

NOVITATES ZOOLOGICAE.

VOL. XXX., 1923.

NOVITATES ZOOLOGICAE.

A Journal of Zoology

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EDITED BY

LORD ROTHSCHILD, F.R.S., PH.D.,

DR. ERNST HARTERT, AND DR. K. JORDAN.

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(WITH FOUR PLATES.)

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MARCH 1923.

No. 1.

ON THE BIRDS OF CYRENAICA.

By ERNST HARTERT.

WHILE for many years the ornithology of Egypt in the east of North Africa, and of "Africa Minor," i.e. the Atlas region from Tunisia to Morocco, in the west, has been more or less explored, and is—though still more or less superficially—known, and while we also have a certain amount of knowledge of the birds of Tripoli, until quite recently nothing had been known of the bird-life of Cyrenaica or Barka and the Libyan Plateau, i.e. about roughly the vast region between long. 20° and 29° E. Only in 1901 Dodson, Mr. Whitaker's able collector, touched the utmost east of Cyrenaica, travelling from Bisher along the coast to Benghazi, where he discovered one of the forms peculiar to the country, the *Galerida theklæ cyrenaicæ*. In January 1920, Col. Meinertzhagen made a flying trip to Sollum or Sellum, close to the political boundary of Egypt and Cyrenaica, and to the Siwa oasis, by motor, and collected a few birds. Quite recently Dr. Festa has made two expeditions to Cyrenaica, from April to May 1921, and again from November 1921 to June 1922. He also acquired a little collection brought together near Benghazi by an army official in 1916, and Salvadori and Festa have published lists of the first and last collections, which added another very distinct peculiar form: "*Alectoris barbara callolaema*"—already named *barbata* by Reichenow from a cage-bird of unknown origin.

The results of his last collections made in 1921-22 are not yet known, but from samples seen by me, it is evident that they will be very interesting and add many species to the list. The Zoological Gardens at Giza near Cairo have also received live specimens of the same *Alectoris* from Mersa Matruh, between Sollum and Alexandria!

Neither Gerhard Rohlfs (1868-69) nor Rosita Forbes (1920), who made the difficult journey to Kufra (Kufara), or other older writers, have given us any information about birds.

Considering this state of affairs and that neither in Tring nor in any other collection outside Turin material from Cyrenaica existed, Lord Rothschild asked me to visit this country and to make a collection of birds and lepidoptera, as far as this could be done in the short space of about two months. I readily agreed, after Lord Rothschild had obtained permission for me and Carl Hilgert to go to Cyrenaica and to collect, from the Italian Ambassador in London,

whose brother was Governor of Cyrenaica, but unfortunately died of influenza there.

In order to pick up Hilgert I travelled via Germany and rested a day at Ingelheim, where, on March 15th, I saw the first White Stork circling over the Rhine. In Bonn I stopped a few hours, seeing my friends Koenig, Jordans, and Geyr von Schweppenburg; in Munich, Carl Hellmayr, who has now emigrated to Chicago, saw me at the station. The journey through beautiful Tirol excited keen longing to roam over those magnificent mountains, but our goal was farther away! In Bozen ("Bolsano") Stresemann greeted me at the station for, alas! about 15 or 20 minutes. The long journey through Italy was beautiful, but we were content to reach Naples, which we left on March 21st, arriving at Benghazi on the 24th. We saw Capri in the glow of the setting sun, Catania in pouring rain, Messina—still partially in ruins from the last earthquake—in sunshine, Syracuse by night. In the harbour of Messina we saw a Gull which was strange to us, and we are convinced it must have been *Larus genei* (*gelastes* auct.). Otherwise no birds were observed except *Larus argentatus cachinnans*, and on the 23rd *Sylvia cantillans* and *Phylloscopus sibilatrix* visited the ship.

Benghazi (the Berenice of the ancient Greeks) looks pleasant enough from the roadway where large ships stop, about 2 km. from the little harbour: a breakwater, a great extent of European houses, an old Turkish fort, palm-trees right and left of the town on the flat shore. In rough weather landing is difficult and sometimes impossible. There is a good and comfortable hotel, the "Albergo Italia," with only one great drawback, viz. the innumerable mosquitoes of actually three species, for which nets are not provided.

Benghazi is a comfortable and in the spring evidently healthy place, with numerous cafés and large bazaars in which one can buy almost everything; the town is said to have now 40,000 inhabitants, including numerous Jews, some of ancient origin, maybe partially descendants of those who came under Ptolemy Soter and, during the reign of Trajan, massacred, it is said, 200,000 (?) Romans and natives, others recent immigrants since the Italians conquered this colony from the Turks in 1911 and 1912; needless to say, they form the majority of the shop-owners. For an ornithologist it is disappointing. There is only one place which one can easily reach by walking, i.e. the little peninsula of the "Giuliana," where one finds some bushes and shore-vegetation, as well as a few palm-trees, and where the Italians first landed and have erected a large and striking monument in memory of the fallen soldiers. There one can collect and observe numerous small migrants and sparrows, and find some insects. Every other excursion is more or less long and tedious: first, one has to pass through the town with extended, straggling suburbs, then follow in every direction, except along the uninteresting sandy shore without birdlife, wide, flat, salt-water lagoons, where one sees in March and April swarms of Waders, chiefly Dunlins and small Plovers. Beyond the tedious lagoons one comes across a belt of barbed-wire entanglements, and after these, at last, one is in the open! But the open country during my visit was a disappointment: not like a garden full of flowers and bushes, as described by Rohlf in 1869, but a bare, Karst-like, stony, calcareous plain, with patches of red soil and poor, thin fields of low barley, and generally very little wild vegetation. No doubt in former times there must have been more of the latter; in the present state the ancients would hardly have described this place as the gardens of the Hesperides; for miles round the town every bit of green stuff

is gathered to feed goats, sheep and cattle, donkeys, mules and horses, and every tree and bush is cut down for firewood. This plain, with a few oases of palm-trees and gardens, is, however, inhabited by numerous *Calandrella minor* and *Galerida cristata*, a few Stone Curlews, and now and then, but apparently not regularly, some Cursors. The gardens and oases are uninteresting, only very few birds nesting there, but migrants are numerous everywhere in the spring, many resorting to the barbed-wire entanglements, where they find resting-places and some vegetation and food.

To explore other parts of Cyrenaica is inconvenient, as the colony is very young and no development took place during the war. Communication between Benghazi and the other ports, Derna and Tobruk, is irregular, and mostly bad; there are so far not many good roads, accommodation can only be found in a few places, the safety is often uncertain, and the authorities, though very kind generally, and especially in granting us readily permission to shoot everything during the close season, refused to grant us an excursion into the real desert south of the plateau of Barka. Even to Msus they did not allow us to go, and at Sheleidima we were not permitted to sleep, but were given an armed escort and had to go back many miles to the fort of Soluk for the night, where we got a small room with one bedstead, one table, and one chair, inside the wire entanglements. There is in Soluk a small garrison and some kind officers.

Soluk and Sheleidima are south of the plateau of Barka. The steppe plain between the two places is mostly well covered with small plants, chiefly *Salsola*, a stiff kind of grass, and pretty-flowering *Statice pruinosa*. From Sheleidima a dry river-bed extends into the semi-desert, with thick bushes of *Zizyphus*, in which Grey Shrikes abound and *Alectoris* are not rare. Northwards are very bare, stony hills, on which *Galerida theklæ cyrenaicæ* represents the *Galerida cristata festæ* of the plains. The more or less green steppe is frequented by Bustards, *Chlamydotis undulata undulata*, thirteen of which were once seen on the wing together, *Alaemon alaudipes*, *Cursorius*, Stone Curlews, *Oenanthe moesta*, and others. The steppe near Soluk is covered with small plants of *Salsola*, *Suaeda fruticosa*, *Reaumuria mucronata*, *Echmiopsilon* and others.

Near Soluk birds are scarcer, but Crested Larks, *Alaemon alaudipes*, *Calandrella minor*, *Cursorius*, are common enough. Stone heaps are inhabited by Little Owls, and here and there we found a pair of the beautiful *Chersophilus duponti margaritæ*. On the way back from Soluk a terrible southerly gale, "gebli," arose, covering us with red dust, which was often so thick that we had to stop the automobile in order to see the road.

A trip by the short railway from Benghazi to Er-Regima on the plateau was not very fruitful, as the heights are only covered with grass and fields; but the plain near Benina and the source of the Lethe are better, there being some low wild vegetation and barley-fields; *Melanocorypha calandra* and blue butterflies abounded.

In a north-easterly direction from Benghazi, beginning about 25 km. from the town, the plain of Driana is covered with numerous thick bushes of *Rhus oxyacantha*, *Pistacia lentiscus*, *Periploea laevigata*, and a few *Zizyphus*, and there the coveted peculiar form of the "Barbary partridge," *Alectoris barbara barbata*, is not rare, though difficult to get in the spring; hares are sometimes seen; *Sylvia melanocephala* nests; Grey Shrikes, Little Owls, Ravens, and a few other birds are met with. Further pursuing the road, which is under construction and often

very bad or non-existing—we travelled mostly in a big motor-lorry—one enters a low plain, separated from the sea by a salt-lagoon; this plain, some miles before Tokra, was of great beauty in May, the large bushes of *Limoniastrum monopetalum*, which abounds, being in the glory of their purple flowers, and there were many butterflies, though very few species, beetles, hymenoptera, flies, also neuroptera.

A few miles after Tokra the road—here already completed and quite good—mounts the Djebel Achdar in serpentine, and affords beautiful views over the coastal plain and the sea. The mountains here are somewhat sparsely covered with trees of *Juniperus phoenicea*, some *Arbutus*, and quite a lot of small vegetation. We had hardly entered these woods when its principal inhabitant, the *Fringilla coelebs spodiogenys*, was seen, and the orange-yellow *Gonepteryx cleopatra palmata*, a very distinct subspecies. After a long drive through these interesting woods one gets down into the large plain of Merg, the Barea or Barka of the Greeks and Romans, about 30 km. long and at least 10 to 12 wide. This is on the plateau, a treeless plain with only small vegetation and extensive barley-fields, in the middle of which lies the town of Merg, with a strong garrison of Abyssinians, from the Eritrea, protected by wall and ditches and by barbed-wire entanglements. This valley is surrounded by hills on most sides, all more or less wooded with *Juniperus* and a few other trees. Parts of the plain near the hills are also wooded, and these woods had formerly a much greater extension, as one can see by old trunks and other remains. In the winter a great portion of this plain is under water and looks like a lake from the hills, whence Rohlfs appears to have viewed it in 1868. This water is of course visited by numerous shore- and water-birds, but it disappears entirely in the summer, and during our visit there were barley-fields in place of the water, which were being cut during the second half of May. There are, however, at Merg numerous wells, mostly outside the town, one in the middle of the street near the main entrance. In Merg we found shelter and food in the only so-called hotel, a rather dirty, uncomfortable place, but there is also a restaurant where one can eat. The wooded hills were of course our principal collecting-grounds. They were very beautiful, they afforded magnificent views, the air was fragrant and fresh, even when it was rather hot in the plain, and there was an interesting fauna and flora. According to all information I could get (among others from the chauffeurs of the Government and Army, who know the country from one end to the other), there are some few towering cypress-trees farther east on the plateau of Barka, but nothing that one could call a cypress forest. I have not seen any oaks or pines. Dr. Festa, however, tells me, in litt., that he saw many large evergreen oaks in the mountains near the Wadi Kuf and Wadi Gergeromma, about 80 km. north-east of Merg; he has thoroughly explored these oak-woods, but found no Titmice, nor apparently any special forest birds; doubtless his forthcoming list of the birds he collected will give us full information. He has never seen any *Pinus*, but Colonel Spatocco told him that he saw some thickets of pines, probably *Pinus halepensis*, not far from the Wadi Latrun between Marsa-Susa and Derna. In 1869 Gerhard Rohlfs also mentions having seen oaks in great numbers, but the tall "thuyas" forming an "almost impenetrable forest" west of the ancient town of Cyrene were doubtless large *Juniperus phoenicea*, as explained long ago by Ascherson and Haimann. Barth's "Fichten" and Beechey's "fir-trees" were doubtless all *Pinus halepensis*. Possibly the

drier climate of recent times and the continual destruction of trees by the Arabs and Europeans may be instrumental for the almost total disappearance of these trees, for they must have been much more numerous and extended in olden times.¹

From all information received, and after having seen Dr. Festa and his last collections, I decided not to go to Derna and Cyrene. The gardens of Derna, where bananas and other fruits grow abundantly, must doubtless be very pretty, but not interesting for an ornithologist, if compared with the juniper woods of the Djebel Achdar, the steppe and desert south of the plateau of Barka, and collecting in gardens is difficult and inconvenient, as one cannot enter them as a rule and is always stopped by walls and fences.

As Cyrenaica lacks the high mountains of Algeria and Marocco, the Saharan climate, flora, and fauna range right up to the coast in the west and east, and only the plateau of Barka with its red soil, the "Barka-el-homra" of the Arabs, is principally Mediterranean, though even that is to a small extent mingled with Saharan elements.

Altogether the fauna, and especially the avifauna, is poor in comparison with that of the western parts of North Africa, and the whole country may be looked upon as a relic of former ages. Everywhere one is confronted with ruins and graves; in the rocks are excavated great sepulchres, often with fine pillars. The once-famous town of Cyrene has dwindled down to an insignificant place, chiefly visited for its ruins and antiquities. The old Greek and Roman roads became mere bridle-paths; only quite recently fine new roads are being built by the Italians, and automobiles fly along where once the Roman legions marched and where for many centuries camels, mules, and donkeys alone were seen. Thus death and decay for centuries is evident everywhere, and it is to be hoped that the Italians will succeed in making Cyrenaica again a flourishing colony, rich in agriculture and produce. This is clearly their intention, but whether they will succeed or not cannot be predicted. They are building fine roads and houses in the towns, they have a bureau of agriculture in Benghazi with branches in other towns, and strong garrisons of Italian and Abyssinian soldiers—the latter a lot of stalwart, good-looking negroes who evidently like being soldiers—and Arab irregulars or country police; and the scientific exploration of the colony is not neglected. There will, however, be great difficulties, the foremost one being the question if the primitive and not over-successful culture of the soil can be

¹ Though one cannot take the writings of ancient writers too literally, there is no doubt that the plateau of Barka, standing out like an island from the vast expanse of desert and semi-desert, and separated entirely from all other wooded lands, must have been very different in olden times, showing a chiefly Mediterranean or mixed flora, not a true Saharan one like Tripoli and the Libyan desert. *Cupressus sempervirens* over 20 m. high (Rohlf's "50 m." was probably an error) must have been much more numerous, probably *Pinus* has existed and *Quercus* has been widely spread; but in ancient times Cyrene possessed a powerful fleet and invented a special type of ships, and the forests must have given them the wood. More recently, about 1869, the attempts of Ali Rizan Pasha to colonise and rebuild the half-sanded harbours demanded masses of wood. Ancient Romans and Greeks, Turks and Arabs, only understood cutting down, not replanting woods. The Italians, the present masters of Cyrenaica, must begin to stop the destruction of forests, but so far it seems to go on unchecked, and masses of fine wood, apparently all juniper, is being heaped up at Benghazi, but no new plantations are made. If the Italians hope to create once more the fertility and high culture of old Cyrene, Teucheira, etc., which under Arab rule has fallen back into solitude and barbarity, they must preserve the woods and build water-barrages, which have been frequent in the country, ruins being visible in numerous places, even in the plain of Merg, which is fairly fertile and has much deep red soil.

improved so as to yield more regular and richer crops. To do this it will be necessary to regulate the water-supply, to build dams and aqueducts, etc. ; but all this cannot succeed if the rainfall has really considerably diminished, and if the layer of red soil on the rocky slopes has really to a great extent been washed away by the torrential rains, in consequence of the destruction of the woods and bushes. The climate is actually very good in the spring, being, during my visit, nice and warm in the daytime, cool and even cold at night. The gebli or south winds are dreaded and very unpleasant, as they bring sand and dust, especially the red dust from the red soil, which pervades and tinges everything. It is naturally hot in the summer, but can be cold in the winter, when the desert has cooled down. Rain falls frequently and in great quantities in the winter months, but apparently somewhat irregularly. In March the rains diminish, but in March 1868 Rohlfs suffered greatly from rain and cold, while in 1922 I did not see a drop of rain in Benghasi, nor felt one drop in April, when it is always diminished, but not often quite absent. In May rain is not observed, but in 1892 some did fall, and in 1922 we had terrific thunderstorms and nearly two days of rain in Merg, preceded and followed by beautiful dry weather.

The ornithology and in fact the whole fauna is, as I said already, poorer than that of Tunisia, Algeria, and Morocco. The desert of the south is apparently as rich and as poor in birdlife as that south of Algeria and Tunisia, but all we know of it is the result of Dodson's journey along the coast from Bisher to Benghasi, and of Dr. Festa's hurried trip to Mechili, about 100 km. south of Derna, almost in the real desert. Both these collectors have found the same desert birds which occur in the northern parts of the western Sahara, though with a few exceptions: no *Ammomanes deserti* appears to be known, no *Crateropus (Argya)*, no *Merops persicus*, neither *Oenanthe lugens* nor *leucopygia* and others, though they may have been overlooked so far. The steppe and semi-desert which I visited near Soluk and Sheleidima has also the same avifauna as that of similar districts south of Algeria and Tunisia, some species, like the Houbara Bustard, being far more numerous, probably because not yet so much persecuted, on account of the absence of Europeans, who readily pay for the birds (in Algeria mostly trapped at the nest!) and eggs. Strange is the absence of any form of *Ammomanes deserti*, *Calandrella brachydactyla* (except on migration), *Crateropus*, though one or the other of these might still be found somewhere, being, like all desert birds, peculiar to special kinds of formation and vegetation of the desert and steppe.

The chief interest attaches naturally to the wooded and agricultural districts of the plateau of Barka, the altipiano of the Italians. This region is separated from all other forests by wide desert belts in the west and east, and even Egypt has no forests. One therefore would at once expect the inhabitants of these woods to be different from those of all other forest regions. This is indeed the fact to some extent, but as the number of forest birds in Cyrenaica is small, there are not many peculiar forms restricted to it. Possibly the avifauna of the juniper woods of Cyrenaica is also a relic of what it once has been. Only a single species of Titmice (a form of Blue Tit), has been found, while three Tits occur in Tunisia and westwards; we found no *Certhia*, no Woodpeckers, no Jay (!), no *Regulus*, no *Pica*, neither *Coccothraustes* nor *Loxia*, neither *Chloris* nor *Serinus*, no *Emberiza*, neither Skylark nor Woodlark, no *Phylloscopus* nor *Hippolais*,

no *Cisticola*, no Blackbirds nor *Turdus viscivorus*, and other birds which frequent the woods of the Atlas regions.

We observed a good deal of bird migration, the prettiest instance being the number of Red-footed Falcons in the plain of Merg.

The following is the literature on the birds of Cyrenaica :

1902. WHITAKER.—“ On a Small Collection of Birds from Tripoli.” In *Ibis*, 1902, pp. 644–56.

The results of Edward Dodson's plucky journey from Tripoli to Murzuk and thence in a north-easterly direction to the Gulf of Syrtis and skirting along the coast of south-western Cyrenaica to Benghazi.

1916. SALVADORI AND FESTA.—“ Alcune uccelli della Cirenaica, colla descrizione di una nuova specie del genere *Caccabis*.” In *Bolletino del Mus. Zool. ed Anat. comp. R. Università Torino*, xxxi. No. 714.

Enumeration of twelve species collected by an army official in Cyrenaica. This collection was bought by Dr. Festa and presented to the Turin Museum. The species are mostly common migrants. As new is described the finest and most distinct of all Cyrenaican birds, the Barbary Partridge.

1921. SALVADORI AND FESTA.—“ Missione zoologico del Dott. E. Festa in Cirenaica, Uccelli.” In *Boll. Mus. Zool. Anat. comp. Torino*, xxxvi. No. 738.

The well-known traveller and zoological collector Festa visited Cyrenaica in April and May 1921, staying at and near Benghazi, Coefia, about 20 km. north-east of Benghazi, at Gheminez and Sidi-Chelani, near Gheminez, and collected 41 species, including some specimens and remains of birds received from a Mr. Bosio.

Dr. Festa visited Cyrenaica again from November 1921 to June 1922, and the results of this prolonged stay will, we hope, soon be made known. I had the pleasure of meeting him in Merg, and saw some of his collection, a great part of which had previously been sent to Italy. I only made mental notes on the birds I saw in his collection, which will soon be fully listed and described.

Hilgert and I stayed in the colony from March 25th to May 19th.

The species which have been proved to nest or of which we must suppose that they are nesting in Cyrenaica are marked with an asterisk.

* 1. *Corvus corax tingitanus* Irby.

Hitherto no writer had mentioned Ravens as occurring in Cyrenaica. We saw the first specimens about 25 km. north-east of Benghazi, and it is not rare in all the mountainous districts. The form is *C. c. tingitanus*, as we knew it must be, because Meinertzhagen shot it at Sollum, while the Desert-Raven, *C. c. ruficollis (umbrinus auct.)*, is found at Siwa and doubtless in rocky ranges in the desert south of Cyrenaica. We observed *C. c. tingitanus* from Tobruk to Soluk and shot it.

2. *Sturnus vulgaris vulgaris* L.

[Starlings do not nest in Cyrenaica, but *S. vulgaris vulgaris* visits it occasionally in winter, as evidenced by a specimen mentioned by Salvadori & Festa in 1916.]

3. *Oriolus oriolus oriolus* (L.).

Occurs in spring in Cyrenaica. Festa had seen it early in May near Benghazi, and we have seen a male and obtained a female near Merg during the first half of May.

* 4. *Carduelis carduelis africana* (Hart.).

We saw once some Goldfinches in the town of Merg, and came across several old birds and a number of young ones in the juniper woods on the hills near Merg. Early in May the young were flying about with full-grown wings. We were unlucky with these birds, and got only one adult male, on May 6th. I am, however, convinced that it is *C. c. africana*, the size of the bill and the colour agreeing with our Algerian and other specimens, the wings measuring about (rather worn!) 77 mm. When motoring back from Merg a flock passed over the lorry.—Festa told me that he found Goldfinches near Derna, which was to be expected, as it is chiefly a bird of garden land.

* 5. *Carduelis cannabina mediterranea* (Tschusi).

We only saw Linnets in the town of Merg and in the wire entanglements around the place, and once heard their call on the hills, where they were flying overhead. We were only able to shoot one male and two females on May 15th and 16th, another adult male being lost in the barbed wire. As far as I can see from this meagre material of very much worn specimens, they belong to the Mediterranean form, which I believe to range over South Europe from Spain to Dalmatia (typical locality of *mediterranea*), and Greece, and over Africa Minor. This form is very closely allied to *C. cannabina cannabina* of North and Middle Europe, but is in corresponding plumage slightly paler, and the wing averages shorter. Cf. *Vög. pal. Fauna*, p. 2052. The bill is often larger than in *C. c. cannabina*, but all this can only be seen in series. Doubtless these birds at Merg were "at home" and nesting in the country. Dr. Festa shot Linnets in the groves of date-palms near Benghazi, where we saw none in April. These birds may possibly have been visitors from Europe.

* 6. *Erythrospiza githaginea zedlitzii* Neum.

[We did not come across *Erythrospiza githaginea*, but Festa submitted to me a male which he had shot in the desert far south of Derna, which belongs to the slightly different western form *E. githaginea zedlitzii* Neum.]

* 7. *Fringilla coelebs spodiogenys* Bp.

We found this Finch only in the juniper woods of the western plateau of Barka, from the western slopes of the Djebel Achdar to the woods at the foot of and on the hills east and south of Merg. Young with full-grown primaries were shot on May 14th. A nest with two fresh eggs, evidently a second brood, was found near Merg on a juniper tree. They are typical, like Chaffinch eggs from Algeria, Marocco, and elsewhere, even in Europe perfectly similar eggs might be found of *Fringilla coelebs coelebs*. They measure 21×15 and 20.5×15.5 mm. As far as one can see from these much-worn skins they are typical *spodiogenys*. It must be remembered that *F. c. spodiogenys* inhabits only

eastern Tunisia, while in the mountain forests of north-western Tunisia (Ain Draham), *F. c. africana* is found. The wings of the Cyrenaica males measure (worn !) about 90-95 mm.

* 8. *Passer domesticus tingitanus* Loehe.

Sparrows are found wherever towns or villages exist. They are numerous in the town and gardens of Benghasi, Merg, Gheminez, and at Soluk. In many specimens, especially when seen alive in the African sun, the sides of the head appear strikingly white, but in others they are more or less strongly suffused with grey, thus not differing from a long series from Algeria and Morocco. The wings of males measure 75 (two only) to 81 mm. Some specimens have extended black spots on the crown, others show hardly any or none, exactly as in Algeria. The amount of chestnut in the nape varies much, and the pale patches on the back also. In a male from Benghasi and still more in one from Merg chestnut patches extend over a great part of the crown. The latter suggests hybridisation with *Passer hispaniolensis*, which also nests at Merg, but it may be individual variation.

* 9. *Passer hispaniolensis hispaniolensis* (Temm.).

The Spanish Sparrow was only met with at Merg. On May 3rd Hilgert and I spotted its note, which is higher and somewhat more musical than that of *P. domesticus*, in the enormous fig-tree in the garden before our window, and shot a male. Afterwards it was only noticed several times in the town and its immediate surroundings, on the barbed-wire entanglement. The specimens are very worn and agree with those from other countries. The wings measure 78, 79, 81, the last much worn.

* 10. *Emberiza calandra calandra* L.

In the little native gardens near the Giuliana (Benghasi), two specimens seen 27.iii, another shot 17.iv. These birds were apparently not nesting there, but two were seen and the female shot in the fields near Merg, 2.v. These latter were evidently "at home" and nesting somewhere near. The specimens do not seem to differ from others of Europe, Algeria, Morocco. The supposed differences of *E. c. algeriensis* Gönitz (*Falco*, xvii. No. 2, p. 1, 1921) are not confirmed by our series.

[It is very strange that no other species of *Emberiza* has been observed by us in Cyrenaica, neither nesting nor on passage. On the north-west slope of the Djebel Aehdar we once saw a brown bird which might have been some *Emberiza*, but a search at once and again on our return journey in the place was without avail.]

* 11. *Melanocorypha calandra calandra* (L.)

Avoids the arid stony stretches, but abounds in the more fertile plains, as for example along the little 32 km. long railway from Benghasi to Er-Regima, especially near El-Benia, and on the plateau near Er-Regima, and is most abundant in the plain of Merg, in the fields and thistles and other low plants. It nests also near Soluk and Gheminez. On May 3rd Dr. Festa found young birds

not yet half-size. They agree with my description, and the spots on lower throat and jugulum are round and in rows. Nearly all our specimens are more or less rufescent, but this is clearly due to the reddish soil and dust on which they live. Wings, ♂ 130–136, ♀ 116 to over 120 (much worn). The ♀ is much smaller, not "etwas kleiner," as said in *Vög. pal Fauna*, p. 209. The song of the Calandra is sometimes overrated. It is a wonderful singer, its song is louder and more flute-like than that of the Skylark, but it is constantly interrupted by grating notes, lacking somewhat the jubilant quality of that of the Skylark. It is known to imitate other bird-songs beautifully, but evidently only some individuals do this, and in this it cannot compare with the Grey Shrikes, especially in Africa.

* 12. *Galerida cristata festae* Hart.

Galerida cristata festae Hartert, *Bull. B. O. Club*, xliii. p. 12 (1922—Plateau and plains of Barka).

This long-billed Crested Lark is more or less common in the plains at the foot of the hills to the seashore and on the slopes and plateau of Djebel Achdar, at least as far as Gheminez, Tilimun, Soluk, and Sheleidima in the south. On the plateau it is more found at the foot of the hills or in open spaces in the woods, not in the middle of cornfields, but where there is uncultivated land. In habits it agrees with other forms of *G. cristata*, and it is often found together with *Calandrella minor*. Salvadori and Festa called this form *Gal. cristata arenicola*, but it is very different from the latter, being much shorter in the wing and darker, more rufescent brown on the upperside and wings. It is nearest to *G. c. brachyura* and *G. c. zion*, two very closely allied subspecies from Palestine, but it is browner on upperside and wings, more rufescent, and its bill is longer and often thicker. While the bill of the two Palestine races measures generally 19 to 21, and only exceptionally reaches 22 mm., that of *G. c. festae* is 20 to 22.5, mostly 21 to 22 mm. long. The wings of 15 males measure 105–109 (the latter not often), those of 11 females 98 (rarely)–102, once 103 mm.

Meinertzhagen (*Ibis*, 1921, p. 639) united with *G. c. brachyura* not only the birds from lower Jordan Valley, Dead Sea, Sinai, Suez Canal, southern Palestine, Borollos beach in the northern Egyptian delta (where otherwise *G. c. nigricans* occurs), and Alexandria, but also those from Sollum, just east of the Cyrenaican boundary. With this I agree, as there is no difference in colour and size, but it must be noticed that the Sollum birds (Meinertzhagen collected a good series there) have often thicker bills, thus, one might say, showing an approach to *G. c. festae*.

A full clutch of four eggs was found on April 11th on the plateau near Er-Regima on grassland and cultivated stretches by the side of a thistle-bush. The eggs are rather pale, white with pale olivaceous-brown spots, and a few grey deeper-lying spots and patches. They measure 21.9 × 17, 22.9 × 17, 23 × 17, and 23 × 17.2 mm. A nearly full-grown young was shot in the same place on the same day. The real colour of this Lark is difficult to understand, as nearly all specimens—and in fact all ground birds in Cyrenaica—are strongly tainted by the red soil and fine dust of the country, but specimens shot on the whitish sand dunes near the coast north of Benghazi and a young bird reveal the actual coloration. No doubt the colour of Crested Larks and many other ground birds is due to the prevailing coloration of the soil and has nothing to do with the amount of rainfall, as pointed out by Meinertzhagen in *Ibis*, 1921.

* 13. *Galerida theklæ cyrenaicæ* Whit.

Galerida theklæ cyrenaicæ Whitaker, *Ibis*, 1902, p. 654 (Cyrenaica, viz. Bir-Tabilleh, Bisher, Sidi Sweya).

Hitherto only known from the coast of south-western Cyrenaica, and from specimens collected by Meinertzhagen near Sollum, just east of the boundary of Egypt and Cyrenaica. It must therefore occur in many other suitable places in Cyrenaica, but neither has Festa found it, nor did we come across it anywhere in the coastal plains or plateau, but on April 21st we found it common on the bare hills near Sheleidima. When seeing these stony, sand-coloured hills (not red as in the north!), their similarity to the hills near Biskra where a form of *G. theklæ* (*hilgerti*) is common, struck me at once. I therefore asked Hilgert to explore the plains and river-bed south of the hills and went myself into the hills, bare and uninviting though they looked. After a dreary walk of half an hour I heard the note of a crested lark, which was evidently not that of *G. cristata festæ*, which was common in the plains, it being higher and somewhat less loud. Ascending the hill from which it came, I soon saw a pair and shot it. All specimens were of course in worn plumage, and there were young ones about, as I handled one shot by a chauffeur, unfortunately with big shot and impossible to skin.

These Larks kept entirely to the hills, on the foot of which, near the deserted fortress, it met *G. c. feae*, and could there be seen in the same places, exactly as *G. c. hilgerti* and *G. c. arenicola* near Biskra, which inhabit different places, but meet at the foot of the hills. Doubtless *G. t. cyrenaicæ* will occur along the southern slopes of the Cyrenaican plateau in many places.

The wings of our specimens measure: seven ♂, 98-102.5; two ♀, 92, 95; Meinertzhagen's specimens from Sollum ♂ 97-102, ♀ 91-96 mm. (a "male" with a wing of 94 is doubtless wrongly sexed).

The winter plumage differs somewhat from the spring birds; the upper-side looks lighter, as the greyish edges to the feathers are more or less hiding the dark centres; on the chest the dark brown centres are more or less covered by the white edges, therefore the blackish spots look as if they were less sharply defined, more washed out. Similar differences are seen in all Larks.

The nearest subspecies is *G. t. deichleri* from the Tuneso-Algerian Sahara, but the latter is, as a rule, much lighter on the upperside, the dark centres to the feathers being more sandy, not so dark, the wing is longer, the bill larger; the coloration of *G. t. deichleri*, however, varies very much, and a few specimens which we collected south of Biskra differ very little from *G. t. cyrenaicæ* in colour; our *G. t. cyrenaicæ* hardly differ individually, which is unusual in *G. theklæ*.

14. *Calandrella brachydactyla brachydactyla* (Leisl.).

We were rather astonished not to find any *Calandrella brachydactyla* breeding, but several times during the last week of March and again on April 15th flocks of *Calandrella brachydactyla*, as a rule rather shy, and obviously on migration were observed. Specimens shot are very reddish, but they do not belong to the paler *C. br. hermonensis* (= *rubiginosa*), which nests in N.W. Africa (Marocco, Algeria, Tunisia).

* 15. *Calandrella minor minor* (Cab.).

This species, of which so far one skin without tail from Sidi Chelani, east of Gheminez, was known (Festa leg.), is the commonest bird on the plains near Benghasi, and is found all along the flat country south to Gheminez and thence to Soluk, and north to Tokra. It is an inhabitant of the open stony districts and fields, but is rare in or absent from the bush country. We found it rare on the plateau near Er-Regima, and never came across it in the plain of Merg nor, of course, in the juniper woods. On May 17th I caught a young bird which could only fly a little in the coastal plain between Tokra and Benghasi. A young just hatched from the egg was taken on April 28th. It had the inside of the mouth flesh-colour, edges yellow, a striking black tip to both upper and under mandibles. The down is long and plentiful, pale yellowish brown or sand-colour; tarsi light. A single fresh egg was taken at Soluk, 23. iv. 1922. The nest stood by the side of a little *Salsola* bush, and was surrounded on the outside by pieces of caked mud, recalling the stone-walls, or runs of *Oenanthe leucura*, *Rhamphocorys*, and other birds. The egg is white and is covered with small pale brown spots and very few pale greyish ones.

* 16. *Chersophilus duponti margaritae* (Koenig).

A female was shot by Dr. Festa at Mechili, about 100 km. south-west of Derna in March 1922, and the nest with 3 eggs found. About a month later, April 22nd, we discovered it near Soluk, where a few pairs lived, and not far from Tilimun, on April 24th. It inhabits plains rich in low scrub-vegetation and tussocks of grass, and the edges of fields. It is, as everywhere, mostly difficult to detect, running on the ground in silence or with a soft, by no means loud "tsiii," and soon disappearing in cover. Thus it may easily be overlooked during hurried visits to certain places. On the other hand, it cannot pass unnoticed in the spring, when singing, as its song is unlike any other; it soars skywards singing, singing, until it is almost and sometimes quite lost sight of, its song still continuing, until it suddenly "falls" down to the ground. We have watched it sometimes half an hour and nearly an hour before it descended; it alights on an open space, but if one wants to shoot it one must be quick, as it soon runs into cover or ascends again into the air after a very short rest. With regard to the song, we made the most unexpected observation. While both *Chersophilus duponti duponti* on the plateau of Algeria and *C. d. margaritae* in South Tunisia sing "tsii didla didla diii," the "tsii" being a high-pitched fine introductory note only, not heard at a great distance, the specimens we heard near Soluk and Tilimun sang entirely different, very clearly "dii-drii" or "dii-dii-drii," or "dür-drii," often followed by a trilling "drrrrrrr." The two songs are quite different, but there is no mistake about this fact, nor is the song of the two subspecies different. Hilgert described the song of *C. d. margaritae* in South Tunisia to me as "didla didla diii" year after year, and when at last, in 1914, we came across *C. d. duponti* (see NOVITATES ZOOLOGICAE, 1915, pp. 72, 73), I found its song absolutely as he had described it (see above). On the other hand, we heard three males singing in South Cyrenaica, and each sang exactly like the other. We were very much astonished at this difference of song, which I put down in my notebook on the spot. We had the song from Algeria well in our memory, but when we first heard *C. d. margaritae* sing we thought it was

the song of another bird unknown to us, until looking through the glass we found it was the bird we were particularly looking out for, because it had been shot by Meinertzhagen fifteen miles west of Sollum—therefore it was bound to occur in southern Cyrenaica. It is thus the bird of the northern Sahara from Tunisia to the northern Libyan desert; in Tripolitania it is sure to occur, but has not yet been found. About the distribution of *Chersophilus* in Algeria, cf. NOVITATES ZOOLOGICAE, 1914, p. 73. Though difficult to collect on account of its habits, *Chersophilus* is not really shy.

It is somewhat unfortunate that Koenig discovered *C. d. margaritae* as far north as Gabes, as specimens from there and Gafsa and Feriana to Djebel Souenia are not so red as others from farther south, i.e. from Medenine, Oued Nakhla, and Tatahouine in S. Tunisia, from Cyrenaica and Sollum. One is tempted to recognise three forms, the darkest one from the plateaux of Algeria and Tunisia, the intermediate typical *margaritae* from Gafsa to Gabes and Djebel Souenia, and the reddest from Tatahouine, Oued Nakhla, and Medenine to South Cyrenaica (Soluk, Tilimun, Mechili) and Sollum. This is, however, not to be done, because there is a good deal of variation, both in the northern form and in *margaritae*. One of our Soluk specimens in fact agrees perfectly with one from Gabes; others being as beautifully reddish as those from Tatahouine, etc., and as the very fine reddish one obtained by Meinertzhagen west of Sollum. (Cf. also Whitaker, *B. Tunisia*, i, p. 245-50.)

It must also be repeated that the bill in males is longer than in *C. d. duponti*, and this refers to specimens from Gabes and Tatahouine, Soluk, and Sollum. The wings of the Cyrenaica males measure 99 to 104, that of the one female 92 mm.

One thing must be added: these birds must have had young and were evidently going to nest a second time; the sexual organs were already reduced, but they were singing incessantly, though only in the early morning, not a note being heard after eight in the morning, nor did they sing near Soluk in the late afternoon and evening.

* 17. *Alaemon alaudipes alaudipes* (Desf.).

The "Muka" of the Arabs was seen here and there between Sheleidima and Soluk, and near Soluk. Specimens agree with Tunisian and Algerian ones. The difference in size and spotting of the chest is very striking, but it is difficult to understand that Tristram, who described the female as a different species, did not notice that the large and small birds were sexes, as he must have been able to observe the Muka frequently on his journey to El-Oued, Tuggurt, and Biskra. Dr. Festa received a specimen shot near Benghasi in winter, but it is doubtless not there in the spring, and must have been a stray bird.

18. *Rhamphocorys clot-bey* (Bp.).

[Dr. Festa shot a specimen near Mechili, about 100 km. south of Derna. As it ranges east to Egypt this is not very surprising, but it is of importance to have obtained the proof of the occurrence in South Cyrenaica, where it will be found nesting.]

* 19. *Eremophila alpestris bilopha* (Temm.).

[*Eremophila alpestris bilopha* was obtained by Festa near Mechili, about 100 km. south-south-west from Derna. We were astonished not to find it near Soluk and Sheleidima, where it seemed quite suitable for the species.]

* 20. *Ammomanes phoenicura arenicolor* (Sundev).

[A specimen of *Ammomanes phoen. arenicolor* was shot by Festa near Mechili. It is strange that no form of *Ammomanes deserti* has so far been found in Cyrenaica !]

21. *Anthus trivialis trivialis* (L.).

Was common in bushes near the shore at Benghasi from end of March to April 17th, also several seen as late as April 21st.

22. *Anthus pratensis* (L.).

Several times observed near Benghasi end of March and early April.

23. *Anthus campestris campestris* (L.).

Observed on migration 1. iv. near Benghasi, 8. iv. in the plain of Driana, 11. iv. Er-Regima, on the plateau.

24. *Motacilla flava dombrowskii* (Tschusi).

This was the commonest form of the Yellow Wagtail from March 27th to April 3rd near Benghasi, when they were observed in flocks of 30 to 50 and sometimes to about 200, mostly near the shore. Small flocks of either this or *M. flava flava* were seen April 8th, 13th, and 25th, but the big ones had left their familiar haunts before the middle of the month.

(*M. f. dombrowskii* has darker crown of the head, blacker ear-coverts, slightly darker back ; it is striking when one compares a series from Rumania and Herzegovina with breeding birds from Central Europe and South Sweden, i.e. true *flava*, but sometimes specimens of the latter can hardly be distinguished and it is sometimes difficult to say to which form a single bird shot on migration or in winter quarters in Africa may belong, though as a rule they can be easily separated.)

25. *Motacilla flava flava* L.

A male shot at Benghasi out of a small flock on April 26th is, in my opinion, this form. A small flock seen the day before on the beach in the town of Benghasi appeared also to be *M. f. flava*, very likely indeed it was the same flock, out of which one was killed the next day.

26. *Motacilla flava feldegg* Michah.

From March 28th to April 2nd in small numbers near Benghasi, in flocks of *M. f. dombrowskii*. On April 2nd two males easily recognisable among many *dombrowskii*. On March 30th a small flock apparently all *feldegg*. Dr. Festa told me that near Derna in eastern Cyrenaica he had only seen *M. f. feldegg*.

One of our males has an indication of a yellow superciliary line—dull though distinct above the lores, indicated by two yellow feathers behind the eye. One male has white chin and line under sides of head like *M. f. melanogrisea* (rectius *kaleniczenkii*, cf. *Vög. pal. Fauna*, p. 2098). The females of *M. f. feldegg* have no superciliary line—it occurs only quite exceptionally!

27. *Motacilla alba alba* L.

Observed at close quarters March 27th and April 2nd. (Said to be common earlier in the year.)

* 28. *Parus caeruleus cyrenaicae* Hart.

Parus caeruleus cyrenaicae Hartert, *Bull. B. O. Club*, xlii, p. 140 (1922—"Woods of the mountains and plateau of north-western Cyrenaica, or Barka").

This form is nearest to the *Parus caeruleus ultramarinus* from Tunisia, Algeria, and Marocco, but differs in the smaller white frontal patch, deeper blue upperside, and shorter wings. Wings: three ♂ ad. 57, 58, 60, four ♀ ad. 56–58 mm. Our specimens being very worn, I cannot be certain, but it seems to me that in fresh plumage the white tips to the longer upper wing-coverts must be larger, and perhaps the breast brighter yellow. In *P. c. ultramarinus* the wings measure ♂ 63–67, ♀ 61–64 mm. The young birds which we collected have the back darker, more olivaceous, than an Algerian youngster, and the pale yellow semi-circular band round the back of the crown is absent or very faintly indicated; perhaps this is also narrower in adults in fresh autumn plumage. We found this Tit only in the juniper woods on the hills and at the foot of the latter, both south and west of Merg, and it was by no means common. On May 11th an adult male began already moulting its quills. Parties of full-grown young were met with on May 6th and 8th. In habits and notes exactly like *P. c. ultramarinus*, a true "Blue Tit," but perhaps less tame.

No other Titmouse was found in Cyrenaica. This is perhaps showing that the country has never been very thickly wooded, as every wooded country in the palaearctic region has more than one species of *Paridae*. It may be that with the partial disappearance of forests certain wood-birds disappeared, but Titmice are often content with bushwood and gardens and would hardly have become extinct. Should there be or have been other Tits, they would almost certainly have been of a peculiar subspecies, as the Cyrenaica forests are widely separated in every direction from other forest countries.

* 29. *Lanius excubitor dodsoni* Whit.

Grey Shrikes were met with wherever zizyphus bushes were found, more or less numerous. They were not rare in the Driana plain, but more frequent in a zizyphus zone north-west of Soluk, and abounded in the river-valley near Sheleidima. Twice a pair was observed in the hill woods near Merg. They must be called *L. e. dodsoni*, being darker than *L. e. elegans*, and as a rule paler on upperside and underneath than *L. e. algeriensis*. They are, however, much nearer the latter, and in fact the two forms can only be distinguished if series are compared. One male, Driana plain, 6. iv., is underneath as grey and above as dark as *L. e. algeriensis*, the others from the same locality do not differ from Soluk and Sheleidima specimens. Wings, eight ♂ 106–112, ♀ 105, 107 mm.

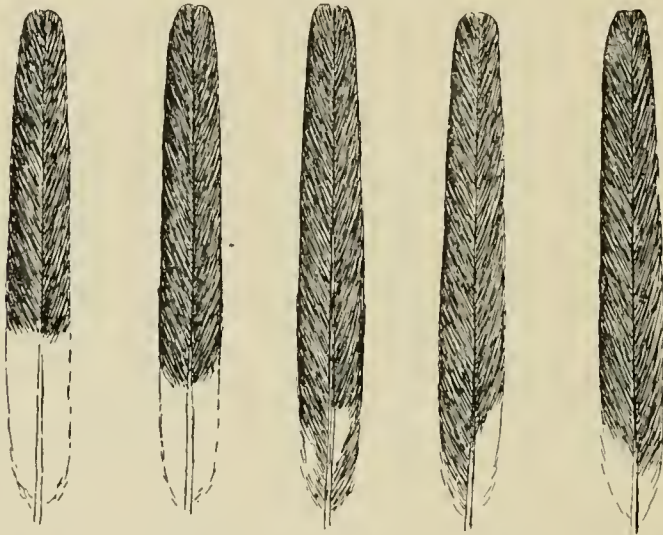
Young birds had already left nests April 8th in the Driana plain, and 20th near Soluk. A clutch of 6 eggs, Driana, 8. iv. Nest in large *Rhus oxyacantha* bush, typical, laid out with sheeps wool and vegetable wool; like many nests of *L. e. elegans*, troublesome to reach, being deep inside the thornbush. The same day clutches with young fully developed in eggs were found. Clutches of 4 and 5 eggs, hard set, but still good enough to be preserved, were found 21. iv. near Sheleidima; same day a clutch of 7 too hard set. Eggs measure: 24.7×20.5 , 25×20 , 25×20 , 25×20.4 , 24.5×20 ; 28×19.5 , 27.5×20.2 , 27.2×24.5 , 27.2×19.5 ; 24.5×20.2 , 26×19.7 , 24×19 , 25×19.6 , 24×19.6 mm.

Stomachs contained beetles and fruit of *Rhus*.

(Whitaker, *Ibis*, 1902, p. 652, mentions *L. excubitor elegans* as having been obtained in south-western Cyrenaica; this may be quite correct, as it represents *L. e. algeriensis* of North Algeria, North Tunisia, and Tangier in Marocco, and *N. e. dodsoni* in the real Sahara.)

* 30. *Lanius senator senator* L.

The Red-headed Shrike is a very common breeder in Cyrenaica, wherever it finds sufficient trees; it nests in gardens and oases near Benghazi, but more



L. s. niloticus. EGYPT. *L. s. niloticus.* PALESTINE. *L. s. senator.* ITALY. *L. s. senator.* CRETE. *L. s. senator.* CYRENAICA.

numerous in the woods on the hills. Evidently some are also passing through on migration. One male has barely an indication of the white loreal patches; this is rare, but I have one quite without them from Macedonia, another like the Benghazi one from Aïr. One of the males has a little white at the base of the middle rectrices, but this is not rarely found in *L. s. senator*, not, however, covering the base for about 2 to 4 cm. entirely, as in *L. s. niloticus* (Meinertzhagen—*Ibis*, 1921, p. 131—erroneously referred the breeding birds from Crete to *L. s. niloticus*.) The accompanying figures will show the difference between true

niloticus from Egypt and true *senator* with a little white at base of central rectrices. These latter varieties are, according to Stresemann, commoner in Macedonia than in Central Europe. A pair from the Leontes valley in Coelesyria has the base of the middle rectrices 22 mm. white. *L. s. senator* also occurs on migration in Palestine.

A number of nests were found in the juniper woods near Merg during the second week of May, but they were all too hard set for preparation. On May 9th and 12th, however, fresh clutches of 3 and 5 were found, probably of pairs whose first clutches had been destroyed. Some nests contained already young. The nests were placed nearly all in *Juniperus*, generally from 6 to 10 ft. high, sometimes higher, one in a *Ceratonia siliqua*, and contained more or less aromatic smelling herbs. The song of these Shrikes was often very disturbing, as they seemed to imitate *Pycnonotus* (not found in Cyrenaica), sang like a Thrush, nearly like *Turdus viscivorus*, and hardly two males seemed to sing alike. The food of the Red-headed Shrike consists mainly of beetles, *Orthoptera*, *Bombus*, small lizards, and we saw one eating the breast of a *Sylvia cantillans* which it had pinned on a thorn of an *Acacia*.

31. *Muscicapa striata striata* (Pall.).

We observed the species, 21.iv., 22.iv., 27.iv., 28.iv., 15.v., 17.v., near Soluk, Benghasi, and Merg. From April 27th to 29th they were very numerous in Benghasi! Festa mentions neighbourhood of Benghasi, Gheminez.

32. *Muscicapa hypoleuca hypoleuca* (Pall.).

(*M. atricapilla* auct., but *hypoleuca* two years' priority.)

A number were observed near Benghasi, 14.iv. and 15.iv., but I saw, if I remember right, only one quite black-backed male.

33. *Muscicapa albicollis* Temm.

A more frequent migrant than *M. hypoleuca*. Specimens shot near Benghasi, 9.iv., 13.iv. (several observed), 14.iv., 17.iv. In 1921 Festa had also shot one, but not *M. hypoleuca*.

34. *Phylloscopus bonelli orientalis* (Brehm).

This was the commonest *Phylloscopus* in and near Benghasi. The first was shot April 2nd, on the 3rd and 4th they were common. On the 15th one was seen, 17th several, 27th one, on May 18th still one in the garden in Benghasi in front of the Hotel Italia. In 1921 Festa had shot one at Gheminez, 29.iv. Our specimens belong all to the eastern form, being slightly more greyish on the upperside and larger: wings, ♂ 67, ♀ 65, 66, 67 mm. (Cf. *Vög. pal. Fauna*, p. 2138.)

35. *Phylloscopus trochilus trochilus* (L.).

We only shot one male, Benghasi, 26.iv., but *Phylloscopi*, which were this species or *collybita* were observed at Merg 13.v., and two keeping in the barley (!) 14.v. These latter were, I think, *collybita*, another 15.v. They were, however, by no means common.

36. *Phylloscopus sibilatrix erlangeri* Hart.

Cf. *Vög. pal. Fauna*, pp. 516, 2139.

Wood-warblers visited the steamer on March 23rd, between Sicily and Benghazi. The next we saw (and shot) was April 13th, near Benghazi; 3 were seen May 1st near Benghazi. In 1921 Festa had shot one as late as May 24th near Benghazi.

My specimen is brightly coloured, and would belong to the Mediterranean subspecies, if that can be separated. It seems to me that all those obtained on migration in spring are brightly coloured, and that they become duller in colour during breeding-season—in North and Central Europe at least! Salvadori and Festa, however, also distinguish this subspecies!

37. *Acrocephalus arundinaceus arundinaceus* (L.).

We shot one Great Reed-warbler, which kept in some fig-trees near Benghazi (Giuliana), on April 14th. Another was shot in the barbed wire at Merg, May 15th, but lost.

38. *Hippolais icterina* (Vieill.).

[We never observed any kind of *Hippolais*, but Festa got one near Gheminez, May 5th, 1921.]

* 39. *Sylvia hortensis crassirostris* Cretzschm.

The eastern form of the Orphean Warbler nests in small numbers on the hills and on the plain at the foot of the mountains near Merg. These birds were very shy and we had to use the 12-bore guns to get a few specimens; while in Northern Algeria, we found the western form more or less tame, in the gardens of Algiers for example, so that one could shoot them with a stick. The song is, in my opinion, less beautiful than that of the Blackcap, and resembles more that of the Garden Warbler, but sometimes resembled that of *Pycnonotus barbatus*. On May 9th young had already left a nest, though wings and tail were not yet full grown. The iris of adults is ivory-white, that of the young brown!

We shot an adult male with testicles 11×5 mm., in fine fresh plumage, and a slaty-grey—not black—crown, while other males and a female had brownish black crowns and very worn plumage.

The species is new for Cyrenaica, and it is interesting to see that it is the eastern form, the "*Curruca jerdoni*" of Blyth.

40. *Sylvia borin* (Bodd.).

[We did not come across this species, but Festa shot one near Benghazi (Fuehat) on May 18th. No doubt on passage, notwithstanding the late date. In North Algeria met with as late as May 19th quite common, but *not* nesting! At El-Golea in the Sahara shot on May 13th.]

41. *Sylvia communis communis* Lath.

Only a few times observed and collected: Benghazi April 5th and 26th, Merg May 15th, either in small bushes and fig-trees, or in barbed wire. Evidently on migration.

42. *Sylvia ruppeli* Temm.

Passed through Cyrenaica in April. Specimens were observed and collected in the low fig-trees and *Retama* bushes at the Giuliana near Benghazi, April 4th and 9th, single adult males, and several April 17th. I did not hear them sing. This is the westernmost locality for the species. Loche's statement that a pair nested near Milana in Algeria is probably an error; a specimen was evidently not preserved, and the description of the eggs does not agree with those I have seen.

* 43. *Sylvia melanocephala melanocephala* (Gm.).

A common breeder—though it does not figure in the list of birds collected in 1921 by Festa!—in the plains covered with bush, in the Driana north of Benghazi, and in the woods near Merg, in the plain as well as on the mountains. Young birds with full-grown wings May 4th near Merg. Quite a number of nests were found on the 9th, 10th, and 11th of May, some with small young, mostly with 3 or 4 eggs, all too hard set for preparation. They were mostly in juniper trees, some on branches far from the trunk, one in *Pistacia lentiscus*. They consisted entirely of dry fine grass and tiny stems of other small plants, with seeds resembling those of dandelions, lined with finer material, but without hair or feathers.

44. *Sylvia cantillans albistriata* (Brehm).

Subalpine Warblers were very common during last week in March in the scrub near the shore near Benghazi and in the Driana district; they even visited the new garden in front of the Hotel Italia, and visited us on the steamer between Syracuse and Benghazi, March 23rd. They were, however, evidently only on passage, and do not nest in Cyrenaica, in our opinion. A male was one of the first birds we obtained. Towards the middle of April they became rarer, and none were seen April 17th, but they reappeared April 26th in numbers; after that we have not seen any. Belated specimens may, however, have passed, but then we left Benghazi and worked in other places. The specimens we collected belong all to *albistriata*; though one or two of the females cannot easily be classified, the males are all quite distinctly of the eastern form.

* 45. *Agrobates galactotes galactotes* (Temm.).

The Rufous Warbler—typical western form—nests in small numbers in the woods of juniper, lentiscus, etc., near Merg. We found them much more shy than in Algeria and Tunisia. I was rather astonished not to see them in the hedges of "prickly pear" (*Opuntia*) near Benghazi, surrounding some of the gardens and little oases. Festa, however, told me that he had obtained specimens of *Agrobates*, apparently on migration, near Benghazi and Derna.

46. *Monticola saxatilis* (L.).

One seen in the wire entanglements near Benghazi 14.iv., two in the plain between Soluk and Benghazi, 20.iv., obviously on migration.

47. *Oenanthe oenanthe oenanthe* (L.).

The Wheatear was the commonest migrant near Benghasi from March 24th to end of April, but specimens were getting scarce then, though a few were observed as late as May 15th at Merg.

48. *Oenanthe hispanica melanoleuca* (Güld.).

(Cf. *Vög. pal. Fauna*, p. 2162 !)

Single specimens observed in the neighbourhood of Benghasi, 29.iii., 31.iii., several 1.iv., 2.iv. Both black-throated and white-throated males collected. Only a bird of passage in Western Cyrenaica; none seen on the plateau near Merg.

(In birds in the first spring, i.e. not quite a year old, the inner webs of primaries and secondaries are usually pale dull brownish, in older birds nearly quite black; such first-year birds, recognisable by their more brownish quills, are hardly distinguishable from *Oe. h. hispanica* if the throat is white.)

* 49. *Oenanthe moesta* (Licht.).

Five or six pairs were observed between Soluk and Sheleidima, evidently having young. Already collected by Dodson in south-western Cyrenaica.

* 50. *Oenanthe deserti homochroa* (Tristr.).

[Collected by Dodson in south-westernmost Cyrenaica, and one damaged ♀ was obtained by Festa near Gheminez, 1.v.1921.]

51. *Saxicola rubetra spatzi* (Erl.).

(Cf. *Vög. pal. Fauna*, pp. 703, 2164.)

First seen 31.iii., in small numbers here and there throughout April near Benghasi, at Er-Regima on the plateau near Soluk, and near Gheminez 24.iv., also a few as late as May 12th, 13th, 15th near Merg. On April 26th quite common near Benghasi. All these are pale, agreeing perfectly with *S. r. spatzi*. On p. 2164 of my book I have thrown doubt on this pale race, but certainly all western birds from Spain, Great Britain, to Germany, Sweden, Baltic Republics, etc., are darker, more reddish than *spatzi*, which, however, appears to have a wide distribution in the east.

52. *Saxicola torquata rubicola* (L.).

A single male, probably of this form, observed at length 16.iv. on small bushes at the edge of barley-fields; we had only walking-stick guns and could not get near enough to shoot it.

53. *Phoenicurus phoenicurus phoenicurus* (L.).

From March 29th to April 26th frequently in small numbers in gardens and bush near Benghasi, also on April 21st at Soluk.

* 54. *Luscinia megarhyncha megarhyncha* Brehm.

The Nightingale nests in Cyrenaica, at least in the gardens of Benghazi (Berka). We saw it already on 28.iii., and heard it singing for the first time 2.iv. No Nightingales were seen on the plateau near Merg or in the juniper woods. I was told that it is common at Derna, so it seems to be entirely a garden bird in Cyrenaica. One of our specimens has unusually rich buff under tail-coverts, the other not. Similarly rich ones occur in England, Morocco, Germany. No nest was seen, but from behaviour and statements by several inhabitants there can be no doubt that these birds breed in the country.

* 55. *Troglodytes troglodytes juniperi* Hart.

Troglodytes troglodytes juniperi Hartert, *Bull. B. O. Club*, xlii. p. 140 (1922—"juniper woods on mountains and plateau of north-western Cyrenaica, or Barka").

This Wren is nearest to *T. t. kabylosum* from Algeria and neighbouring countries, but differs in its longer bill and darker brown feet. When I described it in June 1922, I had only one pair before me, the bulk of my collection arriving later, and the series bears out my original diagnosis. On one label I had marked: "Iris brown. Bill black horn-brown, base of lower flesh. Feet brown." In Algerian skins I have marked on the labels: "Feet fleshy-brown, very light yellowish brown, dirty brownish flesh." Riggerbach described the feet in Morocco as "hellbraun." The series of nine Cyrenaican skins compared with fifteen from Algeria and Morocco shows the darker, deep brown, sometimes almost black feet at a glance. The bills of *T. t. juniperi* are in every specimen longer than in every one of *T. t. kabylosum*. It may be added that the lower bill of *T. t. juniperi* has nearly always a greater portion of the distal part blackish, often about half of the bill, while in *T. t. kabylosum*, as a rule, only the tip, seldom half of it, is dark, and sometimes the whole under-mandible is flesh-colour, as marked on the labels. The bills of *T. t. juniperi* measure 15.5 to 16.3, in *T. t. kabylosum* 13.5 to 15 mm. Moreover, the bill of *juniperi* is slenderer. Wings of *T. t. juniperi*: 46-48, mostly 47 mm. All our specimens are males.

We found the Wren not very rare, though by no means numerous in the woods of *Juniperus*, *Arbutus*, and *Lentiscus* on the Djebel Achdar, especially on the mountains south of Merg. One empty nest, built of dry leaves of *Lentiscus*, was found; eggs and young were not obtained. Festa also collected some specimens which I saw. The song is rather varied, sometimes a beautiful whistling tiiii-titwi, more often like bi-bi (very fine), pitsiwi-pitsiwi (stronger), bit-bit, and bitbitsiwi, bitsiwi-bit. They were mostly singing in the juniper-trees, their real home. It was never seen in gardens or bush woods without junipers. It is a more strikingly distinct subspecies than *T. t. kabylosum* and *koenigi*.

* 56. *Hirundo rustica rustica* L.

From the time of our arrival we found Swallows at home on their breeding-places in and near Benghazi, and they were evidently also breeding in houses in Soluk, Gheminez, and Merg. Judging from the varying number we used to see end March and early April, I must think that some were also passing through at that time. We only shot one, undoubtedly one that would have been nesting, at Benghazi. It is slightly reddish underneath, but not more so than many

British specimens, and among the many we saw we did not notice one that was more reddish than usual in spring in England and Germany, and some appeared to be quite white. The wing of the male we collected measures only 122 mm.

57. *Delichon urbica urbica* (L.).

Rather to my surprise the House-martin is not nesting in western Cyrenaica. Wherever we saw them they soon disappeared again, and no nests were seen, though we looked out for them on all likely-looking buildings. The first we saw were three specimens flying over the town of Benghazi, 13.iv. A single one in the steppe east of Benghazi, 15.iv. Two Soluk, 23.iv. Near Merg, 3.v., small flock; 7.v., one single; 12.v. and 13.v., Merg, a few. Specimens shot near Merg show that they belong to *D. u. urbica*.

58. *Riparia riparia riparia* (L.).

As far as we know, there is no breeding-place of Sand-martins in Cyrenaica, but it is a frequent bird of passage. The first I saw were a couple near Benghazi, 5.iv. None were observed after that until May 3rd, when I saw a single one at Merg, and several 7.v., and more still 12.v. On May 13th there was at Merg a larger flock, and again on the 14th a number were seen over the town of Merg. They had disappeared the following day and only a single one was noticed on the 16th.

The specimens agree perfectly with European specimens from England, Germany, Sweden. The length of wing is variable, one male having a wing of 100, the other of 109 mm. I do not think that *fuscocollaris* (cf. *Vög. pal. Fauna*, p. 2175) is a separable form. Festa obtained the Sand-martin at Gheminez April 24th, 1921.

59. *Apus pallidus brehmorum* Hart.

"Pallid" Swifts were seen in smaller or greater numbers around the town of Merg and in the hills of Djebel Achdar from May 6th to May 12th, but they disappeared on May 8th and after the 12th. Taking all facts into consideration, I am of opinion that they do not nest in Western Cyrenaica, though Festa told me he had seen them entering caves, where he was inclined to think they nested.

The specimens we collected are indistinguishable from the dark form *brehmorum* from the Canary Islands, Marocco, Madeira, etc., not in the least paler, not in the least approaching *A. p. pallidus* (cf. *Vög. pal. Fauna*, p. 2180). Specimens from Biskra and Algerian Sahara, as well as those nesting in Air, are mostly paler than typical *brehmorum*, but seldom as pale as darker specimens from Egypt and Palestine, i.e. *pallidus* (NOVITATES ZOOLOGICAE, 1921, p. 111).

60. *Apus apus apus* (L.).

Among the paler birds, undoubtedly recognisable by its black colour, I saw a single specimen at Merg on May 7th.

61. *Apus melba* (L.).

One seen at Benghazi, April 5th, another single one at Merg on May 7th, flying with *Apus pallidus*. Two more seen May 11th. Festa obtained one at

Coefia near Benghasi, May 25th. Which subspecies I do not know, but presumably *A. m. melba*.

62. *Caprimulgus europaeus* (L.).

A Nightjar of the *europaeus* type was seen at dusk in the evening of May 15th in the town of Merg.

63. *Merops apiaster* L.

Festa recorded a specimen from near Benghasi. April 8th I saw a small flock high up over the bush of Driana, April 30th a few over Benghasi, May 8th several were heard high over Merg. Nothing known of breeding colonies.

* 64. *Upupa epops epops* L.

A few seen near Benghasi during last days of March, at Soluk April 30th, and two or three times near Merg in May. Probably nesting, but no absolute proof. Festa had one at Gheminez, 6.v.1921.

* 65. *Alcedo atthis atthis* (L.).

(Cf. *Vög. pal. Fauna*, p. 2182.)

A Kingfisher was seen March 27th, flying close by along the salt-water lagoon at Benghasi.

* 66. *Athene noctua saharae* (Kleinschm.).

Little Owls were found near El-Benia and Er-Regima, in the Driana plain, near Soluk, Gheminez, and Sheleidima, as well as Merg and Djebel Aehdar, wherever stone-heaps, old walls, or sometimes rocks gave them shelter to nest, and they are fond of bushes, being apparently rare in quite open country without bushes or trees. On April 22nd we found a clutch of 4 hard-set eggs in a stone-heap near Soluk. The eggs measure 33×26.5 , 33×27.5 , 32.5×27.2 , 31.7×26.7 mm.

All the specimens we collected are most decidedly of the paler, very good race, *A. n. saharae* (Kleinschm.), not the darker *A. n. glaux*, quoted by Salvadori & Festa, 1921, and which I would have expected; there is of course some variation, but not as much as in places in southern Algeria, and some specimens are much more worn than others, some strongly soiled with red, others not. In the stomachs I found beetles, locusts, and once a small lizard.

(We have not seen a sign of any other Owl.)

67. *Asio flammeus flammeus* (Pontopp.).

[One shot in Cyrenaica was acquired by Festa.]

* 68. *Falco subbuteo jugurtha* Hart. & Neum.

A beautiful adult ♀ was shot in the juniper woods at the foot of the hills near Merg on May 5th, sitting on a low tree eating a Crested Lark. In the stomach were found the remains of another Crested Lark. Iris brown. Bill horn-black, bluish at base; cere pale yellow. Feet lemon-yellow. Wing, 270 mm. This

is a very typical "*jugurtha*," forehead and lores pale, back pale, belly and under tail-coverts pale (the latter with some blackish shaft-lines and two spots), wing long. Another Hobby, probably the ♂ of the pair, was seen twice afterwards in the woods near by where the ♀ was shot, and an empty nest on a juniper tree might have been the nest that would have contained the eggs, if the ♀ had not been killed.

(*Falco subbuteo jugurtha* is, like all the named forms of the Hobby, not a very distinct subspecies, but comparing our series with a large series of *F. subbuteo subbuteo*, the longer wings and paler upperside of the former are obvious. We have now, besides the ♀ from Cyrenaica: two juv. in first year, N. Tunisia (no dates), bought from Blanc; ♀ second year, Lambèse, Algeria, 8.vi.1903, Ernst Flückiger leg.; ♂ ad. Tiltzhempt between Laghouat and Ghardaïa, 13.iv.1911, Rothschild, Hartert & Hilgert leg.; ♂ ad. between Laghouat and Tiltzhempt, 11.iv.1911, Rothschild, Hilgert & Hartert leg.; ♂ ad. near Tanger, Marocco, May 1899, H. Vaucher leg.; ad. Lagouat, S. Algeria, 21.iv.1911, fresh skin received from Madame Deport; 2 ad. near Lagouat, June and July 1911, bought from Madame Deport.)

69. *Falco vespertinus vespertinus* L.

Red-legged Falcons migrate through Cyrenaica in great numbers. A male was shot by Festa at Gheminez, April 30th, 1921. We saw a single old male sitting on a telegraph wire about thirty miles south-east of Benghazi on April 20th. May 4th in the open plain near Merg, about 50; May 6th probably even more; May 9th about a dozen; May 10th to 15th always some seen. A single male near Tokra, May 17th. They were generally hunting over the plain for locusts and beetles, often in lines, and not quite easy to approach. It was a beautiful sight, so many of these graceful falcons day by day, and especially the old blue-grey males with black underwings looked very fine. In the stomachs I found nothing but orthoptera and coleoptera. About one-half of all the birds seemed to be in the second year, having partially juvenile and partially adult body plumage, but still juvenile wings with wing-coverts and tails, though sometimes (in two out of three males) middle rectrices already like adult; in one male the body plumage is almost entirely blue-grey, with only a few juvenile feathers on breast and abdomen, but lower back and wing-coverts juvenile; in two others there are more juvenile than adult feathers on the underside, the blue-grey feathers mostly show black shaft-lines, and there are some pale chestnut-reddish feathers; this plumage is well described in *Pract. Handb. Brit. B.*, ii, p. 129, by Witherby. No feather is actually growing, it is thus evident that the moult is arrested in May, i.e. during migration, but it commences again, and tail and wings are completed in June to about October. While adult males are very constant, females vary in the intensity of the colour of the underside, especially on throat and breast, as well as in the width and length of the dark moustachial stripe.

(I take this opportunity to mention a specimen shot near Sarepta, S. Russia, April 30th. It is in adult female's plumage, but has a large blue-grey patch on the right side of the jugulum, blue-grey feathers on the right half of the crown and on the right side of the nape and neck. It is marked ♀ by the collector (the late Rückbeil), but it would have been interesting to examine the sexual

organs. The blue-grey feathers are uniform as in adult males, not striped or in any way brownish as in young birds.)

70. *Falco eleonora* Gené.

April 15th Hilgert and I distinctly recognised a specimen in striped plumage near Benghasi in open steppe, coming from an oasis. Though unable to shoot it, we distinctly saw the long, pointed wings, whitish throat, and brown, striped underside.

* 71. *Falco tinnunculus tinnunculus* L.

Though by no means rare, it is, like other common birds, a "specie nuova per la Cirenaica," as Salvadori and Festa would say. We saw a few specimens now and then near Benghasi from March 27th to end of April; on April 1st more than a dozen on the shore, battling with the southerly gale, apparently on migration. One seen at Soluk. Near Merg, during the first half of May, I saw one or two almost every day, either on the plain or on the hill woods. They were evidently "at home" there.

(We never saw any of the larger Falcons, but Festa has seen some form of Peregrine, which was shot near Derna.)

72. *Falco naumanni naumanni* Fleisch.

Observed on passage near Benghasi, 25.iii.

* 73. *Aquila chrysaëtos occidentalis* Olphe-Galliard.

Golden Eagles were seen over the river-bed near Sheleidima 21.iv., and a pair observed for some time soaring over the plain of Merg, May 11th and 12th. As Salvadori received *A. c. occidentalis* from Kussabat near Homs in Tripoli, and these birds were evidently at home, I have no doubt that they also belonged to this subspecies.

74. *Hieraaëtus fasciatus fasciatus* (Vieill.).

Festa mentions a preserved specimen he saw in Benghasi, which had been killed on the plateau of Barka.

* 75. *Buteo ferox cirtensis* (Lev.).

Distinctly seen over the Driana plain, 6.iv.

76. *Circus macrourus* (Gm.).

A by no means rare bird of passage, observed several times near Benghasi, end of March and early in April. A female was caught alive in a trap by a Maltese gardener, 26.iii.

77. *Circus pygargus* (L.).

A wing was found near Benghasi, March 25th, of a specimen evidently killed there not long ago. Harriers were often seen from March to about mid-April, and among them seemed to be one or two *pygargus*, most specimens being either *macrourus* or *cyaneus*.

78. *Circus aeruginosus aeruginosus* (L.).

The dead body of a Marsh-Harrier was found close to Benghasi, April 28th. It had been lying there probably a week or longer. One was observed near Merg, May 11th.

79. *Milvus migrans* (Bodd.).

May 12th, Hilgert and I observed on the hills near Merg a dark Kite of this species, presumably *M. migrans migrans*.

* 80. *Circaëtus gallicus* (Gm.).

Not at all rare in Cyrenaica. We first saw a specimen flying near Sheleiddima, and in the neighbourhood of Merg we observed one or two nearly every day. Festa had received several, and also an egg found near Merg. What was new to me was to see *Circaëtus* hovering over the ground like Kestrels. A pair was displaying over the wood their wonderful flight, descending and ascending for quite a time. When attacked by a pair of Ravens they made themselves scarce. In the stomach of a male shot I found a frog.

* 81. *Neophron percnopterus percnopterus* (L.).

The Egyptian Vulture is common near Merg, where one can see it almost every day coming to the outskirts of the town to feed. Single ones were also seen in the plain of Driana. Is said to be common near Derna.

82. *Ciconia ciconia ciconia* (L.).

Storks pass through Cyrenaica in spring. Festa received specimens, one caught at Fuehat, near Benghasi, in a famished condition. One was caught near Merg early in May. I saw one near Benghasi, 31. iii.

83. *Ardea purpurea purpurea* L.

On April 18th one was captured and shown to me alive by a doctor. He said a number were flying over in the night and this one had struck a wire, so that he could take it with his hands.

84. *Ardeola ralloides* (Scop.).

A specimen shot at Berka, a suburb of Benghasi, 19. iv. 1922, was presented to me fresh in the flesh. I found the iris yellow with a narrow red outer ring. The bird, an adult male, is still in winter plumage, but moult for the nuptial garb is beginning on back and neck.

85. *Nycticorax nycticorax nycticorax* (L.).

Festa saw two specimens shot near Benghasi, second half of April. We saw eight standing in the shallow sea-water lagoon at Benghasi, 16. iv. 1922.

86. *Ixobrychus minutus minutus* (L.).

I put up an adult male in the juniper woods near Merg, May 12th. The specimen flew some distance and could not be found again.

87. *Botaurus stellaris stellaris* (L.).

[Festa has seen a wing of a Bittern shot near Benghazi.]

88. *Phoenicopterus ruber antiquorum* Temm.

[Festa has seen the head and wing of one shot near Benghazi. (Regarding nomenclature, see *Vög. pal. Fauna*, p. 2221.)]

89. *Pelecanus onocrotalus onocrotalus* L.

[Festa has examined the head of a specimen killed at Benghazi.]

90. *Phalacrocorax graculus desmarestii* (Payr.).

[A young bird shot in Cyrenaica was bought by Festa, 1916.]

* 91. *Columba livia gaddi* Sar. & Loudon.

We only shot two females at Sheleidima, on the rocks bordering the river-valley, but Festa, who stayed in Cyrenaica from November to June, collected, with the help of some officers, quite a series, which he kindly sent me for comparison. At first sight it was apparent to me that these birds were not true *livia*, which I knew well from Algeria, being lighter and smaller. We saw a flock near Merg, but through the stupidity of the man driving the dogcart failed to procure any. We also saw two near Tokra, while we were catching butterflies. Festa has specimens from Benghazi, Er-Regima, Merg, Mechili, and Derna. Comparing all these, together with skins from Rodos, Shiraz, Mesopotamia, Damascus, Birejik on Upper Euphrates, Sea of Galilee, Crete, Sollum, Jericho, Dead Sea, Sinai, Muscat, Menacha (Arabia Felix, Yemen), and near Aden, I come to the conclusion that they all belong to one and the same race, i.e. the nearest eastern form of our *livia*. I consider it impossible to separate *palaestinae*, which are not constantly paler nor smaller than *gaddi*. The colour of the rump varies so much, that the fact that nine specimens from southern Arabia have all grey backs is insignificant; we find in Fayoum (Egypt) white-rumped and grey-rumped *schimperi*, grey-rumped and white-rumped *palaestinae* in the same localities, and among Festa's Cyrenaica specimens are two with grey rumps, though by far the majority (also the two we shot at Sheleidima and the flock we saw near Merg) had pure white rumps. In *Ibis*, 1922, p. 64, Meinertzhagen says that he "hopes to show that it is incorrect" that I consider birds from S.W. Arabia to be identical with *palaestinae*; as, however, he does the contrary, at least he calls south-west-Arabian birds *palaestinae*, this must be a misprint or slip, and should read "correct" instead of "incorrect." In fact, I must go further and unite *palaestinae* with *gaddi*, while *schimperi* is smaller and usually lighter, and must be kept separate. Cf. Meinertzhagen, *Ibis*, 1922, pp. 65-8. I add to Meinertzhagen's measurements:

Rodos, ♀ 221, 220.

Cyrenaica¹: Mechili, 221, ♀ 216, ♀ 218; Sheleidima, ♀♀ (very worn) 210, 210; Derna, 227, 230; Merg, ♀ 217; Benghazi, 215, 215; Er-Regima, 216; Shiraz, ♀ 215; Akberabad, ♂ 228; Shushter, ♂ 221; Ardakan, ♂ 240 mm.

I found the iris of these birds light red-brown; bill dull black, cere white but black at distal end; feet dull raspberry-red.

¹ Many of Festa's specimens are unsexed.

* 92. *Streptopelia turtur arenicola* (Hart.).

The birds breeding in great numbers in the juniper woods of the plateau and mountains near Merg must be united with the paler race, *S. t. arenicola*. Wings, ♂ 172, ♀ 170, 164 mm. During the last week of April flocks of Turtle-doves passed through the neighbourhood of Benghasi; they were much persecuted, and would probably nearly all have been shot, if any intended to remain. They were slightly darker and a little larger, the heads more blue-grey; wings: ♂ 181, 179, 176, ♀ 176, 176 mm. These specimens were probably—

93. *Streptopelia turtur turtur* (L.)

on migration. It is easy to separate a series of *S. turtur* from breeding-areas in North Africa from a similar series from England, Germany, and Russia (cf. *Vög. pal. Fauna*, p. 1486). It is, however, sometimes quite difficult to name properly single migrants from Africa, where both may occur, as *S. t. arenicola* is also migratory. While in the woods near Merg, nest with eggs and even young were found; flocks of similar birds occurred also around the town; while they were common one day, they had disappeared next day, when I wanted to shoot some.

During the first half of May nests were found about 6 to 8 ft. or more high in juniper-trees near Merg, some fresh, others hard incubated, and small young were found as early as May 11th. Eggs always two, measuring 33×22.5 , 32.5×22.3 ; 32×24 , 31.5×24 ; 30×23.2 , 30×24 ; 30.5×22.5 , 29.5×23.5 mm.

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

On April 12th and 13th a large flock flew over Benghasi. The flock seemed to come from the sea and to fly in an easterly direction.

(* ?) 95. *Pterocles senegallus* (L.).

Probably common in the desert south of Barka. April 14th, 15th, and 16th observed flying high over the steppe near Benghasi. Festa had a specimen from the steppe east of Gheminez.

* 96. *Burhinus oedicnemus saharæ* (Rchw.).

Breeds in small numbers on the stony plain near Benghasi, in the Driana plain between Benghasi and Tokra, near Soluk and Sheleidima. Festa collected it near Gheminez end of April. One female shot at Benghasi had evidently already been laying, another had an egg inside, which is bluish-white with dark brown and mauve spots and lines.

* 97. *Cursorius gallicus gallicus* (Gm.).

On the bare stony plain with some barley-fields close to Benghasi we heard Cursors and saw them flying overhead on April 5th. In the same place we found three, of which we shot two. The female had evidently laid one egg, another, half-size, inside. Near Soluk and Sheleidima, and east of Gheminez, where Festa discovered it in 1921, they were seen here and there in pairs or three

and four together. Specimens as in Algeria. Iris dark brown. Bill dull black. Legs and feet milky white. A male shot near Soluk 23.iv. moulted its body plumage, both on the back and underneath.

(* ?) 98. *Charadrius dubius euronicus* Gm.

Common on the salt lagoons. Possibly some remain to breed, but the species became much less numerous towards May.

* 99. *Charadrius alexandrinus alexandrinus* L.

Common on the salt lagoons and seashore, but seemed to get much less numerous towards May; some doubtless remained to breed and were several times seen on dry ground far from the sea, and even a pair near Soluk, probably going to nest there.

100. *Calidris alpina* (L.).

(*Tringa alpina* and *Erolia alpina* auct. Cf. *Vög. pal. Fauna*, p. 2212.)

Large flocks of Dunlins were seen on the salt lagoons round Benghasi, end of March and April, but about mid-April the flocks became smaller, and the species became rare towards May. As we did not shoot specimens, I cannot say which subspecies.

101. *Calidris minuta* (Leisl.).

[Many other Waders visit Cyrenaica in winter, and Dr. Festa received several not mentioned here, among them *Calidris minuta* (*Erolia* or *Tringa minuta* auct.) shot at Merg in May.]

102. *Philomachus pugnax* (L.).

Probably a common bird of passage. Two adult females visited Merg and came for food to the neighbourhood of one of the numerous wells, where cattle and camels were given water. The colour of the legs is evidently variable; one had them greenish lead-blue, the other yellowish-brown.

103. *Crocethia alba* (Pall.).

Several flocks were seen near Benghasi early in April, and an adult female was shot at Merg May 16th.

104. *Tringa totanus totanus* (L.)

Observed near Benghasi March 25th and April 9th.

105. *Tringa nebularia* (Gunn.).

Observed near Benghasi, March 25th.

106. *Tringa ochropus* L.

Near Merg early in May.

107. *Tringa hypoleucos* L.

Seen several times near Benghazi first half of April. Festa shot it as late as May 11th.

(Of course many more *Limicolae* occur on passage, and I believe several more have been collected by Dr. Festa during his long stay in Cyrenaica.)

108. *Hydrochelidon leucoptera* (Temm.).

May 17th a pair flying up and down a lagoon not far from Tokra and to the bushes of tamarisks and *Limoniastrum*, evidently catching insects, probably *Neuroptera*.

109. *Larus argentatus cachinnans* Pall.

Sometimes a few seen at and near Benghazi, but never many.

* 110. *Chlamydotis undulata undulata* (Jacq.).

Common in the plain near Sheleidima April 21st. Sometimes in pairs, sometimes five or six, once thirteen got up together! Two eggs of a clutch of three were brought from "five hours south of Benghazi" to a gardener, Mr. Vella, who presented them to me. Festa saw one in May 1921 that was brought to Gheminez by an Arab.

111. *Fulica atra* L.

[Festa saw some that were captured by an Arab for sale at Benghazi in April 1921. (Said to be common at times in winter.)]

112. *Gallinula chloropus* (L.).

Seen remains of specimens.

* 113. *Alectoris barbara barbata* (Rehw.).

Caccabis barbata Reichenow, *Orn. Monatsber.* 1896, p. 76 (specimen which had lived in the Cologne Zoological Garden some time, where it had been brought together with some *chukar* from India); id. *Die Vögel*, i. p. 287 (1913).

Caccabis callolaema Salvadori & Festa, *Boll. Mus. Zool. Torino*, xxxi. No. 714, p. 2 (1916—Cyrenaica); Hartert, *Vög. pal. Fauna*, p. 1912 (1921).

Alectoris barbara barbata Hartert, *Vög. pal. Fauna*, p. 2215 (1922).

The Hadjél, as this "Barbary Partridge" is called by the Arabs in Cyrenaica, like *Alectoris barbara barbata* and *spatzi* in Tunisia, Algeria, and Marocco, inhabits Cyrenaica from the west to Merg, Sheleidima, Mechili, and Mersa Matruh, which is politically Egypt, but obviously, like Sollum, zoogeographically Cyrenaican. The types were supposed to have been brought to Benghazi from south of that town, but more likely had come from the north, the plain of Driana between Tokra and Benghazi. Looking in vain for it near Benghazi, we came across it for the first time in the Driana, in the plain covered with thick bushes of *Rhus oxyacantha*, *Lentiscus*, *Periploea laevigata*, and a few *Zizyphus*, where it was not rare. We then found it in the bush country all along to Tokra, in the

woods of the plateau towards Merg and higher up on the mountains, also in the *Zizyphus* bushes near Sheleidima, and Dr. Festa also saw a covey near Meehili, where the fauna is that of the desert, *Rhamphocorys*, *Eremophila*, etc., being found there. Festa did not shoot a specimen near Meehili, but we collected four near Sheleidima, in a very open country, except for the *Zizyphus* bushes in the river-beds; at first sight they look paler than the series from Driana and the Djebel Aehdar, near Merg, but that is because they are more worn and more faded, some fresh-growing feathers being as dark as in the more northern birds; the colour of the breast varies much, and one from Driana is quite as light there as the lightest Sheleidima specimen.

This is the most strikingly different of the birds peculiar to Cyrenaica. It is better compared with *A. b. spatzi* than with the darker, more northern *A. b. barbara*, and differs most obviously in the feathers of the sides and flanks having much wider black bars, white the chestnut ends are quite narrow and paler, often barely noticeable. The feathers of the throat and sides of the head are dark bluish grey instead of pale grey or whitish, and these feathers are less rounded, a little longer, more pointed, a little stiffer, with small buff tips. The collar and sides of neck are pale chestnut, more bright cinnamon, but not dark chestnut, and the light spots at their tips are pale grey instead of white. Top of head much lighter. Breast as in *A. b. spatzi*. Bill and feet red. Bare skin round eye orange-red to bright brick-red. Iris light brown. Wings, ♂ 168-175, ♀ 155-165 mm. The specimens from the woods of junipers, lentiseus, and arbutus near Merg, where the soil is reddest, are very much reddened, like Larks and other ground birds.

Eggs like those of *A. b. barbara* and *spatzi* were found in April, but all I saw were eaten by some animals, probably rodents. About May 15th Festa caught some young, just from eggs. They are pale cream-colour, almost white, top of head and neck pale brownish chestnut, back with rows of black and rufous spots, wings with similar cross-bars; underside uniform whitish cream.

Though by no means rare, they are not easy to collect in the spring, as it is difficult to flush them without dogs. Generally, one must strike the bush with stick or stone, or kick it, and then the birds get out on the other side of the often high and large clumps of bushes, though in the early morning one sees them running on the roads, picking up food. In the stomachs and crops I found plenty of the hard little sweet berries of *Rhus oxyacantha*, little seeds, grass-seeds, and others, bulbs like small onions, locusts, and beetles (mostly *Curculionidae*), near Merg also a few juniper fruits. The alarm cry is the same as that of *A. b. barbara* and *spatzi*, that of the male louder than that of the female. Though protected in the spring by game-laws, they are even then often shot and their eggs taken, they will therefore soon become scarcer along the newly-built main roads; but in the juniper woods farther away and down south they will not be persecuted any more than of old by the Arabs, and will long remain common enough. Their flesh has the same peculiar flavour of the Barbary Partridges in Algeria, and is not to be compared with that of *Perdix perdix*. (It will be interesting to compare a series of fresh birds from Mersa Matruh, but the specimens at hand, which died in the Giza Zoological Gardens, do not show any reliable differences.) This Partridge was already mentioned by Haimann in 1882 as a Red-legged Partridge, larger than the Italian one, which is correct.

114. *Coturnix coturnix coturnix* (L.).

A few were seen 29.iii., but quite a number on 26 and 27.iv. They were obviously on migration. Festa saw one near Benghasi (Fuehat) on May 20th, 1921, but there is no proof of the nesting in Cyrenaica. If I understand right, the Quail is the only bird mentioned in addition to the Partridge by the Italian traveller Haimann.

115. *Alauda arvensis intermedia* Swinh.

One day I picked up on a field not far from Berka, a suburb of Benghasi, the wing of a female of the Siberian Lark, generally called now *A. arvensis cinerascens* Ehmeke, 1904. In the list of *Alaudidae* of the Chinese collection made by Weigold, in "Zool. Ergebn. Stötzner Exped." in *Abhandl. u. Ber. Mus., Dresden*, xv. 1922, p. 19, I have explained that I consider *Alauda intermedia* Swinh. from China (winter bird), *dulcivox* Brooks, N.W. India, and *cinerea* 1903, *cinerascens* 1904, to be one and the same form, which migrates in winter in the east to China, in the west as far as Algeria, and which nests in Siberia from west to east.

This list shows that the ornithology of Cyrenaica is mainly of the nature of Africa Minor, i.e. Tunisia, Algeria, and Morocco, with a few peculiar forms, and a very slight eastern element, viz. *Columba livia gaddi*, and of migrants *Sylvia ruppeli* and the frequency of *Falco vespertinus*. The forms peculiar to the country are:

Galerida cristata festae, *Galerida theklæ cyrenaicae*, *Parus caeruleus cyrenaicae*, *Troglodytes troglodytes juniperi*, and *Alectoris barbara barbata*, all with their nearest allies in Algeria-Tunisia, except *G. cristata festae*, which is somewhat nearer to *G. c. brachyura* (Palestine to Egypt) than to the Algero-Tunisian *G. c. arenicola*.

ON A SECOND COLLECTION SENT BY MR. GEORGE FORREST
FROM N.W. YUNNAN

By LORD ROTHSCHILD, F.R.S.

THIS collection, though not quite so numerous in species as the first, is very interesting, and the make of the majority of the skins is excellent. The most striking feature of the collection is the fine series of "Pheasants" and also the large woodpeckers.

* 1. *Tetraophasis szechenyii* Mad.

Tetraophasis szechenyii Madarász, *Zeitschr. f. ges. Orn.* ii. p. 50, pl. ii. (1885) ("East Thibet").

Forrest sent 2 ♂♂, 1 ♀ of this very rare species. "Bill black-brown; feet, legs, and claws dark black-brown; iris pale yellow, naked space round eye pink." 2 ♂♂ Lichiang Range, November 1921, 12,000–14,000 ft., conifer forest and alpine meadows; 1 ♀ Mekong—Yangtze Divide, east of Atuntze, lat. 28° 28' N., long. 99° 6' E., 12,000 ft., September 11, 1921.

New to the Yunnan avifauna.

2. *Ithaginis clarkei* Rothschild.

Ithaginis clarkei Rothschild, *Bull. B.O.C.* xl. p. 67 (1920) (Lichiang Range, Yunnan).

