snake was eventually dropped, but the Eagle did not descend for it again. Small Eagles could be seen at almost any time on the Struma plain.

Haliaëtus albicilla. White-tailed Eagle.

A fair proportion of the Eagles seen were of this species. Most numerous in winter, but seen in spring.

Hieraaëtus fasciatus. Bonelli's Eagle.

Common on the left bank of the Struma in winter. The light breast, which looks quite yellow at long ranges, is a good field point. I suspect that the "Ospreys" of my sportsman friends were usually examples of this Eagle. I kept a close watch for Ospreys, but was unsuccessful; but Major Sladen tells me in a letter that he has eggs—taken by an officer—from the hills to the south-east of Lake Doiran.

Neophron percnopterus. Egyptian Vulture.

Flocks consisting of a score or more of these birds were quite common in the summer. The species seemed to be most numerous in the direction of the Serbian frontier, where the state of the country must have been more congenial to their wants than the cleaner area occupied by the British forces. One sultry afternoon in April a flock of these Vultures remained in the air through a thunderstorm. The downpour of hail, which was particularly violent, made no appreciable difference to their easy manœuvring aloft.

Gypaëtus barbatus. Bearded Vulture.

Single birds seen on three occasions on the hills at Paprat in November. At close range the wedge-shaped tail is very conspicuous, and a uniform grey appearance serves to distinguish the species afar. The closest investigation of all large Raptores failed to reveal this species on the plain.

Gyps fulvus. Griffon Vulture.

Common, but usually seen at a great height over the Struma plain. Bursting shrapnel (anti-aircraft) caused them to mount to an even greater altitude. This species was only once seen under really favourable circumstances. This was in August, when a flock of eight birds descended into the valley at Baisili, attracted by the assembling of a large

number of Ravens and Egyptian Vultures ; but even on this occasion the Griffons remained well above the other birds present—circling round on practically motionless wings. Looking at them from my dug-out, high up on the adjoining hillside, it appeared to me that their light colour was their best distinguishing mark.

Vultur monachus. Black Vulture.

Probably more common than my few clear cases of identification would suggest—as most of the larger Vultures seen were very dark.

Phalacrocorax carbo. Cormorant.

Seen in January on the Struma. One shot.

Phalacrocorax pygmæus. Pygmy Cormorant.

Often seen in winter. One frequented the stream near Ormanli throughout February. This stream was shallow, and for the most part overgrown with vegetation. The Cormorant was very persistent in its habits, but very shy. It would take flight whenever there was a suspicion of danger, always flying quite away from the place.

Anser albifrons. White-fronted Goose.

Anser finmarchicus. Lesser White-fronted Goose.

I spent the greater part of the winter of 1916–17 on the Struma plain, and had plenty of opportunities for watching the Geese. Skeins were first commonly seen in October, and the number increased daily, regular flight-lines being established across the plain. At the end of February the number of Geese taking part in the daily flights was vastly in excess of that seen at the beginning of winter. On a few days I estimated that at least five thousand Geese passed over Ormanli (*i. e.* in one direction). I kept a daily record of the Geese seen. There was a great falling off in numbers 11 March (*circa*), and from 13 March onwards there were frequently blank days—days on which not a Goose was seen or heard. As late as 5 May, however, flocks could be

heard at night. Seven birds were examined during the winter. Four of these were Whitefronts. The other three were undoubted examples of the Lesser White-fronted Goose (all in February). They were very small and showed the characteristic features of *A. finmarchicus*. Most of the Geese seen on the plain seemed to be pretty well marked with black on the underparts. I have no evidence to support Major Sladen's notes as to the breeding of Grey Geese in Macedonia, nor have I any records of the Grey Lag Goose.

[DUCKS.—Good Duck-shooting was to be had on the Struma plain in winter. The majority of the fowl that came to the water near Ormanli in February were Mallard and Pintail, but a lot of Wigeon and Smew were killed during the month with a fair sprinkling of Pochards. I examined a good bag of Garganey and Shovelers on 20 March. The Ducks fell off in numbers in March, but a few could be seen on the plain right through the spring, and these comprised both diving and surface-feeding fowl. I left the plain in May. A large percentage of the Ducks on the Struma in January 1918 were Smew. During the day small parties of from two to four birds could be seen paddling about like Moorhens on the river. One or two fine adult males came to hand for identification at various times. The following species of waterfowl were common, but I can do little beyond giving a list as my dates are discontinuous.]

Anas boschas. Mallard.

Anas strepera. Gadwall.

Querquedula querquedula. Garganey.

Mareca penelope. Wigeon.

Spatula clypeata. Shoveler.

Dafla acuta. Pintail.

Nyroca ferina. Pochard.

Nyroca fuligula. Tufted Duck.

Mergus albellus. Smew.

Platalea leucorodia. Spoonbill.

A considerable number crossed the Struma—going east—on the evening of 23 May; they were travelling in parties of from 6 to 20 birds. Seen again in June. It is quite probable that I had overlooked these high flying Spoonbills for several weeks. At a good height, the flocks are very liable to be mistaken for flocks of Geese or Storks. This may seem rather ridiculous, but when the air was thick, the light failing, and the sky full of passing skeins of Whitefronts, it was a very easy mistake to make.

Ardea cinerea. Heron.

Seen in no great numbers along the course of the Struma and Butkova rivers, December and April.

Ardea purpurea. Purple Heron.

Odd birds seen near the Struma at intervals.

(I did not meet with any "White" Heron, but should say that I never visited the lakes.)

Botaurus stellaris. Bittern.

Occasionally on the Struma plain.

Ciconia ciconia. White Stork.

Noted on 13 May in the springs of 1917 and 1918. Breeds plentifully on the plain—almost always in trees. There were numerous nests at Kopriva, Orljak, Elisan, Dragos, and Ormanli. Some of the villages on the hills were not so favoured. At Ormanli there were 26 occupied nests on one side of the village alone. There were very few chimney-top nests in my district, although a few birds had nests on the church towers. Odd birds seen late in October.

Otis tarda. Great Bustard.

I only saw one, but from all accounts was unfortunate in not seeing more. A single bird flew over our camp on 7 April, at Alexia.

Otis tetrax. Little Bustard.

Seen commonly when once the right localities were found. On 4 May, one of these birds jumped out of the long grass

within twenty yards of a train, but all the others seen were extremely shy.

Burhinus œdicnemus. Stone-Curlew.

A common summer bird in some districts. Broken eggs at Gramatna on 18 June were well incubated.

Charadrius dubius. Little Ringed Plover.

Noticed in the dried-up river beds in April and May. Always alone or in pairs. Eggs during the first week in June. First bird seen 7 April at Orljak. All the Ringed Plovers seen were of this species. One bird suspected of having eggs was observed chasing a Swallow and was without doubt the aggressor.

Vanellus vanellus. Lapwing.

Common in winter.

Erolia alpina. Dunlin.

Struma plain in winter.

Tringa ochropus. Green Sandpiper.

Seen near the Struma in January, February, and March, but never really common. Other Sandpipers not noticed on the Struma plain.

Tringa totanus. Redshank.

Plenty seen in winter.

Tringa nebularius. Greenshank.

Fairly numerous near the Struma between Kopriva and Orljak in January.

Numenius arquata. Curlew.

Common in winter.

Gallinago gallinago. Common Snipe.

Numerous in winter. Pairs seen during the first week in April near Kurkut.

Limnocryptes gallinula. Jack Snipe.

Common in winter.

Scolopax rusticola. Woodcock.

In winter this bird is as numerous as the keenest sportsman could wish it to be.

Hydrochelidon nigra. Black Tern.

Terns seen on the Struma from June onwards were mostly of this species. I was shown eggs, taken from islands in the river, but could not identify them from memory as being assuredly Black Tern's. Major Sladen met with thousands of these Terns at Lake Ardzan, preparing to breed in May, and later had eggs sent to him from this place.