George Forrest succeeded in getting 4 ♂♂ and 1 ♀ on this journey in full unworn plumage at 11,000–13,000 ft. in conifer forests in November and December 1921. I think it will be of interest to give a fresh description of the unworn plumage.

♂ Above: Forehead black, crown of head and prolonged crest bluish-ash-grey, somewhat washed with buff on crown, feathers much disintegrated; cheeks bare, broad band above eye black, feathers below bare portion of face black and red; ear-coverts prolonged, narrow, and pointed, light grey edged with fuscous and more or less washed with pale carmine, neck hackles long and pointed whitish-grey edged with bluish-grey. Back and rump bluish-ash-grey with whitish shaft-stripe edged with sooty black, these shaft-stripes widen towards the rump and get very wide on upper tail-coverts. Tail-feathers ash-grey edged with crimson, getting paler towards tips. Primaries outer webs edged with whitish-grey, rest of outer and inner webs dark grey, secondaries dark brownish-grey edged all round with whitish-grey, the outer ones also washed towards the tips with pale grey clouding shaft-stripes pale whitish-grey. Outer and lower wing-coverts somewhat disintegrated apple-green.

Below: Throat and chin whitish to ash grey more or less strongly saturated with orange, buff, and crimson; breast ash-grey washed with dark buff shaft-stripes very narrow whitish; lower breast and abdomen grey, more or less strongly saturated with apple-green and with in most cases crimson breast spots. Under-tail-coverts deep crimson with narrow whitish shaft-lines and whitish tips. Bill black, cere scarlet, feet and legs scarlet. Iris orange-yellow, naked skin of cheeks scarlet.

Wing 202–212 mm.

♀ Forehead cinnamon-brown; crown, crest, and hind-neck bluish-ash-grey; rest of upper side brownish-grey vermiculated finely with fuscous. Tail dark brown vermiculated with grey. Primaries fuscous brown tinged with grey. Chin and throat cinnamon merging into grey on neck; rest of underside brown-grey washed with cinnamon and finely vermiculated with dark fuscous. Under-tail-coverts more tinged with ash-grey.

Bill black; cere dull red.

4 ♂♂, 1 ♀ Lichiang Range, 11,000–13,000 ft., November–December 1921, conifer forest.

3. *Tragopan temminckii* (Gray).

Satyra temminckii Gray, in Hardwicke, *Ill. Ind. Zool.* i. pl. 1. (1830–1832) (no locality given; type marked China in British Museum).

There appears to be no appreciable difference between Central Chinese examples and those from Yunnan and Burma.

Bill black, upper mandible tipped horn-brown, lower flesh-pink; legs and feet greyish-flesh-colour, claws grey-brown; iris orange-yellow; wattles, horns, and skin round eye bright blue.

2 ♂♂, 2 ♀♀ Lichiang Range, 13,000–14,000 ft., conifer forest and open Alps, November 1921; 2 ♂♂ Mekong—Salwin Divide, lat. 28° 20' N., 12,000–14,000 ft., September 23, 1921, conifer and cane forest.

4. *Crossoptilon crossoptilon crossoptilon* (Hodgs.).

Phasianus crossoptilon Hodgson, *Journ. As. Soc. Bengal*, vii. p. 864 (1838) (no exact locality).

Forrest only got one young ♀ (marked ♂), but this is interesting, as confirming my former conclusion that the dark tinge was abnormal. This example is interesting as it exhibits feathers of three different plumages, the grey and brown freckled wing-feathers and brown-grey neck-feathers of the first plumage, the greyish-white or pale lavender-grey of the second plumage, and the pure white of the adult plumage.

1 ♀ juv. Mekong—Salwin Divide, 12,000 ft., lat. 28° 20' N., September 3, 1921, pine forests.

5. *Pucrasia meyeri* Mad.

Pucrasia meyeri Madarász, *Ibis*, 1886, p. 145 (Central Tibet!).

The fine series of this exceedingly rare species sent by Forrest is a most welcome addition to our knowledge of a rather obscure form. Mr. Beebe puts *meyeri* down as a subspecies of *xanthospila*, but in view of the chestnut colouring as opposed to blue-grey on the outside 14 tail-feathers I keep them as species; though Beebe considers some birds enumerated by Oustalet from Sechuen as being almost intermediate, Mr. Stuart Baker considers it a good species.

Bill dull black; feet dull dark grey, legs slightly paler; iris pale yellow.

6 ♂♂, 3 ♀♀ Lichiang Range, 14,000–14,500 ft., open Alps, October–December 1921, lat. 27° 40' N.

6. *Phasianus colchicus elegans* Elliot.

Phasianus elegans Elliot, *Abnn. Mag. Nat. Hist.* (4) vi. p. 312 (1870) (Sechuen).

The 2 ♂♂, 1 ♀ sent by Forrest are in beautifully fresh plumage and therefore the hindneck and interscapulium of the ♂ are deep chestnut, whereas in more worn birds these parts are more golden chestnut.

The single Sechuen ♂ (type of the species) in the British Museum differs from Burmese and Yunnan examples in the lavender-blue edges of the rump-feathers being wider and the black basal area of the neck-feathers is more extended, but it is impossible to separate the latter as a race on the evidence of one Chinese example only.

2 ♂♂, 1 ♀ Lichiang Range, December 1921, 8,000–11,000 ft., forests and open meadows.

7. *Syrmaticus humiae burmanicus* (Oates).

Galophasis burmanicus Oates, *Ibis*, pp. 124–125 (1898) (Ruby Mines and S. Shan States).

The single ♂ Forrest sent is undoubtedly *h. burmanicus*.

Bill greyish-black, tip yellow; legs and feet greyish-black-brown; iris orange-brown.

1 ♂ Yungping—Yangpi Divide, lat. 25° 35' N., 7,000–8,000 ft., dense mixed forest, April 1921.

8. *Chrysolophus amherstiae* (Leadb.).

Phasianus amherstiae Leadbeater, *Trans. Linn. Soc. Lond.* xvi. p. 129. pl. xv. (1828) (said to be from mountains of CochinChina).

Forrest has sent a magnificent series of this beautiful bird, of which wild shot examples are very scarce in museums. The series consists of 4 adult males, 5 young males of the year, 4 adult females, 2 young females, and 2 chicks in down.

♂ Bill "dark blue-grey, tip paler; legs and feet dark steel-grey; iris milky-grey; naked skin round eye pale greenish-blue."

♀ Bill "dark blue-grey, tip paler; feet pale brownish-grey; iris pale milky yellow."

2 ♂♂ ad., 5 ♂♂ juv., 4 ♀♀ ad. Lichiang Range, November 1921, 8,000–11,000 ft., thickets and forests; 1 ♂ ad., 1 ♀ juv., 2 chicks in down, Mekong—Salwin Divide, 7,000–9,000 ft., lat. 28° N., September 1921. 1 ♂ ad., 1 ♀ juv. Mekong Valley, 7,000–9,000 ft., lat. 28° N. (thickets and forest).

9. *Scolopax rusticola rusticola* Linn.

1 sex? Lichiang Range.

10. *Tringa ocropus* Linn.

1 ♀ Mekong River.

11. *Charadrius dubius dubius* Scop.

1 ♂ Teng Chuan Valley.

12. *Sphenurus sphenurus yunnanensis* (La Touche).

Sphenocercus sphenurus yunnanensis La Touche, *Bull. B.O.C.* xlii. p. 13 (1921) (Lotukow).

In my former paper [Nov. Zool. xxviii. p. 18 (1921)] I did not venture to separate the single ♀ sent by Forrest, though I stated that it appeared to be darker green above and less yellow below. Mr. La Touche has, however, since procured a ♂ and described it as above. Forrest has now sent 1 ♂ and 3 ♀♀, and I am able to describe the Green Pigeon of N.W. Yunnan in completion of Mr. La Touche's diagnosis.

♂ ad. Above differs from *S. sph. sphenurus* in having the yellow edges to the secondaries wider and more numerous. The abdomen is decidedly more apple-green, less yellowish, and the throat is more green, less yellowish.

"Bill bright blue; feet crimson; iris pale blue."

♀ Much more distinct. Above darker, more blackish-green. Below apple-green, not saturated with yellow.

1 ♂, 1 ♀ Mekong Valley, 7,000–9,000 ft., lat. 28° N., June 1921, pine forest; 2 ♀♀ Mekong—Salwin Divide, 9,000–11,000 ft., lat. 27° 30' N., July 1921.

13. *Oenopopelia tranquebarica humilis* (Temm.).

2 ♂♂, 2 ♀♀ Tali Valley; 2 ♂♂ Teng Chuan Valley.

14. *Columba hodgsoni* Vig.

1 ♂ Lichiang Range; 1 ♀ juv. Mekong—Yangtze Divide.

15. *Butorides striatus javanicus* (Horsf.).

1 ♂ Lichiang Range; 1 ♀ Tali Valley.

16. *Ardeola bacchus* (Bp.).

1 ♂ Hsia Kuon Valley.

* 17. *Buteo buteo japonicus* (Temm. & Schleg.).

Falco buteo japonicus Temminck & Schlegel, in Siebold's *Fauna Japonica*, Aves, p. 16. pls. vi. and vib (1844–1845) (Japan).

1 ♀ Lichiang Range, 8,000–10,000 ft., open country, December 1921.

"Bill dark blue-grey; cere dull yellow; feet and legs orange-yellow, claws black-brown; iris yellow."

This specimen is an example of the dark phase. New to Yunnan.

18. *Falco tinnunculus interstinctus* (McClell.).

Tinnunculus interstinctus McClelland, P.Z.S. London, part vii. p. 154 (1840—Assam).

Forrest sent a series in this collection and the younger examples show instructive plumages.

2 ♂♂, 3 ♀♀ ad., 1 ♂ juv. Mekong—Salwin Divide, 8,000–9,000 ft., lat. 28° 21' N., September 1921, pine and mixed forest; 1 ♂ jun. Lichiang Range, 9,000–12,000 ft., December 1921.

* 19. *Accipiter affinis* Gurney.

Accipiter virgatus subsp. *affinis* Gurney, *List Diurn. Birds Prey*, pp. 39 and 168-173 (1884) (Himalayas [and Formosa]).

This is the first record for Yunnan.

1 ♂ Mekong Valley, 7,000-8,000 ft., lat 28° N., pine forests, September 1921.

“Bill blackish-grey, slate-grey below; feet orange-yellow, claws greyish-black; iris orange-yellow.”

20. *Accipiter trivirgatus rufotinctus* (McClell.).

Astur rufotinctus McClelland, *Proc. Zool. Soc. Lond.* part vii. p. 153 (1840—Assam).

The single ♂ sent by Forrest is very dark above and very large (wing 233 mm.).

“Bill blue-grey; cere yellow; feet light orange; iris orange.”

1 ♂ Mekong—Salwin Divide, 8,000 ft., lat. 28° 10' N., September 1921.

21. *Strix aluco harterti* (La Touche).

Syrnium harterti La Touche, *Bull B.O.C.* xl. p. 50 (1919) (S.W. Hupeh).

In my article on the first collection [Nov. Zool. xxviii. p. 20. No. 38 (1921)] I called the adult ♀ and juvenile examples *S. aluco nivicola* Blyth with a ?. The adult ♂ now sent agrees absolutely with Mr. La Touche's type of *harterti*, also a ♂, and only has a wing 4 mm. longer. Whether *harterti*, when we can examine a series, will prove distinct from *nivicola* must be left for future workers to determine, but undoubtedly for the present we must identify the N.W. Yunnan birds as *aluco harterti*.

1 ♂ Lichiang Range, 11,000-13,000 ft., December 1921.

* 22. *Glaucidium cuculoides whitelyi* (Blyth) ?.

Athene whitelyi Blyth, *Ibis*, (2) iii. p. 313 (1867) (Japan).

The single ♀ sent by Forrest is so much worn that it is difficult to identify; but it appears to have been much darker than any of the *Tring* series of *whitelyi*.

1 ♀ Yangtze Valley, 6,000-7,000 ft., lat. 27° 20' N., June 1921.

“Bill greenish-yellow, base blue-green; feet and iris yellow.”

New to Yunnan.

23. *Cuculus canorus telephonus* Heine.

1 ♂ juv. Mekong—Salwin Divide.

24. *Cuculus sparverioides* Vig.

1 ♂ juv. Mekong Valley.

25. *Cacomantis merulinus querulus* Heine.

1 ♂ Mekong Valley.

26. *Eudynamis honorata malayana* Cab. & Heine.

Eudynamis malayana Cabanis and Heine, *Mus. Hein.* iv. p. 52 (1852) (Sumatra).

Forrest sent 2 ♂♂, both of which have a wing measurement of 203 mm. = 8 in., whereas *honorata honorata* the wing is given as 194 mm. = 7.6 in. Therefore I think the race *malayana* is worthy of being kept separate.

"Bill dull greenish-yellow, base dull green; legs blackish-grey; iris crimson."

1 ♂ Tali Valley, lat. 25° 40' N., 6,500 ft., thickets and forests, May 1921;

1 ♂ Mekong—Salwin Divide, September 1921, 8,000 ft., lat. 28° 20' N.

27. *Rhopodytes tristis* (Less.).

Melias tristis Lesson, *Traité d'Orn.* p. 132 (1831) (? Sumatra).

Forrest sent 2 ♀♀ of this species, one being sexed ♂ Salwin Valley, 3,000–4,000 ft., lat. 25° 20' N., forests, April 1921. New for Yunnan.

"Bill dull green, base darker; naked skin of face crimson; legs dull blackish-grey; iris dark crimson."

28. *Yynx torquilla japonica* Bp.

1 ? Yangtze Valley.

* 29. *Dryocopus martius khamensis* (But.).

Picus khamensis Buturlin, *Ann. Mus. Zool. Acad. Imp. St. Petersburg*, xiii. p. 229 (1908) (eastern slopes Thibet Plateau).

The character given by Buturlin of the much reduced feathering of the tarsi is very clear in the 2 ♂♂ and 3 ♀♀ sent by Forrest. The culmen measurement is not so clear though the dimensions are certainly less. This is undoubtedly the most southerly record for any form of *Dryocopus martius*.

2 ♂♂, 3 ♀♀ Mekong—Salwin Divide, 10,000–12,000 ft., lat. 28° 20' N., September 1921, mixed forest.

"Bill light blue-grey, becoming darker towards tip, which is black; legs, feet, and claws black; iris cream-grey."

New for Yunnan.

* 30. *Dryocopus forresti* Rothschild.

Dryocopus forresti Rothschild, *Bull. B.O.C.* xliiii. p. 9 (1922) (Mekong Valley).

This is a wonderful discovery.

There are a number of smaller forms from Burma, the Philippines, and other localities somewhat allied to this bird, but they are all much smaller. In size it equals *D. richardsi* Tristr. from the island of Tsushima, but the ♀ has the red occiput of the Burmese *D. feddeni*, whereas in *richardsi* the ♀ has the whole head black. I am keeping it as a separate species as I am not yet clear as to the relationship of the *feddeni* group, and the latter has occurred in Yunnan.

♂ ad. Differs from *richardsi* in the darker scarlet, LESS orange-scarlet of the crown and nape, in the less white on the concealed portions of the inner secondaries, and in the almost complete absence of the narrow white edges of these secondaries. It also differs from *richardsi* in the less extent of the black portion of the lower upper tail-coverts. On the undersurface it apparently is more strongly tinged

with cream-colour on the white portions. From *feddeni* it differs in its much larger size, longer white tips to the primaries, and much blacker chin and throat.

♀ ad. Differs from *richardsi* in the scarlet nape-band, in much less amount of white on the concealed portions of the inner secondaries, in the complete absence of the white edges to secondaries, and in the more creamy underside. From *feddeni* it differs in its much larger size, larger white tips to the secondaries, and much blacker chin and throat.

Culmen ♂ 62 mm. ; wing 253 mm. ; tarsus 40 mm.

„ ♀ 50 mm. ; „ 247 mm. ; „ 35 mm.

“ Bill black ; feet greyish-black ; iris pale green.”

1 ♂, 1 ♀ Mekong Valley, lat. 28° N., 6,000 ft., August 1921, open forest [Outram Bangs records *Dryocopus feddeni* from Yunnan (Malipa, Burmese Border)].

* 31. *Dryobates obscurior* Rothsch.

Dryobates obscurior Rothschild, *Bull. B.O.C.* xliii. p. 10 (1922) (Lichiang Range).

The single ♀ sent by Forrest has an entirely black head ; a much heavier banded breast, and a more triangular and pointed bill than *D. p. scintilliceps*.

1 ♀ Lichiang Range. New for Yunnan.

31A. *Dryobates pygmaeus omissus* Rothsch.

Dryobates pygmaeus omissus Rothschild, *Bull. B.O.C.* xliii. p. 10 (1922) (Lichiang Range).

This is the bird I formerly called *D. p. scintilliceps* (Nov. Zool. 1921, p. 22).

32. *Dryobates darjellensis* (Blyth).

1 juv. ? Mekong Valley.

* 33. *Picoides tridactylus funebris* Verr.

Picoides funebris Verreaux, *Nouv. Arch. Mus.* vi. *Bull.* p. 33 (1870) (Mountains of Chinese Thibet).

Of this exceedingly rare species Forrest sent two fine ♂♂, the first to reach England.

“ Bill blackish-grey above, steel-grey below ; feet and claws black ; iris dark brown.”

2 ♂♂ Mekong—Salwin Divide, 10,000 ft., lat. 28° 20' N., mixed forest, September 1921. New to the avifauna of Yunnan.

34. *Picus canus sordidior* (Rippon).

1 ♂, 1 ♀ ad., 1 ♂, 1 ♀ juv.

Lichiang Range ; 2 ♀♀ juv. Mekong Valley ; 1 ♂ juv. Mekong—Salwin Divide.

35. *Cyanops asiatica* (Lath.).

1 ♂ Tali Valley (no red on sides of foreneck).

* 36. *Ceryle lugubris guttulata* Stejn.

Ceryle guttulata Stejneger, *Proc. U.S. Nat. Mus.* xv. pp. 294, 295 (1893) (India and China).

I believe this is a quite fresh record.

1 ♂ jun. Tung Chuan Valley, 7,000 ft., lat. 25° 56' N., May 1921, water-courses.

“Bill black, base below and tip pale brown; legs and feet blackish-grey; iris dark brown.”

37. *Coracias affinis* McClell.

1 ♂ Tengyueh Valley.

38. *Caprimulgus indicus jotaka* Temm. & Schleg.

1 ♀ Mekong—Salwin Divide.

* 39. *Chaetura caudacuta nudipes* Hodgs.

Chaetura nudipes Hodgson, *Journ. As. Soc. Bengal*, v. p. 779 (1836) (Nepal).

1 ♂ Mekong—Salwin Divide, 10,000–11,000 ft., lat. 27° 30' N., August 1921, cliffs.

“Bill and feet black; iris dark brown.” New for Yunnan.

* 40. *Collocalia fuciphaga brevisrostris* (McClell.).

Hirundo brevisrostris McClelland, *Proc. Zool. Soc. Lond.* part vii. p. 155 (1840—Assam).

1 ? juv. Mekong—Salwin Divide, 9,000 ft., lat. 27° 30' N., July 1921, cliffs
New for Yunnan.

41. *Hirundo daurica nipalensis* Hodgs.

Hirundo nipalensis Hodgson, *Journ. As. Soc. Bengal*, v. p. 780 (1837—central region of Nepal).

1 ♂, 1 ♀ Tali Valley, 6,500 ft., lat. 25° 40' N., May 1921, human habitations;
1 ♂ Mekong—Yangtze Divide, 8,000–9,000 ft., lat. 27° N., June 1921. New for Yunnan.

“Bill black; legs and iris dark brown.”

41A. *Tesia cyaniventer* Hodgs.

1 ♀ Salwin Valley.

42. *Troglodytes troglodytes talifuensis* (Sharpe).

2 ? Lichiang Range; 1 ♂, 2 ♀♀ Mekong—Salwin Divide.

43. *Prunella collaris ripponi* Hart.

1 ♂ Lichiang Range; 1 ♀ Mekong—Salwin Divide.

44. *Prunella strophiatatus multistriatus* (David).

3 ♂♂, 1 ♀ Lichiang Range; 1 ♀ juv. Mekong—Salwin Divide.

45. *Prunella immaculata* (Hodgs.).

2 ♂♂ Lichiang Range ; 1 ♂ ad., 1 ♂ juv. Mekong—Salwin Divide.

46. *Enicurus sinensis* Gould.

1 ♂ ad. Lichiang Range ; 1 ♂, 1 ♀ juv. Mekong—Salwin Divide.

47. *Phoenicurus schisticeps* (Gray).

6 ♂♂ ad., 6 ♀♀ ad. Lichiang Range ; 1 ♀, 2 ? Yangtze Valley ; 1 ♀ Mekong—Salwin Divide.

48. *Phoenicurus hodgsoni* (Moore).

4 ? Yangtze Valley.

49. *Phoenicurus aureus leucopterus* Blyth.

1 ♀ Mekong—Salwin Divide.

50. *Phoenicurus frontalis sinæ* Hart.

9 ♂♂ ad., 1 ♂ juv., 2 ♀♀ ad., 1 ? Lichiang Valley ; 1 ♂ ad., 1 ♀ juv. Mekong—Salwin Divide ; 2 ♀♀ Yangtze Valley ; 1 ♀ Salwin Valley. (This further material seems to show that Yunnan examples are somewhat intermediate between *f. frontalis* and *f. sinæ*.)

51. *Chaimarrornis fuliginosa fuliginosa* (Vig.).

1 ♂ ad. Salwin Valley ; 3 ♂♂ ad., 4 ? juv. Mekong—Salwin Divide, 1 ♂ ad., 3 ? juv. Mekong Valley.

52. *Chaimarrornis leucocephala* (Vig.).

1 ♂ Salwin Valley.

* 53. *Tarsiger indicus yunnanensis* Rothsch.

Tarsiger indicus yunnanensis Rothschild, *Bull. B.O.C.* xliii. p. 10 (1922) (Lichiang Range).

♂ Differs from *T. i. indicus* in having a less uniform underside, the throat being much paler, and the rest of the underside much suffused with yellow, less rust-coloured.

The white edging to lower edge of sides of face more distinct, and the underwing-coverts and axillaries more sulphur-yellow ; undertail-coverts greenish, less rusty.

♀ Differs in paler throat and more yellow, less brownish colour of rest of underside.

1 ♂ (Type) Lichiang Range, 10,000 ft., November 13, 1921, thickets ; 1 ♀ Mekong—Salwin Divide, 11,000 ft., lat. 28° 20' N., September 1921.

“ Bill and feet black ; iris dark brown.”

54. *Tarsiger cyanurus* (Pall.).

Motacilla cyanurus Pallas, *Reise Prov. Russ. Reichs.* ii. p. 709 (1773) (Ycnissei).

The adult ♂♂ are easily distinguished from the forms of *rufilatus*, but the ♀♀ are very much closer in appearance.

1 ♂ ad., 3 ♂♂ juv., 4 ? Lichiang Range, 9,000–11,000 ft., October–December 1921.

55. *Tarsiger rufilatus practicus* (Bangs & Phill.).

1 ♂, 2 ♀♀ ad. Lichiang Range; 1 ♂ ad., 1 ♂ juv., 1 ♂, 2 ♀♀ juv. Mekong—Salwin Divide; 2 ♀♀ Mekong Valley.

56. *Tarsiger chrysaeus* Hodgs.

5 ♂♂ ad., 1 ♂ juv., 1 ♀ juv. Mekong—Salwin Divide; 1 ♀ Lichiang Range.

57. *Copsychus saularis saularis* (Linn.).

1 ♂ Tengyueh Valley.

58. *Oreicola ferrea haringtoni* Hart.

1 ♂ ad. Mekong Valley; 1 ♂, 1 ♀ ad., 1 ? juv. Mekong—Salwin Divide; 2 ♂♂ ad. Salwin Valley; 4 ♀♀ ad. Tali Valley.

59. *Saxicola torquata indica* Blyth.

Pratincola indica Blyth, *Journ. As. Soc. Bengal*, xvi. p. 129 (1847) India).

In my paper on Forrest's first collection I recorded *P. torquata przewalskii* (Pleske), and correctly so. Ingram also recorded that form from Mengtz, but on re-examining the specimen I find it is *t. indica*. We thus have both forms in the breeding season from Yunnan, *przewalskii* from the high mountains and *indica* from the plains, but the pair now sent are winter birds and probably on migration. I think therefore we have too little evidence to say whether either, or both, or neither breed in Yunnan.

1 ♂ Mekong Valley, 8,000 ft., lat. 27° 30' N., September 1921; 1 ♀ ? Lichiang Range, 10,000 ft., November 1921.

60. *Myiophoneus eugeniae* Hume.

2 ♂♂ ad., 1 ♂ juv. Mekong Valley; 1 ♀ Salwin Valley.

61. *Monticola solitarius pandoo* (Sykes).

1 ♂ ad., 4 ? juv. Mekong Valley; 1 ? juv. Lichiang Range.

62. *Monticola solitarius pandoo* × *Monticola philippensis*.

1 ♂ Lichiang Range; 1 ♂ Mekong Valley.

63. *Turdus castaneus gouldi* (Verr.).

13 ♂♂, 5 ♀♀ ad., 2 ? Lichiang Range; 1 fledgeling Mekong—Salwin Divide. (It appears more than likely that the breeding race in Yunnan is much

darker than Chinese examples and will require a new name, but till we can compare breeding Kansu examples I do not dare to separate them.)

64. *Turdus fuscatus* Pall.

1 ♂ ad., 2 ? Liehiang Range ; 1 ♀ ad. Salwin Valley.
(All Yunnan birds have very little red on the wings.)

65. *Turdus fuscatus* × *Turdus naumanni*.

1 ♀, 1 ? Liehiang Range. These birds show mixture of red all over back and tail, and black spots on breast.

66. *Turdus auritus conquisitus* Bangs.

Turdus auritus conquisitus Outram Bangs, *Bull. Amer. Mus. Nat. Hist.* xlv. art. xx. p. 591 (1921)
(Liehiang Range).

Bangs has separated this solely on the heavier spotted underside, and I quote these two birds under his name, but they are not so heavily spotted as the former specimens sent by Forrest.

2 ♂♂ ad. Liehiang Range.

67. *Turdus mollissimus* Blyth.

1 ♂ ad., 2 ♂♂, 1 ♀ juv. Mekong—Salwin Divide ; 1 ? ad. Liehiang Range.

* 68. *Turdus dauma dauma* Lath.

Turdus dauma Latham, *Ind. Orn.* i. p. 362 (1790) (India).

1 ♂, 1 ? Liehiang Range, 11,000–13,000 ft., December 1921. New for Yunnan.

“Bill dark horn-brown, lower base yellowish ; legs and feet light brown ; iris dark brown.”

69. *Pomatorhinus ruficollis stridulus* Swinh.

4 ♂♂ ad., 1 ♀ ad., 2 ? Liehiang Range ; 1 ♂ Tali Valley ; 1 ♀ Mekong Valley.

70. *Pomatorhinus maclellandi odicus* Bangs & Phill.

5 ♂♂, 6 ♀♀, 2 ? ad. Liehiang Range ; 2 ♂♂, 1 ♀ ad. Mekong Valley.

71. *Ianthocincla affinis oustaleti* Hart.

11 ♂♂, 1 ♀, 3 ? ad. Liehiang Range ; 2 ♂♂, 1 ♀ ad., 1 juv. Mekong—Salwin Divide. (The nestling differs only in having head and back uniform rich brown.)

72. *Ianthocincla ellioti ellioti* (Verr.).

13 ♂♂, 7 ♀♀, 7 ? ad. Liehiang Range ; 6 ♂♂, 2 ♀♀ ad., 1 ♀ juv. Mekong—Salwin Divide.

73. *Ianthocincla lanceolata bonvaloti* (Oust.).

2 ♂♂, 2 ♀♀ Liehiang Range.

73A. *Ianthocincla lanceolata lanceolata* (Verr.).

Pterorhinus lanceolatus Verreaux, *N. Arch. Mus.* vi. *Bull.* p. 36 (1871) (Mountains of Chinese Thibet).

The low-country birds belong to the smaller typical race.

1 ♂ Salwin Valley, 3,000–4,000 ft., lat. 25° 20' N.

74. *Ianthocincla maxima* (Verr.).

5 ♂♂, 2 ♀♀, 2 ? Lichiang Range; 2 ♂♂, 3 ♀♀ Mekong—Salwin Divide.

75. *Ianthocincla cineracea styani* (Oust.).

Trochopteron styani Oustalet, *Bull. Mus. Paris*, p. 226 (1898) (Ta-Tsien-Lu).

1 ♂, 1 ♀ Mekong Valley, 6,000–7,000 ft., lat. 28° N., September 1921.

76. *Ianthocincla bieti* Oust.

Ianthocincla bieti Oustalet, *Bull. Mus. Paris*, p. 163 (1897) (Upper Mekong River).

This species has only hitherto been known from the type examples in the Paris Museum, and the description differs somewhat from Forrest's birds, but I believe I have correctly identified them.

1 ♂ Lichiang Range, 9,000–11,000 ft., December 1921, forests and thickets. (Bill horn-brown, lower mandible yellowish; feet pale brown; iris pale greyish-yellow.) 1 ♂, 1 ♀ Mekong—Salwin Divide, 10,000 ft., lat. 28° 20' N., September 1921.

77. *Ianthocincla sannio* (Swinh.).

2 ♂♂ ad. Lichiang Range; 1 ♂, 1 ♀ ad. Tali Valley; 2 ♀♀ ad. Mekong—Salwin Divide.

Outram Bangs maintains that *albosuperciliaris* Godw. Aust. is distinct from *sannio*, but the very large series at Tring both from China and the Burmese regions are absolutely identical.

78. *Moupinia poecilotis sordidior* Rothsch.

5 ♂♂ ad., 5 ? Lichiang Range.

78A. *Schoeniparus genestieri* (Oust.).

5 ? Lichiang Valley. (All these are considerably whiter below than any from the typical localities.)

* 79. *Schoeniparus intermedius* (Rippon).

Schoeniparus intermedius Rippon, *Bull. B.O.C.* xi. p. 11 (1900) (Bhamo).

The six birds Forrest sent from the Mekong—Salwin Divide which I have placed here are apparently younger birds, but they may be only a stage of *genestieri*, though they have the chin spotting of *intermedius* and do not agree with any of our young *genestieri*. In my former article I united *genestieri* and *intermedius*, but I am now somewhat doubtful in view of the new material.

2 ♂♂, 3 ♀♀, 1 ? Mekong—Salwin Divide, 8,000–10,000 ft., lat. 28° N., July—August 1921. New to Yunnan.

80. *Proparus ruficapillus sordidior* Ripp.

6 ♂♂, 4 ♀♀, 7 ? Lichiang Valley ; 5 ♂♂, 6 ♀♀ Mekong Valley and Mekong—Salwin Divide.

81. *Proparus striaticollis yunnanensis* Rothsch.

Proparus striaticollis yunnanensis Rothschild, *Bull. B.O.C.* xliii, p. 11 (1922) (Mekong Valley).

Nearest to *P. str. manipurensis* Grant, and like that form has the lores the same colour as the crown, NOT black as in *P. str. striaticollis* and *P. str. guttaticollis*,

Differs in being larger and the flanks and rump more yellow, less tawny.

Wing 55 mm. ; in *manipurensis* 49–51 mm.

1 ♀ Mekong Valley, 5,000–6,000 ft., lat. 25° 20' N., April 1921 ; 1 ♂ Mekong—Salwin Divide, 10,000 ft., lat. 28° 5' N., September 1921. (This is recorded by Ingram as *S. striaticollis*.)

82. *Proparus vinipectus bieti* Oust.

5 ♂♂, 4 ♀♀, 6 ? ad. Lichiang Range ; 3 ♂♂, 1 ♀ ad. Mekong—Salwin Divide.

83. *Proparus swinhoei* Verr.

1 ♂ Lichiang Range.

84. *Lioptila desgodinsi* (Dav. & Oust.).

6 ♂♂, 3 ♀♀, 10 ? ad. Lichiang Range ; 1 ♀ Mekong—Salwin Divide ; 1 ♀ Tali Valley.

85. *Lioptila pulchella coeruleotincta* Rothsch.

2 ♂♂ Tali Valley.

86. *Stachyridopsis ruficeps bhamoensis* Har.

1 ? Lichiang Range ; 2 ♂♂, 3 ♀♀, 2 ? Mekong—Salwin Divide.

87. *Minla ignotincta* Hodg's.

3 ♂♂, 1 ♀ ad. Salwin Valley.

87A. *Siva strigula yunnanensis* Rothsch.

12 ♂♂, 9 ♀♀, 10 ? Lichiang Range ; 1 ♂, 1 ♀ N.W. flank of Lichiang Range. (All this fine series collected in November and December have very yellow backs, as they are in fresh plumage, and the postocular band is yellow.)

88. *Pteruthius xanthochloris pallidus* (David).

1 ♀ Mekong Valley ; 2 ♂♂, 3 ♀♀ Mekong—Salwin Divide.

89. *Suya crinigera yunnanensis* Har.

4 ♂ ad. Yangpi Valley, April 1921; 2 ♀♀ juv. Mekong Valley, September 1921. (This series, though most useful, does not yet clear up the seasonal changes.)

89A. *Suya parvirostris* La Touche.

Suya crinigera parvirostris La Touche, *Bull. B.O.C.* xlii. p. 53 (1921) (Shuitang S.E. Yunnan).

1 ♀ Mekong Valley, lat. 27° 30' N., September 1921, 7,000 ft., scrub grass.

The two striped birds sent by Forrest in the first collection belong to this species also.*

90. *Suya superciliaris* Anderson.

3 ♂♂ Tali Valley.

91. *Yuhina gularis griseotincta* Rothsch.

12 ♂♂, 10 ♀♀, 5 ? ad. Lichiang Range; 1 ♂ Salwin Valley. (The whole of the Lichiang series are much greyer on the head and have much less vinous tint below than the five former examples, only the single Salwin ♂ agrees with the type. However, the Lichiang series date from November—December, whereas the Salwin examples date from April—May, so I dare not separate them.)

92. *Yuhina diademata ampelina* Ripp.

1 ♂, 11 ? ad. Lichiang Range; 1 ♂ Salwin Valley; 1 ♂, 2 ♀♀ Mekong—Salwin Divide.

93. *Yuhina nigrimentum intermedia* Rothsch.

Yuhina nigrimentum intermedia Rothschild, *Bull. B.O.C.* xliii. p. 11 (1922) (Mekong Valley).

Intermediate between *Y. n. nigrimentum* and *Y. n. pallida*, differing from the former by the greyer back and from the latter by the intermediate shade of buff on the abdomen and flanks. (Recorded by Ingram as *Y. n. nigrimentum* fide Oustalet.)

1 ♂ ad. Mekong Valley, 9,000 ft., lat. 28° N., August 1921; 2 ♂♂, 2 ♀♀ ad., 1 ? Mekong—Salwin Divide, 9,000–10,000 ft., lat. 28° N., September 1921.

“Bill brown-black above, brownish-orange-red below; feet pale brown; iris brown.”

94. *Yuhina occipitalis obscurior* Rothsch.

6 ♂♂, 5 ♀♀, 11 ? ad. Lichiang Range; 2 ♂♂, 1 ♀ Mekong—Salwin Divide.

95. *Myzornis pyrrhoura* Hodgs.

Myzornis pyrrhoura Hodgson, *J. As. Soc. Bengal*, xii. p. 984 (1843) (Nepal).

This is the second record of this beautiful little bird for Yunnan, and the farthest south-east it has been found.

2 ♂♂, 2 ♀♀ ad. Mekong—Salwin Divide, 11,000–12,000 ft., July 1921, lat. 28° 5' N., cliffs and alpine meadows.

“Bill black; legs and feet olive-yellow; iris brown.”

* This bird will probably prove to be *Prinia catharia* Reichen.

96. *Alcippe nipalensis yunnanensis* Har.

1 ♂ ad. Salwin Valley.

97. *Prinia inornata exar* Thay. & Bangs.

1 ♀ ad. Teng Chuan Valley.

98. *Pyctorhis sinensis* (Gm.).*Parus sinensis* Gmelin, *Syst. Nat.* i. p. 1012 (1788) (China).

This is the first time it has been sent by Forrest, but we have at Tring a series from Mengtz.

1 ♂ Salwin Valley, 3,000 ft., lat. 25° 20' N., April 1921.

99. *Lusciniola thoracica* (Blyth).

1 ♂ Lichiang Range; 1 ♂ Yangtze Valley; 1 ♂ juv. Mekong—Salwin Divide.

100. *Horeites flavolivaceus intricatus* Hart.

1 ♀ juv. Mekong—Salwin Divide.

101. *Horeites brunneifrons* (Hodgs.).

1 ♀ ad. Teng Chuan Valley; ? 1 ♂ juv. Mekong—Salwin Divide.

102. *Phylloscopus affinis* (Tick.).*Motacilla offinis* (error for *affinis*) Tickell, *Journ. As. Soc. Bengal*, ii. p. 576 (1833) (Jungles of Borabhúm and Dolbhúm).

1 ♀ ? Mekong—Salwin Divide, 9,000 ft., lat. 28° N.; 1 ♀ Mekong Valley, 7,000–8,000 ft.; 1 ♀ Lichiang Range, 10,000 ft., lat. 27° 40' N.

103. *Phylloscopus fuscatus* (Blyth).

1 ♂, 1 ♀ Mekong Valley and Mekong—Salwin Divide.

104. *Phylloscopus lugubris* Blyth.*Phylloscopus lugubris* Blyth, *Ann. Mag. Nat. Hist.* xii. p. 98 (1843) (Calcutta).

1 ♀ Mekong Valley, 7,000–8,000 ft., lat. 27° 30' N., September 1921.

* 105. *Phylloscopus magnirostris* Blyth.*Phylloscopus magnirostris* Blyth, *Journ. As. Soc. Bengal*, p. 966 (1843) (Calcutta).

2 ♀♀ Mekong Valley, 9,000–10,000 ft., lat. 28° and 27° 30' N., July—August 1921. New to Yunnan.

106. *Phylloscopus maculipennis debilis* (Thay. & Bangs).

1 ♂ Mekong Valley; 1 ♀ Mekong—Salwin Divide.

107. *Phylloscopus proregulus forresti* Rothsch.

2 ♂♂ ad. Salwin Valley.

108. *Phylloscopus pulcher* Blyth.*Phylloscopus pulcher* Blyth, *Journ. As. Soc. Bengal*, xiv. p. 592 (1845) (Nepal).

1 ♀ Lichiang Range, 9,000–12,000 ft., November 1921.

109. *Phylloscopus humei praemium* Math. & Tredale.*Phylloscopus humei praemium* Mathews and Tredale, *Austral. Av. Rec.* iii. 2, p. 45 (1915) (nom nov.).
Motacilla superciliosa Gmelin, *Syst. Nat.* i. p. 975 (1788) (Russia).The name *M. superciliosa* Gm. is preoccupied by *M. superciliosa* Bodd.

1 ♀ Lichiang Range, 10,000–12,000 ft., November 1921.

110. *Cryptolopha burkii tephrocephala* (Anders.).

1 ♂ ad. Mekong Valley ; 1 ♂ ad. Mekong—Salwin Divide.

111. *Cryptolopha ripponi* (Sharpe).*Abrornis ripponi* Sharpe, *Bull. B.O.C.* xiii. p. 11 (1902) (Gyi-dzin-shán).

2 ♂♂ Mekong—Salwin Divide, 7,000–9,000 ft., lat. 27° 40' N., August 1921.

112. *Culicicapa ceylonensis* (Swains.).

1 ♂, 2 ♀♀ Salwin Valley ; 1 ♂, 4 ♀♀, 1 ? Mekong—Salwin Divide ; 4 ♀♀ Mekong Valley.

113. *Chelidorynx hypoxantha* (Blyth).

2 ♂♂ ad. Salwin Valley ; 2 ♂♂, 1 ? ad., 1 ♂, 1 ♀ juv. Mekong—Salwin Divide.

114. *Muscicapa melanops melanops* Vig.

2 ♂♂ ad. Chutong Valley.

115. *Muscicapa leucomelanura cerviniventris* (Sharpe).

1 ♂, 1 ♀ ad., 1 ♀ juv. Mekong—Salwin Divide ; 1 ♂ ad. Salwin Valley.

116. *Muscicapa parva albicilla* (Pall.).

2 ♂♂ Salwin Valley.

117. *Muscicapa strophciata* (Hodgs.).

1 ♂ ad. Mekong Valley ; 1 ♂ juv., 2 ♀♀ ad. Mekong—Salwin Divide.

118. *Muscicapa blythi* Rothsch.

1 ♂ ad. Salwin Valley.

* 119. *Muscicapa vivida oatesi* (Salvad.).

Niltana oatesi Salvadori, *Ann. Mus. Civ. Gen.* (2). v. p. 514 (1887-1888) (Mooleyit, Burma).

This species is new to the avifauna of Yunnan. The plumages of the young ♂, ♀ adult, ♀ fere adult have not been described. ♂ juv. Above each feather with large diamond-shaped rufous buff patch, tail blue, remiges black. Below rufous buff, feathers edged with black. ♀ ad. Head and nape ash-grey; rest of upperside grey, suffused with olive, rectrices rufous brown; remiges black-brown edged with olive; chin buff, throat olive-grey mixed with buff, with a whitish patch at juncture with breast; rest of undersurface ash grey, whiter towards crissum, washed with olive more strongly on breast; crissum and under-tail-coverts buff patched with olive, thighs brown. The younger ♀ is darker above and has the whole underside uniform greyish-olive with a few pale buff dots on chin.

1 ♂ ad., 1 ♂ juv., 1 ♀ fere ad. Mekong—Salwin Divide, lat. 28° 10' N., 9,000 ft., August 1921; 1 ♀ ad. Mekong Valley, 6,000-7,000 ft., June 1921, lat. 28° N.; 2 ♂♂ ad. Mekong—Yangtze Divide, 10,000-11,000 ft., lat. 27° 12', June 1921.

“Bill and feet black; iris black-brown.”

* 121. *Muscicapa cinereiceps* (Sharpe).

Muscicapa cinereiceps Sharpe, *Ibis*, p. 441 (1887).

Hemichelidon ferruginea Hodgson, *Proc. Zool. Soc. Lond.* p. 32 (1845) (Nepal).

This is the first record for Yunnan.

1 ♂ ad. Salwin Valley, 3,000 ft., lat. 25° 20' N., April 1921; 2 ♂♂ juv. Mekong Valley, 6,000-9,000 ft., lat. 28° 20' N., August—September 1921; 1 ♂ ad. Mekong—Salwin Divide, 7,000-8,000 ft., lat. 28° N., August 1921.

“Bill dark brown, base lower mandible paler; legs light brown; iris dark brown.”

122. *Muscicapa sapphira* (Blyth).

Muscicapula sapphira Blyth, *Journ. As. Soc. Bengal*, xii. p. 939 (1843) (Sikkim).

Anderson records one specimen of this beautiful species from Yunnan.

2 ♂♂ Salwin Valley, 3,000-4,000 ft., lat. 25° 20' N., April 1921, thickets by streams.

123. *Rhipidura albicollis albicollis* (Vieill.).

2 ♂♂, 3 ♀♀ ad., 1 ♀ juv. Mekong—Salwin Divide; 1 ♂ juv. Mekong Valley.

124. *Pericrocotus roseus* (Vieill.).

1 ♂ ad., 1 ♂ juv., 1 ♀ ad. Salwin Valley.

124. *Campephaga melanoptera* (Rüpp.).

1 ♂ Salwin Valley.

125. *Microscelis leucocephalus* (Gm.).

1 ♂, 2 ♀♀ ad. Mekong Valley; 2 ♂♂, 2 ♀♀ ad., 1 ♀ juv. Yangtze Valley.

126. *Microscelis concolor* (Blyth).

1 ♀ Salwin Valley; 1 ♀ Mekong—Salwin Divide.

127. *Microscelis perniger sinensis* (La Touche).

Haringtonia perniger sinensis La Touche, *Bull. B.O.C.* xlii. p. 53 (1921) (Hakow).

♂♀ Differs from *M. p. perniger* in its larger size, longer and more slender bill, and more distinct glossy edges to the head-feathers.

Wing ♂ 126–129 mm.; ♀ 116–123 mm. *p. continentalis*.

„ ♂ 118–121 mm.; ♀ 111–115 mm. *p. perniger*.

1 ♂, 1 ♀ Yangtze Valley, 5,000–7,000 ft., 27° N., June 1921; 3 ♂♂, 2 ♀♀ (sexed ♂♂) Mekong—Salwin Divide, 6,000–8,000 ft., lat. 28° N., August 1921; 2 ♂♂ Mekong—Yangtze Divide, 6,000–8,000 ft., June 1921, lat. 27° N., mixed forest.

“Bill orange, scarlet, light crimson; feet crimson; iris dark brown.”

128. *Spizixos camifrons* Blyth.

2 ♀♀ ad. 1 ♂ juv. Yangtze Valley; 1 ♂ juv. Salwin Valley; 1 ♂ ad. Lichiang Range.

129. *Iole maclellandi similis* Rothsch.

2 ♂♂, 1 ♀ Salwin Valley.

130. *Pycnonotus xanthorhous* And.

1 ♂, 1 ♀ Tali Valley.

* 131. *Molpastes nigripileus* (Blyth).

Pycnonotus nigripileus Blyth, *Journ. As. Soc. Bengal*, xvi. p. 472 (1847–1848) (Tenasserim Provinces).

This species is new for Yunnan.

1 ♂ Tali Valley, lat. 25° 40' N., 6,500 ft., May 1921.

132. *Lanius schach tephronotus* (Vig.).

1 ♀ Mekong—Salwin Divide.

133. *Conostoma aemodium* Hodgson.

Conostoma aemodium Hodgson, *Journ. As. Soc. Bengal*, x. p. 857. pl. (1841) (Nepal).

The single ♂ sent by Forrest differs from Sikkim examples by being much greyer, less brownish in the same way as my *Paradoxorius unicolor obscurior* differs from *obscurior obscurior*, but it would be too risky to separate the Yunnan race on a single specimen.

1 ♂ Lichiang Range, 11,000–13,000 ft., December 13, 1921.

134. *Paradoxornis unicolor saturator* Rothsch.

1 ♂, 2 ♀♀, 1 ? ad. Lichiang Range.

135. *Paradoxornis webbiana brunnea* (And.).

1 ♂, 2 ♀♀ Tali Valley.

* 136. *Paradoxornis webbiana ricketti* Rothsch.*Paradoxornis webbiana ricketti* Rothschild, *Bull. B.O.C.* xliii. p. 11 (1922).

♂ ad. Nearest to *w. styani*, but head and nape much darker chestnut and the rest of the uppersurface much greyer, *not* so strongly washed with yellowish-brown. Below throat and chest white, not suffused with vinaceous feathers with longitudinal chestnut stripes reaching on to two-thirds of the breast, not stopping short at lower neck and much sharper defined; abdomen much paler than in *styani*.

♂ ♀ Yangtze Valley, 6,000–7,000 ft., lat. 27° 10' N., October 1921. (Type ♀, No. 466, Forrest.) New to Yunnan.

137. *Paradoxornis fulvifrons cyanophrys* (Dav.).

1 ♂ Mekong—Salwin Divide; 1 ♀ Lichiang Range.

138. *Regulus regulus yunnanensis* Ripp.

7 ♂♂, 1 ♀ Lichiang Range.

139. *Aegithaliscus bonvaloti* (Oust.).

9 ♂♂, 13 ? ad. Lichiang Range; 1 ♀, 1 ? N.W. flank of Lichiang Range; 1 ♂, 1 ♀ ad., 1 ♀ juv. Mekong—Salwin Divide; 1 ♂ Mekong Valley.

140. *Aegithaliscus concinnus talifuensis* Ripp.*Aegithaliscus talifuensis* Rippon, *Bull. B.O.C.* xiv. p. 18 (1903) (Gyi-dzin-Shán).

Stuart Baker has shown that *erythrocephalus* Vig. is not *erythrocephalus* Linn., and so the oldest name for the species becomes *concinnus*, and *erythrocephalus* Vig. must be known as *concinnus iredalei* Baker. The new material sent by Forrest, contrary to what I stated in my former article, seems to confirm the status of *talifuensis* as opposed to *c. concinnus*.

1 ♂, 1 ♀ Tali Range, 8,000–9,000 ft., lat 25° 40' N., May 1921; 1 ♀ Mekong Valley; 2 ♂♂, 1 ♀ Mekong—Salwin Divide.

141. *Parus dichrous wellsi* Baker.

2 ♂♂, 2 ♀♀ ad., 1 ♂ juv. Mekong—Salwin Divide; 1 ♂, 1 ? ad. Yangtze—Mekong Divide; 1 ♂, 2 ♀♀, 3 ? Lichiang Range.

142. *Parus rufonuchalis beavani* (Jerd.).

1 ♂ ad., 1 ♀ juv. Mekong—Salwin Divide; 1 ♂, 1 ♀, 1 ? Lichiang Range; 1 ♂ Mekong Valley.

- 143. *Parus ater aemodius* Hodgs.

Parus aemodius Hodgson, *Journ. As. Soc. Bengal*, 13. ii. p. 943 (1844) (Nepal).

In my former article I recorded a very worn pair of a *Parus ater* form as *Parus aler* subspecies?, and suggested that it might prove to be distinct from *aemodius*. Forrest unfortunately only sent a single ♂ this time, but it is in beautifully fresh plumage and proves to be indistinguishable from *a. aemodius*.

1 ♂ Lichiang Range, 10,000–12,000 ft., December 1921.

144. *Parus major longipennis* Rothschild.

Parus major longipennis Rothschild, *Bull. B.O.C.* xliii. p. 11 (1922) (Lichiang Range).

Differs from *P. major commixtus* Swinh. in being larger.

Wing ♂ 70 mm. (Bangs gives one 74 mm.), ♀ 67 mm. *longipennis*.

Wing ♂ 66 mm., ♀ 62 mm. *commixtus*.

3 ♂♂, 1 ♀, 7 ? Lichiang Range.

145. *Parus monticolus monticolus* Vig.

1 ♂ Lichiang Range (named *m. insperatus* in error in former list).

146. *Parus hypermelaena dejeani* Oust.

1 ♂, 2 ? Lichiang Range.

* 147. *Parus modestus saturator* (Rippon).

Sylviparus saturator Rippon, *Bull. B.O.C.* xvi. p. 87 (1906) (Mount Victoria, Chin Hills).

The specimen sent by Forrest is certainly this form, but I consider it not very distinct.

1 ♀ Mekang—Salwin Divide, 7,000–12,000 ft., lat. 28° N., September 1921. New to the Yunnan list.

148. *Sitta europaea montium* La Touche.

2 ♂♂, 1 ♀, 6 ? Lichiang Range ; 1 ♀ Mekong Valley ; 1 ♀ Mekong—Salwin Divide.

149. *Sitta yunnanensis* O.-Grant.

1 ♂ Tali Range ; 1 ♀ Mekong—Salwin Divide ; 3 ? Lichiang Range.

150. *Certhia himalayana yunnanensis* Sharpe.

1 ♂ Lichiang Range.

151. *Certhia familiaris khamensis* Bianchi.

1 ? Lichiang Range ; 1 ♂, 1 ♀ ad., 1 ♀ juv. Mekong—Salwin Divide.

152. *Zosterops palpebrosa simplex* Swinh.

2 ♂♂, 2 ♀♀ Salwin Valley ; 1 ♂, 3 ♀♀, 1 ? Mekong Valley ; 4 ♂♂, 1 ♀ ad., 2 ? juv. Mekong—Salwin Divide.

153. *Dicaeum ignipectus ignipectus* (Blyth).

1 ♂, 2 ♀♀ ad., 1 ? juv. Mekong—Salwin Divide.

154. *Dicaeum minullum olivaceum* Wald.

1 ? Mekong—Salwin Divide.

155. *Pachyglossa melanozantha* Blyth.

1 ? Mekong—Salwin Divide ; 2 ♂♂ ad. Yangtze—Mekong Divide.

156. *Aethopyga ignicauda* Hodgs.

2 ♂♂, 1 ♀ Mekong—Salwin Divide.

157. *Aethopyga dabryii* (Verr.).

4 ♂♂ Salwin Valley ; 4 ♂♂, 1 ♀ Mekong—Salwin Divide.

158. *Arachnothera magna magna* (Hodgs.).*Cinnyris magna* Hodgson, *Ind. Rev.* p. 272 (1837) (Nepal).

Messrs. Phillips and Bangs record four specimens from the plains (Loukouchai), but so far no record appears to exist for the mountainous regions of Yunnan.

1 ♂ Salwin Valley, 6,000 ft., lat. 25° 20' N., April 1921.

159. *Anthus berezowskii yunnanensis* Uch. & Kur.

1 ♂ Salwin Valley.

160. *Anthus roseatus* Blyth.

1 ♂ Mekong Valley ; 1 ♀ Salwin Valley.

161. *Anthus spinoletta blakistoni* Swinh.*Anthus blakistoni* Swinhoe, *Proc. Zool. Soc. Lond.* p. 90 (1863) (Banks of Yangtze River).

1 ♀ Lichiang Range, 12,000 ft., December 8, 1921.

162. *Oreocorys sylvanus* (Hodgs.).*Heterura sylvana* Hodgson, *Journ. As. Soc. Bengal*, xiv. p. 556 (1845) (Nepal).

1 ♂ Mekong Valley, 7,000 ft., lat. 28° N., June 1921.

163. *Alauda arvensis japonica* Temm. & Schleg.*Alauda japonica* Temminck & Sehlegel, in Siebold, *Fauna Japon.*, Aves. p. 87. pl. lvii. (1848) (Japan).

In my former article I quoted this species as *Alauda gulgula coelivox* Swinh. Since then Dr. Hartert has worked out a series of larks collected by Dr. Weigold in various parts of China. After comparing this very considerable material with the collections of Mr. La Touche and the Tring and British Museums, he has come to the conclusion that it is impossible to maintain *Alauda gulgula* as a separate species from *Alauda arvensis*, and that the five or six subspecies hitherto ascribed by himself and others to *Alauda gulgula* must be added to the eight or

ten forms now grouped as subspecies under *Alda arvensis*. Whether further material will reduce or increase the fifteen or sixteen recognised forms cannot be judged now, but one thing appears certain, that the present form is *arvensis japonica*, and from the dates of the examples of Forrest's two collections, viz. March, June, October, and December, we may conclude that it is a non-migratory resident.

1 ♂, 1 ♀ Lichiang Valley, 8,000–9,000 ft., December 1921; 1 ♂ Upper Lichiang Valley, 9,000–10,000 ft., lat. 27° 10' N., October 28, 1921.

164. *Melophus melanicterus* (Gm.).

1 ♂ juv., 1 ♀ Salwin Valley; 1 ♂ ad. Tengyueh Valley.

165. *Emberiza pusilla* Pall.

1 ♂ Tali Valley; 1 ♂, 1 ♀ Tengyueh Valley.

166. *Emberiza cia yunnanensis* Sharpe.

3 ♂♂, 1 ? Lichiang Range; 1 ♀ juv. Mekong—Salwin Divide; 1 ♂ Mekong Valley.

167. *Emberiza spodocephala melanops* Blyth.

1 ♂ Tali Range; 3 ♂♂ Lichiang Range.

168. *Passer rutilans intensor* Rothsch.

Passer rutilans intensor Rothschild, *Bull. B.O.C.* xliii. p. 11 (1922) (Mekong Valley).

♂ ♀ Differs from *rutilans cinnamomeus* in its smaller size, and from *rutilans debilis* Hart. in the much darker upperside. Unfortunately I identified this bird in my former article (*Nov. Zool.* xxviii. p. 61) as *assimilis* Wald., which is identical with *rutilans rutilans* and due to wrong data of type specimen. Ingram quoted this as *cinnamomeus*.

1 ♂ Mekong Valley; 1 ♀ Mekong—Salwin Divide.

* 169. *Montifringilla nemoricola nemoricola* (Hodgs.).

Fringalanda nemoricola Hodgson, *Asiat. Res.* xix. p. 158 (1836) (Central and Northern Nepal).

All the birds sent by Forrest have the wing from 2–5 mm. longer than Sikkim birds, but I have not enough material to safely separate them.

6 sexed ♀ ? ! Lichiang Range, 9,000–11,000 ft., November—December 1921. This is new to the Yunnan list.

* 170. *Fringilla montifringilla* Linn.

Fringilla montifringilla Linnaeus, *Syst. Nat.* ed. x. p. 179 (1758) (Europe).

This is an addition to the Yunnan avifauna.

8 ♂♂ ad., 4 ♀♀, 2 ♂ juv. Lichiang Range, 9,000–11,000 ft., November—December 1921.

171. *Loxia curvirostra himalayensis* Blyth.

Loxia himalayensis Blyth, *Journ. As. Soc. Bengal*, xiii. p. 952 (1844) (Nepal).

1 ♂, 1 ♀ ad., 1 ♀ juv. Lichiang Range, 11,000–13,000 ft., August–December 1921.

172. *Propyrrhula subhimachala intensior* Rothschild.

Propyrrhula subhimachala intensior Rothschild, *Bull. B.O.C.* xliii. p. 12 (1922) (Lichiang Range).

Forrest sent this time 1 adult ♂, 3 younger ♂♂, 2 ♀♀, which enables me to describe this as a new race. In my former article I already hinted at this.

♂ ad. Above more intensely and completely saturated with dark crimson. Below more intensely crimson, especially on the chin and throat, and this colour extends farther over the chest; abdomen deeper and purer grey.

♀ Above less suffused with olive-green; below the yellow is deeper.

1 ♂ ad., 3 ♂♂ jun. and juv. Lichiang Range, 12,000–13,000 ft., November 1921; 2 ♀♀ Mekong—Salwin Divide, lat. 28° 20' N., September 1921. Type from Lichiang Range in Tring Museum.

173. *Procarduelis rubescens saturator* Rothschild.

Procarduelis rubescens saturator Rothschild, *Bull. B.O.C.* xliii. p. 12 (1922) (Lichiang Range).

In my former article I did not venture to separate the Yunnan race on the evidence only of the single ♂ sent by Forrest, but he has now sent a young ♂ and ♀ which confirm the deeper coloration.

♂♀ Differ from *P. r. rubescens* in the much darker and deeper coloration all over.

♂ Shweli—Salwin Divide, 1918; 1 ♂ juv., 1 ♀ ad. Lichiang Range, 11,000–12,000 ft., November–December 1921. Type ♂ ad. Shweli—Salwin Divide, May 1918, in Tring Museum.

174. *Procarduelis nipalensis* (Hodg.).

2 ♂♂, 2 ♀♀ ad. Mekong—Salwin Divide.

175. *Carpodacus vinaceus* Verr.

1 ♀ (marked ♂) Mekong—Salwin Divide.

176. *Carpodacus ripponi* (Sharpe).

3 ♂♂, 2 ♀♀ ad., 1 ♀ juv. Lichiang Range.

177. *Carpodacus pulcherrimus pulcherrimus* (Moore).

Propasser pulcherrimus Moore, *Proc. Zool. Soc. Lond.* p. 85 (1855) (Nepal).

4 ♂♂, 7 ♀♀, 1 ? Lichiang Range, 9,000–12,000 ft., November–December 1921, alpine meadows.

“Bill grey-brown; feet and iris brown.”

178. *Carpodacus thura femininus* Ripp.

6 ♂♂, 14 ♀♀ ad., 5 ♂♂ juv. Lichiang Range.

* 179. *Carpodacus trifasciatus* Verr.*Carpodacus trifasciatus* Verreaux, *Nouv. Arch. Mus.* vi. *Bull.* p. 39 (1870) (Mountains of Chinese Thibet).

This is quite new to the Yunnan avifauna.

2 ♂♂, 1 ♀ (marked ?) ad., 2 ♂♂ juv. Lichiang Range, 11,000–13,000 ft., December 1921.

* 180. *Carpodacus rubicilla rubicilloides* Przew.*Carpodacus rubicilloides* Przevalsky, *Mongoli Strana Tangut*, ii. p. 90. pl. xii. (1876) (Kansu).

This is also new for Yunnan.

2 ♀♀ (1 marked ♂ ?) Lichiang Range, 11,000–13,000 ft., November 1921.

181. *Carpodacus erythrinus roseatus* (Hodgs.).

1 ♂ juv. Lichiang Range.

182 and 183. *Carpodacus edwardsi edwardsi* Verr.*Carpodacus edwardsi* Verreaux, *Nouv. Arch. Mus.* vi. *Bull.* p. 39 (1870) (Mountains of Chinese Thibet).

Both the birds sent by Forrest are somewhat abnormal; the ♂ in ♀ plumage is very large, having a wing 5 mm. longer than all but 1 ♂ measured, both Chinese and Himalayan birds. The almost full-plumaged ♂ is excessively dark and almost warranted the resuscitation of *saturatus* Blanf. as a distinct subspecies, but unfortunately the two only specimens equalling this bird in depth of colour come one from Nepal and one from Ta-Tsien-Lu, thus proving the difference to be individual and not racial.

1 ♂ (in ♀ plumage) Lichiang Range, 11,000–13,000 ft., November 1921; 1 ♂ Mekong—Salwin Divide, 13,000 ft., September 1921.

This species is new to the Yunnan avifauna.

184. *Pyrrhula erythaca altera* Ripp.

3 ♂♂, 3 ♀♀ Lichiang Range; 1 ♂, 1 ♀ Mekong—Salwin Divide.

* 185. *Uragus sibiricus lepidus* Dav. & Oust.*Uragus lepidus* David and Oustalet, *Ois. Chine*, p. 359. pl. xeviii. (1877) (Tsinling, Shensi).

This is quite new for Yunnan.

1 ♀ Mekong Valley, 7,000–8,000 ft., lat. 28° 20' N., September 26, 1921.

186. *Carduelis ambiguus* (Oust.).

1 ♂ Lichiang Range.

187. *Perissospiza icteroides affinis* (Blyth).

10 ♂♂, 3 ♀♀ Lichiang Range.

(This fine series of adult ♂♂ appears to be darker yellow than typical *affinis*, but my single Sikkim ♂ is insufficient for comparison.)

188. *Mycerobas carnipes* (Hodgs.).

Coccothraustes carnipes Hodgson, *As. Res.* xix. p. 151 (1836) (Nepal).

Ingram records this species on Colonel Rippon's authority.

4 ♂♂, 2 ♀♀ juv. Mekong—Salwin Divide, 12,000 ft., lat. 28° 20' N., September 1921; 1 ♀ ad. east flank Lichiang Range, 12,000–13,000 ft., lat. 27° 40' N., November 1921.

(“ Bill blackish-grey; legs dull greyish-brown; iris pale greyish-yellow.”)

189. *Dicrurus leucophaeus nigrescens* Oates.

Dicrurus nigrescens Oates, *Birds Ind.* i. p. 315. No. 329 (1889) (Rangoon, Tenasserim, etc.).

1 ♂ Lichiang Valley, 8,000–9,000 ft., December 1921; 1 ♂ Tali Valley 6,500 ft., lat. 25° 40' N., May 1921.

(“ Bill and feet black; iris crimson.”)

190. *Spodiopsar nemoricola* Jerd.

1 ♀ Tali Valley, May 1921.

190. *Gracupica nigricollis* (Payk.).

2 Tengyueh Valley.

191. *Pyrrhocorax pyrrhocorax* (Linn.).

2 ♀♀ Lichiang Range.

192. *Garrulus bispecularis sinensis* Swinh.

1 ♀, 1 ? Lichiang Range; 1 ♂ Mekong—Yangtze Divide; 1 ♀ Mekong Valley.

193. *Nucifraga caryocatactes yunnanensis* Ingr.

2 ♂♂, 1 ♀, 2 ? Lichiang Range; 2 ♂♂, 4 ♀♀, 1 ♂ juv. Mekong—Salwin Divide.

Bangs declares *c. yunnanensis* to be the same as *c. macella* Thay. & Bangs, but until I can compare a series from Hupch with Yunnan birds I shall keep them distinct.

194. *Urocissa erythrorhyncha erythrorhyncha* (Gm.).

1 ♀, 1 ? Lichiang Range; 2 ♂♂ ad. Mekong Valley; 1 ♂ juv. Mekong—Salwin Divide.

195. *Coloeus dauricus* (Pall.).

Corvus dauricus Pallas, *Reise Russ. R.* iii. append. p. 694 (1776) (Baikal Region).

2 ♂♂, 1 ? Lichiang Range, 8,000–11,000 ft., December 1921; 1 ♂, 1 ♀ east flank of Lichiang Range, 8,000–9,000 ft., lat. 27° 30' N., November 1921.

The collection consists of 1,029 specimens of 198 species and subspecies and 2 unidentifiable young birds. There are of these 60 not contained in Forrest's former collection, of which 25 are new to the avifauna of Yunnan. This brings the total number of species and subspecies, not including Mr. La Touche's recent descriptions, up to 526 recorded for Yunnan. Those marked with a * are new to the Yunnanese list. The types of the new forms discovered by Mr. Forrest are nearly all in the British Museum, the rest at Tring.

RECORDS AND DESCRIPTIONS OF ORTHOPTERA FROM NORTH-WEST AFRICA.

By B. P. UVAROV.

(Plate I.)

THE present paper is based mainly on a collection of Orthoptera made by Lord Rothschild and Dr. E. Hartert on their several expeditions to different parts of Sahara, but I thought it convenient to include also a few records from some other sources, particularly from a collection of Dr. Auguste Cros, Mascara, Algeria, and from the British Museum collection. A considerable part of the first-mentioned collection has been already worked out by I. Bolivar and the results have been published in this magazine,¹ but I cannot agree with all his identifications after a study of the specimens named by him, because of the reasons stated under corresponding species; the species recorded by Bolivar under the names, in my opinion, correct, are not mentioned by me. As regards the part of the collection which came to me unnamed, I do not think it necessary to record some more common, widely distributed, and well-known species, but I include all those which are of interest on account of synonymy or distribution, besides those which are new to science or insufficiently known. As may be seen from the paper, there exists a good deal of confusion in systematics and synonymy even of some very common species, and the collections studied presented good opportunities for revising some cases of that kind. Several very interesting novelties described in the paper give us a new proof that the fauna of Orthoptera of N.W. Africa is still very inadequately known.

My most sincere thanks are due to Lord Rothschild and Dr. Hartert for giving me the opportunity to study their interesting collection, and to Dr. A. Cros for the collection from Mascara.

The types of new species described in the paper are in the British Museum.

The report on the collection would not be half as complete without illustrations, and I am most grateful to Lord Rothschild who provided for the same.

FAM. **MANTIDAE.**1. *Iris oratoria* (L.).

(Text-fig. 1 B.)

Batna, Algeria, 27.viii.1910 (British Museum); Azazga, Kabylie, 17.ix.1920 (Rothschild and Hartert).

The typical locality for this species is Algiers, because Linné described it from the specimens received by him from Brander, Swedish Consul at Algiers from 1753 to 1765 (see Catal. of the Linnean Specimens, etc., by B. D. Jackson, Suppl. to the *Proc. Lin. Soc. of London for 125th Session*, 1912-13, p. 10); this fact should be kept in mind in case it would be found necessary to separate

¹ NOVITATES ZOOLOGICAE, xx, 1913, pp. 603-15.

the western Mediterranean form from the eastern one, which seems to be somewhat larger and more heavily marked on the wings; for that latter the subspecific name *fenestrata* Brullé may be used. I do not propose, however, this division just now, as the material at my disposal is too scanty.

I. oratoria has been recorded by previous authors from many localities in N.W. Africa, but mostly from the coastal regions, while records from Sahara are likely to apply to the next species, which has not been recognised hitherto.

2. *Iris deserti* sp. n.

(Text-fig. 1 A; Plate I, figs. 7, 8, 9, 10.)

1913. *Iris oratoria* var. *polystictica* Bolivar l.c., p. 604, no. 3 (nec Fisch. Waldheim!).

♀. Distinctly smaller than *I. oratoria* (L.). *Head* strongly transverse; its width, including the eyes, subequal to the length of the metazona of pronotum. Facial scutellum more than twice as broad as its maximal height; its margins all

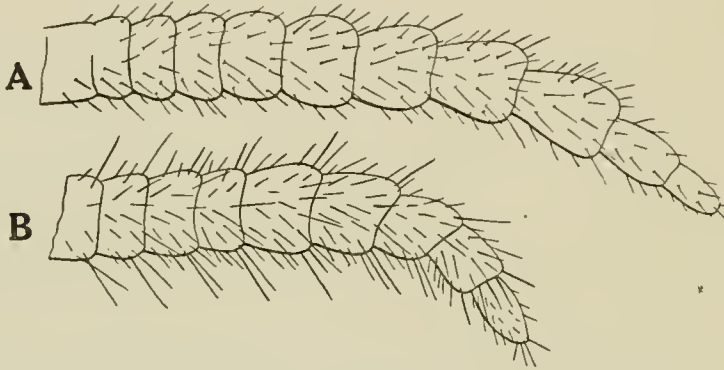


FIG. 1.—Male cerci of two species of *Iris*. A, *I. deserti*, sp. n., paratype. B, *I. oratoria* (L.), from Batna, Algeria. $\times 40$.

distinct, the upper one more raised than the lateral ones; the angles scarcely tuberculate; the surface with two submedian tubercles just above the middle, a low median carinula in the upper half and two subobliterate, closely approximate tubercles near the middle of the lower margin. Tubercles between the base of antennae and the eyes very low, almost obliterate. Ocelli distinctly elliptical; the middle one transverse; the two lateral ones longer than broad. Vertex distinctly concave, with deep sutures, which are very distinct in the occiput, as well. *Pronotum* about two and half times as long as its maximal width; prozona half of the length of metazona, distinctly narrowed anteriorly; the coxal dilatation very distinct and the metazona behind it is narrowed rather more suddenly than in *I. oratoria*; the median keel very feeble; margins not at all denticulate. *Elytra* somewhat less than half again as long as the pronotum, subcoriaceous; their apex elliptical. *Wings* distinctly shorter than the elytra, slightly longer than broad. *Supra-anal plate* elliptical, distinctly longer than broad, with a feeble median carinula. The armure and granulation of the front legs very much the same as in *I. oratoria*.

General coloration very pale ochraceous; the inner side of the first joint of

front tarsi, and the apices of spines of the front legs are brown. *Wings* pale sulphurous, not transparent; the anterior part somewhat brownish with hyaline spots; the hind part with but a small bluish-black spot surrounded externally by the concentrically disposed small spots which are not coloured, but simply hyalinous.

♂ (paratype). The head still more distinctly transverse than in the female; the facial scutellum about three times as broad as its maximal height; ocelli strongly elliptical, their longer diameter about twice of the shorter one; vertex strongly concave. Cerci long, 11-jointed, composed of elongate joints. Supra-anal plate longer than broad. Elytra of the same texture as in *I. oratoria*, extending to the apex of the abdomen. Coloration very pale ochraceous; wings faintly sulphurous; their front margin faintly brownish, with small hyalinous spots; the typical bluish-black spot quite small; the concentric spots very small and indistinct, mostly hyalinous, or very faintly brownish.

	♀ (type)	♂♂ (paratypes)
	mm.	mm.
Length of body	37	35-38
Width of the head with eyes	6	5-6
Length of prozona	3.5	3-3.5
„ „ metazona	7	6.5-7
Width of the coxal dilatation of pronotum	4	3-3.5
„ „ metazona in its middle	3	2.25-2.75
Length of elytra	14	24.5-30
„ „ wings	10.5	22.5- ?
Width „ „	8.5	12- ?
Maximal diameter of the spot on the wings	3.5	3- ?

One female type and two male paratypes are from Ain Guettara, north of In Salah, 12-14.iv.1912 (Hartert and Hilg.); one male paratype from Ain Sefra, South Oran, 1-18.v.1913 (Rothschild and Hartert).

The specimens of *Iris* from Ain Guettara (together with others from S. Oued Mya, Algerian Sahara, which I have not seen) attracted the attention of Bolivar by their very pale coloration with the typical pattern on the wings very imperfectly developed, and he referred them to the insect described by Fischer Waldheim as *Mantis polystictica*, from "Dauria," which he regards as a mere colour variety of the common *I. oratoria*. A closer examination of those specimens revealed, however, a fair number of purely morphological differences between them and the typical *I. oratoria*, which I believe to be quite sufficient for separating them specifically. In describing this species I did not accept for it the name *polystictica* F.W., as Bolivar does, because Fischer Waldheim does not mention in his description nor figures the characters which are of real specific value, and his species should remain as a doubtful synonym of *I. oratoria* until the type, or at least topotypes, may be studied; in any case, there is not much probability in the new Saharan species being the same as the Eastern Siberian one.

As regards the differences between *I. deserti* and *I. oratoria*, they are as follows: the head in the new species is much more transverse, which is especially noticeable in the shape of the facial scutellum (compare figs. 10 and 11 of the plate); the ocelli are perfectly round in *I. oratoria* and distinctly elliptical in *I. deserti*, which is especially well marked in the male; vertex in *I. oratoria* is almost flat, with indistinct sutures, while in *I. deserti* it is decidedly concave, with

the sutures deep; tubercles between the bases of antennae and the eyes are well developed in *I. oratoria* and obsolescent in *I. deserti*; margins of the pronotum in both sexes of *I. deserti* are unarmed, while they are very distinctly denticulate in the female of *I. oratoria*; supra-anal plate in both sexes of *I. deserti* is somewhat more elongated than in *I. oratoria*; male cerci in *I. oratoria* are 9-jointed, with the joints transverse (compare figs. 1 A and B). The difference in the coloration of the hind wings is obvious from the description and must not be ignored, although the development of the typical pattern may be, to a certain extent, liable to variations.*

One male of the new species from Aïn Sefra differs from the rest by somewhat larger dimensions, which are given in the last column of the table of measurements (the wings in it are not spread and therefore their measurements are not given), and by distinctly greenish general coloration; in its morphological characters, however, it shows no difference from the specimens from typical locality.

It is not impossible that some of the previous records of *I. oratoria* from Sahara really belong to *I. deserti*, which seems to replace the Mediterranean species in the desert.

3. *Sphodromantis viridis* (Forsk.).

Biskra, 30.x.1920, 1 ♂.

4. *Empusa egena* (Charp.).

Hamman R'irha, 30.v.1913 (Rothschild and Hartert).

5. *Blepharopsis mendica* (F.).

Aïn Sefra, S. Oran, 1-18.v.1913; Biskra (Rothschild and Hartert).

Krauss (*Denkschr. Akad. Wiss. Wien*, lxxi. 1902, p. 12 of sep. reprint) suggested that this species should be called *B. monstrosa* (Forsk.) but, apart from the indication of Giglio-Tos (*Bull. Soc. Ent. Ital.*, xlvi. 1916, p. 69) that the priority of Forskal's name is doubtful, both his book and that by Fabricius bearing the same date (1775), this name cannot be employed because *Gryllus monstrosus* of Drury (*Ill. Exot. Entom.*, 1773) makes *Gryllus monstrosus* of Forskal not acceptable.

FAM. TETTIGONIIDAE.

6. *Tettigonia savignyi* (Lucas).

Hamman R'irha, June 1913, 1 ♂ (Rothschild and Hartert).

7. *Uromenus innocentii lobata* (Sauss.).

Aïn Sefra, S. Oran, 1-18.v.1913, 1 ♂, 1 ♀, and some larvae (Rothschild and Hartert).

All the specimens show distinctly lobate lower margins of the pronotal lobes, which is characteristic for the Oran subspecies (see Vosseler, *Beitr. Faun. Biol. Orth. Alger. Tunes.*, p. 400).

* I am inclined to think that the variability of the wing-pattern in *I. oratoria* is rather geographical than individual.

8. *Odontura algerica* Br. Watt. (?).

Hammm R'irha, 30.v.1913, 1 ♀ (Rothschild and Hartert).

I cannot be quite sure in my identification of the single female specimen.

FAM. ACRIDIDAE.

9. *Platypterna geniculata* Bol.

1913. *Platypterna geniculata* I. Bolivar, *l.c.*, p. 608, no. 9.

N. El-Golea, Alger. Sahara, 2 ♂♂, 2 ♀♀ (paratypes).

Not less than six species of this difficult genus have been described from the Sahara, four of them in Bolivar's paper, and practically all founded on single specimens. Out of the four species of Bolivar, I was able to examine the paratypes of *P. geniculata* only, as all other types have been retained by that author and are in the Madrid Museum now. My study of *P. geniculata* makes me to observe that the key to species given by Bolivar (*l.c.*, p. 610) is very misleading, as this species is included in the division of key with the fastigium "medio haud carinatum," while in the description of the species (p. 608) it is said "caput supra subcarinatum" (as it really is); foveolae of the vertex are also described in the diagnosis as "elongatae, marginatae" while according to the key they should "subrepletae" in this species and *P. rothschildi*, and "elongatae, marginatae, laeves" in *P. tibialis* and *P. intermedia*. On the whole, it seems to me that the key is far from being satisfactory, and the more so that very little is known about the individual variability of the characters used in it.

The unnamed part of the Lord Rothschild collection contains another species of *Platypterna*, from Aïn Sefra, S. Oran, which does not quite agree with all existing descriptions, but I abstain from describing one more new species on a single specimen.

10. *Chorthippus albolineatus* (Lucas).

1849. *Oedipoda albolineata* Lucas, *Explor. Alger.*, iii. p. 38, no. 66; iv. pl. 4, fig. 6. *Stenobothrus pulvinatus* auctor., nec Fisch. Waldh. 1846.

Mascara, v-vi.1922 (A. Cros).

I cannot agree with the authors who regarded the Algerian *Chorthippus* as conspecific with the European *Ch. pulvinatus* F.W. The first to start this confusion has been Brunner v. Wattenwyl (*Prodromus Europ. Orth.*, p. 124), who obviously has not seen the Algerian species, as he does not mention Algeria amongst the localities whence he has seen *Ch. pulvinatus*, and he has sunk the species of Lucas on the strength of its figure and not very lucid description. It is quite inconceivable, on the other hand, that Finot (*Ann. Soc. Ent. Fr.*, lxiv. 1895, pp. 433-4) accepted this synonymy in spite of the differences of the Algerian species from *Ch. pulvinatus* stated by himself quite correctly and clearly in a note after the description (which latter, by the way, is evidently based not on the Algerian insect, but simply taken, with some slight alterations, from his *Faune de la France, Insectes Orthoptères*, pp. 125-6). All subsequent authors relied upon Brunner's authority and never entered into criticism of the synonymy established by him.

In fact, *Ch. albolineatus* is closely allied to *Ch. pulvinatus*, and I failed to find any substantial difference between them in the venation, but the male

subgenital plate in the Algerian insect is of the same type as in *Ch. albomarginatus*, and not horizontally produced as it is in *Ch. pulvinatus*; this character is, of course, of specific value. In its general habitus, *Ch. albolineatus* is also more like *Ch. albomarginatus* than *Ch. pulvinatus*. Dimensions of *Ch. albolineatus* are as follows :

	♂♂	♀♀
	mm.	mm.
Length of body	16-18	21-23
.. .. pronotum	3.5-4	4-4.5
.. .. elytra	12.5-14	15-16
.. .. hind femora	11-12	13.5-14

The occurrence of *Ch. pulvinatus* in Algeria and other parts of N.W. Africa should be regarded as not yet proved, as all existing records are based on the presumption that it is identical with *Ch. albolineatus* and must apply to the latter.

11. *Eremogryllus hammadæ* Krauss.

Aïn Sefra, South Oran, 1-18. v. 1913, 2 ♀♀ (Rothschild and Hartert).

One of the specimens is reddish ochraceous, with irregular reddish-brown spots and dots; another is very pale ochraceous from above, with the sides reddish ochraceous, and the lateral lobes of the pronotum with chocolate-brown spots at the upper margin which reminds somewhat of the colour-form common in some species of *Doclostaurus*, described as var. *castaneopicta* Kr. of *D. anatolicus*.

Previous records of this interesting insect are: Gafsa, Tunis; El-Mreir; Ouargla to Ghardaia; Oued Mزاب to Oued Nsa (all in Algerian Sahara).

12. *Notopleura rothschildi* sp. n.

(Plate I, figs. 3, 4.)

♂ (type). *Antennae* strongly flattened throughout, not longer than the head and pronotum together. *Head* distinctly prominent above the pronotum; face strongly reclinate; frontal ridge between the antennae strongly prominent and in profile convex, below them perfectly straight; near the ocellum feebly impressed, below it flat, widened and disappearing towards the clypeus; fastigium of the vertex deeply impressed, almost twice as long as it is broad, elongato-pentagonal, with the apex acute and lateral margins slightly convergent behind; foveolae of the vertex elongato-trapezoidal, somewhat narrowed anteriorly, not deeply impressed, punctured, with the margins obtuse. *Pronotum* as in *N. saharica* Krauss. *Elytra* extending a little beyond the hind knees; mediastinal area distinctly dilated near the base, reaching to the apical third; scapular area reaching almost to the apex of the elytron, strongly dilated in its apical third, with sparse, oblique veinlets; the first radial vein almost straight, in more than the basal half thick, then suddenly attenuate, but thickened again near the apex which is somewhat bent backwards; the second radial vein thick throughout, though distinctly irregular in the apical half, somewhat bent backwards; inter-radial area broad, regularly transversely reticulate, except in the apical part which is divided by a false vein; discoidal area distinctly broader than the scapular area in its broadest part, with irregular, sparse, transverse reticulation; the false vein between the apical halves of the hind radial and the ulnar veins

distinctly and irregularly incrassate basally; inter-ulnar area very narrow, sparsely reticulated; axillar vein free. *Wings* slightly shorter than the elytra, broad, with the principal veins incrassate. *External genitalia* as in *N. saharica*, but the cerci shorter and thicker, and the subgenital plate more obtuse apically.

General *coloration* reddish brown. Face and lower halves of the lateral lobes of pronotum ochraceous. Elytra with some brownish spots in the discoidal area and in the apical half. Wings with the principal veins brownish. Hind femora from above ochraceous with a triangular chocolate-brown spot in the middle, and somewhat marmorated with white in the apical half; the outer area whitish, hind tibiae bluish.

♀ (paratype). Antennae distinctly flattened throughout, slightly widened basally. Frontal ridge sulcate throughout, reaching the clypeus. Elytra reaching to the hind knees; scapular area less dilated than in the male; discoidal area also moderately dilated, closed apically; interulnar area almost as broad as the discoidal, with an irregular false vein. Coloration of the same type as in the male, but the lateral lobes of pronotum are blackish-brown in their upper parts.

	♂ (type).	♀ (paratype).
	mm.	mm.
Length of body	11.5	18.5
" " pronotum	2.5	3.75
" " elytra	9.5	13.5
" " hind femora	7	11

Aïn Sefra, South Oran, 1-18.v.1913, 1 ♂, 1 ♀ (Rothschild and Hartert).

This is the third species of the curious genus *Notopleura*, two others being known also from Sahara only. The new species is nearer to *N. saharica* Krauss than to *N. pygmaea* Voss., which is the smallest of the three and strongly differs from its relatives by the imperfectly developed lateral keels of the pronotum. From *N. saharica* our species differs by the venation of the male elytra, and especially by the strongly dilated scapular and discoidal fields; the venation of the female elytra is difficult to compare without studying the specimens of *N. saharica*, as Krauss does not figure the female of his species.

It is obvious that further careful collecting of small grasshoppers of this group in the Sahara should bring many more interesting discoveries.

13. *Thalpomena coeruleascens* sp. n.

(Plate I, figs. 5, 6).

♀. Somewhat smaller and distinctly more slender than *Th. algeriana* (Luc.). *Antennae* distinctly longer than the head and pronotum together; the joints of their apical half three times as long as broad. *Face* slightly reclinate, with few scattered punctures; frontal ridge distinctly constricted at the fastigium, gradually widened towards the ocellum, feebly constricted below it and slightly widened towards the clypeus, which it does not reach by about one-third of the distance between ocellum and clypeus; its surface convex and coarsely punctured near the fastigium, impressed with the margins callous and strongly raised below the ocellum and down to the lower third where the margins disappear and the surface of the ridge is scarcely more raised than that of the face; lateral facial keels regularly and not strongly arched, callous. *Fastigium of the vertex* scarcely broader than the frontal ridge at its widest, strongly impressed, oval-shaped,

open in front; its margins distinctly raised, callous; foveolae of the vertex irregular, not impressed, rugosely punctured; vertex just behind the fastigium with a transverse impression; occiput with an indistinct median carinula in its fore part; eyes comparatively larger and more projecting sideways than in *Th. algeriana*, oval-shaped, quite as high as the subocular distance. Pronotum more compressed laterally than in *Th. algeriana*; the prozona almost half of the metazona, feebly, but distinctly, convex, transversely gibbulate between the sulci, which are all well developed; metazona practically flat, indistinctly subrugulose; median keel distinctly raised between the front margin and the first sulcus, obliterate between the sulci and sharp, linear in the metazona; lateral keels undeveloped, but the surface of the metazona forming distinct rounded angles with the sides; hind angle somewhat less than 90°; lateral lobes much higher than they are long, very indistinctly rugulose, with the lower margin ascending, not sinuate. Mesopleurae and metapleurae scarcely rugulose. Pectus and legs pilose. Elytra extending well beyond the hind knees, hyalinous throughout; discoidal vein well developed, sinuate, approximated apically to the radial vein but not touching it; reticulation not very dense even in the basal half, and regular in the apical third. Wings large and broad; principal veins distinctly incrassate. Hind femora moderately widened, strongly pilose.

Coloration ochraceous-brown. Face greyish, with darker marmoration. Head with dull blackish dots on the occiput, and with postocular bands of the same colour. Pronotum marmorated indistinctly with dull blackish colour. Elytra with the basal quarter darker than the rest, and with a faint suggestion of a darker submedian fascia. Wings very faintly coerulescent, almost hyaline, with the veins dark. Hind femora with two oblique blackish fasciae externally more pronounced on the upper area than on the median one; the inner side black with a narrow pale fascia just behind the middle, and another broader one before the knee; the lower inner sulcus black except a broad pale preapical fascia. Hind tibiae pale (discoloured?), with the very base black, and with two indistinct darker fasciae.

	♀
	mm.
Length of body	21.5
„ „ pronotum	4.5
„ „ elytra	22 (? the tips broken off).
„ „ hind femora	9.5
Width „ „ „	3.5

Aïn Sefra, South Oran, 1-18.v.1913, 1 ♀ (Rothschild and Hartert).

This new species differs from the only other Algerian known in so many important characters that it may be necessary to separate it generically. In fact, some of its characters do not agree with the original diagnosis of the genus (lack of lateral keels on the pronotum, not coriaceous elytra, wings without a band, etc.), but the whole complex of genera related to *Thalpomena* (*Thalpomena*, *Fortunata*, *Wernerella*) is as yet very insufficiently studied and their interrelations being very poorly understood, it would be inadvisable to describe one more genus of uncertain relationship.

Th. coerulescens has, of course, nothing to do with *Th. algeriana* var. *coeruleipennis* Fin., as that latter form differs from the typical one only in the coloration of wings, but not in the morphological characters.

14. *Sphingonotus rubescens* (Walk.).

(Plate I, figs. 1, 2).

1870. *Oedipoda rubescens* Walker, *Zoologist*, (2) v. p. 2301, no. 38.1884. *Sphingonotus coeruleans* var. *aegyptiaca* Saussure, *Prodromus Oedipod.*, p. 200, no. 3a.1910. *Sphingonotus rubescens* Kirby, *Syn. Cat. Orth.*, iii. p. 274, no. 12 (*syn. excl.* !¹).1913. || *Sphingonotus coeruleans* Bolivar, *l.c.*, p. 612, no. 17.

Aïn-Sefra, S. Oran, 1-18. v. 13.

Saussure, who did not get an opportunity of studying sufficiently long series of specimens of what he called *Sphingonotus coeruleans*, came to the conclusion that this is a very widely distributed and highly variable species, and he has given names to some most striking "varieties" without considering the taxonomic value of their characters. All other authors followed him in calling any *Sphingonotus* with the hind wings coerulescent or hyaline as *S. coeruleans*, but H. Krauss and especially I. Vosseler in their studies of North African representatives of the genus have definitely found that there exist quite a number of species in this group, easily separated from each other by a number of sufficiently constant morphological characters; Vosseler has shown even that some colour characters, particularly the pattern of the elytra, are also very constant, if sometimes rather minute. Nevertheless, most authors still do not pay any attention to morphological characters and go in the identification of species of *Sphingonotus* exclusively by the coloration of the hind wings and particularly by the shape and grade of development of the dark band on the latter, which is, in fact, the most unreliable and individually variable character. As a result, almost all existing records of *S. coeruleans* outside of Europe require a most careful revision which will undoubtedly result in great and badly wanted improvements in the systematics of species confused under that name, as well as in a much better understanding of their distribution.

As regards *S. rubescens*, it has been always misidentified as *S. coeruleans* L., but it differs from that European species in a number of important and quite constant characters. Thus the median carina on the vertex is in *rubescens* usually much more developed, prozona of the pronotum comparatively shorter, its metazona more rounded behind, elytra and wings comparatively much longer than in *coeruleans*; still more important and absolutely reliable character may be found in the reticulation of the discoidal field: in *coeruleans* the discoidal vein is straight and almost parallel to the radial vein, the hind discoidal area being irregularly reticulated, while in *rubescens* that vein is distinctly curved, strongly approaching apically to the radial vein, leaving a broad hind discoidal area reticulated by subparallel transverse veinlets forming fairly regular transversely elongate cells; this type of reticulation is very like that in *S. savignyi* Sauss., though considerably less regular. The coloration of *rubescens* is characterised by the tendency of dark bands of the elytra to split up into small quadrangular spots which often are very irregularly scattered; wings are mostly perfectly hyalinous with the principal veins distinctly incrassate and blackish, as are also the veinlets in the marginal zone occupying almost half of the wings.

¹ I do not see any reason to include var. *candidus* Costa from Sardinia amongst the synonyms of *rubescens* as Kirby does.

The dimensions of *S. rubescens* are as follows :

	Type ♀ ¹	♂♂	♀♀
	mm.	mm.	mm.
Length of body	31	19-23	27-32
„ „ pronotum	5	3.5-4.5	5-6
„ „ elytra	32.5	21.5-28	29-33
„ „ wings	30	19.5-26	28-32
Width „ „	16.5	10-14.5	17-18.5
Length of hind femora	13	8.5-11	11.5-13

The range of distribution of *S. rubescens*, of course, cannot yet be defined in all its details ; I have seen it (in the British Museum collection) from the following localities : Wády Gehnah (type) ; Sandy Plains, Mt. Sinai ; Athens, Greece ; Amman, Transjordanía ; Enseli, N. Persia ; Abadeh, Persia ; Muscat, Arabia ; Hunza and Doyen, N. Kashmir ; Libyan Desert ; Teneriffe ; Canaries ; Gr. Piton, Salvage Islands.

There is no doubt that many of the records of *S. coeruleans* from the desert parts of N. Africa must be referred to *S. rubescens* ; thus Vosseler (*Zool. Jahrb.*, xvi, p. 372) describes his specimens of “*S. coeruleans*” from a number of localities in Algeria and Tunis so that he obviously had *rubescens* before him ; on the other hand, the specimen figured by him, which is from Sousse, Tunis, is a typical *coeruleans*. Krauss (*Verh. Zool.-Bot. Ges. Wien*, 1902, p. 242) also records undoubtedly *rubescens* under the name *coeruleans* from Biskra, Salahin, Ouargla, and Oued Nsa in Sahara. All specimens from the Tring Museum identified by Bolivar (*l.c.*) as *coeruleans* are also typical *rubescens*.

It seems, from all these records, that *S. rubescens* replaces *coeruleans* in the whole Eremian subregion, and the areas of both species partly overlap each other ; thus they occur together in Greece and in Enseli, N. Persia ; in the latter locality, however, *coeruleans* is much more common than *rubescens*. I do not know any specimens of typical *coeruleans* from the Eremian subregion, and believe that all previous records apply either to *rubescens* or to some other species with hyalinous wings. This may lead to the suggestion that *rubescens* is but a desert subspecies of *coeruleans*, and not a distinct species, but I leave this question open until more is known about the group.

15. *Sphingonotus octofasciatus* (Serv.).

1839. *Oedipoda octofasciata* Serville, *Ins. Orth.*, p. 278, no. 10.

1870 ? *Oedipoda obscurata* Walker, *Zoologist*, (2) v. p. 2300, no. 37.

1884. *Sphingonotus kittaryi* Saussure, *Prodr. Oedip.*, pp. 197, 207, no. 17.

1888. *Sphingonotus octofasciatus* Saussure, *Addit. ad Prodr. Oedip.*, pp. 76, 79, no. 1 (*synon. excl. !*)

1910. *Sphingonotus octofasciatus* Kirby *Syn. Cat. Orth.*, iii. p. 272, no. 3.

1913. *Sphingonotus octofasciatus* Bolivar, *l.c.*, p. 612, no. 18.

Oued Nsa (Ghardaia to Guerrara), 3-5.vi.1912 ; Hammam-es-Salahin, Algeria (B.M.) ; Gafsa, Tunis (B.M.).

Saussure in 1884 quite correctly separated two species of *Sphingonotus* with red wings, one with the prozona of pronotum cristate which he rightly referred to *S. zini* Kitt., and another, without a raised carina in the prozona, described

¹ Walker says in his description (*l.c.*) that the type is a male, but mistakes of this kind are unfortunately quite usual in his writings.

by him under the name of *S. kittaryi*. Four years later, however, in "Addita-
menta" he made a simply astonishing muddle in the group, while he sank *zinini*
as a synonym of *octofasciatus* Serv. (of which he then studied the type), including
the latter in his revised key in the section with the prozona cristate. In reality,
however, Serville's species has the prozona *not* cristate¹; and, therefore, it is
identical not with *zinini* Kitt., but with *kittaryi* Sauss. *Sph. suschkini* Adelung,
described in 1906 (*Mater. ad cognit. faunae et florae Ross.*, vii.), is identical with
zinini Kitt., and both names are mere synonyms of *Sph. salinus* Pall. (see below,
under *Oedipoda miniata* Pall.).

S. octofasciatus seems to be more widely distributed all over Eremian sub-
region, while *S. salinus* is known from the Kirghiz Steppes only, where the former
does not occur.

16. *Hyalorhipis calcarata* (Voss.).

1902. *Leptopternis calcarata* Vosseler, *Zoolog. Jahrb.*, xvi, p. 382, no. 50, pl. 18, figs. 9a, 9b, 10.

1913. || *Hyalorhipis canescens* Bolivar, *l.c.*, p. 611, no. 14.

N. of El-Golea, 18.v.1913.

I cannot agree with Bolivar's identification of this species, as the specimens
named by him as *H. canescens* Sauss. agree much better with the detailed
description and excellent figures by Vosseler than with the rather incomplete
diagnosis by Saussure (*Prodr. Oedip.*, p. 89; *Mitt. Schweiz. Entom. Ges.*, viii.
p. 94). The only difference of the specimens before me from Vosseler's
description is in the dimensions, which are as follows:

	According to Vosseler.		In our specimens.	
	♂ mm.	♀ mm.	♂ mm.	♀ mm.
Length of body	15	21.5	17.5-20	28 (distended !)
„ „ pronotum	2.5	4	3	5
„ „ elytra	16.2	23	18-21	28.5
„ „ hind femora	8	11	9-9.5	13

It is easy to see that the difference is in the general size only, our specimens
being somewhat larger than Vosseler's types, and not in proportion; this
difference may be either due to geographical variation (Vosseler's types were from
Bou-Sâada, i.e. much more to the north than our specimens), or simply to
individual variability, which is as yet very insufficiently known, as Vosseler had
only three specimens before him and I have seen five.

It is not impossible, of course, that *calcarata* is only a western subspecies of
canescens, originally described from Egypt and known also from Sinai, but it
cannot be stated until both species are better known.

17. *Oedaleus decorus* (Germ.).

1826. *Acrydium decorum* Germar, *Fauna Insect. Europ.*, fasc. xii. pl. 17.

|| *Oedaleus nigrofasciatus* auctorum, nec De Geer, 1773 (!).

Although this species is not represented in the collection studied, it has
been recorded from many localities in Algeria, Tunis, and Morocco, and I included
it in the paper in order to establish its correct name. In fact, De Geer, in his

¹ According to Mr. N. Ikonnikon, who studied the type in Paris Museum and kindly permitted
me to publish the above considerations, forming an abstract from his manuscript on *Oedipodidae*
in *Faune de la Russie*.

description of *Acrydium nigrofasciatum* (*Mem. Ins.*, iii. p. 493, no. 9), says that it is from the Cape of Good Hope, and he mentions even *Gryllus docusta flavus* of Linné as a synonym.¹ All subsequent authors could not separate the South-African species from the very closely related Mediterranean one, and called them either *flavus* or, most often, *nigrofasciatus*. Quite recently, however, I have shown (*Ann. Mag. Nat. Hist.*, ser. 9, vol. ix. 1922, p. 102, no. 2) that the South-African species is distinct from the Mediterranean one, but unfortunately I, like most other Orthopterists, did not take the trouble to look up the original description by De Geer, and therefore called the South African species *O. gracilis* Sauss. It is quite obvious that in separating those two species we must apply the name *nigrofasciatus* De Geer to the Cape species and not to the Palearctic one, for which the next available name, viz. *Oedaleus decorus* Germ., should be used. In case it will be found necessary to split up *O. decorus* into subspecies (and there is no doubt that it varies considerably according to locality), it must be borne in mind that Germar described it from "Podolia australis."

18. *Oedipoda coerulescens coerulescens* (L.).

Mascara, vi. 1922 (Dr. A. Cros).

The typical European blue-winged race of this common species seems to be almost entirely replaced in N.W. Africa by the subsp. *sulfurescens* (see below); doubtless records of subsp. *coerulescens* are from Ceuta (Bolivar, *Mem. Soc. Esp. Hist. Nat.*, viii. 1914, p. 189) and from several localities in Tripoli and Barka (Werner, *Zoolog. Jahrb., Syst.*, xxvii. 1909, p. 112). From Mascara I have seen four specimens only and three of them have got the wings pale greenish blue, i.e. of a shade somewhat intermediate between both subspecies, which is only what one would expect in the transitory zone; one male is blue-winged, though the blue colour is distinctly paler than in European specimens. Further detailed study of long series of specimens from different localities in N.W. Africa should give very interesting results with regard to the distribution of both subspecies.

19. *Oedipoda coerulescens sulfurescens* (Sauss.).

Azazga, Kabylie, 17.ix.1920 (Rothschild and Hartert); Bône, 6.ix.1896 (British Museum).

20. *Oedipoda miniata* (Pall., *nec auctor.* !).

1771. *Gryllus miniatus* Pallas, *Reise durch versch. Prov.*, etc., p. 467, no. 49.
 1790. || *Cryllus salinus* Gmelin, *Linné, Syst. Natur.*, i. (4), p. 2083, no. 182.
 1820. || *Acrydium salinum* Fischer Waldh., *Entom. Imp. Ross.*, i. p. 39, no. 3, Orth. pl. 1, fig. 3.
 1833. || *Acrydium germanicum* Costa, *Monogr. Acrid. Podism. Regni Napoli*, p. 32.
 1836. || *Acridium germanicum* Costa, *Fauna Regni Napoli, Orth.*, p. 17.
 1839. *Oedipoda gratiosa* Serville, *Ins. Orth.*, p. 727, no. 9.
 1846. || *Oedipoda germanica* Fischer Waldh., *Nouv. Mém. Soc. Imp. Nat. Moscou*, viii. (*Orth. Imp. Ross.*), p. 278 (*partim* !), pl. xxii. fig. 7.
 1848. || *Oedipoda salina* Eversmann, *Addit. ad Fisch. Waldh. Orth. Ross.*, p. 9, no. 4.
 1849. *Oedipoda mauritanica* Lucas, *Explor. Alger.*, *Zool.*, iii. p. 32, no. 55, Orth. pl. 4, figs. 2, 2a.
 1852. || *Oedipoda salina* Siebold, *Stett. Ent. Ztg.*, xiii. p. 27.
 1853. *Oedipoda gratiosa* Fieber, *Lotos*, iii. p. 124, no. 9.
 1853. *Oedipoda fasciata* var. *C.* Fischer, *Orth. Europ.*, p. 413.

¹ This is not correct according to Stål, who examined the Linnean types (*Rec. Orth.*, p. 126).

1882. *Oedipoda gratiosa* Brunner Watt., *Prodr. Eur. Orth.*, pp. 159, 164.
 1884. *Oedipoda gratiosa* Saussure, *Prodr. Oedip.*, pp. 148, 152, no. 6.
 1895. *Oedipoda gratiosa* Finot, *Ann. Soc. Ent. France*, lxiv. pp. 442, 444.
 1898. *Oedipoda gratiosa* Bolivar, *Ann. Sci. Porto*, v. pp. 73, 74 (sep. copy).
 1902. || *Oedipoda salina* Jacobson, *Priam. i Lozhnoset. Ross. Imp.*, pp. 189, 261.
 1922. || *Oedipoda salina* Chopard, *Faune de France, Orth.*, pp. 134, 164.

Merg, Cyrenaica, v. 1922 (E. Hartert).

The history of the synonymy of this species is extremely instructive, showing, as it does, how utterly misunderstood and misapplied some specific names given by old writers are.

Pallas has described two red-winged Acridids from the steppes along the river "Yaikum" (which is now called Ural)—*Gryllus miniatus* (for the quotation see above) and *Gryllus salinus* (*l.c.*, ii. p. 727, no. 78).

As the fauna of Orthoptera of the steppes along the river Ural is known at present better than that of many other parts of Russia and even of the Western Europe,¹ there can be no difficulty in identifying both Pallasian species. In fact, there are only three red-winged species known from that region (apart from *Celes variabilis* described from Pallas himself, and from *Calliptamus italicus* which he undoubtedly knew and which has not got a fascia on the wings), *Oedipoda gratiosa* Serv., *Sphingonotus zinini* Kitt., and *Pyrgodera armata* F.W. The latter, being a rather rare insect, remained unknown to Pallas; if he knew it, he would not fail to describe its quite unusually high crest of the pronotum. Thus, only two species remain to be compared with the Pallasian insects, and there is not the slightest doubt as to which is which. In fact, *Gryllus miniatus* of Pallas is described by that author as being of the same size, shape, and colour as *Gryllus coerulescens*, but differing in more distinctly maculated elytra and in the coloration of the hind wings, which he described very unfortunately (and not quite correctly) as "miniaceae" instead of "roseae"; anyhow, this insect cannot be anything else than *Oedipoda gratiosa* Serv., since *O. germanica* Latr., which has been regarded by the most authors as a synonym of *miniata*, is a Western European species which does not and cannot occur at Ural, being wholly unknown from Russia in Europe. As regards *Gryllus salinus* of Pallas, which has been also grossly misunderstood by some later writers who identified it either with *Bryodemus tuberculata* F. (Fischer Waldheim) or with *Oedipoda gratiosa* Serv. (Eversmann, Siebold, Jacobson,² Chopard), its description agrees in all its details with *Sphingonotus zinini* Kitt. (for synonymies of this species see under *Sph. octofasciatus* Serv.), and even its habitat ("locis aridissimis salisque") is exactly the same as I have observed myself for the latter species (*l.c.*, p. 16). Both Pallasian names ought to be, therefore, restored in their original sense, although it involves some very substantial changes in the present incorrect nomenclature.³

The area of distribution of *O. miniata* comprises the whole Eremian subregion,

¹ Owing to the investigations by Pallas, Eversmann, Kittary, and myself (see my list of the fauna in *Horae Soc. Entom. Ross.*, xxxix. 1910, pp. 359-90).

² This author made the mistake only in the main part of his book (p. 261), but in the appendix (p. 929) he corrected it in saying that *salina* Pall. is identical either with *Sphingonotus octofasciatus* or with *S. zinini*; this correction has been overlooked by all other writers.

³ I take this opportunity to restore another Pallasian species, *Gryllus tibialis* (*l.c.*, 2, p. 728, no. 78c), which is undoubtedly identical with *Acridium gibbosum* F.W. 1839 = *Cyphoporus maculatus* F.W. 1846 = *Derocorys fumeipennis* Adelung, 1906 (Uvarov, *l.c.*, p. 377), and should be called *Derocorys tibialis* Pall. (*nec* Fieb. 1853!).

extending even somewhat beyond it—in Spain, S. France, Italy, Greece, Macedonia, S.E. Russia; in the extreme north-west of its area *O. miniata* comes into contact with *O. germanica*, but always maintains its distinctive characters, which shows that they are quite independent species. Inhabiting such a vast area, *O. miniata* varies considerably according to locality and may be split up into several geographical races, differing principally in the shade of the coloration of hindwings and in the shape and width of their fascia, but it is not advisable to do so without a comparative study of long series of specimens from different localities.

21. *Oedipoda fuscocincta* Lucas.

Bône, 31.viii.1896, 1 ♀ (Brit. Museum).

Pronotum and head in this specimen are somewhat more rugose than they should be in the typical form; there is also a very short and irregular radial branch of the black band of wings; the disc of wings is of a bright sulphur-yellow coloration.

Var. *coelestina* n.

One female in the British Museum collection, from Cyrene in Cyrenaica, 1,700, ft. 22.x.1910 (Dr. A. F. S. Sladden), is provisionally referred to this species, but it differs from the typical form in so many important characters that I consider it necessary to describe it under the indifferent name of a variety until its true relationship to the typical form may be established after a study of additional materials.

Size and general appearance of the typical form, but the head and pronotum much more rugose. *Face* strongly rugose; frontal ridge with the margins distinctly raised and reaching the clypeus, strongly constricted below the ocellum; its surface strongly punctured, bifoveolate just below the fastigium. *Fastigium* distinctly rugulose and punctured, scarcely marginated, as long as broad; temporal foveolae rotundato-triangular, their bottom rugulose. *Vertex* and occiput rugulose. *Pronotum* shorter and broader than in the typical form; its surface strongly and densely rugulose; median keel feebly raised, though more so in the prozona; metazona less than twice as long as the prozona, with the hind angle 90°; lateral lobes rugose. *Elytra* with the dark fasciae strongly marked but irregularly defined, with numerous and dense small dark spots, especially in the apical third. *Wings* with the disc of intense blue; black fascia as in the typical form, but not reaching the inner margin and with a quite short radial branch divided in two; apex hyaline with the veinlets brownish. In other respects quite similar to the typical form.

	♀
	mm.
Length of body	32
„ „ pronotum	7
„ „ elytra	30
„ „ hind femora	16

It is not impossible that this beautiful insect has something to do with *Oedipoda miniata* (= *germanica*) var. *coerulea* described by Saussure (*Prodr. Oedip.*, p. 150) from an unknown locality, but it differs from that in the coarsely rugose head and pronotum, which are described by Saussure as being sculptured in *coerulea* exactly as in *germanica*.

22. *Tmethis cisti harterti* subsp. n.

♀. Not large, but robustly built. *Fastigium* of the vertex broader than usual, feebly impressed. *Pronotum* very thick, distinctly depressed; its prozona but feebly compressed and scarcely constricted, with the median keel thick, tectiform, distinctly, but not deeply, interrupted by the sulci; the typical sulcus not deep, metazona distinctly broader than it is long, broadly rounded. *Elytra* only one-half again as long as the pronotum, extending to the apex of the fifth tergite and not reaching the hind knees by one-third of the length of femora. *Hind femora* with the upper carina strongly dilated, irregularly denticulate, excised in the apical third (as in *Oedipoda*); the lower carina also strongly dilated, broadly undulated.

Sculpturation of the exposed parts mostly granulose; metazona with some sharp lamellar, but low, carinulae; one transverse lamelliform rounded carinula at the end of the basal third of the superno-median area of hind femora, and two more just beyond the preapical incision of the latter.

General *coloration* uniformly reddish-ochraceous; antennae pale; metazona narrowly marginated with pale yellow; *elytra* with a scarcely perceptible dark pattern; *wings* with the base and anal part faintly bluish; their fascia in the shape of two small brown spots in the two first sectors; the two apical lobes hyaline with the veins and veinlets brown; hind femora with the inside violaceous in the basal half, red in the rest, with a pale yellow preapical ring; hind tibiae inwardly sanguineous, outwardly reddish ochraceous with brownish dots; their spines red, brown-tipped.

♂ (paratype) differs from the female by somewhat more compressed pronotum, with the metazona more triangular; by the presence of pale yellow callous ridges on its prozona, along the upper margins of the lateral lobes; by the *elytra* extending a little beyond the hind knees; and by the wings faintly rosculent in the hind third, with the fascia fully developed, but not sharply defined.

	♀ (type)	♂ (paratype)
	mm.	mm.
Length of body	42	28
„ „ pronotum	13	9
„ „ elytra	19	21
„ „ hind femora	20	15

Type and paratype taken at Merg (Merdj in some atlases), Cyrenaica, May 1922, by Dr. E. Hartert, after whom the subspecies is named.

Vosseler (*Zool. Jahrb.*, xvi. 1902, pp. 384-7) has shown that *T. cisti* gives a great number of different forms in various parts of its vast area of distribution, some of them obviously geographical. Of course, only a study of very long series of specimens may help to distinguish more constant geographical races from individual aberrations or topographical adaptive forms (*morphae*), but I feel justified in regarding the strikingly aberrant form described above as a subspecies, peculiar to the coastal region of Cyrenaica; the form from Bir bou Rekbah, at the eastern Tunisian coast described by Vosseler (*l.c.*, p. 386; pl. 3, fig. 1) seems to represent a transition from the long-winged, heavily marked forms of Algeria to the new Cyrenaican subspecies.

23. *Pyrgomorpha conica* (Ol.).

1902. || *Pyrgomorpha cognata* Vosseler, *Zoolog. Jahrb.*, xvi. p. 388 (*ad partim? nec Krauss!*).

Biskra, iv.1908 (Rothschild); Ghardaia, 16.iv.1911; Aïn Sefra, South Oran, 1-18.v.1913 (Rothschild and Hartert).

Since *Acrydium conicum* of Olivier has been described from the south of France, it is obvious that the species of *Pyrgomorpha* from S.W. Europe should be regarded as that to which the name may only be applied; this species has been redescribed and figured so many times that it is simply astonishing that a careful systematist like Vosseler should make such a mistake in identification of his material as he did. In fact, the South-European *Pyrgomorpha conica* has got a very distinctly sinuated lower margin of pronotal lobes—exactly as Vosseler figured in what he called *P. cognata* (*l.c.*, p. 388), while his figure on the preceding page which is supposed by him to represent *P. grylloides* Latr. (= *conica* Ol.) belongs to a species quite distinct from the real *conica* and which is described below.

As regards *P. cognata* of Krauss, originally described from Senegal, its description is far too insufficient to make its separation from *conica* easy and beyond any doubt. Some of the specimens from Sahara are more slender than those from Southern Europe and their antennae are also somewhat longer, but I hesitate to identify them as *cognata*, until the type of the latter species is redescribed in more details. I am inclined to think that the meagre descriptions of *cognata* caused a good many mistakes to be made by different authors, and I regard all records of this species (except, of course, the original one) as doubtful.

24. *Pyrgomorpha vosseleri*, sp. n.

(Text-fig. 2.)

1902. || *Pyrgomorpha grylloides* Vosseler, *Zoolog. Jahrb.*, xvi. p. 387, fig. (*nec Latr.!*).

♀. About the same size as *P. conica* Ol., but less slender. *Antennae* not reaching the hind margin of the pronotum, triangular in the basal half, rounded in the rest. Face less reclinate as in *P. conica*, scarcely rugulose. *Fastigium* of the vertex, seen in profile, somewhat shorter than the length of an eye; seen from above it is shorter and more elliptical in front than in *P. conica*, not strongly and irregularly transversely rugulose, with a distinct median carinula running right across the occiput. Eyes almost twice as long as they are high. Lateral facial keels feebly sinuate, not much raised. A broad granulated fascia runs obliquely from the eye to the lower margin of the pronotum. *Pronotum* thick, not strongly rugulose; median keel linear, distinct throughout; lateral keels in the prozona practically straight, slightly divergent backwards; in the metazona they are more distant from each other and almost obliterate; hind margin of the pronotum rounded; lateral lobes with the lower margin practically straight and the hind angle obliquely truncate (see figure by Vosseler, *l.c.*, p. 387). *Mesosternal interspace* about half again as broad as it is long. *Elytra* extending a little beyond the hind knees.

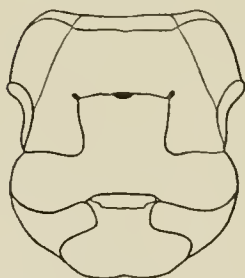


FIG. 2.—*Pyrgomorpha vosseleri*, sp. n., ♀ (type).
Sternum. × 6.

mesosternal interspace about half again as broad as it is long. *Elytra* extending a little beyond the hind knees.

General coloration green with the granulose post-ocular fascia and the lower margin of the pronotal lobes (which is also slightly granulose) pale. Antennae brownish. Abdomen with black spots on each tergite. Wings rose.

	♀ (type). ♂ (paratype).	
	mm.	mm.
Length of body	28.5	17.5
" " antennae	6	6
" " pronotum	6	3.75
" " elytra	22	13.5
" " hind femora	13	9

The type is from Hammam R'irha, 30.v.1913 (Rothschild and Hartert); the paratypes are from the same locality—3 ♀♀ and 1 ♂—and as follows: Saïda, Oran, 1 ♀, 22.v.1913 (Rothschild and Hartert); Mascara, Algeria, 4 ♂♂ (A. Cros); Medeah, Algeria, 1 ♂, 1 ♀ (British Museum).

The new species is easily separated from *P. conica* by the shape of lateral lobes of the pronotum, as well as by its lateral keels being practically straight in the prozona, while they are distinctly incurved in *P. conica*, as well as by the strongly transverse mesosternal interspace which in *P. conica* is almost as broad as it is long. The carinula on the vertex and occiput, as well as the lateral keels on the metazona of pronotum, are not constant and may be either well developed or almost obliterate; it must be noticed that these characters are not constant in *P. conica* as well. The coloration of the new species is liable to variations of the same kind as in *P. conica* and in other species of the genus, and both green and grey (or brown) forms are represented, though of the latter I know three males only, the rest of the paratypes belonging to the green form.

As regards the distribution of this species, the following localities given by Vosseler (*l.c.*, p. 387) may be added to those recorded above: Perrégaux, Hammam bou Hadjar, Er Rachel, Rio Salado, Saïda, Ain Sefra, Medeah. There is no doubt that many of the other records of *P. conica* must be also referred to *P. vosseleri*, but it is impossible to decide which ones.

I have much pleasure in naming this well-marked new species after Dr. J. Vosseler, whose work on the Orthoptera of Algeria and Tunisia is a model of systematical and ecological study.

25. *Dericorys albidula* (Serv.).

- 1839. *Dericorys albidula* Serville, *Ins. Orth.*, p. 639, no. 1.
- 1889. *Derocorystes curvipes* Redtenbacher, *Wien. Ent. Ztg.*, viii. p. 29.
- 1913. *Dericorys albidula* I. Bolivar, *Novit. Zool.*, xx. p. 613.

Sands of El-Arich, S.W. of Touggourt, 8-9. vi. 1912, 1 ♀ (Hartert).

D. albidula is undoubtedly synonymous with *D. curvipes*, as the characters indicated by Bolivar (*l.c.*) as separating them are obviously of no value. The species is distributed from Transcaspia and Persian Gulf (Fao; British Museum), through Sinai (Krauss, in *Verh. Natur. Ver. Karlsruhe*, xxi. pp. 32-4, figs. 3, 4) and Egypt (Serville's type) right across the Sahara.

26. *Thisoecetrus littoralis charpentieri* (Stål).

- 1873. *Pezotettix (Euprepocnemis) charpentieri* Stål, *Rec. Orth.*, i. p. 75, no. 3.
- 1876. *Euprepocnemis charpentieri* Stål, *Bih. Sven. Akad.*, iv. 5, p. 15, no. 4.

Tunis (Stockholm Museum; the types of Stål).

Owing to the kindness of Prof. Y. Sjöstedt I have been able to study the actual

types of Stål's species, with the result that I believe it to represent a well-defined Tunisian subspecies of *Th. littoralis* Ramb. which occurs in its typical form in the S.E. of Spain. At the same time it is obvious that Stål's insect is different subspecifically from the Algerian representatives of the species which have been incorrectly called by I. Bolivar (*Bol. Soc. Esp. Hist. Nat.*, 1908, p. 328) *Th. charpentieri* (*nec* Stål!). In fact, the true *charpentieri* St. from Tunis¹ has got a much narrower vertex and still more irregular lateral keels of the pronotum than the insect described under that name by Bolivar; the disc of the prozona in the true *charpentieri* is distinctly punctured, while it is perfectly smooth both in the typical *littoralis* and in the insect described by Bolivar, which latter must receive a new name.

27. *Thisoecetrus littoralis bolivari*, subsp. n.

1908. || *Thisoicetrus charpentieri* I. Bolivar, *Bol. Soc. Esp. Hist. Nat.*, p. 328 (*nec* Stål, 1873!).

Biskra, hills north of the town, 22.ii.1895, 1 ♂, 1 ♀ (A. E. Eaton: British Museum).

To this subspecies must be, probably, referred most of the existing records of *Th. littoralis* from Algeria. I. Bolivar (*l.c.*) has been inclined to include in it also the representatives of the species from Egypt and Persia, but it seems that a careful study of series of this species from the eastern Mediterranean countries will make it necessary to separate several more subspecies.

I do not give a description of the new subspecies, because it has been very fittingly characterised by Bolivar, and its principal distinctive features are also quite obvious from the key to the subspecies of *Th. littoralis* given below.

Dimensions of the types are as follows:

	♂ (type)	♀ (paratype)
	mm.	mm.
Length of body	28	35
„ „ pronotum	5.5	7
„ „ elytra	23	28
„ „ hind femora	15	18.5

28. *Thisoecetrus littoralis harterti* Bol.

1913. *Thisoicetrus harterti* I. Bolivar, *Novit. Zool.*, xx. p. 614, no. 28.

Biskra, 4 ♀♀ (Rothschild and Hartert).

The original type of Bolivar's description² is before me, and three more females are exactly like it. It is very strange that Bolivar did not compare it with what he called *charpentieri*, i.e. my *bolivari*, but with the Spanish *littoralis*; still more incomprehensible is that he should say that the latter has been many times recorded from Algeria, while he himself stated positively in 1908 (*l.c.*) that *littoralis* does not occur in Algeria and all records must be referred to his "*charpentieri*."

¹ Prof. Sjöstedt has sent me one male and one female both from Tunis; only the female bears the original label by Stål, but it cannot be considered the holotype of the species, because Stål's description is based on a male; I have, therefore, selected the male specimen studied by me as the holotype.

² It is a female, as indicated in description, and not a male, as it is stated, obviously by a misprint, in the table of measurements.

I believe that the subspecies *harterti* is peculiar to the Sahara, which is evidenced by its very pale general coloration. The fact that this subspecies and *bolivari* are both known from Biskra may be explained by the geographical position of Biskra on the very dividing line between the mountainous and hilly Algeria populated by *bolivari* and the desert where it is replaced by *harterti*. Indeed, the types of *bolivari* have been taken by Mr. Eaton on the hills north of Biskra, while those of *harterti*, though not bearing a detailed label, near the town and southwards from it.

29. *Thisocetrus littoralis minuta* Uvar.

1921. *Thisocetrus littoralis* var. *minuta* Uvarov, *Trans. Ent. Soc. London*, p. 123, no. 1a.

I am inclined now to regard this minute form as a distinct subspecies, known so far only from Bône, Algeria.

The four subspecies of *Th. littoralis* known to me from N.W. Africa and S. Spain may be separated by the following key :

1 (8). Distance between the eyes at least half again as broad as the distance between the first and the second pronotal sulci. Prozona of the pronotum smooth; the lateral keels straight, or practically so, gradually divergent backwards.

2 (3). Distance between the eyes twice as broad as the distance between the first and the second sulci. General form more slender; elytra extending distinctly beyond the hind knees. Hind femora elongated, slender. Hind tibiae with 15-17 external and 12-14 internal spines.—S. Spain.

1. *littoralis* (Ramb.)

3 (2). Distance between the eyes about half again as broad as the distance between first and the second sulci of pronotum. General form less slender; elytra just reaching the hind knees or scarcely longer. Hind femora thick and short. Hind tibiae with 12-14 external and 11-13 internal spines.

4 (7). Hind tibiae in the apical half red or reddish all over. General coloration not faded. Hind femora with the transverse fasciae more developed. Small and middle-sized insects.

5 (6). Very small (♂ 16 mm.; ♀ 27 mm.). Coloration vivid. Elytra just reaching the hind knees.—Bône, Algeria.

2. *minuta* Uv.

6 (5). Of middle size (♂ 28 mm.; ♀ 35 mm.). Coloration somewhat less vivid. Elytra extending a little beyond the hind knees.—Biskra, Algeria.

3. *bolivari* subsp. n.

7 (4). Hind tibiae pale, only the inner side near the apex somewhat reddish. General coloration very pale. Hind femora with but narrow dark linear spots along the upper carina of the externomedian area. Size large (♀ 50 mm.).—Sahara.

4. *harterti* Bol.

8 (1). Distance between the eyes not or scarcely broader than the distance between the first and second sulci of the pronotum. Prozona of the pronotum distinctly punctured; the lateral keels very irregular, strongly punctured, subparallel and distinctly convex before the first sulcus, distinctly displaced nearer to the middle and parallel between the first and the second sulci, divergent between the second and the third sulci.—Tunis.

5. *charpentieri* (St.).

30. *Schistocerca gregaria* (Forsk.) ph. *flaviventris* (Burm.).

1838. *Acridium flaviventre* Burmeister, *Handb. Entom.*, p. 631.

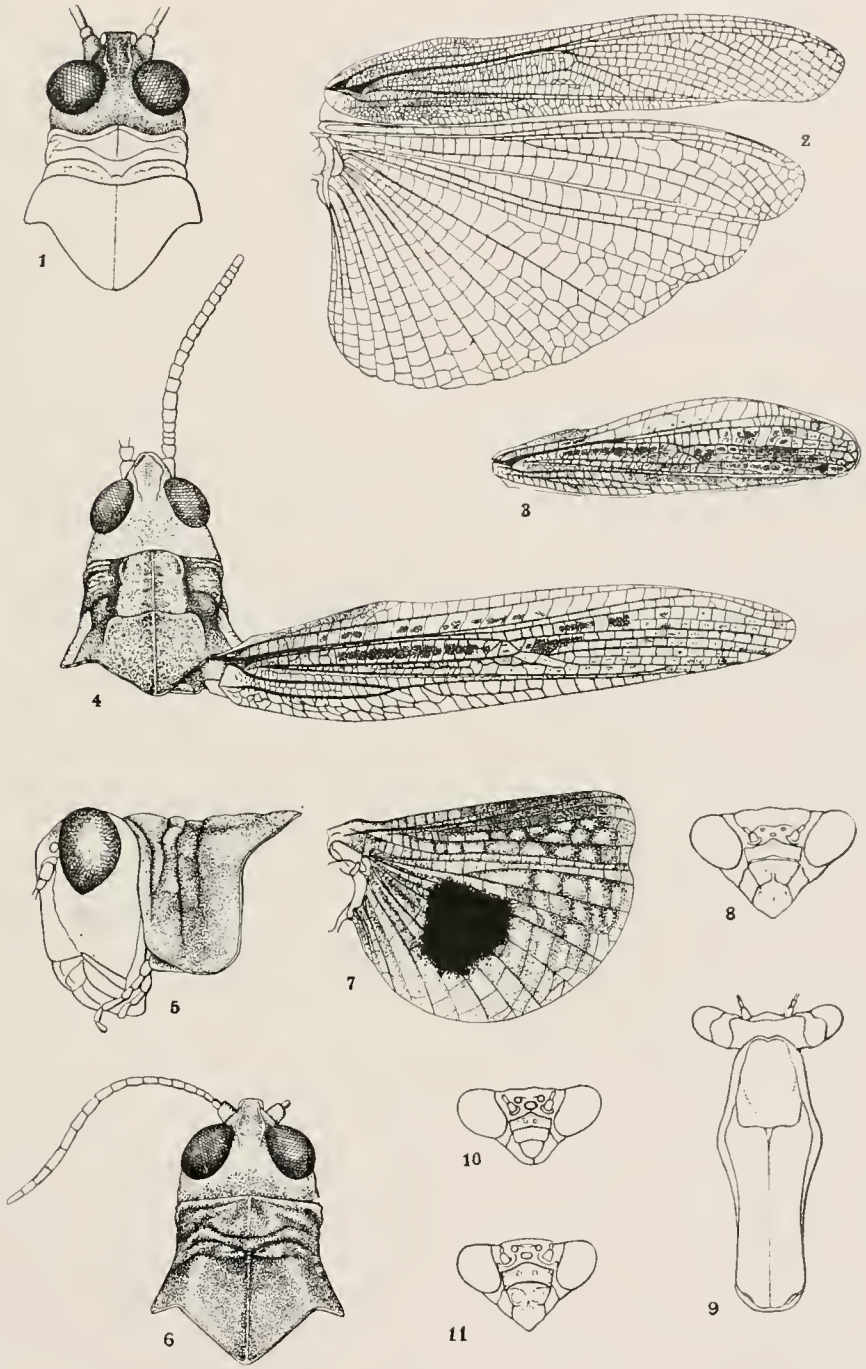
1922. *Schistocerca gregaria* ph. *flaviventris* Uvarov, *Bull. Entom. Res.*, xiv. (in print).

Ain Guettara, north of In Salah, 12-14. iv. 1912 (Hartert and Hilg.), 1 ♀.

The only specimen of this common migratory locust of Algeria proved to be of an extraordinary interest, as it belongs not to the ordinary swarming phase¹ of the species, but to the single-living ph. *flaviventris* (Burm.). A full description of this phase is given by me in a special paper (*l.c.*) dealing with some migratory locusts.

EXPLANATION OF THE PLATE

1. *Sphingonotus rubescens* (Walk.), male from Ain Sefra. × 6.
2. *Sphingonotus rubescens* (Walk.), male from Ain Sefra. × 3.
3. *Notopleura rothschildi* sp. n., male. × 4.
4. *Notopleura rothschildi* sp. n., female. × 4.
- 5, 6. *Thalpomena coerulea* sp. n., female. × 6.
- 7, 8, 9. *Iris deserti* sp. n., female. × 4.
10. *Iris deserti* sp. n., male. × 4.
11. *Iris oratoria* (L.), male from Batna, Algeria. × 4.



AN ORNITHOLOGICAL AUTUMN JOURNEY TO ALGERIA.

BY LORD ROTHSCHILD AND ERNST HARTERT.

ALL skins from Algeria in the Tring Museum, and in fact nearly all in European collections, are from the late winter and spring months, we decided in 1920 to make an autumn excursion to Algeria, so as to get at least all the commoner birds in autumn plumage. We arrived at Alger on September 3rd. It was still very hot, but the Swifts had already left. In the neighbourhood of Alger it was very dry and dusty, and we soon left for the hills of the Kabylie. Our first stay was at Tizi-Ouzou, but as good collecting grounds were mostly rather far we proceeded from there, after a short stay, to Azazga, 425 m. high above the valley of the River Sebaou and a few minutes from the vast forest of Bu-Hini, which stretches almost unbroken to and beyond the village of Yacouren. These forests consist chiefly of Cork-oaks, other oaks, here and there *Pinus halepensis*, and various other trees. There is at Azazga an important cork industry, and at Yacouren the roots of the tree-heather are largely collected and the "pipes de bruyère," in English called "brier-pipes," cut in the raw, to be completed in factories and by house industry in the Jura Mountains. In Azazga our friend, Paul Saby, whom Hartert had met in Djelfa in May 1914, and who discovered *Numida sabyi* in Marocco, was stationed as inspecteur des Forêts et des Eaux, and we had his company on most of our excursions from Azazga. The woods near Azazga were at this time very dry, no butterflies were flying and very few moths, but they were rich in birds. *Telephonus senegallus cucullatus* was not rare in thick wood near Azazga and, to our astonishment, at this season, was often pouring forth its beautiful, rich, flute-like notes. The forests are the home of *Turdus viscivorus deichleri*, *Parus ater ledouci*, *Parus caeruleus ultramarinus*, *Parus major excelsus*, Robins, Creepers, and Wrens, of three Woodpeckers (*Dryobates major numidus*, *D. minor ledouci*, and *Picus vaillantii*), Jays, Wood Owls, Golden Eagles and other birds. To our disgust (as we wanted full-plumaged birds in fresh autumn plumage for comparison) most of the birds were still in moult.

From Azazga we returned to Alger, whence we proceeded to Biskra, and on our return journey stayed some days at our beloved picturesque El-Kantara. Migration was in full swing at Azazga, where Redstarts, Whcatears and others were common, but the oasis of Biskra was still more full of migrants. In Biskra it was hot but dry, and therefore pleasant to us. During the last week of October rain set in in many places in Algeria, and the temperature cooled down. When we arrived again at Alger a perfectly terrific downpour received us. We left Alger on October 30th for Port Vendres, a very picturesque small town near the Spanish frontier. While we started in fine weather from Alger, in the night a gale set in and our not too large ship danced in a more than pleasant manner. A few hours before Port Vendres we saw several large water-spouts running, as it seemed, along the shore, where they did much damage, as we learnt afterwards, and one of the largest sailing vessels afloat foundered in the early morning at the Cap de

Creus. Port Vendres looked very dishevelled from the gale and torrential rains that had swept it, fallen trees lying about on the square and in gardens. The snow-covered Pic de Canigou and other mountains of the Pyrenees afforded beautiful views just outside the town.

We were accompanied on this trip by Mr. Fred Young, the caretaker of the Tring Museum, as taxidermist.

It did not seem necessary to mention every kind of birds collected or observed, so we only refer to those that were of some interest to ornithologists generally, either with regard to locality, moult, or habits.

***Pyrrhonorax pyrrhonorax* (L.).**

Only seen near El-Kantara, where it is always common. A ♂ shot 23.x. in beautiful fresh plumage differs from birds shot March to May in being more purplish, not in the least greenish or bronzy, as in all spring specimens.

(It will no doubt become necessary after all to divide the Chough into sub-species, on account of the length of the wing. Irish and British specimens have the shortest wings, but we have not enough topotypical Swiss birds to define this well. Algerian, Moroccan, and Tunisian specimens have longer wings, but do not seem to differ enough from Central Asiatic birds from Turkestan and Sikkim, to Yunnan and Szetchwan.)

***Garrulus glandarius cervicalis* Bp.**

Not rare in the forests between Yacouren and Azazga. Still moulting September 19th.

***Carduelis carduelis africanus* (Hart.).**

Generally common in Algeria from the north coast to Biskra, but seemed to be especially numerous in September near Tizi-Ouzou, both young and adults being in full moult.

***Fringilla coelebs africana* Levaill.**

Common in the woods near Alger, Azazga and Yacouren, in full moult in second half of September. A male shot at El-Kantara 23.x. had only just completed moult. It differs like other Chaffinches from specimens in spring by having brown tips to feathers of head and neck and back.

***Emberiza cirius* L.**

Several times in the Kabylie, near Azazga and Yacouren. Still moulting 16 . and 19.ix.

***Emberiza striolata sahari* Lev.**

During October very common in gardens and date groves at and near Biskra, many still in moult during first half of the month. An aberration (male) has the head pure white with some blackish centred feathers, ear-coverts white, throat and crop very whitish, and some white feathers on the rump and in the wing. The iris was dark rufous brown, bill wax-yellow, upper mandible brownish, feet light wax-yellow. When the wide white edges to the feathers of head and neck wear off in the breeding season the black centres stand out more and appear to be more numerous, which is of course not the case.

Rhamphocorys clot-bey (Bp.).

On October 5th a single ♂ was shot in the sanddunes near Biskra and a flock encountered on the fields between the dunes and the oasis. On October 20th and 21st they were common and in flocks near Biskra. The autumn specimens have a bluish-grey "bloom" which disappears in spring, so that then the upperside looks more vinaceous, and as the white edges to the feathers wear off, the black spots on the underside become larger in appearance. The wings of males measure 124-131, generally 126-128, of females 118-123 mm. As a rule the bills of females are also smaller, but they vary much. There is no difference in the colour of the upperside, but the black patches on the underside are smaller. The stomachs in October contained seeds and sand, in one case bones of a small lizard, and in another some green stuff, evidently young green shoots. The iris is brown (dark coffee-brown, greyish-brown, brown), bill very light brown, lower with yellow tinge, in spring whitish-blue or bluish-white with horn-black or dark grey tips. The feet are at all seasons milky (sometimes dirty) white.

Alaemon alaudipes alaudipes (Desf.).

As usual not rare among the dunes near Biskra and towards Sidi-Okba. No appreciable difference from spring specimens, except that in the latter the black spots on upper chest are more conspicuous, when the white edges of the feathers wear off. Often pairs kept together and twice we heard a male singing and displaying!

Galerida cristata arenicola Tristr.

Common about Biskra, especially in the plain of El-Outaya and in the Mouleina, etc., and at the foot of the mountains meeting *G. theklæ hilgerti*, which, however, replaced it on the hills. Autumn specimens are slightly browner and have a slightly more greyish tinge, but when the greyish edges to the feathers of the upperside wear off, in the spring, the upperside becomes a little more yellowish sandy and paler. Moulting had finished in October.

Galerida theklæ hilgerti R. & H.

Common on the bare hills near Biskra and El-Kantara. Varies a good deal individually, like most *theklæ* forms. On October 10th we shot close to Biskra, on the range of stony hills, a female which is darker than any other we had, and closely approaches *G. t. harterti*, but is less brown. There is no appreciable difference between autumn and spring specimens, the wearing off the edges of the feathers not altering their coloration. The moulting had only just finished in some specimens in October, but some had evidently moulted some time.

Galerida theklæ harterti Erl.

A few were seen near Tizi Ouzou and on open ground near the River Sebaou near Azazga. About half of the specimens were still moulting during second half of September. The specimens do not differ much from spring examples, but the unworn greyish edges to the feathers of the back make them appear more grey, and they look cleaner, not tinged by the blackish or dark rufous-brown soil as in spring.

Of all the Crested Larks we obtained far more females than males, of the latter in each case only a few. In the spring the opposite has been the case, probably because very often one is attracted by the song of the males at that season, while they did not sing in the autumn.

***Galerida theklæ deichleri* Erl.**

This pale sand-coloured form, which in the breeding season in Western Algeria is restricted to the rolling low sand stretches, especially where there are some flat stones, though never occurring among the high dunes without vegetation, roams more about in the autumn, and we encountered it three times, twice on the stony ground north of the Col de Sfa, in the area of *G. theklæ hilgerti*, and close by in that of *G. cristata arenicola*, once among the sanddunes, where otherwise only *G. c. arenicola* is found. We knew already from Witherby, who had shot a specimen in winter near Biskra, that it occurred there occasionally out of the breeding season. Autumn specimens do not differ in appearance from worn spring specimens.

***Ammomanes deserti algeriensis* Sharpe.**

Common in October, as it is in spring, near Biskra and El-Kantara. Autumn birds differ from worn spring specimens in being more vinaceous, of a somewhat warmer tinge, and the upperside is generally considerably more greyish-vinaceous. From the end of September (at least) they were right through their moult, though a male shot 15.x. has the outer primaries still in moult.

***Anthus trivialis trivialis* (L.).**

Quite common on passage near Azazga and Yacouren during second half of September, a few seen Biskra end of September and early October.

***Anthus campestris campestris* (L.).**

Several on fields between Alger and Rouiba, 13.ix. Outer primaries moulting.

***Motacilla alba alba* L.**

A few seen late October on the river near El-Kantara.

***Motacilla cinerea cinerea* Tunst.**

One clearly seen by both of us in the river bed near El-Kantara 23.x. Rare in Algeria, by us only once seen in West Algeria.

Motacilla flava.

Flocks of Yellow Wagtails were seen during second half of October on inundated places close to Biskra.

***Parus caeruleus ultramarinus* Bp.**

Common near Alger, Tizi-Ouzou, and Azazga. Also not rare in the gardens of Biskra and El-Kantara, and sometimes seen far away from trees in the desert

among small plants. In moult at Alger, Tizi-Ouzou and Azazga throughout September, but in October through the moult at Biskra and El-Kantara, except a bird of the year, which had not quite completed moult 23. x.

Parus ater ledouci Malh.

Not at all common in the mixed woods near Yacouren and Azazga and moulting second half of September. The yellow of the underside, unlike the rather constant yellow of *P. caerul. ultramarinus*, fades very noticeably in the skin, being quite brilliant in the fresh shot bird. This fleeting character of the yellow on the underside is still more obvious in *P. ater hibernicus*. The upperside in autumn is pale olivaceous green and fades to grey with a faint, sometimes hardly perceptible, tinge of green, only the rump remaining greenish.

Parus major excelsus Buvry.

Common near Azazga, full moult second half of September.

Lanius excubitor elegans Swains.

A few were seen on Zizyphus and Tamarisk bushes near Biskra, also in date-palm groves. A male of the year 17. x. is nearly through the moult, but the lores are still whitish. The fresh autumn feathers on the upperside are very light; evidently the upperside gets darker grey in the spring, but there is a certain amount of variation in this.

Lanius senator senator L.

Common in bush near Tizi-Ouzou and Azazga. In middle of September plumage old and worn, but some fresh feathers already in wings (inner primaries, secondaries, some coverts). Young bird shot same time (15. ix.) still in first barred plumage.

Telophorus (Harpolestes or Tschagra) senegalus cucullatus (Temm.).

This bird is very local and mostly rare, only in the coastal range of mountains and coastal plains of Algeria, Tunisia, Marocco. We found it in flocks in the bush-wood and outskirts of forest near Azazga on and about September 18th. They were quite noisy, often emitting their loud, full flute-like notes, and this had attracted Mr. Saby's attention, who first told us of their occurrence. The specimens moulted their body plumage, and mostly also the tails, the quills being already fresh plumage. They should nest near Azazga, but Mr. Saby did not notice them at all in spring, nor in fact after September.

Pycnonotus barbatus barbatus (Desf.).

A few near Azazga, but not common. In full moult, body-plumage, tail, and wings, 18. ix.

Muscicapa striata striata (Pall.).

Common in the gardens of Alger first week in September, not rare Azazga middle September, and common at Biskra 30. ix. and to about 20. x. At Biskra undoubtedly on passage, and probably also at Alger and Azazga, though the Spotted Flycatcher nests in Algeria in various places.

Phylloscopus trochilus trochilus (L.).

Phylloscopi were not rarely seen at Azazga during second half of September and at Biskra early in October. The few specimens procured were *trochilus*.

Sylvia melanocephala melanocephala (Gm.).

In Alger 9. ix. almost entirely through the moult. Near Tizi-Ouzou, where it was specially common in woods and scrub in low-lying districts, still in moult on head, body, tail, in middle of September. Plumage as in spring.

Sylvia conspicillata conspicillata (Temm.).

Common near Biskra from 29. ix. to 17. x. (and probably still later and throughout winter). Some had still old rectrices, some were moulting, also parts of body-plumage. In fresh autumn plumage the ashy-grey crown is hidden by the sandy-brown edges to the feathers.

Sylvia nana deserti (Loche).

A single specimen on the sanddunes between Biskra and Oumash 5. x. Molt on primaries and body-plumage. Fresh autumn plumage warmer, more reddish than in breeding season !

[We never noticed any *Hippolais* in September and October. They must probably have been departed already.]

Sylvia atricapilla atricapilla (L.).

Alger 9. ix. through the moult, only outer primaries not fully grown. Upperside in fresh autumn plumage darker, browner than in spring.

Agrobates galactotes galactotes (Temm.).

Must be an early migrant, as we did not see any specimens, except one near Biskra early in October.

[Song-thrushes, which are so common in winter in northern Algeria, had not yet arrived when we were in the Kabylie in September. They are supposed to arrive late in October. Mistle-thrushes were seen in small numbers in the forests near Azazga and Yacouren. Blackbirds were seen near Yacouren, Azazga, and Biskra, but were shy, as usual in Algeria. A male from Yacouren 17. ix. is in full moult from first juvenile to adult plumage, a male Biskra 14. x. has black first body-plumage, still moulting, tail in full moult, wings still juvenile and measuring only 122 mm., though it should be *Turdus merula mauretanicus*, from the locality.]

Monticola solitarius solitarius (L.).

A ♀ in full fresh plumage Biskra 7. x. Common El-Kantara, 24 and 25. x., fresh plumage.

Oenanthe oenanthe oenanthe (L.).

Common in the plains from Alger to Tizi-Ouzou and near Azazga and Yacouren during second half of September and around Biskra throughout October. A few were still moulting body-feathers in September.

October 19th we shot a female at Beni Mora near Biskra, which from its distinctly lighter, more sandy upperside we consider to belong to *O. o. seebohmi*. So far we have no indication where this bird winters, but it cannot remain through the winter in the high altitudes where it nests and must be migratory to some extent. (It is astonishing how numerous *O. o. oenanthe* is in autumn and spring on passage, from Marocco to Egypt.)

Oenanthe hispanica hispanica (L.).

A few between Alger and Tizi-Ouzou middle September, not rare at Biskra throughout October, but all males shot and clearly observed were first autumn's birds, except one Biskra 21. x.

Oenanthe lugens halophila (Tristr.).

The western form of this Chat is evidently one of the most sedentary birds, as we found it all around Biskra in exactly the same places, where we formerly came across it in winter and in the breeding season. The fresh autumn males (they had completed their moult) do not differ in appearance from spring specimens, except that the white edges to the primaries and tips of the quills are very conspicuous, while they wear off entirely, or almost so, in the breeding season. The females of the western subspecies are quite different from the males, while in the eastern form they are almost exactly like the males. In the western form, *halophila*, the throat is white with a more or less pronounced grey wash, but not unfrequently, in fact almost as often, it is dull black with whitish patches or whitish wash, and sometimes, though rarely, it is a black as in the males; such black-throated females we shot at Biskra, February 21st, 1908, and October 1st, 1920, and we have one from Flückiger, shot 31. xii. 1902. In the October specimen the back is also more blackish than usual, yet it is at once recognisable by the chiefly grey-brown back and shorter wing, apart from the examination of the sexual organs, which was made by Hartert and Young. The amount of black on the throat has evidently nothing to do with age. Birds in the first autumn and second spring are at once recognisable by their brownish quills.

Oenanthe leucura syenitica (Heugl.).

This is equally sedentary as *O. lugens halophila* and *O. moesta*, for we found both in exactly the same places where they nest. It was remarkable that *O. moesta* was frequently pouring forth its most peculiar rolling song in the middle of October, while the other Chats did not sing.

Saxicola rubetra rubetra (L.).

Not rare near Tizi-Ouzou and once near Yacouren middle of September. Beautiful fresh plumage. Two were shot, one typical *S. r. rubetra*, the other lighter, apparently *S. r. spatzi*!

Diplootocus moussieri (Olphe-Galliard).

Never noticed in the Kabylie. Only twice near Biskra, 8.x. and 21.x. Evidently the majority of specimens were still in their breeding area in the Atlas (chiefly the southern range). Autumn males have wide brownish-grey edges to the feathers of the upperside, which in spring, when the edges are worn off, is quite black; also the feathers of the underside have white tips which disappear in spring.

Erithacus rubecula witherbyi Hart.

In small numbers near Tizi-Ouzou and in the forest of Yacouren (Kabylie) second half September, in full moult of body-plumage. Undoubtedly the resident Algerian race.

Phoenicurus phoenicurus phoenicurus (L.).

Very common in the Kabylie second half September and at Biskra in October. A specimen (♂) from Biskra and another from Azazga resemble *P. p. algeriensis* in the length of the sixth primary, but *P. p. algeriepsis* requires confirmation by skins from breeding places!

Phoenicurus ochruros gibraltariensis (Gm.).

A beautiful male in finest full autumn plumage Biskra 21.x.

Luscinia megarhyncha megarhyncha Brehm.

Twice first half of October near Biskra.

Cisticola cisticola cisticola (Temm.).

A specimen Biskra 16.x. in full moult. (About nomenclature see *Vög. pal. Fauna*, p. 2151.)

Delichon urbica meridionalis (Hart.).

A few seen Alger first week September. At Tizi-Ouzou, where great numbers nested on the hotel, they came every night to sleep in the nests. They also sat in long rows on the telegraph wires between Tizi-Ouzou and Azazga. The moult seems to be very irregular. Young birds shot 16.ix. were not moulting, but of old birds one had a new wing, another an old worn one, while two showed some few fresh or moulting secondaries in the otherwise old wing. (Swallows were seen in small numbers throughout October at Biskra.)

Caprimulgus europaeus meridionalis Hart.

A ♀ shot by Monsieur Saby's son at Yacouren 19.ix.1920 is all we saw of Goatsuckers on our autumn journey. It shows some moult of body-plumage. The rectrices are old, except the lateral on the left side (only), which are new.

Merops apiaster L.

Flocks of Bee-eaters were several times seen early in September over the gardens of Mustapha Supérieur, the beautiful suburb of Alger, and Mr. Paul Saby shot one near Azazga 16.ix.

(We looked in vain for *Merops persicus chrysocercus* south of Biskra ; they had evidently left for the south already in first week of October.)

Alcedo atthis atthis (L.).

Kingfishers are generally rare in Algeria. One was seen close to Mustapha Supérieur, September 3rd, flying along the waterless bed of a stream. Hartert shot a male in the bed of the River Sebaou, near Azazga, at a pool of water, one was frequently seen on the river near Biskra, another in the town of Biskra in October. The male shot 21.ix. near Azazga moulted body-plumage above and below and rectrices. In its stomach were small frogs, though small fishes were seen in the water.

Dryobates major numidus (Malh.).

Common in the big forests near Azazga and Yacouren and in full moult (body and wings) during second half of September.

Dryobates minor ledouci (Malh.).

Inhabits the forests of Azazga and Yacouren, but is not numerous. We only once saw a pair near Yacouren, but could not shoot them. Mr. Paul Saby sent a pair of wings of a specimen he shot in the little town of Azazga 9.x., and two males injected with formaline, which were skinned in Tring by Fred. Young ; they were shot in the woods 4.v. and 10.iv. These birds are very much like Italian Lesser Woodpeckers (*D. m. buturlini* Hart.), but the back seems to be less white and the bars on the wings are slightly smaller ; the feathers of the forehead are darker, more blackish at their bases. Bills 16.8, 17, wings 86.5, 87, 88 mm.

Picus vaillantii (Malh.).

Not very rare in the forests of Azazga and Yacouren. Badly in moult 17.ix., body-plumage, wings, and tail.

Yynx torquilla torquilla L.

A ♀ Biskra 14.x., no moult.

(We did not see *Yynx t. mauretanicus* Rothsch., which seems to be a migrant.)

[No Rollers, *Coracias garrulus*, were observed. They had evidently already left northern Algeria by the middle of September, as they are most likely not uncommon near Azazga and Yacouren.]

Buho (? bubo) ascalaphus Sav.

When passing through the little town of Alma we inspected a small collection of stuffed birds belonging to the Rev. Father Fröhliger. In it we saw a *Bubo ascalaphus* shot near Azazga about 1909, which the owner kindly let us have later on. It is rather pale, but, allowing for about ten years' fading, it may still pass for the northern form, though not one of the darkest specimens. Cf. *Vög. pal. Fauna*, p. 2194, second and third notes.

***Strix aluco mauritanica* (With.).**

In the evenings early in September the hooting of this owl could be heard in the bedrooms in the Hotel Alexandra in Alger, and a ♂, its plumage wet from the heavy dew, was shot in the morning of September 15th in a thick wood near Tizi-Ouzou, Kabylie. It agrees entirely with other specimens from Algeria (Djebel Taya, Batna) and North Morocco.

***Tringa ochropus* L.**

Small flocks in River Sebaou near Azazga 21.ix. An adult ♀ showed some moult on body-plumage.

***Alectoris barbara barbara* (Bonn.).**

Numerous in the ravines and bush near Azazga. Birds of the year still moulting 21.ix. Autumn feathers are a little darker than in spring.

***Alectoris barbara spatzi* (Rehw.).**

A ♀ shot 24.x. at El-Kantara still moults some body-feathers. Fresh autumn feathers darker than in spring.

***Coturnix coturnix coturnix* (L.).**

Only seen a few end September near Tizi-Ouzou.

SHORT NOTES ON THE MAMMALS OF CYRENAICA.

BY ERNST HARTERT.

DURING the short time of my stay, less than two months, in Cyrenaica I concentrated myself on birds and butterflies, and was unable to make a useful collection of mammals; nevertheless, the following short notes may be of some interest.

I am not aware that there is any information about large mammals, at least not in modern times. Lions and leopards, not long ago common in Algeria, do not seem to have existed, nor do I know of the occurrence of wild pigs and of the Arui or Barbary sheep, *Ovis lervia*, or any of the larger species of *Gazella*. Wild pigs are, however, said by Haimann to exist in the mountains. The common gazelle, *Gazella dorcas*, is not rare in the south, as, for example, near Sheleidima. I saw several tame gazelles in Benghasi, and mutilated skins for sale. *Hyaena hyaena* occurs in the mountains, as, for example, according to information, within a day's march from Merg, and Festa has a young specimen. Of *Cynailurus guttatus* Festa saw a live specimen from Cyrenaica in Benghasi. Jackals (*Canis anthus* teste Festa) are common, especially near Merg, where Hilgert shot a fine specimen. Festa mentions two foxes—one he identified as *Vulpes aegyptiaca* (which is a subspecies of *V. vulpes*), from Cyrene, another he described as *Vulpes cyrenaica*, from Gheminez and the environs of Benghasi. *Genetta afra* and *Zorilla libyca* are mentioned by Festa. There are several bats, and more will doubtless be found, if not already in Festa's hands.

Hares are not rare in the bush-covered plain between Benghasi and Tokra, as well as in the woods near Merg: they are *Lepus barcaeus* Ghigi; while Festa identified a specimen from Sidi Ghilani east of Gheminez as *Lepus whitakeri*, and discovered a third form, not yet described, near Mechili (*in litt.*).

A feature of many places on the plateau, especially near Er-Regima and Merg, is the presence of innumerable mole-hills, sometimes almost touching each other and covering the whole ground. These are the work of *Spalax aegyptiicus* Nehring. This form was for the first time described from a specimen from Ramleh, near Alexandria in Lower Egypt, in the Berlin Museum, while Letourneux and Anderson had discovered it near Meryut, seven or eight miles west of Alexandria. Its stronghold is apparently Barka, from where it extends east to the neighbourhood of Alexandria and Ramleh. As is well known, *Spalax* lacks the external eye. This actual blindness of the little beast is well known to the Arabs, who call it abu-ama, or bu-amian, i.e. the "father of the blind." They have the stupid superstition that when they handle it they become blind themselves, and refuse to touch a specimen in any way. In the *Mammalia of Egypt*, by Anderson and de Winton, it is stated, from native information, that the animal is said never to appear on the surface; but this is not quite correct, at least not without exception. The entomologist Geo. Krüger saw and caught one near Merg, and I saw one for a moment above ground in the early morning,

also near Merg, but it disappeared at once, and digging in the rather hard red soil was impossible without a strong instrument.

In the mountain woods lives a fine wild cat, *Felis libyca cyrenarum* Ghigi, of which we procured a specimen near Merg.

A dormouse, *Eliomys cyrenaicus* Festa, very similar to and evidently a subspecies of *E. lerotinus*, has been described from Gheminez, but it lives also in the gardens of Benghasi, where I found a damaged, dried-up specimen.

The house-mouse is common in houses and in the gardens of Benghasi (Berka); Festa calls it *Mus musculus gentilis*. Other rodents of the genera *Dipodillus*, *Meriones*, and *Jaculus* are not rare, and doubtless the recent collections made by Festa will considerably add to the number of Cyrenaica species.

The porcupine occurs, but is said to be very rare.

Domestic animals flourish in Cyrenaica. Horses and donkeys abound, but mules are very seldom seen. Cattle are numerous but small, goats and sheep are seen everywhere; of the latter I saw only the fat-tailed kind, often with enormous tails. Since the terrible famine in 1892 the number of domestic animals has enormously diminished. Camels are of course the means of transport in the Sahara, but in Cyrenaica proper one does not usually see great numbers. The camels I saw were, however, rather fine, strong animals, for load-camels, but I saw no mehara or riding-camels.

It is obvious that the mammals of Cyrenaica have comparatively more peculiar forms—as it ought to be, considering that mammals are much less mobile than the birds—and that they are less pronounced of western affinities: *Spalax* is not found in Africa Minor, and the affinities of most of the other mammals are as much Egyptian as Algero-Tunisian; but we hope that Dr. Festa will teach us much more about these interesting questions when he has worked out his new material, the result of about seven or eight months in Cyrenaica.

The following is the meagre literature of Cyrenaican Mammals:

E. Festa, "Mammiferi, Missione Zoologica in Cirenaica," in *Bollettino Musei di Zool. ed. Anatomia comp. Torino*, xxxvi., No. 740. (20 species.)

Ghigi, *Memorie R. Accademia Sc. Instit. Bologna*, ser. vii., vol. vii., 1919–20.

Zavattari, *Atti Soc. Natural. Mathemath.*, Modena, ser. v., vol. vii., 1922.

Cornalia gave a list of animals collected by Haimann in Haimann's *Cirenaica*, 1882. I have not seen this book.

THE HITHERTO KNOWN BIRDS OF MAROCCO

BY ERNST HARTERT, ASSISTED BY F. C. R. JOURDAIN

SO far large parts of Marocco remain unexplored ornithologically: the whole eastern portion is unknown, except that Saby told us, that *Comatibis eremita* nested in a colony not far from Mahiridja in north-eastern Marocco. The Rif Mountains are unknown, except for some peeps into the hills near Tetuan by several Englishmen and by Vaucher. In the Middle Atlas Lynes collected most successfully about Azrou; the country around Tanger is fairly well known; observations and collections have been made in various places on and near the west coast, notably near Rabat and inland at Meknès, near Mazagan and on the Oum-er-Rbia; around Mogador; in the districts of Rehamna, Haha, Chiadma, inland to Marrakesh (chiefly Riggerbach), and in the south-western High Atlas by Dodson (as far east as Glaoui), Meade-Waldo and Riggerbach, but the greater parts of that great mountain range is still unknown. Boudarel collected as far south as Agadir, but very superficially, as far as birds are concerned. Not a feather is known from south of the Great Atlas. The richest collections known are those in the Tring Museum made by F. W. Riggerbach in western Marocco and in the south-western Atlas.

A list of all the literature on Maroccan birds by Jourdain and Hartert will follow after the end of this article, which we trust will be a useful basis for future workers, as it shows what is hitherto known in Marocco. The species which are known to breed, or of which we must suppose that they undoubtedly nest in the country, are marked with an *.

* 1. *Corvus corax tingitanus* Irby.

Widely distributed and common from Tanger (typical locality) to Mazagan, Larache and Mogador, on the Oum-er-Rbia, and found in the Atlas Mountains (Fenzou, Tamarouth). Breeds in large numbers in the forest of Mamora. Nests on trees and rocks, according to opportunity.

[*Corvus corone* is recorded by Drake, but probably in error.]

2. *Coloeus monedula* subsp. ?

Drake and Munn saw Jackdaws commonly near Tetuan, the latter in May. We have two skins in the preparation of Olcese, and labelled "Marocco," dates and sexes, as usual with Olcese's skins, not marked. As Jackdaws have not been seen near Tanger, they are probably from Tetuan, all Olcese's skins being from the wider neighbourhood of Tanger, not necessarily close to Tanger. The two birds are evidently summer specimens, being very worn; it is therefore impossible to say with certainty to which subspecies they belong, but they are apparently not *cirtensis*, which inhabits the gorge of Constantine in Algeria. A colony is said to exist in a natural rock arch 60 km. east of Marrakesh (W. B. Harris).

* 3. *Pica pica mauritanica* Malh.

An extremely local species, but not rare in certain suitable places near Mazagan and Mogador (Adamna, Achassin), Rabat, Forest of Mamora and Marrakesh. Menegaux received it from Agadir. Breeds, according to Jourdain, in colonies. Typical locality: Oran in north-west Algeria.

* 4. *Garrulus glandarius oenops* Whit.

Lynes found this form not uncommon and nesting in the woods near Azrou in the Middle Atlas. His specimens agree with those collected by Riegenbach and those taken by myself and Hilgert near Djelfa in Algeria, unless their wings are a little longer! Riegenbach collected 16 skins in the forests of the western High Atlas near Fenzou, Temerui, Tisi-Taletukiar (1,500 m.) and Tamarouth (6,000–7,000 ft.).

This form of Jay was first described as *Garrulus minor* by Verreaux, from the woods near Djelfa, but the name *minor* being preoccupied we must call it *oenops*, a name given by Whitaker to examples from Tilula and Enzel in the Great Atlas south of Marrakesh.

* 5. *Garrulus glandarius whitakeri* Hart.

So far only known in Marocco from the neighbourhood of Tanger, where it nests, but it must occur in suitable places in the Rif, as we found it in north-western Algeria, not far from Tlemcen. (Not recorded from Forest of Mamora).

* 6. *Pyrhocorax pyrhocorax* (L.) (subsp. ?).

Probably in all suitable rock-districts of Marocco: Tetuan, Djebel Mousa, near Azrou in the Middle Atlas, and sent by Riegenbach from Tamarouth, south-western Great Atlas, 6,000–7,000 ft.; wings from Tamarouth: ♂ 300, 310, ♀ 280 mm. Nesting.

7. *Pyrhocorax graculus* (L.).

Irby saw a bird at Apes Hill, northern Marocco, in 1877, of which he "thought he could distinguish the yellow bill." We have two skins in the unmistakable preparation of Olcese, supposed to come from Tanger. It is not known that Olcese ever had birds from anywhere else. As this species occurs in Spain, it might easily visit Marocco at times or it might live near Jetuan.

* 8. *Sturnus unicolor* Temm.

Riegenbach collected specimens at Mazagan, on Cape Blanco, and Chiadma, hinterland of Mogador. It nests on the precipitous cliffs of Cape Blanco. Widely spread, but somewhat local, from Tanger to Mogador and Agadir. Lynes found it common near Azrou, Dodson collected it at Fez, Mequinez, Marrakesh. The bill is blackish in autumn, yellow in the breeding season; in Marocco they begin to get yellow as early as January, and sometimes end of December, and after the breeding season in July, or even end of June, they begin to become black again. Whitaker's note in *Bull. B.O. Club*, vii. p. xvii, 1897, is somewhat misleading, but the description in his "Birds of Tunisia" is quite correct. It breeds (Jourdain) in buildings in towns and in trees. Also in Forest of Mamora.

9. *Sturnus vulgaris vulgaris* L.

A winter visitor only, extending its migrations (*at least*) as far as Mogador, where Escalera and Ratto collected specimens.

* 10. *Oriolus oriolus oriolus* (L.).

The Oriole nests in the woods of Marocco, as Meade-Waldo found it "swarming" in the Great Atlas, and saw "full-grown young" in mid-July. Not rare in Forest of Mamora, but Lynes did not notice it in the Middle Atlas; it is therefore probably local, as in Algeria.

* 11. *Coccothraustes coccothraustes buvryi* Cab.

[Favier records two Hawfinches from Tanger, where, according to Meade-Waldo, Olcese also received specimens—but it is possible that these Tanger specimens were visitors from Europe, which occur, exceptionally at least, near Alger and Tunis.]

Lynes found *C. c. buvryi* breeding and common in the Middle Atlas near Azrou, Meade-Waldo saw it once Sould Jedid. Riggensbach did not come across it in the southern Atlas.

* 12. *Chloris chloris aurantiiventris* (Cab.).

We have trade-skins collected by Olcese, from Tanger, Dodson collected a few in "North and South Marocco." Jourdain found it breeding in gardens at Rabat, Kenitrea, etc. It is common in the orange-woods of the Mehnila on the Oum-er-Rbia, where it breeds, and Riggensbach sent also a few from Mogador. Meade-Waldo does not mention Greenfinches, and Lynes found them absent from Azrou in the Middle Atlas. A bird of plantations and gardens, less in forests.

[*Carduelis linaria* is recorded by Drake as seen once !]

* 13. *Carduelis carduelis africana* (Hart.).

Seems to be common everywhere in Marocco, nesting in the mountains up to 6,000 ft.

14. *Carduelis spinus* (L.).

Irregular visitor in winter and early spring, but sometimes numerous near Tanger (H. Vaucher). Common in early spring 1892 near Tanger (Meade-Waldo).

* 15. *Carduelis cannabina mediterranea* (Tschusi).

Nesting, mentioned in all lists from Tanger to Mogador.

[*Carduelis cannabina cannabina* may occur as winter visitor, as it does in Algeria.]

* 16. *Serinus canaria serinus* (L.).

Evidently nesting almost everywhere in gardens and woods, in the Great Atlas as high as the limit of trees, near Azrou to 5,000–6,000 ft. and as far south as Ida (Boudarel).

* 17. *Erythrospiza githaginea* subsp. ?

Riggenbach sent a very worn adult ♂ from Tizi in the Great Atlas, shot 11. vi. 1904. Its bill is rather larger, about as in the Canary Islands form, wing apparently not over 85 mm., thus smaller than *zedlitzii* usually is. It would be interesting to have a series of measurable specimens, as it appears almost as if it was *amantium* or a form between the latter and *zedlitzii*. That the species has so far remained unknown to Morocco is, because it is a desert bird and the country south of the Atlas in Morocco is entirely unexplored.

* 18. *Rhodopechys sanguinea aliena* Whitaker.

On May 28th Dodson met with this representative of the Asian *Rh. s. sanguinea*, 5,000 ft. high at Glaoui in the Great Atlas, south-east of Marrakesh, and shot 1 ♂ and 2 ♀♀. The discovery of this bird was the most interesting one that could be made, but its presence in Africa Minor was recorded already in 1867, when Loche, under the name *Rhodopechys phoenicoptera*, described it from a skin which Buvry had brought from "the Tunisian frontier," and another "in very bad condition" from the neighbourhood of Zaatcha. Loche was a trustworthy naturalist, and these statements cannot be doubted. But Buvry's specimens (with the exception of a few duplicates in the Brehm collection) are in the Berlin Museum, and Stresemann and I have failed to find there a *Rhodopechys* from Algeria. Zaatcha is an oasis at the foot of the southern or Saharan Atlas range, about 36 km. west of Biskra. It is a small place now, and in 1849 was razed to the ground by the French for a rising against their rule, after it had held out against an army for fifty-two days, and the fight for Zaatcha was one of the bloodiest in the Algerian wars.

Here near Zaatcha are only low hills, which Rothschild, Hilgert and I searched in vain in 1909, and we doubt whether *Rhodopechys* lives there, but it might well exist on the higher mountains of the southern Atlas range, which are almost unknown to ornithologists—practically only the Djebel Mahmel is explored, where Dixon and Elwes, Koenig, Hilgert and myself, and Flückiger collected, and the latter visited also the Djebel Chelia and Ahmar-Khaddou. I also made two trips to the Dj. Mekter near Ain-Sefra—but all these were short excursions, so that the highest regions of the southern Atlas may still be called almost unexplored! As *Rhodopechys* is a mountain bird, it may still inhabit certain places in Algeria!

19. *Loxia curvirostra* (subsp. ?).

We have no knowledge of the occurrence of Crossbills in Morocco, except that Favier mentions having picked up a specimen in a dying state in 1855 near Tanger. (Irby, *Orn. Gibraltar*, sec. ed., p. 106, 1895.)

* 20. *Fringilla coelebs africana* Lev.

Cf. *Vög. pal. Fauna*, p. 127. This Chaffinch is common from the Middle Atlas to Mogador and the Great Atlas (Imintanout, Tamarouth, Imizen, Fenzou). It is probably also this form which nests near Rabat.

* 21. *Fringilla coelebs koenigi* Rothsch. & Hart.

Cf. *Vôg. pal. Fauna*, p. 128. Only known from the neighbourhood of Tanger, but probably found in the Rif, which is unexplored.

22. *Fringilla coelebs coelebs* L.

Said by Vaucher to nest in Tanger, but this requires confirmation, though the European Chaffinch is a winter visitor to North Marocco (S. Reid, Meade-Waldo), generally scarce, sometimes numerous.

23. *Fringilla montifringilla* L.

Has occurred near Tanger in 1845, according to Favier.

* 24. *Petronia petronia barbara* Erl.

Irby says common in sierras and rocky ground, nesting in May in holes of rocks. Jourdain found it fairly common on rocky ground south of Tanger. Lynes did not find it common near Azrou and obtained only 1 ♂, Dodson sent 5 ♂ ♀ from Glaoui, Great Atlas. Riegenbach never came across it, so it must be local. I have examined no specimens, but *suppose* the Maroccan form will be *barbara*.

* 25. *Passer domesticus tingitanus* Loche.

The Mauretanian House Sparrow is common in towns and villages from Tanger to Mogador. Hybridisation with *P. hispaniolensis* is apparently rare (unlike Algeria), but there can hardly be any doubt that Kleinschmidt's *Passer ahasver* from Marrakesh is a hybrid, and so is a male shot at Mogador 12.iv.1904 by Riegenbach. The crown is chestnut with a few grey edges (not the brownish ones of the autumn plumage), the sides are unstriped, and the rump is grey without black, as in *domesticus*.

It is remarkable that hybrids are so rare elsewhere and so common in Algeria (and Tunisia), but Meinertzhagen shot an obvious hybrid (between *P. domesticus biblicus* and *P. hispaniolensis transcaspicus*) at Beisan in the Upper Jordan Valley (see *Ibis*, 1921, p. 630!).

* 26. *Passer hispaniolensis hispaniolensis* (Temm.).

Also very locally distributed over Marocco, from Tanger to Mogador, but absent from many places. Common in the Mehuila and elsewhere near Mazagan.

* 27. *Emberiza calandra calandra* L.

A common bird in the plains and rolling corn lands, but evidently local and not ascending mountains to any great height: dependent on agriculture! Numerous near Tanger, Rabat, near Mazagan (Sidi Bouarfi, Rahamna, south-east of Mazagan, nesting in the Mehuila), but breeding as far as Shtida in Mtonga, south-east of Mogador, where Riegenbach shot a quite young bird 21.v.1904.

* 28. *Emberiza cirius* L.

Common near Tanger; Lynes found it rare in the plains and lower forests of the Middle Atlas; Whitaker: Marrakesh and Ras-el-Ain in summer; Meade-

Waldo : common throughout the Atlas region as high as about 5,000 ft. Riggenbach sent it from the Mehula on the Oum-er-Rbia, several places about Mazagan and Mogador, and from Seksawa in the Great Atlas.

* 29. *Emberiza cia africana* le Roi.

Cf. *Vög. pal. Fauna*, p. 2073. Lynes saw it twice at the base of the Middle Atlas. Whitaker received it from Zarakten and Tilula. Riggenbach found it breeding at Dacharat, Tizi Orcus, Fenzou and Tamarouth in the south-western Great Atlas. Irby saw it near Tanger, but Favier did not know it.

* 30. *Emberiza hortulana* L.

According to Favier common near Tanger on passage, and also nesting ; Messrs. Vaucher say it is a winter bird there. Riggenbach shot it 20.iv.1903 at Rehamna, south-east of Mazagan, 28.x.1900 at Mazagan, and collected 3 ♀♀ at Seksawa and Emsassen in the south-western Great Atlas in May and June.

* 31. *Emberiza striolata sahari* Levaill.

This species is found as far north as Marrakesh, where it nests. It does not, apparently, breed in Mazagan, but is of rare appearance there—Riggenbach shot a ♀ 30.xi.1902. It breeds commonly in Mogador, Shtida (Mtonga), and Imintanout in the westernmost Atlas. Meade-Waldo found it locally common in the Atlas. Menegaux mentions it from Agadir.

Maroccan specimens are rather richly coloured, but can be matched by Algerian and Tunisian ones, and this bird varies a good deal in depth of coloration.

32. *Emberiza schoeniclus schoeniclus* (L.).

Favier said he had met with it in December near Tanger, and Reid records it as common at Lake Masharalhadden. I have not seen his specimens, but there is a female in the British Museum shot by Olcese near Tanger which belongs to this form.

33. *Plectrophenax nivalis nivalis* (L.).

“ One was picked up dead at Cape Sparte,” Drake, *Ibis*, 1867, p. 427, no year, no date. Irby (*B. Gibraltar*, p. 111) saw the skin in Olcese's possession and says it was a female in fine plumage.

* 34. *Melanocorypha calandra calandra* (L.).

Abundant near Tanger. Whitaker mentions it from the Sebu river, Hawara, Ouled Aloo, and Dukalier. Meade-Waldo did not notice it nesting south of the Oum-er-Rbia, though abundantly locally north of the latter. Riggenbach only sent it from the plains near and south-east of Mazagan : Zauia Sidi-Abbes-ben-Omar, Ouled Farsh, Aounat, Rehamna. It is a bird of agricultural districts.

* 35. *Calandrella brachydactyla hermonensis* Tristr.

Riggenbach sent specimens from Ouled Farsh (doubtless breeding), Aounat and Djebel Cheddar near Mazagan, and a worn male from Shtida (Mtonga), south-east of Mogador. Whitaker received it from Uled Aloo, Mequinez, Oued Enger and Dukalier, but not farther south. (See *Vög. pal. Fauna*, p. 2078 !)

* 36. *Calandrella brachydactyla brachydactyla* (Leisler).

Short-toed Larks are common passing through on migration and also nesting in the Tanger Peninsula. Specimens sold by Oleese were *C. b. brachydactyla*, not *hermonensis* (= *rubiginosa* Fromholz). Like all Oleese's birds they were not dated, and we cannot say whether they were breeding birds or migrants, but it is probable that *hermonensis* does not range so far north, and that migrants and residents from Tanger and Tetuan are *C. b. brachydactyla*.

* 37. *Calandrella minor minor* (Cab.).

Riggenbach has never sent a specimen of this species. Meade-Waldo found it common on the semi-deserts north of the Atlas, and came across it locally throughout the country south of the Oum-er-Rbia. Whitaker received it from Mazagan and four other localities farther south. Messrs. Vaucher (*Rev. Franç. d'Orn.*, iv. p. 109. no. 61) say that it nests near Tanger, but is this not an error for *brachydactyla*, which they do not mention?

[*Ammomanes deserti algeriensis* is bound to occur south of the Atlas, but those regions are unknown. *Ammomanes phoenicurus arenicolor* also doubtless occurs, since we have specimens of this or an allied subspecies from the Rio de Oro !]

* 38. *Galerida cristata kleinschmidti* Erl.

Only known from the northern Peninsula, i.e. near Tanger, but some of Whitaker's birds from northern parts of Marocco may belong to it. Cf. *Ibis*, 1898, p. 602.

* 39. *Galerida cristata riggenbachi* Hart.

This is the long-billed Crested Lark of the middle parts of Marocco. Casablanca, base and lower altitudes of Middle Atlas, Mazagan to interior, south to Mogador. Also a very worn skin from Shtida (Mtouga) appears to belong to this race. According to Whitaker (*B. of Tunisia*, i. p. 255) there would be another race, near *G. c. macrorhyncha*, in the more southern districts, but our Mogador one is typical *riggenbachi*, and the Mtouga one, though rather pale for the latter, is much too rufescent for *macrorhyncha* and *arenicola*.

* 40. *Galerida theklæ erlangeri* Hart.

Found near Tanger and at Sehaf-el-Akabb and El Horush not far from Tanger.

* 41. *Galerida theklæ ruficolor* Whit.

Middle and southern Marocco, from Mazagan, the Oum-er-Rbia and Cape Bianco north to Mogador, Ida, and Seksawa at the foot of the Great Atlas. Must extend over great parts of Marocco, as it was found by Lord Rothsehild and me on the plain of Lalla Marnia, near the Maroccan boundary, in north-west Algeria.

* 42. *Lullula arborea* (? *harterti* Hilgert).

Woodlarks occur near Tanger on passage in Mareh (Favier), Capt. Savile Reid obtained some near Larache in winter. Jourdain and Congreve found them

fairly common in the Forêt de Mamora and breeding. Lynes found them abundant in the mountains above Azrou, but his specimens are too much worn to make sure about the subspecies. Meade-Waldo observed Woodlarks fairly common in the Great Atlas, breeding in July. Riggenbach never sent a specimen.

* 43. *Alauda arvensis* L.

Winter visitor near Tanger and Schaf-el-Akab. Lynes found Skylarks breeding abundantly near Azrou, but specimens so much worn that subspecies uncertain. Meade-Waldo and Riggenbach did not come across any. Jourdain says he heard its song between Casablanca and Rabat and near the Bou-reg-reg, but no specimens were taken. Menegaux mentions "*Alauda arvensis harterti*" (1 ♀ ad.!) from Fedhala, 1.iii.1912.

[*Alaemon alaudipes claudipes* was taken by Riggenbach at the Rio de Oro and is certain to occur south of the Atlas, in the southernmost quite unexplored regions of Morocco.]

* 44. *Eremophila alpestris atlas* Whit.

Discovered by Dodson at Glaoui, about 5,000 ft., found by Meade-Waldo on Tizi Gourza, up to about 10,500 ft., in the Great Atlas, and common above Azrou by Lynes. (Probably local above forest on most grass-covered plateaux.)

[*Eremophila alpestris bilopha* is bound to occur in the deserts south of the Atlas, as it—or a closely allied form—is found at Rio de Oro. Drake's note that it occurs near Rabat and Casablanca is not credible.]

* 45. *Anthus campestris campestris* (L.).

Recorded as a migrant at Tanger, but not very common, in the plains, but Lynes found it nesting in the plateau of the Middle Atlas; Whitaker quotes it from Central Morocco and Zarakten. Riggenbach sent only one single young male from Mazagan, shot 4.x.1901.

46. *Anthus trivialis trivialis* (L.).

Passes through on migration in spring and autumn, from Tanger to Mogador and Seksawa in the south-western Atlas.

47. *Anthus pratensis* (L.).

Migrant and winter visitor throughout winter months, but so far only specimens as far south as Mazagan.

48. *Anthus cervinus* (Pall.).

Two adult males collected by Riggenbach at Mazagan, 26.i.1903, and Mogador, 11.iv.1904, both red-throated, are the only records for Morocco. Not very rare during winter and on spring passage in Algeria and Tunisia.

49. *Anthus spinoletta petrosus* (Mont.).

(*Anthus spinoletta obscurus* auct.)

A skin of *A. s. petrosus* from Olcese, shot near Tanger (no date, but in winter plumage), is in the Dresser collection in Manchester. It has been mentioned by Dresser and Irby, and through the kindness of Drs. Tattersall and Coward, I have been able to compare it. Favier stated that this subspecies could always be seen in winter on the shore near Tanger, where, however, *A. s. spinoletta* might also occur.

50. *Motacilla flava rayi* (Bp.).

Two adult males were collected by Riggenbach at Sidi-Bousid, an hour south-west of Mazagan, 18.iii.1900. Whitaker received both sexes from Mazagan, April, Irby mentions it from Tanger.

51. *Motacilla flava iberiae* Hart.

Cf. *Vög. pal. Fauna*, p. 2097, 1921. We have the following specimens of this race: 2 fine ♂♂ ad. Tanger, Olcese coll., like nearly all Olcese's birds, no dates! ♂ ad. Mazagan (Sidi-Bousid), 18.iii.1900, Riggenbach coll. 2 ♂♂ ad. Mazagan, 17.iv.1901, Riggenbach coll. 2 ♂♂ ad. Rehamna, between Mazagan and Marrakesh, 20.v.1903, 23.v.1903, Riggenbach coll. Probably common during both migration periods, as all Yellow Wagtails nesting in the Iberian Peninsula are likely to pass through Morocco or Algeria. The white superciliary line which distinguishes this subspecies is obvious in all in front and behind the eye, except in the two from the Rehamna, in which it is only distinct behind the eye; such variations from the rule, however, occur; in Italy and north-east to the Herzegovina and Bosnia nearly all specimens lack the white superciliary line entirely, while in a few it is indicated or obvious behind the eye, and in one, shot near Florence in April 1917, it is continuous as in *iberiae*! Another question is whether this form nests in Morocco, as it does near Lac Fetzara in Algeria, and whether specimens nesting in north-west Africa differ from *M. f. cinereocapilla* and *iberiae*! (Cf. *Vög. pal. Fauna*, p. 2098.) Lozano mentions specimens from Mogador shot in August and September.

[*Motacilla flava thunbergi* Billb. recorded by Irby as passing through Gibraltar, therefore doubtless occurring in Morocco as a migrant, but no definite record.]

52. *Motacilla flava flava* L.

2 ♂♂ Tanger, 20.iv.1888. Olcese coll.

4 ♂♀ neighbourhood of Mazagan, 30.ix.1902, 30.x.1902, 12.xi.1902, 18.iii.1900. F. W. Riggenbach coll.

Whitaker received males from Casa Blanca, Mazagan, Karia-el-Habessi, and Isseremont "between March and May." Common from February 20th till April 20th, according to Irby.

* 53. *Motacilla cinerea cinerea* Tunst.

A winter visitor at least to North Morocco, but also nesting in the Middle and Great Atlas, and probably in all suitable localities, on mountain streams, waterfalls, etc. Riggenbach collected it only near Mogador, in November, and Aïn-Moussa in the Atlas, 22.iv.1905.