On the 4th of May—when travelling by train from Salonica towards Larissa—I passed two places well stocked with Terns. One place was on the marshes, near the point at which the railway crosses the Vardar (Karasuli, apparently where they are common, according to Major Sladen), and the other—a smaller colony—yet further from Salonica. From their behaviour at both these places I should say that the Terns contemplated breeding.

[GULLS.—Black-headed Gulls on the Struma from December to March were—I am almost sure—*Larus ridibundus*. Larger Gulls at Salonica throughout the winter (sp. ?).]

Gallinula chloropus. Moorhen.

A few that frequented a reed-bed near Ormanli in winter were the shyest birds I have ever met with.

Fulica atra. Coot.

Abundant on the rivers in winter. In January 1917 the Butkova River was swarming with Coots.

Puffinus kuhlii. Mediterranean Shearwater.
Gulf of Salonica in October.

Podiceps cristatus. Great Crested Grebe.
Plenty on the Struma in January.

Podiceps griseigena. Red-necked Grebe.

A pair seen several times in the Gulf of Salonica in November 1916.

Podiceps nigricollis. Black-necked Grebe.

A pair on a pond near Salonica, 4 May. Small Grebe on the Struma in January were probably of this species.

Colymbus sp. ?

Seen from the shore at Salonica in November.

Columba palumbus. Wood-Pigeon.

One record only, Hamzali in October.

Columba oenas. Stock-Dove.

Small flocks in winter. A large flock of Doves—attributed to this species—travelling north on 4 March, were flying rather low.

Streptopelia turtur. Turtle-Dove.

Common in summer, but avoiding the villages, thereby differing greatly from the next species. Quite a number bred in the Gramatna area. In many cases the nests were out on the hills a good distance from the villages. As late as 1 July I found several nests with eggs—in one case three eggs in the clutch. In the majority of cases the nests were built on branches that sprang out directly from the main trunk of a tree. They were often very accessible, being sometimes about six feet from the ground. Two nests were found, only separated by a distance of about as many yards, and one of them was so exceptionally frail that it was really wonderful that the eggs did not drop through it.

Streptopelia risoria. Collared Dove.

A common resident, but inclined to be local in distribution, which fact probably explains why Major Sladen did not meet with it. This Dove is most domesticated in its habits, spending the day pottering about the housetops and roosting in trees near by. When roosting they are easy to approach and could be knocked off the boughs by means of long sticks.

It is interesting to note that the present species and *S. turtur* were rarely found together in the same district—*i. e.*, in any numbers. A curious little trick associated with the courtship was noticed at the end of February. One bird—no doubt the male—would leave its mate sitting on a branch of a tall tree, and then flutter upwards for a few yards. The back would be turned towards the female, and the tail spread to its fullest extent. This display was always of short duration. The act of mating (in March) often took place on the very slender twigs at the top of tall trees. The male would absolutely pounce on the female, and then flutter round her in a small circle, after which he would alight on her back again with poised wings. In the spring it is difficult to find nests, for they are placed in large and very leafy trees. Later in the season, when the boughs are quite bare, they can be located with much greater ease.

Coturnix coturnix. Quail.

Some in February. Plenty in April and May. There is little doubt that a few Quails winter near the foothills. In May several pairs frequented an acre or so of very densely vegetated ground on the plain. There were huge thistles, of a kind that grows to the height of a man, growing in this place, and they were so thick that getting after the Quails was out of the question.

Perdix perdix. Partridge.

Common at all seasons, and more numerous in most districts than the next species.

Alectoris sp.? Partridge.

In some localities a red-legged Partridge is common at all seasons, but I often went over wide stretches of country without seeing a single bird. As I have no specimens from the Struma plain I hesitate to call these birds *A. græca*.

Phasianus colchicus. Pheasant.

Seen in a few favoured localities only.



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