54. *Motacilla alba yarrellii* Gould.

According to Favier rare near Tanger, but probably common enough during migration. Irby obtained one, Dodson four during a stay of barely four weeks near Tanger, and we have a beautiful adult spring ♂ from there, bought from Olcese. Riggenbach sent two specimens from Mazagan, 2.ii.1903, 30.x.1900.

55. *Motacilla alba alba* L.

Passes through and winters in Marocco, from Tanger to Mazagan—received from Riggenbach from 29th September to 10th February—and we have an adult male from Seksawa, on the slopes of the Great Atlas, 19.iii.1905, with the tail-feathers in moult. Favier records it from Tanger from September to March.

* 56. *Motacilla alba subpersonata* Meade-Waldo.

Discovered by Meade-Waldo at Zrna on the Oum-er-Rbia. Riggenbach collected it on the same river from the Mehuila to Rehamna “32 hours south-east of Mazagan.” Lozano (*Mem. R. Soc. esp. Hist. nat.*, viii, p. 81, 1911) mentions a pair collected by Escalera not far from Mogador. It must be very rare and local there, as Riggenbach during about two years never came across it, and not even observed it anywhere except on the Oum-er-Rbia, and sent all specimens which he collected to Tring, nor, he assures me, is it found on the Oued Kseb.

* 57. *Certhia brachydactyla mauritanica* With.

Specimens from Marocco do not seem to differ from Algerian ones, but it must be admitted that only worn spring and summer birds have been examined.

Irby mentions only a single specimen shot near Tanger. Lynes found it common near Azrou, and Riggenbach sent skins from Temeroui, Tamarouth, and Azur Melloul in the south-western Great Atlas.

Apparently absent from the Forêt de Mamora (Jourdain). They are, in Algeria and Marocco, chiefly inhabitants of oak-woods, cork-oaks, *Quercus ilex*, and others, but in the oases of El-Kantara they live in the gardens of fruit-trees and date-palms!

(??) 58. *Tichodroma muraria* (L.).

In *Rev. Franç. d'Orn.*, Alfred Vaucher says that his brother Henri observed the Wall-creeper during his expedition of 1892, and that it nests there and is resident! Alfred Vaucher kindly wrote to me that his late brother, in 1892, made an expedition, unless he is mistaken in May, to the mountains near Tetuan forming the westernmost part of the Rif. As Henri Vaucher was a reliable observer and knew this species well from his native mountains of Switzerland, the observation—though not proved by specimens—cannot be doubted, but that it is resident can, of course, only be a suggestion, and probably that it nested was only a conclusion from the date when observed. From these almost unknown mountains Alfred Vaucher writes that he received *Pyrrhocorax pyrrhocorax*, *Accentor collaris* (!), *Cinclus*, *Monticola saxatilis*, and *Turdus torquatus*!! Unfortunately specimens are not available.

* 59. *Sitta europaea atlas* Lynes.

Cf. *Ibis*, 1920, p. 292. This Nuthatch is nearest to *S. e. hispaniensis*, but different again, having a slenderer bill. It was discovered by Lynes near Azrou, where it is not rare. According to Reid (*Ibis*, 1885, p. 243), Olcese obtained 5 or 6 Nuthatches from the "montañas" or low hills near Tanger; probably they belonged also to *S. e. atlas*. Neither Drake nor Irby observed the species there.

* 60. *Parus major excelsus* Buvry.

"Extremely scarce" near Tanger, according to Favier, but Meade-Waldo saw "plenty" there in February, presumably of this subspecies, which nests and extends from Morocco to Tunisia. Fairly common in the Forêt de Mamora (Jourdain). Common in the orange-woods of the Mehuila on the Oum-er-Rbia near Mazagan, not rare near Mogador, in the Rehamna, and at Seksawa and Tamarouth in the western Great Atlas. Lynes found it common in the lower and middle forest of the Middle Atlas, rare in the upper, and Meade-Waldo did not see many above the limit of the olive.

(The note in *Vög. pal. Fauna*, p. 2108, is misleading, as the outer aspect of the wing is blue in European and other Great Tits as well. It is true, however, that the wing looks as a rule darker blue in *excelsus*, the edges of the secondaries lack the green tinge, and the light bar is not greenish-white or yellow, but white! I cannot admit that mountain specimens run larger than Moroccan plain birds as Lynes suggested.)

In Seksawa young ♂ shot as early as 22.iii.1905.

* 61. *Parus caeruleus ultramarinus* Bp.

Appears to be common all over Morocco as far as trees grow in sufficient numbers: Tanger, Mazagan, Middle Atlas near Azrou, forest of Mamora, Oum-er-Rbia, Marrakesh, Great Atlas (Fenzou, Seksawa, Tamarouth), Rehamna—but not mentioned or received from Mogador.

Moroccan specimens agree with Tunisian and Algerian ones and vary individually, but not according to localities.

* 62. *Parus ater atlas* Meade-Waldo.

Discovered by Mr. Meade-Waldo in the Great Atlas, where it abounds in the moister woods, chiefly between 6,000 and 7,000 ft., "ascending as high as the limit of trees or scrub." Riegenbach collected a fine series near Tamarouth, 6,000-7,000 ft., and Temeroui in the western Great Atlas, and Lynes found it abundant from about 5,100-6,000 ft., and also below these elevations. The nests were all found in the ground. Riegenbach found the iris deep brown, feet mouse-grey, bill black. Wings: ♂ 67-69, ♀ 64-66 mm.

* 63. *Regulus ignicapillus ignicapillus* (Temm.).

Lynes (*Ibis*, 1920, p. 293) found the Firecrest common in the lower, middle, and upper forests of the Middle Atlas, near Azrou, where they breed and are doubtless resident. There seems to be no other information of the occurrence in Morocco.

* 64. *Lanius excubitor algeriensis* Less.

The dark grey Shrike is only known, in Marocco, from the neighbourhood of Larache, Tanger, Tetuan, where it is evidently not rare. The distribution is peculiar. It is evidently a form of the coastal region, being known from Tanger, Oran, Blidah, Alger, Lake Fezzara, and northernmost Tunisia (near Tunis town).

* 65. *Lanius excubitor dodsoni* Whitaker.

This is the common Shrike of the neighbourhood of Mazagan, Rehamna, Marrakesh, Mtouga and Mogador. The grey Shrikes from the low hills of Bataille and Dar-bel-Hamri in the environs of Rabat, observed by Jourdain, may belong to this form. Most likely this form is widely spread all over middle Marocco, for we have collected it at Lalla Marnia in Algeria, near the Maroccan boundary, and even 28 km. north-east of Tlemcen, where it was common. It occurs also in the middle parts of Algeria and Tunisia, between the countries inhabited by *L. e. algeriensis* (north) and *L. e. elegans* (south of the Atlas). *L. e. dodsoni* is intermediate between the two latter forms in colour as well, but nearer *algeriensis*, in fact some single specimens are somewhat difficult to distinguish. Wings of *dodsoni* 106-112, exceptionally 105 and 113 mm., therefore the same as *algeriensis*, but as a rule smaller than *elegans*.

This form does not ascend the mountains to any great elevation, but Meade-Waldo says he saw it up to 3,500 ft.

* 66. *Lanius senator senator* L.

The red-headed Shrike appears to be common in all suitable localities in the places explored, but it is scarce in extensive forests and does not range high up in the mountains. It nests near Tanger, is common in the gardens of Rabat, and not rare near Mazagan, Mogador, in the Rehamna, south-east of Mogador and as far south as Ida. Lynes found it common in the "brushwood" near Ito, but only saw it twice at Azrou. Riggenbach came across it only twice in the Atlas, once at Ichsertralet, on April 1st, 1906, probably on the lower slopes, where he shot an adult male, and once at Seksawa, 27.iv.1906. Meade-Waldo noticed it "migrating south over the mountains in July," a very early date for the southward migration.

* 67. *Harpolestes (Telophonus) senegalus cucullatus* (Temm.).

(About the generic name see Nov. Zool., 1920, p. 449.)

This bird is not rare in the neighbourhood of Tanger, especially, according to Irby, about a day's journey south. Near Rabat, Jourdain (*Rev. Franç. d'Orn.* 1921, p. 130) suggests that it might occur with *Lanius excubitor (dodsoni)*. He and Congreve think they saw it, and certain places are suitable. As this species is such a striking bird, especially in the spring, when it must be singing its very loud whistling song, and as it has no connection in life with *Lanius*, this must remain doubtful, and remains a mere suggestion. On the other hand, it probably occurs in many places along the coast of Marocco, since it inhabits again the neighbourhood of Mogador. Riggenbach shot a male at Adamna near Mogador, another at Tagouidert, south of the Oued Kseb, and Dodson at Ras-el-Aïn in the Haha country, south of the same river. Dodson shot it also at Marrakesh

city in May. This latter place is the most inland locality known. Otherwise it is only known from the coastal region of northern Tunisia and northern Algeria. Being a closely allied subspecies of *H. s. senegalus*, it doubtless originally spread north along the coast and never crossed the Sahara inland, thus following the "high-road" of bird migration, as Lynes calls that coast, to which I have several times called attention.

* 68. *Pycnonotus barbatus barbatus* (Desf.).

The "Bulbul" occurs locally in suitable spots (gardens, etc.) from Tanger to Mequinez ("Meknès"), Rabat, Marrakesh, Fez, the orange-woods of the Melhila near Mazagan, Ouled Farsh, south-east of Mazagan, Mogador, Seksawa in the Atlas. Meade-Waldo says it "abounds everywhere throughout the Atlas region, and ascends to at least 7,000 ft. in the moist woods." Generally it is not abundant "everywhere" in the mountains, but is rather local; it is fond of hills, but chiefly an inhabitant of gardens, scrub and trees, not of extensive forests, except on the outskirts. Dodson obtained it at Ras-el-Aïn, in the Haha country south of Mogador.

* 69. *Muscicapa striata striata* (Pall.).

The Spotted Flycatcher passes through on migration and breeds from Tanger to Mogador, and in the western Atlas Mountains at Imintanout and Seksawa, also at Azrou. It is interesting that the Spotted Flycatcher of the Atlas regions does not differ from the European race, while distinguishable forms are found on Corsica, Sardinia and the Balearic Isles.

* 70. *Muscicapa hypoleuca speculigera* Bp.

Lynes found this distinct form commonly nesting in the lower and middle forests in the "Moyen Atlas," in the neighbourhood of Azrou. Whitaker suggested that it also nests in the southern or Great Atlas, but this remains so far uncertain, as he did not distinguish the two subspecies. Doubtless all Pied Flycatchers breeding in Marocco must belong to *speculigera*, but specimens shot in May need not be nesting, but may be belated migrants, like those shot by Riggenbach at Aïn-Moussa by the end of April. The latter collector did not come across this species later in the southern Atlas, nor does Meade-Waldo mention it.

71. *Muscicapa hypoleuca hypoleuca* Pall.

(*Muscicapa atricapilla*)

Numerous passage migrant. Specimens examined from Tanger, the neighbourhood of Mazagan, Rehamna south-east of Mazagan, and Aïn-Moussa in the south-western Atlas.

72. *Phylloscopus collybita collybita* (Vieill.).

Common migrant and winter visitor, not breeding. Specimens from Tanger, neighbourhood of Mazagan, Seksawa in south-western Great Atlas. Lozano mentions two specimens shot in October near Mogador.

73. *Phylloscopus trochilus trochilus* (L.).

Also a common migrant, passing through in August and September, and no doubt later. If Favier says "November," and quotes no other month, this is misleading, as surely September is the principal month of the autumn passage. Irby said: "There is no doubt, although I did not find a nest, that this species breeds near Tangier." As there is no proof of this species breeding in Africa, I do not accept this statement; late birds, however, are sometimes observed. Lynes shot an adult ♀ "in beautiful fresh plumage" (speaking against its breeding!) near Azrou in the Middle Atlas. Riggerbach shot two females at Imintanout in the south-western Great Atlas, on May 12th, and a male at Dellain Diruchan in south-west Morocco. Near Mazagan it is chiefly common in September.

* 74. *Phylloscopus bonelli bonelli* (Vieill.).

This is the only *Phylloscopus* of which the nesting in Morocco has been proved. It is found on migration near Tanger and doubtless nests in north Morocco. Not noticed in the Forêt de Mamora, but Lynes found it abundant in the forests of the Middle Atlas, where it nests late, the young being seen abroad not till near July. Meade-Waldo says it is the most common wood-inhabiting Warbler in the high moister woods of the northern slopes of the Great Atlas. Riggerbach collected skins near Ibrehan, 1,500 m. high, in the southern Great Atlas, and on the Djebel Schorr in Rehamna, south-east of Mazagan, on May 11th, 1903. Everywhere more a hill-bird than in the plains, where it does not seem to nest.

75. *Phylloscopus sibilatrix (erlangeri)* (Beechst.).

The Wood-Wren evidently does not nest in Morocco, nor anywhere else in Africa. Loche talks as if it nested in Algeria and describes its nest and eggs, but this does not prove that he actually had found it nesting in the country, because, to make his book more complete, he often described nests and eggs of birds which he supposed to nest in Algeria. Neither Koenig, Whitaker or Erlanger found the nest in Tunisia, though Erlanger believed that it nested in the "oasis of Gafsa," which it most certainly does not. When I saw, heard, and shot this bird in the orange-woods of the Mehuila, near Mazagan, on the Oum-er-Rbia, I noticed that it did not utter its "shivering" or "whirring song," but only a short note of piping sounds; a similar observation was made by Meade-Waldo, who, at the meeting of the Brit. Orn. Club in May 1902, told us that he met the Wood-Wren "frequently" in the interior of Morocco, and that they never had the familiar whirring song as in Europe, but in the notes on Morocco in *Ibis*, 1903, he omitted to make mention of this species. Witherby made the same observation in Algeria, Ogilvie-Grant in Madeira. Erlanger named Tunisian birds (the type, unfortunately, an obvious albinistic, or rather yellowish, aberration!) *flavescens*, and this name being preoccupied, I called the supposed southern subspecies *erlangeri* (*Vög. pal. Fauna*, p. 516), type Morocco. Now, however, I doubt the distinctness of this form, because the brighter, more yellowish throat and upperside seem to be due to season, these colours becoming duller when the birds breed, and it is certain that the different notes are—as in *Phyll. bonelli*—merely a "seasonal modification," as Whitaker calls it

If *erlangeri* should be different, it could only be the south European race, not an African one.

Generally *Phyll. sibilatrix* is not numerous in Morocco. We have only vague statements that it has been observed at Tanger by Irby (while Favier did not see it), and by Meade-Waldo that he saw and heard it in Morocco, and the two beautiful males which I shot in the Mehuila, where a few others were seen, are the only Moroccan specimens I know of. Riggenbach never obtained a specimen, though he was on the look-out for it in the Mehuila. That specimens have been seen rather late in Africa, as for example a ♀ I shot at Ain-Oussera in middle Algeria, is no proof of their nesting, such late birds occurring among many species.

* 76 *Cettia cetti cetti* (Temm.).

Cf. *Vög. pal. Fauna*, p. 2141. Probably found in most suitable places, i.e. in thick undergrowth, especially among brambles near water, and often among reeds on dry ground. Favier mentions it from Tanger, but his idea, that it is there a passage migrant, is perhaps erroneous as it is rather a sedentary bird. This is also explained by Irby, who found it not rare in spring near Tanger. Jourdain observed it in the neighbourhood of Rabat, Mamora and Mequinez. I found it not rare in the Mehuila near Mazagan, and took eggs early in April. This is the only place where Riggenbach collected specimens for us. Lozano, however, found it near Mogador, and Dodson sent specimens to Whitaker from Fez, Marrakesh and Ras-el-Aïn, in latitude 31° N., in the Halia country south of Mogador. Neither Lynes nor Meade-Waldo makes mention of *Cettia*.

77. *Locustella naevia naevia* (Bodd.).

Occurs in northern Morocco in winter, and Vaucher (*Revue Franç. d'Orn.* iv. p. 111) records it as nesting and not rare in the marshes of Charf-la-Kab and Boucharem. The vast marshes of the Lower Sebou region require further investigation, and it is there where *L. luscinioides* might be expected. Riggenbach never obtained any kind of *Locustella*.

78. *Locustella luscinioides* (Savi).

Drake (*Ibis*, 1867, p. 427) makes the vague statement that Savi's Warbler is "rare" in Morocco. That it should occur is probable, as it nests in Spain and was found in Algeria more than half a century ago (though not since, because nobody visited the place where Salvin found it) by Salvin and Loche, and is probably nesting there now. Nevertheless that vague statement of Drake can hardly be accepted as evidence!

* 79. *Acrocephalus arundinaceus arundinaceus* (L.).

According to Alfred Vaucher very numerous in the great swamps of the "Charf-la-Kab" and Boucharem. It occurs, according to Irby, near Tanger. Riggenbach, not having collected in the great swamps, never came across it, nor most of the other reed-birds.

(? *) 80. *Acrocephalus scirpaceus* (Herm.).*(A. streperus)*

Hardly any information from Morocco. Favier and Irby have not observed it near Tanger, but Whitaker received two shot at Marakesh, in May. (The species probably nests in suitable places and passes through on migration.)

* 81. *Acrocephalus schoenobaenus* (L.).

According to Favier occurs on passage near Tanger. We have three specimens shot at Diabet near Mogador, on August 4th and 5th, by Riggenbach, and Lozano mentions others from August 17th and 21st from Mogador. (It is quite possible that it also breeds, as it seems to do in Tunisia and Algeria.)

82. *Acrocephalus aquaticus* (Gm.).

Drake says he shot it in March, and Lozano mentions a ♀ shot near Mogador on September 1st.

* 83. *Hippolais polyglotta* (Vieill.).

While there appears to be no record of *H. icterina*, this species is recorded by most writers. It nests near Tanger, in the Middle Atlas (Lynes), in the Great Atlas (Djebel Tafirt, 4,000 ft., Imintanut, Dellaïn-Diruihan near Mogador, in the Rehamna, and doubtless in many other places. Dodson obtained it at Ras-el-Aïn in Haha, south of Mogador. Like other species of the genus it is migratory.

* 84. *Hippolais pallida opaca* Cab.

Apparently a common breeder from Tanger, Rabat, Mequinez (Meknès), the neighbourhood of Mazagan, and the Rehamna south-east of Mazagan, to Marrakesh, Mogador, and Ras-el-Aïn in the Haha country south of Mogador. In the higher portions of the Atlas it has not been observed, neither by Lynes in the Middle Atlas near Azrou, nor in the Great Atlas, except a male shot by Riggenbach at Seksawa, on April 7th. Migratory, collected by Riggenbach in winter at Thiès, western Senegal Colony.

(? *) 85. *Sylvia hortensis hortensis* (Gm.).*(S. orphea orphea auct. antiqu.)*

Like a number of other species, only recorded as a migrant in spring and autumn by Favier, but probably nesting from Tanger to the Rehamna south-east of Mazagan, and perhaps even to Ras-el-Aïn in the Haha country, where Dodson shot it in June. A number doubtless also pass through on migration from Spain, but the winter-quarters were not really known, until Buchanan collected specimens in Zinder and southern Air, from which we may conclude that some winter in Hausaland.

86. *Sylvia borin* (Bodd.).*(S. hortensis auct. antiqu.)*

Passes through, but apparently not in great numbers. Lozano mentions a single male shot in September near Mogador, Riggenbach sent a pair he collected

at Seksawa, south-west Great Atlas, April 20th and 26th, 1906. Favier mentions it as a migrant near Tanger, where it also nests, according to Irby. I concluded—as I am now convinced, erroneously—from specimens shot about middle May in Algeria, that it nested there, and apparently the statements of its nesting in Tunisia are also merely due to late birds having been collected in May. Irby's observation requires confirmation. Vaucher does not mention the species, Whitaker had specimens from Marrakesh shot in May. (Irby made also very definite statements as to the breeding near Gibraltar, but his observations are not confirmed by Jourdain, Congreve, Stenhouse, and others.)

* 87. *Sylvia atricapilla atricapilla* (L.).

Both resident and migratory in Marocco, though very few definite observations as to nesting have been made known, in fact only from Tanger, Meknès, Azrou, and the Melhuila near Mazagan.

* 88. *Sylvia communis communis* Lath.

Both migrant and summer visitor. Favier, as in other cases, talks as of a migrant only near Tanger, but doubtless in error, and it nests according to Vaucher. Lynes found it common and breeding in various altitudes in the Middle Atlas near Azrou. Meade-Waldo, who must have often observed it, apparently forgot to mention it. Lozano enumerates specimens shot near Mogador from August 10th to September 9th. Riegenbach found it common on migration near Mazagan in September, and shot it in April, also at Fenzou in the south-western Great Atlas, in April, but did not prove its nesting anywhere. Also near Rābat and in Marrakesh only migrants observed.

* 89. *Sylvia melanocephala melanocephala* (Gm.).

A common bird in scrub country and at the edge of forests, and nesting from Tanger and Rabat to Mazagan, the Rehamna, and Mogador. It does not, apparently, range high in the mountains, for Lynes says it is absent at Azrou, and Riegenbach only shot one male at Iehserretalet in the Atlas on April 1st, which is too early for breeding. Boudard shot it at Agadir.

* 90. *Sylvia cantillans inornata* Tschusi.

The north-west African form of the Subalpine Warbler nests near Tanger (Vaucher), near Azrou in the Middle Atlas (Lynes), and in the Great Atlas up to considerable elevations, 3,000–7,000 ft. according to Meade-Waldo. Riegenbach collected males at Fenzou and Temeroui in the Great Atlas in the middle of April, and two females, apparently of this form, at Sidi Moussa near Mazagan, 15. ix. 1901. (*S. cantillans cantillans* might occur on migration.)

* 91. *Sylvia conspicillata conspicillata* Temm.

Evidently resident in suitable places from Tanger to Ras-el-Aïn south of Mogador, but not in high elevations. Lynes observed only a single male near Azrou, Meade-Waldo does not mention it as observed in the Atlas, Riegenbach sent one adult ♂ from Tiza, south-western Atlas, 10. iv. 1906. Dodson shot it at Ras-el-Aïn in June.

* 92. *Sylvia deserticola maroccana* Hart.

Like *Sylvia deserticola deserticola* in Algeria apparently only found in the southern Atlas and on the High Plateau, but not in the northern mountain Ranges. Meade-Waldo said that it "abounded in the cistus and broom scrub, above the forest, up to 9,000 ft.," in the Great Atlas, but he collected only one female at Tsauritz Entsaoutz, 4. vii. 1901. Riegenbach shot one male at Sek-sawa, 27. iii. 1906. No other specimens are so far available.

* 93. *Sylvia undata toni* Hart.

Nests near Tanger and is perhaps restricted to the northernmost hills, as already at Azrou it seems to be absent, Lynes not observing a specimen there.

* 94. *Agrobates galactotes galactotes* (Temm.).

Nesting from Tanger to Mogador, the Great Atlas, and evidently Ras-el-Aïn, where shot in June. These birds are migratory, and had already left Algeria during the second half of September 1920.

* 95. *Cisticola juncidis cisticola* (Temm.).

(The nomenclature of the North African and European forms of *Cisticola* has had to suffer several changes. In *Vög. pal. Fauna*, p. 611, I called the form from Africa Minor *Cisticola cisticola arquata*, having been led, by the scarcity of South European skins examined, to believe that one and the same form inhabited Spain and Italy, and recognising that the North African one differed from that of Italy. Witherby, however, first recognised that Spanish birds agreed with those from North Africa and differed from Italian ones; he therefore named the latter *C. cisticola harterti*. Stresemann (*Journ. f. Orn.*, 1922, p. 129) now discovered an older name, "*Sylvia juncidis*" Rafinesque 1810, for the Italian subspecies, so that the following forms must be recognised: *Cisticola juncidis juncidis* (Rafin.): southern France and Italy to Asia Minor, synonym *C. c. harterti*. *Cisticola juncidis cisticola* (Temm.): Spain, Portugal, Balearic Isles, north-west Africa, synonyms *C. c. arquata* (Müll.), *C. c. mauritanica* Whith., *C. c. jordansi* Tratz.).

Resident in north and south Morocco: Tanger, Casablanca, Kenitrea, forest of Mamora, Mazagan, Mogador. Favier's notes about migration of *Cisticola* require confirmation.

* 96. *Crateropus fulvus fulvus* (Desfont.).

A rare bird in the plains between Marrakesh and Mogador, near Marrakesh, and in the Rehamna. These open plains appear to have a very desert-like aspect, and the numerous bushes of *Zizyphus* seem to have attracted the *Crateropus* which in Algeria is a bird of the desert, south of the Atlas.

97. *Turdus pilaris* L.

Like other northern birds (Siskins for example) the Fieldfare usually winters in Central and South Europe, but occasionally crosses the Mediterranean and has been observed in "moderate numbers" in Tunisia, Algeria, and was observed in "abundance" by Meade-Waldo near Tanger in the spring of 1892.

* 98. *Turdus viscivorus deichleri* Erl.

Occasionally nests near Tanger (Irby), and was noted in the forest of Mamora (Jourdain), common in the Middle Atlas near Azrou, and in the High Atlas (Fenzou, Tamarouth, Metloss—Riggenbach). (Favier's note that they pass through Tanger on passage with the Song-thrushes requires confirmation!)

99. *Turdus philomelos philomelos* Brehm.

Unlike *T. pilaris* and *musicus* L. a regular winter visitor to Marocco, having been collected from Tanger to the neighbourhood of Mogador and Seksawa in the south-western Great Atlas from end October to end of March, the latest date recorded being April 2nd. All specimens sent by Riggenbach agree well with *T. p. philomelos*, not with *T. p. clarkei*.

100. *Turdus musicus* L.

(*Turdus iliacus* auct.)

Also, like the Fieldfare, an exceptional visitor, observed by Favier, Olcese and Meade-Waldo near Tanger.

101. *Turdus torquatus*.

Our knowledge of Ring Ouzels in Marocco is very unsatisfactory. Favier says that he met with them in small flights on passage near Tanger, in spring and autumn. Alfred Vaucher of Genève informs me that his late brother Henri shot three or four Ring Ouzels on the high mountains near Tetuan. Unfortunately these were sold (before 1900) to a dealer, and cannot now be traced. As they were apparently obtained in May, they may have belonged to the race nesting in small numbers in northern Algeria; this is a form of *T. t. alpestris*, but perhaps not typical. No material at hand to clear up this form!

* 102. *Turdus merula algirus* (Mad.).

I have only examined two Tanger specimens, both being *algirus*. Perhaps restricted to the Rif and neighbourhood of Tanger.

* 103. *Turdus merula mauritanicus* Hart.

Common in the southern Atlas range, Rehamna, Mogador and Mazagan, found by Dodson as far south as Ras-el-Ain. According to Lynes the Blackbirds of the neighbourhood of Azrou also belong to this race, and in that case Jourdain would probably be right in calling those from the neighbourhood of Rabat *mauritanicus*.

* 104. *Monticola saxatilis* (L.).

Observed near Tanger, according to Favier on passage, but probably nesting on mountains of Rif. Nests, according to H. Vaucher, in middle Marocco, but not observed by Lynes. Meade-Waldo says: "Not numerous, but breeding in all suitable places up to a great elevation, in Atlas. I saw it at an altitude of 10,500 feet." Riggenbach did not observe it.

* 105. *Monticola solitarius solitarius* (L.)

Evidently nesting from north to south: Tanger, Timoudint, Azrou, Rehamna, Great Atlas. There will doubtless be some migration, as there is in Algeria, where these birds are commonly seen in villages in the northern Sahara in winter.

106. *Oenanthe oenanthe oenanthe* (L.).

A bird of passage in autumn and spring: Tanger, Mazagan, Djebel Chedar Rehamna, Seksawa (Atlas), Mogador.

107. *Oenanthe oenanthe leucorhoa* (Gm.).

The large Greenland (and Iceland) form of the Wheatear, which was first named from a Senegal specimen, seems to pass along the west coast of Morocco in fair numbers as it winters in Senegambia, and Riggenbach shot half a dozen near Mazagan in October 1900 and 1901.

* 108. *Oenanthe oenanthe seebohmi* (Dixon).

This black-throated form, until 1898 only known from the Djebel Mahmel in Algeria (later found by Flückiger also on Chelia and Montagne nue), was collected by Dodson on the Great Moroccan Atlas near Tilula and Zarakten, by Riggenbach on the Azur Meloul near Seksawa; Lynes found it abundant on the plateau above Azrou.

[In the unexplored desert-land south of the Atlas *Oenanthe deserti homochroa* must occur, as it is common everywhere south of the Atlas, and Dalmas shot it at the Baie de Lévrier, Cape Blanco south.]

* 109. *Oenanthe hispanica hispanica* (L.).

A common breeder in suitable localities from Tanger to the Rehamna and the Great Atlas, also south to Ras-el-Aïn, where it was collected by Dodson in June. A migrant, not remaining in winter; doubtless Spanish specimens also pass through Morocco on passage.

(There are still ornithologists who express their opinion that the "Black-eared" and "Black-throated" Wheatears are different species. It seems to me that they have not read what has been written on the subject and that it is hopeless to try to convince them of the truth.)

* 110. *Oenanthe leucurus syenitica* (Heugl.).

Lynes found it not rare below the forest in the Middle Atlas near Azrou. Riggenbach collected a small series in the Rehamna in May, and on Djebel Tiza and near Emsassen in the Atlas. It must be local there, as Meade-Waldo only mentions having seen it on migration, on Djebel Bourzegane, which cannot be correct as these birds are not migratory. Favier says it occurs near Tanger; if this is the case, it remains to be seen whether specimens from Tanger belong to the North African form or are stray ones from South Spain, where *Oe. leucurus leucurus* is fairly common.

* 111. *Saxicola torquata rubicola* (L.).*(Pratincola rubicola* auct.)

Resident and in places common : Tanger, Rabat, Mazagan, Oum-er-Rbia, Shtida, Aounat south-south-east of Mazagan, Rehamna, Mogador, Atlas. Riggenbach sent it from Seksawa and Imintanout in spring; it appears, however, not to ascend high in the mountains. It was not found in the Great Atlas by Dodson; Meade-Waldo found it absent in the hills; Lynes did not come across it in the Middle Atlas.

112. *Saxicola rubetra rubetra* (L.).

Migrant from Tanger to Mogador. Riggenbach collected specimens at Mazagan in September, one ♂ in the Rehamna, 7.v.1903. All specimens examined are typical *S. r. rubetra*. (Jourdain saw a pair in the forest of Mamora end April.)

* 113. *Phoenicurus phoenicurus algeriensis* (Kleinschm.).

Lynes found this form abundantly breeding in the lower, middle, and upper forest of the Middle Atlas near Azrou. His specimens showed the racial characters in the shape of the wing quite clear; this seems to be the only difference, the colour differences not being constant. An adult male, Mazagan, 15.ix, and a female, Mazagan, 17.ix, have also clearly the wing formula of this subspecies; on the same days typical *phoenicurus* were also collected, but this is not too strange, as the Atlas Mountain race is also migratory. In the Great Atlas it has not been found, so far, but will certainly occur. It is very local in Algeria.

114. *Phoenicurus phoenicurus phoenicurus* (L.).

Common bird of passage : Tanger, Rabat, El Horush, Mazagan (very numerous second half September and first half October), Mogador, from where recorded by Lozano as early as 3.vii (!), unless it is a specimen of *Ph. ph. algeriensis*, which, however, is surely restricted to the mountains.

115. *Phoenicurus ochruros gibraltariensis* (Gm.).

Winter-bird. Common at Tanger, but very little information elsewhere. Meade-Waldo says he saw it "at the highest elevations in the Atlas"; Menegaux reports a specimen from Fedhala. Riggenbach sent ♂ ♀ from Mazagan (November), and a ♂ from the Mehuila inland of Mazagan (February). It has been queried whether it nests in Morocco, but there is no reason to suppose that this is the case.

* 116. *Diplootocus moussieri* (Olphe-Galliard).

Generally only nesting on mountains, and more in the south. Apparently only of irregular appearance in the immediate neighbourhood of Tanger; though by no means a migrant, descends in winter from its mountain-homes and is seen in places where it does not breed. Lynes found it common near Azrou, Middle Atlas, in spring and summer; Meade-Waldo records it from the Great Atlas from 3,500-9,000 ft.; Whitaker received it (May and June) from Amsmiz, Enzel, Zarakten, Tilula, Glaoui, Ras-el-Aïn, and Ecrú; it evidently nests also

on the hills near Mogador, from where Lozano received young in July. Riggenbach collected it in the Atlas at Fenzou and Temeroni, also at Ibrehan (8.v), Dellain Diruihan (31.v), Emsassen (10.iv), and on Djebel Chedar, 16 hours south-south-east of Mazagan (27.ii). It is common near Mogador in winter and at Agadir in April.

* 117. *Luscinia megarhyncha megarhyncha* Brehm.

(North-west African Nightingales are like Central European ones. In colour there is no difference, the size is the same! The wings of 14 males measure 80–86.5, of 8 females 80–82 mm. From this we cannot conclude that they are smaller than European ones. It is true that in Europe (in the Tring Museum chiefly specimens from Italy and Cyprus) the wings are sometimes, but not often, longer, ranging up to 89 mm., but we cannot possibly know that in our small series from Morocco and Algeria we have reached the maximum measure; moreover in Europe females have sometimes wings of 78 mm. only, which is perhaps the minimum, which is also not reached in our African specimens.)

Common and nesting in suitable localities from Tanger to the Mehuila in the Oum-er-Rbia, Meknès, Marrakesh, and probably the Great Atlas, though the dates on Riggenbach's labels are not conclusive, and there is no proof yet of nests found in the Great Atlas; common in the Middle Atlas.

118. *Luscinia svecica cyanecula* (Wolf).

The White-spotted Bluethroat is known as a somewhat scarce migrant near Tanger and evidently passes the winter in Morocco, not being known from the Senegal or other parts of West Africa. Riggenbach shot it on Djebel Chedar in April, at Mazagan in October and November, and once January 28th.

* 119. *Erithacus rubecula atlas* Lynes.

Erithacus rubecula atlas Lynes, *Bull. B.O. Club*, xl. p. 32 (Azrou); *Ibis*, 1920. p. 296.

Lynes found the Robin breeding commonly near Azrou, Middle Atlas. This form appears to differ in having the upper surface more olivaceous, almost with a greenish tinge ("olive-green" is too strong!), but as only very worn summer specimens were collected, this form requires confirmation by fresh examples! The bill is somewhat long. (Probably nesting in other suitable places in the northern Atlas ranges—Rif!—and Meade-Waldo says: "Common in the moister woods on the north slopes," viz. of the Atlas.) Birds supposed to nest near Tanger may belong to this form.

120. *Erithacus rubecula rubecula* (L.).

What are apparently all—or at least mostly—*E. r. rubecula* pass through northern Morocco on migration and winter in the country. Riggenbach sent it from Mazagan (September, October), Mehuila inland of Mazagan (March), Djebel Chedar (February), and Seksawa in the Great Atlas (20.iii.1905).

121. *Prunella collaris* (? subsp.).

Alfred Vaucher says, in litt., that his late brother Henri shot several specimens of the Alpine Accentor in the Rif Mountains close to Tetuan, and that these

were sold to Schlüter in Halle, not long before 1900. The present manager of the firm of Schlüter and Massen has not been able to find out what happened to these skins.

122. *Prunella modularis* (? subsp.).

Irby (p. 49) says that he has seen specimens of the Hedge Sparrow from the African side of the Straits of Gibraltar. That is all that is known about the occurrence in Marocco.

* 123. *Troglodytes troglodytes kabyloorum* Hart.

Wrens—apparently all of this race—nest commonly near Tanger. Jourdain found it breeding in Meknès. Whitaker received a male from Fez. Lynes found it common and, of course, nesting in the woods of the Middle Atlas near Azrou. Meade-Waldo found it “common enough in one tract of moist forest” in the Great Atlas, and “obtained only a single specimen after much perseverance”—perhaps not having small firearms or small charges for such small birds. Riggensbach sent two adult females, one from Fenzou in the Great Atlas, 12. iv, one from Tamarouth, 5. vi. Both are rather heavily barred on the sides, and Lynes says that “specimens from high altitudes appear to be more barred below.”

* 124. *Cinclus cinclus minor* Tristr.

Evidently very local in the higher mountains, as it is in Algeria. Hemi Vaucher found it not rare “in the mountains” during his trip of 1902, when he visited the mountains near Tétuan—so it was presumably there where he saw it, and we may look out for Dippers in the Rif, when it is accessible.

Meade-Waldo saw a number of Dippers on a branch of the upper waters of the Oued Amsmiz running down from the east of Tizi Gourza. He saw them up to an altitude of about 9,000 ft., and caught a nearly full-fledged young bird. To tell us to which subspecies Maroccan Dippers (or at least those of the Great Atlas) belong we have two males and one female collected by Riggensbach near Tamarouth in the Atlas, early in June. The slightly longer bill and brighter rufous chest seem to separate them from *C. c. aquaticus*, to which they are nearest, and I consider them to be the same as the Algerian *C. c. minor*. Lynes found it absent from the part of the Middle Atlas which he explored.

The distribution of the Dippers in south-west Europe is most peculiar. While a quite distinct form inhabits the Pyrenees, Witherby collected Dippers in the Cantabrian mountains which appear to be inseparable from *C. c. cinclus* of Scandinavia (!), and the few specimens I have examined from South Spain are neither the latter, nor *pyrenaicus*, but seem to be exactly like *C. c. aquaticus*! More material may prove them to belong to *minor*, which is very close to *aquaticus*. *C. c. minor* was originally described quite wrongly: Tristram said it differed only in size, probably comparing his single (!) small female with a male (or several males) of the Central European form, while he overlooked the rather slight distinguishing features.

* 125. *Hirundo rustica*

(The Swallows nesting in Marocco and Algeria average, as far as measured, smaller than European, and especially eastern ones, where the largest measure-

ments are commoner than in Europe; the long wings of Turkestan specimens—males mostly over 127—are, however, also found in Europe, where even 130 mm., but only as an exceptional outside length, occurs; in Algeria and Marocco wings of 127 mm. are apparently rare, and even in males they are generally only 121–124 mm. long. As, however, these measures vary very much, and only four undoubted breeding adults from Marocco and seven from Algeria have been measured by me, I do not feel justified in *naming* the form from Africa Minor. Such cases, where birds differ only in average longer wings, are always disputable; it is most desirable to call attention to them and to fully investigate them, but they should not be named, unless a large series has been compared. The gist of science is not merely to give names to forms, and this should be avoided if doubts exist.)

Swallows pass through Marocco in autumn and spring, but they also nest in (apparently all) towns and many villages from Tanger to Mogador and Ras-el-Aïn. Lynes found it common near Azrou, but neither Meade-Waldo nor Riegenbach mentions it from the Great Atlas; this may be an oversight, as it will most likely prove not to be absent from the towns of the Great Atlas, and probably ranges even south of the Great Atlas to Tarudant and the Sus country. Swallows are migratory in Africa Minor, as they are in Europe and western Asia.

* 126. *Hirundo daurica rufula* Temm.

Meade-Waldo observed several pairs nesting at Rabat, and it nests in Marrakesh, in the Great Atlas region, and at Ras-el-Aïn. Riegenbach sent a male from Djebel Tiza, 25.iii, and a pair from "Rhiat de Shishawa," 16.vi.1904.

* 127. *Delichon urbica*.

House Martins (probably *D. urbica meridionalis*) are said to nest frequently near Tanger by Favier, while according to Vaucher they are only birds of passage during the two seasons. Jourdain saw specimens near Rabat on April 21st. Whitaker received one shot at Tilula, 24.v. Drake has only a casual note that it occurs near Tanger, but gives no details. It is peculiar that we have no more information about the Martin in Marocco, as it nests in very great numbers in Algeria and Tunisia. Riegenbach has not sent a single specimen.

128. *Riparia riparia riparia* (L.).

Definite observations of nesting in Marocco are wanting, though Irby says that he "had no doubt" that they were nesting near Ras-el-Doura in northern Marocco.

Riegenbach shot an adult male on the Oum-er-Rbia, "32 hours south-east of Mazagan," on May 19th, 1903, which he saw in company with *Riparia paludicola mauritanica*, which nests there.

*129. *Riparia paludicola mauritanica* (Meade-Waldo).

(This is a most interesting member of the Maroccan avifauna, as it is really a tropical element in the country. In fact it is very closely allied to *R. p. minor* from Nubia and the Egyptian Sudan, while the other forms of *R. paludicola* inhabit tropical Africa.)

Meade-Waldo discovered this little Sand Martin on the Oum-er-Rbia, where it is common. Riggenbach also found it in the Mehulla, five hours from Mazagan, on the Oum-er-Rbia, in February and May, though during my brief stay there in April 1901 I did not see any. He found it nesting *as early as February*, and by the end of May it was common farther up the river, about thirty-two hours' riding from Mazagan. On June 16th old birds in full moult—including wings and tail—were not rare near Shishawa, inland of Mogador. That is all the information we have about this Martin.

130. *Riparia rupestris rupestris* (Scop.).

There does not seem to be any definite statement that Crag Martins breed in Marocco, but they possibly do, though Lynes did not find them in the Middle Atlas! According to Favier and Vaucher it is numerous at Tanger on migration, and it doubtless winters in Marocco. Riggenbach shot specimens eight hours' journey south-east of Mazagan on February 11th, near Mogador November 14th, and one at Emsassen in the Great Atlas on April 10th.

* 131. *Apus melba tuneti* Tschusi.

Information about the Alpine Swift in Marocco is not very plentiful. It migrates through Tanger (March-May and August-October) and nests there, as well as in great numbers at Meknèz, in buildings, also evidently on the plateau near Azrou, in the Middle Atlas. Riggenbach only sent one adult ♀ shot on May 27th in the Mtouga, south-east of Mogador, judging from the date probably breeding there.

(P. 834 of *Vög. d. pal. Fauna I* united "*Apus melba tuneti*" with *A. m. melba*, but I agree now that a paler, less brownish, race, breeding from eastern Algeria and Tunisia to Palestine and Persia (but not in Somaliland!), must be separated. Not all Alpine Swifts shot in Africa Minor, however, belong to *A. m. tuneti*; in fact, specimens shot by us and Hilgert near Biskra and in the Sahara south of Biskra in March are all true dark *A. m. melba*, and so is one shot in May at Gafsa in Tunisia by Hilgert. The specimen from the Mtouga is pale enough to belong to *A. m. tuneti*, though not quite so greyish as some other N. African breeding specimens; it is, however, probable that all Alpine Swifts nesting in Marocco belong to *tuneti*, while those passing through may be *A. m. melba*. It must be repeated that the winter quarters of the specimens passing through Africa Minor are not yet known!)

* 132. *Apus apus apus* (L.).

Black Swifts pass through on migration at Tanger, and according to Favier many breed there. Lynes also states that they nest in the plains near the Middle Atlas and stray to the mountains in summer, and Jourdain observed them at Rabat and forest of Mamora. I saw dark Swifts on migration south of Mazagan, in April. It is remarkable that Riggenbach never sent us a specimen.

* 133. *Apus pallidus brehmorum* (Hart.).

Evidently nesting throughout Marocco from Tanger to the Haha country south of Mogador (young, wings half grown, from nest, Mogador, 4.vii.1905),

but Meade-Waldo's sweeping statement "breeding everywhere" is too optimistic, at least Lynes did not find it in the Middle Atlas. Riggenbach sent skins from Azemour, Mazagan and neighbourhood, Cape Blanco, and Mogador. Specimens from Morocco exactly like those from Canary Islands.

* 134. *Apus affinis galilejensis* (Antin.)

The only definite localities I know of in Morocco are Mazagan and Marrakesh, where they nest in quantities under archways of houses and walls. They have been observed neither at Tanger nor at Mogador, nor in the High Atlas. Riggenbach sent a series from Mazagan, where they appear early in April and leave in the autumn. These birds agree entirely with specimens from Algeria, Tunisia, and Palestine, and are paler than *A. a. affinis*. Whitaker must accidentally have had very pale summer birds from Tunisia, when he found them paler than Moroccan (cf. *Ibis*, 1898, p. 607) ones, and he was in error when he believed the latter to be typical *A. a. affinis*, which is a tropical form.

135. *Caprimulgus europaeus europaeus* L.

Nightjars pass through Tanger on migration, and of these no doubt a certain number are typical *C. e. europaeus*. A male shot near Tanger by Oleese, wing 198 mm., is *C. e. europaeus*.

* 136. *Caprimulgus europaeus meridionalis* Hart.

Lynes found the southern form of our Nightjar breeding at moderate elevations near Azrou in the Middle Atlas, where they arrived about May 9th. Meade-Waldo says "breeding throughout the Atlas up to a great elevation." Riggenbach sent an adult male from Tamarouth in the south-western Great Atlas, shot 7.vi.1904, a dark specimen, but typical *meridionalis*, wing 181 mm.

(*C. e. meridionalis* can always be recognised by its smaller size. Far more than half the specimens (Meinertzhagen says 60 per cent.) of this form are much paler than *C. e. europaeus*; such pale specimens occur also among *C. e. europaeus*, but are much rarer; Meinertzhagen says about 30 per cent. are as pale as *meridionalis*, in any case the preponderance of pale specimens in *meridionalis* is striking when the series in the Tring Museum is laid out.)

* 137. *Caprimulgus ruficollis ruficollis* Temm.

This form of the red-necked Nightjar, the same as the one found in Spain, is common near Tanger both on passage and nesting. Jourdain observed it in the gardens of Chellia and in the forest not far from Kenitrea. Riggenbach sent a dark typical *C. r. ruficollis* from Cape Blanco and another from Imintanout in the south-western Great Atlas, shot 13.v. He also sent a male from the Rehamna, south-east of Mazagan, and a female from Djebel Chedar between Mazagan and Rehamna, both shot in April. These two specimens are paler than true *ruficollis*, but too dark, especially on wings and underside, for *desertorum*, which inhabits Algeria and Tunisia; both are, however, birds of the year before, still having some juvenile rectrices, and are moulting (tail, body)! Whitaker received a specimen from Marrakesh, and the Tring Museum has a specimen from the H. H. Slater collection, labelled "Wazan, Morocco, 12.vi.1887."

* 138. *Merops apiaster* L.

Passes through the district of Tanger in great numbers and nests as well. Evidently nests in suitable places in all parts of Morocco, though Lynes says it is absent from the neighbourhood of Azrou, Middle Atlas. Escalera collected it July 10th near Mogador, Riggenbach May 19th and 26th in Mtouga with eggs in nest, Dodson as far south as Ras-el-Aïn in Haha south of Mogador, at Fez, and Marrakesh. Meade-Waldo says he saw it in July "frequenting the highest mountains" and "migrating south" at night. At Tanger the migration begins again by the end of July; the latest date when noticed at Gibraltar was August 18th. We have, however, seen flocks at Alger during first week of September and September 16th near Azazga.

* 139. *Upupa epops epops* L.

A common bird in Morocco from Tanger to Ras-el-Aïn in Haha, south of Mogador, both on passage and breeding.

* 140. *Coracias garrulus garrulus* L.

Occurs both on passage and breeding from Tanger, Rabat (very common), Forest of Mamora, Middle Atlas, Meknèz, Marrakesh, to Mogador and the southern High Atlas, nesting in holes of trees as well, but chiefly in old walls, ruined buildings, city walls, and other holes. Particularly numerous at Meknèz and Marrakesh. Meade-Waldo says he found it breeding up to 6,000 ft.

[*Ceryle rudis rudis* (L.), sub nomine *Alcedo rudis*, is said by Carstensen, *Naumannia*, ii, 1. Heft, p. 77, 1852, to have occurred on the Tetuan River! There is also a statement of its occurrence in Algeria! Unless the specimen is found in some museum, this must remain doubtful, but it is not possible to leave such a definite statement unmentioned.]

* 141. *Alcedo atthis atthis* (L.).

Probably occurring sparingly on waters all over Morocco, where there is opportunity to nest, though Lynes quotes it as "absent" near Azrou in the Middle Atlas. Favier says it is found near Tanger from August to March, but not numerous, though more abundant near Rabat. We have specimens from Tanger from Olcese; Riggenbach sent a series from Mazagan, Mehuila, and Mogador (Oued Mogador, Oued Kseb). Whitaker mentions only a specimen from "Wed Enger." Meade-Waldo says: "Very common and breeding on the Wad Nyfys."

The wings of Moroccan specimens measure 74-77, once 78, once (Tanger) 79.5 mm. This form differs from *A. a. ispada* only in the slightly shorter wing, slenderer, usually more pointed and sometimes longer bill, and on an average paler underside, though this is not a constant character.

Favier's statement that Kingfishers are only found near Tanger from August to March must be erroneous. Kingfishers nest in Morocco, and are not migratory.

* 142. *Picus vaillantii* (Malh.).

Evidently resident in most, if not all, wooded mountain districts of Marocco. Rare near Tanger, "but common near Tetuan and in the province of Angera, especially among the short stunted trees which grow in the valleys about Jebel Musa" (Irby). Abundant in the lower, middle and upper forest about Azrou in Middle Atlas (Lynes). "Very common in the mountains. I used to see it far up on the mountain-sides above the limit of trees" (Meade-Waldo). Riggensbach found it at Fenzou and Ibrehan (1,500 m.) in the High Atlas; in the latter place fresh eggs 3. v.

* 143. *Dryobates major mauritanus* (Brehm).

Favier said: "Resident and common in the vicinity of Tanger, being found only in large woods." To this Irby adds that he did not find it "common" near Tanger, and that there are no "large woods" near that town, but that it is plentiful about Tetuan. Evidently Favier, as in other cases, meant by "vicinity of Tanger" a rather wide area. This woodpecker, however, cannot be rare somewhere not very far from Tanger, as there are a good many specimens in collections from Favier and Olcese. Vaucher mentions it from Larache. It is common in the forest of Mamora (Meade-Waldo, Lynes, Jourdain). Lynes found it "abundant" in the lower, middle, and upper forest near Azrou, Middle Atlas. Meade-Waldo says it is "very common throughout the Atlas." It is strange, in the face of this statement, that neither Dodson nor Riggensbach have sent specimens from the Great Atlas, nor is it known from the neighbourhood of Mogador and in the Haha country.

[The Lesser Woodpecker is not yet known to occur in Marocco.]

144. *Jynx torquilla torquilla* L.

A bird of passage near Tanger, its return passage beginning in August, and occasionally seen in winter. Probably found in many places, though Riggensbach sent only one shot near Mazagan 28.ix.1901. Whitaker received it only from North Marocco, but Escalera collected specimens near Mogador in August and September, and one 1.vii.!

[No *Jynx* is known to nest in Marocco; Lynes did not observe it in the Middle Atlas. Should it be found somewhere breeding, it would probably be *J. t. mauretunica* Rothsch.]

* 145. *Cuculus canorus bangsi* Oberh.

(Cf. *Vög. pal. Fauna*, p. 2191.)

This Cuckoo evidently propagates—probably in many places—in Marocco. It occurs near Tanger and Jourdain heard it (probably this form) a few times in the forest of Mamora. Lynes only once heard a Cuckoo (May 9th) near Azrou. Neither Whitaker nor Meade-Waldo mentions the species. Riggensbach sent five skins from Mtouga (16.v.), and Seksawa, Azur Meloull, and Fenzou in the Great Atlas (May, one 22.iii.). Escalera collected a "very young" ♂ near Mogador, 9.viii., which was apparently hatched there. That is all the information we have

about *C. c. bangsi*. Payton heard Cuckoos at Mogador, but there is no information about the subspecies.

[*Cuculus canorus canorus* probably occurs on passage, but we have no proof of it yet.]

* 146. *Clamator glandarius* (L.).

Occurs near Tanger, though apparently not very common. Henri Vaucher says it "nests," and he shot one as late as January. What Favier says about its migrations, i.e. that they pass over to Europe in January, February, and March, and return in June, July, August and September, is obscure, and cannot be correct. The species is evidently migratory in southern Europe, arriving early in March or end of February, and departing again early in autumn. It is said to have been seen (in a flock!) in January near the Lake of Masharalhaddar in N. Marocco (*Ibis*, 1885, p. 247). It is found commonly in the forest of Mamora (Meade-Waldo), but Jourdain saw only one or two there at the end of April. Lynes and Whitaker do not mention it in their lists, nor does Meade-Waldo mention its occurrence in the High Atlas. Riggenbach shot it December 12th "eight hours S.S.E. from Mazagan," on Djebel-Chedar (Aount) February 26th, near Mogador 25.vi. and 6.xii. Probably in the nesting season it is found only where Magpies nest, on the nests of which it depends obviously in Marocco, though there is not yet any proof of its laying in the country!

* 147. *Bubo (bubo) ascalaphus* Sav.

(The question whether *ascalaphus* is rightly considered to be a subspecies of *B. bubo* is not yet satisfactorily settled.)

Probably this owl or an allied race occurs in the unexplored parts of Marocco south of the Atlas. The only proof of its occurrence in the north is a specimen of the dark form killed at Cape Tres Foreas (Ras-Ouark) just north of Melilla, in the Spanish Territory, which we bought from Schlüter about 15 years ago. Riggenbach sent two females which he shot at "Cherarda" and "Kanāfa," south-east of Mogador, 4.iii. and 16.xi.1906. Both these are very dark specimens, like the one from the Rif country. The stomach of one contained parts of birds and dung-beetles.

* 148. *Otus scops scops* (L.).

Evidently in all wooded districts from Tanger to the Great Atlas. Lynes only observed and shot it once near Kenitrea. Riggenbach sent specimens from Boulaban and Seksawa in the Great Atlas. Neither Riggenbach nor Escalera found it near Mogador. It is migratory, though occasionally a few remain in winter, even in Spain.

* 149. *Asio otus otus* (L.).

Oleese obtained one in the hills near Tanger in the summer of 1884, where it also occurs according to Meade-Waldo. Dodson shot a female at Aïn-Embark, two days north of Fez, and Bondarel a female at Mogador. Lynes found a nest near Kenitrea!

(?*) 150. *Asio flammeus flammeus* (Pontopp.).*(Asio accipitrinus et brachyotus auct.)*

Evidently on passage through Morocco, but the only real evidence before us is the observation at Tanger and two skins sent by Riggenbach from Mogador 7.xi and 28.xi. According to Favier and Vaucher (*Rev. Franç. d'Orn.*, iv, p. 107) nesting near Tanger, but these observations should be confirmed, as the species apparently does not breed in Spain south of the Pyrenees.

(There is—Irby, *B. Gibraltar*, 2nd ed., p. 139—a wild story of Favier of the interbreeding of this species with *Asio capensis tingitanus*. This story is, as Irby puts it, “difficult to believe,” and I do not accept it, though it is strange what Favier could have meant by these birds with a “half yellow” iris.)

* 151. *Asio capensis tingitanus* (Loche).

Evidently quite a common bird locally: near Tanger, Fedhala, and Rabat, where it seems to be resident. Riggenbach sent an adult male from Ouled Farsh, “eight and a half hours S.E. of Mazagan,” 16.ii.1902. First mentioned as nesting near Tanger—as well as *A. flammeus*—by Carstensen in *Naumannia*, 1852!

* 152. *Athene noctua glaux* (Sav.).

Common in suitable parts of Morocco from Tanger to Mogador. Localities: Tanger, near Fez, Forest of Mamora, Rabat, Azrou, Mazagan and neighbourhood, Azemur, Mtouga, Rehamna, Mogador, Marrakesh, Tameshlot, Asendo in the Atlas. Meade-Waldo says “not common above 3,500 ft.,” nor did Lynes find it at higher elevations, but only in the lower regions of the Middle Atlas. (Irby's statement that the Little Owl of Tanger was “undoubtedly *C. noctua*” and not *glaux* is erroneous.)

* 153. *Tyto alba alba* (Scop.).

Barn-Owls are common in the neighbourhood of Tanger. Meade-Waldo said: “As elsewhere in Morocco, this species abounded throughout the foot-hills of the Atlas.” Besides from Tanger (Favier, Olcese, H. Vaucher), we have specimens from the neighbourhood of Mazagan and the orange-woods of the Mehuila on the Oum-er-Rbia, and from Shiadma, east of Mogador, where Escalera also collected specimens. They breed, of course, in Morocco and must be more or less resident, and not migratory, though Alfred Vaucher (who, strange to say, queries its nesting in Morocco) talks of its being commonest during the period of their migrations. About the coloration of Moroccan specimens see *Vög. pal. Fauna*, p. 1035, to which may be added that a skin from Favier, from the neighbourhood of Tanger, is so dark, that it might pass for one from Germany, i.e. *T. a. guttata*, while others from there are as snowy white underneath as British specimens.

* 154. *Strix aluco mauritanica* (With.).

Evidently only recorded proofs from northern Morocco. Near Tanger, Favier, Olcese, and Henri Vaucher collected specimens. Meade-Waldo quite correctly stated (cf. Irby, *Gibraltar*, p. 141) that the specimens were very grey and

large—the reason being that they were not *S. aluco aluco* L. but *S. a. mauritanica*. The statement of their migrations to and from Europe by Favier is very doubtful. Lynes twice saw owls near Azrou, which he took to be *S. aluco*, and they must have been of this subspecies. Jourdain and Congreve found this owl breeding in the Forest of Mamora and obtained eggs on April 23rd.

155. *Falco peregrinus calidus* Lath.

Riggenbach shot an adult male in moult in the Haha Province south of Mogador on November 20th, 1905, which I consider to belong to this subspecies, which inhabits Siberia and extends its migrations south to the Sunda Islands and even (rarely) to New Guinea, but also westwards to Central and South Europe, Egypt, and Tunisia. The white on the sides of the head is spotted with blackish and extends up to about 1 cm. from the eye, the moustachial stripe is in the middle nearly 1 cm. wide; the lower back and rump is much lighter than usual in adult ♂ *F. p. peregrinus*, though the bars of the underside are rather close and not very narrow, the underside thus being darker than usual in *F. p. calidus*. The wing measures about 315 mm., but this measurement is not quite exact, as the tip is slightly worn and the three outer feathers are old, the other remiges freshly moulted.

(*F. p. calidus*, the eastern form of the Peregrine, differs distinctly from *F. p. peregrinus* if a series is compared. It differs as follows: The white on the sides of the head extends up close to the eyes, though often about 1 cm. remains black under the eye, and often the white is spotted with black; consequently there appears a longer, and often narrower, moustachial stripe, though the latter does not extend further down on the sides of the throat. The underside has a whiter ground-colour and is usually less barred, the crop mostly unspotted, the middle of the abdomen as a rule not barred across, but with semi-cordate spots; under wing-coverts usually whiter. Lower back, scapulars, and upper wing-coverts lighter grey in freshly moulted birds, though even this is not always constant! Though all these characters vary, the sum of them enables us to distinguish the two forms in nearly every case. I admit that the Moroccan bird is not an over-typical *calidus*, but the amount of white on the sides of the head, the fairly white ground-colour of the underside, and light lower back and abdomen induce me to consider it to belong to *F. p. calidus*. It must also be considered that the latter is a mighty wanderer (the real "Peregrine") which migrates from its boreal regions in winter south to India and the Malayan Islands, and westwards to Europe and the Mediterranean, while the European Peregrines are not migrants, though in winter they stray about for food. I do not see that the name *calidus* must be rejected. The description of the male agrees fairly well, though the upper side of an adult bird is not "blackish brown," but we learn from Jerdon that the description was made from an Indian drawing, and in very worn plumage, before the moult, which takes place in winter (in the European race in summer and autumn), the colour gets rather brown—the Moroccan bird is in full moult and has among the fresh grey and black feathers of the back and wing-coverts some old ones (not juvenile ones!) which are brown! Latham described the "bhyri" (spelt "behree") of Indian falconers a name used in Latham's time and now!)

Riggenbach informed us that the Arab Chiefs knew and distinguished this Falcon from the others, i.e. *Falco biarmicus erlangeri* and *Falco peregrinus ptele-*

grinoides found in Marocco. This is quite natural, as it is larger than the latter and probably more powerful and dashing than the former—but if that is the case, viz. that the Arabs knew it, it must occur oftener in Marocco! In fact Peregrines different from *F. p. pelegrinoides* and *brookei* are said to occur in winter near Tanger—and in southern Spain. They may be large specimens of *brookei*, *calidus*, or even *peregrinus*, which seems to nest in the Pyrenees and might in winter straggle over Spain, though not being real migrants.

* 156. *Falco peregrinus pelegrinoides* Temm.

Nests in Middle and South Marocco, on the Oum-er-Rbia, Rehamna, near Mogador, on Djebel Tiza, and in the Haha country south of Mogador. Not rare, but obviously less numerous than *F. biarm. erlangeri*. Specimens have also been shot in North Marocco, somewhere in the neighbourhood of Tanger, but the form which nests there is evidently *F. peregrinus brookei*.

* 157. *Falco peregrinus brookei* Sharpe.

Nests in the Northern Peninsula of Marocco, about Tanger and Cape Spartel. Beautifully figured in Irby's *Orn. Straits Gibraltar*, 2nd ed.

* 158. *Falco biarmicus erlangeri* Kleinschm.

This Falcon nests near Tanger and is resident in suitable districts all over Marocco. Meade-Waldo says he "saw it on many occasions in the plains," and Lynes did not shoot specimens near Azrou, but Riegenbach sent it also, with eggs (30.iii.) and young about two-thirds grown (28.iv.) from the Djebel Tiza in the south-western Great Atlas. It also nests in Shidma, Rehamna, near Mogador, and in the Haha country south of Mogador, where it is particularly numerous, for example on the Oued Titsi. The moult of adults begins after the breeding season and lasts until September or October (cf. Nov. Zool., 1915, p. 179).

(It is strange that the Falcons of this group were so little understood; apart from their being mixed up by some authors with the totally different *F. p. pelegrinoides*, they were generally called *feldeggi* by British authors, who did not take the trouble to obtain skins of the real *feldeggi*, so that this remained unknown to them. Sharpe, *Handlist*, i, p. 274, 1899, mixed up *feldeggi* and *erlangeri*, which are so obviously different. In the *Cat. of Eggs, Brit. Mus.*, ii, pp. 299, 378, are enumerated 13 clutches of eggs as those of *feldeggi*, of which not a single one can possibly be of that form, as already stated by Reiser—fancy Volga, Tanger, Egypt, Fashoda! Dresser, *Eggs B. Europe*, 1910, figured true eggs from Bulgaria, and gave the distribution almost correctly.)

* 159. *Falco eleonorae* Gené.

Nests in great numbers on the island near Mogador and on the cliffs of the Haha province south of Mogador. (There are no proofs of its occurrence in Northern Marocco, nor on Cape Blanco, but as the species breeds in the Mediterranean it is not unlikely to occur north of Mogador, at least as a straggler.)

* 160. *Falco subbuteo jugurtha* Hart. & Neum.

Nests near Tanger and in the Middle Atlas, in the Middle and Lower Forests near Azrou. Meade-Waldo says "found breeding in the Atlas in July," without further details. Jourdain and Congreve observed it in the Forest of Mamora.

[If Favier's statement that Hobbies are crossing from Tanger to Europe and return in autumn is correct, these birds would probably be *F. s. subbuteo*, but there is so far no proof that I know of.]

161. *Falco columbarius aesalon* Tunst.

Reid and Favier quote the Merlin as a winter visitor to North Marocco.

162. *Falco vespertinus vespertinus* L.

Evidently only an irregular bird of passage near Tanger (and doubtless in other parts of Marocco, but there is no evidence), observed by Irby, Favier, and Olcese. Their appearance is connected with that of swarms of locusts, but these birds find enough Orthoptera even when locusts are not swarming.

* 163. *Falco naumanni naumanni* Fleisch.

Nests in Northern and Middle Marocco, being abundant in suitable localities, where old buildings, walls, ruins, towers give them opportunity for hatching their eggs, but seem to be absent from mountains and are not known nesting south of Mazagan, though they probably occur. Migrant even in North Africa, and doubtless passing through the whole of Marocco, even if not nesting in its southern parts. Nest always more or less socially.

* 164. *Falco tinnunculus tinnunculus* L.

The Kestrel is common and nests all over Marocco in suitable places. According to Favier (who, however, declares of every bird that it migrates to and from Spain!) and Vaucher there is also a strong migration observed in North Marocco. Vaucher also says that the resident birds are "très foncées d'un roux vif," which appears to be erroneous; nor are they paler as has been suggested: the brighter, darker, and paler coloration being due to the individual variation and age of plumage.

[*Falco cherrug cherrug* Gray.

The London Zoological dealer Castang, who used to import birds from Mogador, had a specimen which he said he had received from there, and which was sold to Lord Lilford. As Arrigoni had received a specimen from Tunisia, as it has occurred several times in Italy, and, according to Loche, once in Algeria, it is not an impossibility that it strays to Mogador, but considering how live birds are mixed up by dealers the occurrence in Marocco requires further confirmation.]

* 165. *Aquila chrysaetos occidentalis* Olphe-Gall.

Nests in the mountains, from the northern Peninsula, in the Forest of Mamora, near Azrou, in the south-western Great Atlas, and in the Haha country.

Riggenbach sent a fine adult male from Tizi Orcus, 1,200 m., shot on April 3rd, and one from Djebel Hadid, shot August 31st. The former had in stomach and gizzard remains of 2 *Alectoris* and 1 Rock-Dove. As the Arab name Riggenbach quotes "Emta." This name may be a local or Berber name; in Algeria, Tunisia, and Egypt, Eagles are called Ogab or Nissr (Nissr), the latter name in Algeria being generally applied to *Gyps fulvus*.

* 166. *Aquila heliaca adalberti* Brehm.

Nests near Tanger, or at least in the northern peninsula of Marocco, according to Irby, Favier, and Vaucher, who caught a parent bird on two eggs, which are in his collection. Meade-Waldo (*Ibis*, 1903, p. 197) saw it in the great plain-swamps of the "Wad-li-kous," the Ouad Lekkous of the French maps, south of Larache.

* 167. *Aquila rapax belisarius* (Lev.).

Favier says it occurs near Tanger, and this statement has often been repeated, and recently Vaucher made more definite statements, saying it nests there. There seems to be no other information except that Lilford got three live specimens from the dealer Castang in Leadenhall Market, "said to be from Mogador." Recently, however, Riggenbach sent three adult specimens from Rehamna and the Haha country south of Mogador. About the value of the subspecies *belisarius* I cannot add anything to what I said in *Vôg. d. pal. Fauna*, p. 1096. It is interesting, however (though cage-birds do not afford proof of plumages!), that the Tunisian specimen obtained by the late Carlo von Erlanger in 1897 is still in excellent health in Ingelheim, where I saw it as late as August 1922, and has not changed its pale plumage.

* 168. *Hieraaëtus fasciatus* (Vieill.).

Breeds from North Marocco to the Haha country south of Mogador and the High Atlas, where Riggenbach shot adults and took downy young on March 26th at Assmert Agadir. Meade-Waldo records two pairs as noted in the Forest of Mamora (1902). Vaucher took eggs at Larache and Boudarel obtained young from nest near Mogador in 1912.

* 169. *Hieraaëtus pennatus* (Gm.).

Also nesting from North Marocco (Tanger district) to south-west High Atlas, where Riggenbach shot a female and took its clutch of 2 eggs on Djebel Tiza, 30.iv.1906.

* 170. *Buteo ferox cirtensis* (Lev.).

Breeding and resident from Tanger to the south-west High Atlas (Djebel Tiza, young in down taken 27.iv.), Mogador and the Haha province. Jourdain and Congreve took eggs in the Forest of Mamora, April 23rd.

171. *Buteo buteo*.

Irby (and Favier) observed Buzzards which they called "*Buteo vulgaris*" crossing the Straits of Gibraltar, and the former says that they are abundant

on the Spanish side from November to the end of February. I have never examined a common Buzzard from North Africa; they are evidently rare there; the statement of Mr. Blanc that he had received 2 or 3 from Tunisia must remain doubtful as it is not probable that Blanc can tell a dark-coloured juvenile *eirtensis* from *buteo*. The birds that visit Marocco in winter are probably *B. buteo buteo*, but the Buzzards nesting in Spain require study!

* 172. *Circus aeruginosus harterti* Zedl.

This southern subspecies of *C. aeruginosus* nests in Marocco from the north (Tanger, Rabat) to the Rehamna, south-east of Mazagan, and it also winters in Marocco. Naturally it is confined, in the spring, to swamps and borders of lakes or rivers, and therefore local. A young bird shot by Riggenbach near Mogador 15.x. We have 13 adult and one young bird sent by Riggenbach, also 1 ♀ from Tanger (Olcese); all belong to *C. ae. harterti*.

[According to Favier, Marsh Harriers occur on passage to and from Spain. These birds might be *C. ae. aeruginosus*, but the status of the Spanish race is not yet settled; my suggestion that it belongs to *C. ae. harterti* requires confirmation.]

173. *Circus cyaneus cyaneus* (L.).

We have never received a specimen from Marocco, but according to Favier it occurs rarely—doubtless in winter—near Tanger.

174. *Circus macrourus* (Gm.).

One specimen from the neighbourhood of Tanger is in the Norwich Museum, and Favier states that it occurs there on passage. It is probably of regular occurrence in Marocco, as it is not rare in Algeria in winter and on migration.

* 175. *Circus pygargus* (L.).

Nests in North Marocco according to Irby, Favier, and Vaucher. Irby says, "near Lixus in Marocco we found, at the end of April, a regular colony. There must have been 15 or 20 pair on a marsh across the river." Doubtless, as stated by Favier, also on passage. Jourdain and Congreve found half a dozen pairs breeding near Rabat, also nesting near Kenitrea. Riggenbach sent a young bird shot in September in Haha, South Marocco.

* 176. *Accipiter gentilis*.

Nests in North Marocco (Favier, Irby, Drake, Jourdain). Unfortunately no skins available, so it remains an open question whether this is *A. g. gentilis* or a different subspecies! Eggs in Jourdain's collection are very small!

* 177. *Accipiter nisus punicus* Erl.

This closely allied subspecies is slightly paler on the upperside and slightly larger than *A. n. nisus*. Resident near Tanger and elsewhere in North Marocco, to Azrou (Middle Atlas). Observed in Forest of Mamora, 27th April. Probably also nesting in the orange woods of the Mehula on the Oum-er-Rbia, inland of Mazagan, from where Riggenbach sent us adult males and females in February

and March. Riggenbach also sent a fine adult male from Seksawa in South-West Morocco, shot 2.iv.1905.

* 178. *Melierax canorus metabates* Heugl.

Ibis, 1869, p. 153, Drake mentioned a specimen which he had shot near Mogador. It is not a stray bird in South Morocco, but apparently a not very rare breeder in South-West Morocco: Riggenbach sent adult and young specimens from the Haha province and Shiadma north-west of Mogador. Specimens agree with others from Abyssinia, Senegambia, Nigeria. This is one of the few interesting tropical birds which have extended their range into the palaeartic zone north of the Sahara.

* 179. *Milvus milvus*.

Red Kites occur in winter in North Morocco and nest, according to Favier, Vaucher, and Lynes, who found a nest near Azrou, the two young sitting outside the nest, 20.vi. Meade-Waldo records them also from the Great Atlas. Unfortunately I have not been able to examine a specimen from North-West Africa, but Loche said that Algerian specimens were smaller than European ones, which may be true or only an impression from memory. Jourdain saw Red Kites daily near Kenitrea. I saw some on the cliffs of Cape Blanco in April, which may have been still on passage. Riggenbach never sent us a specimen.

* 180. *Milvus migrans migrans* (Bodd.).

Nest in the whole of Morocco from Tanger to the Haha province south of Mogador. Great numbers also pass through the country on migration, chiefly in March and in September and October. This species is migratory even in North Africa. Boudarel shot it at Agadir.

* 181. *Elanus caeruleus caeruleus* (Desf.).

Said to be rare in the early spring and in autumn near Tanger, but common near Larache, where it breeds. Vaucher says that it is rather common in "the whole of Morocco," meaning of course where he has been. He took a clutch of 5 eggs. Olcese sold a lot of specimens from the neighbourhood of Tanger, apparently all spring birds. Riggenbach never came across it in the district of Mazagan or in the interior, but sent two adults, shot in March, from the neighbourhood of Mogador. First stated to breed in *Naumannia*, ii, 1, p. 76, 1852, and already mentioned by Beauclerk in 1828.

[Carstensen, *Naumannia*, ii, 1, p. 76, 1852, says that "*Naucerus furcatus*" occurred near Tanger once in 14 years! The statement is so definite, that one must mention it, but possibly the Senegalese *Naucerus riocouri* was meant, not the American *Elanoides forficatus* or *furcatus*? ?]

182. *Pernis apivorus apivorus* (L.).

* Passes through North Morocco on migration, both in spring and autumn. (Meade-Waldo records this species seen in pine forest in the Great Atlas in June!)

* 183. *Circaëtus gallicus* (Gm.).

Generally distributed. Nesting near Tanger, Larache, Forêt de Mamora, Middle Atlas, near Mazagan, Shiadma and Adamna near Mogador. July 25th Riegenbach still found young with wings only 27 and 34 cm. long in a nest at Adamna. Migratory, generally supposed to be absent or very rare in winter, but Vaucher says it is "sédentaire et aussi hôte d'hiver," which may be a generalisation of a few facts. As a rule not high mountain birds, but Meade-Waldo says "nests up to 7,000 ft."

* 184. *Pandion haliaëtus haliaëtus* (L.).

Recorded from North Morocco, where it nests in small numbers, while it is very common in the winter. "Sarcelle" observed it near Mogador.

* 185. *Gypaëtus barbatus barbatus* (L.).

Nests on the mountain ranges: Middle Atlas (Lynes), Djebel Tiza (Riegenbach, March, a young in the second year). No doubt many more localities could be added, if more of the Atlas ranges were explored.

* 186. *Neophron percnopterus percnopterus* (L.).

Observed in suitable places, where they can nest on rocks, from Tanger to the southern Atlas. (After visiting Andalusia in Spain the scarcity of Vultures over a great part of Morocco struck Mr. Jourdain.)

* 187. *Gyps fulvus fulvus* (Habl.).

Nesting in North Morocco, and apparently widely spread, but little information. Appears to be scarce except near mountains.

* 188. *Aegypius monachus* (L.).

Evidently not at all common, and only observed in North Morocco by Favier. "Quite a number of eggs were sent from a place roughly about 70 km. from Tanger, to dealers in Germany, taken from nests on trees. I have examined several of these eggs" (Jourdain, in litt.).

* 189. *Ciconia ciconia ciconia* (L.).

Nests in nearly all towns in great numbers on buildings and on trees, and being protected are very tame. How far south they breed could not be ascertained. Many pass also through on migration. Over 50 pairs were observed in one part of the town of Meknès (Mequinez) alone by Jourdain. Mentioned by Beauclerk in 1828.

190. *Ciconia nigra* (L.).

Regular migrant near Tanger, *teste* Favier. Also observed there in October by Irby, and five seen in January near Tetuan by Verner.

(*?) 191. *Platalea leucorodia leucorodia* L.

Reported by Favier from North Morocco, quantities seen near Larache in April by Irby. Whether nesting in Morocco not yet ascertained, but the

swamps of that country are not thoroughly explored. Payton observed it near Mogador.

* 192. *Plegadis falcinellus falcinellus* (L.).

Nests in North Marocco and probably other suitable localities in Middle and South Marocco, and passes through on migration. Specimens collected from Tanger south to Mogador, where it must nest somewhere near by, as Riggenbach sent a very young bird from the Sultan's garden, obtained 12.ix.

(Mr. Jourdain calls my attention to Irby's statement that the eggs he saw from Marocco were "pale bluish-green," which they are not, and which suggests that the eggs he got were not Ibis' eggs, but some Heron's.)

* 193. *Comatibis eremita* (L.).

The Bald-headed Ibis is said to have been obtained once near Tanger by Favier. Mr. Paul Saby sent us a specimen from North-East Marocco, not far from Mehridja, and he found a breeding colony east of Taza. It nests, or anyhow *used* to nest, near Dar-ben-Arousi, north of Rabat and on the Sale cliffs, where it is not seen now; it nests on the Cape Blanco north, in the Middle Atlas, where Lynes found it common at base and plateau, breeding on cliffs. It also nests on the Oum-er-Rbia, near Mogador, and on Cape Tafetneh in the Haha country south of Mogador. Meade-Waldo says he did not see it in the mountains, "but it does occur there," and he saw flocks in several places in the plains. (Alfred Vaucher says that his specimens from Rabat had the naked space on the neck more extended than in specimens from Syria. This is, however, not the case, and he probably compared badly prepared specimens or young from Syria.)

* 194. *Ardea cinerea cinerea* L.

Known to occur from Tanger to Mogador (Riggenbach, 14.ii.1904). Nests in the north and probably in other parts of the country, but not known how far south.

* 195. *Ardea purpurea purpurea* L.

Common and resident in swampy districts from the north to Mogador, but no definite statements about nesting-places. (Jourdain and Congreve saw nests of some large Heron in the reeds of the Laguna de Mehdiya near Kenitrea, which probably were Purple Heron's.)

196. *Egretta alba alba* (L.).

J. J. Walker, *Trans. Entom. Soc.*, London, 1890, p. 367, mentions that just north of Cape Negro, north of Tetuan, he saw "once or twice the majestic white heron, *Ardea alba* L., a very rare bird in these parts." Though Walker was an entomologist, his few notes on birds are most correct, and the expression "majestic" could only have been referring to *E. a. alba*, not to any other white heron of Marocco. "Once or twice" is, however, an abominable figure of speech in a scientific article, and surely an observer should remember if he saw the "majestic" bird once or twice. Irby saw one on the lakes of Ras-el-Doura in North Marocco in April 26th. There seems to be no other record for Marocco, and we have no specimens.

* 197. *Egretta garzetta garzetta* (L.).

Nests in North Marocco, not far from Tanger, and occurs all over the country in suitable swamps, south to the neighbourhood of Mazagan (September, December) and Mogador (November).

* 198. *Bubulcus ibis ibis* (L.).

The Buff-backed Heron nests from North Marocco to the Mogador district. Meade-Waldo found on a low rocky island in the sea, between Fedahla and Rabat, an "enormous colony," "absolutely covering the whole island," amounting to thousands; many were still building their nests on May 28th; on April 1st of the following year, 1902, the breeding-place was still quite deserted.

Many nest in the city of Marrakesh. First mentioned by Beauclerk in 1828.

* 199. *Ardeola ralloides* (Scop.).

In North Marocco nesting and common, but no information from other parts of Marocco.

* 200. *Nycticorax nycticorax nycticorax* (L.).

Common in North Marocco, where Vaucher found it a common breeder. Riggensbach sent it from the Mehuila on the Oum-er-Rbia, 13.iii. No doubt found (and probably nesting) farther south, but no records.

(??) 201. *Ixobrychus minutus minutus* (L.).

No information except that of Favier, who says that it is a rare bird near Tanger, arriving and passing on north in April, and returning during August to winter farther south. (No doubt nests in Marocco, but there appears to be no proof.)

* 202. *Botaurus stellaris stellaris* (L.).

A common bird in North Marocco in winter, according to Favier, but also nests there, at least as far south as Rabat (Irby).

203. *Phoenicopterus ruber antiquorum* Temm.

Flamingoes are numerous in suitable salt-lagoons from Tanger to Mogador, but apparently they do not nest in Marocco.

204. ? *Cygnus cygnus* (L.).

Swans are sometimes seen in numbers passing over Tanger, but rarely remain in the vicinity (Favier). As no specimens are available it is impossible to say whether these are *C. cygnus* or *olor*.

205. *Anser anser* (L.).

Greylags are numerous near Tanger, arriving during November and December, but evidently none remain to breed.

206. *Anser fabalis fabalis* (Lath.).

As common as Greylag near Tanger, on passage, according to Favier.

207. *Branta leucopsis* (Bechst.).

"Sareelle" (Payton), *Field*, 1891, i, p. 289, records two seen 3.xi.1887, near Mogador.

208. *Branta bernicla bernicla* (L.).

"Sareelle" (Payton) states, *Field*, 1891, i, p. 289, that he obtained it near Mogador 2.ii.1891.

209. *Tadorna tadorna* (L.).

Irregular in appearance near Tanger, between November and February (Favier).

* 210. *Casarca ferruginea* (Pall.).

Resident and migratory from Tanger to Mogador (Payton, Riegenbach), but few dates and localities on record. Evidently breeding in Middle Atlas (Lynes).

* 211. *Anas platyrhynchos platyrhynchos* L.

Common in winter and also nesting in the Tanger district, according to Favier, though Vaucher quotes it only as numerous winter visitor. Payton shot it near Mogador. Jourdain observed it on the lagoon of Mehdia (Mahediya) near Kenitrea (Kenitra), 25th April.

212. *Anas crecca crecca* L.

Common winter visitor in North Morocco. Payton shot it near Mogador.

213. *Anas querquedula* L.

Common winter visitor in North Morocco and near Mazagan. Seen on the lagoon of Mehdia as late as 25th April (Jourdain).

214. *Anas strepera* L.

According to Favier a scarce and irregular winter visitor near Tanger.

215. *Anas penelope* L.

According to Favier the most abundant duck near Tanger in the winter months. Riegenbach shot it near Mogador in November, where Payton observed it in great flocks in 1881.

216. *Anas acuta acuta* L.

Plenty in the vicinity of Tanger in winter. Dodson shot it at Hawara; Payton, Escalera, and Riegenbach, near Mogador.

* 217. *Anas angustirostris* Ménètr.

Common and breeding on larger waters in North Morocco. No information from the south.

218. *Spatula clypeata* (L.).

Sometimes in winter common near Tanger, according to Favier, but Vaucher considers it to be a rare visitor. Payton recorded it from Mogador, where Riegenbach collected specimens in November.

219. *Netta rufina* (Pall.).

Favier says he obtained one in 1835, and another in 1849, near Tanger.

220. *Nyroca ferina ferina* (L.).

Common in winter on lakes near Tetuan and near Tanger. (No records of nesting.) Payton shot it near Mogador.

* 221. *Nyroca nyroca nyroca* (Güld.).

Said to be most abundant in North Marocco, and nesting. Irby saw many hundreds at the lakes of Ras-cl-Doura, being even then in flocks. According to Favier they disappear "for a time in winter," and breed in June and July—probably, however, also in May. Riggenbach shot a female near Mogador on November 1st. Whitaker records specimens shot by Dodson near Casablanca and Azimur.

*

222. *Nyroca fuligula* (L.).

Very common some years in North Marocco (Tanger, Esmir) in winter. Riggenbach shot a male at Mogador 9. xi.

223. *Nyroca marila marila* (L.).

Though not actually *obtained* in Marocco, Irby says that it is of rare occurrence in the Straits of Gibraltar. "Sarcelle" (Payton) quotes it as occurring near Mogador, but there is, of course, no proof of this statement.

224. *Bucephala clangula clangula* (L.).

No *proof* of occurrence in Marocco, but Irby states that "they rarely occur about the Straits of Gibraltar in winter," and Payton records it from Mogador! As it has been found (exceptionally) on the Azores, there is no reason to doubt this statement.

[*Oidemia fusca fusca* (L.).

Quoted by Payton as occurring near Mogador, but there appears to be no proof, and Payton was not an ornithologist.]

225. *Oidemia nigra nigra* (L.).

In some seasons very common at sea and according to Vaucher on swamps near Tanger. Sometimes common at sea near Mazagan (Meade-Waldo beginning of August! Riggenbach). Mogador in winter and a ♀ shot 11. vi. 1905! (Boudarel, Riggenbach).

* 226. *Oxyura leucocephala* (Scop.).

Common and nesting in North Marocco, also in winter (Tanger: Favier, Olcese, Vaucher; Kenitrea: Jourdain).

227. *Mergus merganser merganser* L.

Near Tanger October 1862 (Favier), another found dead on the shore in winter 1869-70 by Irby.

228. *Mergus serrator* L.

Not actually obtained in Marocco, but according to Irby in some winters in considerable numbers in the Straits of Gibraltar, therefore bound to occur sometimes on the Maroccan shore.

229. *Mergus albellus* L.

According to Irby occurring in the Straits of Gibraltar in some winters, but no specimen known from Marocco.

* 230. *Phalacrocorax carbo maroccanus* Hart.

This form, which is somewhat intermediate between *lucidus* and *carbo*, but much nearer to the former, nests on the west coast of Marocco, on Cape Blanco (north) south of Mazagan, near Mogador—and probably other suitable localities.

[Probably the Cormorants which, according to Favier, visit North Marocco in winter, belong to another subspecies, possibly *P. carbo carbo*! I have, however, not examined any specimens.]

* 231. *Phalacrocorax graculus riggenbachi* subsp. nov.

Phalacrocorax graculus subsp., Hartert, *Vög. pal. Fauna*, p. 1395.

Bill as short as in *P. g. graculus*, but feet with more or less yellow, as in *desmarestii*—other differences see l.c.

Type of *P. g. riggenbachi*: ♀ ad. Cape Blanco north, 5.v.1902. F. W. Riggenbach leg.

I have hitherto hesitated to separate this form, because I have not seen an adult *male* in full plumage; as it seems that I shall never get one, unless I fetch it myself, I venture to separate this form, as it is undoubtedly neither *P. g. graculus* nor *desmarestii*. All specimens collected by Riggenbach, and one kindly sent me for comparison by Mr. Vaucher, agree.

This form inhabits the west coast of Marocco, where it nests on Cape Blanco north, and on the rocks and islets near Mogador, and doubtless other places. Probably the Shags which occur near Tanger partly also belong to this form, but

232. *Phalacrocorax graculus desmarestii* (Payr.)

occurs sometimes near Tanger. As there are breeding-places on the Balearic Isles, and possibly nearer, this is not astonishing; how far north and south *P. g. riggenbachi* extends cannot at present be ascertained.

233. *Sula bassana bassana* (L.).

Great numbers of Gannets winter on the coasts of Marocco from Tanger to Mogador. They seem to be rather common about Mazagan, where I saw them still in numbers first week of April.

234. *Hydrobates pelagicus* (L.).

According to Irby frequently seen skimming about the Straits of Gibraltar.

235. *Oceanodroma leucorhoa leucorhoa* (Vieill.).

Nine recorded from the Straits of Gibraltar near Tanger, and an adult male shot by Riggenbach at Mazagan 5.xi.1902.

236. *Puffinus puffinus mauretanicus* Lowe.

The western form of the "*yelkoun*" is common in the Straits of Gibraltar in autumn; according to Favier often picked up dead on the sea-shore.

237. *Puffinus kuhlii kuhlii* (Boie).

Abundant in the Straits of Gibraltar and often picked up dead on the shore (Irby).

[Monsieur H. Vaucher states that an Albatross, which he calls *Diomedea exulans*, was captured on the west coast of Marocco in 1885. He kindly sent me for inspection and presented to the Tring Museum the skull of this specimen, but I find that its beak agrees with that of *D. epomorpha* Less., the *D. regia* of authors, only known from the East Australian and New Zealand seas. Albatrosses have occurred in many out-of-the-way places, so that nothing is impossible, but the occurrence on the Maroccan coast is most unexpected.]

* 238. *Podiceps cristatus cristatus* (L.).

Common and breeding on lakes in North Marocco. At the lakes of Ras-el-Doura, at the end of April, Irby says the number of these Grebes was perfectly marvellous. They were in pairs, but had not yet commenced laying. It is doubtless found on other waters in Marocco, but there is no information. Riggenbach shot a female near Mazagan 26.i.1902.

* 239. *Podiceps griseigena griseigena* (Bodd.).

Favier said it was not rare in North Marocco, and bred there. Irby saw many on the lakes of Ras-el-Doura, and saw birds so young "that they must have been bred in the country."

240. *Podiceps auritus* (L.).

Irby saw a specimen obtained in the Straits of Gibraltar in October 1867.

* 241. *Podiceps nigricollis nigricollis* Brehm.

Evidently common at all seasons in North Marocco and nesting there. No records from the south, except a ♀ shot by Riggenbach near Mogador 6.xii.1904.

* 242. *Podiceps ruficollis ruficollis* (Pall.).

Resident and on passage in North Marocco, very common on the lakes at Ras-el-Doura. Lynes found it in June on a lake on the plateau of the Middle Atlas. Riggenbach collected specimens near Mogador in November.

243. *Colymbus stellatus* Pontopp.

Common in the Straits of Gibraltar in winter (Irby). Lozano mentions a specimen obtained by Escalera near Mogador!

244. *Colymbus arcticus arcticus* L.

Occasionally seen in winter in the Straits of Gibraltar (Irby).

245. *Colymbus immer* Brünn.

Occasionally seen in winter in the Straits of Gibraltar (Irby).

* 246. *Columba livia livia* Gm.

As elsewhere in North Africa, common in suitable localities from Tanger to Mogador. "Countless numbers," according to Payton. The "*Columba oenas*" mentioned as collected at Mogador by Lozano is most probably *C. livia*. Dodson also collected *C. l. livia* at Amsmiz and Isseremont in the south-western Atlas. Boudarel shot it as far south as Nknafa and Ida-on-Guelloul in the Haha province.

* 247. *Columba oenas oenas* L.

Evidently occurs in winter and nests in North Marocco, Middle Atlas near Azrou, and in the forests of the Great Atlas, where Meade-Waldo says it is "locally common."

* 248. *Columba palumbus excelsa* (Bp.).

(Cf. *Vög. pal. Fauna*, p. 1478.)

Evidently all specimens nesting in Marocco belong to this deeply coloured subspecies, which is, however, not a very distinct one. It is numerous between Tanger and Tetuan, in the Middle Atlas, near Kenitrea, etc., and in the woods of the south-western Great Atlas (Meade-Waldo, Jourdain, Riggenbach).

* 249. *Streptopelia turtur arenicola* (Hart.).

Migrant, but nesting in suitable localities all over Marocco, as far as explored. Boudarel shot it as far south as Ida-on-Guelloul in the Haha country.

The specimens which have been seen to cross the Straits of Gibraltar are probably *S. t. turtur*, but all examples which I examined are paler than European breeding birds.

[Irby, *Orn. Straits Gibraltar*, 2nd ed., p. 235, says that according to Mr. Drake "*Turtur senegalensis*, the Egyptian Turtle-Dove" is common in the southern part of Marocco. This appears to be an error, at least we cannot find where Drake said this. In *Ibis*, 1869, pp. 151, 153, he said that he saw two "*Turtur risorius*, Barbary Dove," in a cage, and was told that they were taken from a nest in the palm-groves of Marrakesh, but that he never saw any wild. Probably they were domestic Doves, and there is certainly no indication that they were *S. senegalensis phoenicophila*; probably this occurs in the palm-groves south of the Great Atlas, but not in the parts of Marocco which have hitherto been explored.]

* 250. *Pterocles orientalis* (L.).*(Pterocles arenarius* auct.)

Common and nesting in plains of central and southern Marocco : Casablanca, Rehamna, Mtouga, south-east of Mogador, Mogador, even on the lower slopes of the Atlas. First mentioned by Beauclerk in 1828.

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

Said to be common near Casablanca (Favier), and known to breed there, on several places in the plains (Meade-Waldo), and near Mogador (Vaucher).

[There is no record of *Pterocles senegallus* nor of *coronatus* in Marocco, but both will most probably occur south of the Atlas.]

* 252. *Burhinus oedicnemus saharæ* (Rehw.).

Evidently common in suitable plains from Tanger to Mtouga, south-east of Mogador, and of course nesting. I have not examined a series from Tanger, but all specimens I have examined from Mazagan to Mtouga are *B. oe. saharæ*, but the flocks that, according to Favier and Irby, cross the Straits of Gibraltar, would probably be

***Burhinus oedicnemus oedicnemus*.**

(South European Thick-knees (Stone Curlews) require further study. I should like to examine a series from Spain. A specimen from Corsica looks like *saharæ*.)

* 253. *Cursorius gallicus gallicus* (Gm.).

Appears usually in the summer (after the breeding season) near Tanger ; Meade-Waldo says, "seen in small numbers throughout the plains," meaning probably in sandy stretches only. Vaucher and Riggenbach shot specimens near Mogador, and the latter found it common in spring on the plateau of Mtouga, south-east of Mogador. Dodson found it near Ras-el-Ain in Haha, south of Mogador, and at Nzela-Swinia.

* 254. *Glareola pratincola pratincola* (L.).

Common in suitable places and breeding from North Marocco to Mogador (Escalera, Riggenbach). According to Favier and Vaucher many pass to and from Spain in the respective seasons.

255. *Charadrius hiaticula hiaticula* L.

Common on the shores and inland by rivers from August to April, from Tanger to Mogador. Breeding not ascertained. A specimen shot by Riggenbach in Mtouga 20.v.1904 is in winter plumage !

* 256. *Charadrius dubius euronicus* Gm.

Common on inland waters and breeding. Specimens examined from Tanger and Mogador. According to Meade-Waldo, "nesting in suitable places throughout the country and up to a considerable elevation in the Atlas,"

* 257. *Charadrius alexandrinus alexandrinus* L.

Common on migration and nesting. Recorded from North Marocco and Mogador, "El Mousourier" and "Skera Dukomphil" (Dodson).

258. *Charadrius morinellus* L.

According to Favier found near Tanger sparingly on its annual passage. (Favier's idea that they travel in company with *Cursorius gallicus* is absurd. Evidently he incidentally met them in the same places and together, from which he concluded that they "travel together").

259. *Charadrius apricarius* L.

According to Favier "abundant around Tanger in large flocks," from October to March. Jourdain saw it on the Bou-Reg-Reg in April and on May 5th. This is confirmed by Reid, Drake, and Vaucher, and Payton mentions Golden Plover from Mogador. (No specimens examined, therefore not possible to say if *C. a. apricarius* or *oreophilus*.)

260. *Squatarola squatarola squatarola* (L.).

Near Tanger in winter, and evidently all along the west coast in suitable places. Riggenbaeh shot it near Mazagan in December, Payton mentions it from Mogador, Jourdain saw it on the Bou-Reg-Reg May 5th.

(?*) 261. *Vanellus vanellus* (L.).

Common in winter in North Marocco. Payton mentions it from Mogador. Said to breed by Irby near the Ras-el-Doura, about 80 miles south of Tanger; this requires confirmation, but is possible, as the Peewit nests in southern Spain.

262. *Arenaria interpres interpres* (L.).

Evidently common on the west coast, being found near Tanger, Mazagan (as late as 2. v., and a young bird as early as 29. viii.), and Mogador.

263. *Calidris ferruginea* (Brünn.).

(Curlew Sandpiper.)

Doubtless more or less common on migration on the coasts of Marocco, but records only from Tanger (Favier, Olcese, Vaucher), Azemur (Whitaker), and Mogador (Menegaux, Lozano).

264. *Calidris alpina alpina* (L.)

and

265. *Calidris alpina schinzii* (Brehm).

Dunlins are common on passage and in winter in the neighbourhood of Tanger and near Mazagan and Mogador. Among the specimens from Tanger (without dates (!) ex Olcese) are both *C. a. alpina* and *schinzii*. In *Vög. pal. Fauna*, p. 1574, I did not separate these two European forms, after due consideration, but since then Mr. Schiöler has studied them and brought together beautiful series from their breeding places, shot in breeding season; of these he sent me

fine series for comparison, and I agree that the two forms must be separated: *C. a. alpina* larger and in nuptial plumage brighter (Sweden, etc.), and *C. a. schinzi* smaller and in nuptial plumage darker (coasts of Germany, Denmark, Holland, and apparently Scotland). Other forms require no discussion here, but I hope to discuss them elsewhere.

266. *Calidris minuta* (Leisl.).

Irby says it is found near Tanger from autumn to spring, and on the 26th of April he "fell in with vast flocks at Meshree-el-Haddar, in company with Dunlins and Ringed Plovers." Whitaker received it from Rabat, and Lozano from Mogador.

267. *Calidris temminckii* (Leisl.).

Common in winter near Tanger (Irby). No other records, but doubtless occurring elsewhere.

268. *Calidris canutus canutus* (L.).

The only notice we have of the occurrence in North Marocco is that of Favier, who said that it passes near Tanger in June. Payton mentions its occurrence near Mogador. (Riggenbach shot it on the "Rio de Oro.")

269. *Calidris maritima maritima* (Brünn.).

Uncommon in autumn and spring near Tanger (Irby).

270. *Philomachus pugnax* (L.).

No record except from Tanger: "Near Tanger on migration, crossing to Europe during March, returning in July, August, and September" (Favier).

271. *Crocethia alba* (Pall.).

(*Calidris arenaria* auct., Sanderling.)

Abundant near Tanger on migration, large flocks, observed by Irby early in April between Tetuan and Ceuta. Mentioned from Mogador by Payton, Lozano (Escalera coll.), and Menegaux (Boudarel coll.).

272. *Tringa erythropus* (Pall.).

According to Favier near Tanger in September and October. Riggenbach sent it from Mogador, shot in November.

(?*) 273. *Tringa totanus totanus* (L.)

and

274. *Tringa totanus robusta* (Schiöler).

Redshanks are numerous near Tanger on passage, and some remain to breed there, according to Favier! Though this requires confirmation, there is no reason why it should not be correct, as they nest in quantities in South Spain. Jourdain and Congreve saw some near Kenitrea as late as April, 25th. Irby found them at the lakes of Ras-el-Doura towards the end of April, when they "were evidently beginning to nest," but he did not prove this either. Riggenbach sent it from

Mazagan, Payton and Lozano quote it from Mogador. Our specimens from Tanger and Mazagan are *T. t. totanus*, while one from Tanger (Olcese coll., no date as usual) is *T. t. robusta*, the Iceland form, which probably occurs oftener in Marocco.

275. *Tringa nebularia* (Gunn.).

(*Totanus glottis* auct., Greenshank.)

On passage northwards in Mareh, April, and May, and returning about October, near Tanger (Favier, Irby). Drake mentions it from Rabat. Payton observed and shot it near Mogador.

276. *Tringa ochropus* L.

Not rare in winter and on migration near Tanger. Meade-Waldo saw one at Marrakesh on June 13th.

277. *Tringa glareola* L.

Though not mentioned by Favier, appears to be commoner in winter and on passage than *T. ochropus*. Irby saw "plenty" towards the end of April at the lakes of Ras-el-Doura and other swamps in North Marocco. Drake mentions it from Larache, Whitaker from Meskra Eroomla (April), Lozano from Mogador (August 23rd).

278. *Tringa hypoleucos* L.

Very common in winter and on passage in autumn and spring: Tanger, Kenitrea, Rabat, Skera-Dukomphil, Larache, on lakes and rivers, Mazagan, Mogador.

279. *Phalaropus fulicarius* (L.).

Drake, Favier, and Irby mention specimens shot near Tanger.

280. *Phalaropus lobatus* (L.).

Vaucher received a specimen shot on the "petite plage" at Tanger. (Correspondence with Mr. Vaucher has proved beyond doubt that he obtained this species, not the larger one.)

* 281. *Himantopus himantopus himantopus* (L.).

A very common bird, and nesting in suitable places. Localities: south of Tanger, Tanger, Meshrec-el-Haddar, Larache, Rabat, Mazagan, Mogador.

(?*) 282. *Recurvirostra avosetta avosetta* L.

Recorded from Tanger (Favier, Vaucher) and Mogador (Lozano). Nesting suspected, but no proof.

283. *Limosa limosa limosa* (L.).

The Black-tailed Godwit occurs on passage near Tanger "in abundant flocks" (Favier). Escalera collected 4 near Mogador in August. (Favier's idea that this species breeds near Tanger cannot be credited!)

284. *Limosa lapponica lapponica* (L.).

The Bar-tailed Godwit is also common at times in North Marocco. Riggenbach collected specimens near Mazagan in November. Payton recorded it several times from Mogador.

285. *Numenius arquata arquata* (L.).

A winter visitor in North Marocco, September to end of April: Tanger, Larache, Bou-Reg-Reg May 5th! Mogador (Payton, Lozano). (The idea of "a Spaniard who resided in Larache" that the Curlew nests there cannot be credited!)

286. *Numenius phaeopus phaeopus* (L.).

Regular migrant near Tanger, but according to Favier not staying throughout the winter. Riggenbach collected specimens near Mazagan, Escalera near Mogador, where Payton also recorded it.

287. *Numenius tenuirostris* Vieill.

Savile Reid found this species abundant in the Larache valley and at Meshrec-el-Haddar, in December 1884 or January 1885. They were in flocks from twenty to a hundred. Several specimens were obtained.

288. *Scolopax rusticola rusticola* L.

Occurs from November to March near Tanger, in small numbers, and is mentioned from Mogador by Payton.

289. *Capella gallinago gallinago* (L.).

Very numerous in North Marocco in suitable places from October to February and March, known to occur as far south as Mogador.

290. *Capella media* (Lath.).

Three records from Tanger (2 Drake, 1 Favier), 1 Mogador (Payton).

291. *Lymnocyptes minimus* (Brünn.).

(*Lymnocyptes gallinula* auct.).

Arriving near Tanger about November and being fairly common till February. Probably occurring on all swampy ground. Quoted from Mogador by Payton.

292. *Haematopus ostralegus ostralegus* L.

Not very rare near Tanger on passage, and observed near Mogador by Payton. Whitaker mentions one from Skera-Dukomphil. (Favier says it nests near Tanger, but this cannot be credited; the eggs which he sold as Oyster-catcher's were *Oedicnemus* eggs—Irby.) D'Aubusson observed a flock at the mouth of the Oued Mellah, north of Casablanca, where waders were frequent.

293. *Hydrochelidon nigra nigra* (L.).

Common enough on migration near Tanger on passage, returning rather late in spring, i.e. April and May. No observation of nesting, though nesting commonly in South Spain. Sarcelle (Payton) says he saw hundreds near Mogador early in May!

294. *Hydrochelidon leucoptera* (Temm.).

One shot at Sharf-el-Akab near Tanger in May 1869 (Irby). Several seen and one shot at Mogador in May (Payton).

* 295. *Hydrochelidon leucopareia leucopareia* (Temm.).

Said by Favier to be rare near Tanger, but Olcese sold a number being shot there, in winter plumage. Nest in "immense numbers" at the lakes of Ras-el-Doura between Larache and Rabat, in "vast colonies." Riggenbach and Escaiera collected specimens near Mogador in August.

* 296. *Gelochelidon nilotica nilotica* (Gm.).

By the end of April Irby found this species "in great numbers about the lakes of Ras-el-Doura." He was told by the natives that they nested there "a little later on in the season," which would be quite correct. No information from southern Marocco.

297. *Hydroprogne tschegrava tschegrava* (Lep.).

Favier obtained one near Tanger in February 1844, Irby observed one in the winter of 1869.

298. *Sterna bengalensis arabica* (Math.).

Occurs in the Straits of Gibraltar and is sometimes very common in spring and autumn, near Tanger and Larache.

(?*) 299. *Sterna maxima albidorsalis* Hart.

Irby mentions one obtained in the Straits of Gibraltar by Favier, and two from Tanger, December 1882, in J. J. Dalglish's collection. Olcese collected a number of specimens near Tanger in September 1888. They will doubtless occur in other places along the west coast of Marocco, as they must breed on the coasts of West Africa (and possibly in Marocco), having been collected at the Rio de Oro in June and Cape Blanco south (21° lat.) in May.

300. *Sterna sandvicensis sandvicensis* Lath.

"Near Tanger abundant in flocks from November to February" (Favier). "Very numerous at the mouth of the river, Larache, during April" (Irby). We have specimens in winter and summer plumage from Tanger, collected by Olcese. Riggenbach shot a specimen near Mazagan in November. Vaucher says it occurs along the coast, and he received specimens in June.

301. *Sterna hirundo hirundo* L.

According to Favier occurring in "large flights" near Tanger on migration. Riegenbach shot a young bird near Mazagan in November. Lozano quotes it from Mogador.

302. *Sterna paradisaea* Brünn.

Irby obtained this Tern in winter plumage in the Straits of Gibraltar. The Tring Museum has a specimen of the year from Olcese, labelled Tanger 21.viii. 1888; it was of course labelled "*Sterna hirundo*."

* 303. *Sterna albifrons albifrons* Pall.

Passing through on passage and nesting not far from Tanger (Favier). Nesting in great numbers on the lake of Boucharem near Larache (Vaucher). In August and September common near Mazagan; also middle of May in the Mehuila on the Oum-cr-Rbia east of Mazagan, therefore probably nesting not far off.

304. *Larus marinus* L.

Found in small numbers, mostly young birds, in the Straits of Gibraltar from January to March.

305. *Larus argentatus argentatus* Pontopp.

Said by Favier to be common during winter near Tanger; but did he know these Gulls perfectly?

* 306. *Larus argentatus atlantis* Dwight.

This is the form of "Herring-Gull" which replaces *L. a. argentatus*, except in winter, on the coasts of Marocco, at all seasons. Riegenbach found it breeding on an island at Mogador.

(*?) 307. *Larus fuscus affinis* Reinh.

Said to be common, especially in winter, on the coast and, according to Irby, "some few pairs remain to nest on the rocks of the African shore, laying about the end of April." These statements, however, require confirmation. Specimens examined from Tanger, Mazagan, Cape Blanco.

308. *Larus canus canus* L.

According to Irby common in some winters in the Straits of Gibraltar. No Maroccan specimen examined.

309. *Larus hyperboreus* Gunn.

The Glaucous Gull was once obtained near Tanger in immature plumage by Favier (Irby, p. 301).

[*Larus audouinii* Payr. was found by Lilford on the island of Alboran and occurs on the Spanish coast opposite Marocco; it will therefore probably sometimes visit the Maroccan shore.]

310. *Larus genei* Brème.

(*Larus gelastes* Keys. & Blas.)

Favier recorded a specimen obtained by him near Tanger in 1852. It must necessarily occur more often, as it breeds in southern Spain and has been found at Cape Blanco south (Baie de Lévrier), and is said to occur on the Sengal.

311. *Larus minutus* Pall.

Favier obtained one near Tanger in February 1854, and Irby saw some there, though irregularly, and in small numbers, in winter. According to Payton, at Mogador.

312. *Larus ridibundus ridibundus* L.

Said to be the commonest Gull near Tanger from November to March. Riggenbach and Boudarel found it common near Mazagan and Mogador from November to March. Lozano (p. 105) mentions two females shot at Mogador 6.viii.

313. *Rissa tridactyla tridactyla* (L.).

Common in winter on the north coast of Morocco, but there are no dates from South Morocco.

314. *Stercorarius skua skua* (Brünn.).

Favier recorded a specimen obtained near Tanger in December 1852. (According to Irby it occurs regularly, though not commonly, during winter in the Straits of Gibraltar.)

315. *Stercorarius pomarinus* (Temm.).

Favier recorded a specimen obtained near Tanger as far back as November 1845.

316. *Stercorarius parasiticus* (L.).

Richardson's Skua (*S. crepidatus* auct.) is mentioned by Favier as having been shot near Tanger in 1844. According to Irby it is not rare in winter.

317. *Stercorarius longicaudus* Vieill.

Recorded by Favier as twice obtained near Tanger, in 1846 and in October 1858.

318. *Alca torda* L.

Occurs near Tanger in winter, and has been obtained as far south as Mazagan (Boudarel).

319. *Uria troille troille* (L.).

Occasionally seen in the Straits of Gibraltar in small numbers in winter (Irby).

320. *Fratercula arctica grabae* (Brehm) (?).

Puffins occur near Tanger from November to March, and even, according to Favier, to April and May. I am not sure to which subspecies they belong, but apparently they are *grabae* or the still doubtful *meridionalis* (cf. *Vög. pal. Fauna*, pp. 1794-6).

* 321. *Otis tarda tarda* L.

Visits, from southern Spain, where it nests, the neighbourhood of Tanger and Tetuan, where it also nests, according to Vaucher, who obtained the eggs. Jourdain was assured that it breeds in the cornfields as far as Mequinez. How far southwards this species occurs, cannot yet be ascertained.

* 322. *Otis tetrax tetrax* L.

According to Favier there is migration from and to Spain in autumn and spring, near Tanger, but "great numbers are resident during the nesting-season." Irby found the Little Bustard common in North Marocco on all open low cultivated land. According to Meade-Waldo it "abounded in all the open spaces on the outskirts of the forest of Mamora." Riggenbach sent specimens from near Mazagan and from Ouled-Farsh (Ouled Fahs), not far from Mazagan. Lynes found it breeding in the plains at the foot of the Middle Atlas. Jourdain met with it near Mequinez (Meknès).

* 323. *Choriotis arabs* (L.).

(Cf. *Vög. pal. Fauna*, pp. 1806, 1807, 2222.)

Forest of Mamora (Meade-Waldo, *Ibis*, 1905, pp. 162, 163), near Rabat (Théry in litt., and eggs sent by Théry), Casablanca (Drake), south to Mogador, Ouled Bouziri, Mechra Chair, on the Oum-er-Rbia, at Beni-Aser, Kebila-Amar (Vaucher). Also in East Marocco, between Taourirt and Taza (Saby, in litt.).

324. *Chlamydotis undulata undulata* (Jacq.).

Irby (p. 260) saw one specimen which had been obtained near Tanger in August—and he adds "further south it is stated to be frequently met with." If Irby said he saw the bird killed near Tanger, there can be no doubt about the fact, but near Tanger it was about as much out of its range as the specimens met with at Malaga, Sevilla, or Italy. The hearsay that it was frequently met with further south is probably erroneous, as nobody has yet met with it in Marocco, though south of the Atlas it is sure to occur.

325. *Megalornis grus grus* (L.).

Not uncommonly observed near Tanger in winter. Meade-Waldo saw flocks on the plain south of the Oum-er-Rbia on June 9th; this date is so late that one cannot help suspecting they might have been *A. virgo*.

(?) 326. *Anthropoides virgo* (L.).

Of rare occurrence near Tanger; according to Favier, "passing northwards without making any stay, during March, April, and May." These statements

require confirmation, as the species nests in April and May, and it is quite possible that it does so in Marocco, as it does (or did) in Spain and Algeria.

327. *Rallus aquaticus aquaticus* L.

According to Favier on passage near Tanger. (There is no record, but it is quite possible that the Water Rail nests in Marocco.) Payton recorded it from Mogador.

328. *Porzana porzana* (L.).

Common near Tanger during passage. (No record of nesting, but quite possibly may nest.) Riggenbach obtained it near Mogador in November.

* 329. *Porzana pusilla intermedia* (Herm.).

Favier only met with "Baillon's Crane" once, in 1857. Irby obtained two near Tanger in the spring of 1877, and suggests it may be common. Vaucher says it is nesting and resident, in the great swamps of Boucharem.

[*Porzana parva* (Scop.) is not yet recorded from Marocco, but very likely will be found if the swamps are fully explored; the sportsman and travelling collector with little time does not get much chance to come across these quiet, more or less nocturnal birds.]

330. *Crex crex* (L.).

According to Favier on passage and occasionally in winter near Tanger.

* 331. *Gallinula chloropus chloropus* (L.).

Both on passage and nesting in North Marocco. Whitaker received a young bird from Marrakesh in May. Payton records it from Mogador. Riggenbach collected specimens in Adamna south of Mogador.

* 332. *Porphyrio caeruleus* (Vandelli).

Commonly nesting in North Marocco, in larger swamps, and according to Favier also on passage, but Favier was evidently very easily convinced that birds were on migration. Vaucher says these birds are resident. Olcese obtained it near Tetuan on May 22nd.

333. *Porphyrio alleni* Thomps.

On December 26th, 1902, Riggenbach shot an adult female at Ouled-Aissa 6½ hours south-west of Mazagan. That is the only record for Marocco, but there may be swamps in southern Marocco where this bird is more or less resident; it is, however, remarkable that in December 1902 a specimen was also obtained near Bizerta, in Tunisia, and yet another near Catania, Sicily, on December 4th, where it is said one was also seen in January 1903! (cf. *Vög. pal. Fauna*, p. 1850).

* 334. *Fulica atra atra* L.

Commonly breeding and on passage : Tanger, Tetuan, Azemur, Oum-er-Rbia, Mogador.

* 335. *Fulica cristata* Gm.

Also common in North Marocco, about Tanger (though not mentioned by Vauelher), and especially nesting in great numbers on the lakes of Ras-el-Doura between Larache and Rabat (Irby).

* 336. *Turnix sylvatica sylvatica* (Desf.).

Quite common near Tanger, and nesting. Also nesting near Mazagan and Cape Blanco north, as well as Mogador. Specially found among palmetto (*Chamaerops humilis*).

* 337. *Alectoris barbara barbara* (Bonn.).

Appears to be more or less common and resident in all suitable districts : Tanger, Larache, foot-hills of Middle Atlas, Mazagan, Oum-er-Rbia, Rchamna, Oued Djedida, Mogador, Ouled Farsh, southern or Great Atlas (Seksawa), Haha country south of Mogador as far as Ras-el-Aïn at least, also North-East Marocco. First mentioned by Beauclerk, 1828. (South of the Atlas *A. barbara spatzi* or maybe another allied form is to be expected.)

* 338. *Francolinus bicalcaratus ayesha* Hart.

First mentioned by Carstensen, *Naumannia*, ii, 1852, as occurring in Marocco as "*Perdix francolinus* (im Innern !)." The next mention is by Drake, *Ibis*, 1869, p. 150, who "saw two birds alive in the possession of Mr. Smith, the English Vice-Consul, which were evidently some kind of Francolin," etc. Under its correct specific name it appears to have been recorded first by Reid, *Ibis*, 1885, p. 251, who mentioned specimens sent alive from Mogador and Casablanca ! It is also said to occur near Rabat, from where Meade-Waldo received live specimens. Extraordinary as it seems to be, no collector has ever come across this Francolin in Marocco, all specimens known being birds that died in captivity in Marocco or England. When I was camping on the Lower Oum-er-Rbia, two Spaniards, who were camping near by, told me they had shot two Francolins, and promised to send them to me—instead of which came the sad news that they had already been plucked by the cook ! In spite of all entreaties Rigggenbach never succeeded in obtaining a Francolin in Marocco, and in fact he told me there was no such bird, the name being applied to the Lesser Bustard, *Otis tetrax*. In this he was evidently wrongly informed, as quite a number of specimens were sent some thirty years ago and before and afterwards from Mogador to Castang in Leadenhall Market and probably other dealers ; nevertheless the bird must be very local and rare, or some of the collectors, especially Rigggenbach, should have come across it. Cf. *Vôg. pal. Fauna*, p. 1926.

* 339. *Coturnix coturnix coturnix* (L.).

Quails are common on migration, in winter, and nesting in northern Marocco, southwards to the Plateau of the Middle Atlas near Azrou and the Valley of Tigriga, near Mazagan and Marrakesh, and probably further south.

* 340. *Numida sabyi* Hart.

Meade-Waldo was presented with living examples of a Guinea-fowl said to be from Zair (Zaer), and he heard their cries repeatedly in or near the forest of Mamora, but he did not compare the specimens. The first actually to send a specimen was Paul Saby, who had shot it near Oulmès, and who informed me that it was only found between the rivers Bou-Reg-Reg and Sebou; Zaer is just west of the Bou-Reg-Reg. This is evidently the Guinea-fowl which the Romans nearly 2,000 years ago used to get from Numidia from traders of Carthage, and it must formerly have been widely spread in Africa Minor. Cf. *Bull. B.O. Club*, xxix. p. 86; *Vög. pal. Fauna*, p. 2006.

[*Struthio camelus camelus*

There is no trustworthy information about the occurrence of Ostriches in Marocco, but the probability is great that there used to be some south of the Atlas, and that they are no longer found there. In *Proc. Zool. Soc. London*, i. p. 145, is a letter from Mr. Drummond Hay, then British consul at Tanger, stating that the Sultan of Marocco presented to the King of England four Ostriches, "which have since been graciously presented by His Majesty to the Zoological Society." It is said that "they were obtained in a region of the Desert called Hamadah, situated about eight or ten days journey from Tafileht in the direction to which the Mousselmin address their prayers." Hammada (Hamadah) is, of course, the name of the stony desert anywhere from Marocco to Arabia, and 8 or 10 days' journey eastwards from Tafileht would bring a native party probably to the Hammada-el-Hadj-Rahmoun, which in 1831 might have been looked upon as Maroccan territory, but has long since been annexed by France. It is quite possible that Ostriches lived there at that time.]

(The statements of occurrences of birds near Tanger may be to some extent facts of the past, and no longer hold good. Alfred Vaucher informs me that the best localities in the neighbourhood of Tanger, Charf-la-Kab (also spelt Schaf-el-Akab or Shaf-el-Karb) and Boucharen (Boucharem), are only memoirs of the past, the fine oak forests which covered them no longer existing! They have been destroyed by the charcoal-burners and the carelessness and improvidence of the Maroccan government. Therefore a number of species which formerly nested there commonly will not be found in the vicinity of Tanger; also the immediate surroundings of the town have changed a good deal, as the population has increased and the town spread out considerably, but the numerous fine gardens are still inhabited by many passerine birds which are partial to garden land. Visitors of Tanger must bear this in mind, and must not expect all the species which have been observed there, according to the above list, which, however, will all be found in Marocco, if one goes farther afield.)

BIBLIOGRAPHY ON THE BIRDS OF MAROCCO.

BY F. C. R. JOURDAIN AND E. HARTERT.

(A Book not seen by either of us is marked with an asterisk.)

1828. G. BEAUCLERK, *A Journey to Morocco in 1826*. London, 8vo, p. 356, with 8 plates. (German translation Jena 1829.)

Although no ornithologist, the writer makes a few references to birds on pp. 66, 210, 211, 292, and a few others. The Black Curlews seen south of Larache are evidently *Comatibis*; while a large-horned Owl, standing 2½ ft. high, is mentioned in some brief notes on the Birds of Morocco. No birds are represented on the plates.

1831. G. W. H. DRUMMOND HAY, *Proc. Zool. Soc. London*, pt. i. p. 145; letter stating that four young Ostriches were presented who had come from eight or ten days' journey east of Tafleht (see under *Struthio camelus*).
1840. G. W. H. DRUMMOND HAY, *Proc. Zool. Soc. London*, pt. viii, pp. 133-5; list of 53 species collected and observed near Tanger. Many misprints or slips in the names.

The collection was presented to the Zoological Society, but seems to have disappeared. They were the first skins from Morocco that reached Europe of which there is any record.

1852. CARSTENSEN, stud. medic., Verzeichniss der in der Umgegend von Tanger und im nördlichen Fez vorkommenden Vögel. *Naumannia*, ii, Heft 1, pp. 76-9, 1852.

A list of 242 species, the breeding ones, 140, being printed in wider type. In this list are many species never before recorded from Morocco, and generally with correct statements about their nesting in the country or not. No collection is known in any museum containing birds collected by Carstensen, and there can be no doubt that his list is made from Favier's MS. notes. On p. 76 Carstensen says that the "*Naucleus furcatus*" was obtained only once in 14 years! Now Favier died in 1867 "after a residence of about 31 years at Tanger." Thus in 1851 he would have been there about 14 years, and a student of medicine, as Carstensen called himself, could not have been all that time in Tanger! The wrong identifications, such as "*Vultur Kolbi*" for *Gyps fulvus*, *Accipiter gabar*, *Thalassidroma bulweri*, and others, were doubtless later on corrected or eliminated by Favier, or by Irby, who published Favier's notes in his book on the *Birds of the Straits of Gibraltar*—see 1875 and 1895!

- *1859. FERNANDO AMOR, *Recuerdos de un viaje á Marruccos*. Sevilla. 214 pages.

Said to contain some ornithological notes.

1859. In *Ibis*, i, 1859, p. 474, SCLATER states that the Zoological Society in London had received from Mogador two live "*Buteo tachardus* or African Buzzard." This was of course our *B. ferox circensis*.

1864. In Newton's *Ootheca Wolleyana*, pt. i, pp. 1-3, are given some notes on eggs by Wolley, who visited Favier in 1845, "who dealt in monkeys, and who also skinned boars' heads, jackals, ichneumons, and other trophies of the Consul's shooting parties. He showed me a quantity of birds' skins, well preserved. . . ." Follow descriptions of eggs of *Necophron percnopterus*, which at that time—1845—were almost unknown and believed to be white, unspotted.

1867. C. F. TYRWHITT DRAKE, Notes on the Birds of Tangier and Eastern Marocco. *Ibis*, 1867, pp. 421-30.

142 species enumerated with short notes about localities, nesting, and time when met with. Why Tanger and Tetuan—the only places where Drake collected, as he specially says that it was impossible to penetrate east of Tetuan—was called "Eastern Marocco," is a mystery.

1867. P. L. SCLATER, *Proc. Zool. Soc. London*, 1867, p. 315, mentions a specimen of *Larus argentatus atlantis* (sub nomine "*Larus fuscescens*") living in the Zool. Gardens, "out of a vessel coming from Mogador."

1868. THOMAS WAITE, *Proc. Zool. Soc. London*, 1868, p. 567, describes the island of Mogador, on which *Falco eleonorae* lives, two of which he presented to the Zool. Soc. collection.

1869. C. F. TYRWHITT DRAKE, Further Notes on the Birds of Morocco. In *Ibis*, 1869, pp. 147-54.

Twenty-seven species added to the list in *Ibis*, 1867, mostly from the west coast down to Mazagan, Marrakesh, and Mogador.

1872. L. H. IRBY, letter adding to Saunders' list of the Birds of Southern Spain. Mentioned "*Cypselus pallidus*" and stated that he once saw *Parus cristatus* near Larache, a statement which must be erroneous and which is not repeated in Irby's book.

1874. H. IRBY, notice of an apparently undescribed species of *Corvus* from Tanger.

Description and drawing of head of *Corvus tingitanus*.

1874. P. L. SCLATER, note on the "Yellow-legged Herring Gull" from Mogador and elsewhere, correcting his former nomenclature of 1867, and saying it should be called *Larus leucophaeus*.

1875. L. H. IRBY, *The Ornithology of the Straits of Gibraltar*.

This, and still more the second edition (see 1895!), is the most important and absolutely reliable source of knowledge on the birds of Morocco, as it treats not only of Gibraltar but also of the opposite coast. The notes on Moroccan birds are "in a great measure culled from the MS. of the late M. F. Favier." Favier was a dealer who lived about 31 years in Tanger, and was succeeded by Olcese. Both men would have collected much better and labelled their specimens better if anyone had instructed them! (see 1864).

1878. "SARCELLE" (C. A. PAYTON), Natural History Notes from Mogador, *Field*, 1878, February 23rd, p. 215.

These and all the other notes by "Sarcelle" are pleasantly written descriptions of shooting and fishing excursions near Mogador. Many birds are mentioned, mostly only under their English names; the author was evidently well acquainted

with Game Birds and Waterfowl, but did not know Birds of Prey and small birds. His notes are here only quoted if they contain anything of ornithological interest.

1879. C. A. PAYTON ("SARCELLE"), *Moss from a Rolling Stone, or Moorish Wanderings and Rambling Reminiscences*. London, 1879. 506 pages, containing the above notes from the *Field*, etc.
1880. "SARCELLE" (PAYTON), Sporting Notes from Mogador, *Field*, 1880, ii, pp. 406, 945.
1881. "SARCELLE" (PAYTON), A Wild Goose Chase in Chiadma, *Field*, 1881, i, p. 830, June.
1881. "SARCELLE" (PAYTON), The Shooting Season at Mogador, *Field*, 1881, ii, p. 80, July.
1882. "SARCELLE" (PAYTON), Wild-Fowling in Morocco, *Field*, 1882, i, p. 464, April; ii, p. 470, September.
1884. "SARCELLE" (PAYTON), Shooting near Mogador, *Field*, 1884, i, p. 838.
1884. J. J. DALGLEISH, Occurrence of the Royal Tern (*Sterna regia* Gambel) at Tangiers in Morocco.

Two specimens of *Sterna maxima* shot out of a flock of 30 at Tanger.

1885. "SARCELLE" (PAYTON), A Spring Ramble in Morocco, *Field*, 1885, i, p. 658, May.
1885. S. G. REID, Winter Notes from Morocco, *Ibis*, 1885, pp. 241-55.
118 species mentioned from N. Morocco, mostly Tanger.
1887. R. JANNASCH, *Die Deutsche Handelsexpedition*, 1886.

The mouth of the Oued Chebika, Oued Draa, Oued Noun, and Mogador were visited. Contains a few unimportant notes on birds seen on pp. 31, 32. Sâfi said to be northernmost place where *Emberiza striolata sahari* nests.

1889. H. SCHALOW, *Journ. f. Orn.*, 1889, pp. 331-3. Corrects some errors in Diederich's article on the distribution of the genus *Corvus*.

(It is now well known that *tingitanus* represents *corax* in N. Africa, and, according to modern views, we must treat it as a subspecies of the *corax* group.)

1890. J. J. WALKER, Notes on Lepidoptera from the region of the Straits of Gibraltar, *Trans. Entom. Soc. London*, 1890. On p. 367 some notes on birds, *Egretta alba*, both sp. of *Fulica*, and others.
1891. C. A. PAYTON, *Ibis*, 1891, p. 296. Records having shot a *Branta bernicla* and observed *B. leucopsis*.
1892. "SARCELLE" (PAYTON), Notes from Mogador, *Field*, 1892, p. 810, May. (Partially quoted *Ibis*, 1892, p. 471.)
1893. W. ROTHSCHILD & E. HARTERT, Die Formen von *Fringilla spodiogenys* in Nordafrika, *Orn. Monatsber.* i. p. 97.
Description of "*Fringilla spodiogenys koenigi*" from N. Morocco. (Corrected diagnosis, *Orn. Monatsber.* 1894, p. 75.)

1895. L. H. IRBY, *The Ornithology of the Straits of Gibraltar*, second edition. The most important source of information about Moroccan birds (see 1875).

1895. E. HARTERT, Ueber die nordafrikanischen *Garrulus*-Arten, *Orn. Monatsber.* iii. pp. 169-72.

Chiefly discussing the North Moroccan Jay, which is erroneously believed to be "*Garrulus minor*." The ideas about species and subspecies are viewed differently now—after 28 years!

1896. R. BLASIUS, Ornitholog. Leuchtthurm-Beobachtungen aus der Strasse von Gibraltar, *Ornis*, viii. pp. 339-40.

A few notes by Ph. Gumpert from the lighthouse at Cape Spartel.

1896. A. KRICHELDORFF, Ueber neu eingetroffene oologische Sendungen, *Zeitschr. f. Oologie*, vi. p. 6.

Description of some eggs from North Morocco.

1897. P. W. MUNN, Ornithological Notes from Marocco, *Ibis*, 1897, pp. 51-8.

Describes a trip from Tanger to Tetuan and Ceuta. List of 43 observed species.

1897. J. I. S. WHITAKER, *Bull. B.O. Club*, vii. pp. xvii, xviii.

Notes on colour of bills of *Sturnus unicolor*. The conclusions, however, are not quite correct. The fact is that the bill begins to get yellow about February (sometimes end of January), and remains yellow during the breeding season, becoming blackish again soon after the latter, in July or June. Description of "*Garrulus oenops*" and "*Rhodopechys aliena*" from Marocco.

1898. *Id.*, tom. cit., p. xlvi.

Description of "*Otocorys atlas*" from Glaoui (not Glani) in the Great Atlas.

1898. *Id.*, On a Collection of Birds from Marocco, *Ibis*, 1898, pp. 592-610, pl. xiii.

One of the most important articles on the birds of Marocco, being the results of Edward Dodson's expedition from Tanger to Fez, Marrakesh, Amsmiz, Enzel, Zarakten, Tilula, and Glaoui in the Great Atlas, as well as to the Haha country, south to Ras-el-Ain. List of 134 species and subspecies.

1901. E. G. B. MEADE-WALDO, *Descriptions of three New Birds from Marocco.* "*Parus atlas*, *Motacilla subpersonata*, *Cotile mauritanica*."

1902. E. HARTERT, Reise nach Marokko, und einige kurze Notizen über die Vögel der Gegend um Mazagan im mittleren Marokko. In: *Aus den Wanderjahren eines Naturforschers*, pp. 293-303, 305-22.

(Also published in NOVITATES ZOOLOGICAE, ix. 1902, July.)

Journey to Mazagan, to the Oum-er-Rbia, and Cape Blanco north. Notes on 83 species collected and observed. *Turdus merula mauritanicus* and *Galerida cristata riggenbachi* described.

1903. E. G. B. MEADE-WALDO, Bird-Notes from Morocco and the Great Atlas, *Ibis*, 1903, pp. 196-214, pl. vi.

Notes on a journey through Marocco to the Great Atlas. Eighty-five birds mentioned as observed and partially collected. An important addition to the knowledge of the avifauna of Marocco.

1904. O. KLEINSCHMIDT, Einiges über Spatzen, *Orn. Monatsber.* 1904, p. 7.

Description of "*Passer ahasver*" from Marrakesh, collected by Floricke, who collected near Tanger and Casablanca and Mazagan, and from there to

Marrakesh. His collections were not extensive and no list of the species collected has been published.

1905. E. G. B. MEADE-WALDO, A Trip to the Forest of Marmora, Morocco, *Ibis*, 1905, pp. 161-4.

Notes on the forest of Marmora (Mamora), north-east of Rabat and Salé, and its birds.

1905. W. ROTHSCHILD, Exhibition of Eggs of *Comatibis eremita* from near Mogador, *Bull. B.O. Club*, xvi. p. 15.

1906. HERM. SCHALOW, Beiträge zu einer ornithologischen Bibliographie des Atlas Gebietes, *Journ. f. Orn.*, 1906, pp. 100-43.

An almost entirely complete list of ornithological literature of Morocco, Algeria, Tunisia, and Tripolitania.

1911. L. LOZANO, Contribución al estudio de las aves de Mogador, *Memorias de la Real Soc. Española de Hist. Nat.*, viii. No. 2, pp. 63-108.

List of 96 species collected by Martínez de la Escalera in 1905 near Mogador.

1913. A. MENEGAUX, Oiseaux recueillis dans le sud-ouest du Maroc, par M. A. Boudarel, de la mission de Mme. C. du Gast., *Rev. Franç. d'Orn.*, vol iii., pp. 33-8.

The results of a trip as far south as Ida and Agadir. Unfortunately the shortness of the time and probably collecting many other things besides birds prevented the collector making more extensive bird collections, Agadir being the southernmost place where attempts to collect have been made. Only 47 species were collected.

1915. HENRI ET ALFRED VAUCHER, Liste des Oiseaux observés au Maroc de 1884 à 1914, *Rev. Franç. d'Orn.*, vol. iv. pp. 94-6, 107-11, 134-77.

This list is compiled by Alfred Vaucher, from the notes and collections of his late brother Henri, and from his own observations and collection of birds and eggs from Morocco. The notes refer mostly to the birds from N. Morocco, where both brothers resided, in Tanger. 177 species are mentioned, but several quite common ones have accidentally been omitted. Mr. Vaucher kindly supplied, in litt., some valuable explanations and information for which we are much obliged.

1915. M. D'AUBUSSON, Au Maroc: Les Oiseaux du Bled, *Bull. Soc. Nat. d'Acclimatation*, 1915, pp. 263-73, 289-309.

A popular description of journeys near Casablanca and via the Chaouia country and Settat to Marrakesh. Only common birds were observed, and their names are generally old-fashioned and sometimes wrong. The "Martinet à croupion blanc" was of course not "*Cypselus cafer*" but *affinis*! "*Lanius meridionalis*" is of course either *algeriensis* or *dodsoni*, etc.

1916. A. VAUCHER, Note sur la faune ornithologique du Maroc, *Rev. Franç. d'Orn.*, iv. p. 225.

On eggs of four species.

1919. LYNES, *Bull. B.O. Club*, xl. p. 32.

Description of *Sitta europæa atlas* and *Erethacus rubecula atlas*.

1919. E. HARTERT, *Bull. B.O. Club*, xxxix. pp. 68, 69, 85-7.

Description of Saby's wonderful discovery of a different Guinea-fowl inhabiting Marocco—not feral! The fact that wild Guinea-fowls were found in parts of Marocco was known to Meade-Waldo, but he supposed they were *Numida galeata* Pall. (*meleagris* auct.!).

1920. LYNES, Ornithology of the Maroccan "Middle-Atlas," *Ibis*, 1920, pp. 260-301, pls. iii-xii.

Important contribution to the ornithology of the Middle Atlas, of which nothing was known. A Nuthatch was discovered, a new Robin described, *Oenanthe oenanthe seebohmi*, *Parus ater atlas*, *Eremophila alpestris atlas*, and other rare birds common. Plates, maps, and views.

1920. F. C. R. JOURDAIN, *Bull. B.O. Club*, xl. p. 154, 1920. Description of eggs and nesting-place of *Strix aluco mauritanica* from Marocco.

1921. F. C. R. JOURDAIN, Les Oiseaux de la forêt de Mamara et des environs de Rabat, *Rev. Franç. d'Orn.*, xiii. pp. 128-33, 149-53.

The author, accompanied by W. M. Congreve, visited Casablanca, Rabat, Kenitrea, and the forest of Mamara (Marmora, Mamora). Birds were observed only and eggs collected. 101 species mentioned.

[WHITAKER, *The Birds of Tunisia*, 1905, and HARTERT, *Die Vögel der paläarkt. Fauna*, 1903-22, contain many statements on the occurrence and descriptions of birds of Marocco. P. 1698 of the latter work is described *Sterna maxima albididorsalis* from Marocco. Cf. also, among others, p. 1395, p. 1222 (*Comatibis*), p. 991 (*Asio*), p. 2005 (*Numida sabyi*).]

ON THE COMB-BEARING FLAP PRESENT ON THE FOURTH
ABDOMINAL SEGMENT IN THE MALES OF CERTAIN
NOTODONTIDAE.

BY DR. KARL JORDAN.

(Pl. II, figs. 9-13.) *To Plate see facing*

IN the majority of *Notodontidae* the fourth abdominal segment is normal in build like the adjacent segments. A large number of species, however, have that segment modified in the ♂ (not in the ♀). The modification consists in an enlargement of the dorsal margin of the sternite, a flap being formed which projects upwards. The Notodontids being very hairy, this peculiar organ, though conspicuous in many species, evidently has escaped notice; at least I do not find it mentioned by any of the authors who have dealt with the family extensively.

In most cases the organ becomes at once visible when the scaling is moistened with benzine, and in the larger species, such as *Hapigia*, is easily discovered on account of the upward direction of the hairs which cover the flap. Our diagrams (Pl. II, figs. 9-13) illustrate to some degree the variation in the size and position of the flap, but are by no means exhaustive. The armature of the flap consists of bristles and black or brown spines, which are arranged in a bunch at the apex in the case of short flaps, or in a row or in rows at the hind margin in the case of long flaps. Sometimes the spines stand ten deep along the margin (fig. 13). The tips of the spines are usually sharp and either curved towards the body, or upwards, or upwards and frontad. As a rule the spines lie so close together as to present a smooth outward surface. They are modified hairs (as are the abdominal spines found in the *Sphingidae* and some *Castniidae*), there being a gradation from hairs to bristles to spines.

The flap, or cteniphore as we may call it, is movable. Where the cteniphore is very short, as in figs. 9 and 12, it can only slightly be moved in conjunction with the whole sternite. But in the species where it has become very narrow at the base, being shifted close to the anterior margin of the segment (figs. 10, 11, 13), the narrowness of the connection with the main body of the sternite and the flexibility of the chitin at the narrowest point admit of a considerable independent movement away from the body, the cteniphore being able to assume a more or less horizontal position nearly at right angles to the body.

The cteniphore partly covers a cavity situated in the pleurum of the fourth segment and often extending into the third segment. An examination of this cavity from outside and from inside the abdomen (of the dry specimens at our disposal) leaves hardly any doubt in our minds that a large gland opens in the cavity.

If the classification of the Notodontids as it stands at present is correct, the organ in question is distributed quite irregularly in the family, occurring in species of *Salluca*, *Trichomoplata*, *Heterocampa*, *Psorocampa*, *Hapigia*, some

Oriental *Phalera* (not in European *Phalera*), and a host of others, but is most frequent in American forms.

What is the function of this eteniophore? In the absence of observations on live specimens we must be content with drawing our opinion from the build of the organ. A comparison of species with and without eteniophore gives us some evidence of the meaning of the structure. The following points are of importance:

1. The majority of the Notodontids with eteniophore have (in the ♂♂) some modification in the sealing of the underside of the hindwing or in the sealing and neuration. Where in a Notodontid ♂ there is a deviation from the normal distad direction of the sealing, i.e. where the hairs and upper layer of sealing is partly (or almost totally) directed transversely or where tufts and patches of erect sealing occur on the underside of the hindwing, there we are certain to find also the abdominal eteniophore.

2. There are species which have a eteniophore, but no modified sealing on the underside of the hindwing.

3. The tibiae of the Notodontids with and without eteniophore are very hairy, the hindtibia in particular bearing a dense clothing of long hairs, many of which are fairly stiff, recalling the radiating hairs of scent-organs.

4. It is almost certain that a gland is present beneath the eteniophore.

5. In many cases the costal vein of the hindwing, on the underside, bears, at or near the point where it touches the subcostal, a blunt spur projecting well above the surface of the wing; in some other species there is a wart or tubercle at the costal margin.

Considering these points in connection with the movability of the abdomen, legs, and eteniophore, we come to the conclusion that the hindtibia and hindwing are rubbed across the eteniophore in order to receive the scent produced by the gland, the spines penetrating in between the hairs (combing them) and thus communicating the essence more effectively to the covering of these organs than would be the case if the tibia and wing were moved across the unarmed opening of the gland. Whatever the proceeding may be in detail, so much seems to be certain that the eteniophore is a special ♂-apparatus developed in connection with a scent-organ.

Don plate as p. 153.

ON A SENSORY ORGAN FOUND ON THE HEAD OF MANY LEPIDOPTERA.

BY DR. KARL JORDAN.

(With Pl. II, figs. 1-8.)

IN certain families of Lepidoptera there is behind the antenna near the eye an area of very varying extent which more or less contrasts with the scaling surrounding it or adjacent to it, and is studded with thin bristles. The organ appears in two chief types, exemplified by figs. 1 (*Sematura*) and 2 (*Micronia*). In fig. 1 the organ consists of a rounded, non-scaled, swelling bearing numerous bristles radiating in all directions. Fig. 2 represents a type in which the bristle-bearing area is extended transversely and covered with small scales, the scales standing upright and being so arranged as to form cylinders or funnels from which protrude the bristles. Though the extremes of the two types look very different, there does not seem to be any fundamental difference, for both types are found in the same families, and intergradations occur. The non-scaled patch is often (always ?) covered with minute cilia in between the bristles. The organ is the same in the sexes. It is absent from a large number of families of *Heterocera* and always present in many other families, while in a few families certain genera or subfamilies possess the organ and others are without it. On account of this somewhat sporadic distribution—sporadic at least in *Heterocera*—and the great diversity in its development in some of the families, the organ is of importance for diagnostic purposes (especially in the case of aberrant forms).

It is found in all Rhopalocera and Grypocera and in the following *Heterocera* :

<i>Sematuridae</i>	<i>Zygaenidae</i> (but not in <i>Charideidae</i>)
<i>Uraniidae</i>	<i>Heterogynidae</i>
<i>Epiplemidæ</i> (and <i>Epicopeia</i>)	<i>Megalopygidae</i> (and <i>Somabrachys</i>)
<i>Geometridæ</i>	<i>Tortricidae</i>
<i>Callidulidae</i> (and <i>Pterothysanus</i>)	<i>Pyralidae</i> (absent in many).

Among Butterflies the organ is most prominent in the Lycaenids and Erycinids. In both these families the occiput bears a transverse crest or screen which is highest mesally, leaning forward and forming a sort of tunnel. The sensory organ extends through this tunnel from side to side, usually being more or less interrupted in the middle (Pl. II, fig. 5, *Amblypodia*). The crest is much lower in some forms than in others. Laterally the scitiferous organ lies immediately behind the antenna. The scaling along the centre of the frons in Lycaenids is rougher or more depressed than at the sides.

In Pieridae (Pl. II, fig. 4) the organ is often inconspicuous, if similarly scaled as the surroundings. It is longitudinal, extending close to the antennal groove and being anteriorly rather broader than posteriorly, as a rule. Behind it, or medianly, there is often a tuft or crest of hairs leaning forward, recalling the transverse crest of the Lycaenids and Erycinids.

Most *Nymphalidae* (s.l.) have the organ likewise elongate (Pl. II, fig. 3),

but more distant from the antenna and eye than in *Pieridae*. In many instances it is reduced to a small roundish patch (f.i. in *Brassolis*, some *Satyrinae*). The bristles are frequently short and weak. In species with a very hairy head the organ is often difficult to trace.

As in Pierids the setiferous spot (or chaetosema) of the *Papilionidae* is densely covered with small erect scales, which often form collars around the bristles. The spot is elongate, being broadest in front.

In the *Hesperidae* or *Grypocera* the sensory organ is of particular interest. The family falls into two sections according to this organ, in one section the head bearing a setiferous patch on the occiput, rounded or transverse (*Ismene* and allies), and the other section having in addition a similar patch in front of the antenna, i.e. four patches in all (Pl. II, fig. 6, view obliquely from the side). The head of Hesperids has a transverse crest at the hind edge and another behind and between the antennae; the sealing in between these crests is more or less smooth, as in Lycaenids and Erycinids. In the majority of the Skippers the frons bears anteriorly a third crest, and in between this crest and the antennae there is the additional pair of patches of radiating bristles. I have not found this pair anywhere else but in the Skippers.

In the *Geometridae*, *Tortricidae*, and *Megalopygidae* the patch is always small, but while it is as a rule plainly visible in a dorsal view in the former two families, it is concealed from above in *Megalopygidae* (and *Somabrachys*). In these moths the long hairs of the head form immediately behind the antenna a pocket which opens laterally. The sensory patch lies in this pocket. In *Somabrachys* the patch is much reduced, also in some wingless females of *Geometridae*.

The chaetophorous organ or chaetosema is most prominently developed in the *Sematuroidae* (Pl. II, fig. 1), being definite in shape and bearing particularly long and strong bristles.

The *Uraniidae* and *Epiplemidae* (inclusive of *Epieopeia*) exhibit a great variety in the size of the patch, many species having quite a small patch without sealing, while in others there is a scaled belt from eye to eye (Pl. II, fig. 2), more or less interrupted in the centre, many intergradations occurring between the lateral patch and the transverse belt.

In the *Callidulidae* (inclusive of *Pterothysanus*) the patch is very distinct, usually scaled and transverse, often bounded posteriorly by a crest of sealing; the bristles frequently are long.

The greatest diversity in the development of the organ in any one family obtains in the *Zygaenidae*. The African group of genera which I separated in 1907 as *Pompostolinae* chiefly on account of the absence of the upper submedian vein SM¹ (= 1e), and which Hampson in 1918 has raised to the rank of a family under the name of *Charideidae*—*Pompostola* being synonymous with *Charidea*—is entirely devoid of the organ in question. In all the other *Zygaenidae* the chaetophorous area or spot is present and generally large or at least conspicuous, the hairy genus *Pseudopsyche* with the organ concealed in the hair being an exception. We find a series of stages from a small round spot with radiating bristles to a complete scaled belt with short bristles protruding from cylinders formed by the sealing. The belt is usually divided in the centre by a longitudinal groove, and as a rule is sharply defined, extending halfway down the sides behind the eyes in many *Chalcosiinae*. Behind the belt the sealing forms a crest or screen leaning forward (Pl. II, fig. 7). It is most interesting to note that such a crest

has to a more or less extent developed in all the Lepidoptera in which the setiferous organ has a transverse direction.

The *Tortricidae*, as far as I have compared them, possess a distinct, though small, chaetosema; there may be exceptions, albeit I have not come across any.

The *Pyralidae*, on the other hand, are divided into two groups as regards the chaetosema, many genera being characterised by the possession of the organ, and many others being devoid of it. Looking at this portion of the head only, the Pyralis fall into four sections: (1) with chaetosema and ocellus, (2) with chaetosema and without ocellus, (3) without chaetosema and with ocellus, and (4) without both chaetosema and ocellus. I mention this merely in order to draw attention to the existence of such a combination of characters, positive and negative (+ +, + —, — +, — —), which may be of some help in defining genera or higher categories.

The *Heterogynidae*, which stand between the Zygaenids and Psychids, have a chaetosema distant from the eye as well as antenna, and quite distinct in spite of the head bearing a vestiture of long scattered hairs. The head is like that of a Psychid, except for the presence of the chaetosema, which is absent from the *Psychidae*.

As the organ varies in some families from being very large to being quite small, and as it is absent in one portion of Pyralidae and present in the other portion, we must expect to find families in which the chaetosema has been lost more or less completely, remnants having persisted, and families in which only rudiments of the organ have as yet appeared. The chaetosema having been known to me for a number of years I have frequently taken the opportunity offered at the Tring Museum of testing large numbers of species, with an entirely negative result in the case of *Hypsidae*, *Lymantriidae*, *Syntomidae*, *Arctiidae*, *Noctuidae* (and *Agaristidae*), *Notodontidae* and *Dioptriidae*, *Sphingidae*, *Brahmaeidae*, *Bombycidae*, *Perophoridae*, *Eupterotidae*, *Saturniidae*, *Lasiocampidae*, *Limacodidae* and *Chrysopolomidae*, *Psychidae*, *Thyrididae*, *Castniidae*, *Cossidae* and allies, *Pterophoridae*, *Charideidae*, *Aegeriidae*, and *Tineidae*, as well as the *Jugatae*.

We find, however, in the *Drepanidae* and *Cymatophoridae* traces of the organ, at any rate in some of the species, there being at some distance behind the antenna bristles among the hair-sealing which may be homologous with the organ described above. In some *Lemoniidae* we observe similar indications of a chaetosema, all very indefinite.

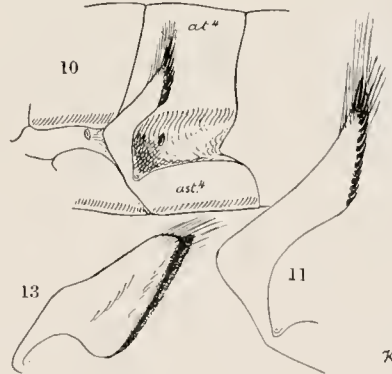
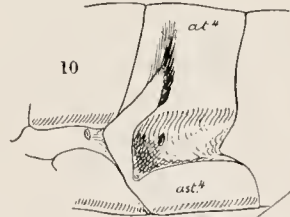
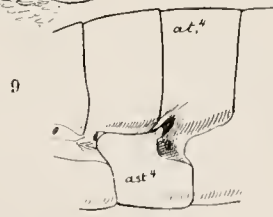
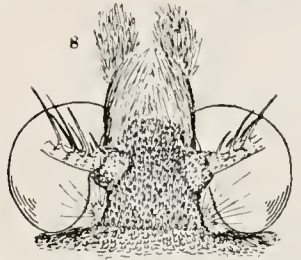
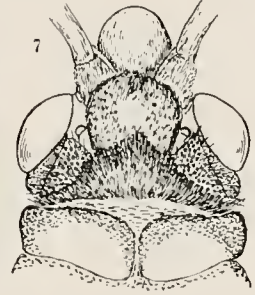
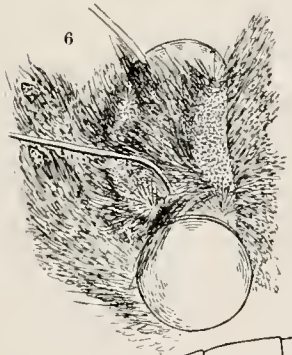
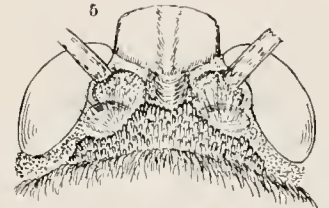
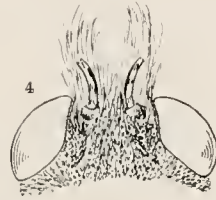
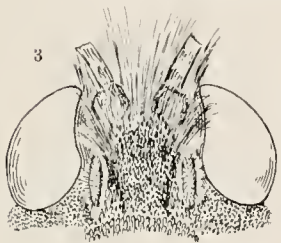
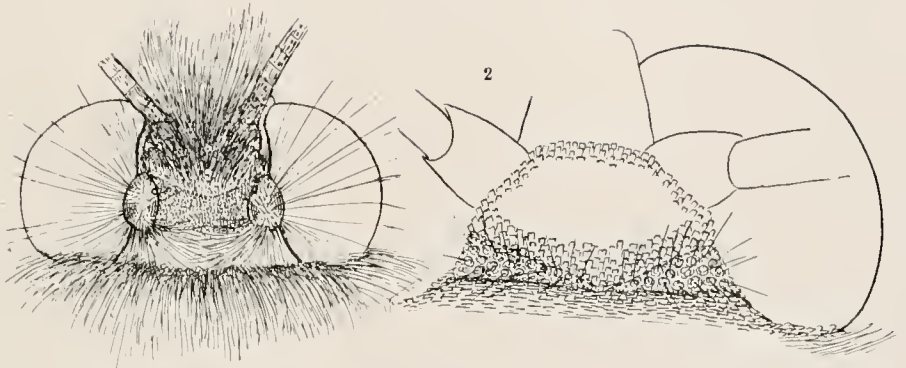
In the genus *Hepialus* occur very minute papillae on each side of the occiput, sometimes one papilla being larger than all the others. Whether these papillae are in a remote way homologous with the chaetosema is doubtful to us.

We have called the chaetosema a sensory organ for two reasons.* First, its position on the head, its difference from the ordinary vestiture of the head, the minute cilia between the bristles, and the connection of the chaetosema with the brain, render it highly probable that it is an organ for some kind of perception. Second, it is similar to an organ obtaining in *Lasiocampidae* on the labial palpus. In this family the palpus bears on the ventral or on the lateral surface a spot of varying size which contrasts with the rest of the palpus in being bare except for a largish number of dispersed bristles and hair-scales more or less radiating. Sometimes the patch occupies the larger proportion of the outer

* Dr. H. Eltringham is going to study the histology of the organ.

surface of the first segment. This organ being in that place can hardly be looked upon as anything else but a sensory organ. Its persistence throughout the family is very remarkable. It is absent from the *Endromidae*, nor has it been met with anywhere else outside the Lasiocampids.

What special sensation these palpal and capital organs are adapted to perceive we do not know. Insects possibly have less sense than the higher mammals, but probably more senses.



K. J. nel

ON THE SCENT-ORGANS IN THE MALES OF CERTAIN AMERICAN CASTNIIDAE.

BY DR. KARL JORDAN.

(With 7 text-figures.)

AMONG the American *Castniidae* there is a group of species which closely resemble Danaine and Heliconiine butterflies of the same districts. The mimetic species I have in mind are typified by *Castnia linus* Cram. (1779), *C. zagraea* Feld. (1874), *C. cycna* Westw. (1877), *C. melessus* Druce (1890), and *C. yellonia* Druce (1890). In these species and their near allies the hindwing bears hairs on the upperside at and near the base, the subcostal SC² (= vein 7) and the radial R¹ (= vein 6) of the hindwing are on a long stalk, from which projects the short spur representing the cross vein D³, the tibiae are without spines and the anal tergite of the ♂ is bipartite, as is also the manubrium (= saccus) of the ninth sternite. The mimetic species which have these somatics in common fall into two sections chiefly characterised by some remarkable secondary sexual characters of the males.

SECTION I

In this section the portion of the scaling of the pronotum which is light-coloured is buff or pale yellowish, being about as pale as the subterminal markings of the wings; the four spots in the centre of the mesonotum and the two at its apex are more or less distinctly separate, the abdomen has no pale yellowish dorsal median line, and the black stripe which extends on the underside of the hindwing from the base distad does not bear a pale central streak. The ♂♂ have no external abdominal scent-organ, the hindtibia and first hindtarsal segment are not covered with long soft scaling on the inside, and the paronychium of the midtarsus is much enlarged.

We give a somewhat diagrammatical figure of the paronychium of *C. linus* (text-fig. 1). The lobes of the paronychium are covered on the underside, and fringed along the margin, with long hairs which, in the cabinet specimens, are caked together in bunches. After having been cleaned with benzine, these hairs are more or less separated, the paronychium appearing almost woolly. This enlarged paronychium is found only in the midtarsus of the ♂. It occurs, in a slightly different form, outside the mimetic species under consideration in *C. cronida* H. S. (1854), not in *C. cronis* Cram. (1777), both of which have spinose tibiae and are also otherwise differently built from *C. linus*; it is likewise found in the ♂♂ of *C. huebner* Godt. (1830) and *C. gramivora* Schaus (1896), which are very similar to one another, closely agreeing in structure and pattern, and in a few other species. The function of the enlarged paronychium is obscure. It is a problem which probably will be solved together with the meaning of another peculiarity of the midleg of many Castniids, namely the great width of the first midtarsal segment which obtains in the males of all the species we have mentioned and some others, this segment being often as wide or wider than the tibia. As

the Castniids are supposed to copulate in the air, it is possible that the midleg is used for clasping the abdomen of the female, presumably at the base, and requires special strength for that purpose.

As species belonging to this section of mimics I mention *C. linoïdes* Strand (1913), *C. carilla* Schaus (1911), *C. salvina* Westw. (1877), *C. daguana* Preiss (1899), *C. juanita* Preiss (1899), *C. personata* Walk. (1864), in which the fourth and fifth subcostals of the forewing are long-stalked, the areole is always open, the spurs of the mid- and hindtibiae are very short, the abdomen-above is black irrorated with tawny or creamy scales and beneath cream-coloured with a black streak, and *C. zagraea* (Feld. 1874) and *C. linus* Cram. (1779), in which the subcostals SC¹ and SC² arise from the areole or are short-stalked, the areole is

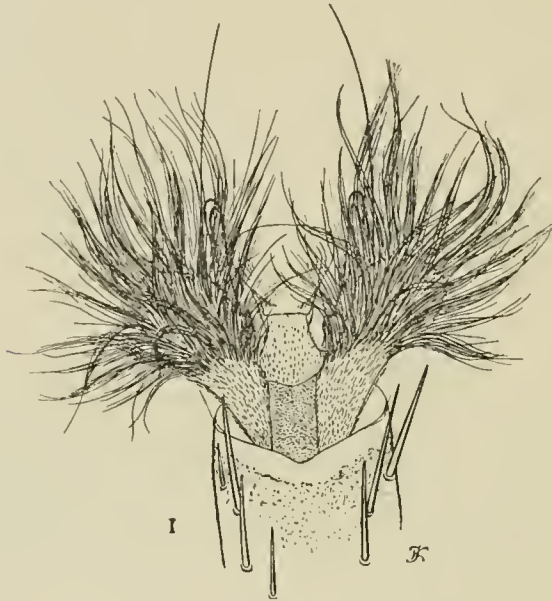


FIG. 1.

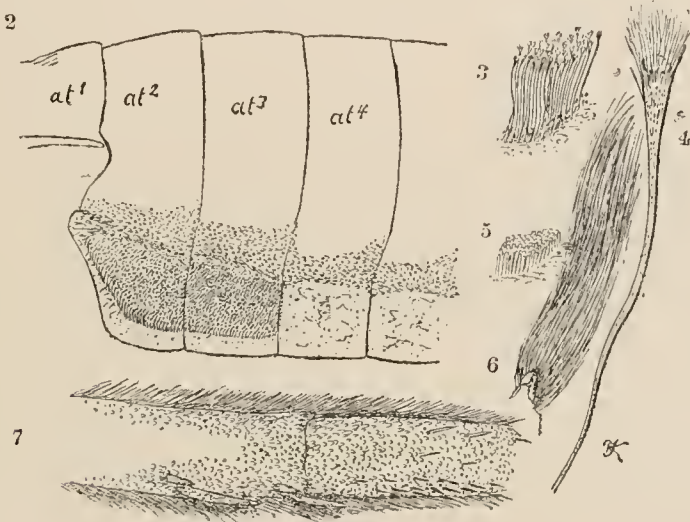
usually closed, the spurs of the mid- and hindtibiae are longer than in the previous species, the abdomen has above and beneath a broad median stripe which narrows at the base, and the forewing bears a large black patch proximally to tornus.

SECTION 2.

The light-coloured scales of the pronotum are tawny or reddish orange, the median spots of the mesonotum are merged together into a transverse band, there is no distinct spot at the apex of the mesonotum, but the metanotum is light-coloured in the middle, and the black longitudinal stripe on the underside of the hindwing bears a light-coloured, more or less central, streak or spot; in most species the abdomen has a distinct pale dorsal median line. The ♂♂ are distinguished by a very large abdominal scent-organ, and by the hindtibia and first hindtarsal segment being covered on the inner surface by long, soft, pale scaling; the paronychium of the midtarsus is not enlarged.

This section comprises the majority of the tawny and black mimics, for instance *C. cycna* Westw. (1877), *C. melessus* Druce (1890), *C. michaeli* Preiss (1899), *C. cratina* Westw. (1877), and *C. garleppi* Preiss (1899), in which the submarginal series of spots of the forewing is complete, *C. truxilla* Westw. (1877), *C. pellonia* Druce (1890), *C. ecuadoria* Westw. (1877), and *C. buckleyi* Druce (1882), in which the upper three submarginal spots are absent on the forewing and there is a rounded black spot at the upper cell-angle of the forewing, and *C. mars* Druce (1882), *C. tarapotensis* Preiss (1899), *C. simulans* Boisd. (1875), and *C. cononia* Westw. (1877), in which the upper three submarginal spots of the forewing are likewise absent and the same wing bears a black band at the upper cell-angle. Many other forms have been described, but I have no specimens before me.

In spite of its large size the scent-organ of these Castniids does not seem to



Figs. 2-7.

have been noticed by the authors who described the species. The two proximal abdominal sternites are covered on the sides by a dense mass of erect hairs which are widened at the apex and end with a large number of very thin, but rather stiff, filaments (text-figs. 2-7). The areas covered by these hairs are well defined. The hairs are hollow and evidently serve as outlets for the liquid produced by glands presumably lying in the abdomen. The ventral surface of these two sternites and the whole of the next four sternites—more rarely three, as in *C. cycna*, also in *C. hahneli* Preiss (1899), which is probably a form of *C. simulans* Boisd. (1875)—look bare of scaling. They are plastered over with a thick layer of a mud-like substance, buffish or blackish in colour, which is undoubtedly the product of scent-glands. The exudation is also present on the proximal sternites in the patches of trumpet-hairs, which sometimes stand in this mud up to their necks. If the exfluvia are examined under the microscope, the mud appears to be composed of densely packed, angular columns, like a liquid matter would look when hardened (text-fig. 5). After treatment with a solvent, the remains consist of a large mass of small hollow warts each crowned with

innumerable excessively thin hairs, which are very long under the microscope, but in reality are minute, forming on the sternites in question a downy covering on which the exudations of the glands settle (text-fig. 6). The down is also present among the trumpet-hairs. Some species, f.i. *C. mars* Druce (1882), have in addition fairly numerous long fluffy hairs on the first two sternites ventrally to the patches of trumpet-hairs and on the sides of the third sternite (= st. of fourth segment). The apparatus by which the products of the glands are distributed over the sternites is furnished by the hindleg. The scaling on the inner surface of the hindtibia and first hindtarsal segment is long and soft, most of the scales resembling slender blades of grass with the tips cut off, the scaling being transformed into a brush (text-fig. 7). As this brush, when the leg is fully stretched backward, does not reach farther than the fifth abdominal segment, whereas the product of the glands settles also on the sixth abdominal segment or even the seventh, we must regard the fluffy covering of the sternites to be an absorbent which sucks up the liquid like blotting-paper, the hard glossy scaling of the last one, or two, sternites remaining free of the coating of the previous segments.

There is no trace of this scent-organ in the preceding section of mimetic *Castniidae*, but we find outside the mimics a similar organ in the males of *C. cochrus* Fabr. (1787) and its near allies *C. garbei* Foett. (1903) and *C. combinata* Strand (1913). In *C. cochrus* and *C. combinata* the first two abdominal sternites, the merum of the hindcoxa and a lateral patch on the third sternite—distinct in *C. combinata* and less developed in *C. cochrus*—and in *C. garbei* the same sclerites and the entire third sternite are covered with hair. On closer examination the covering is found to consist of very long scales which are deeply slit, being divided into stiff hair-like processes. In between this long and rather hard scaling there is the same down as in Section 2 of the mimics, usually covered with a white mass, the product of the scent-glands. The fourth and following sternites are scaled in the normal way and not plastered over as in the above mimics. In *C. cochrus* and allies again the hindtibia and first hindtarsal segment are converted into a brush, their inner surface being covered with short erect, rather stiff, hair-like scaling, which is pale as in the mimetic *Castniids* with scent-organ.

A brush of a different kind obtains in *C. cacica* H. S. (1854) and *C. angusta* Druce (1907), but not in *C. papilionaris* Walk. (1864). In both sexes of these species, not only in the males as in the preceding cases, it is again the hindleg which has developed a brush. This brush, however, is neither situated on the inner surface nor is it the hindtibia which forms its main portion. Here the dorsal and ventral bristles of the first hindtarsal segment are very much prolonged and end with a long thin filament, the bristles standing several deep and being slightly inclined towards the abdomen. The brush is continued to the last segment of the tarsus, but is not well developed on the distal segments; there are also some bristles between the two pairs of spurs on the hindtibia, and the midtibia likewise has an indication of a brush. The object of this brush is unknown to me. There is evidently no scent-organ, and if there were one, its presence in the male would not explain why the brush is so strongly developed in the female as well. The scaling on the inner surface of the hindtarsus is short and smooth in the two species.

C. papilionaris, which is devoid of the brush, has larger paronychial fringes, possibly as a compensation.

A NOTE ON THE FAMILIES OF MOTHS IN WHICH R^2 (= VEIN 5)
OF THE FOREWING ARISES FROM NEAR THE CENTRE OR
FROM ABOVE THE CENTRE OF THE CELL.

By DR. KARL JORDAN.

(With Plate III.)

THE pursuit of our researches on *Saturnioideae* renders it necessary for us to assign a definite place to the genera *Oxytenis*, *Asthenidia*, and allies, which have variously been classified as Saturnians, Uraniids, Bombycids, and even Geometrids.

According to the neuration and general build their affinity is with the families in which R^2 (= vein 5) of the forewing (usually also on the hindwing) arises from near the centre of the cell-apex or from well above the centre. However, the central position of R^2 is an ancestral character and must not be regarded as proving, by itself, a close relationship between any of the various families in which the vein is found in this position. And as a recognition character it is also not so reliable throughout as to warrant the large divisions based on it in Hampson's key, published in Nov. Zool. XXV. p. 389 (1918). In some families (f.i. *Dioptidae* and *Drepanidae*) the central position of R^2 is no more than a difference between genera or species. But it is nevertheless a convenient family distinction if not insisted on too rigidly.

The upper submedian vein SM^1 (= 1c) is a vein the presence and absence of which must also be interpreted with caution, and the same applies to SM^2 (= 1a), in both the fore- and the hindwing. In the families in question SM^1 is usually absent or represented by a more or less distinct fold, but there are species among the *Perophoridae* and *Bombycidae* in which it is almost fully developed, and others in which it is a distinct tubular vein only distally, while the majority of the species have a thin fold in its place, which in most cases flattens out and disappears when the wing is moistened with benzine, with intergradations.

As the key we have drawn up for our own guidance may be of some use to other Lepidopterists, we publish it here as a preliminary contribution towards a fuller characterisation of the "Maero" families with vein R^2 more or less central in the forewing.

In the modern classification of Lepidoptera the development of the frenulum plays an important part, the presence or absence of this organ being extensively seized upon in the drawing up of keys to the families. We also employ this organ in the characterisation of some families, but in a rather different sense, which requires explanation.

The frenulum consists of two parts: (1) the incrassate base of the costal margin of the hindwing, from which emanate (2) the bristles (in the ♂ usually fused together into one bristle). The bristles are often reduced and frequently altogether absent. But even in extreme cases the incrassation of the costal margin remains distinct (Pl. III, fig. 10), and the organ cannot be regarded as entirely absent. All such moths are considered by us as possessing a frenulum.

In most families in which the frenulum normally is reduced, there occur also species with fully developed frenulum, and vice versa. On the other hand, in those families under consideration which are truly without a frenulum the base of the costal margin of the hindwing is thin, not incrassate, and somewhat expanded (Pl. III, fig. 11), as already explained by Comstock (*The Wings of Insects*, 1918, p. 331).

We distinguish the families mainly by structures in the metathorax and proximal abdominal segments. These distinctions* nearly always hold good when the differences (often numerous) by which the normal types of the families are generally easy to recognise break down. We will deal with the families in question in six sections :

I. Head with a sensory organ (chaetosema, cf. p. 155) behind the antenna consisting (externally) of thin radiating bristles, which are either arranged in a patch placed on a more or less elevated hump, or protrude from the short scaling. Sometimes this organ is quite small (in some *Geometridae*), sometimes it is very strongly developed (in *Sematuridae*, for instance).

1. *Geometridae*.—Basal abdominal sternite (Pl. III, fig. 1) with a large, well-defined, tympanal cavity on the ventral side of the first stigma. SC^2 of forewing always stalked with SC^1 . Frenulum present. C of hindwing curved down at extreme base, costally at the bent with a hump or spur directed towards the frenulum ; M of hindwing free from base, soon after base contiguous with or approximated to C for some distance. Tympanum absent in some apterous ♀♀.

2. *Sematuridae*.—Postantennal sense-organ strongly developed. No tympanal organ at base of abdomen, no lateral cavity beneath second segment. SC^2 stalked with SC^1 . Frenulum present. In hindwing C strongly curved down to base,肘ed, the area between C and frenulum more or less swollen ; M at first remote from C, soon approximated to it at one point and here touching it or connected with it by a bar (= SC^1).—I place here *Apoprogones* Hamps. (1903), from South Africa, as representing a separate subfamily differing from the American genera in the eye being naked, the tibiae non-spinose, and other minor details.

3. *Uraniidae*.—Postantennal sensory organ usually strongly developed. Males (Pl. III, fig. 6) with a large lateral cavity under the second abdominal segment opening behind ; females (Pl. III, fig. 7) with a tympanal organ in the basal sternite ventrally to the first stigma, recalling the corresponding organ of the *Geometridae* ; it consists of a glossy drum, shaped somewhat like a Dutch cheese, with the concave surface, which is directed towards the thorax, bearing a tympanum ; the metepimerum opposite this organ more or less hollowed out, sometimes much inflated. Frenulum absent except its vestigial base. SC^2 of forewing always remote from the other subcostals, stalked with R^1 or originating with it from the upper cell-angle ; a short spur (= SM^1) projects from M near base, in the small and delicate species often scarcely traceable. In hindwing C curved down at extreme base, C and M contiguous from base for a short distance, then diverging strongly. Eye naked, but sometimes with short hairs (*Chrysidia*).

4. *Epilemidae*.—Like the *Uraniidae*, but with frenulum, bristles of frenulum often reduced or absent, but basal incrassation of costal margin of hindwing

* Forbes, "On the Tympanum of certain Lepidoptera," in *Psyche*, xxiii. p. 183 (1916).

always present. No subbasal spur from M of forewing. No precostal vein on hindwing. Abdominal organ in ♂ and ♀ as in *Uraniidae*, in some forms absent (f.i. *Chatamla*, *Amana*; in *Psychostrophia* the ♂ has below the first abdominal stigma a large scent-tuft, which, if not spread out, lies concealed under a longitudinal fold).—Includes *Epicopeia*.

II. Postantennal sensory organ absent or vestigial. Both sexes with large cavity (Pl. III, figs. 8 and 9) under the FIRST abdominal pleurum opening behind (as in ♂ of *Uraniidae*, in which the cavity is under the SECOND segment) the first stigma on the lateral surface of the convex pleurum (in both sexes of *Uraniidae* it is placed in the constriction between abdomen and thorax). Below first pleurum and towards thorax a fairly large glossy vesicle externally without opening and without tympanum, the vesicle divided into two unequal compartments, and projecting forward; the posterior portion (= merum) of the hind-coxa being correspondingly caved in, very narrow in a lateral aspect, membranous at the epimerum. Frenulum present. In hindwing C bent down towards SC² beyond upper cell-angle. Tarsal claw with tooth.

5. *Cymatophoridae* and 6. *Drepanidae*.—There does not appear to be any difference between these two families which holds good throughout the series of species. In most *Drepanids* R² of the forewing (= vein 5) arises from near the lower cell-angle, but there are also species in which it arises as in *Cymatophoridae* from the centre or from above the centre, f.i. in some species of *Euchera*: *E. javana* Auriv. (1894), *E. ociferaria* Walk. (1860), *E. pitmani* Moore (1886).—*Cimelia* and *Epicimelia* have neither cavity nor vesicle at base of abdomen, but agree otherwise well with the *Cymatophoridae*.

III. No postantennal sensory organ. No abdominal tympanal cavity, but the metathorax (Pl. III, figs. 2–5) bears in front of the rather strongly chitinised longitudinal groove bounding the first abdominal tergite laterally, a tympanum which covers a cavity lying within the metathorax; externally (in dorsal aspect) the metascutum has a transverse depression from the metascutellum towards the wing-base, and behind this depression, and posteriorly bounded by the chord which connects the posterior margin of the wing-base with the metascutellum, there is a vesicular sclerite (third pteralium), separated from the metascutum by a suture, this vesicle sometimes strongly prominent, sometimes less conspicuous, but always present. On the metasternite, below the before-mentioned chord, and either on the posterior surface of the metepimerum or on its lateral surface, there is either a cavity, usually deep, or a depression or tympanum-like membrane, more or less on a level with the first abdominal stigma. Frenulum present. C of hindwing remote from SC², not bent down beyond upper cell-angle; tarsal claw usually with tooth, often minutely serrate.

7. *Dioptidae* (Pl. III, figs. 2 and 3).—Palpus upturned over the face. First abdominal stigma not in a definite hollow.—Mimetic species, in appearance very unlike the *Notodontids*.

8. *Notodontidae* (Pl. III, figs. 4 and 5).—End-segment of palpus more or less porrect. First abdominal stigma in a definite hollow or pocket, which is often deep (and in many cases recalls the tympanal cavity of the *Noctuoidea* families).—Includes *Thaumetopoea*.

V. No sensory organ of radiating bristles behind the antenna. No tympanal cavity at base of abdomen. C of hindwing not bent down towards SC² beyond upper cell-angle. Frenulum present, but its bristles often lost. Tarsal claw, as in V and VI, always without tooth, but frequently serrated.

9. *Perophoridae*.—Branches of antenna scaled in both sexes. C and SC of hindwing anastomosing close to the base, basal portion of C excised and sharply edged opposite the condylus of M.

10. *Bombycidae*.—Branches of antenna not scaled. Last subcostal of forewing (Pl. III, figs. 12 and 13) more or less down-curved, or at least the distance between it and R¹ larger at the base of SC⁵ than at termen.—Here belong also *Apatelodes* and allies, which used to be considered Notodontids.

11. *Eupterotidae*.—Branches of antenna not scaled. Last subcostal not curved down, the distance between it and R¹ smaller at the base of SC⁵ than at termen.—Evidently restricted to the Old World. There is an almost complete connection between the Eupterotids and Lemoniids.

V. Like IV, but frenulum truly absent, the basal costal margin of the hindwing not being thickened. Superfamily *Saturnioideae*.

As we have begun to monograph this superfamily, we abstain from entering here upon a division into families.

VI. Like IV, frenulum present, but its bristles often missing. C of hindwing approximated to SC² beyond upper cell-angle.

12. *Lemoniidae*.—Cross-vein D³ of forewing longer than D² and angulate, R² from well above this angle, at the most one subcostal free from cell of forewing. Foretibia with a heavy apical claw.—This family is very close to the *Eupterotidae*; in some of the African Eupterotids the foretibia is short and armed with a claw, and C of hindwing runs close above the cell to near its apex before curving forward.

13. *Brahmaeidae*.—As before, but foretibia at the most with short spines.—Includes *Spiramiposis*.

14. *Sphingidae*.—D³ of forewing shorter than D², not angulate, R² from below centre, two subcostals free from cell of forewing.

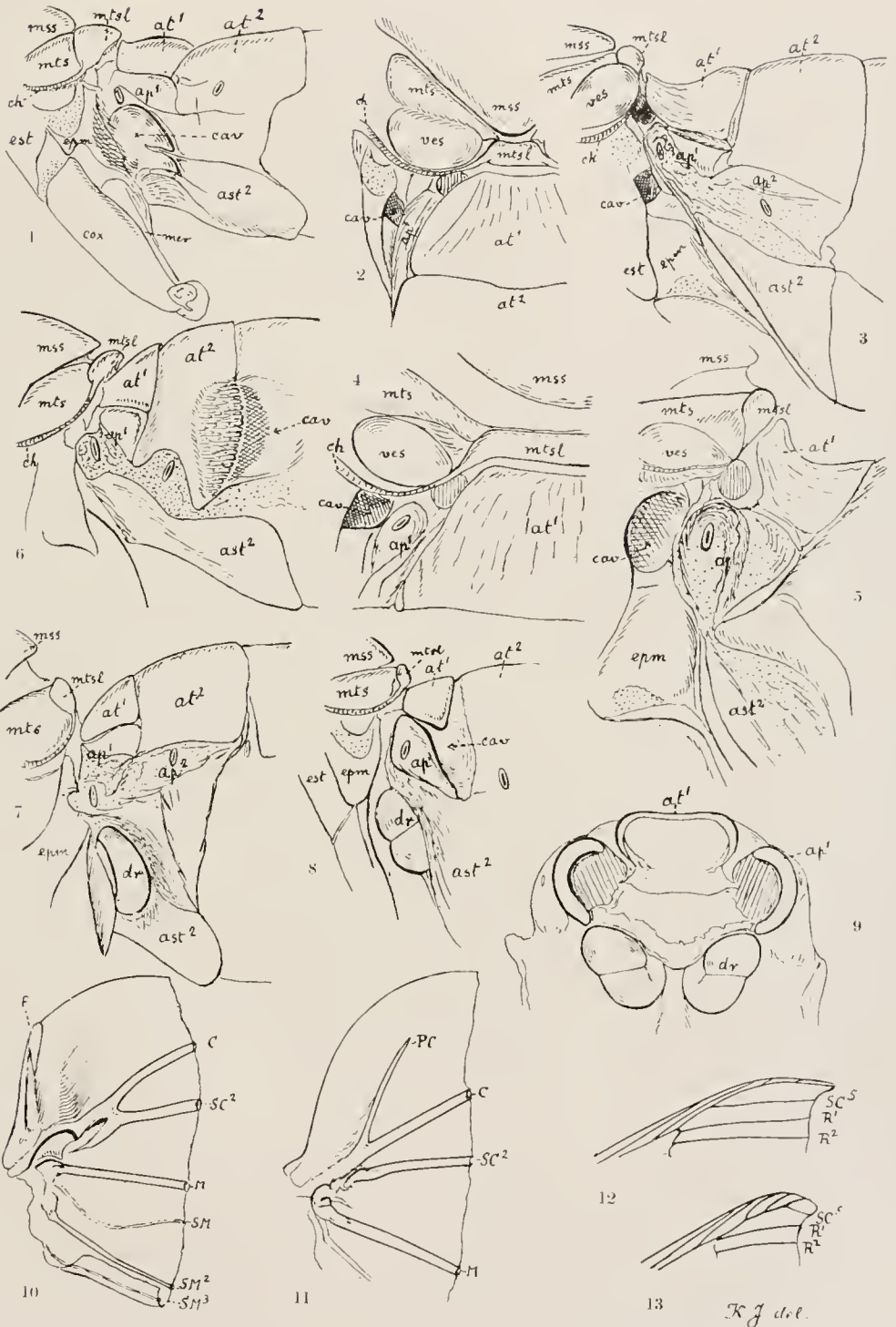
The genera *Oxytenis*, *Asthenidia*, and some others agree with the *Saturnioideae*, and must be classified with them.

The distinction given above between the *Bombycidae* and *Eupterotidae* is very slight in some species, but as it is corroborated by differences obtaining in the wing-bases and the thorax, we consider the two families distinct. As we shall have an occasion to describe and illustrate the differences in another place, we only mention here that in the Eupterotids there is along the distal side of the base of the frenulum a transverse tubular swelling, which is replaced in the Bombycids by a dorsally convex and ventral concave fold (not tubular), and that the posterior dorsal angle of the merum of the midcoxa extends further dorsad than the anterior angle in *Bombycidae* (as also in *Sphingidae*, *Brahmaeidae*, *Lemoniidae*), while in *Eupterotidae*, *Saturnioideae*, and *Perophoridae* the posterior angle remains below, or at the level of, the anterior angle if the body is in a horizontal position.

EXPLANATION OF PLATE III.

FIG.

1. *Ourapteryx sambucaria* L. (1758), lateral aspect.
mss = mesoscutellum ; mts = metascutum ; mtsl = metascutellum ;
ch = chord ; est = episternum and epm = epimerum of metasternite ;
cox = coxum and mer = merum of hindcoxa ; at¹ and at² = first and
second abdominal terga ; ap¹ = first pleurum ; cav = tympanal cavity ;
ast² = basal sternum = sternum of second segment.
2. *Josia auriflua* Walk. (1864), dorsal aspect.
As before ; ves = vesicle of metatergite ; cav = cavity in metepi-
merum.
3. *Josia auriflua* Walk. (1864), lateral aspect.
4. *Stauropus fagi* L. (1758), dorsal aspect.
5. *Stauropus fagi* L. (1758), lateral aspect.
6. *Cyphura destrigata* Kirsch (1877), ♂, lateral aspect.
cav = cavity of second abdominal segment.
7. *Cyphura destrigata* Kirsch (1877), ♀, lateral aspect.
dr = drum in basal abdominal sternum.
8. *Thyatira batis* L. (1758), lateral aspect.
cav = cavity in first abdominal segment ; dr = drum in basal
abdominal sternum.
9. *Thyatira batis* L. (1758), frontal surface of abdomen.
at¹ = first abdominal tergum ; ap¹ = first pleurum with tympanum ;
dr = drum.
10. *Perophora melsheimeri* Harris (1841), base of hindwing, underside.
Fr = incrassate base of costal margin (remnant of frenulum) ; C =
costal ; st² = subcostal ; M = median ; SM¹, SM², SM³ = first, second, and
third submedian veins.
11. *Asthenidia podaliriaria* Westw. (1841), base of hindwing, underside.
PC = precostal vein.
12. *Andraca bipunctata* Walk. (1865), subcostals and upper radials of forewing.
13. *Bombyx mori* L. (1758) ; subcostals and upper radials of forewing.



K J dol.



NEW EASTERN ANTHRIBIDAE.

BY DR. KARL JORDAN.

1. *Phloeopemon acuticornis continentalis* subsp. nov.

♂♀. Proboscis thicker than in the Malayan form, its dorsal surface more curved in a lateral aspect; thorax a little wider posteriorly; elytra less coarsely scriate-punctate; black markings of upperside rather larger.

Hab. Assam (type from the Khasia Hills), Burma, Tonkin, Annam.

2. *Sintor rhabdotus* spec. nov.

♂♀. Rufescenti-brunneus, supra ochraceo-luteo tomentosus, brunneo vitatus, subtus pube grisea obtectus, rostro supra fossa mediana postice angustata instructo, pygidio apice acuminato, submucronato; antennis pedibusque ex maxima parte rufis.

Long. (cap. excl.*) 6.7 mm., lat. 2.7 mm.

Hab. Perak (W. Doherty), ex coll. van de Poll, 2♂♂, 1♀; a ♂, likewise in Mus. Tring, labelled "Malacca."

Mouth-parts with the exception of the mandibles rufous; shaft of antenna and the legs dull rufous; body rufescent brown, densely pubescent clayish ochraceous above and grey beneath. The sides of the rostrum, a double stripe on the head, four stripes on the pronotum, and two on each elytrum blackish brown, the two dorsal pronotal stripes being broader than the median clayish stripe and narrower than the dorsal lateral clayish ones. The stripes of the elytra are continuations of the pronotal ones, the dorsal stripe being somewhat irregular and bearing some clay irrorations, the lateral one being limbal, occupying the margin and one interspace and being interrupted behind the shoulder, where it is widened into a spot; suture brown posteriorly. Scutellum clayish grey. The median groove of the rostrum deep, posteriorly narrowed, extending a little on to the frons, and continued almost to the apex of the rostrum, the ridge bordering the groove on each side distant from the eye; the apical lateral edge of the rostrum not merged together with the dorsal edge of the antennal groove. The frons convex centrally.

Prothorax slightly broader than long. Pygidium rounded, a little shorter than broad, ending with a short projection.

3. *Blabirhinus obliquus* spec. nov.

♂. Niger, supra tomento fulvo-ochraceo, subtus griseo obtectus, antennis pedibusque rufescentibus, elytris duabus fasciis valde obliquis angustis obsolentibus dorsalibus nigro-brunneis notatis; rostro late impresso carina mediana instructo, pronoti carina dorsali in medio angulata, carinula dorsali completa.

Long. (cap. excl.) 4.8 mm., lat. 2.4 mm.

* In all cases the length is measured in a straight line from the anterior margin of the pronotum to the apex of the pygidium.

Hab. Banguay I., north of Borneo (J. Waterstradt), ex coll. van de Poll, 1 ♂.

The rostrum thick and apically very slightly widened, broadly impressed above, the impression being bounded on each side by a subcariniform ridge, the two ridges converge towards the middle posteriorly, the impression narrowing perceptibly towards the frons; a strong central carina extends from the apex to the base, just entering on to the frons. Antennae rufescent, probably rufous in live specimens, segment 9 a little longer than 8, 10 proximally very strongly rounded, apically truncate-emarginate, broader than long, 11 a little longer than broad.

Prothorax almost twice as wide before the base than at the apex, sides beneath black, on upperside at the base two indistinct brownish streaks, one at the angle, slightly outlined in grey, the other half-way to the centre; both the dorsal transverse carina and carinula angulate in the middle and both complete, the carinula (between transverse carina and basal margin) not being obsolete centrally as is usually the case in this genus.

Elytra convex basally, depressed above the shoulders, rounded-declivous in lateral aspect, flattened together posteriorly, almost gradually narrowed from base, tawny-ochraceous, a faint, interrupted, oblique, brown line dorsally to the basi-humeral depression, followed by faint brown dots in the alternate interspaces, a more distinct brown line from about the middle of the third interspace obliquely backwards to near outer margin, ninth and tenth interspaces indistinctly dotted with brown; basal and lateral margins, above and behind the brownish shoulder-angle, slightly grey. Legs rufous and like the underside of the body pubescent grey, tibiae with three brownish rings or spots.

Near *Sintor vethi* Jord. (1912), from Java, but in the latter the rostrum is distinctly dilated at the apex, the pronotum is less widened posteriorly, the dorsal carina of the pronotum is not distinctly angulated in the centre, the carinula is incomplete, the elytra are parallel from the base to the middle, and bear a broad subbasal transverse brown fascia.

4. *Blabirhinus plumbeus* spec. nov.

♀. Niger, omnino pube grisea tectus, subcoerulescens, setis brevibus nigris in punctis nigris sitis adpersus abdomine excepto; rostro late depresso bicarinato. Long. (cap. excl.) 5 mm., lat. 2.5 mm.

Hab. Perak, Malay Peninsula (W. Doherty), 1 ♀ ex coll. van de Poll.

Black, uniformly clothed with a grey pubescence, the insect appearing bluish grey on account of the black background; with the exception of the abdomen the body is densely irrorated with numerous black punctures, each bearing a short black bristle. The rostrum, its apex excepted, is broadly impressed, the impression being bounded by a sharply marked carina, which terminates at the frontal edge of the eye, the two carinae being slightly divergent posteriorly; the non-impressed apical portion is subcarinate in the centre and carinate above the antennal groove. Club of antenna black, broad, the segments broader than long, 10 being about twice as broad as long.

Prothorax shorter than broad, convex; carina extending to the middle of the sides, dorsally its central half slightly concave, while towards the sides the carina is somewhat convex; dorsal carinula complete, lateral carinula distinct, but anteriorly abbreviated. Scutellum twice as broad as long. Elytra evenly

convex, widest at the base, finely striate, basal margin curved forward near scutellum.

The derm of the underside faintly rufescent in places, femora likewise rufescent.

Eupanteos gen. nov.

♂. Rostrum supra 3-carinatum, margine antennarum acetabulorum etiam in forma carinae oculos versus continuato. Antennae breves, crassae, articulo 3^{io} secundo paululo longiore, 3^{io}-8^o hirsutis, clava crassa, leviter complanata, inter segmenta constricta, 11^o ovato; acetabula sulciformia, oblique in longitudinem posita. Elytra basi truncata. Tarsorum articulus 1^{us} brevis, secundo paulo longior.

Genotypus: *E. ornatus*.

Near *Eusintor* Jord. (1904); rostrum shorter, dorso-lateral carina joining the raised frontal margin of the eye; shaft of antenna shorter, segments 3 to 8 hirsute, club densely ciliated, not more hairy below than above. Last abdominal segment of ♂ with a half-circular apical impression.

We know two species only, both ferruginous scarlet.

5. *Eupanteos ornatus* spec. nov.

♂. Ferrugineo-coccineus, infra parum griseo pubescens. Antenna nigra, articulis 1^o et 2^o et 3^o basi rufis, 10^o et 11^o pallidissimis pube griseo-alba dense obtectis. Rostrum cum capite flavo-luteo bivittatum, capite fortiter rugato-carinulato, vitta media eodem colore. Pronotum nigro-quadrinaculatum maculis parvis luteo-griscis notatum. Elytra ante medium fortiter depressa, in depressione macula nigra suturali signata, macula dorsali postmediana et duabus limbalibus etiam nigris. Infra latus prosterni et genua et femorum bases nigrescentes.

Long. (cap. excl.) 5.7 mm., lat. 2.7 mm.

Hab. Richmond R., N.S. Wales, 1 ♂ ex coll. French.

Pronotum about $\frac{1}{10}$ broader than long, not quite twice as broad at the carina as at the apex, with a widely interrupted thin median stripe and at each side of it in middle a small spot luteous grey, further sideways before and behind this spot a larger, distinct, rounded black spot, further laterad a curved spot near apex and a smaller one at carina luteous grey, inconspicuous; carina black, distant from base, slightly interrupted in middle, quite gradually rounded laterally, extending but little forward at the sides; dorsum finely punctate, sides with dispersed large punctures and before middle a little swollen.

Scutellum ovate. Elytra widest at base, strongly impressed transversely behind the subbasal swelling, the impression curving forward laterally, extending to base above shoulder, but here less deep than further back, apical third strongly convex-declivous; punctate-striate, the punctures large and deep, each with a short erect bristle (most of them broken in our specimen); a sutural spot in ante-median depression, a median dorsal spot from 2nd stripe sideways, another obliquely behind it at side, and a more rounded lateral one before middle in a depression all black; from the dorsal spot backwards a pale low crest of erect pubescence, at sides three greyish spots and a fourth before the apex. Pygidium rounded.

Abdomen with greyish lateral spots, sides of prosternum, knees, and base of femora blackish. Tooth of claw in anterior and middle tarsi subapical.

Third segment of antenna (δ) half as long again as broad at apex, 7 and 8 slightly broader than long, 9 as long as broad, broadest at apex, which is truncate, 10 shorter than 9, slightly transverse, 11 a little longer than broad, widest near base, half as long again as 9, both 10 and 11 cream colour.

6. *Eupanteos doddi* spec. nov.

Praecedenti similis, maculis nigris fere nullis, pronoto multo fortius inaequali, elytris ante medium levius depressis, pilis erectis adspersis.

Hab. Queensland: Kuranda, i. 1904 (F. P. Dodd), 1 ♀, type; in D. Ent. Mus. 1 ♂, 2 ♀♀ from the same place.

A little smaller than the previous species. Entirely red, the black spots faintly indicated on the elytra, absent from the pronotum, the most distinct spot being the antemedian limbal one of the elytra; pronotum with a faint trace of a grey median streak and of two lateral spots. The chief differences are structural: the sides of the disc of the pronotum are more strongly elevate and the oblique impression in front of these swellings is deeper than in *E. ornatus*; the antemedian depression of the elytra, on the contrary, is less deep, the subbasal swelling less elevate, and the posterior portion of the elytra is more gradually slanting. Antenna a little slenderer, 3rd segment over twice as long as broad.

7. *Litocerus didymus* spec. nov.

♂. Statura et colore *L. khasiano* simillimus. Niger, supra albo-maculatus, subtus albo-griseo-pubescent; pronoto inter apicem et carinam decem-maculato, post carinam maculis tribus notato, carina laterali obliqua recta, angulo valde rotundato; elytris maculis ut in *L. khasiano* fere dispositis, macula scutellari transversa majore.

Hab. Toli-Toli, North Celebes, Nov.–Dec. 1895 (H. Fruhstorfer); 1 ♂.

Black, the derm rufescent under the spots of white pubescence. The spots of the pronotum and elytra occupy less space than the black ground. The prothorax is more strongly rounded at the sides than in *L. khasianus*, agreeing in the shape of the outline better with *L. sticticus* Jord. (1904), from Tonkin and Formosa. The pronotum has a slightly uneven surface, the transverse antemedian sulcus is indistinct, the punctures are a little less distinct than in *L. khasianus* and *sticticus*, the dorsal carina is angulate in the centre, the lateral angle of the carina less rounded than in *L. sticticus*, but more so than in *L. khasianus*, the lateral carina being almost straight in a lateral aspect; two median markings, one being subapical, the other short, triangular, placed in front of the carina and forming one spot with the antescutellar dot, four spots on each side, of which one is elliptical, slightly transverse, placed at the end of the discal sulcus, the second and third ones behind the other, subapical and subbasal respectively, and the fourth placed at the lateral carina and somewhat resembling a swimming bird. The basal sutural spot of the elytra is the largest of all, it is transverse, occupying the scutellar and first interspaces and part of the second, being moreover continued laterad at the basal margin half-way to shoulder; on suture an elongate-elliptical spot before middle and a smaller spot behind middle, a round one on subbasal

callosity, an irregular ovate spot above shoulder, a rather large and very conspicuous median spot, subquadrangular, from second row of punctures to fifth interspace, and about 13 additional, smaller spots on each elytrum, of which five are placed on the apical declivity (1, 2, 2).

The white ring of the tibia conspicuous on the upperside, its width about equalling the distance from the base; tarsi with sparse white pubescence at the apex of the first segment and along the centre of the second.

8. *Litocerus effatus* spec. nov.

♂. *L. philippinensi* Jord. (1895) similis, antennis pedibusque minus rufescentibus, maculis centralibus pronoti in formam crucis dispositis separatis, elytris nigris maculis luteis dispersis notatis.

Hab. Balabac (type) and South Palawan; 2 ♂♂.

Antenna dark brown, the first two segments and the base of the third paler, but not so pale as in *L. philippinensis*. The six spots on the disc of the pronotum are all separated, in the Palawan example also the lateral luteus pubescence is broken up into spots.

Elytra with the luteous spots isolated, excepting the humeral spot, which is connected with a basal sutural spot by means of short basal longitudinal lines; behind the basal callosity a transverse, subluniformal, spot, on the suture an elliptical spot before the middle, a small subrectangular one behind the middle, between these two spots, but more laterally, the largest spot of all, subrotundate, expanding between the second and fifth lines of punctures, slightly encroaching upon the second and sixth interspaces; on apical declivity two spots at suture and two at lateral margin, with a longitudinal dash between (but a little forward) the first lateral and the first sutural spots, at or near the lateral margin; moreover, a spot behind shoulder, a double one before and a single one behind middle, on disc a few dashes.

Legs rufescent brown, segments 2 to 4 of tarsi as dark brown as first segment.

9. *Litocerus plagiatus doximus* subsp. nov.

♂. Pronoto vitta mediana grisea quam vitta fusca multo angustiore, lateribus late griseo-pubescentibus; elytris area luteo-grisea post medium ad limbum extensa, macula subapicali fusca magna.

Hab. Toli-Toli, North Celebes, Nov.-Dec. 1895 (H. Fruhstorfer); 1 ♂.

The light-coloured pubescence grey, with hardly a trace of yellow; antennae and legs darker rufous than in *L. plagiatus plagiatus* Jord. (1895), from the Philippines; the grey median stripe of the pronotum about as wide as the antescutellar spot, constricted at the carina, about half as wide as the dark brown stripes, which are straight; the sides grey, a brown median spot joined to the brown dorsal stripe. The grey sutural area of the elytra, as in *L. p. plagiatus*, extended from base to apex, invaded from the sides by a large brown-black area, which is irregularly triangular, almost reaches to the sutural line of punctures and encloses a rather large grey limbal spot and a minute dot situated behind this spot; before apex a large, somewhat reniform, brown-black spot, reaching the sutural stripe and enclosing a small grey sublimal spot and two minute dashes; between the two brown-black limbal patches the grey sutural area

extends to the lateral margin as a narrow uninterrupted oblique band. On underside two brown spots on the metasternum and a row of spots on the abdomen, all lateral.

10. *Litocerus plagiatus semnus* subsp. nov.

♀. Pronoto vitta mediana grisea recta quam macula antescutellaris parum angustiore, maculis lateralibus parvis; elytris areae suturalis lobo postmediano angusto brevi; pedibus fere nigris, tarsorum segmento 2° hand rufo.

Hab. Palawan (W. Doherty); 1 ♂.

The sides of the pronotum and elytra are black and show only traces of markings, being somewhat soiled and abraded. The median stripe of the pronotum is slightly broader than in *L. plagiatus doximus*. The postmedian projection of the sutural area is narrow and reaches only to the sixth interspace.

11. *Litocerus zosterius* spec. nov.

♂. Speciei *L. histrio* Gylh. (1833) dictae valde affinis, antennarum articulo primo brevior, quarto et sequentibus minus clavatis, fronte latiore, elytris fascia lata sinuata transversa nigra diversus.

Hab. Perak (W. Doherty); 1 ♂.

Frons as broad at the narrowest point as the apex of the third antennal segment. Antenna slenderer than in *L. histrio*, segment 1 shorter, 3 somewhat longer, 3 to 7 apically less widened, and more compressed, also more extended rufous.

Pronotum less distinctly punctate, greyish luteous, with a brown stripe half-way between centre and sides, this stripe broadened at apex, between it and centre an elongate brown spot reaching neither carina nor transverse sulcus, another brown spot between lateral carina and apex; angle of carina a little less rounded than in *L. histrio*.

Elytra the same colour as the pronotum, with some black-brown small spots and very short lines behind the base and on the apical declivity, in middle a broad black transverse band from side to side, sharply defined dorsally as far as the sixth stripe, anteriorly sinuate once, in third interspace, posteriorly twice, broadest laterally, but here bearing some greyish luteous spots. In *L. histrio* the black band is broader, antemedian, and much more irregular.

12. *Phaulinia dissensa* spec. nov.

♂♀. *Ph. schauimi* simillina; elytris sine macula subapicali nigro-velutina, margine lato apicali cum toto pygidio luteo-grisco tomentoso.

Hab. Madura district, South India; a small series.

The apical border of the elytra is sharply defined and ends laterally about on a level with the middle of the lateral margin of the second abdominal segment. The large velvety black basal sutural patch of the elytra varies slightly in size and, as in *Ph. schauimi*, has a narrow luteous grey border.

13. *Xylinades vicinus* spec. nov.

♂♀. *X. nodicorni* Web. (1801) simillimus; pronoto fortius granulato-rugoso, abdomine maculis rotundatis nigris lateralibus, tibiis absque macula mediana nigra, maris segmento anali ventrali interno diverso distinguendus.

Hab. Borneo (type from Brunei), Sumatra, Perak.

We have no specimen from Java, all our Javan examples of this type of *Xylinades* belonging to *X. nodicornis* (= *westermanni* Fahr. 1839), which occurs also in Borneo, Sumatra, and Malacca.

The abdominal spots of *X. vicinus* are more or less rounded and completely brownish black; in *X. nodicornis* they are either rings with a grey centre, or sickle-shaped, or are reduced to longitudinal dashes. The tibiae of *X. nodicornis* always have a black median spot or half-ring, which is absent from *X. vicinus*. The (nearly) smooth apical area of the pronotum is larger in *X. nodicornis* than in *X. vicinus*, and on the whole the third segment of the antenna is slightly longer. The most important evidence that *X. vicinus* is independent of *X. nodicornis* is furnished by the internal anal sternite. The two lobes of this sternite are broad, narrowing from the middle to the apex, while in *X. vicinus* they are strongly narrowed from base to apex, curved, and pointed, resembling a tarsal claw to some extent, but are flattened.

14. *Phloeobius stenus* spec. nov.

♂. *P. alternans* structura, sed multo angustior, oculis crassioribus magis remotis, pronoti earina laterali magis prominente, elytris ad suturam depressis, processu mesosternali angustiore distinctus. Pronotum lateribus atque elytra area suturali ante plagam apicalem griseam optime definitam ad latera usque dilatata nigrescentibus.

Long. 8.5-11 mm.

Hab. Shanghai, 3 ♂♂.

As in *P. alternans* Wied. (1819), the frons with 2 distinct carinae, the underside of the head without a groove-like transverse depression from eye to eye, the labiophore not being sharply separated from the throat. The lateral carina of the prothorax much more prominent anteriorly (i.e. in middle of side) than in *P. alternans*, the sides of the prothorax from this angle forward gradually rounded-narrowed, without an apical projecting angle. Rostrum and head yellowish grey, this colour continued as a sort of median band to base of pronotum, sides of pronotum brownish, slightly relieved with luteous spots. Scutellum white. Elytra nearly twice as long as broad, much narrower than in *P. alternans*, sub-basal swelling less distinct, sutural interspace more distinctly depressed from base to apex, sutural area much spotted with blackish, rather strongly contrasting with the lateral area, which is not spotted with blackish, but with greyish white in the alternate interspaces, the dark area continued laterad in front of the grey apical patch.

Prosternum not quite so long in front of the coxae as in *P. alternans*, with transverse groove. Mesosternal process narrower than the coxa. Tarsi as much dilated as in *P. alternans*. Pygidium barely one-third broader than long.

15. *Pioenia poecila* spec. nov.

♂♀. Brunneo-nigra, supra luteo-pubescentis, brunneo-maculata, albo-griseo-subtessellata, scutello albo-griseo, subtus omnino albo-grisea. Pronoti carina dorsalis basalis, earina lateralis fere ad apicem extensa. Pygidium tam longum quam latum, apice truncato (♂) vel rotundato (♀). Tibia postica (♂) curvata, apice producto penicillo instructo, tarso postico longo.

Long. 5.8 mm.

Hab. Borneo : Doesonlanden (Wahnes), 1 ♂, type ; " Borneo," 1 ♂, 1 ♀.

Head longitudinally plicate, with a slightly more prominent median carina on frons, anteriorly a transverse non-plicate space separating frons from rostrum. Laterally the dorsal surface of rostrum rugate, medianly punctate. Pubescence of head and rostrum shaded with grey, not very dense, the brown ground shining through in middle of head, where there is an indication of a whitish spot. Antennal segment 3 half as long again as 4, also longer than 2, 8 somewhat broader than 7. Pronotum rugate-granulate, smooth at apex under the pubescence, across disc a transverse row of three large spots, a smaller spot further towards side, two dorsally at apex and four dorsally before carina, and indications of spots laterally, all variable and sometimes more or less connected with one another, in middle of apex an indication of a greyish white line, vestigial greyish white spots on disc and sides, all very indefinite ; dorsal carina basal, lateral carina extending forward to near apex, but not reaching apical margin. Scutellum transverse. Elytra rather strongly punctate-striate ; a round shoulder-spot, another on subbasal callosity, an antemedian spot between third and fifth or sixth stripe and joined to the corresponding spot of the other elytrum by some smaller, more or less confluent, spots, a largish spot on apical declivity half-way between suture and outer margin, a lateral spot before middle and a number of smaller spots brown, behind the larger brown spots indications of greyish white ones. Pygidium as long as broad, in ♂ truncate and slightly emarginate, in ♀ more strongly narrowed and the rounded apex somewhat turned up.

Underside without spots, excepting a lateral one on last sternite. In ♂ the metasternum and abdomen strongly depressed, with silky hairs in the depression, last sternite impressed, the impression somewhat rounded anteriorly, deepest apically, the margin of the segment excised, with a distinct angle on each side of the sinus. Hindtibia of ♂ also modified, slightly curved, convex ventrally, the apex ventrally produced and acuminate, with a minute brush close to the tip, the tarsus inserted on dorsal (hollow) side of the process. First hindtarsal segment in ♂ one-half and in ♀ one-fifth longer than claw-segment ; hindtarsal claw without tooth in ♂.

16. *Pioenia pulchrina* spec. nov.

♀. *P. pocilae* simillima, maculis multo melius circumscriptis, magis numerosis, pygidio semicirculari.

Long. 6-7 mm.

Hab. Borneo : Sarawak, Matang Road, July 1914, type, and December 1920, from the Sarawak Museum.

Broader than *P. pocila*. Pronotum with fifteen dark brown spots in three transverse rows : 4 behind apical margin, 7 in middle, of which the second from the side is shifted backwards, and 4 before carina, behind or between the spots indications of white markings, white median line more distinct, interrupted by the brown middle spot. Elytra more finely striated than in *P. pocila*, the alternate interspaces spotted with dark brown and white, two dorsal subbasal spots and a shoulder spot on each elytrum, a sutural spot in middle and a subsutural one at some distance from apex larger, the last spot connected across suture with the spot of the other elytrum. Pygidium half as broad again at base as long,

semicircular, i.e. much shorter than in the ♀ of *P. pocilla*, at each side of centre a brownish spot.

Second tarsal segment, tips of tibiae, and a lateral spot on anal sternite dark brown. Dorsal carina of pronotum laterally subbasal. Sutural and limbal impressed lines of elytrum connected with one another across apex, this apical sulcus incurved.

17. *Pioenia irrorata* spec. nov.

♂♀. Nigra, supra schistaceo-pubescens, guttulatim griseo-notata, subtus grisea, tarsi plus minus nigris. Caput cum rostro longitudinaliter rugosum. Antenna pronoti basim superans (♂) vel vix attingens (♀), segmento 2^o tertio aequali (♂) vel parum longiore (♀). Carina lateralis versus apicem pronoti extensa, carina dorsalis versus latus subbasalis. Elytra leviter striato-punctata, sat dense guttulata. Pygidium tam longum quam latum, subtriangulare, granulolum, apice acuminato (♂) vel rotundato (♀).

Long. 5.5-6 mm.

Hab. Philippines: Samar, vi. vii. 1896 (J. Whitehead), 2 ♂♂, type; Borneo: Doesonlanden (Wahnes), ex coll. van de Poll, 1 ♀, and Sarawak, 1 ♀.

No smooth space between rostrum and frons. Pronotum rather coarsely rugate longitudinally, reticulate in front of the carina, apex almost smooth under the pubescence; numerous small grey specks, condensed at the sides of the pronotum; dorsal carina laterally subbasal, the basal carina visible behind it (not placed below it). Scutellum semicircular, not transverse, whitish grey. Elytra with the rows of punctures feebly impressed, these rows (not the interstices) dotted with grey, the dots slightly more concentrated near the suture in basal fourth and in the ♀♀ again dorsally in middle and at apex. The basal median groove of the propygidium extending for some distance on to the pygidium, gradually fading away beyond centre; apex of pygidium acuminate and turned up in ♂, two rows of granules extending from this projection on to the pygidium, forming two indistinct ridges; in ♀ the apex much less acuminate, rounded, with the margin slightly turned up. Metasternum and base of abdomen flattened in ♂, anal sternite shorter than in ♀, the apex rounded in both sexes. Second and third foretarsal segment broad in ♂ and segment 4 as long as 1 to 3 together.

The cariniform dorsal margin of the antennal groove remains distant from the eye and is more ventral than in the previous species, the direction of the margin being below the sinus of the eye.

18. *Pioenia pannosa* spec. nov.

♂. Nigro-brunnea, supra pube lutea et alba variegata, pronoto medio nigro-brunneo, luteo-triguttato, clytris undulatim subfasciatis, pygidio truncato, albo et luteo pubescente; subtus griseo-flava, tarsi apice plus minus nigris. Metasternum cum abdomine medio deplanatum, segmento anali late impresso, emarginato. Tibia postica apice minus quam in *P. pulchrina* producta, intus nota apicali e granulis acutis composita instructa.

Long. 5.6 mm.

Hab. Perak (W. Doherty), 1 ♂ ex coll. van de Poll.

Head and rostrum covered with luteous and whitish pubescence, the white

colouring more prominent at the sides of the rostrum and in the centre of the frons. Antenna brownish black, club slightly paler, segment 3 one-third longer than 4, club rather slender, two and one-half times as long as broad, 11 a little longer than 9. Antennal groove large, its cariniform dorsal margin extending close to eye; upper lobe of eye projecting farther orad than lower lobe.

Pronotum granulate-rugate, almost smooth anteriorly; a broad central band, widened in middle, blackish brown, with three small luteous spots placed in a triangle, sides clay-colour, with several brown spots and two or three white ones; dorsal carina basal, laterally nearer basal carina than in *P. pulchrina*, the lateral angle of the carina less broadly rounded than in that species, lateral carina not quite extending to apex. Elytra as in *P. pulchrina* with the stripes hardly at all impressed, apart from the sutural and limbal ones, which are connected with one another along apical margin, the connecting ridge very distinct incurved, not interrupted; colouring different from that of *P. pulchrina*: basal third of suture occupied by a broadish streak pointed behind and connected with a basal spot along basal margin; behind subbasal swelling a transverse band from sutural streak to lateral margin, zigzagging and sending in fifth interspace a branch towards shoulder, behind middle a similar band, from this band to apex the suture rather broadly clayish, apex coloured like the transverse band clayish and white, the rows of punctures here and there with some clayish pubescence, particularly towards the sides in between the bands, the incrassate lateral margin of the elytrum with hardly any spots. Scutellum clayish white, transverse, slightly smaller than in *P. pulchrina*. Pygidium longer than broad, finely punctate, apex truncate and slightly emarginate, the angles rounded.

Hindfemur more strongly incrassate than in *P. poecila* ♂, with brown apical patch; apex of hindtibia slightly produced on underside, the tarsus being inserted on the upperside; on the inner surface of the apical projection there is a patch of sharp tubercles (the patch also present in *P. poecila* ♂, but smaller), but no pencil of hairs; hindtarsus half as long again as hindtibia, claw with tooth near base.

19. *Pioenia pilosa* spec. nov.

♂♀. Nigra, dorso nigro-brunneo-pubescens, omnino albo-guttulata, scutello albo, subtus albo-pubescens, lateribus nigro-brunneo-maculata, tibiis nigro-brunneo-bimaculatis.

Rostrum et caput et pronotum rugosa. Labrum pallidum. Antenna basi rufescens, clava triarticulata.

Long. 4-6 mm.

Hab. Borneo: Doesonlanden (Wahnes), a series ex coll. van de Poll.

The dark brown upper surface is almost evenly dotted with white, the spots being variable in size and shape, but always small. Antenna longer in ♂ than in ♀, shaft almost naked, with the exception of segments 7 and 8, which are pubescent white, 3 longer (♂) or shorter (♀) than 2, club thrice (♂) or less than thrice (♀) as long as broad, 9 longer (♂) or a little shorter (♀) than apically broad; sometimes the whole shaft rufescent, as a rule only the basal segments. Pygidium as long as broad, slightly narrowing apically, apex broadly rounded; propygidium with white middle keel. Abdomen of ♂ somewhat flattened. Femora usually with blackish brown patch at apex. Tarsi white, segment 4 and tip of 5 blackish brown.

20. *Pioenia divisa* spec. nov.

♂♀. Nigra, dense luteo-cinereo-pubescent, capite pronotoque medio atque elytrorum fascia latissima postmediana communi nigris cinereo-irroratis; antenna et pedibus plus minus rufis, clava atque tarsorum apice nigris. Antennarum segmentum 3^{ium} longius quam 2^{um}, 3^{io}-8^o maris apice penicillo instructis.
Long. 6.5-9 mm.

Hab. Borneo: Kuching, April, type, 1 ♂; Sumatra: Palembang, 1 ♀.

Less convex above than *P. pilosa*. Frons plicate. Antenna much longer in ♂ than in ♀; shaft pubescent greyish white, pubescence densest on distal segments, apices slightly dilated, in ♂ with tuft on inner side on segments 3 to 8, the tuft indicated in ♀ by the pubescence being rather longer at the apices of the segments; club black, in ♂ twice as long as broad, in ♀ a little more than half as long again as broad, segment 8 broader than 7, 10 transverse, shorter in ♀ than in ♂, in ♀ width 19, length 7, in ♂ width 22, length 12.

Pronotum punctate-rugate, anteriorly minutely and densely punctate. Scutellum a little broader than long, narrowing anteriorly. Black, or brownish black (type), band of the elytra about twice as broad as the grey apical area. Pygidium slightly broader than long, rounded. Abdomen of ♂ flattened, anal sternite short, subtruncate, with the lateral angle distinctly projecting; in ♀ anal segment much longer, its apical margin laterally very slightly incurved.

21. *Pioenia canuta* spec. nov.

♀. Nigra, rufescens, albo-griseo-pubescent, supra maculis griseo-albis et nigris ornata, antennis pedibusque rufis, illarum clava 4-articulata nigra, segmento 8^o basi rufa.

Long. 9 mm.

Hab. Batjan (Wallace), 1 ♀.

Differs from the preceding species considerably in the eighth segment of the antenna being gradually widened and forming part of the club, 9 correspondingly modified, being transverse, about half as broad again as long, base of 8 rufous like the shaft, proportional length of segments two to four 3 : 5 : 4.

Proboscis almost smooth in middle. Head plicate. Pronotum transversely rugate, finely rugulose, and punctate at apex. Pubescence condensed around eye. On pronotum two brown apical spots close together separated by a greyish white line which is indistinctly continued to base, behind apical margin two more whitish lines, of which the lateral one reappears posteriorly, on each side of disc a whitish spot, on the outer side of this spot a brownish one. Scutellum a little broader than long, narrowed anteriorly. Elytra cylindrical, posteriorly slightly flattened along suture; interspaces 3, 5, 7, and 9 with inconspicuous, short, whitish linear markings; about 8 black spots on each elytrum: one on shoulder rounded, another at base half-way to scutellum irregular, a larger one in centre between stripes 2 and 6 very irregular, two on apical declivity, and three at the sides, besides these spots (which probably are variable in shape and size) a small number of minute blackish specks. Pygidium and anal sternite with a blackish spot each side. Second tarsal segment measured along centre a little less than one-third the length of the first.

Tropidobasis gen. nov.

♂♀. Near *Penestica* Pasc. (1859) and *Paraphloeobius* Jord. (1912). Rostrum very short, sublaterally only half as long as the eye, apically very shallowly and very broadly emarginate, without median carina. Eye coarsely granulated, its dorsal lobe much further extending orad than the ventral lobe. Antennal groove large, its cariniform dorsal margin running into the sinus of the eye, extending backward much farther than the anterior point of the eye. Antenna short, club not compact, constricted at the joints, 11 ovate or elongate. Pronotum longer dorsally than at the side, the apex projecting over the occiput, dorsal carina basal, lateral carina reaching to apex, but often the anterior portion not so much raised as the posterior portion. Basal margin of elytrum curved forward. Pygidium semicircular in both sexes. Prosternum flattened medianly, short, intercoxal process much lower than coxae. Legs short, foretarsal segment 1 only one-fifth longer than the tibia is broad. Genotype: *T. plasta* spec. nov.

22. **Tropidobasis plasta** spec. nov.

♂. Rufo-brunnea, supra griseo-pubescentis, maculatim et guttulatim brunneo-variegata, elytro inter striam 1^{am} et 5^{am} macula brunnea rotundata majore notato, tibiis basi apiceque brunneo-maculatis. Caput cum rostro punctato-rugatum. Segmentum tertium antennae quarto dimidio longius; clava altero et dimidio tanto longior quam latior, segmento 9^o decimo paulo longiore, 11^o nono triente longiore. Pronotum sat grosse et confertim punctatum. Elytra striato-punctata, transversim et longitudinaliter convexa. Pygidium (♂) leviter convexum. Tarsus posticus tibia parum brevior. Metasternum leviter deplanatum. Segmentum anale abdominale nec impressum nec sinuatum, sed ejus margo fere rectus.

Long. 4.3 mm.

Hab. Borneo: Kina Balu (J. Waterstradt), 1 ♂.

In colouring similar to *Dendrotrogus hypocrita* Jek. (1855). Much shorter, almost evenly convex from side to side and from head to pygidium. Underside rufous, without spots on sterna and abdomen. The brown antemedian spot on each elytrum is rather conspicuous; there is another brown spot on a level with it at the lateral margin; in front of and behind these spots, and again at a short distance from the apex, the grey pubescence is slightly more concentrated than elsewhere.

23. **Tropidobasis vicina** spec. nov.

♀. Speciei praecedenti persimilis, latior, pronoto minutius punctato, albo signato, carinae lateralis dimidio apicali minus elevato, macula elytrorum brunnea minore.

Long. 5-6 mm.

Hab. Philippines: North Luzon (J. Whitehead), 3 ♀♀.

More robust than the previous species, less elongate. The brown pubescence on pronotum forms anteriorly on disc an indistinct semicircle open behind, in centre of disc a brown spot, at anterior angle a white suffusion, and in front of carina, nearer middle than side, a distinct white spot more or less bounded by brown. Scutellum almost circular, greyish white like the base of the suture. Sutural and seventh interspaces almost regularly dotted with brown, the other

interspaces also with a few brown dots, between brown patch and apex a slight concentration of brown, at lateral margin before middle a brown spot, which extends on to the underside in two specimens. Pygidium flat, semicircular. Tibiae with basal and subapical brown spots, which are conspicuous on account of the light colour of the pubescence of the tibiae. Abdomen with indication of a lateral row of brown spots, spot on last sternite distinct.

Pubescence of upperside clayish or more grey.

24. *Tropidobasis parilis* spec. nov.

♂. Speciebus praecedentibus similis, elytro absque macula majore brunnea, antennae clava laxa, segmento 9° et 10° triangularibus atque 11° elongato-ovato bene distincta.

Long. 4.5 mm.

Hab. Singapore, one ♂.

In shape similar to *T. plasta*, being narrower than *T. vicina*. Upperside densely variegated with greyish white, the elytra appearing almost tessellated. Pronotum without definite markings, dotted and irrorated with greyish white, behind centre a diffuse brown patch; puncturation coarse; lateral carina continued to apex, but quite low at apex. Scutellum nearly circular, greyish white like the base of the suture. Pygidium slightly convex, nearly semicircular, greyish white, with a faint brown median patch at base. Tibia with two faint brown spots.

Club of antenna slenderer than in the previous species, loose, all three segments quite narrow at base, 9 and 10 triangular, 11 twice as long as broad, proportional lengths 8 : 7 : 12.

25. *Tropidobasis gemella* spec. nov.

♂♀. *T. plastae* simillima, elytro ante et post medium macula irregulari sat magna griseo-alba notato, maculis anticis trans suturam conjunctis; carina pronotali laterali antice abbreviata.

Long. 3.2-4.6 mm.

Hab. Ceylon, one ♀ (type), and one ♂ without antennae.

Chitin as pale as in *T. parilis*. Club of antenna brown (♀, antennae of ♂ missing), segments 9 and 10 nearly equal, 11 pale at apex, half as long again as 10 and not quite half as long again as broad. Pronotum coarsely punctate, irrorated with grey, derm deep brown except at sides and apex, which are paler rufous with a slightly denser grey pubescence and indications of some brown spots; lateral carina reaching beyond middle, obsolete further forward. Elytrum dotted with brown in the alternate interspaces, a basal patch above shoulder, a large one behind subbasal swelling, connected with the patch of the other elytrum by means of a spot placed in the sutural interspace, and another patch behind the middle greyish white, conspicuous. Tibiae with a brown spot near base and another at apex, both prominent. Abdomen with brown lateral spots at the bases of the segments.

26. *Tropidobasis discophora* spec. nov.

♂♀. Brevis, lata, valde convexa, nigro-brunnea, antenna pedibusque rufis, pronoto macula magna nigro-velutina rotunda griseo-cincta ornato.

Long. 5-5.7 mm. ; lat. 3-3.3 mm.

Hab. Borneo : Matang Road, Sarawak, July 1909, 1 ♂, type. East Sumatra : Sibolangit, 550 m., October 1921, Tanah Besar, May 1919, Boseher Bander, September 1919 (J. B. Corporaal), 2 ♂♂, 1 ♀.

Less than twice as long as broad, strongly convex, resembling in shape *Pioenia pulchrina*. Rostrum rugosely punctate. Head rugulate. Pronotum finely rugate-punctate, apex minutely punctate, lateral carina extending to apex, high throughout, ending abruptly close to apical margin, forming here a kind of tubercle ; from carina to near apex a round velvety black spot, a little longer than broad, edged with grey, rest of pronotum brown slightly intermingled with grey. Scutellum transverse. Elytra regularly punctate-striate, brown, with some grey dots, especially around scutellum, behind middle and at apex, suture convex behind scutellum ; sutural and limbal impressed lines connected across apex as in *Pioenia*. Pygidium semicircular, minutely coriaceous, in ♂ somewhat convex.

Underside grey ; tibiae brown at base and apex, with large white median spot. In ♂ metasternum and abdomen flattened, hairy, as are also the undersides of the femora, tibiae, and first and second tarsal segments ; anal sternite emarginate.

Antennae rufous, club loose, segments 9 and 10 triangular, more dilated towards one side than the other, 11 elliptical, as long as 9, 10 much shorter.

27. *Paraphloeobius sodalis* spec. nov.

♂♀. Statura et color *Penesticae ineptae* Pasc. (1859), sed rostrum ut in specie *Paraphloeobius tricolor* Jord. (1912) dicta levissime emarginatum atque carina basali mediana instructum ; oculus levius emarginatus.

Brunneus, rufescens, supra pube lutea et alba et brunnea variegatus, elytris macula magna basali atque fascia lata communi mediana brunneis manifeste notatis, tibiis ante medium brunneo-maculatis.

Long. 8 mm.

Hab. Borneo : Matang Road, Sarawak, 3,200 ft., August 1909, 1 ♂, type ; Kuching, May 1900, 1 ♀. Perak (W. Doherty), 1 ♀.

Pubescence of upperside pale clay-colour, much variegated with white. On head and rostrum the middle and sides white. On pronotum a brown basal spot half-way between middle and side, continued forward across the carina and joining the outside of a brownish discal patch, in centre of disc a largish patch and half-way between it and side a small one, and an apical patch each side of middle brown and ill-defined ; a median stripe interrupted by the central brown patch, a somewhat triangular patch, posteriorly emarginate, in front of the submedian discal brown patch, and some indefinite spots in the lateral area white ; dorsal carina subbasal. Scutellum white, slightly clayish. Elytra with a broad brown median band across suture, obsolescent at sides, a patch on subbasal swelling, a small one at base and a few dots here and there brown, lateral margin dotted with brown, between band and apex a largish brown shadowy patch, alternate interspaces 2, 4, 6, 8, 10 more or less luteous, as is the base around the brown subbasal patch, rest of elytra greyish white. Pygidium white variegated with pale luteous, in ♂ truncate with the angles rounded, very little shorter than basally broad, in ♀ rounded, one-fifth broader than long.

Underside greyish white, with sparse luteous shading. Tibiae with conspicuous brown antemedian spot. Tarsal segment 4 and apex of 2 brown. Metasternum of ♂ depressed, with silky median patch invaded by the median groove. Abdomen broadly depressed medianly, the impression of the last segment narrowing frontad, trapezoidal, anal sternite medianly longer than the two previous segments together, apex truncate, not sinuate, the angles rounded.

28. *Nerthomma dorsalis* spec. nov.

N. stictico similis, sed rostro brevior apice distincte sinuato, eum capite et pronoto densissime reticulato, elytris postice parum dilatatis, pygidio truncato-rotundato, fere semicirculari, tibiatarum dimidio apicali et tarsorum articulis 2°-4° nigrescenti-brunneis.

Long. 6.1 mm., lat. 3 mm.

Hab. Borneo: Pontianak.

Much less cylindrical than the other known species of this genus, the elytra distinctly widened behind. Rostrum shorter, with a small median sinus, no carina. Frons about one-fourth the width of the rostrum. Pronotum with three greyish-white stripes connect in middle by a transverse band, a window of four panes being formed, the median stripe widened into a patch before the scutellum, these markings very prominent. Carina a little nearer the base than in *N. stictica*. Elytra in a lateral aspect convex from base to apex, more strongly so near base, gradually slanting posteriorly, brown like head and thorax, the sutural area from basal sixth and laterally as far as the third line of punctures greyish white, suture dotted with brown, third interspace with a larger, oblong, brown spot in middle and two smaller ones further back, in front of apical margin across the suture a brown spot, lateral area shaded with grey, and spotted with grey and brown, but these markings not so prominent as the dorsal ones. Pygidium grey at the sides.

Underside grey. Apical three-fifths of foretibia, half of midtibia, and two-fifths of hindtibia, tip of first tarsal segment, and the entire second to fourth segments blackish brown.

29. *Protaedus pallidus* spec. nov.

♂. Pronotum ante medium transversim depressum, lateribus fortius quam in specie *P. moerens* dicta explanatis.

Long. 4 mm.

Hab. New Guinea: Humboldt Bay (W. Doherty), 2 ♂♂.

Rostrum, frons, pronotum, base of elytra, nearly the whole of the sterna, and the antenna and legs pale buff, the rest more or less brownish black, club of antenna also brown, on pronotum an elongate, curved, spot on each side of middle, and another spot (divided in second specimen) towards the sides blackish. Grey markings of elytra essentially as in *P. moerens* Pasg. (1860), suture grey from basal fifth to near apex as in that species.

Pronotum much more uneven than in *P. moerens*, the posterior depression deeper, and the disc transversely depressed before middle. The derm of the elytra is paler in the second specimen.

30. *Protaedus suturalis* spec. nov.

♀. *P. moerenti* similis, rostro parum angustiore, pronoto ante medium subhiimpreso, tota sutura alba.

Long. 3.6 mm.

Hab. Perak (W. Doherty), 1 ♀.

Antenna entirely pale rufous buff. Pronotum as uneven as in *P. pallidus*, the lateral margin less explanate than in that species, and the angle of the carina a little less obtuse. Subbasal callosity of elytrum brown, this patch widest at white sutural stripe, continued backwards in interspace 2 and joined to a large brown median area which extends sideways to interspace 5 and also is broadest near suture, on apical declivity a third, smaller brown area, irregular and ill-defined, rest of elytrum with somewhat dispersed narrow luteous scales intermingled with white ones, behind brown median area a white band-like area running obliquely forward to the side, conspicuous on account of the whiteness of the scales, but rather indefinite, ninth interspace dotted with white and tenth almost entirely white from middle forward, some white scaling dorsally in ante-median depression. Pygidium white, as long in middle as broad at base, gradually narrowing apical, apex rounded. Underside with a somewhat dispersed white pubescence, densest on side of metasternite. Legs pale rufous buff.

31. *Protaedus schistaceus* spec. nov.

♀. Niger, pube alba sparsim vestitus, elytris pone basim et in medio et ante apicem transversim nigris, antennis pallide rufo-luteis, articulo 2^o tertio fere aequali, hoc quarto paululo longiore; pedibus paulo rufescentibus, apice tarsorum pallidioribus. Rostrum ante antennis dorso parum concavum, haud sulcatum, margine antenarum fossae elevato triangulari. Caput cum pronoto sat fortiter granulato-rugosum. Pronotum convexum, ante carinam sat fortiter depressum, carina antebasali, concava, ad latera rotundatim antrorsum flexa, apicem haud attingente. Elytra fortissime striata, interspatiis subcariniformibus. Pygidium granulatum, gradatim angustatum, longitudine parum latius, apice rotundato. Prosternum grosse rugoso-foveolatum.

Long. 2.4 mm.

Hab. Perak (W. Doherty), 1 ♀.

Carina further away from the base than in the previous species, the lateral angle of the previous species replaced by a gradual curve, the side-carina is much less elevate anteriorly than posteriorly and does not quite extend so close to the apical margin as in the previous species. The derm, especially of the head and prothorax, is much more coarsely sculptured than in *P. moerens* and allies, agreeing in this respect better with the following species.

32. *Protaedus lugens* spec. nov.

♀. Niger, pube alba sat dispersim vestitus, elytris duabus fasciis nigris, una basali communi humeros non attingente, altera mediana completa lateribus parum antrorsum flexa, antennis rufis, pedibus paulo rufescentibus, tarsis apice pallidioribus.

Rostrum inter antennis concavum, haud sulcatum, apice medio parum emarginatum. Caput cum pronoto modice granulato-rugulosum. Antenna

articulo 2° tertio multo brevior, 3° et 4° aequalongis. Pronotum ante carinam deplanatum, carina antehasali, lateribus gradatim antrorsum flexa, haud angulata. Elytra fortiter striata, intervallis minus quam in *P. schistaceo* elevatis. Pygidium granulatum, triangulare, apice rotundato, longitudine parum latius. Prosternum fere laeve.

Caput inter oculos elevatum, oculis distincte emarginatis.

Long. 3·7 mm.

Hab. Perak (W. Doherty), 1 ♀.

Differs from all the previous species in the eye being distinctly sinuate and the frons elevate above the level of the eyes, a broadish depression or groove surrounding the eye dorsally.

The basal transverse black band of the elytra is incurved behind in middle, whereas the median band is incurved in front; this second band is narrowest at the fourth interspace.

33. *Protaedus humeralis* spec. nov.

♂. Rufo-brunneus, hic et inde nigro-brunneus, pube grisea sat sparsim vestitus, macula humerali alba, antennis pedibusque luteo-rufis. Oculi sinuati. Angulus carinae prothoracialis obtusus apice rotundatus.

Long. 3·2–3·4 mm.

Hab. Entrecasteaux Is. : Fergusson, ix–xii. 1894 (A. S. Meek), 2 ♂♂.

Elongate, cylindrical. Rostrum strongly impressed behind apical margin, and medianly sulcate between the antennae. Frons convex, but not so much raised as in *P. lugens*. Eye sinuate, sinus a little larger than in *P. lugens*. Antennal segments 2 to 5 measure 10, 15, 22, 26 respectively. Pronotum like the head rather finely coriaceous, somewhat longer than in *P. moerens* (proportions 28 : 38), depressed along the carina, and slightly also longitudinally at each side of the middle, a transverse dark brown median shadowy mark curved backwards at the sides and here reaching the carina; angle of carina more rounded than in *P. moerens*, but much less than in *P. lugens*, dorsal carina as in *P. moerens* near base and slightly concave, lateral carina reaching apical fifth, low anteriorly. Elytra strongly striated; subbasal swelling distinct, brown, in middle a brown band extending from side to side, narrowest at suture, and extending forward laterally, with a branch running from the lateral portion upwards on to the antemedian depression, before apex a broad brown band, all these markings rather indefinite, behind shoulder a prominent white spot between stripes 5 and 8, the greyish white pubescence in between the brown areas here and there condensed. Pronotum minutely coriaceous.

34. *Protaedus bryanti* spec. nov.

♂. Rufo-brunneus vel rufus, pube alba sparsim vestitus ac maculatus, antennis pedibusque pallide rufis, clava brunnescente. Rostrum antice fortiter depresso-impressum, inter antennis convexum sulco mediano instructum, margine acetabulorum fortissime elevato, album ut latera capitis. Frons convexa ad oculos subito declivis. Oculi sat magni sinuati. Antenna longa, articulo 1° crasso, 2° et 3° aequalatis et aequalongis et caeteris latitudine similibus, 4° dimidio longiore quam 3°, 5° quarto paululo longiore. Pronotum cum capite rugulosum, subreticulatum, longitudine triente latius, ad carinam late depressum, carina

dorso leviter concava, lateribus arcuatim antrorsum flexa, pube alba ad margines parum densiore.

Scutellum album. Elytra cylindrica fortiter punctato-striata, interspatiis convexis, ab limbi medio ad suturam apicem atque dorso ante apicem declivem nonnullis maculis variabilibus albis notata, sutura inter scutellum et depressione antemediana nigricante, deinde ad apicem declivem usque alba, plaga a limbo subhumerali oblique dorsum ac posticum versus continuata, et altera minore transversa communi ante apicem ipsum brunneis indefinitis variabilibus. Pygidium sparsim albo-pubescentis, gradatim rotundato-angustatum, apice rotundatum, longitudine parum latius. Subtus prosternum subtilissime coriaceum, metasternum lateribus dense albo-pubescentis ac nonnullis punctis grossis haud profundis instructum.

Long. 3 mm.

Hab. Queensland: Kuranda (F. P. Dodd) ex coll. G. E. Bryant, 2 ♂♂.

Pronotum slightly depressed before middle on each side of disc. Carina almost basal in middle, curving away from base laterally.

Differs from the other species with sinuate eyes especially in the 2nd and 3rd antennal segments being alike.

35. *Protaedus insignis* spec. nov.

♀. Brunneus, tomento albo vestitus, elytris brunneo tomentosus, quatuor maculis magnis albis, una antemediana rotundata suturali, altera postmediana transversa, ad suturam latiore, ad latus antrorsum continuata, atque una utrimque supra humerum.

Long. 2.9 mm.

Hab. Banguay I. (J. Waterstradt), 1 ♀.

Antenna pale rufous buff, segments 2 to 4 measuring 9, 12, 11. Rostrum concave near apex, subsulcate between the antennae. Frons feebly convex. Eye sinuate. Pronotum rugate-coriaceous, more coarsely so at the sides than in middle, one-fifth shorter than broad, transversely convex in middle, white tomentum slightly more concentrated in centre, carina with the angle more oblique and more rounded than in *P. humeralis*, lateral carina extending close to apical margin. Elytra strongly striated, interspaces convex; the white postmedian band produced forward and backward on the suture. Pygidium as long as broad, gradually narrowed, with the apex rounded. Prosternum minutely coriaceous.

36. *Protaedus leucomelas* spec. nov.

♀. Brevis, latus, brunneo-niger, pedibus rufescentibus, antennis rufis basi pallidioribus, rostro cum capitis lateribus albo, pronoto linea tenui indistincta mediana, macula in utroque angulo carinae sita, elytrorum maculis sat bene expressis, pygidii basi atque mesosterni latere albis. Rostrum antice planatum, inter antennis parum elevatum atque subsulcatum, margine acetabuli valde elevato. Caput vix convexum. Oculi valde elevati, sinuati. Antenna articulis 3^o et 4^o aequilongis. Pronotum minutissime coriaceum, longitudine dimidio latius, transversim leviter convexum, ante carinam late deplanatum, angulo carinae valde rotundato, carina laterali apicem fere attingente. Elytra latitudine triente longiora, a latere visa valde convexa, basi depressa, fortiter striata, inter-

vallis granulatis. Pygidium longitudine paululo latius, granulatum, gradatim rotundato-angustatum. Prosternum impunctatum. Processus mesosternalis coxae fere aequilatus.

Long. 3.5 mm., lat. 2.5 mm.

Hab. New Guinea : Humboldt Bay (W. Doherty), 1 ♀.

Very much broader and more rounded than any of the previous species of this genus. Proportional lengths of segments 2 to 4 of antenna 9, 12, 11. The elytra are strongly depressed around the scutellum and above the shoulder, the subbasal swelling is distinct, but the depression behind it feeble, the sutural interspace not depressed from behind base to near apical declivity, but rather higher than the second interspace. The white spots nearly all well defined : a sutural basal one triangular, transverse, another basal spot above shoulder, two somewhat elongate spots in third interspace, one before and one behind middle, traces of spots between the first of these two and the side-margin, and a triangular spot on each elytrum at apex. On metasternite and laterally at apices of fourth and fifth abdominal segments the white pubescence denser.

37. *Mauia squalens* spec. nov.

♀. Rostrum late concavum. Oculi valde prominuli subsinuati. Antenna multo brevior quam in *Protaedo*, articulis 1° et 2° crassis, 2° tertio parum longiore, 3° et 4° aequilongis, 5°-8° gradatim brevioribus, clava distincta, 9° et 10° aequilongis apice truncatis pyriformibus, 11° eadem longitudine elongato-elliptico. Caput antice valde convexum.

Rufo-brunnea, supra sparsim albo-griseo squamosa, macula transversa communi indefinita ante elytrorum apicem sita brunnea, infra sparsim albo-griseo pubescens ; antennis pedibusque pallide rufis.

Long. 3 mm., lat. 1.3 mm.

Hab. New Guinea : Andai (W. Doherty), 1 ♀.

No markings except the brown transverse space on the apical declivity of the elytra. Cylindrical, slightly flattened above. Eye small, very strongly elevate. Frons vertical at eyes, strongly convex anteriorly in a lateral aspect, this convex portion very prominent on account of the rostrum being concave. Apex of rostrum truncate. Margin of antennal groove triangularly raised. Antenna reaching beyond basal margin of elytra, segment 2 slightly longer than 3, 9 one-third longer than 3, as long as 7 and 8 together, and twice as broad near apex as long, the distal segments 9 to 11 gradually narrowed to a basal stalk, 3 to 8 somewhat clavate.

Pronotum transverse, strongly narrowed from middle to apex, minutely coriaceous; feebly convex, depressed along the carina, which is basal and slightly concave ; angle of carina completely rounded, lateral carina extending to four-fifths ; anterior and posterior margins paler rufous than disc. Elytra coarsely punctate-striate, interspaces moderately convex, basal margin incurved from shoulder to shoulder, subbasal swelling feeble. Pygidium faintly coriaceous, gradually rounded-narrowed, somewhat broader than long. Metasternum convex in middle between mid- and hindcoxae. Last abdominal sternite granulated.

FOUR NEW SPHINGIDAE DISCOVERED BY T. R. BELL IN NORTH KANARA.

BY DR. KARL JORDAN.

(With 10 text-figures.)

1. *Oxyambulyx belli* spec. nov.

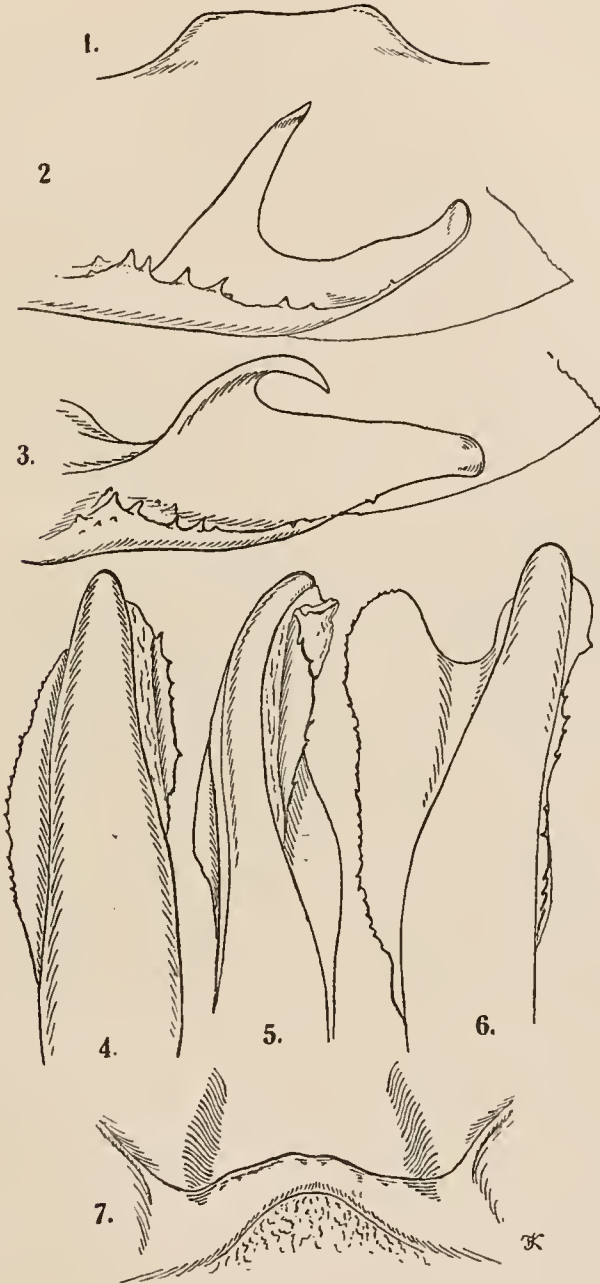
♂♀. A rather small species. General colour deeper ochraceous tawny than in the other Indian species of *Oxyambulyx*, with the exception of *O. subocellata*. In markings somewhat resembling *O. maculifera*. Abdomen with an indistinct dorsal line, which is not widened into a patch on tergite VIII of the ♂, the line sometimes scarcely traceable. Forewing flushed with purple, especially in the ♀, which is darker tawny than the ♂; two dark olive subbasal spots, the costal one the smaller of the two in the ♂, the larger in the ♀, in two ♂♂ the costal spot vestigial, in one ♀ both spots; the costal bar of the outer antemedian line reaches hindmargin of cell at some distance from lower cell-angle, being less oblique than in *O. maculifera* and more oblique than in *O. ochracea*; discocellular dot inconspicuous; in ♂ the veins in outer two-fifths of wing slightly darker than the ground, especially R¹ and R², this outer area from R¹ backwards a deeper colour than the rest of the wing; olive black submarginal line posteriorly close to termen, accompanied by a pale line as in other species, but this pale line bounded on the proximal side by more or less distinct traces of a dark line. Hindwing with the usual markings, its ground colour paler than on forewing, the abdominal area slightly shaded with pinkish grey, base not darkened; fringe white in the last two marginal recesses (the long scales only), dentition stronger than in *O. substrigilis*.

Underside tawny, slightly paler proximally, feebly irrorated with small darker speckles, no blotches; forewing with a grey terminal band, which is very narrow posteriorly and does not reach tornus; the blackish line bounding this band diffuse, feebly marked, often vestigial. On underside of hindwing the bands of upperside present, or at least the median band indicated, shadowy.

Body similar to the wings; palpus and breast tawny, sides of breast with a vinous red tint.

♂. Eighth sternite with a distinct median lobe (text-fig. 1), which is truncate, with the angles more or less rounded and sometimes turned inward (= upward). Tenth sternite, broad with a very small rounded median sinus. Armature of clasper recalling *O. substrigilis* and *O. placida*, with two processes (text-figs. 2, 3), the upper process pointed and somewhat curved mesad (i.e. away from the inner surface of the clasper), the apical process much broader, a little longer, gradually narrowed but remaining obtuse, with the apex also curved mesad; both processes slightly variable in length and width; above the ventral margin of this harpe a row of teeth variable in number. Penis-sheath (text-figs. 4-6) of the same type as in *O. substrigilis*, ending with a rod-like process, which is

much broader and shorter than in that species ; at each side of this dorsal rod, which is slightly curved ventrad apically, there is a longitudinal dentate ridge



connected with the sheath by a membrane and capable of being moved a short distance away from the sheath, as represented in text-fig. 6.

♀. Postvaginal sclerite smooth, transversely concave nearly in centre ; in front of the orifice a definite ridge of chitin, sharp, slightly uneven, highest in middle (text-fig. 7).

Length of forewing ♂, 39-42 mm. ; ♀, 43-50 mm.

Breadth ,, ,, 16-17 mm. ; ,, 17-19 mm.

Hab. North Kanara (T. R. Bell), a series. Larva on *Xylia xylocarpa*.

2. *Oxyambulyx substrigilis aglaia* subsp. nov.

♂. Similar to *O. s. substrigilis* from North India, the underside of the body, palpi and wings, and the upperside of the hindwing much deeper orange fulvous. The costal subbasal spot on the forewing above usually absent, but sometimes nearly as large as the one placed below the cell.

♀. On forewing, above, the antemedian pair of lines less distinct than in North Indian specimens, sometimes absent, closer together before hindmargin and here more oblique. On underside the wings more sparsely irrorated with brown. In two colour forms : a pale form nearly as bright tawny ochraceous as *O. belli*, beneath brighter orange than North Indian ♀♀ ; and a dark drab specimen darker than any of our North Indian *substrigilis* ♀♀, with the markings of hindwing above smaller.

Ventral process of harpe shorter than in *O. s. substrigilis* ; penis-sheath slender, with the right side ridge shorter.

Hab. North Kanara (T. R. Bell), several specimens of both sexes.

Bright tawny specimens, especially ♀♀, might easily be mistaken for *O. belli*. In *aglaia*, however, the dorsal line of the abdomen is more prominent, the underside of the wings is more yellowish orange, the tornus of the forewing is almost rectangular, less obtuse than in *O. belli*, the hindwing broader, with the apex more rounded, the base deeper in colour, and the discal band posteriorly more deeply incurved. On underside the brown submarginal line of forewing complete.

3. *Oxyambulyx matti* spec. nov.

♂. Intermediate between *O. belli* and *O. substrigilis aglaia*. Upperside of body and of forewing with a pink tint, less cold grey than in *O. substrig. aglaia* ♂ and much less warm tawny than in *O. belli*. Abdomen with a very faint median line. Forewing with two blackish olive subbasal spots, the posterior one larger than the costal spot, its diameter rather longer than the distance of the spot from the fringe of the hindmargin ; costal portion of outer antemedian line as oblique as in *O. substrig. aglaia*, running to lower cell-angle and appearing as a continuation of the dark vein R¹ ; proximal discal line just outside upper cell-angle, the second discal line (which is very faint) crossing the stalk of the subcostal fork about 1 mm. from SC⁵, both these lines being more proximal than in *O. substrig. aglaia*, the two outer bars before hindmargin near tornus distant from each other, slightly curved, not forming a horse-shoe mark as in *O. substrig. aglaia* ; before this group of bars no rounded spot, as is usually the case in the ♂♂ of *O. substrigilis* from India.—Hindwing narrower than in *O. substrigilis* ; ground paler yellow, the dark brown basal patch smaller ; abdominal area less shaded with grey ; dark brown median band very distinct, touching lower cell-angle, second band less distinct than in *O. substrig. aglaia*, less crenulated, extending forward to R¹ ; submarginal band vestigial inclusive of its anterior portion, which is present in *O. substrig. aglaia* as a subapical spot or short band ; long scales of

fringe more or less extended white or whitish between the veins as in *O. substrig. aglaia*.

Underside of body and wings slightly paler yellow than in South Indian *O. substrigilis*. On forewing a pinkish brown subcostal spot close to upper cell-angle between SC⁴, ⁵ and R¹, only a minute yellow dot separating it from that angle; outer fourth of forewing rather densely and coarsely irrorated; grey terminal band continued to tornus as a thin line. Median band of hindwing touching lower cell-angle.

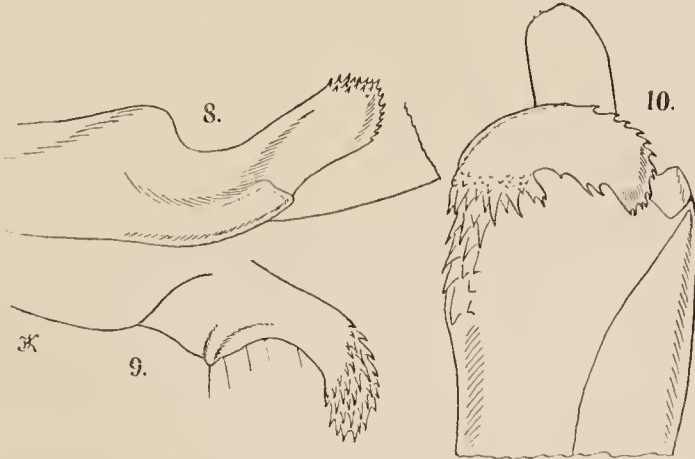
Genitalia: Eighth sternite as in *O. substrigilis* without distinct median lobe. Ninth tergite somewhat broader in dorsal aspect, its frontal margin less deeply sinuate. Compressed apical portion of tenth tergite slightly wider in a lateral view and its tip without the right and left ridge present in South Indian *O. substrigilis*. Tenth sternite intermediate in shape between these sclerites of *O. substrigilis* and *O. belli*, the lobes being broader than in the former species and narrower than in the latter. Clasper and its armature as in *O. belli*, but with fewer and smaller subventral teeth. Penis-sheath similar to that of *O. substrig. substrigilis*, i.e. slightly stouter than in South Indian *O. substrigilis aglaia*, and the right side dentate ridge longer (= left side in a dorsal view with the tip of the sheath directed upwards).

Hab. North Kanara (T. R. Bell), one ♂. Larva on *Terminalia tomentosa*.

The occurrence of these three closely allied *Oxyambulyx* in North Kanara is a surprising fact. We are most grateful to Mr. Bell for having submitted these interesting species to us for study and for having so generously presented the specimens to this Museum. Mr. Bell has bred the species, and we are looking forward to his account of their life-history.

4. *Macroglossum vicinum* spec. nov.

♂♀. In size, colour, and markings similar to *M. insipida insipida*. Palpus less grey, being rather strongly shaded with walnut-brown. Grey margin of



mesothoracic tegula less contrasting. Forewing, above, as in *M. i. insipida*, the markings the same, but softer, the wing appearing less variegated. Hindwing: median band slightly deeper yellow, the black marginal band less angulate below centre than is usually the case in *M. i. insipida*.

On *underside* the forewing uniformly dark cinnamon rufous from base to terminal band, the basal area hardly at all shaded with darker brown, without yellow. Hindwing less extended yellow than in *M. insipida*.

Genitalia of ♂: Harpe (text-figs. 8, 9) very different from that of *M. i. insipida*, short, with a broadish subspathulate process, which is curved upwards and slightly away from the inner surface of the elasper and bears numerous teeth at the roundate apex, at the margin as well as on the outer and inner surfaces. Penis-sheath (text-fig. 10) with a transverse apical process which is dentate around its obtuse apex and along its proximal margin, the teeth near the base of the process rather long, conical, the dentition extending on to the sheath, the large triangular tooth found on the sheath of *M. insipida* absent; inside the sheath two daggers, one acuminate and dentate, the other spathulate and non-dentate.

Hab. North Kanara (T. R. Bell), two pairs.

EXPLANATION OF TEXT-FIGS. 1-10.

1. *Oxyambulyx belli* ♂, lobe of eighth abdominal sternite.
2. " " " " elasper, inner side, lateral aspect.
3. " " " " " " view vertical on surface of harpe.
4. " " " " penis-sheath, dorsal aspect.
5. " " " " " " lateral "
6. " " " " " " dorsal " , another specimen.
7. " " " ♂, antevaginal sclerite.
8. *Macroglossum vicinum* ♂, harpe, lateral aspect.
9. " " " " " " from above.
10. " " " " penis-sheath.

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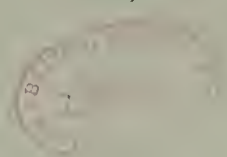
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(PLATE IV.)

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NOVITATES ZOOLOGICAE.

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NEW GEOMETRIDAE IN THE TRING MUSEUM

By LOUIS B. PROUT, F.E.S.

SUBFAM. HEMITHEINAE.

1. *Prasinocyma candida* sp. nov.

♂, 30 mm. Face black. Palpus about $1\frac{1}{4}$, black, beneath and at base white. Antenna pectinate to about two-thirds, the branches short (scarcely 2), slightly thickening distally; white, tinged with buff. Vertex, thorax, and abdomen white, the thorax above tinged with buff. Foretibia and tarsus blackish, the legs otherwise white; hindtibia not appreciably dilated.

Forewing with apex not sharp, termen gently rounded; SC^1 free, R^1 very shortly stalked, M^1 just separate; white, absolutely without markings.—*Hindwing* moderately broad, apex rounded, termen rounded, only inconspicuously bent at R^3 ; M^1 connate; white.

Underside white.

Madagascar: Diego Suarez, January 3rd, March 4th, and April 24th, 1917, 4 ♂♂ (G. Melou).

The specimens are quite fresh, with no suspicion of having faded from green; in any case the rounded wings and black face point to an outlier from the bulk of the genus.

2. *Omphacodes pulchritacta* sp. nov.

♀, 28 mm. Face reddish brown. Palpus $1\frac{1}{2}$ or $1\frac{3}{4}$; dirty whitish, third joint browner, not so long as second. Fillet white. Crown green. Antenna apparently not pectinate (only a short proximal part remaining). Thorax and abdomen green above, white beneath. Fore and middle legs (especially forecoxa) tinged with rose.

Forewing with costa arched, apex acute, termen strongly oblique, nearly as straight as in *pulchrifimbria* Warr., which it closely resembles in shape; SC^1 anastomosing shortly with C, DC^2 short, DC^3 deeply incurved anteriorly, M^1 almost connate; bright green, the costal edge narrowly whitish buff; a short, inwardly oblique rosy streak from M^1 to near fold; fringe white.—*Hindwing* with costa elongate, apex moderately rounded, termen not very strongly convex, slightly irregular, with an extremely weak but perceptible

bend at R^3 ; SC^2 long-stalked, M^1 moderately stalked, DC^3 moderately incurved; costal margin white proximally; rest of wing concolorous with forewing; a rosy dot or short dash on M^1 ; fringe white.

Underside slightly paler, the rosy markings faintly showing through.

Central Abyssinia: Moraqui, January 9th, 1916 (O. Kovacs).

Differs from *pulchrifimbria* in the less long terminal joint of palpus, lack of rosy tips of fringe and presence of the rosy marks; a strong lens reveals single rosy scales on some of the anterior veins of both wings, indicating that the marks are part of an obsolete postmedian.

SUBFAM. STERRHINAE.

3. *Epicosymbia spectrum* sp. nov.

♂, 30 mm. Face black. Palpus black, first and second joints pale beneath. Vertex whitish. Occiput narrowly dark fuscous. Antenna whitish proximally; pectinations about 3. Thorax and abdomen light brown, the latter with a blackish dorsal stripe, leaving free a white spot at base. Hindtibia without spurs; tarsus rather less than 1.

Forewing light brown; costal margin blackish fuscous to near apex; lines black; antemedian obliquely incurved between SC and SM^2 , oblique inward to hindmargin; postmedian oblique inward from costa, forming a gentle and very shallow inward curve between costa and M^1 , a shorter and deeper one between M^1 (or M^2) and SM^2 , the angles outward at M^1 and SM^2 not acute; area between these lines blackish fuscous, but containing a large circular patch of the ground colour between C and M, with the black cell-dot in its centre; subterminal as deeply sinuous as in *nitidata* Warr., but with the subsidiary denticulation almost wanting.—*Hindwing* with cell-dot minute; antemedian far proximal to it, gently incurved and weak in cell, bluntly angled outward at M, thicker and oblique outward to abdominal margin; subterminal much as on forewing but more proximal, angled on R^1 .

Underside paler, the markings, except cell-dots and subterminal, shadowy, the subterminal on hindwing more distal than above.

East Africa: Nabagulo Forest, 15 miles from Kampala, October 25th–November 6th, 1921 (W. Feather).

4. *Scopula mesophaena* sp. nov.

♂♀, 17–19 mm. Face black. Palpus black, beneath whitish proximally. Vertex and antenna white; antennal joints in ♂ slightly projecting, the cilia fairly long (well over 1). Collar tinged with ochreous. Thorax and abdomen white, with fine and sparse black irroration. Foreleg slightly infuscated; hindtibia in ♂ slender, the tarsus longer than the tibia.

Forewing not very broad (slightly narrower in ♀), apex not acute, termen smooth, oblique, very gently curved; white, with sparse and very fine black irroration; a tinge of brown along costa and subcostally; cell-dot rather small, but sharply black; lines brown; antemedian extremely fine, very oblique from hindmargin near base to cell near its end, obsolete anteriorly; median thick and strong, very oblique and straight from middle of hindmargin to SC^2 about 1.5 mm. from termen, here recurved and weakened; postmedian fine, curved, very near

termen, parallel with it anteriorly, slightly more oblique posteriorly, subterminals both present but weak, parallel with and close to postmedian; terminal dots black, strong, connected by a faint line; fringe concolorous.—*Hindwing* (at least in the ♀) rather narrow, termen smooth, rounded, except near tornus; cell-dot as on forewing; median shade just proximal thereto, strong; postmedian and subterminal curved, especially anteriorly; termen and fringe as on forewing.

Forewing beneath suffused with brown except at hindmargin, hindwing white; markings of upperside reproduced, excepting the antemedian of forewing; median weaker than above.

Kenya Colony: Kibwezi, May 6th, 1920, type ♂, December 1920, 1 ♂, 2 ♀♀ (W. Feather).

Smaller and less slenderly built than *fragilis* Warr. (1903), whiter, with stronger median shade and more strongly marked hindwing. Occurs also at Taveta.

SUBFAM. LARENTIINAE.

5. *Eois ingrataria tambora* subsp. nov.

Differs from *i. ingrataria* Warr. (NOVITATES ZOOLOGICAE, v. 23, Assam) in having the lines much feebler but apparently more numerous, and in having on the discocellulars of the forewing a conspicuous, more or less elongate, pale yellow, partially reddish-edged spot, which in *i. ingrataria* is only represented by a small and inconspicuous dot.

Sambawa: Tambora, April-June 1896 (W. Doherty), 13 ♂♂.

6. *Eois (Pseudasthena) suarezensis* sp. nov.

♂♀, 20-24 mm. Superficially similar to *lunulosa* Moore. Smaller on an average.—*Forewing* relatively rather shorter, termen less oblique anteriorly, more bent in middle; generally more reddish in tone, the red lines thicker, more evenly spaced; cell-dot generally rather smaller; antemedian line often and postmedian nearly always mixed with dark grey, the latter line more proximal, especially anteriorly, where it bends baseward; terminal dark dots subobsolete.—*Hindwing* similarly marked, the base rarely clear yellow.

Madagascar: Diego Suarez, March 26th-28th, 1 ♂, May 26th-June 27th, 5 ♂♂ and 6 ♀♀, including the type ♂, July 24th-29th, 1 ♀ (G. Melou, 1917).

Perhaps a race of the widely distributed *grataria* Walk., which in continental Africa sometimes produces rather similar aberrations. One Madagascar ♀ is a yellowish ab., with the median area more solidly clouded with violet-grey.

7. *Xanthorhoë transjugata* sp. nov.

♂, 29-32 mm.; ♀, 32-35 mm. Smaller than *transcissa* Warr. (NOVITATES ZOOLOGICAE, ix. 514, British East Africa), especially in the ♂. Antenna of ♂ as in that species, with short, well-ciliated pectinations and secondary processes (cf. *fluctuata* Linn.). Abdomen dorsally with rather conspicuous paired (generally subconfluent) black spots.—*Forewing* with basal patch generally almost concolorous with the succeeding area, on which also the dark suffusions of *transcissa* are generally quite undeveloped; antemedian line strongly excurved

but not (as in *transcissa*) angulated, never bisecting the median band; median band in ♀ broad, in ♂ moderate, its anterior half partly suffused with black, especially in a longitudinal streak at R³, in front of this streak and distally to the cell-spot generally pale; posterior half of median band variable, as in *fluctuata* Linn., being sometimes solid, but in the ♂ more usually dissolved into undulate lines, the central ones of which commonly meet (at least at fold and SM²) and enclose pale circles; postmedian line deeply indented at SC⁴; terminal dark shade narrower and weaker than in *transcissa*, especially in the ♂, the subterminal line less deeply lunulate, and with the sharp white tooth behind R³ replaced by a much less conspicuous white lunule or mere spot.

Kenya Colony: Escarpment, 6,500–9,000 ft., January–March 1901 (W. Doherty), a long series, misidentified by Mr. Warren as his *ansorgei* (NOVITATES ZOOLOGICAE, vi. 299), which has merely fasciculate ♂ antenna and various other differences.

8. *Xanthorhoë curcumoides* sp. nov.

♂, 28–30 mm. Closely similar to *curcumata* Moore (*vide* Prout, *Ent. Mitt. Deutsch. Ent. Mus.*, iii. 246, *Euphyia*). Antennal ciliation longer (nearly 2, against scarcely 1), forming more definite, paired fascicles.—*Forewing* with median band slightly more tinged with red-brown, on an average slightly narrower, its proximal edge generally less sharply defined, the proximal area being darker suffused; the proximal indentation of the band on fold wanting; the double lobe of band between R³ and M² shorter; distal area much paler, the only conspicuous dark markings being the small, interrupted costal patch, the twin wedges between the radials (here well differentiated, whereas in *curcumata* they are more or less connected into a single blotch) and a small terminal patch behind SC⁴.—*Hindwing*, on the contrary, darker and more unicolorous than in *curcumata*, even the costal edge only very slightly lightened.—Underside as in *curcumata*, or with the cell-spot of hindwing on an average smaller or weaker.

Assam: Cherrapunji, August 1893, type; “Khasis” (native collector, without exact localities), March, April, May, and October, 6 ♂♂; also 3 ♂♂ in coll. Joicey. Sikkim: Kurseong, 5,000 ft., 1 ♂ in coll. T. B. Fletcher.

A ♀ in coll. L. B. Prout, also from the Khasis, shows that there is no marked sexual dimorphism; median band, as usual in ♀♀ of the genus, fairly broad.

9. *Xanthorhoë hyphagna* sp. nov.

♂, 28 mm.; ♀, 30 mm. Face pale green, coarsely irrorated with black. Palpus just over 1½; predominantly black. Antenna blackish; pectinations slender, rather long. Vertex and thorax pale greenish; patagia variegated, crossed by two black bands; metathoracic tuft black. Abdomen dorsally irrorated with red-brown and heavily blotched with black.

Forewing pale greenish, irrorated (especially on postmedian line) with white; markings brown-red, so densely irrorated with black as to appear to the naked eye uniform brown-black; subbasal band moderate, straightish; succeeding band broader than the pale areas which bound it; the pale area beyond it with dark bisecting line; median band containing black cell-mark and traversing lines; its width moderate in ♂, broad in ♀, proximal edge gently curved and minutely crenulate, distal crenulate, weakly incurved between the

radials, moderately bilobed in middle; band beyond with bisecting line weak, limiting line stronger; distal area with costal patch fairly large proximally, tapering outside subterminal, twin radial spots wedge-shaped, subconfluent, a terminal cloud as far as R^3 , leaving a broad oblique apical streak of ground-colour between it and costal patch; subterminal line fine, white, in the ♂♂ only defined on the dark areas; fringe dark-clouded opposite the veins.—*Hindwing* whitish, in the ♀ rather less clear; cell-dot small, terminal dots in ♂ very small, in ♀ confluent into dashes.

Forewing beneath more glossy, more suffusedly marked, nearly uniform from base to postmedian. Hindwing with dark irroration, strong cell-dot, moderately distinct crenulate and curved postmedian line, and vague subterminal markings.

W. Java: Bandong (type ♂), Dradjad, Preanger R. (♂), Pengalengan, Preanger (♀).

Recalls some Indian species (*griseiviridis* Hmps., *curcumata* Moore, and *curcumoides* Prout) in coloration and markings of forewing, but has the antennal pectination only a little less long than in *ludifica* Warr. (NOVITATES ZOOLOGICAE, v. 30).

10. *Ortholitha vacuimargo* sp. nov.

♂, 47 mm. Near *pulchrata* Alph. and *adornata* Stgr., in some respects intermediate. Structure similar. Head and body coloured as in *pulchrata*.

Forewing very slightly broader than in *pulchrata*; tone slightly intermediate towards *adornata*, the extreme weakness of irroration giving it somewhat the smooth, glossy aspect of that species; cell-mark wanting; subbasal line rather sharp, dark-brown, straighter than in the allies, accompanied proximally by a weaker line; antemedian band strong, nearly as thin as in *adornata* but slightly more oblique inward, gently incurved in anterior half, bluntly angled outward on base of M^2 ; postmedian much as in the ♂ of *pulchrata*, but with the blunt lobe between R^3 and M^2 double, being rather sharply indented on M^1 ; two faint lines proximally to the postmedian; distal area almost unmarked, the oblique black apical dash wanting; terminal line brownish, very weak.—*Hindwing* similar to that of *adornata*, but even whiter; cell-dot wanting.

Underside more whitish than in the allies; cell-dot wanting.

Tibet: Sinin (received as "n.sp. Stgr. 1894," but not dealt with by Mr. Warren).

11. *Sarracena euides* sp. nov.

♂, 36 mm. Smaller than *chlamydaria* H.-Sch. Antennal pectinations longer, especially those of the inner series, which in *chlamydaria* are quite rudimentary.

Forewing with the hindmarginal lobe slighter than in *chlamydaria*; the specialised scaling beneath much less developed; coloration and markings closely similar, lines slightly yellower, the middle one more strongly oblique where it crosses the pale costal area, the postmedian more deeply incurved between R^1 and SM^2 , not bisected by a red line.—*Hindwing* with the apex not falcate, merely somewhat produced (about as in *Phyllia* Blanch.); anteriorly much more ochreous than in *chlamydaria* ♂ and to a rather larger extent, the

posterior green patch scarcely separated from the ochreous by any grey shading; the line slightly yellowish, not bisected.

Forewing beneath with less extended red anteriorly, outer line as above; hindwing with the black line sharply bent about R^1 , oblique inward to costa.

S.E. Peru: Agualani, Carabaya, 9,000 ft., December 1909, wet season (G. R. Ockenden).

12. *Larentia irma* sp. nov.

♂, 36 mm. Head and body white, closely irrorated with dark fuscous, mostly paler beneath than above. Abdomen above with indications of paired dark spots. Palpus rather long (about 2), roughly scaled. Antennal pectination rather longer and less stiff than in the genotype (*clavaria* Haw.). Metathoracic crest well developed.

Forewing with termen slightly less oblique than in *clavaria*, more markedly crenulate; white, very closely irrorated with fuscous and blackish, so that to the naked eye the whole wing appears dark with faint rippings and with the four principal lines remaining white; subbasal almost straight, from costa at 4 mm. to hindmargin at 2 mm.; antemedian from costa at 6.5 mm. to hindmargin at 3.5 mm., rather acutely angled inward at M, deeply excurved between this and SM^2 ; postmedian bluntly angled outward behind R^3 and slightly bent inward at M^3 , with slight teeth inward at all the veins, a deep one at SC^5 ; subterminal lunulate-dentate, slightly interrupted at SC^6 (whence an oblique and sinuous, faintly darker line is traceable to apex), slightly more proximal before the interruption than behind it; cell-dot blackish, rather thin; a dark terminal line, interrupted by white dots at ends of veins; fringe with a slight pale line at base.—*Hindwing* with apex even more produced than in *clavaria*, termen rather less convex, with stronger teeth; paler than forewing, darkening a little at border, in which the subterminal line is traceable nearly to apex; distal half of abdominal margin, broadening to tornus, concolorous with forewing and showing the beginnings of lines, especially a double whitish postmedian; cell-dot small and very weak.

Underside feebly marked, but with distinct cell-spots, especially on hindwing; forewing with a slight dark costal spot proximally to the subterminal.

Patagonia: Nahuel Huapi, June 1912.

A worn pair from Valley del Lago Blanco, Chubut (♂ 39 mm., ♀ 36 mm.), suggest that the species is variable, the shape of the median band being apparently more regular in them, the white lines obsolescent, etc.

13. *Larentia oculisigna* sp. nov.

♂♀, 38–39 mm. Related to the preceding, but very anomalous in appearance, the wings being narrowed, with termen of forewing highly oblique posteriorly, tornus rounded. Palpus slightly longer; terminal joint partly, but not wholly, concealed. Pectinations short, subclavate (somewhat as in *Kuldscha* Alph.).

Forewing whitish, mostly clouded with brown, leaving patches of the ground-colour with only dark wavy lines, namely, an ill-defined, obliquely bounded patch at base of hindmargin, traversed by dark oblique subbasal band; an ill-defined, rather irregular, oblique band (circ. 4 mm. wide) from rather before

middle of hindmargin directed towards apical part of costa, on the proximal edge of which band is placed the small black cell-mark, conspicuously surrounded with white (on the middle of this band, between M^2 or M^1 and hindmargin the lines are confluent into oval ocelli); a narrow, elongate tornal patch to M^2 , bounded proximally by the subterminal, which in the rest of its course is scarcely indicated except by vein-dots; terminal line black, slightly interrupted at the veins; fringe traversed by a basal and a central pale line.—*Hindwing* and underside corresponding to those of *irma*, the underside, however, brown instead of whitish fuscous.

Patagonia: Valley del Lago Blanco, Chubut (Thursby), 2 ♂♂, 2 ♀♀.

Two larger males (43 mm.), more strongly marked, from Nahuel Huapi, show this also to be a variable species; in both, the central band reaches costa very clearly; in one it is yellowish white, the cloudings nearly typical, in the other it is whiter and all the cloudings blackish fuscous.

14. *Gonanticlea meridionata nesaea* subsp. nov.

♂♀, 28–31 mm. Smaller and darker than *m. meridionata* Walk. (1862), from the Cape, hindwing beneath more strongly marked.

Comoro Islands: Grande Comoro, September 1921 (♂ type), August 23rd and October 1921 (2 ♀♀); Anjouan Island, July 17th, 1911 (1 ♀). All collected by G. F. Leigh.

Electrophaës gen. nov.

Electra Curt., *Brit. Ent.*, xiii. 603 (1836), nec Steph. (nom. praecoc.).

Face rather flat, slightly or scarcely sloping, scarcely rough-scaled, without cone below. Palpus longish, first joint rough-scaled beneath, second rough-scaled, the scaling more erect above than beneath, third moderate, partly exposed. Tongue developed. Antenna in ♂ pubescent or minutely ciliated. Pectus slightly hairy. Femora glabrous. Hindtibia with all spurs. Metathorax crested. Abdomen not crested, in ♂ with anal part rather long, typically with lateral-ventral tufts posteriorly.

Forewing moderate or slightly elongate, apex moderate or rather blunt, termen smooth; cell almost one-half, DC normal; areole double, SC^1 from before its end, R^1 generally stalked, R^2 rather before middle, M^1 separate.—*Hindwing* moderate or very slightly elongate, angles not sharp, termen smooth, rounded; cell about two-fifths, DC oblique, especially posteriorly, sometimes weakly bent; C anastomosing to near end of cell, SC^2 stalked, R^2 from slightly before middle of discocellulars or about central. Larva (*E. corylata*) with head bifid, supra-anal flap ending in a single point.

Type of the genus: *Electrophaës corylata* (Thnbg.) = *Geometra corylata* Thnbg.

Pierce (*Genit. Brit. Geom.*, p. 66) merges this in *Plenymria*, but the morphological differences are too considerable, apart from those of the larva, and even the genitalia are only approximately homogeneous. The genus, though evidently referable to the natural group which is nearly covered by the *Cidariinae* + *Therinae* of Pierce ("anellus lobe" group), is somewhat anomalous and seldom shows much tendency towards the biangulate form of the discocellulars of the hindwing which generally characterises it. The coremata are rudimentary.

The following species (perhaps in part subspecies—no very far-reaching investigations have yet been possible) should be referred here: *corylata* Thnbg. (1792), *fabrefactaria* Oberth. (1880), *granitalis* Butl. (1881), *albida* Herz (1903), *tsermosaria* Oberth. (1893), *aliena* Butl. (1880), *niveonotata* Warr. (1901), *perpulchra* Butl. (1886), *chrysophaës* Prout (sp. nov.), *fulgidaria* Lecch (1897) (= *aurata* Moore (1867), nec Pack. 1866), *nigrifulvaria* Hmps. (1902), *albipunctaria* Lecch (1897), *niveopicta* Warr. (1893), *chimakaleparia* Oberth. (1893). All are Palaearctic or North Indian, and therefore traceable through the works of Seitz and Hampson.

15. *Electrophaës chrysophaës* sp. nov.

♂, 24–26 mm. Smaller than *fulgidaria* Lecch, slightly narrower-winged. Antennal ciliation slightly less vestigial.

Forewing with boundary-line of dark basal patch blunt in cell, but with a marked angle behind M, which is wanting in *fulgidaria*; subterminal line with an elongate proximal tooth on R², the golden-brown shade which precedes it consequently here bent.—*Hindwing* yellower than in *fulgidaria*. *Forewing* beneath with apex not, or scarcely, dark-mixed, the dark subterminal shade between SC⁵ (or SC⁴) and R³ more sharply differentiated. *Hindwing* beneath with the postmedian less zigzag than in *fulgidaria*, finer, more fuscous (less yellow-mixed).

North India: Khasia Hills, February 1894 (type ♂), November 1893 (2 ♂♂, Cherrapunji) and 3 undated (2 Shillong); Sikkim, April 6th, 1888 (Möller), Sikkim Interior (Möller), Darjiling. Further paratypes from Shillong (coll. L. B. Prout), Khasia Hills (Brit. Mus.; Hill Mus.).

Unless this be a tiny golden race of *perpulchra* Butl. vera (N.W. Himalayas), of which I know only ♀♀, and which has been wrongly sunk, it is hitherto undescribed.

16. *Thera comitabilis* sp. nov.

Larentia comis part. Hmps., *Faun. Ind. Moths*, iii. 379 (1895), nec Butl.

Near *comis* Butl. (Japan), the antennal structure similar but with the branches slightly shorter. Wing markings apparently equally variable. Coloration darker, recalling dark forms of *Electrophaës corylata*.

Forewing with the white edgings of bands more sharply expressed, in general broader; antemedian less oblique outward anteriorly and without the marked projection inward in front of SM², sometimes with, sometimes without, the acute tooth outward (into the median band) at fold; postmedian with a tooth outward on R¹; teeth of subterminal dark-filled proximally; no prominent black mark on hindmargin between subbasal and antemedian, the greater part of this area, on the other hand, noticeably dark-clouded; a slight apical dash.

Sikkim (ex coll. Elwes): Jongri, 13,000 ft., 1887, type ♂; Tonglo, 10,000 ft., July 1886, allotype ♀; "Sikkim" (Knyvett), ♀.

17. *Cirrhoreuma androconiata* sp. nov.

♂, 25–27 mm. Similar to *pallidimargo* Warr. Head and body browner (less greyish-fuscous).

Forewing with termen a little bent in middle; beneath, in addition to the

tufts of erect blackish hair, with an extended patch of bright ochreous-brown androconial scaling, anteriorly crossing R^3 , posteriorly nearly reaching hindmargin and distally reaching about to the middle of R^3 and M^1 ; whitish, clouded with brown, brighter and much more variegated than *pallidimargo*; lines distinct; antemedian much less oblique inward at costa; median often in part duplicated, forming irregular rings or spots; postmedian denticulate, gently excurved in its anterior part; the white subterminal not angulated about R^2 ; distal area pale, but less sharply contrasted than in *pallidimargo*.—*Hindwing* rather paler than in *pallidimargo*, abdominal margin folded, browner than the rest.

Underside brighter than in *pallidimargo*.

Peru: Oconeque, Carabaya, 7,000 ft., July 1904, dry season (G. Oekenden), 6 ♂♂, including type; Cushi, Huanuco, 1,900 m. (W. Hoffmanns), 4 ♂♂. Also in other collections.

This species has been passing as *pallidimargo*, of which Warren's type, so far as I know, remained unique until last year, when I obtained 2 ♂♂, which were collected at Oxapampa.

18. *Triphosa oenozona* sp. nov.

♂, 51 mm.; ♀, 52 mm. Face fuscous; frontal tuft developed. Palpus moderate, blackish. Head and body drab, the vertex, tegulae, and patagia largely rufescent; a blackish band indicated across front of thorax; abdominal tergites posteriorly spotted or belted with pale rufous and with (generally weak) paired blackish spots as in the *sericata* group.

Forewing variegated, the drab or brown ground-colour only showing here and there; a slender, wavy, vinaceous-rufous subbasal band, becoming blackish at costa and finely dark-edged almost throughout; a whitish line succeeding, except at costa; a less definite rufescent band between this and the median area, bounded on each side by a dentate (on the veins black-dotted) line, nearly twice as far from the base anteriorly as posteriorly and with its distal boundary-line angled outward in cell; median fascia light cinnamon-rufous with a tinge of vinaceous, 8 or 9 mm. wide at costa, a little less at hindmargin, a little less still between the radial and submedian folds, its edges irregularly lunulate-dentate, the proximal with a rather deep bay in cell (not quite reaching cell-spot), the distal similar to that of *rubrodotata* Walk., but with the lobes at M^1 more rounded off; the wavy lines on this fascia feeble, excepting a sharply black one near its proximal edge, which expands into a costal triangle like that of *sericata* Butl.; cell-spot and postmedian and subterminal costal marks also as in *sericata*; ill-defined whitish belts proximally and distally to the median fascia, each divided by a brownish line; subterminal line whitish, dentate, somewhat interrupted, enlarged subterminally as in *rubrodotata*; the rest of the distal area mostly with rufescent shading, whitish only in front of R^1 between postmedian and subterminal; terminal line black; veins, except in median area, dotted with black and whitish; fringe with a pale vinaceous line at base, a dark band in middle.—*Hindwing* pale drab with a tinge of brown; markings much as in *sericata*, with the characteristic subbasal band of that species well developed, the postmedian rather less bent, the subterminal finer, shades accompanying it more complete (extending to termen and almost to costa), more vinaceous.

Underside as in *rubrodotata* or *sericata*.

Assam: Khasia Hills, 3 ♂♂, 1 ♀. Also 1 ♂ in coll. L. B. Prout.

19. *Calocalpe intersita* sp. nov.

♂, 40–41 mm. Face with small pointed cone below. Palpus rather short (less than $1\frac{1}{2}$). Head and body fuscous. Palpus with first and second joints beneath pale proximally. Abdomen, at least at base, with faint indications of paired dark dorsal spots.

Forewing slightly less broad than in *affirmata* Guen., the termen behind middle curving somewhat more obliquely; fuscous, the markings consisting of waved darker and lighter lines, about as numerous as in *undulata* Linn., though coarser and slightly less regular; veins more distinctly spotted; median area scarcely differentiated, except by a costal thickening and straightening of its lines and slight widening of the pale pairs that bound it; cell-mark rather large, black; subterminal line very fine, its proximal dark bordering rather broad, in places (at least between the radials) somewhat intensified, a pale expansion between M^2 and SM^2 about as in *affirmata*; termen and fringe as in *affirmata*.—*Hindwing* slightly narrower than in *affirmata*, the sexual tuft at abdominal margin strong and blackish; markings beyond cell-spot strong, corresponding to those of forewing.

Underside more strongly marked than in *affirmata*.

French Guiana; St. Jean de Maroni, 2 ♂♂.

A ♀ from Potaro River, British Guiana, April 1908 (S. M. Klages), is slightly larger (44 mm.), but otherwise agrees exactly.

Although the description of this species agrees pretty closely with that of the variable *affirmata*, the actual effect is very different on account of the smaller size, appreciable difference of shape, less warm colour, and especially the more even strength of the markings, which, with the strong variegation of the veins, etc., produce a nearly uniformly dotted appearance not comparable to any *Calocalpe* known to me.

20. *Eutrepisia neonympha* sp. nov.

♂, 33 mm. Similar to *metagrapharia* Walk. (*List Lep. Ins.*, xxv. 1472 = *coenonympha* Feld., *Reise Novara, Lep. Het.*, t. cxxx. f. 4, 4a), conceivably a very remarkable aberration thereof. Face with the same white stripe down each side. Thorax and abdomen above darker.

Forewing with basal area broadly vandyke-brown (to 5 mm. at costa, to 7 or 8 mm. at SM^2 , the hindmargin continuing very narrowly of that colour to tornus); apical black area somewhat extended at costa, the orange central area consequently tapering anteriorly to only 1.5 mm.; subapical orange dash rather short and oblique.—*Hindwing* above uniform vandyke-brown.

Forewing beneath with basal area similar, the orange median band white from costal margin to C; subapical mark white (as also in *metagrapharia*); submarginal line less pure white. Hindwing with the white markings, except the submarginal, greatly narrowed, the longitudinal band beyond cell replaced by two widely separated lines, the anterior between R^2 and R^3 , the posterior behind R^3 ; all the veins (except for the narrow white mark on DC^2) and both folds bright brown.

Mexico: Guerrero (O. T. Baron).

21. *Eutrepisia gadowi* sp. nov.

♂, 32 mm. Near *cydonia* Druce (*Biol. Centr.-Amer., Lep. Het.*, ii, t. 58, f. 16, 17).—*Forewing* perhaps slightly squarer, with a superficial suggestion of the *Scordylia quadruplicaria* group; the orange area rather more prolonged in the direction of tornus (its distal edge from costa to between M^1 and M^2 being more oblique), on the other hand restricted by irregular dark hindmarginal clouding, which proximally reaches the cell, medially scarcely crosses SM^2 , and distally broadens again slightly and blackens, joining the distal border.—*Hindwing* marked almost as in *haemataria* H.-Sch. (*Samml. Aussereur. Schmett.*, i, fig. 320, 321 = *substriata* Dyar, *Proc. U.S. Nat. Mus.*, xxxviii, 260, syn. nov.).

Forewing beneath with curved whitish subapical streak as in *cydonia*, but with the red shade continuing thence to apex; costal margin also reddened, with a whitish spot beyond middle. Hindwing with the red markings much broader than in *cydonia*, more as in *haemataria*, but with the red border not black-mixed; distinct from both in the maculation of distal half of costal region, which consists of a short red band opposite the furcation of SC^2 with R^1 , running into the streak behind R^1 , and a narrow pale band of the ground-colour between this band and the terminal border.

Mexico: Omiltene, 1,700–2,000 m., wooded mountains, July 9th–12th, 1904 (Dr. Gadow).

22. *Stamnodes gaudialis* sp. nov.

♂, 34 mm. Head brown, face narrowly edged with creamy white. Palpus $1\frac{1}{2}$, fuscous, at base whitish. Antenna with minute ciliation (scarcely $\frac{1}{2}$). Thorax and abdomen brown, beneath mixed with whitish. Tarsi and middle and posterior tibiae mostly pale.

Forewing with costa rather markedly arched near apex, termen little rounded, rather strongly oblique; glossy ochre-yellow; markings grey-brown; a small basal patch, about 3 mm. at costa, 2 at hindmargin, very gently concave-edged; a triangular costal patch beyond middle, nearly 4 mm. broad at costa, its apex on R^1 , blunt; a somewhat paler-rippled distal border, 4.5 mm. broad at costa, where it is only narrowly separated from the triangular patch, narrowing rather rapidly behind R^2 , tapered to a point about submedian fold, continued as a slight terminal line to tornus.—*Hindwing* relatively rather small, termen less produced about R^1 than in *margarita* Warr. (1905), *dukinfieldi* Warr. (1900), etc.; ochre-yellow, with brown basal and terminal shading, the postmedian line of underside indicated in paler yellow; fringe red, slightly mixed with white, especially at tips and about the radials.

Forewing beneath nearly as above, the brown rather deeper, a costal line connecting basal patch with outer triangle, a red suffusion behind this line (as far as SC and R^1), the streak between triangle and border white, the border pale except proximo-costally. Hindwing with whitish markings, almost exactly as in *dukinfieldi* but rather narrower, the postmedian obsolete tornally.

E. Peru: Huancabamba, Cerro de Pasco (E. Boettger).

23. *Lithostege interstincta* sp. nov.

♀, 19–21 mm. Face and palpus irrorated, brown, blackish, and white; vertex similar, with rather more white. Tongue short. Thorax white, strongly

irrorated with black and slightly with brown. Abdomen robust; pale brown. Foretibia with a strong claw above and a smaller (about half its length) beneath.

Forewing rather elongate; white, strongly irrorated with olive-brown, black-tipped scales, leaving free some ill-defined streaks in and behind cell, parts of the median area (especially between bases of median veins), and a broad subterminal line; the irroration heaviest at the edges of the bands, especially beyond the postmedian, where it forms a supplementary band, originating in an oblique apical streak, widening in the middle and cut by some white vein-streaks which run in from the subterminal; markings russet, with a tinge of ferruginous, consisting of a subcostal streak (from base to first band) and two bands formed much as in *lapsicolumna* Prout, *Ann. Transv. Mus.*, v. 165, t. 25, f. 20 (i.e. the first the more oblique and not reaching costa, the second more parallel with termen), but with the second in bent in middle and deeply indented distally by white on the veins; terminal line fine, scarcely interrupted; fringe whitish, with a grey dividing-line and feeble grey spots.—*Hindwing* narrow, costally elongate; pale drab-grey; terminal line and fringe nearly as on forewing.

Both wings beneath grey, the forewing with faint traces of the upperside markings in anterior part and especially of pale spots proximally and distally to the outer brown band.

Kenya Colony: Uaso Nyiro (Guaso Njiro), 3,000 ft., December 1920 (W. N. van Someren), type and another.

The ♂ will probably prove to belong to the pectinate section *Conchylia* Guen., though the species is not glossy.

24. *Scordylia primulimacula* sp. nov.

♂, 25–27 mm. Group of *conduplicaria* Hb. Head and body coloured as in that species.

Forewing with the costal margin slightly more shouldered at base than in *conduplicaria*; black, with the markings primrose yellow; costal markings minute, the subbasal fine, antemedian and postmedian slightly more triangular, median wanting; the patch on middle of hindmargin large, measuring 4–4.5 mm. on the margin, anteriorly rather broadly rounded, almost reaching base of M^1 ; fringe chequered with whitish.—*Hindwing* with slight dark base and broad black border, as in *conduplicaria*, the central band primrose yellow.

Underside as in *conduplicaria*, the postmedian costal spot on an average shorter, though much larger than above.

Panama: Boquete, Chiriqui, 3,500 ft. (Watson), type and others. Also in other collections from Costa Rica and Panama.

Druce (*Biol. Centr.-Amer.*, *Iep. Het.*, ii. 152), with fine disregard of geographical considerations, identified this as *basilata* Guen. and consequently opined that that was not a synonym of *conduplicaria* Hb. Both Hübner's and Guenée's types, however, were from the district of Rio, and their figures well exhibit the species which occurs there and in Paraguay, and of which Warren's *restricta* (NOVITATES ZOOLOGICAE, xiv. 258) is a slight ab.—almost synonym (cf. Berg, *An. Soc. Cient. Arg.*, xvi. 271). In these forms the colour is more maize-yellow, the costal spots large, etc.; *primulimacula* may possibly be a subspecies, but looks very distinct, and I do not know representatives from any intervening localities.

25. *Erateina prodiga* sp. nov.

♂, 25–26 mm. Head dull red, mixed with black; a whitish ring round eye; palpus mixed with whitish beneath. Antenna black, minutely ciliated. Body above black, with a slight admixture of pale scales, beneath mixed with red and white, sides of abdomen mainly red, front of pectus white. Legs spotted.

Forewing short and broad, apex rounded (more so than in *arocha* Druce); brownish black; two large, slightly hyaline creamy-white spots a little beyond the cell; the first between SC and R¹, about 2 mm. long, in its middle with a smaller extension behind R¹; the second between R³ and M¹, nearly 3 mm. long, its ends rounded; a minute spot (in one example almost obsolete) in front of R³ at proximal end of second spot; fringe chequered with white (interneural) and tipped with dark red.—*Hindwing* narrow and elongate, termen weakly (behind R³ deeply) crenulate, forming a slight tail at R³; a moderately large folded flap beneath (just over $\frac{2}{3}$ length of abdominal margin); brownish black, with a large ochraceous-rufous area from behind R¹ almost to tornus, its length from tornus basewards 5 or 6 mm., but encroached upon by the ground-colour at base of R³ and M¹ and separated from termen by about 1.5 mm. between the radials; fringe more narrowly pale-spotted than on forewing.

Underside of forewing predominantly ferruginous, except behind M and M², of hindwing more orange-rufous; forewing with the spots of upperside and small additional ones on mideosta (rather yellower) and behind end of posterior large spot (rather greyer, transversely elongate); hindwing proximally mottled with whitish, ochreous, and brick-red, edge of flap brick-red; an irregular post-median line of confluent white-grey spots, acutely angulated inward in front of R², excurved anteriorly and posteriorly.

S.E. Peru: Oconeque to Agualani, Carabaya, 6,000–9,000 ft., March 1905 (G. Oekenden), 3 ♂♂.

Labelled by Warren as *bosora* Druce, but quite different in the more tailed hindwing (though rather broader than in *arocha* and *meduthina* Druce), the large white spots, etc. etc. In one aberration the rufous area of hindwing is more restricted.

26. *Anemplocia melambathes* sp. nov.

♀, 38 mm. Head and body black, shot with blue; cheek bluish white. Palpus with third joint longer than in the type species (*flammiifera* Warr.).

Forewing slightly less broad than in *flammiifera*; orange, the extreme costal edge interruptedly marked with black; apex, distal and hind margins black, the boundary starting at five-ninths costa, very slightly oblique to behind R¹, then making a wide outward sweep (curve) so as to approach termen (little over 1 mm. distant) between the medians, widening again to 2 mm. at tornus and scarcely less along hindmargin.—*Hindwing* black.

Underside similar, the hindwing with the basal cell and almost the whole costal area (to C) whitish buff, more or less irrorated with orange.

Peru: Cushi, Prov. Huanuco, 1,900 m. (W. Hoffmanns).

A good mimic of the Diophtid genus *Scea*, especially *S. erasa*, which occurs with it at Cushi.

27. *Pardodes flavimacula* Warr.

This species, which occurs without noteworthy variation from Dutch New Guinea to Rossel Island (though more extensive material may possibly establish

a race for Dutch New Guinea), produces strikingly differentiated forms on New Hanover and Woodlark Island. The name-typical, banded form has been intelligibly described by Warren (NOVITATES ZOOLOGICAE, iii. 295), although the fourth (subterminal) "band" cannot accurately be called "double," as it consists merely of a curved line, thickening into blotches at SC^1-R^1 and R^2-M^1 , and he overlooks the (generally very weak, costally obsolete) subbasal and postmedian. The other forms may be distinguished as:

P. f. absorpta, subsp. nov. *Forewing* with basal and subbasal markings broad and solid, almost confluent; antemedian and postmedian bands, except at costal margin, confluent into a solid median band of an average breadth of about 4 mm.—*Hindwing* with the markings on an average much stronger than in *f. flavimacula*.

New Hanover, February–March 1897 (Webster), 10 ♂♂. A race from Rook Island, of a more uniform orange tone, will probably prove differentiable, but I only know three specimens in indifferent condition.

P. f. woodlarkensis, subsp. nov. Intermediate between the other two races, though nearer *f. absorpta*, the yellow ground-colour a little more tinged with orange than in either. Subbasal and median bands of forewing generally nearly as solid as in *f. absorpta*, but traversed (especially in the middle of the median band) by very noticeable paler shading, which occasionally even forms definite bisecting bands of the ground-colour.

Woodlark, 1895 and March 1897 (A. S. Meek), 8 ♂♂, 5 ♀♀.

One of the males (the largest) is an aberration practically indistinguishable from *f. flavimacula*; one or two other males and one female are in some measure transitional towards it, but these exceptions clearly do not invalidate the tenability of the race.

Desmoclystia gen. nov.

Face typically with small cone of scales. Palpus moderate or rather long, 2nd joint heavily scaled, 3rd distinct, though typically rather short. Tongue developed. Antenna of ♂ bipectinate (Nos. 1–3), fasciculate (4–5), or more evenly ciliated (6–9). Pectus and femora not hairy. Hindtibia with spurs fully developed. Abdomen slightly crested.

Forewing moderately broad, termen smooth, gently curved, not very oblique; areole double, both ample, SC^2 proximally forked, one branch running to C, the other to proximal areole near its end, R^1 connate or separate, R^2 central.—*Hindwing* much as in *Eupithecia*, generally larger in proportion.

Genitalia of ♂ with 7th segment corcmata; two long slender arms arising apparently from juxta (as also in *Xenoclystia*); remarkable for the long 8th segment.

Type of the genus: *Desmoclystia unipuncta* (Warr.) = *Xenoclystia unipuncta* Warr. (1906).

I unite provisionally a group of species sharing the very specialised subcostal venation noted, namely: 1. *unipuncta* Warr. (1906); 2. *humerala* Warr. (1906); 3. *hirticosta* Warr. (1907); 4. *rubecula* Warr. (1906, as *Ochyria*); 5. *prodiga* Warr. (1907, *Ochyria*); 6. *dilataria* Warr. (1906, *Ochyria*); 7. *fulvistriga* Warr. (1906, *Ochyria*); 8. *falsidica* Warr. (1906, *Eucymatoge*); 9. *nigribasis* Warr. (1906, *Eucymatoge*).

28. *Desmoclystia prodicia* sp. nov.

♂♀, 23-25 mm. Extremely similar to *falsidica* Warr., scarcely distinguishable except as follows :

Antenna in ♂ with the joints projecting, the projections bearing pairs of slender fascicles of cilia slightly longer than diameter of shaft (in *falsidica* the joints do not project appreciably and the ciliation is shorter than diameter of shaft).—*Hindwing* above on an average paler, especially towards termen. Both wings beneath with the distal area less conspicuously darkened, bisected by a whitish subterminal line of inter-neural dashes, which are not or scarcely indicated in *falsidica*.

British New Guinea : Angabunga River, 6,000 ft. upwards, November 1904 to February 1905 ; Biagi, Mambare River, 5,000 ft., April 1906. A series collected by A. S. Meek, the type from the first-named locality.

29. *Collix basicristata* sp. nov.

♀, 35 mm. Face black-mixed. Palpus not quite so long as in *hypospilata* Guen. (about $2\frac{1}{4}$), strongly mixed with black on outer side ; 2nd joint with strongly projecting triangular scaling above. Antenna closely lamellate, as in *hypospilata*. Abdomen dorsally with the confused mottling of that species.

Forewing slightly more shouldered near base than in *hypospilata*, otherwise similar in shape ; slightly less dark and less rufescent ; recognisable at once by having a small tuft of erect black scales at base and three others along M in basal area, the third (and smallest) reaching the vague pale band which separates this area from median band ; raised tuft at end of cell longer than in *hypospilata* ; markings otherwise similar, but with the lines of median area rather finer, weaker and more uniform, the dark dashes between subterminal and termen less developed.—*Hindwing* rather narrower than in *hypospilata*, the termen being less convex ; the black cell-dot marked in its posterior part with a minute white dot ; median area corresponding to that of forewing ; postmedian line rather strongly excurved in middle.

Underside with cell-spots large, postmedian vein-spots not very thick, inclining to confluence, subterminal more or less strongly confluent, especially on forewing, rather thick on anterior part of forewing, thinner behind R³, with rather large spots behind M¹ and behind M², on hindwing rather thin throughout, moderately macular.

S. Flores, November 1896, dry season (Everett).

30. *Horisme leucotmeta* sp. nov.

♂, 26 mm. ; ♀, 28 mm. Face white, mixed with blackish scaling, which sometimes forms a transverse band above middle. Palpus 2 ; 2nd joint with long, loose scaling beneath, 3rd rather elongate ; blackish, mixed (especially at ends of joints) with white. Antennal ciliation minute (less than $\frac{1}{4}$). Occiput and collar light brown. Thorax and abdomen brown, mottled with blackish fuscous and (especially the thorax and end of abdomen) with white.

Wing-shape and general effect of *brunneata* Warr. (NOVITATES ZOOLOGICAE, xiii. 116).

Forewing with the brown median area darker (more black-mixed) and con-

taining in its middle a white patch reaching from costa about to M, rather variable in width, before R³ with a tendency to longitudinal extension (faintly suggesting that of *notata* Rothsch., *Lep. Brit. Orn. Un. Exp.*, p. 94), the elongate black cell-mark placed on its proximal edge; basal patch at costa 2.5 mm., at hindmargin not quite 2 mm., its margin scarcely more irregular than in *contaminata* Warr. (NOVITATES ZOOLOGICAE, xiii. 117); intermediate area with some ferruginous spots, behind SM² rather clear white; antemedian incurved, fairly regular; postmedian bilobed, much as in *brunneata*; some ferruginous shading beyond, especially between the radials, the proximal border of the distal area here (as in several of the group) forming a rather conspicuous dark, ferruginous-mixed streak; subterminal white line lunulate, much more distinct than in *brunneata*; an oblique white dash from apex.—*Hindwing* and underside much as in *brunneata*, the subterminal rather more distinct.

Dutch New Guinea: Mount Goliath, 5,000–7,000 ft., January–February 1911, 3 ♂♂, 2 ♀♀.

31. *Horisme symmetriczona* sp. nov.

♂, 22–24 mm. Structure and general coloration of body-parts nearly as in *illustris* Prout (NOVITATES ZOOLOGICAE, xxiii. 31), the palpus with third joint scarcely so long, the abdomen with the dark parts somewhat accentuated.

Forewing with the same strong gloss and the same colours as in *illustris*, their distribution quite different; basal patch much as in *illustris*; succeeding area traversed to near hindmargin by an ochraceous band; median area black-brown, comparatively solid and regular, at costa about 4 mm. wide, at hindmargin about 3, its proximal edge gently curved and with a small bend or tooth at fold, its distal with a small acute tooth inward at SC³ and a small lobe at R³; the white postmedian only duplicated at costa; a fairly broad, slightly irregular ochraceous shade between postmedian and subterminal.—*Hindwing* much as in *illustris*, the postmedian weaker and much less acutely angled, the subterminal at least as strong as in *illustris*.

Underside almost as in *illustris*, except for the less angulated postmedian of hindwing.

Dutch New Guinea: Mount Goliath, 5,000–7,000 ft., January 1911, 3 ♂♂, including type, February 1911, 2 ♂♂ (A. S. Meek).

32. *Horisme genuflexa* sp. nov.

♂♀, 30–32 mm. Similar at first glance to large *brunneata* Warr., such as were taken with it on Mount Goliath. Structure much the same (i.e. as in *illustris* Prout, etc.). Collar ferruginous. A longitudinal ferruginous dash on prothorax.

Forewing with basal patch about as in *contaminata* Warr. (NOVITATES ZOOLOGICAE, xiii. 117); median band broad, its edges more mixed with black than in *brunneata*, especially at costa and hindmargin; antemedian fairly direct to fold, then suddenly bent inward strongly, recalling that of *Euphyia basochesiata* Dup.; postmedian with a conspicuous, inwardly curved black mark between the radials, followed distally by a white and then a tawny one; then follows an interrupted, dark ferruginous line, bounding proximally the blurred

distal area ; cell-mark divided into a pair of minute dots, as is usually the case also in *brunneata*.—*Hindwing* and underside much as in *brunneata*.

Dutch New Guinea : Mount Goliath, 5,000–7,000 ft., January 1911, a pair (A. S. Meek).

33. *Collix multiflata infecta* subsp. nov.

♂♀. Darker than *m. multiflata* Warr. (1896), from North Queensland, the ochreous ground-colour being more densely irrorated, the dark lines thick and rather ill-defined ; the clear ochreous costal spots narrower and less conspicuous.

Louisiades : Rossel Island (the type ♂ from Mount Rossel, 2,100 ft., December 1915–January 1916) ; Sudest Island ; St. Aignan. A good series collected by A. S. Meek and W. F. Eichhorn.

34. *Hoplosauris limnetes* sp. nov.

♂♀, 31–32 mm. Head and palpus white-grey, mottled with fuscous ; the palpus over 1, with the 3rd joint deflexed. Antenna in ♂ slightly thickened in the middle, tapering to a fine point at tip. Thorax whitish, mixed—more heavily above—with fuscous and with a darker metathoracic crest. Abdomen long and thin, especially in ♂ ; mostly pale.

Forewing (especially in ♂) elongate, with apex rather acute and termen rather strongly oblique, gently curved ; cell not very broad distally, DC bent to become oblique, both areoles ample, R¹ shortly stalked ; general tone greyish, the whitish ground-colour being irrorated and rippled with fuscous and—especially in the ♂—some brighter brown ; basal area nearly 3 mm., somewhat suffused proximally, marked with a vague brown band or double line distally, the first of these lines blacker than the second, both somewhat angled outward before middle ; the succeeding pale area traversed by some similar lines of variable intensity, leaving the usual clear, bisected space proximal to the median band ; the latter moderately broad (circ. 4–4.5 mm.), its proximal edge slightly angled outward in cell and curving outward behind SM², its distal with a slight tooth at SC², small double lobe (anteriorly stronger than posteriorly) in middle and outward bend behind SM², both its sides brown (especially in the ♂♂), its centre greyer, with a minute cell-dot closely followed by a rather irregular dark line ; the usual bisected pale space beyond median band ; subterminal line whitish, irregularly lunulate-dentate, in places blurred ; some dark costal marks proximally to it ; a very small oblique blackish dash just behind apex, pointing to (but not touching) a blackish spot in cellule 6 ; a terminal line of subconfluent paired spots ; fringe with a darker central line.—*Hindwing* in ♂ small and narrow, in ♀ less small ; cell in ♂ extremely short (scarcely over one-fourth), C remote, connected by a bar, SC²–R¹ on a long, somewhat curved stalk, DC slightly incurved, R² central, R³–M¹ stalked, running to tornus, a slight vein (M² ?) placed very near base and oblique **inward**, abdominal margin cut away, with a small, long-fringed lobe at base ; ♀ venation normal (C anastomosing, DC biangulate, M¹ approximated but not stalked) ; whitish, tinged—especially distally—with fuscous.

Forewing beneath glossy, with the markings vague, fading out towards hindmargin, which, together with the hindwing, is pale and devoid of markings.

Patagonia : Valley del Lago Blanco, Chubut (Thursby), type ♂ and another pair ; Punta Arenas, February 17th, 1908 (Mutschke), a ♂ in coll. Deutsch. Ent. Mus.

Seems to be a true *Hoplosauris*, but as Butler's generic diagnoses are worthless and the Chilian genera of the group have not been revised, I have given the chief structural characters.

SUBFAM. GEOMETRINAE.

35. *Arycanda hypanis tenuisignata* subsp. nov.

Rather more bluish-grey than *h. hypanis* Cram. Upperside with the lines much thinner, subterminal spots smaller. Underside more weakly marked and with the postmedian line thinner.

New Guinea : Arfak Mountains, Snow Mountains, Owen Stanley Range, Hydrographer Mountains. Type ♂ from Ninay Valley, Central Arfak Mountains, 3,500 ft., November 1908 - January 1909.

Cramer's type of *hypanis* (*Uitl. Kapellen*, ii, 72, t. cxlii D, inaccurately registered by Sherborn, *Ind. Anim.*, i, 473, as *hypanus*, from a misprint in the French text), as is well known to workers at Indo-Australian Geometridae, was quite obviously from Amboina, not from "Surinam" as given, and *maculifera* Walk., *List Lep. Ins.*, xxxi, 123, is an absolute synonym.

36. *Cosmethis woodfordii disparilis* subsp. nov.

Differs from *w. woodfordii* Butl. (*Ann. Mag. Nat. Hist.* (5), xix, 215 = *ampliplaga* Warr., 1905, *bougainvillicola* Strand, 1915), from Bougainville and Shortlands, in that the abdomen in the ♂ is cadmium orange almost to the base (as in *w. siriella* Druce, 1888, from Guadalcanar), while in the ♀ it remains, as in the name-typical race, black nearly to the tip. In both sexes the white markings, though variable, are on an average considerably reduced in size. From *w. siriella* ♂ it differs in the narrower longitudinal spot near base of forewing, longer subapical patch (reaching M² instead of M¹), and general retention—though in greatly reduced size, often quite minute—of the additional spot of *w. woodfordii* (near base of R³ and M¹). The forms from Choiseul and Florida Islands (*w. floridensis* Warr., 1903) are somewhat transitional between the name-type and the new form, the abdomen being as in the former, the maculation nearer the latter, though with the subbasal patch larger.

Solomon Islands, western group : Rendova, 4 ♂♂, 4 ♀♀, including ♂ type ; New Georgia, 2 ♂♂, 3 ♀♀ ; Guizo, 3 ♂♂, 2 ♀♀ ; Vella Lavella, 4 ♂♂, 4 ♀♀.

This group has evidently no special connection with *Bordeta*, with which Warren placed it ; R² of the forewing does not arise so far forward, the shape and coloration are different, the ♂ possesses a fovea, etc. Provisionally I regard it—by short cell of hindwing and other characters—as a section of *Cosmethis* Hb. (type *barbara* Stoll) and as probably one collective species ; although the slightly more extreme reduction of hindwing cell in *siriella* may indicate a specific divergence, the new race seems almost to intergrade.

37. *Bandobena apicalis pyrigona* subsp. nov.

♀, 42-46 mm. Smaller than *a. apicalis* Walk., from S. Celebes.

Forewing with the black streak at base of costa reduced to a thin, incon-

spicuous line; the red area broadened, in the type reaching to M, in both the examples twice as broad tornally as in typical *apicalis*.—*Hindwing* with the termen perhaps slightly more bent than in *a. apicalis*, the red border twice as broad, with its proximal edge less regular, the black ground-colour projecting bluntly but noticeably at the veins, especially at R¹.

N. Celebes: Tondano, September–October 1899, 2 ♀♀.

The only example known to me from Central Celebes is intermediate, the forewing resembling *a. pyrigona*, the hindwing *a. apicalis*.

38. *Bordeta bursadoides dignitosa* subsp. nov.

♂♀. Tegula dark slaty grey, little paler than the head and thorax.

Forewing with the golden yellow band deeply coloured, broader than in *b. bursadoides* Warr. (1909), at least as broad as in the larger, less deeply coloured race *superior* Prout (1916); a conspicuous slate-grey spot between fold and SM² at about three-fourths (sometimes indicated in abs. of the other races).—*Hindwing* with the yellow area very ample, at abdominal margin 4–5 mm.

Goodenough Island, 2,500–4,000 ft., March 1913 (A. S. Meek), 2 ♂♂, 6 ♀♀.

39. *Craspedosis flavimedia auriflua* subsp. nov.

♂♀. Differs from *f. flavimedia* Warr. (1899) in the development of additional orange markings; the most constant is a longitudinal subcostal streak on the upperside of the forewing near the base, sometimes extended more obliquely, (parallel with proximal edge of central band) as far as fold, so as to form a bent half-band. Proximal area of forewing nearly always more or less strongly suffused or mottled with orange. Hindwing beneath nearly always with thin or broad orange longitudinal suffusion about the fold (not reaching base or termen) and always with some orange irroration on some of the veins. In one ab. the yellow submedian suffusion of hindwing is indicated also above, is very extended beneath and here joins an incomplete postmedian band, which reaches forward nearly to R¹, while the forewing beneath has indications of a corresponding postmedian band from R¹ to tornus.

Goodenough Island, 2,500–4,000 ft., March 1913 (A. S. Meek), 7 ♂♂, 1 ♀.

Except in one ♂, which has the band of *forewing* almost typical in shape, the distal edge of this band is more curved, thus more nearly approaching the proximal edge at costa.

40. *Craspedosis transtinens* sp. nov.

♂♀, 40–51 mm. Very similar to *semiplaga* Warr. (1896), of which *laticlava* Warr. (1903) seems to be clearly a rather larger, broader-banded race. Easily distinguished, however, as follows:

<i>semiplaga</i> .	<i>transtinens</i> .
Terminal joint of palpus extremely short, not distinct.	Terminal joint of palpus much less short, distinct.
Fovea obsolescent.	Fovea well developed.
White band of f.w. terminating at SM ² , not noticeably tapering.	White band of f.w. continuing to tornus, tapering posteriorly.
Anal tuft of ♂ mixed with whitish.	Anal tuft of ♂ concolorous.

British New Guinea : Upper Aroa River, April 1903, type and others ; Angabunga River : Biagi, Mambare River ; Hydrographer Mountains. Dutch New Guinea : Ninay Valley, Central Arfak Mountains ; Upper Setekwa River and near Oetakwa River, Snow Mountains.

Mr. Warren seems to have correctly sorted the Upper Aroa specimens into two series, but to have neglected to consult his Fergusson Island type ; for he has labelled the new species as *semitiplaga*, the form which I believe to be a race of the true *semitiplaga* as *laticlava*. It is just possible that the true *semitiplaga* and *uniplaga* Warr. (1896) are dimorphs of a single species, without and with a white patch on hindwing, as their structure seems to agree ; but this would not affect the status of the new species.

41. *Milionia xanthobathra* sp. nov.

♀, 56 mm. Eye minutely hairy. Antennal ciliation long for a ♀, almost as in *weiskei* Rothsch. (1901). Head, tegulae and a spot in front of patagia predominantly metallic blue ; palpus at ends of joints spotted with the same. Thorax and abdomen above orange, shading off to grey ; beneath blacker, slightly mixed with blue.

Forewing rather broad, a little recalling *dulitana* Rothsch. (1897), though not quite so extreme ; deep orange (almost cadmium-orange) ; a black costal border proximally, just entering the cell ; an oblique, subtriangular black band across middle of wing, sharply defined distally but not proximally, tapering to a point at hindmargin near tornus, widening to 5 or 6 mm. where it joins the proximal streak ; a black distal border, 8 or 9 mm. wide at costa, tapering to a point at tornus, its proximal edge very slightly concave.—*Hindwing* orange, with black borders at costal margin (just entering the cell) and termen, the latter tapering almost to a point at tornus, gradually widening to about 5 mm. at apex ; a shadowy indication of the dark basal and inner-marginal black of underside.

Forewing beneath black, with broad orange band corresponding to the discal band of upperside ; some blue scaling at base, extending in streaks about SC and R and along M to just beyond the origin of M². *Hindwing* black, with a very large oval orange patch in middle, extending from near C to near SM², its greatest longitudinal diameter 7 mm. ; proximal blue streaks broader than on forewing.

Dutch New Guinea : near Oetakwa River, Snow Mountains, up to 3,500 ft., October–December 1910, 2 ♀♀.

The general colour-scheme slightly recalls *dulitana*, but there are abundant differences in shape, extent of the orange areas, increase of metallic blue scaling (in some light Nile-blue or even green), etc. Really nearer, at least on the forewing, to the unique *flavostriata* B.-Bak. (*Ann. Mag. Nat. Hist.* (8) vi. 454, the type a ♂, not “♀” as printed), not inconceivably a ♀ form thereof.

42. *Milionia isodoxa* sp. nov.

♂, 45–48 mm. Similar to *aroensis* Rothsch. (1904) and *euglennia* Rothsch. and Jord. (1907), agreeing structurally with the latter in the absence of the apical area of modified scales on the hindwing beneath. Head and tegulae in most lights less greenish, thus less contrasted with base of wings.

Wings coloured as in *fulgida* Voll., the proximal part having a considerable extension of the bright greenish-blue scales as compared with its New Guinea allies.

Forewing with the bright blue basal area extending nearly 6 mm. anteriorly, 7 or 8 mm. behind SM², distally irregular, though less deeply indented than in *lamprina* Rothsch. & Jord. (1907)—much more sharply defined than in *euglennia*; a narrow, ill-defined deep-blue area between this and the black ground-colour, which shows blue reflections, as in the allies; band red in 4 examples, red-orange in one, about 3 mm. wide, less curved than in *euglennia*, thus less proximal at costa, which it quits perpendicularly; its proximal edge straightish, its distal placed outside DC (in *euglennia* often just within), very slightly curved in its posterior half.—*Hindwing* with the bright blue area much more extended than in *euglennia*, nearly as in *fulgida*, though much less indented, separated from the ground-colour (as in that species) by an ill-defined deep-blue area.

Underside with the blue more broken into streaks than above, these longer than in *euglennia*, additional ones developed in submedian area of hindwing, where they are obsolete (or deep-blue only) in that species.

British New Guinea: Angabunga River, St. Joseph River, 6,000 ft. upwards, November 1904–February 1905 (A. S. Meek), 5 ♂♂.

43. *Lobocraspeda coeruleostriga stygnota* subsp. nov.

♂♀. *Forewing* in all the examples with the subbasal spot large and round (as in rare aberrations of *c. coeruleostriga* Warr., 1897).—*Hindwing* in the ♀ as in the broadest bordered aberrations of *c. coeruleostriga* or still more extreme, in the ♂ with the yellow area restricted and heavily suffused with olive-grey (type and others), in the most extreme examples blackish throughout.—Underside in all the ♂♂ almost entirely blackish.

N.E. New Guinea: Rawlinson Mountains, inland of Huon Gulf (Ch. Keysser), a good series.

44. *Boarmia subdetractaria* nom. nov.

Boarmia detractaria Walk., *List Lep. Ins.*, xxi. 385 (1860) (nec xxi. 357).

Dryocetis subdetractaria nom. nov. Warr. MS. (in coll. Tring Mus.).

Swinhoe (*Cat. Lep. Het. Oxf. Mus.*, ii. 293) notes that Walker used the name *Boarmia detractaria* twice and that "therefore this name should fall," but does not see any necessity for renaming the Indian species. Even if his assumption be granted that the genus to which the Brazilian species should be assigned (? *Iridopsis* Warr.) is "perfectly distinct"—which has not yet been worked out morphologically, though the latest reviser, McDunnough (*Studies in North American Cleorini*, Ottawa, 1920), recognises a number of valid genera in the group—the laws of homonymy demand a change, and I propose to adopt that which was made by Warren in the Tring Museum some thirty years ago, but never published.

45. *Systema longiplaga* sp. nov.

♂♀, 28 mm. Near *semicirculata* Moore (*Proc. Zool. Soc. Lond.*, 1867, p. 654), with which it has been mixed. On an average rather larger*; *forewing* with

* Hampson's measurements (*Faun. Ind. Moths*, iii. 278) include not only this species, but also *concinna* Warr., which he has still more inexcusably sunk.

the dark median shade slightly more distal, absorbing the cell-spot; the white patch beyond much larger, reaching at least to M^2 and with some narrow and ill-defined extensions behind (in *semicirculata* ending at R^1), a small accessory white spot across cellule and touching or connected with it distally; the black spots on the "orange" terminal band smaller; hindwing less clouded, in particular without the dark subternal patch which is always characteristic of true *semicirculata*, the abdominal border less reduced than in that species.

Sikkim, in various collections, the type ♂ and 2 ♀♀ from Darjiling in coll. Brit. Mus.; Turzum Tea Estate, Nagrispur (O. Lindgren), 3 ♀♀ sent by T. B. Fletcher, Agric. Res. Inst. Pusa. Assam, a ♀ in coll. Joicey; Naga Hills (W. Doherty), a small ♂ (22 mm.) in coll. Tring Mus., ex coll. Elwes.

46. *Nadagarodes duplicipuncta* Warr.

Mr. Warren unfortunately selected no type for this species (described NOVITATES ZOOLOGICAE, vi. 356), and his manuscripts leave the question in some confusion. His note shows that he gradually reached the conviction that there were two closely allied species mixed, and in the Ron Island collection (made by Doherty in July 1897) he labelled the second one as *ceramata* Walk. Subsequently discovering that that was a synonym of *mysolata* Walk., he named the new species *duplicipuncta*; but by an accident the note "The St. Aignan specimens are all smaller than the average size," which—as his MSS. and the actual specimens show—referred to *mysolata*, got attached to the description of *duplicipuncta*. As it is highly undesirable to select as type locality the one on which an erroneous statement was published, and as it is reasonable to suppose that the Sudest and Rossel Island collections of 1898 furnished the final incentive to the publication of *duplicipuncta*, I have selected as its holotype and allotype a ♂ and ♀ from Sudest Island, April 1898 (A. S. Meek), the latter bearing a label in Warren's handwriting "*Nadagarodes duplicipuncta* Warr."

47. *Nadagara synodoneura* sp. nov.

♂, 34–36 mm. Very like a large, rather pale, broad-winged *scitilineata* Walk. Hindtibia dilated, with hair-pencil.

Forewing with R^2 arising close to R^1 (apparently not to be regarded in this instance as a generic character, the rest of the structure and the facies being so absolutely typical for the genus); costal margin proximally with the black irroration not very dense; cell-dot above minute and shadowy, beneath well developed; postmedian line rather firm, not crenulate; whitish line at base of fringe not expanded between R^1 and apex.—Hindwing with termen more convex than in *scitilineata*, perhaps slightly more crenulate; fringe (except a slender proximal line) not pale.

Underside more mixed with white than in *scitilineata*, except on anterior part of forewing; forewing with an ill-defined black-grey subterminal blotch in front of R^1 , sometimes almost reaching apex; hindwing with the line more proximally placed than in *scitilineata*.

Dutch New Guinea: Upper Setekwa River, Snow Mountains, 2,000–3,000 ft., August–September 1910 (A. S. Meek), type and paratype. British New Guinea: Hydrographer Mountains, 2,500 ft., January 1918 (Eichhorn Bros.), 2 ♂♂.

Hampson, in defining this genus (*Faun. Ind. Moths.*, iii. 193), gives "hind-tibia not dilated," which is only correct for about half the species.

48. *Nadagara synocha* sp. nov.

♂♀, 34–36 mm. Structure about as in *inordinata* Walk. Hindtibia of ♂ as in that species, not dilated; hindfemur of ♂ fringed with hair. Head and body coloured as in *inordinata*. Both wings more elongate costally, the termen of forewing otherwise nearly agreeing (appreciably crenulate only near apex).

Forewing in ♂ more uniformly fawn-colour or brownish than in *inordinata* (with less white in distal area), in ♀ more coarsely dark-irrorated, in both sexes variable; antemedian line generally well developed, strongly curved, rather strongly oblique posteriorly, white-edged proximally; cell-dot moderately large, black; postmedian line nearly as in *inordinata*, or slightly more oblique, nearly always accompanied proximally (at about 1 mm. distance) by an almost equally distinct line (representing the postmedian of the underside), which converges with it about SC⁵; proximal blackish maculation of subterminal always developed in front of R¹ and in all the yet known ♂♂ forming a conspicuous blotch in cellules 3–4 (in some ♀♀ this blotch is obsolete, or obscured by the heavy irroration); termen with interneural black dots or dashes; fringe with pale line at base.—*Hindwing* whitish costally, the rest concolorous with forewing; a black cell-dot; a straightish postmedian, distally white-edged as on forewing, reaching costa much beyond hinder edge of that of forewing (as in the *irretracta* group); subterminal feeble in the ♂♂, more conspicuous in the ♀♀, where it is generally finely dark-edged proximally.

Underside variable, generally similarly marked to upperside, the chief difference on the forewing consisting in the reversal of the relative strength of the two postmedian lines, the distal one being faint, but connected with the strong proximal one by dark dashes on the veins. Hindwing with the postmedian weak, the subterminal usually strong, marked by blackish dots or teeth on the veins.

Malay Peninsula: Gunong Ijan, 3 ♂♂, 4 ♀♀, in coll. Tring Museum (including the ♂ type), misidentified by Warren as *pulchritineata* Walk. Java: Pengalengan, Preanger, 2 ♀♀, in coll. Tring Museum; Tosari, July 6th, 1910, 1 ♀ in coll. L. B. Prout, kindly presented by Dr. E. A. Cockayne. S.W. Sumatra: North Korintji Valley, 5,000 ft., September–October 1921, a beautiful, heavily marked ♂ aberration collected by the Pratt brothers for J. J. Joicey, Esq.

49. *Nadagara odontias* sp. nov.

♂, 36–37 mm. Head red-brown, mixed (notably on vertex) with brighter red. Thorax and abdomen reddish grey. Hindtibia dilated, with rather strong grey hair-pencil.

Forewing elongate, about as in *synocha* Prout (*supra*), but with the termen slightly more curved and noticeably more crenulate; reddish grey, irrorated and somewhat clouded with red-brown and with a few black scales; costal edge with dark longitudinal streaks alternated with pale spots or shorter streaks; cell-dot black; antemedian line at nearly one-third, moderately curved, almost obsolete, except for a black dot on base of M² and a stronger one on SM²; postmedian marked by a series of black vein-dots, slightly more oblique than termen, edged

distally by a whitish line which is very shallowly lunulate inward between the veins; a thick, ill-defined black dash proximally to this line in front of R^3 ; a series of marks distally to it, mostly brown irrorated with black, the hindmost two black, the first running obliquely from cellule 7 to costa close to apcx, the rest interneural, culminating in a longer one in cellule 3; terminal line slight and interrupted; fringe with a pale line at base and blackish spots opposite veins. — *Hindwing* with termen strongly crenulate; cell-dot rather larger than on forewing, but weaker; postmedian line continued, scarcely beyond middle of wing, unaccompanied by dashes; very faint indications of a pale, irregularly lunulate-dentate subterminal; fringe as on forewing.

Underside as far as postmedian more orange-ochreous, with coarse dark irroration or minute strigulation; beyond more inclining to violet-grey; cell-dots and postmedian dots strong; forewing with vague dark postmedian clouding about R^3 .

Malay Peninsula: Gunong Ijau, 2 ♂♂.

50. *Nadagara extractata* sp. nov.

♂♀, 30–35 mm. Head and collar tawny, the face narrowly edged with white. Palpus in the ♂ almost 2, in the ♀ slightly longer; brown (rarely much mixed with tawny), beneath narrowly white. Tegulae fuscous. Thorax and abdomen concolorous with wings, the abdomen very finely whitish at ends of segments. Legs with some black scales at base of spurs; hindtibia of ♂ dilated, with hair-pencil.

Wings shaped nearly as in *intractata* Walk., the distal margins being slightly crenulate (especially that of hindwing), the forewing minutely produced at apex, somewhat gibbous at midtermen.

Forewing pale grey, tinged with fawn-colour in the ♂, more violaceous in the ♀; irroration fine; costal edge narrowly fuscous, with pale dots; ante-median line excurved and somewhat irregular, never strong, often almost or altogether obsolete; cell-dot small, black; postmedian strong, oblique, very slightly curved, scarcely crenulate, blackish, accompanied proximally by brown shading and distally by a fine whitish line, at costa about 2 mm. from apex, at hindmargin about 4 mm. from tornus; subterminal line indistinct, accompanied proximally by very faint dark shading and often by a more or less conspicuous double spot at R^3 ; terminal line brown, rather variably marked with interneural black dots or dashes (strongest anteriorly); fringe with a pale line at base. — *Hindwing* concolorous, at costal margin paler; cell-dot and post-median as on forewing, the latter not crenulate, arising distally to the hinder end of that of forewing, though less far from it than in *irretracta* Warr., *argyrosticha* Turn., and *reprensata* Prout; subterminal and its proximal shade nearly always stronger than on forewing, but never with a blotch at R^3 .

Underside variable, a great part of the forewing generally rather more ochraceous than above, its distal and posterior parts, with the entire hindwing, paler; all more or less heavily irrorated or strigulated, as in the allies; cell-dots strong; postmedian line less oblique than above, marked by blackish teeth or dots on the veins, sometimes obsolete between; subterminal line and shade often strong, though rather irregularly, the latter expanding to a blotch near apex of forewing.

Louisiades : Mount Rossel, Rossel Island, 2,100 ft., December 1915, 4 ♂♂, 5 ♀♀, including the ♂ type ; Mount Riu, Sudest Island, April 1916, 1 ♂, 5 ♀♀ ; all collected by Eichhorn Bros. Paratypes from the latter locality are in coll. Joicey.

Very near *irretracta* Warr. (NOVITATES ZOOLOGICAE, vi. 356, type ♀ from Tulagi Island, Solomons—not type ♂, Tugela Island, as printed), smaller, palpus darker, wings less elongate, generally more strongly marked, postmedian line less oblique ; underside rather recalling that of *tractata* Prout (NOVITATES ZOOLOGICAE, xxiii. 44).

51. *Psilocladia diaereta* sp. nov.

♀, 33–37 mm. Face and palpus mixed with dark brown ; palpus shortish-moderate. Antenna subserrate. Head, body, and legs whitish brown, with some darker irroration.

Forewing with termen flexuous but not dentate ; tornal lobe well developed ; the coincident vein ($SC^1 + ^2$) free (in the left forewing of the type anastomosing very slightly with C) ; whitish brown, irrorated with wood-brown and more sparingly with dark grey ; cell-spot dark grey, not very sharp, closely followed by an indistinct brown median line ; distal area vandyke-brown (in proximal half clouded with black), its proximal edge 4 or 5 mm. from apex, 1 mm. from tornus, very gently incurved between R^1 and SM^2 ; a subapical wisp of the ground-colour between SC^5 and R^1 ; fringe dark proximally, pale distally.—*Hindwing* broader than in the type species, the excavation between SC^2 and R^3 deeper ; cell-dot almost or altogether obsolete ; median line very faint, just proximal to DC ; dark border as on forewing, but without subapical mark ; fringe as on forewing.

Underside similar, the cell-spot and median line of forewing stronger.

Nairobi (Dr. van Someren), May 30th, 1919 (type), and June 11th, 1919 (paratype).

Probably near *loxostigma* Prout (NOVITATES ZOOLOGICAE, xxii. 380), but larger, rather narrower-winged, with deeper excision in termen of hindwing, the dark borders much more contrasting, differently shaped, the pale subapical mark of forewing elongate.

NEW ANTHRIBIDAE FROM THE EASTERN HEMISPHERE

BY DR. KARL JORDAN.

1. *Acorynus frontalis oceani* nov. subsp.

♂♀. Pronotum macula laterali subrotunda sat magna in arca carinae sita notatum.

Hab. Tanah Masa, Batoe Islands (Kannegieter), three ♂♂, one ♀, in Mus. Natura Artis Magistra, Amsterdam.

The underside is spotted with luteous, as in *A. f. frontalis* Jord. (1895) from Perak, Sumatra, and Borneo; but the pronotum bears a very conspicuous, yellowish lateral spot in the curve of the carina, and the cheek is also yellowish below the eye.

2. *Mucronianus tenuicornis* spec. nov.

♂. Rufus, pube grisea hic et inde aurea vestitus, antennis pedibusque pallide rufis gracilibus; rostro sine carina; pronoto impunctato; pygidio apice rotundato; femore antico subtu villosa.

Long. (cap. excl.) 6 mm.

Hab. Bintang, Riouw Islands, one ♂.

Proboscis depressed apically in centre, without carinae, densely covered with a golden-grey pubescence. Head likewise densely pubescent, more golden than the proboscis. Antenna slender, reaching to middle of elytra, segments III to VIII very slender, IV to VIII almost equal in length, III slightly longer, IX a very little shorter, X about three times as long as broad, the club being slenderer than in the other known species of the genus.

Pronotum smooth, with very minute punctures on the sides, without any coarse puncturation, on disc the grey pubescence partly rubbed off, in an oblique aspect traces of ferruginous brown spots visible; dorsal carina slightly convex, especially towards sides, lateral carina nearly horizontal, the angle completely rounded off, the short basal longitudinal carina joining the lateral carina and forming with it an acute (dorsal) angle; length of pronotum 25, width 38.

Scutellum and elytra pubescent grey, with a golden sheen when viewed at certain angles, an antemedian, elliptical, sutural macula blackish brown, produced to scutellum on suture, a smaller rounded limbal spot before middle and a paler, rather diffuse, transverse band at the beginning of the apical declivity, middle of disc clay-colour, alternate interspaces a little convex. Basal margin of elytrum curved forward. Pygidium as long as broad, flat, completely rounded (♂!), without trace of an apical projection.

Prosternum convex between anterior margin and coxae, on the side a large patch of dense pubescence grey-white with a golden tint. Mesosternal process broader than the midcoxa. Abdomen convex, not at all depressed, but fourth segment with a small apical swelling halfway between middle and sides. Legs uniformly pale rufous, forefemur with long pubescence on underside; apices of tibiae not incrassate.

3. *Mucronianus gerrhus* nov. spec.

♂. Niger, pube cinerea parum lutescente obtectus, brunneo-olivaceo variegatus, elytris macula suturali magna mediana nigra ornatis; antennis crassis, segmento octavo triangulari omnium maximo, nono et decimo brevibus; pygidio simplice, rotundato; abdomine convexo.

Long. (cap. excl.) 5.5 mm.

Hab. Assam: Nengpoh, Khasia Hills, one ♂.

Proboscis densely pubescent cinereous, uneven, but without carinae. Head brown, luteous grey around the eyes, with an indication of median streak of the same pubescence. Antenna reaching to middle of elytra, brownish black, segment I rufous, III a little longer than IV, IV as long as VI, V slightly shorter, VI = VII, both broader than III-V, VIII broadest and longest, triangular, a little over twice as long as broad, one-sixth longer than II, slightly shorter than IX, X, XI together, and a little broader, IX twice as broad as long, X somewhat longer than IX, but still broader than long, XI about as long as broad.

Prothorax more than half as broad again as long (35 : 20), densely punctured; disc with four diffuse brownish patches; dorsal carina slightly convex, lateral carina horizontal, forming a right angle with the dorsal one, but the apex of the angle rounded off.

Basal margin of elytrum strongly curved forward, subbasal callosity broad, low, behind basal margin a diffuse, brownish, transverse band; traces of the same colour along the sides, very indistinct; the black saddle almost pointed laterally, reaching to the fifth line of punctures; width of elytra 38, length 52. Pygidium brownish grey, whitish in centre, broader than long, more convex at base than at apex.

Underside densely ashy grey with slight luteous shadows. Metasternum and abdomen convex. Legs the same colour, but apices of tibiae and of tarsal segment I, the entire segment II, and upperside of III and IV brownish black.

4. *Mucronianus ellipticus* spec. nov.

♀. Like *M. gerrhus*, but pubescence purer ashy white, covering also the tarsi; apices of tibiae very slightly brown; black macula of elytra much larger, regularly elliptical, reaching from basal fourth of suture to apical fourth. Antenna a little farther away from eye, the segments V to VIII not incrassate (♀!), VIII quite short, IX the largest, triangular, twice as long as broad, one-tenth longer than III, also a little longer than X and XI together, X broader than long, XI slightly longer than broad. Dorsal carina of pronotum somewhat more convex than in *M. gerrhus*.

Length: 4.5 mm.

Hab. Borneo: Kuching, i. 1907 (ex Mus. Sarawak), one ♀.

5. *Mucronianus axius* spec. nov.

♀. Brunneo-rufus, supra griseo signatus, subtus griseus. Caput magis convexum quam in huius generis caeteris speciebus, oculis minoribus, rostro longiore, clava antennae longa, segmentis inter se fere aequalibus, longitudine tertii. Pronotum densissime granulosum, carina ad latera fortissime rotundata.

Elytra griseo lineata et guttata, lineis ad marginem basalem coniunctis. Pygidium rotundatum, granulatum. Tarsi brunnei griseo pubescentes.

Long. (cap. excl.) 4 mm.

Hab. Borneo: Kuching (J. Hewitt), one ♀.

Owing to the smaller size of the eye the distance of the eye from the antennal groove is considerably larger than in the other species of the genus. There is no sulcus between eye and antennal groove. The rostrum is narrower and rather longer and has no carinae. Antenna long, reaching beyond middle of elytra (♀!); segments I and II pale rufous, together about as long as III, this nearly half as long again as IV, IV to VII almost equal, VIII about one-fourth shorter, III to VIII thin, club slender, IX as long as III, X = XI a little shorter than IX, IX about three times as long as broad, linear, not triangular.

Pronotum grey at the sides, rufous brown on disc, with an ill-defined grey median line; carina slightly convex, concave at the sides, curved forward in a very wide arc, the lateral carina being oblique.

Scutellum very short, transverse, almost linear. Elytrum with the basal margin curved forward, stripes of punctures weak, in the first (=sutural), third, fifth, and seventh interspaces a grey line, more or less complete from base to beyond middle, the lines united at the base and again behind middle, where they are enlarged into dots, second and third united also before middle, on apical declivity a central dot on each elytrum, at margin grey pubescence at shoulder, in middle, and from apex forward.

Pygidium with grey pubescence, which is sparse at apex; flat, granulose, a little longer than broad, slightly narrowed towards apex, which is strongly rounded.

Underside densely pubescent grey, the pubescence less dense on the legs; the tarsi somewhat darker than the tibiae, except the claws, which are rufous; first foretarsal segment not quite one-third shorter than foretibia (5:7).

6. *Ecelonerus albopictus* Pasc. (1860).

♂♀. Niger, supra pube lutea et nigra vestitus, pronoti apice, elytrorum macula maxima mediana alteraque minore apicali griseo-albis; subtus cum pedibus griseo-albus, tibiis nigro bimaculatis. Antenna longior quam in *E. subfasciato*; pronotum magis rotundatum, carina laterali ad apicem continuata; pygidium latius; foveae abdominales laterales (♂) majores ochraceo pupillatae, segmentum basale fovea mediana griseo pubescente instructum (♂).

Long. (cap. excl.) 8-13 mm.

Hab. Australia: Cairns, Queensland, and N.S. Wales; two pairs.

The white apical border of the pronotum bears several spots of the dark ground-colour at the apical margin, and is posteriorly on each side three times invaded by the ground colour, i.e. six-sinuate; a few minute white dots further back. Scutellum white. The large white area of the elytra extends from side to side, and from basal fourth to apical third, being more sharply defined in front than behind; from the suture a large patch of the dark ground extends into the white area, separating the area dorsally into a larger, transverse, anterior portion and a narrower, oblique, posterior portion; apical white mark about 1 mm. broad at suture, not interrupted. Pygidium white.

Antenna rufescent, segment III very little longer than IV, club much longer than in *E. subfasciatus*, IX and X rather strongly asymmetrical, trian-

gular. The lateral abdominal grooves of the ♂ bear a clayish ochraceous, somewhat golden, pubescence. Tarsi rufescent.

The pubescence of the underside is finer and denser than in *E. subfasciatus* Fahrs. (1839). On the elytra the ochraceous pubescence is a little denser in the interspaces 1, 2, 4, 6, 8 than in the others.

We give the above description of *E. albopictus*, as we have to refer to the species in the descriptions of the following three closely allied *Eceloneri*.

7. *Ecelonerus molitor* spec. nov.

♂♀. *E. albopicto* Pasc. (1860) similis, rostro cum capite albo-cinereo, area albo-cinerea elytrorum postice diffusa, antice oblique truncata et ad suturam divisa, in utroque elytro tribus guttis nigro-velutinis notata, pygidium cum elytrorum apice fusco-ochraceo nec albo; foveis abdominalibus (♂) indistinctis, segmento primo sine fovea mediana.

Long. (cap. excl.) 9–13 mm.

Hab. Woodlark (A. S. Meek), type; Sudest Isl. (A. S. Meek); Mailu, British N. Guinea (Anthony); Aru (H. Kühn).

Proboscis longer than in *E. albopictus*, white like the head, with an admixture of yellowish pubescence, a short median carina at base. Antenna rufous, segments IX and X asymmetrical as in *E. albopictus*, triangular. Prothorax less globose than in *E. robustus*, carina usually interrupted in centre, apical margin white, but this border less sharply marked. Scutellum white. The white (or nearly white) area of the elytra larger than in *E. robustus*, posteriorly diffuse, and here not distinctly interrupted at the suture, its anterior margin laterally very oblique, the fuscous basal area being wider at the sides than above; this area extends along suture to middle, dividing the white patch, with black velvety spot in third interspace before middle and two similar spots (in third and fifth interspaces) further back; apex of elytra and pygidium fuscous like base, i.e. the black derm not quite concealed by a mixture of clayish and greyish pubescence, alternate interspaces (uneven numbers) slightly clay-colour.

Underside grey or nearly white. The abdomen of ♂ flattened in middle, the lateral foveae of segments II to IV very shallow, with but a slight concentration of the pubescence in the centre, not at all conspicuous, no median fovea on first segment. Legs rufescent, tarsi palest, tibiae with prominent black spot a little beyond middle and a trace of a basal spot.

8. *Ecelonerus albinasus* spec. nov.

♂♀. Rostrum cum capite album; antenna rufescens, segmento 3^o quarto longiore, 10^o transverso. Pronoti margo anterior tenuiter albus tridentatus, discus albo variegatus linea tenui brevi mediana basali. Elytra post medium albo pubescentes, macula mediana subsuturali e duabus guttis nigris composita notata. Pygidium album. Subtus albus; tibiae brunneo bimaculatae; foveae laterales abdominales (♂) conspicuae, rotundae, albo-pubescentes.

Long. (cap. excl.) 7.5–12 mm.

Hab. Australia: Coomoooolaro, Dawson district, Queensland (ex coll. Barnard), a pair; "Australia."

The antenna agrees better with that of *E. subfasciatus*, the club being shorter than in *molitor* and *albopictus*, and segment III longer; the colour is also darker. The white marginal apical border of the pronotum is much narrower than in the

two previous species, sharply defined. From it project backwards three teeth one in centre and one each on the level of the upper margin of the eye; from the scutellum across the interrupted carina a thin but distinct white median line, numerous white clouds and small spots, more or less diffuse, all over the pronotum. The lateral carina reaches apex by means of a ridge, but this ridge not quite so distinct as in the previous species here described. The white (or creamy) area of the elytra commencing before the middle of the lateral margin, anteriorly diffuse, reaching up to fourth interspace, but white diffuse pubescence present also further basad and dorsad, in middle a black velvety oblong spot in interspaces III and V, the white at the side and behind these spots sharply defined; from behind middle of elytra the white area very diffuse, but continued to apex by means of white dots and dispersed white pubescence, a subapical small patch fuscous, bearing a white dot, at extreme apex the white pubescence denser, but there is no apical spot contrasting with the ground before it as there is in *E. albopictus*. Pygidium and underside white.

Derm of legs darker than in the two previous species. Abdominal ♂-foveæ circular, smaller than in *E. albopictus*, with white pubescence; median groove of first segment small.

9. *Ecelonerus virgatus* spec. nov.

♂. Rostrum in medio convexo glabrum, ut caput albo trivirgatum. Oculi longior quam in caeteribus speciebus. Pronotum albo et fusco virgatum, duabus maculis apicalibus dorsalibus nigris notatum, carina dorsali versus latera angulata. Elytra albescentes, area basali communi, plaga obliqua mediana, atque macula communi antepicali rotunda fusciscentibus notata, interspatiis 3^o et 5^o duabus guttis nigris signatis, una mediana, altera antepicali. Tibiae indistincte brunneo bimaculatae.

Long. (cap. excl.) 10 mm.

Hab. Australia, no more precise locality given, one ♀.

Eye decidedly longer than broad. Rostrum convex along middle and here almost without punctures, the sides and a median stripe as on head white, pubescence between these ill-defined stripes luteous, with the dark derm shining through. Antenna as in *E. albopictus*, but less pale rufous, club broader, segment III rather longer.

Pronotum with five ill-defined white stripes, a black apical spot between central stripe and the next, and a similar spot at base; dorsal carina interrupted in centre and biangulate towards side, the upper angle pointed forward and the outer one (which is close to it) backward; the forward continuation of the lateral carina less well marked than in *E. albopictus*.

Base of elytra fuscous, but scutellum, the first interspace, and a conspicuous streak above shoulder white, on apical declivity a round sutural patch reaching to the fifth stripe of punctures fuscous, bearing anteriorly a black spot in the third and fifth interspaces, the outer spots further back than the inner ones, in middle of each elytrum an oblique fuscous patch from third interspace to near outer margin, with a black dot in third and fifth interspaces; pubescence of rest of elytra white, but not very dense, and the suture clay-colour. Pygidium white, mixed with luteous.

Pubescence of underside white, less dense than usual on abdomen, no abdominal foveæ (♂!). Legs as in *E. albinasus*, spots of tibiae quite small.

10. *Gulamentus signatus* spec. nov.

♂♀. *G. meliori* Jord. (1922) structura similis; sed toto rostro, pronoti lateribus latissimis, elytrorum macula magna subbasali utrimque ad marginem basalem continuata, macula minore transversa anteapicali conspicue griseis parum lutescentibus, pygidio plus minusve griseo utrimque macula nigro-brunnea notato.

Long. (cap. excl.) 4-6 mm.

Hab. Congo: Elisabethville, xi. 1911 (Miss. Agric.), in the Congo Museum at Tervueren, a series of both sexes.

Pygidium of ♂ almost twice as broad as long, with the apex rounded, hardly at all truncate, in ♀ much longer, with the apex truncate-emarginate; in most specimens with a grey border and grey median line, sometimes entirely grey with scarcely a trace of a brown spot. Anal ventral segment of ♂ with a rounded impression as in *G. melior*, but without distinct hump at the side of the groove. The grey, often slightly yellowish, pubescence occupies the proboscis and the anterior portion of the frons, the pronotum except the median third (or less), the whole undersurface, and the legs. The apices of the tibiae and of the tarsal segments I and II, as well as a spot on the femora and all the claw-segments black, the chitin of the grey portions rufescent; on the abdomen, close to the elytra, a row of small black dots. Scutellum black, with a grey apical spot; suture close to scutellum likewise black. On elytra a large grey sutural macula, which extends to the base at each side of the black, more or less trilobate scutellar spot; the grey macula subquadrate, but irregular, sinuate laterally, truncate or rotundate posteriorly, sometimes continued backwards on the suture, usually bearing a small blackish sutural spot; at apical third of each elytrum a subsutural spot, the two spots nearly always connected with each other across the suture; besides these conspicuous markings numerous grey specklets and small spots, of which a basal one above the shoulder and two limbal ones usually are the largest; in middle of each elytrum a brown longitudinal shadow quite inconspicuous. Usually small grey elongate spots anteriorly and posteriorly in middle of pronotum, and a similar spot on the frons. Eye bordered with grey, except along frons.

REVIEW OF THE BIRDS COLLECTED BY ALCIDE D'ORBIGNY
IN SOUTH AMERICA

By C. E. HELLMAYR

PART III

(Parts I and II Nov. Zool., Vol. XXVIII, pp. 171-213, 230-276)

$$\textit{Anthus fulvus} = \begin{cases} \textit{Lessonia rufa rufa} \text{ (Gm.)}^1 \\ \textit{Lessonia rufa oreas} \text{ (Scl. \& Salv.)}^2 \end{cases}$$

Anthus fulvus "Vieill."³; L. & O., *Syn. Av.* i. p. 26 (Patagonia, Corrientes, rep. Argentina); d'Orbigny, *Voyage*, p. 223 (Chili, "Andes boliviennes," 4,000 à 5,000 feet; Rio Negro; Corrientes).

No. 1, "♂" adult (mounted): "Rép. Argentine, Corrientes, par d'Orbigny, 1829. *Centrites niger* No. 76. Cat. des galleries No. 3916."—al. 75; c. 49; r. 10½ mm.=*Lessonia rufa rufa* (Gm.)

No. 2, (♂) juv. (skin): "Buenos Aires, femelle. *Anthus fulvus* Vieill., par d'Orbigny, juillet 1829. No. 85."=*Lessonia rufa rufa* (Gm.).

No. 3, (♂) ad. (skin): "des Pampas d'Oruro, Bolivie, par d'Orbigny, 1834. No. 117. *Anthus fulvus* Vieill."=*Lessonia rufa oreas* (Scl. & Salv.).

The Corrientes bird is practically identical with adult males from Buenos Ayres (topotypical) and Patagonia (Neuquen), the whole of the quills being uniform sooty-blackish. Chilian skins are apparently not different either.

L. rufa rufa is a common bird in the southern parts of Chili and Argentine, down to Tierra del Fuego, ranging northwards to Tucumán, eastwards through Entrerios and Uruguay to southern Rio Grande do Sul.

No. 3, a perfectly adult male, is typical of *L. rufa oreas*. Like several specimens from near the type locality (mountains of Cuzco), it has the basal half of the inner web of the remiges pure white. This race appears to be strictly limited to the elevated "plateaux" of Central Southern Peru and Western Bolivia.⁴

¹ This species is commonly called *Lessonia* (or *Centrites*) *nigra* by authors. However, *Alauda nigri* [sic! err. typogr.] Boddaert [*Tabl. Pl. enl.*, p. 46 (1783.—ex Daubenton, *Pl. enl.* 738, fig. 2 [not fig. 1, as erroneously quoted by Boddaert], Buffon, etc.: Buenos Ayres, coll. Commerson)] is invalidated by *Alauda nigra* Boddaert [*Tabl. Pl. enl.*, p. 40: ex Daubenton, *Pl. enl.* 650, fig. 1: = *Alauda arvensis* Linn. var. melanist.].—The next available name is *Alauda rufa* Gmelin, *Syst. Nat.* 1, ii. p. 792 (1789.—likewise based upon Daubenton, *Pl. enl.* 738, fig. 2, and Buffon's "Alouette noire à dos fauve": Buenos Ayres, coll. Commerson; descr. ♂ ad.).

² *Centrites oreas* Selater & Salvin, *Proc. Zool. Soc. Lond.*, 1869, p. 154 (1869.—Tinta, Cuzco S.E. Peru).

³ *Alauda fulva* Latham, *Ind. Ornith.* ii. p. 492 (1790.—ex Daubenton, *Pl. enl.* 738, fig. 2 = ♂ ad.).

⁴ The birds from the Puna de Jujuy, N.W. Argentine, which Lönnberg (*Ibis*, 1903, p. 450) refers to *L. rufa oreas*, should be carefully re-examined.

Anthus chii = Anthus lutescens lutescens Puch.¹

Anthus chii (nec Vieillot);² L. & O., *Syn. Av.* i, p. 26 (Corrientes); d'Orbigny, *Voyage*, p. 225 (Banda Oriental: Maldonado, Montevideo; La Plata, Corrientes).

No. 1, adult (skin): "d'Orbigny, juillet 1829. No. 83. Corrientes."—al. 63½; c. 48 mm.

No. 2, ♂ ad. (skin): "Rio-de-Janeiro. No. 7 Pass.—Mâle. Envoi de M. d'Orbigny, 13. 9^{bre} 1829."—al. 64; c. 48; r. 12½ mm.

Both of these examples belong to the small neotropical Pipit, long known under the inapplicable name *A. rufus*,³ which ranges from the Guianas south to Paraguay, northern Argentine, and neighbouring countries.⁴ The bird from Corrientes agrees, in size and coloration, with those from Eastern Brazil.

Anthus variegatus = {ad. = **Anthus correndera correndera Vieill.⁵**
jun. = **Anthus furcatus brevirostris Tacz.⁶**

Anthus variegatus (nec Vieill.);⁷ L. & O., *Syn. Av.* i, p. 26 (Buenos Ayres;—av. junior: La Plata, Cochabamba (rep. Boliviana)).

Anthus correndera, d'Orbigny, *Voyage*, p. 225 ("aux environs de Buenos Ayres jusqu'en Patagonie").

No. 1, adult (skin): "D. 28, Buenos Ayres, *Anthus correndera* Vieill. d'après Azara. d'Orbigny, juillet 1829. No. 84."—al. 72; c. 55 (very worn); r. 13; hind claw 16 mm. = *Anthus c. correndera* Vieill.

No. 2, adult (skin): "d'Orbigny, février 1831. 'Patagonie,' No. 47. *Anthus furcatus* Nob."—al. 81; c. 64; r. 11½; hind-claw 9 mm. = *Anthus f. brevirostris* Tacz.

No. 3, adult (skin): "D. 292. Cochabamba, par d'Orbigny, 1834. *Anthus furcatus* Nob. No. 218."—al. 81; c. 58½; r. [broken]; hind-claw 9½ mm. = *A. f. brevirostris* Tacz.

No. 4, adult (skin): "D. 292, d'Orbigny, 1834. Cochabamba, D. 292."—al. 79; c. 58½; r. 11; hind-claw 8 mm. = *A. f. brevirostris* Tacz.

In the *Synopsis Avium* Lafresnaye and d'Orbigny united *A. correndera* (No. 1, ex Buenos Ayres) and *A. furcatus brevirostris* in freshly moulted plumage as adult and young of the same species under the name *A. variegatus*. In the ornithological portion of the *Voyage* (p. 227) d'Orbigny, correcting his former error, rightly refers the Cochabamba skins (Nos. 3, 4) to *A. furcatus* Lafr. & Orb., to which No. 2, said to be from "Patagonia," unquestionably also belongs.

¹ *Anthus lutescens* (Cuvier MS.) Pucheran, *Arch. Mus. Paris*, vii. p. 343 (1855.—"Brésil," coll. Delalande, sc. *Rio de Janeiro*); cf. Hellmayr, *Nov. Zool.* 13, 1906, p. 307.

² *Anthus chii* Vieillot, *Nouv. Dict. d'Hist. Nat.*, nouv. éd., 26, p. 490 (1818.—ex Azara, No. 146: Paraguay).—Azara's description being too incomplete to be referred with any degree of certainty to either *A. lutescens* or *A. hellmayri* Hart. [= *A. chii* auct.], the name *chii* had better be dropped altogether.

³ Whatever the "petite Alouette, de Buenos Ayres" of Daubenton's *Pl. enl.* 738, fig. 1, may be, the name *Alauda rufa* Gmelin (*Syst. Nat.* 1, ii, 1789, p. 798), founded thereon, is preoccupied by *Alauda rufa* of the same author (l.c., p. 792).

⁴ Cf. Hellmayr, *Abhandl. Bayr. Akad. Wiss.*, math. phys. Kl., 26, No. 2, 1912, p. 99–100.

⁵ *Nouv. Dict. d'Hist. Nat.*, nouv. éd., 26, p. 491 (1818.—ex Azara, No. 145: Paraguay).

⁶ *Anthus brevirostris* Taczanowski, *P.Z.S.* 1874, p. 507: Junin, C. Peru.

⁷ *A. variegatus* Vieillot (*Nouv. Dict. d'Hist. Nat.*, nouv. éd., 26, 1818, p. 499), as well as *Alauda Bonariensis* Bonnatere (*Tabl. enc. méth., Ornith.* i. 1792, p. 317) are both based upon Daubenton's *Pl. enl.* 738, fig. 1 (= Buffon's "La Variole"), from Buenos Ayres, which appears to be unidentifiable. See *El Hornero*, ii, No. 3, 1921, p. 181, footnote 1.

No. 1 (Buenos Ayres) is a typical example of *A. c. correndera*, which I have compared with a large series from Argentine (prov. Buenos Ayres) and Southern Brazil (Rio Grande do Sul, São Paulo). The species is characterised by the exceedingly long hind-claw and by having the scapulars marked with broad, buffy-whitish edges, forming a conspicuous longitudinal stripe on the back. The foreneck, entire breast, and sides of body are coarsely spotted with blackish brown, the ground colour of the under-parts being creamy white.¹

Nos. 3 and 4 (Cochabamba) represent the northern race of *A. furcatus*, widely diffused in the highlands of Southern Peru and Bolivia, which differs from the type form of East. Argentine in slightly larger size, more buffy upper parts, deeper ochreous chest, more purely white throat and abdomen, etc. This well-characterized form is entitled to the name *A. furcatus brevirostris* Tacz. Besides the two Cochabamba skins, I have examined twelve more from Bolivia (Valle Grande, Vacas), eleven from Anta, Cuzco, S.E. Peru, and two topotypes from Ingapirca, Junin, C. Peru. *A. furcatus* may at once be recognised from *A. correndera* by its much shorter as well as more strongly arched hind-claw, and by lacking the buffish edges to the scapulars.

No. 2, from "Patagonia," is in every respect a typical representative of *A. f. brevirostris*. Although on the label as date of its capture "February" is given, at which time, as shown by a number of specimens in the Berlepsch and Munich collections, these Pipits, in Argentine, are extremely worn, the bird wears beautifully fresh plumage, and I cannot help thinking that some mistake has been made in its labelling, and that it was really obtained in Bolivia along with specimens Nos. 3 and 4, dealt with in the preceding lines.

Anthus furcatus furcatus Lafr. & d'Orb. 1837.

Anthus furcatus Lafresnayo & d'Orbigny, *Syn. Av. i. in Mag. Zool. cl. ii. p. 27* (Patagonia); d'Orbigny, *Voyage, Ois.*, p. 227 ("aux environs de Carmen, en Patagonie, . . . puis dans la vallée de Cochabamba, Bolivie").

No. 1, adult (skin): "d'Orbigny, février 1831. No. 47, Patagonie." *Type* of species.—al. 76 (much worn); c. 54 (much worn); r. 11½; hind-claw 10 mm.

[No. 2, adult (skin): "Patagonia"; Nos. 3, 4 (skins), Cochabamba. See under *A. variegatus*.]

In the *Synopsis Avium* *A. furcatus* is described as being similar to *A. variegatus* [= *A. correndera* & *A. furcatus brevirostris*], but smaller, more greyish above, with smaller dusky pectoral spots, etc. No. 1 is the only specimen among d'Orbigny's Pipits in the Paris Museum agreeing with this diagnosis, and may accordingly be regarded as the real type. It is an extremely worn example of *A. furcatus*, with much abraded wings and tail. All colours are exceedingly pale: the upper parts greyish, spotted with dusky; the under surface almost whitish, the dark spots on the chest small and inclining to brownish, etc. As far as coloration is concerned, an adult female from Barracas al Sud (Buenos Ayres) in the Munich Museum is exactly similar.

¹ In Central and Southern Chili, from Coquimbo southwards to Tierra del Fuego, a closely allied race, *A. correndera chilensis* (Less.), is found, while in Peru and N. Bolivia the much more distinct *A. c. calcaratus* Tacz. (*Proc. Zool. Soc. Lond.*, Nov. 1874, p. 507; Junin, C. Peru) takes its place. The latter is easily recognisable from its allies by the much longer bill, much more fulvous general coloration, and greater extension of the white area on the lateral rectrices. Cf. also Berlepsch & Stolzmann, *P.Z.S. Lond.*, 1896, p. 330; Hellmayr, *El Horno*, ii. No. 3, 1921, pp. 185-8.

As I have shown under the preceding species, the birds from Cochabamba, at first attributed to *A. variegatus* junior, were afterwards correctly referred by d'Orbigny to *A. furcatus*. (*Vide supra*, p. 223.)

A. f. furcatus has a somewhat limited range. It is common in the province of Buenos Ayres, whence I have seen many specimens from nearly every month of the year, and was found as far south as Carmen, lower Rio Negro. It has been reported from Cordoba, and the Munich Museum possesses an adult male in rather worn plumage secured on September 7, 1905, by S. Venturi at Col. Ocampo, on the right bank of the Paraná, prov. Santa Fé. This Pipit has not been taken, as far as I know, either in the western states of the Argentine Republic or south of the Rio Negro. In the Andes of Bolivia and Peru it is replaced by *A. f. brevirostris* Tacz., as stated above.

***Anthus rufescens* Lafr. & Orb. = *Anthus bogotensis bogotensis* ScL.¹**

Anthus rufescens (nec Temminck)² Lafresnaye & d'Orbigny, *Syn. Av. i. in Mag. Zool. cl. ii. p. 27* (1837.—Yungas, Bolivia; deser. orig.); d'Orbigny, *Voyage, Ois.*, p. 226 ("sur le sommet de la montagne Biscachal, non loin du village de Carcuata, Yungas, dept. La Paz").

No. 1, adult (skin): "No. 219, d'Orbigny, 1834. Yungas (Bolivia), D. 274. *Anthus*."—al. 78; c. 59; r. 12½ mm.—Type of *A. rufescens* Lafr. & Orb.

This bird agrees well with Bogotá skins. *A. bogotensis* is recognisable amongst its affines by the ochraceous-buff colour of the under-parts, axillaries, and quill-lining. It ranges all over the Andes from Western Venezuela (Mérida) to Bolivia. See *El Hornero*, ii. 1921, pp. 192-3.

***Nemosia nigricollis* = *Hemithraupis guira guira* (Linn.).³**

Nemosia nigricollis "Vieill.";⁴ L. & O., *Syn. Av. i. p. 27* (Guarayos, rep. Boliviana); d'Orbigny, *Voyage*, p. 260 (Rio Tamampaya, prov. Yungas; San-Xavier, Chiquitos; Guarayos, Yuracarès).

No. 1, "♂" ad. (skin): "263, par d'Orbigny, 1834. de Chiquitos D. 255. Mâle. *Nemosia nigricollis* V."—Wing 61 (worn); tail 48 (worn); bill 10½ mm.

This bird, the only representative of the species in d'Orbigny's Bolivian collection, is a perfectly typical example of *H. g. guira*. It agrees with Brazilian skins in having the superciliary stripe, for its entire length, bright golden yellow, confluent with the yellow patch on sides of neck; across the forehead there is just a narrow, yellowish line. An adult male from San Mateo (Yuracarès) in the Berlepsch Collection is practically identical with the Chiquitos specimen. Compared with *H. guira fosteri* (Sharpe), from Paraguay, the Bolivian birds are smaller, with weaker bill, and have much less yellow about the forehead.

A review of the geographical races of this species is given in *Abhandl. Bayer. Akad. Wissens.*, math. nat. Kl. 26, No. 2, 1912, pp. 101-3.

¹ *Proc. Zool. Soc. Lond.* 23, p. 109, pl. ci (Aug. 1855.—"Santa Fé de Bogotá").

² *Man. d'Ornith.*, 2nd éd., i. p. 267 (1820.—new name for *Anthus campestris* (L.)).

³ *Motacilla Guira* Linnaeus, *Syst. Nat.* 12, i. p. 335 (1766.—ex Brisson: ex Margrave: N.E. Brazil).

⁴ *Tanagra nigricollis* Gmelin (*Syst. Nat.* 1, ii. 1789, p. 894: ex Daubenton, *Pl. enl.* 720, fig. 2, Cayenne) is synonymous with *Hemithraupis guira nigrigula* (Bodd.) 1783.

Nemosia pileata = Nemosia pileata paraguayensis Chubb.¹

Nemosia pileata (not of Boddaert²); L. & O., *Syn. Av.* i. p. 28 (Chiquitos); d'Orbigny, *Voyage*, p. 261 (San-Miguel and San-José, Chiquitos; descr. ♂ ♀).

No. 1, "♂" ad. (skin): "D. 341. Chiquitos. *Nem. pileata* V. mâle, par d'Orbigny, 1834. No. 239."—Wing 75; tail 50; bill 12 mm.

No. 2, "♀" ad. (skin): "D. 341, Chiquitos, par d'Orbigny, 1834. *N. pileata* V. femelle, No. 239."—Wing 73; tail 48; bill 12 mm.

The Bolivian skins are fully as large as those from Paraguay, with which they also agree in coloration.

N. pileata paraguayensis thus ranges from Paraguay (Sapucay) north to the hill-country of Eastern Bolivia (Chiquitos, dept. Santa Cruz).³

***Nemosia sordida* Lafr. & Orb. = *Thlypsopsis sordida sordida* (Lafr. & Orb.).**

Nemosia sordida Lafresnaye & d'Orbigny, *Syn. Av.* i. in *Mag. Zool.* cl. ii. p. 28 (1837.—Yuracàres, Bolivia; descr. orig. juv.); d'Orbigny, *Voyage*, Ois., p. 261, pl. 18, fig. 2 (Yuracàres).

No. 1, juv. (mounted): "Yuracàres, par d'Orbigny, 1834 (Nos. D. 404–245). *Nemosia sordida* D'Orb. et Lafr. (T.)."—Wing 60½; tail 51½; bill 11 mm.

No. 2, imm. (skin); "245, d'Orbigny, 1834. *Nemosia sordida*, Nob., de Yuracàres, D. 404."—Wing 63; tail 60½; bill (damaged) mm.⁴

As I have pointed out elsewhere,⁵ the original description of *N. sordida* was based upon immature examples of the species afterwards named *N. fulvescens* by Strickland.⁵

No. 2 corresponds exactly to the diagnosis in the *Synopsis Avium*, having the throat and foreneck as well as the sides of the head and a distinct frontal band light yellow; the crown dull olive-green, with a few orange-rufous feathers of the adult plumage just appearing; the remainder of the upper parts dingy greyish; the flanks pale buffy-brown; the middle of the belly whitish.

Quite similar examples from Bahia, E. Brazil, are in the Berlepsch Collection.

No. 1, in less advanced stage, has the throat white, only the chin and malar region washed with pale yellow; the flanks dingy brownish; the back dull greyish-green; the superciliary region and forehead faintly tinged with dull yellowish, etc. In less advanced birds the whole under-surface is pale olive-yellowish, and the back yellowish-green. This stage evidently represents the juvenile plumage. I have examined two specimens of it, a female from Cuyabá, Mattogrosso, March 1825 (Natterer Coll., Vienna Museum), and an unsexed bird secured by Cherrie at Altagracia, Orinoco R., Venezuela (Tring Museum).

It may be added that adult birds (in perfect plumage) from Yuracàres (San Mateo) in the Berlepsch and Munich Museum do not differ in any way from a considerable series of Brazilian (Mattogrosso, Minas, Bahia) and Venezuelan

¹ *Ibis* (9) iv. p. 629 (1910.—Sapucay, Paraguay).

² *Tanagra pileata* Boddaert, *Tabl. Pl. enl.*, p. 45 (1783.—ex Daubenton, *Pl. enl.* 720, fig. 2: Cayenne).

³ The birds found in the south-western provinces of Brazil (Mattogrosso, northern São Paulo) very likely also belong to *N. p. paraguayensis*. I have not seen specimens from these localities.

⁴ Figured on plate 18, fig. 2.

⁵ *Nov. Zool.* 13, 1906, p. 310.

⁶ *Ann. Mag. Nat. Hist.* 13, p. 420 (1844.—"Brazil").

(Altagracia, El Fraile, Bolivar : Orinoco R.) skins. Several fine specimens from Tucumán, N.W. Argentine, belong also to this race. In Peru it is replaced by *T. sordida amazonum* Sel.,¹ while the inhabitants of the upper Rio Madeira are intermediate between the latter and the typical race.²

Tachyphonus versicolor = Lanio versicolor versicolor (Lafr. & Orb.).

Tachyphonus versicolor Lafresnaye & d'Orbigny, *Syn. Av. i. in Mag. Zool. cl. ii. p. 28* (1837.—Yuracarès, Bolivia; descr. orig. ♂♀).

Pyranga versicolor, d'Orbigny, *Voyage, Ois.*, p. 262, pl. 19, fig. 1 (Yuracarès).

No. 1, (♂) ad. (skin) : without original label, from Bolivia, d'Orbigny Coll. —Wing 84; tail 73; bill 14 mm.

No. 2, “♀” ad. (skin) : “241, d'Orbigny, 1834, de Yuracarès, D. 401. *Pyranga versicolor* d'Orb. femelle.”—Wing 80; tail 70; bill 14 mm.

Besides, there are two mounted specimens, male and female, from Yuracarès, in the galleries of the Paris Museum.

Bolivian skins agree, in size and coloration, with others from Central and South-Eastern Peru (prov. Huánuco and Marcapata). The most easterly localities yet recorded are Humaytha and Allianca, upper Rio Madeira.

In Lower Amazonia (Rio Jamauchim, Tocantins) the typical race is represented by the smaller *Lanio versicolor parvus*, Berl.³

Tachyphonus flavinucha = Compsocoma flavinucha (Lafr. & Orb.).

Tachyphonus flavinucha Lafresnaye & d'Orbigny, *Syn. Av. i. in Mag. Zool. cl. ii. p. 29* (1837.—Yungas, Bolivia; descr. orig.); d'Orbigny, *Voyage*, p. 279, pl. 21, fig. 1 (“auprès des villages Chupé, Irupana et Suri, prov. Yungas de La Paz”).

No. 1, adult (mounted) : “de Yungas, Bolivie, par d'Orbigny, 1834. *Tachyphonus flavinucha*, Lafr.-Orb. type.”

The range of this fine species is restricted to the mountain forests (Yungas) of N.W. Bolivia.

Tachyphonus nigerrima = Tachyphonus rufus (Bodd.).⁴

Tachyphonus nigerrima Gmel.;⁵ L. & O., *Syn. Av. i. p. 29* (Corrientes).

Tachyphonus leucopterus “Vieil.”;⁶ d'Orbigny, p. 277 (Corrientes; ♂♀).

No. 1, “♂” ad. (skin) : “d'Orbigny, juillet 1829. No. 131. Corrientes. *Tachyphonus leucopterus*. Mâle.”—Wing 91; tail 88; bill 19 mm.

No. 2, “♀” ad. (skin) : “d'Orbigny, juillet 1829. No. 114. Corrientes. *Tachyphonus leucopterus*. Femelle.”—Wing 88; tail 88; bill 19 mm.

These birds certainly belong to that wide-spread species which, until recently, was universally called *T. melaleucus* (Sparrm.). No. 1 is a perfectly adult male,

¹ *Thlypopsis amazonum* Sclater, *Cat. Birds Brit. Mus.* 11, p. 229 (1886.—Lower Ucayali, East Peru).

² *Nov. Zool.* 17, 1910, pp. 278–9.

³ *Verhandl. V. Internat. Ornith. Kongr. Berlin* 1910, pp. 1073, 1140 (1912.—Santa Elena, Rio Jamauchim, eastern tributary of the Rio Tapajós).

⁴ *Tanagra rufa* Boddaert, *Tabl. Pl. enl.*, p. 44 (1783.—ex Daubenton, *Pl. enl.* 711 : Cayenne; = ♀).

⁵ *Tanagra nigerrima* Gmelin, *Syst. Nat.*, 1, ii. p. 899 (1789.—ex Daubenton, *Pl. enl.* 179, fig. 2 (= ♂), 711 (= ♀) : Cayenne).

⁶ *Oriolus leucopterus* Gmelin, l.o. 1, i. p. 392 (1788.—part. (excl. syn. Pennant) : ex “White-winged Oriole” Latham, *Gen. Syn. Birds*, 1, ii. p. 440 : Cayenne; = ♂ ad.).

glossy black, with snow-white shoulder-patch, axillaries, and under wing-coverts; without the slightest trace of red in the middle of the crown, which is always more or less developed in the allied *T. coronatus* (Vieill.).¹ The ♂ has rather a thicker, stronger bill than most of the specimens from more northern localities; but the female is hardly different in this respect from another secured by Levrard near Carácas, Venezuela.

T. rufus appears to be rather localised in Argentine. Besides d'Orbigny's, I have not seen any other example taken in the Republic, although Venturi² reports the species as common "dans les forêts du Chaco," and C. B. Grant³ also records an adult male secured at Riacho Ancho, opposite the city of Corrientes, Terr. del Chaco. In Northern Paraguay, on the confines of Matto Grosso, Borelli obtained two adult males at Colonia Risso⁴; while Rohde procured two others on the Lambaré, near Asunción, in the western part of that Republic.

In Misiones and Southern Paraguay (Tebicuari, Sapucay), however, the allied *T. coronatus*, with crimson vertical spot, is met with.

In Brazil, too, the two species represent one another geographically.

T. rufus inhabits the arid campos districts of the northern and central provinces: Piauhy, Pernambuco, Bahia, Western Minas Geraës, Goyaz, Matto-grosso, southwards to northern São Paulo (Porto do Rio Paraná, Itapurá).

T. coronatus lives in the forest region of S.E. Brazil, from Southern Espirito Santo (Victoria) and Eastern Minas (Marianna) through Rio de Janeiro and Southern São Paulo (Mattodentro, Ypanema, Cubatão, Ypiranga, Piracicaba, Piquete, Iguapé, Alto da Serra, Itarare) to Rio Grande do Sul (Taquara do Mundo Novo, etc.).

Tachyphonus luctuosus luctuosus Lafr. & Orb.

Tachyphonus luctuosus Lafresnaye & d'Orbigny, *Syn. Av. i. in Mag. Zool. cl. ii. p. 29* (1837.—Guarayos, Bolivia; descr. orig. ♂♀).

Pyrranga luctuosa, d'Orbigny, p. 263, pl. 22, figs. 1, 2 (♂♀) (Guarayos & Yuracarès).

No. 1, "♂" ad. (skin): "*Pyrranga luctuosa* D'Orb. Mâle. 231, par d'Orbigny, 1834. de Yuracarès, D. 369."—Wing 64; tail 55½; bill 12 mm.

No. 2, "♀" ad. (skin): "*Pyrranga luctuosa* D'Orb. Femelle. 231, par d'Orbigny, No. D. 369, de Yuracarès."—Wing 61; tail 55; bill 12 mm.

This species ranges from Trinidad, Venezuela, and Eastern Colombia south to Matto Grosso and Northern Bolivia.

Tachyphonus capitatus = Poroaria capitata (Lafr. & Orb.).

Tachyphonus capitatus Lafresnaye & d'Orbigny, *Syn. Av. i. in Mag. Zool. cl. ii. p. 29* (1837.—Corrientes; descr. orig.); d'Orbigny, *Voyage, Ois.*, p. 278, pl. 19, fig. 2 (prov. Santa Fé, Entrerios, Corrientes; descr. ♂ ad., juv.).

Nos. 1-4, adults (mounted): "par d'Orbigny, juillet 1829, de Corrientes. No. 118. *Tachyphonus capitatus* Lafr.-Orb. type."

No. 5, imm. (skin): "d'Orbigny, juillet 1829. No. 118, Corrientes."—Wing 78; tail 71; bill 13½ mm.

¹ *Agelaius coronatus* Vieillot, *Tabl. enc. meth.*, Ornith., ii. livr. 91, p. 711 (1822.—ex Azara, No. 77: Paraguay).

² *Nov. Zool.* 16, 1909, p. 173.

³ *Ibis*, 1911, p. 94: *T. melaleucus*.

⁴ *T. melaleucus* Salvadori, *Boll. Mus. Zool. Torino*, x. No. 208 1895, p. 4.

P. capitata, which is readily distinguishable from the *P. gularis* group by the wax-yellow (instead of blackish) legs and upper mandible, is peculiar to the system of the Rio Paraguay, being chiefly found on the banks of the main stream. The farthest southern record is Rosario, prov. Santa Fé, the most northern Cuyabá, on the Rio Cuyabá, one of the sources of the Paraguay, prov. Matto-grosso, S.W. Brazil.

In Argentine the species has been met with in various localities on either side of the Paraná: at Paraná by Burmeister; on the mouth of the Rio Guayquiraro by F. Schulz¹; near Esquina by C. B. Grant²; at Corrientes by d'Orbigny; in the province of Santa Fé, at Rosario, by Grant²; at San Lorenzo, Ocampo, and Mocovi by Venturi³; in the Territorio del Chaco, near Riacho Ancho, by Grant²; on the lower Pilcomayo, Fortin Donovan, by Graham Kerr.⁴

In Paraguay, *P. capitata* was found at Lambaré by R. Rohde; at Puerto Pinasco and Sapatero Cué by Grant²; in Villa Concepcion by Weiske⁵; on the plantation Bernalcué, south-east of Asunción, by Wieninger⁵; at Porto Pagani, Rio Apa, by Borelli.⁶ Farther to the north, the species was procured on the Brazilian portion of the Rio Paraguay at Corumbá and Uacuryzal by Smith⁷; at Villa Maria [= San Luis de Caceres] and Caiçara by Natterer⁸; and finally near Cuyabá, on the Rio Cuyabá, by the last-named traveller.⁹

***Tachyphonus gularis* = *Paroaria gularis cervicalis* ScL.⁹**

Tachyphonus gularis (errore) d'Orbigny, *Voyage*, Ois., p. 279 (Chiquitos, Moxos, E. Bolivia).

No. 1, adult (skin): "D. C. Mojos, No. 248. *Tachyphonus gularis* d'Orb., par d'Orbigny, 1834."—Wing 85; tail 75; bill 14 mm.

This bird and three others obtained by Natterer at Villa Bella de Matto-grosso, Rio Guaporé,¹⁰ differ from a large series of *P. g. gularis*, from Guiana and Northern Amazonia, in lacking the black colour on the lores and round the eye, these parts being uniform cherry-red, like the crown. In the blackish legs and black upper mandible, however, they resemble the typical race. This peculiarity alone suffices to tell *P. g. cervicalis* from *P. capitata*. Selater's diagnosis of *P. cervicalis* and Sharpe's figure,¹¹ which (in contradiction to the statement in the key, p. 809) represents a bird with entirely yellow bill, are both faulty. The yellow upper mandible in the type is no doubt due to its having lost the corneous integument by accident.

P. gularis cervicalis evidently replaces *P. capitata* on the head-waters of the

¹ Specimen in the Berlepsch Collection examined.

² *Ibis*, 1911, p. 97.

³ *Nov. Zool.* 16, 1909, p. 182.

⁴ *Ibis*, 1892, p. 126.

⁵ Specimens in Munich Museum.

⁶ *P. cervicalis* (errore) Salvadori, *Boll. Mus. Zool. Torino*, 10, No. 208, 1895, p. 6.—The adult male secured by Borelli which I have examined in the Turin Museum is a typical example of the yellow-legged species.

⁷ Allen, *Bull. Amer. Mus.* iii. 1891, p. 369.

⁸ Pelzeln *Zur Ornith. Bras.* iii. 1869, p. 228.

⁹ *Paroaria cervicalis* Selater, *Cat. Coll. Amer. Birds*, p. 108 (1862.—Bolivia).

¹⁰ *Paroaria gularis* Pelzeln, *Zur Ornith. Bras.* iii. 1869, p. 228 (part.).

¹¹ *Cat. Birds Brit. Mus.*, 12, pl. 16, fig. 1.

Madeira (Guaporé, Mamoré, Beni Rivers) in Western Mattogrosso, Northern and Eastern Bolivia.¹

Tachyphonus ruficollis = Cypsnagra hirundinacea hirundinacea (Less.).²

Tachyphonus ruficollis (Licht.);³ L. & O., *Syn. Av. i.* p. 29 (Chiquitos, Bolivia); d'Orbigny, *Voyage*, p. 277 ("missions de Concepcion et Santiago," Chiquitos; deser. ♂ ad., ♀ (= juv.)).

No. 1, adult (mounted): "D. 389, de Chiquitos, par d'Orbigny, 1834."

No. 2, adult (skin): "*Tachyphonus ruficollis*, Nob. 294, d'Orbigny, 1834. Chiquitos, D. 389."—Wing 82; tail 66½; bill 14¾ mm.

No. 3, imm. (skin): "D. 339, de Chiquitos. *Tachyphonus ruficollis* Nob., par d'Orbigny, 1834. No. 194."—Wing 84; tail 70; bill 14½ mm.

The adult birds agree with specimens from northern São Paulo (Cimenterio do Lambari, Ytararé), Mattogrosso (Porto Faya, Chapada), Goyaz (Fazenda Esperança, Monte Alegre), and Western Minas Geraës (Bagagem), in having the throat deep cinnamon-rufous and the flanks washed with ochraceous. No. 3, which corresponds to d'Orbigny's description of the female, is an immature bird with ochraceous-buff throat and pale-brownish edges to the feathers of the upper parts.

The dark-throated, typical race, *C. h. hirundinacea*, ranges from the interior (?) of Bahia and Western Minas Geraës over the table-land of Central Brazil (Goyaz, Mattogrosso, northern districts of S. Paulo) to the East Bolivian hill-country (Concepcion and Santiago de Chiquitos).

In Northern Bahia, Piauí (San Antonio de Gilboez),⁴ Ceará, and on the Rio Madeira (Humaytha) it is represented by *C. hirundinacea pallidigula* Hellm.,⁵ which differs at first sight by its much paler buff (instead of cinnamon-rufous) throat, stouter, more curved bill, and several other characters. Reiser's birds from Piauí which I have examined agree perfectly with the types from Humaytha.

Euphonia lanirostris lanirostris Lafr. & Orb.

Euphonia lanirostris Lafresnayo & d'Orbigny, *Syn. Av. i.* in *Mag. Zool.* cl. ii. p. 30 (1837.—Yuracarès, Bolivia; deser. orig. ♂♀); d'Orbigny, *Voyage*, Ois., p. 266, pl. 22, fig. 1 (= ♂) (prov. Yungas, Santa Cruz de la Sierra, Yuracarès, Guarayos).

No. 1, "♂" ad. (skin): "*Euphonia lanirostris*, D'O. 257. Mâle. d'Orbigny, 1834. D. 89. Yuracarès (figuré pl. 22, fig. 1)."—Wing 64½; tail 40; bill (broken) mm.

No. 2, "♂" juv. (skin): "*Euph. lanirostris* Nob. jeune mâle, 257, d'Orbigny, 1834. D. 85, de Guarayos."—Wing 61; tail 36; bill 10 mm.

No. 3, "♀" ad. (skin): "*Euph. lanirostris* Nob. fem. 257, d'Orbigny, 1834. D. 85, de Guarayos."—Wing 59; tail (damaged); bill 10 mm.

The adult birds (Nos. 1 and 3) are practically identical with others from

¹ Besides Natterer's and d'Orbigny's, I know only of one other record of this species in literature: Allen (*Bull. Amer. Mus. N.H.* ii. 1889, p. 84), in his report on H. H. Rusby's Bolivian collections, mentioning two examples from near Reyes and the Falls of the Madeira, N. Bolivia.

² *Tanagra hirundinacea* Lesson, *Traité d'Ornith.*, p. 460 (1831.—"du Brésil").

³ *Tanagra ruficollis* Lichtenstein [*Verz. Dobl. Berliner Mus.* 1823, p. 30: San Paulo, Brazil] is preoccupied by *Tanagra ruficollis* Gmelin [*Syst. Nat.* 1, ii. 1789, p. 894: ex Latham: Jamaica].

⁴ *C. ruficollis* (errore) Reiser, *Denkschr. math. naturw. Kl. Akad. Wiss. Wien*, 76, 1910, p. 84 (esp. examined).

⁵ *C. ruficollis pallidigula* Hollmayr, *Nov. Zool.* 14, p. 350 (1907.—Humaytha, Rio Madeira).

Western Mattogrosso (S. Vicente, Villa Maria [= San Luis de Caceres], Villa Bella), coll. Natterer, and the upper Rio Madeira (Calama, Humaytha, Rio Machados), coll. Hoffmanns. The extension of the white patch on the inner web of the outermost rectrix in the adult males is somewhat variable. No. 2 is a young male in transitional plumage.

E. l. lanirostris is peculiar to the lowlands of N. and E. Bolivia and Western Brazil (upper Rio Madeira and its tributaries, upper Paraguay and R. Cuyabá). Its characters have been explained at length by Allen¹ and Hellmayr.² In Central and Eastern Peru its place is taken by *E. lanirostris peruviana* Berl. & Stolz.³

***Euphonia nigricollis* = *Euphonia cyanocephala aureata* (Vieill.).⁴**

Euphonia nigricollis (Vieill.);⁵ L. & O., *Syn. Av.* i. p. 30 (Corrientes, Argentine; descr. ♂♀).
Euphonia aureata, d'Orbigny, *Voyage*, Ois., p. 267 (Rincon de Luna, près du Rio Batel, Corrientes; descr. ♂).

Although these specimens are no longer in the Paris Museum, there is, nevertheless, very little doubt that d'Orbigny's *E. nigricollis* is referable to the somewhat larger, southern form of the Blue-headed Organist. Mr. C. Chubb⁶ divides this species into three geographic races, which he calls: *E. nigricollis nigricollis*, from Paraguay (and S.E. Brazil); *E. nigricollis intermedia*, n. subsp., from Guiana; and *E. nigricollis pelzelni* Sel.,⁷ from Western Ecuador. This nomenclature, however, is faulty, as has already been shown by Count Berlepsch.⁸ *Pipra cyanocephala* Vieill.⁹ was based on a female obtained by Robin in the island of Trinidad. The type which I have examined in the Paris Museum agrees in size and coloration¹⁰ with females from Roraima, British Guiana, and the Venezuelan north coast (Cumaná, Bermudez; Silla de Caracas). It follows, therefore, that *E. n. intermedia* Chubb is an absolute synonym of *E. c. cyanocephala*.

Birds from S. Brazil and Paraguay (Sapucaya) may be distinguished by their larger size, though the colour-differences alluded to by Chubb do not hold good in the series before me. Two adult males from Eastern Ecuador (Ambato), while agreeing with the southern *E. c. aureata* in large size and deep orange lower parts, have the black frontlet much more extended and may constitute another recognisable form, which, however, I feel not justified in naming with the limited material in hand. The West Ecuadorian *E. c. pelzelni* Sel. is an

¹ *Bull. Amer. Mus. N.H.* iii. 1891, p. 351.

² *Novit. Zool.* 14, 1907, p. 347; l.c. 10, 1910, p. 272.

³ *Ornis* 13, Part 2, p. 77 (1906.—La Merced, Chanchamayo, C. Peru).

⁴ *Tanager Aureata* Vieillot, *Tabl. enc. meth.*, Ornith., ii. livr. 91, p. 782 (1822.—ex Azara, No. 99: Paraguay).

⁵ *Tanager nigricollis* Vieillot [*Nouv. Dict. d'Hist. Nat.*, nouv. éd., 32, 1819, p. 412: "Brésil"] is preoccupied by *T. nigricollis* Gmelin [*Syst. Nat.* I, ii. 1789, p. 894; ex Daubenton, *Pl. enl.* 720, fig. 1: Cayenne].

⁶ *Ibis* (9) iv. 1910, pp. 623-4.

⁷ [*Euphonia nigricollis*] subsp. *pelzelni* (Berlepsch MS.) Sclater, *Cat. Birds Brit. Mus.* 11, p. 61, in text (1886.—type locality designated by Berlepsch as Govinda, W. Ecuador).

⁸ *Verh. V. Internat. Ornith. Kongr.*, 1912, pp. 1013, 1124.

⁹ *Nouv. Dict. d'Hist. Nat.*, nouv. éd., 19, p. 165 (1818.—Isl. Trinidad; descr. ♀).

¹⁰ The original description is incomplete, no mention being made of the rusty-orange frontal band which, however, is present in the type-specimen.

excellent race, being immediately separable by the light-yellow (not orange) colour of the under-surface.

The distribution of four races is as follows :

(a) *E. cyanocephala cyanocephala* (Vieill.).

Trinidad ; British Guiana (Roraima) ; Northern Venezuela, from the Paria Peninsula to Mérida ; Colombia (Bogotá, Antioquia, etc.).

Ten adult males : wing 61–63½, once 64½ ; tail 36½–39 ; bill 6½–7 mm.

Ten adult females : wing 61–64 ; tail 36–39 ; bill 6½–7 mm.

(b) *E. cyanocephala* subsp.

Eastern Ecuador (Ambato) ; possibly also Peru.

Two adult males (Ambato) . . . : wing 66 ; tail 39, 40 ; bill 7 mm.

(c) *E. cyanocephala aureata* (Vieill.).

S.E. Brazil from Bahia to Rio Grande do Sul ; Paraguay ; Northern Argentine (Rincon de Luna, South Corrientes ; Tucumán) ; Mattogrosso (Urucúm).

Eight adult males (S. Paulo & Paraguay) : wing 66–9 ; tail 39–43 ; bill 6½–7 mm.

Four adult females (S. Paulo & Paraguay) : wing 65–6 ; tail 37½–39 ; bill 7 mm.

(d) *E. cyanocephala pelzelni* Scl.

Western Ecuador (Govinda, Intac, Pichincha, Cayanded, Pallatanga, etc. etc.).

Euphonia serrirostris = Euphonia chlorotica¹ **serrirostris** (Lafr. & Orb.)²

Euphonia serrirostris Lafresnaye & d'Orbigny, *Syn. Av. i. in Mag. Zool. cl. ii. p. 30* (1837.—Guarayos, Santa Cruz, Bolivia ; descr. orig. ♂ juv., ♀) ; d'Orbigny, *Voyage, Ois.*, p. 267, pl. 21, fig. 2 (= ♀) (Rio Grande, au hameau de Pacu, prov. Santa Cruz de la Sierra).

No. 1, (♂) juv. (skin) : “*Euphonia serrirostris* D'Orb. 257. d'Orbigny, 1834. D. 85, de Guarayos.”—Wing 59 ; tail 39 ; bill 9 mm.

No. 2, “♀” ad. (skin) : “*Euphonia serrirostris* d'Orb., femelle D. 327. Guarayos, par d'Orbigny, 1834. No. 258, Type de la planche 21, fig. 2.”—Wing 58 ; tail 34 ; bill 7½ mm.

No. 3, skin : “*Euphonia serrirostris* d'Orb. D. 327, de Santa Cruz, par d'Orbigny, 1834. No. 258.”—Wing 57 ; tail 34 ; bill 8 mm.

The first of these specimens, No. 1, corresponds to the description of the male, which is characterised as “subtus aureo-flavus, collo olivaceo” (*Syn. Av.*) and “partie inférieure jaune, passant au vert sur les flancs” (*Voyage*). Nos. 2 and 3 tally with the diagnosis of the female : “pectore abdomineque mediis, crissoque albescentibus” (*Syn. Av.*) and “devant du cou et milieu du ventre cendré blanchâtre” (*Voyage*). The sentence “rectricibus tribus lateralibus macula magna alba intus”—which, by the way, is not repeated in the *Voyage*—can have been taken only from No. 3, since the two others have all the rectrices uniform without white spots.

¹ The specific *chlorotica* has recently been replaced by *aurea*. Under the existing rules, however, the name *Parus aureus* Vroeg cannot be accepted. (Cf. Stone, *Auk*, 29, 1912, pp. 207–8.)

² Needless to say, I am quite unable to concur with the late O. Salvín (*Cat. Strickl. Coll.* 1882, p. 181) in identifying *E. serrirostris* with *E. chrysopasta* Scl. & Salv. ♀, from which the type specimens are widely different.

The alleged male (No. 1) is in very poor state of preservation, the entire chest having been cut away; but from what remains of the under-parts it is evident that the lower throat and foreneck were pale greyish, the anal region whitish, and the sides of the body deep olive-yellow, shaded interiorly with greenish, i.e. exactly as in ordinary females from Bolivia and N.W. Argentine.

No. 2, which we may regard as the type of *E. serrirostris*, is identical with an adult female secured by L. Dinelli, June 4, 1905, at Mctan, prov. Salta, N.W. Argentine, except for the breast being slightly less greyish. Both have the median portion of the under-surface extensively greyish or buffy whitish, while the throat and sides are bright greenish-yellow. The upper parts are dull olive, shading into greyish olive on the crown, and brightening to olive yellow on rump and upper tail-coverts; the forehead is olive yellow, somewhat abruptly defined against the colour of the crown.

No. 3 agrees with the preceding specimen in general coloration, but has a white spot near the tip of the inner web of the two lateral rectrices, and very little yellow about the forehead. It is, no doubt, a young male in transitional plumage.

The geographical variation of *E. chlorotica*, a much discussed problem, presents unusual difficulties, and authors differ as to the number and limits of the recognisable forms. To cite only a few among the conflicting opinions, we will mention that Hartert¹ separates the birds of N.W. Argentine (Salta, Tucumán) and Bolivia, under the name *E. chlorotica serrirostris*, on account of their larger size and lighter yellow under-parts, from those found in more southern latitudes (prov. Santa Fé), which he regards as probably identical with the Brazilian birds, viz. *E. chlorotica violaceicollis* (Cab.).² Dabbene,³ however, declares himself unable to make any distinctions between specimens obtained at such remote localities as Santa Cruz de la Sierra (Bolivia), Salta, La Rioja, Misiones, Paraguay, and Cordoba. The late Count Berlepsch,⁴ on the other hand, considers the inhabitants of Eastern and Southern Brazil as a sub-species of the Guianan *E. chlorotica*, calling it *E. "aurea" violaceicollis*; at the same time this distinguished ornithologist separates specifically the birds from Bolivia, Paraguay, and Argentine as *E. serrirostris*, and the pale-bellied N. Peruvian form as *E. taczanowskii* Sel.⁵ The principal reason for this arrangement was the assumption that the female of the Brazilian race, *E. c. violaceicollis*, like that of the Cayenne form, *E. c. chlorotica*, has the whole under-surface uniform olive yellow; while in the females of *E. serrirostris* and *E. taczanowskii* the median portion of the abdomen is greyish or buffy white. This contention, however, is erroneous, at least as far as *E. c. violaceicollis* is concerned,⁶ as I shall show presently.

Examination of thirty adult males from various parts of Brazil, Paraguay, and Southern Argentine fails to reveal any local variation, either in size or colour, although specimens from Bahia appear to average rather smaller. Birds

¹ *Novit. Zool.* 16, 1909, p. 170.

² *Acroleptes violaceicollis* Cabanis, *Journ. f. Ornith.* 13, p. 409 (1865.—"Brasilien"; descr. orig. ♂).

³ *Anal. Mus. Nac. Buenos Aires*, 23, 1912, pp. 351-4.

⁴ *Bericht V. Internat. Ornith. Congr. Berlin*, 1912, pp. 1014, 1124-5.

⁵ [*Euphonia chlorotica*] subsp. *taczanowskii* Sclater, *Cat. Birds Brit. Mus.* 11, p. 65 (1886.—Callacate, N.W. Peru).

⁶ The female of *E. c. chlorotica* is unknown to me.

from the Argentine states Rioja, Córdoba, and Santa Fé are as deep orange yellow underneath as those from Brazil and Paraguay, and must be referred to the same form. As to the females, I can positively state that there is no difference either between Brazilian and Argentine skins, all having the middle of the breast and abdomen greyish or buffy white, in decided contrast to the pale-yellowish throat and deep olive-yellow sides. Five Brazilian females sexed by such experienced collectors as Reiser and Natterer agree in every respect with others from Misiones, Córdoba, and Catamarca, secured by E. W. White. Examples from Paraguay (Sapucay, Villa Rica, Lambaré) are also precisely similar. The birds with *uniform yellow under-surface* are obviously young males. Such specimens I have seen from Bahia and Chapada, Mattogrosso. There can be no further question that the inhabitants of Eastern and Central Brazil (Piauhy, Bahia, Goyaz, Mattogrosso, Rio de Janeiro, São Paulo), Paraguay, and Central Argentine (Misiones, Santa Fé, Córdoba, Rioja, Catamarca) belong to one and the same form, which is entitled to the name *E. chlorotica violaceicollis* (Cab.).

With regard to the birds occurring in N.W. Argentine and Bolivia, I must confess I am still in doubt about their proper identification. Four adult males from Tucumán (city of Tucumán and Los Vasquez), and one from the "interior of Bolivia," collected by Bridges, in the Tring Museum, differ, indeed, from all the preceding examples in the much paler (clear chrome-yellow instead of orange) under-parts, and more steel-blue (less violaceous) back. In size, they correspond to the largest specimens of *E. c. violaceicollis*. Strangely enough, another male from "Bolivia," Bridges coll., and two from Tilotilo, Yungas of N.W. Bolivia, in the British Museum, agree, however, in the deep orange shade of the lower surface, as well as in other respects, with the ordinary Brazilian form. Bolivian females (d'Orbigny's type and two from Tilotilo) and one taken at Salta (Metan) closely resemble *E. c. violaceicollis* on the under-parts, but above they are somewhat brighter, more yellowish olive. While admitting that the distribution of these pale- and dark-bellied birds in Bolivia is at present altogether unintelligible, I hesitate, without further confirmatory evidence, to unite *E. c. violaceicollis* with *E. serrirostris*, since, in the vast area inhabited by the first-named form, adult males, with clear yellow abdomen, are not known to occur. Another doubtful point is the relationship of the pale-bellied Tucumán and Bolivian "phase" to *E. tacanowskii* Sc., originally described from N.W. Peru (Callacate), with which I am not acquainted. I am sorry to leave the matter in this unsatisfactory state, but until good series from different parts of Bolivia come to hand it will be impossible to arrive at anything like definite conclusions regarding the affinities of the western races of the *E. chlorotica*-group.

The subjoined table may serve to illustrate the dimensions of specimens from various localities :

♂♂ ad.					
<i>E. c. chlorotica</i> (L.).		Wing.	Tail.	Bill.	
Seven Cayenne	. . . . .	52-56	30½-33½	7.7	mm.
One Marajó, N. Brazil	. . . . .	56	33	7	,,
One Tapajóz (Itaitúba)	. . . . .	55	32	7	,,
<i>E. c. pileata</i> Berl.					
Five Orinoco River	. . . . .	58-60	35-37½	7	,,

♂♂ ad.

<i>E. c. violaceicollis</i> (Cab.).	Wing.	Tail.	Bill.
Ten Bahia	55-58½	32½-35½	6½-7 mm.
One Piauhy	59	34½	6¾ "
One São Paulo (Ypanema)	60	37	8 "
Four Goyaz	57-61	35-38	7-8 "
Four Mattogrosso (Chapada)	57-59	33-36	7½-8½ "
Two Rioja, Argentine	58, 59	31, 33	7 "
One Santa Fé, Argentine (Ocampo)	60	37	7 "
One Misiones (Santa Ana)	59	36	8 "
Five Paraguay (Villa Rica, Lambaré)	57-61	35-37	7½ "
One " Bolivia " (Bridges; Brit. Mus.)	57	34	8 "
Two Tilotilo, N.W. Bolivia	59, 60	—	— "

E. c. serrirostris Lafr.-Orb. (?), pale-bellied form.

One " Interior of Bolivia " (Bridges)	60½	37	6½ "
Four Tucumán	59-61½	37½-39	7-8 "

♀♀ ad.

E. c. violaceicollis (ab.).

Two Bahia (Boca da Ipueiro, Rio Grande ; O. Reiser coll.)	58, 58½	34½, 35	7 "
One Piauhy (Parnaguá ; Reiser coll.)	54	—	6¾ "
One Rio de Janeiro (Sapitiba ; Natterer coll.)	59	35	8 "
One São Paulo (Rio Paraná ; Natterer)	59½	34½	7½ "
One Misiones (Concepcion ; White)	60½	36	7½ "
Three Paraguay (Villa Rica, Lambaré)	56-59	34-38	7½ "

E. c. serrirostris Lafr. & Orb., pale-bellied form.

One Guarayos, E. Bolivia (type)	58	34	7½ "
One Salta (Metan), N.W. Argentine	58½	35	7 "

Euphonia ruficeps = Euphonia xanthogaster ruficeps Lafr. & Orb.

Euphonia ruficeps Lafresnaye & d'Orbigny, *Syn. Av. i. in Mag. Zool. cl. ii. p. 30* (1837.—Yuracarès, Bolivia ; descr. orig. ♂♀) ; d'Orbigny, *Voyage, Ois., p. 268, pl. 22, fig. 2* (= ♂) (Yuracarès).

No. 1, ♂ ad. (skin) : " D. 399. Yuracarès. *Euphonia ruficeps* Nob. 256, d'Orbigny, 1834."—Wing 65 ; tail 36½ ; bill (damaged) mm.

No. 2, ♀ ad. (skin) : " 256. *Euphonia ruficeps*, Nob. femelle, par d'Orbigny, 1834. D. No. 399, de Yuracarès."—Wing 63 ; tail 37 ; bill 8½ mm.

In addition, I have examined five males and six females procured, at various localities in Northern Bolivia, by Gustav and Otto Garlepp. The rufous-capped *Euphonia* is restricted to N. Bolivia. About its Venezuelan ally and its nomenclature *vide* Hellmayr & Seilern's remarks in *Arch. f. Naturg.* 78, Abt. A, Heft 5, 1912, pp. 53-4.

Aglaiā Yeni Lafr. & Orb. = Tangara chilensis (Vig.).¹

Aglaiā Yeni Lafresnaye & d'Orbigny, *Syn. Av. i. in Mag. Zool. cl. ii. p. 31* (1837.—Yuracarès, Bolivia; descr. orig.).

Tanagra yeni d'Orbigny, *Voyage, Ois., p. 270, pl. 24, fig. 2* (Yungas, Yuracarès).

Nos. 1, 2, adults (mounted): "par d'Orbigny, 1834, de Yuracarès, Bolivie. *Aglaiā Yeni* Nob. type."

This species ranges over the western parts of the Amazonian region from S.E. Colombia down to Northern Bolivia.

Aglaiā tatao = (?) Tangara seledon (P. L. S. Müll.).²

Aglaiā tatao "Gm.;"³ L. & O., *Syn. Av. i. p. 31* ("imp. Brasiliensis"); d'Orbigny, p. 270 ("Saint-Christophe, près Rio-de-Janeiro").

The Paris Museum possesses no specimen that could possibly be the *A. tatao* of the *Synopsis Avium*. I think we may presume that d'Orbigny only observed the bird, but did not obtain it. The erroneous diagnosis as given in the *Voyage* has all the appearance of having been compiled from memory, or might have been taken from Daubenton's *Pl. enl. 7, fig. 1*, representing *Tangara paradisea* (Swains.), with the tail of some small Parrot (*Urochroma*)! The description "*uropygio fulvo*" can only apply to *T. seledon*, which alone among the various species of this genus occurring in the vicinity of the Brazilian capital has a yellow rump.

Aglaiā schrankii = Tangara schrankii (Spix).⁴

Aglaiā schrankii L. & O., *Syn. Av. i. p. 31* (Yuracarès, Bolivia).

Tanagra schrankii d'Orbigny, *Voyage, p. 270, pl. 24, fig. 1* (Yuracarès; descr. ♂♀).

The specimens are no longer to be found in the Paris Museum. Birds from Yuracarès (San Mateo), in the Munich Museum, however, agree well with the types and a series from Eastern Ecuador and Peru.

Aglaiā montana = Buthraupis montana (Lafr. & Orb.).

Aglaiā montana Lafresnaye & d'Orbigny, *Syn. Av. i. in Mag. Zool. cl. ii. p. 32* (1837.—Yungas (Bolivia); descr. orig.).

Tanagra montana d'Orbigny, *Voyage, p. 275, pl. 23, fig. 1* (Mount Biscachal, près Carcuata, prov. Yungas).

No. 1, adult (mounted): "par d'Orbigny, 1834, de Carcuata, Yungas. *Buthraupis montana* (d'Orb.) type."

This species is peculiar to the Western Yungas of Bolivia. The *B. cucullata*-group, comprising four races in Peru, Ecuador, and Colombia, is probably but subspecifically distinct.

¹ *Aglaiā Chilensis* Vigors, *Proc. Comm. Sci. & Corresp. Zool. Soc. Lond. ii. p. 3* (March 1832.—"Chili," errore! hab. corr. Bolivia—ex coll. H. Cuming).

² *Tanagra Seledon* P. L. S. Müller, *Natursyst., Suppl., p. 158* (1776.—ex Daubenton, *Pl. enl. 33, fig. 1*: "Cayenne," errore! hab. subst. Rio de Janeiro, auct. Berlepsch 1912); = *Tangara tricolor* auct.

³ About the specific title *tatao* Linn. See Berlepsch & Hartert, *Nov. Zool. 9, 1902, p. 18*, note †.

⁴ *Tanagra schrankii* Spix, *Av. Bras. ii. p. 38, pl. 51, figs. 1, 2* (1825.—Amazonia).

Aglaiia igniventris = Poecilothraupis igniventris (Lafr. & Orb.).

Aglaiia igniventris Lafresnaye & d'Orbigny, *Syn. Av. i.* in *Mag. Zool.* cl. ii. p. 32 (1837.—Yungas, Bolivia; descr. orig.).

Tanagra igniventris d'Orbigny, *Voyage*, p. 275, pl. 25, fig. 2 (Apolobamba, au nord de la Paz).

No. 1, adult (mounted): "d'Orbigny, 1834, d'Apolobamba, Bolivie. *Aglaiia igniventris* D'Orb. Type."

The range of this species is limited to the mountain forests of South-Eastern Peru (Marcapata) and North-Western Bolivia (Western Yungas). The *P. lunulata*-group, of which several races have been described from Central Peru to Colombia, is most probably subspecifically related to *P. igniventris*.

Aglaiia cyanocephala = Sporathraupis cyanocephala cyanocephala (Lafr. & Orb.).

Aglaiia cyanocephala Lafresnaye & d'Orbigny, *Syn. Av. i.* in *Mag. Zool.* cl. ii. p. 32 (1837.—Yungas, Bolivia; descr. orig.).

Tanagra Maximiliani d'Orbigny, *Voyage*, Ois., p. 276, pl. 23, fig. 2 (Enquisivi, prov. Sicasica; "un specimen").

No. 1, adult (mounted): "*T. maximiliani* d'Orb. Type, par d'Orbigny, 1834, ♂ Enquisivi, Bolivie."

The type and several additional specimens from N.W. Bolivia in Count Berlepsch's collection agree perfectly with Peruvian skins. Birds from Western Ecuador also belong to the typical race.¹

$$\text{Aglaiia striata} = \begin{cases} \delta = \text{Thraupis bonariensis (Gm.).}^2 \\ \text{\textcircled{f}}, \text{ juv.} = \text{Thraupis darwinii laeta (Berl. \& Stolz.).}^3 \end{cases}$$

Aglaiia striata ("Lin.");⁴ L. & O., *Syn. Av. i.* p. 32 (Valle Grande, Cochabamba).

Tanagra striata d'Orbigny, *Voyage*, p. 273 (Banda Oriental (Montevideo); Buenos Ayres, Corrientes; à l'ouest des Andes à Palca (Ayupaya), "Pérou"; La Paz, prov. Yungas, Sicasica, Cochabamba, Valle Grande, Chuquisaca; descr. "♂ ad., ♀, juv.").

No. 1, "♂" ad. (skin): "D. 181, de Cochabamba, 237, par d'Orbigny, 1834."—Wing 96; tail 75; bill 12 mm. = *Thraupis bonariensis* (Gm.) ♂ ad.

No. 2, (♂) ad. (skin): "237, d'Orbigny, 1834. D. 181, Bolivia. *T. striata* Gm."—Wing 90; tail 77; bill 13 mm. = *Thraupis darwinii laeta* (Berl. & Stolz.) ♂ ad.

No. 3, (♂) ad. (mounted): "237, de La Paz, par d'Orbigny, 1834. D. 181."—Wing 89; tail 75; bill 12½ mm. = *Thraupis darwinii laeta* (Berl. & Stolz.) ♂ ad.

No. 4, 5 (♀♀) (skins): "D. 181, de La Paz, par d'Orbigny, 1834. *T. striata* Gm. 237."—Wing 88, 90; tail 74; bill 12½, 13 mm. = *Thraupis darwinii laeta* (Berl. & Stolz.) ♀.

¹ There is no reason for supplanting the specific name *cyanocephala* by d'Orbigny's term *maximiliani*, since *Aglaiia cyanocephala* Lafr. & Orb. is not affected by the earlier *Tanagra cyanocephala* P. L. S. Müll. 1776.

² *Loxia bonariensis* Gmelin, *Syst. Nat.* 1, ii. p. 850 (1789.—ex "Le Noir-Souci," Buffon, *Hist. Nat. Ois.*, iv. p. 150: Buenos Ayres, coll. Commerson).

³ *Tanagra darwinii laeta* Berlepsch & Stolzmann, *Ornis*, 13, part 2, p. 81 (1906.—Cuzco, S.E. Peru).

⁴ *Tanagra striata* Gmelin, *Syst. Nat.* 1, ii. p. 899 (1789.—ex "L'Onglet," Buffon, *Hist. Nat. Ois.*, iv. p. 256: loc. ign., coll. Commerson).

No. 6, (♀) (skin) : "D. 181, d'Yungas, No. 237, par d'Orbigny, 1834."—Wing 88 ; tail 76 ; bill 13 mm. = *Thraupis darwinii laeta* (Berl. & Stolzm.) ♀.

No. 7, (♀) (skin) : "D. 181, d'Ayupaya [Palca], No. 237, d'Orbigny, 1834."—Wing 87 ; tail 78 ; bill 12½ mm. = *Thraupis darwinii laeta* (Berl. & Stolzm.) ♀.

Examination of d'Orbigny's material shows *A. striata* to embrace both *T. bonariensis* and *T. darwinii laeta*.

No. 1 represents d'Orbigny's adult male : having the anterior portion of the back, including scapulars, glossy black, the rump reddish orange ; the breast bright orange, shading into a paler tint on the abdomen. It is an adult male of *T. bonariensis*, and agrees well with toptotypical examples from Buenos Ayres. Birds from Montevideo and Corrientes, whence there are no specimens at Paris, are likewise referable to that species.

Nos. 2 and 3 correspond to the description of the "foemina dorso viridi." They are adult males of *T. darwinii laeta*, with the mantle olive green, the rump and under-parts light saffron-yellow. In size and colour they exactly resemble specimens from Huiro, valley of Urubamba, near Cuzco, S.E. Peru, which may be taken as toptypes of that subspecies.

Nos. 4-7, which answer to the characters of d'Orbigny's "jeune âge," having the upper parts greyish brown, washed with greenish on the mantle, the rump pale wax-yellow, etc., are ordinary females of *T. d. laeta*.

The distribution in Bolivia of these two closely allied species is not yet satisfactorily established. *T. bonariensis* appears to occur only in the Eastern Yungas (Cochabamba, Valle Grande, Rio Mizque), whence it extends throughout Argentine as far south as Mendoza, Cordova, and Buenos Ayres, ranging in the east through Uruguay to Rio Grande do Sul, the most southerly Brazilian province. *T. darwinii laeta*, on the other hand, has been found at various localities in the Western Yungas (La Paz, Sorata, Chicani, Sicasica, etc.). One of d'Orbigny's females, however, which I must refer to *T. d. laeta*, was taken at Palca, north of Sucre, that is not very far from the Rio Mizque.

The typical *T. darwinii darwinii* (Bonap.)¹ is evidently restricted to the Peruvian coast districts (from Lima to Arequipa).

Aglaia cayana = *Tangara preciosa* (Cab.).²

Aglaia cayana (nec Linnaeus) L. & O., *Syn. Av.* i. p. 32 (Corrientes, rep. Argentina).
Tanagra Cayana (errore), d'Orbigny, p. 272 ("ville de Corrientes" ; deser. mala).

No specimen in the Paris Museum ; probably only observed. In spite of d'Orbigny's erroneous diagnosis ("genus . . . nigris"), there can be little doubt that the bird found "au mois de juillet dans les jardins de la ville de Corrientes." belonged to *T. preciosa*, as this species was procured by W. Foster at Sapucay, Paraguay,³ and by Holland at Santa Elena, in northern Entrerios.⁴

¹ *Tanagra Darwinii* Bonaparte, *Proc. Zool. Soc. Lond.* v. "1837," p. 121 (June 1838.—"Chili," coll. Fitzroy, Brit. Museum).

² *Callispiza preciosa* Cabanis, *Mus. Hein.* i. p. 27 (1850.—"Rio Grande [do Sul]" ; descr. ♂♀).

³ Chubb, *Ibis*, 1910, p. 624.

⁴ Holland, *Ibis*, 1896, p. 315 ; Selater, *Bull. B.O.C.* viii. 1898, p. xxiv.

Aglaia mexicana = Tangara mexicana boliviana (Bonap.).¹

Aglaia mexicana (nec Linnaeus);² L. & O., *Syn. Av.* i. p. 32 (Yuracarès, Bolivia).
Tanagra flaviventris (nec Vieillot)³ d'Orbigny, *Voyage*, p. 271 (Yuracarès, Guarayos).

No. 1, adult (mounted): "du pays des Guarayos, Bolivie, par M. d'Orbigny, 1834. No. 373 (226). *Call. boliviana* Bp. (*type*)."—Wing 72½; tail 50½; bill 10½ mm.

The type is practically identical with specimens from the Rio Madeira, Tapajós (Itaituba), and neighbourhood of Pará, while birds from Upper Amazonia (Peru, E. Ecuador, Bogotá), as a rule, have the shoulder-patch quite uniform azure-blue (cf. Hellmayr, *Nov. Zool.* 14, 1907, p. 7).

Aglaia gyrola = Tangara gyroloides catharinae (Hellm.).⁴

Aglaia gyrola (nec Linnaeus)⁵ L. & O., *Syn. Av.* i. p. 32 (Yuracares, Bolivia).
Tanagra gyrola (errore) d'Orbigny, *Voyage*, p. 272 (Yuracarès).

No. 1, ♂ ad. (mounted): "No. 224, par M. d'Orbigny, 1834. de Yuracarès, Bolivie."

Nos. 2, 3, skins (plumage of the female): "224, d'Orbigny, 1834. D. 398. Yuracarès. *T. gyrola* var."

The adult male and others from the same district (San Mateo) in Count Berlepsch's collection are exactly similar to the typical series in the Munich Museum.

Aglaia cyanicollis = Tangara cyanicollis cyanicollis (Lafr. & Orb.).

Aglaia cyanicollis Lafresnaye & d'Orbigny, *Syn. Av.* i. in *Mag. Zool.* cl. ii. p. 33 (1837.—Yuracarès, Bolivia; descr. orig.).
Tanagra cyanicollis, d'Orbigny, *Voyage*, Ois., p. 271, pl. 25, fig. 1 (Yuracarès).

No. 1, adult (mounted): "par M. d'Orbigny, de Bolivie, 1834. *Tan. cyanicollis* (Lafr. & Orb.). *Type*."

This is an extreme example of the pale-throated race as represented in the Munich Museum by birds from Chaquimayo, Carabaya, S.E. Peru, agreeing notably well with an adult male taken July 2, 1910, by H. & C. Watkins (collector's No. 259), in having the throat and sides of the head uniform pale blue like the crown. Other specimens from the same locality, e.g. ♂ ad., September 4, 1910, Munich Museum, No. 11,426, however, have a more or less distinct purplish sheen along middle of throat. Similar examples, together with pale-throated ones, we have also from Chanchamayo, Central Peru (Schunke Coll.). These birds form the transition to *T. cyanicollis caeruleocephala* (Swains.)⁶ of

¹ *Calospiza boliviana* Bonaparte, *Compt. Rend. Acad. Sci. Paris*, 32, p. 80 (1851.—Guarajos, d'Orbigny coll., Mus. Paris).

² *Tanagra mexicana* Linnaeus, *Syst. Nat.* 12, i. p. 315 (1766.—ex Brisson: Cayenne; excl. syn. Hernandez—Mexico).

³ *Nouv. Dict. d'Hist. Nat.*, nouv. éd., 32, p. 410 (1819.—ex Daubenton, *Pl. enl.* 290, fig. 2: Cayenne).

⁴ *Calospiza gyroloides catharinae* Hellmayr, *Proc. Zool. Soc. Lond.*, 1911, p. 1106 (Dec. 1911.—Chaquimayo, Carabaya, S.E. Peru).

⁵ *Fringilla gyrola* Linnaeus, *Syst. Nat.*, 10, i. p. 181 (1758.—ex Edwards: Surinam).

⁶ *Aglaia caeruleocephala* Swainson, *Anim. in Menag.*, p. 356 (Jan. 1838.—Peru; Coll. of W. Hooker).

N. Peru and E. Ecuador, which, accordingly, can be regarded as only sub-specifically distinct.

***Aglaia olivascens* = *Thraupis palmarum palmarum* (Wied).¹**

Aglaia olivascens Licht.;² L. & O., *Syn. Av.* i. p. 33 (Santa-Cruz, Bolivia).

Tanagra olivascens, d'Orbigny, *Voyage*, p. 274 (Santa Cruz de la Sierra, Guarayos, Yuracarès).

No. 1, adult (skin): "D. 330. Sta. Cruz, Bolivie, par d'Orbigny, 1834. *T. olivascens* Licht., No. 227."—Wing 102; tail 79; bill (damaged) mm.

No. 2, juv. (skin): "D. 330. Guarayos, par d'Orbigny, 1834. *Tanagra olivascens* Licht., No. 227."

The specimen from Santa Cruz de la Sierra, E. Bolivia, a bird in perfect plumage, is an ultra-typical *T. p. palmarum*, having the olive-green edges to the remiges even broader and more distinct than a number of topotypes from Bahia, E. Brazil. The young example from Guarayos is, no doubt, referable to the same race.

T. p. palmarum ranges from the coast of Brazil across the central tableland to the eastern slopes of the Bolivian Andes. Birds from Pará, Maranhão, and Piahy belong likewise to this race.³ The exact western limits of its area in Lower Amazonia I am unable to determine, owing to lack of material from the countries between the Tocantins and Madeira Rivers. On the upper Madeira (Calama) and on the north bank of the Amazon (Manaós), however, the nearly allied *T. palmarum melanoptera* (Scl.) is met with,⁴ which is also the only form occurring in Upper Amazonia, E. Colombia, Venezuela, Trinidad, and Guiana. According to Count Berlepsch⁵ it goes as far south as N.W. Bolivia (San Antonio, Suapi, Cangalli).

***Aglaia episcopus* = *Thraupis sayaca* (Linn.).⁶**

Aglaia episcopus (nec Linnaeus⁷) L. & O., *Syn. Av.* i. p. 33 (Yungas, Cochabamba).

Tanagra episcopus, d'Orbigny, p. 274 ("depuis la Plata jusqu'en Bolivie, sur le versant oriental des Andes à Cochabamba, Valle Grande, Yungas").

No. 1, (♂) ad. (skin): "Corrientes. *T. episcopus* Lin., par d'Orbigny, juillet 1829. No. 113."—Wing 92; tail 67; bill 13 mm.

No. 2, (♀) ad. (skin): "D. 74. Cochabamba, par d'Orbigny, 1834. No. 223."—Wing 94; tail 73; bill 13 mm.

No. 3, (♀) (skin): "D. 74. Bolivie, par d'Orbigny, 1834. No. 228."—Wing 90; tail —; bill 13 mm.

The Corrientes bird is perfectly similar to adult males from Bahia and Rio de Janeiro. The Bolivian skins are somewhat duller, less bluish, on the back and wings, agreeing with females and immature examples from Brazil. *T. sayaca* is widely diffused in Eastern, Central, and Southern Brazil, N. Argentine, and Bolivia.

¹ *Tanagra palmarum* Wied, *Reise Brasil*, ii. p. 76 (1821.—Canavieras, Bahia).

² *Tanagra olivascens* Lichtenstein, *Verz. Dubl. Berl. Mus.*, p. 32 (1823.—Brasil).

³ Cf. Hellmayr, *Abhandl. Bayer. Akad. Wiss.*, math.-phys. Kl., 26, No. 2, 1912, pp. 10-11.

⁴ Cf. Hellmayr, *Nov. Zool.* 17, 1910, p. 274.

⁵ *Bericht V. Intern. Ornith. Kongr.*, 1912, p. 1053.

⁶ *Tanagra Sayaca* Linnaeus, *Syst. Nat.* 12, i. p. 316 (1766.—ex Brisson: ex Maregrave: N.E. Brazil).

⁷ *Tanagra Episcopus* Linnaeus, *Syst. Nat.* 12, i. p. 316 (1766.—ex Brisson: "Brésil").

***Pyranga mississippiensis* = *Piranga flava* (Vieill.).¹**

Pyranga mississippiensis Licht. (nec Gmelin);² L. & O., *Syn. Av.* i. p. 33 (Chiquitos, E. Bolivia; descr. ♂♀).

Pyranga Azarae d'Orbigny, *Voyage*, Ois., p. 264 (between 1838 and 1847.—"environs de Buenos Ayres; dans les provinces Chiquitos, Yungas et Vallc Grande"; nom. nov. for *P. mississippiensis* Licht. nec Gmelin).

No. 1, "♂" vix ad. (mounted): "de Buenos Ayres, par M. d'Orbigny, Nov. 1829. No. 125. *Pyranga Azarae*. J^{ne} ♂."—Wing 99; tail 83; bill 16 mm.

No. 2, "♂" ad. (mounted): "de Chiquitos, par M. d'Orbigny, 1834.—No. 235.—D. 311."—Wing 93; tail 75; bill 16 mm.

No. 3, "♂" ad. (mounted): "de Chiquitos, par M. d'Orbigny, 1834.—No. 235.—D. 311. Mâle. *Pyr. Azarae* D'Orb. type."—Wing 92; tail 76; bill 17 mm.

No. 4, "♀" ad. (mounted): "par M. d'Orbigny, 1834.—D. 311.—235. *Pyranga azarae* Nob. fem. [Bolivie]."—Wing (worn); tail (worn); bill 16 mm.

No. 5, "♀" ad. (skin): "D. 311. Chiquitos, *Pyr. azarae* D'O. femelle. D'Orbigny, 1834. No. 235."—Wing 92; tail 75; bill 17½ mm.

With the limited material at my command, I am not in the position to say whether all the birds generally attributed to *P. flava*, viz. the inhabitants of Bolivia, Western Argentine (from Jujuy south to Mendoza and Cordoba), the banks of the La Plata, and Paraguay, really belong to the same species.

No. 1, from Buenos Ayres, although retaining some of the yellowish feathers of the juvenile plumage on sides of head, throat, and breast, is fully as large as a perfectly adult (red) male procured by A. Ros on the Rio de Oro, Chaco Austral, in the Munich Museum. For geographical reasons it is to be presumed that birds from Paraguay (typical *P. flava*) also belong to this large form, although I have never seen examples from that country. The males from Buenos Ayres and Chaco have wide ashy tips to the feathers of the back, nearly wholly concealing the rosy-red ground-colour.

The two males from Chiquitos (one of which is marked as type of *P. azarae* by d'Orbigny himself) are considerably smaller and, besides, have less greyish suffusion on the interscapulum. Should additional material confirm these differences, the Bolivian birds would have to stand as *Piranga flava azarae* d'Orb.³

From *P. saira* (Spix), of which I have studied a large series from Western Minas (Bagagen), Goyaz, Mattogrosso, Lower Amazons (Serra do Ereré, Monte

¹ *Saltator flavus* Vieillot, *Tabl. enc. méth., Ornith.*, ii. livr. 91, p. 790 (1822.—ex Azara, No. 87: Paraguay; = ♀).

² *Tanagra mississippiensis* Gmelin, *Syst. Nat.* 1, ii. p. 889 (1789.—[part.]: ex Daubenton, *Pl. enl.* 741: Mississippi; = ♂ ad.); = *Piranga rubra* (Linn.), 1758.

³ Since writing the above, I have examined the series in the Berlepsch Collection. The difference in size proves to be not constant, as will be seen from the appended figures; but the males from Bolivia have the interscapulum more underlaid with red, with less greyish suffusion.

Males from various localities measure as follows:

One Buenos Ayres	Wing, 99;	tail, 83 mm.
One Rio de Oro, Chaco	" 98	" 83 "
Eight Tucumán, N.W. Argentine	" 94-96½	" 76½-82 mm.
Three Misque, Bolivia	" 98-100	" 82-83½ "
Two Chiquitos, E. Bolivia	" 92, 93	" 75, 76 "

Alegre), and British Guiana (Quonja, Annai), Nos. 1 to 3 differ at a glance by their much smaller bill, duller red upper parts, with more greyish inter-scapulium, etc. The females from Eastern Bolivia (Nos. 4, 5) may likewise be distinguished from their Brazilian ally by shorter bills and duller, more greyish-green upper surface.

A careful revision of the neotropical red *Piranga*, together with an investigation of their conspecific relations, would be a welcome contribution towards ornithological literature.

***Pyrrangula albicollis* = *Eucometis penicillata albicollis* (Lafr. & Orb.).**

Pyrrangula albicollis Lafresnaye & d'Orbigny, *Syn. Av. i. in Mag. Zool.* cl. ii. p. 33 (1837.—Chiquitos, E. Bolivia; descr. orig.); d'Orbigny, *Voyage, Ois.*, p. 265, pl. 26, fig. 2 ("Santa Ana, Chiquitos; au pays de Guarayos").

No. 1, adult (mounted): "No. 242.—D. 346, de Guarayos, par M. d'Orbigny, 1834. *Pyrrangula albicollis* Nob."—Wing $87\frac{1}{2}$; tail 82; bill 14 mm.

No. 2, adult (mounted): "de Bolivie (Chiquitos), par M. d'Orbigny, 1834.—No. 232—D. 346. *Pyrrangula albicollis* Lafr. & Orb. *Type*."—Wing 90; tail 78; bill 15 mm.

These birds I have compared and found identical with a series of ten from Mattogrosso and Goyaz. As in the Brazilian skins, the throat and foreneck are rusty-white; the sides of the head light-brownish; the top of the head olivaceous grey, without any white at the base of the crest-feathers; the feet and legs are pale fleshy-brown, etc.

E. p. albicollis differs from its Amazonian ally, *E. p. penicillata* (Spix), in rusty-white throat (not tinged with greyish in the lower portion), light-brownish (instead of olive-grey) sides of head, and much paler under-parts (about "chrome yellow" of Ridgway's Nomenclature of Colours, plate vi, fig. 8, against "deep chrome," plate vi, fig. 9). Moreover, the feathers of the pileum are much shorter and lack the white colour on their basal portion, while the bill is much lighter, the maxilla being light horn-brown (instead of blackish), the mandible brownish-white (instead of dark brown).

E. p. albicollis is peculiar to the tableland of Central Brazil and Eastern Bolivia (Chiquitos, Guarayos). Natterer¹ obtained it near the city of Goyaz, and at Mamoneira, not far from the Rio Claro, province Goyaz; at Sangradouro, Lavrinhas, and Cuyabá in Eastern, at Villa Maria (= San Luis de Caceres), R. Paraguay, and Engenho do Gama, Rio Guaporé, in Western Mattogrosso. Smith² collected a large series on the plateau of Chapada, and Borelli³ took three examples at Urucúm, south-west of Corumbá, in the same province. Southwards, this species ranges to the north-western part of the province of São Paulo, where the collectors of the Museu Paulista secured specimens at Itapurá, near the junction of the Rivers Tieté and Paraná.⁴

The birds of the Rio Juruá referred by Jhering⁵ to *E. albicollis* prove, on examination, to belong to *E. p. penicillata*.

(To be continued.)

¹ Pelzeln, *Zur Ornith. Bras.*, p. 212.

² Allen, *Bull. Amer. Mus. N.H.*, iii. 1891, p. 358.

³ Salvadori, *Boll. Mus. Zool. Torino*, 15, No. 378, 1900, p. 4.

⁴ Jhering & Jhering, *Cat. Faun. Brazil*, i. 1907, p. 364.

⁵ *Rev. Mus. Paul.* vi. 1905, p. 432.

ON *ANAITIS EFFORMATA* GUEN. (1858), A SPECIES DISTINCT
FROM *A. PLAGIATA* L. (1758)

By DR. KARL JORDAN.

(With 9 text-figures.)

WHILE selecting from our collection specimens illustrating a certain type of geographical variation, it struck me as very peculiar that all the specimens of *Anaitis plagiata* incorporated in the collection from Portugal, Spain, Morocco, and Algeria appeared to belong to that small form which is generally known as the summer brood of this Geometer. There was nothing in the external appearance which aroused suspicion, but it seemed to me most interesting that Algerian spring specimens should agree with the British and Central European summer specimens. That made me linger a little longer, and then something else arrested my attention as my eyes wandered over the series of specimens in the drawer: all the examples from the western and southern Mediterranean countries had a shorter abdomen, as if they were all females, none of them showing the long pointed abdomen of the *plagiata* male. That we should have from these countries a large number of females of a species of Geometer collected at random and no male was hardly credible, and I inspected the species more closely, with the result that what appeared to the naked eye to be females turned out to be mostly males quite different in the end of the abdomen from true *plagiata*. It was evident that the name *Anaitis plagiata* L. (1758) covered two species.

We subsequently exhibited the two species at a meeting of the Entomological Society of London and gave a short description of the differences and the distribution, and now present a somewhat fuller account.

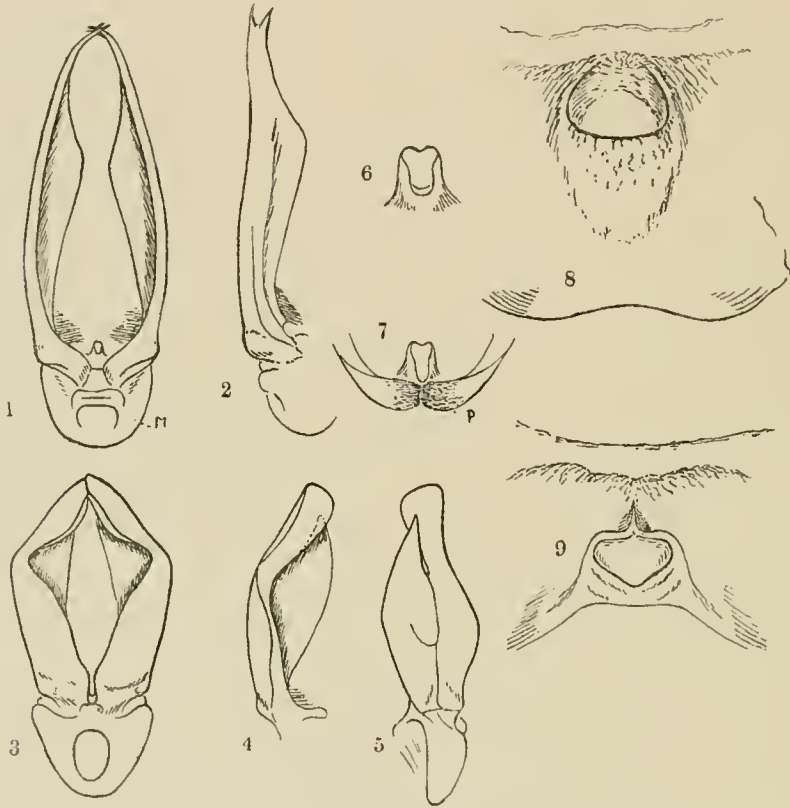
For reasons given below we identify the second species as *A. efformata* Guen. (1858), a name generally sunk as a synonym of *plagiata*.

A. efformata from all localities agrees in externals with the small summer specimens of *A. plagiata*, but some examples attain a considerable size, being fully as large as medium-sized *plagiata* of the spring brood. Colour and pattern do not offer any distinction on which we could rely for separating the two insects. *A. efformata* may be described as being on the whole the paler of the two and as having the subcostal angle of the discal band of the forewing a little more obtuse. However, fresh specimens often have the markings as strongly pronounced and the subcostal angle of the discal band as sharply acuminate as vividly coloured *A. plagiata*. The absence of constant colour-distinctions sufficiently explains why *A. efformata* has been overlooked as a species.

We have compared the various parts of the body and appendages in the two species, and have found no other differences but those presented by the tail-ends of both sexes.

♂. In the male of *A. plagiata* the apex of the abdomen is long and pointed on account of the great length of the claspers (text-fig. 2, inner surface), which are more than six times as long as they are broad at the widest point (at two-fifths).

The claspers are forked at the end and converge, the teeth interlocking (text-fig. 1, ventral aspect). There is a wide gap between the claspers dorsally as well as ventrally, the proximal portion of the dorsal interspace being filled up by the ninth and tenth tergites (omitted in our figures). The ventral gap is almost as broad as the body, and, when the scales have been brushed aside, permits the inside to be examined without dissection. The manubrium (= saccus) of the claspers is short, broad, and rounded (M). The clasper of *A. efformata* is quite different in size and shape. In a ventral aspect (text-fig. 3) the claspers are elbowed beyond the middle, diverging from the base to this point and then



converging; their shortness and the lateral convexity gives the apex of the abdomen that stumpy and somewhat clavate appearance by which a male of *A. efformata* is at a glance differentiated from *A. plagiata*. Text-fig. 4 is a representation of the inner surface, corresponding to fig. 2. In a dorsal aspect (text-fig. 5) the clasper is found to be divided by a narrow sinus into two lobes: the dorsal lobe is triangular, pointed, and lies with its tip on the ventral lobe, which is the longer of the two. The ventral lobe is spatulate, somewhat asymmetrically rounded at the apex, with the under surface concave. It is much more strongly chitinised than the dorsal lobe, and corresponds to the harpe of other Lepidoptera, a kind of suture separating also the proximal parts of the strongly chitinised ventral sclerite from the feebly chitinised dorsal sclerite (= valve

of other Lepidoptera). In *A. plagiata* there is no incision between these two sclerites which compose the clasper, the apical prongs belonging both to the ventral sclerite.

In the middle line, a little more dorsal than the bases of the claspers, there is a small ring of chitin, from which protrudes the long and strongly curved penis-sheath. This ring, or penis-funnel, as we termed the homologous organ in *Charaxes* twenty-five years ago, is slightly sinuate apically on the dorsal side in *A. plagiata*, and much more strongly so ventrally (text-fig. 6, ventral aspect). In *A. efformata* the funnel is smaller and less chitinised, with the dorsal sinus deep and the ventral one small, so that the dorsal view of it (text-fig. 7) resembles the ventral view of the funnel of *A. plagiata*. Above the funnel, but only in *A. efformata*, there is a larger outer collar, which consists of two spatulate processes projecting from the bases of the dorsal margins of the ventral sclerites of the two claspers. The processes (text-fig. 7, P) touch each other or nearly, and are covered on the dorsal side with numerous minute ridges, which give them a rough appearance.

The anal tergite forms in both species a single pointed process, slightly curved down at the tip. The apex is compressed in *A. plagiata*, its vertical diameter being rather longer than the transverse diameter. In *A. efformata* the inverse proportions obtain, the transverse diameter being the longer. However, this difference in the two species is inconspicuous.

♀. The females of the two species are likewise readily distinguished if the abdomina are not too much contracted. In this sex the last external segment (the seventh) again is much longer in *A. plagiata* than in *A. efformata*, being longer than broad in the one species, and broader than long in the other. If the segments are too much telescoped, the difference in length is not easily ascertained at dry specimens. In this case recourse can be taken to another distinction, obtaining in the genital sclerite. This plate is large in *A. plagiata* (text-fig. 8), convex proximally at each side, and bears the aperture near the apex. The cavity in which the orifice of the duct of the spermatheca is situated is sharply defined on the frontal and lateral sides, but fades away on the anal side. In *A. efformata*, on the other hand, the sclerite is smaller (text-fig. 9), less convex proximally, with the frontal (= basal) margin more deeply excised, and the aperture placed near the base instead of the apex. The cavity is well defined all round, and the rim enclosing it projects on the anal side in the centre as a sharply marked longitudinal ridge, which does not quite reach the apical margin of the segment.

Length of forewing (spring and summer specimens): *A. plagiata* ♂, 15–24 mm.; ♀, 15–24 mm. *A. efformata* ♂, 13–19 mm.; ♀, 13–20 mm.

Distribution: *A. plagiata* is found from Great Britain to the South of France, eastward to the Kuku-nor and North-West India. The summer specimens from Central Asia and Kashmir are, on an average, slightly larger than Western spring specimens, not smaller, as is the case in Western and Central Europe.

A. efformata is known from Great Britain, France, Switzerland, Croatia, Hungary, Greece, Asia Minor, and all the West Mediterranean countries (Portugal, Spain, Morocco, and Algeria, where *A. plagiata* does not seem to occur).

Nomenclature: The type of *efformata* came from Syria, and is no longer in the collection of the Paris Museum. My colleague, Monsieur F. Le Cerf, informs me that in the Poujade collection there is a specimen with two labels on the

pin, one bearing the name *efformata* Gn., and on the other being written “= v. *pallidata* Stgr.” This specimen belongs to the species with the short abdomen.

Monsieur Charles Oberthür has very kindly compared the specimens of *Anaitis* in the Guenée collection, which forms part of his magnificent collection, and tells me that *efformata* is not among them.

We may take it for certain, therefore, that the type of *A. efformata* is lost, which, in this case, is of little importance. After consultation with L. B. Prout, I accept *efformata* as the name for the short-bodied species.

The species was redescribed by Staudinger in 1870 as *plagiata* var. *pallidata* from Greece and Asia Minor. I am much indebted to Herr A. Bang-Haas for re-examining the original specimens.

Our British specimens of *A. efformata* are from Tring, St. Albans, Ranmore Common (Surrey), and Dorking.

L. B. Prout has specimens from Tilgate Forest (Sussex), and also from Vigo, Alassio, Corsica, Malta, and Greece.

A. plagiata evidently was originally a Mediterranean species, which has spread northward. Now we have drawn attention to its distinctness, it will no doubt be found to occur in most European countries.

The Japanese specimens, which are similar in externals to *A. plagiata* and *A. efformata*, are quite different in the genitalia; they are *A. percleigans* Warr. (1894), described as *Carsia perelegans*.

ON A THIRD COLLECTION OF BIRDS MADE BY MR. GEORGE FORREST IN NORTH-WEST YUNNAN

By LORD ROTHSCHILD, F.R.S.

THIS collection is a remarkably fine one; and, in fact, when it is considered that the main object of the expedition was the collection of seeds, plants, and botanical specimens, it is a wonderful achievement. The majority of the skins are very good, and the series are very fine. The series of game birds is magnificent, and the discovery of *Palaeornis derbyanus* somewhat extends the known range of this species.

1. *Bambusicola fytchii fytchii* Anders.

1 ♂, hills east of Tengyueh, April 1922, 8,000 ft. (The specimen at Tring out of the first collection is not quite adult.)

2. *Tetraophasis szechenyii* Mad.

Tetraophasis szechenyii Madarász, *Zeitschr. f. ges. Orn.* ii. p. 50. pl. ii (1885) ("East Thibet").

Forrest sent a very fine series of 3 adult ♂♂, 6 adult ♀♀, 6 adult sex ?, and 2 young just fledged. These, together with the 2 ♂♂ and 1 ♀ adult sent before, make a series unrivalled in the world.

The young birds resemble strongly the young of various *Tetraonidae*.

Young.—Downy feathers of head black-tipped and spotted with rufous. Feathers of hindneck, back, and wing-coverts dark yellowish wood-grey on concealed half, black-barred with rufous and with rusty buff or buffish-white shaft stripes which expand into a broad tip on some larger wing-coverts. Rump and upper tail-coverts grey, barred with blackish. Outer three pairs of tail feathers black-barred and edged with white and rufous; rest of rectrices basal portion black, more or less marbled with grey, outer portion white. Chin and throat white; breast sooty grey, with buffy flammulation in one specimen and rufous in the second; abdomen buff in one, rufous in the other, with black spots; lower abdomen with grey transverse lines. Quills black-brown, with rusty-brown vermiculation at tips.

3 ♂♂, 6 ♀♀, 6 ? ad., 2 ? fledglings, N.W. flank of Lichiang Range, 14,000–16,000 ft., February–November 1922 (2 young July).

3. *Ithaginis geoffroyi clarkei* Rothsch.

Ithaginis clarkei Rothschild, *Bull. B.O.C.* xl. p. 67 (1920) (Lichiang Range, Yunnan).

The marvellous series sent by Forrest, consisting of 29 ♂♂ and 9 ♀♀, throws complete light on the status of this form, and incidentally shows that both my former conclusions are wrong. In my article on the first collection I put forward the statement that the red-headed bird was the fully adult ♂, while the birds with black throat and face were younger ♂♂. In the article on the

second collection I described the plumage I took to be the freshly moulted plumage, and by so doing implied that the variable colour of the throat and head in the former lot was due to wear.

It is now quite clear from 33 ♂♂ in fine unworn condition that *Ithaginis clarkei* is a subspecies of *I. geoffroyi*, differing in the extreme form which lacks completely all red colouring, only in the shorter and less disintegrated crest and the shorter ear-coverts; but the extraordinary thing is that out of the 37 ♂♂ Forrest has sent home in his three collections, only 5 lack all red, and the remaining 32 show every gradation to birds with red chins and throats and whitish or buff chests, spotted with red instead of entirely ash-grey ones, and thus strongly resembling certain *Ithaginis cruentus*. The females apparently show little variation, and differ from *geoffroyi* chiefly in the browner tinge of the underside and in the variable amount of rufous on the head.

29 ♂♂, 9 ♀♀, February–November 1922, 14,000 ft., N.W. flank of Lichiang Range.

4. *Tragopan temminckii* (Gray).

Satyra temminckii Gray in Hardwicke, *Ill. Ind. Zool.* i. pl. i (1830–2) (no locality given; type marked China in British Museum).

Forrest sent a series of 8 ♂♂, 4 ♀♀ ad., 2 ♂♂ juv., December 1921, February 1922, and October and November 1922, 14,000 ft.

5. *Crossoptilon crossoptilon crossoptilon* (Hodgs.).

Phasinus crossoptilon Hodgson, *Journ. As. Soc. Bengal*, vii. p. 864 (1838) (no exact locality).

The series this time is a remarkable one, consisting of 6 ♂♂, 6 ♀♀ ad., 1 fledgling, and 3 chicks in down, as well as 2 eggs.

The coloration of the adult ♂♂ is certainly not pure white, but rather milk to buffy white, with more or less of a pale-blue grey wash on the wing-coverts. I, however, still do not venture to separate the Yunnan birds as a race, although my four skins from Ta-t sien-lu and Szechuan are much whiter. All the series of 7 ♂♂ and 8 ♀♀ ad. sent by Forrest show signs of staining on various parts of the plumage, so that it is not certain if all Szechuan birds are always so white when shot wild and the skins not remade at home. There are in some of Forrest's specimens, moreover, some fresh-coming feathers pure white in colour. The fledgling is very interesting, as it resembles in pattern what one would expect a young *Tetraogallus* to be like.

Fledgling.—Head still in down, centre of crown and hindneck chestnut brown, sides buffish grey-white, sides of head buffish cream-colour, a line behind eye on to hindneck black; back and wing-coverts grey, with rusty-buff shaft lines and bands; wings blackish brown-grey, vermiculated with brown; rump grey, mixed with chestnut; tail grey; chin and throat yellowish cream-colour; breast grey, flammulated with buff; abdomen pale buffish grey.

Chick.—Top of head, hindneck, and rest of upperside deep chestnut brown mixed with rufous; sides of head and neck creamy yellow, streak behind eye and patch on sides of neck black; whole underside creamy yellow, deepest on throat and chin.

Egg.—Oblong, both ends about equal, shell very rough; colour cream buff;

53 × 41 mm. and 58 × 41 mm. Two eggs hard-set, Lichiang Range. These eggs are very small.

6 ♂♂, 6 ♀♀ ad., 1 fledgling, 3 pulli, July and October 1922, 12,000–14,000 ft., east flank of Lichiang Range.

6. *Pucrasia meyeri* Mad.

Pucrasia meyeri Madarász, *Ibis*, 1886, p. 145 (Central Thibet!).

The very fine series consists of 7 ♂♂, 1 ♀ ad., and 3 ♂♂ juv., of two ages. The one ♂ is apparently 7 to 8 months old (February 1922), and is in fully mature ♂ plumage, except the thighs and wings, which still retain the ♀ coloration. The other two young ♂♂ cannot be more than 4 months old (October 1922); they are not much more than two-thirds the size of the adult ♂, and exhibit almost everywhere, except on the flanks and sides of breast, the ♀ plumage. On the flanks and sides of the breast the ♂ lanceolate feathers are present, but with a less sharply marked colour pattern.

7 ♂♂, 1 ♀ ad., 3 ♂♂ juv., N.W. flank of Lichiang Range, 14,000–15,000 ft., February and October 1922.

7. *Phasianus colchicus elegans* Elliot.

Phasianus elegans Elliot, *Ann. Mag. Nat. Hist.* (4), vi. p. 312 (1870), Seehnen.

Forrest sent 1 ♂, 2 ♀♀ adult.

I am convinced that Mr. La Touche's *Phasianus colchicus rothschildi* is nothing but *C. elegans* in worn plumage, when the feathers of the hindneck and inter-scapulum get somewhat disintegrated and fade from deep chestnut to golden brown, for all Mr. La Touche's series is from March and April, while all Forrest's 3 ♂♂ and 3 ♀♀ are from December, July, and September.

1 ♂, 2 ♀♀, July–September 1922, Lichiang Range, 9,000–11,000 ft. [*Egg*.—Pointed at smaller end, grey-brownish olive, darker than most other forms of *colchicus* and rather small: 45 × 36 mm.; 44.5 × 35 mm.; 46 × 34 mm.; 44.5 × 34 mm.; 46 × 34.5 mm. Five very small eggs.]

8. *Chrysolophus amherstiae* (Leadb.).

Phasianus amherstiae Leadbeater, *Trans. Linn. Soc. Lond.*, xvi. p. 129, pl. xv (1828) (said to have been from mountains of Cochinchina).

Of this wonderful pheasant, Forrest has sent another fine series.

Ch. amherstiae produces absolutely fertile hybrids with *Ch. pictus*; when these hybrids are bred back with *amherstiae* they eventually revert to a plumage almost absolutely similar to pure *amherstiae*, but can always be recognised by the absence of the green forehead and the deeper, more crimson colour of apical portions of the lateral tail feathers.

6 ♂♂ ad., 3 ♀♀ ad., 2 ♂♂ juv., 1 ♀ juv.

9. *Sphenurus sphenurus yunnanensis* La Touche.

3 ♂♂, 2 ♀♀ adult, July–October 1922, Lichiang Range, 10,000–12,000 ft.

10. *Oenopopelia tranquebarica humilis* (Temm.).

5 ♂♂, 4 ♀♀, Tali Valley, 6,000–7,000 ft., May 1922.

11. *Columba hodgsoni* Vig.

1 ♂, Lichiang Range, 10,000–11,000 ft., June 1922.

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

Pelecanus sinensis Shaw & Nodder, *Nat. Misc.*, xiii. pl. 529 and text (1801) (China).

1 ♂ jun., volcanic crater pool east flank Lichiang Range, 10,000 ft., October 25, 1922.

13. *Butorides striatus javanicus* (Horsf.).

1 ♂, Tali Valley, 5,000–6,000 ft., May 1922.

*14. *Pernis apivorus orientalis* Tacz.

Pernis apivorus orientalis Taczanowski, *Faun. Orn. Sib. Or.*, i. p. 50 (1891) (East Siberia).

The ♂ is uniform deep brown, with the tailbars indistinct and of a blacker brown. The ♀ is much paler, above brown, with paler wood-brown or whitish on wing secondaries and coverts, and most feathers of hindneck pale wood-brown with dark centres; below chin and throat buffish white, with black horse-shoe band on sides of throat and upper breast; rest of underside grey buff washed with wood-brown; bill dark bluish-black on upper mandible and tip of lower, rest of lower and base of upper mandible pale greenish blue; cere pale orange; feet pale orange; iris brown.

1 ♂, 1 ♀, cliffs and conifer forests, east flank of Lichiang Range, 12,000–13,000 feet, October 16, 1922.

*15. *Milvus lineatus* (Gray).

Haliaeetus lineatus Gray in *Hardwicke's Ill. Ind. Zool.*, i. p. 1, pl. xviii (1832) (China).

1 ? Lichiang Range, 10,000 ft., September 5, 1922.

16. *Accipiter affinis* Gurney.

1 ♀ ad., hills east of Tengyueh, 8,000 ft., April 1922; ♂ jun., April 1922, vicinity of Tengyueh, 5,000–7,000 ft., March 1922.

17. *Accipiter nisus melanochistus* Hume.

1 ♀ ad., 1 ♂ ad. (labelled ♀), east flank of Lichiang Range, 12,000–13,000 ft., October 1922.

18. *Accipiter gentilis khamensis* (Bianchi).

Astur palumbarius khamensis Bianchi, *Bull. B.O.C.*, xvi. p. 70 (1906) (Kham, S.E. Thibet).

In my article on Forrest's first collection, NOVITATES ZOOLOGICAE, xxviii. p. 19, No. 32 (1921), I assigned a young ♀ Goshawk to the subspecies *A. gentilis schvedowi* (Menzb.), but I expect that also belongs here, though it may have been a bird on migration.

1 ♀ ad., Lichiang Range, 11,000–12,000 ft., September 30, 1922.

19. *Falco tinnunculus interstinctus* (McClell.).

2 ♂♂ ad., 5 ♀♀ ad., Lichiang Range, 9,000–12,000 ft., September–October, 1922. (One ♀ is very black.)

20. *Glaucidium cuculoides whitelyi* (Blyth).

Athene whitelyi Blyth, *Ibis* (2), iii. p. 313 (1867) (Japan).

Forrest obtained a ♂ in fresh plumage, which proves that the worn ♀ of his second collection and the present ♂ are true *whitelyi*.

1 ♂, N.W. flank of Lichiang Range, 11,000 ft., July 1922.

21. *Otus bakkamoena glabripes* (Swinh.).

1 ♂ ad., environment of Tengyueh, 7,000 ft., March 1922.

22. *Cuculus canorus telephonus* Heine.

1 ♂, 3 ♀♀ ad., 1 ♂ jun., 2 ♂♂ juv., Lichiang Range, 9,000–10,000 ft., May–June 1922.

23. *Cuculus intermedius intermedius* Vahl.

1 ♂, 1 ♀, N.W. flank, Lichiang Range, 9,000–10,000 ft., August–September 1922.

24. *Cuculus sparverioides* Vig.

3 ♂♂ ad., N.W. flank, Lichiang Range, 10,000 ft., July 1922.

25. *Jynx torquilla japonica* Bp.

1 ♀, Lichiang Valley, 8,000–9,000 ft., September 9, 1922.

26. *Dryocopus forresti* Rothsch.

1 ♂ (labelled ♀), N.W. flank Lichiang Range, 9,000 ft., July 1922.

27. *Picoides tridactylus funebris* Verr.

1 ♂ ♀, Lichiang Range, 10,000 ft., October 1922.

28. *Dryobates pygmaeus omissus* Rothsch.

1 ♂, 2 ♀♀, environment of Tengyueh, 6,000–7,000 ft., March 1922; 1 ♂, 4 ♀♀, Lichiang Range, 9,000–11,000 ft., June–August 1922.

29. *Dryobates hyperythrus subrufinus* (Cab. & Heine).

2 ♂♂, N.W. flank Lichiang Range, 11,000–12,000 ft., September 1922.

30. *Dryobates cabanisi cabanisi* (Malh.).

1 ♀ ad., east flank Lichiang Range, 12,000–13,000 ft., October 14, 1922; 1 ♂ juv., Lichiang Range, 10,000–11,000 ft., September 1922; 1 ♀ ad., hills round Tengyueh, 8,000 ft., March 1922.

31. *Picus canus sordidior* (Rippon).

3 ♂♂ ad., 1 ♀ juv., Lichiang Range, 9,000–11,000 ft., September 1922 ;
1 ♂, hills round Tengyueh, 6,000 ft., March 1922.

32. *Cyanops asiatica* (Lath.).

1 ♂ ad., hills round Tengyueh, 7,000 ft., April 1922.

33. *Halcyon smyrnensis fusca* (Bodd.).

1 ♂ ad., hills north of Tengyueh, 7,000 ft., March 1922.

34. *Ceryle lugubris guttulata* Stejn.

1 ♂ jun., Ma-Chang Valley, north of Tengyueh, 6,000 ft., latitude 25° 30' N.,
February 10, 1922.

35. *Palaeornis schisticeps finschi* Hume.

3 ♂♂, 1 ♀ ad., 1 ♀, 1 ? juv. (in full moult), N.W. flank Lichiang Range,
10,000–12,000 ft., September 1922 ; 1 ♂ ad., N.W. flank Lichiang Range,
10,000–12,000 ft., October 1922 (fresh complete plumage).

*36. *Palaeornis derbyanus* Fraser.

Palaeornis derbyanus Fraser, P.Z.S., 1850, p. 245, pl. xxv. (No locality, Cage Bird.)

Oustalet described the bird from the West of China (Upper Yangtze) as *P. salvadorii*, giving as distinction the smaller size and different underwing coverts. I find that a ♂♀ sent to me by Oustalet in exchange as eotypes of *salvadorii* do not differ from typical *derbyanus*, and therefore Oustalet's name sinks as a synonym. The ♂ differs from the ♀ in the breast, throat, and abdomen, being of a purer, deeper, lavender purple, and in the absence of the pink band above the green on the sides of the neck. The ♂ also has the upper mandible scarlet.

Bill ♂ scarlet crimson, tip yellow, lower mandible black. ♀ upper and under mandibles black ; legs and feet ♂ grey brown, ♀ dark grey ; iris pale greyish yellow.

1 ♂, 1 ♀ ad., 1 ♂ juv., N.W. flank Lichiang Range, 10,000–12,000 ft.,
September 1922.

37. *Coracias affinis* McClell.

1 ♂ hills round Tengyueh, 6,000 ft., March 1922 ; 1 ♀, Lichiang Range,
9,000 ft., June 1922.

38. *Caprimulgus macrurus ambiguus* Hart.

1 ♂, Lichiang Range, 11,000 ft., September 1922.

39. *Tesia castaneo-coronata* (Burton).

3 ♂♂, Lichiang Range, 11,000–12,000 ft., September 1922.

40. *Troglodytes troglodytes talifuensis* (Sharpe).

1 ♂, 1 ♀, eastern flank Lichiang Range, 9,000–11,000 ft., September–October 1922.

41. *Prunella strophciata multistriata* (David).

8 ♂♂, 2 ♀♀ (1 marked ♂), eastern flank Lichiang Range, 9,000–11,000 ft., October 1922; 1 ♂, Lichiang Range, 9,000 ft., June 1922.

42. *Prunella immaculata* (Hodgs.).

1 ♀ fledgling, Lichiang Range, 10,000 ft., July 1922.

43. *Enicurus sinensis* Gould.

1 ♂, eastern flank, Lichiang Range, October 19, 1922.

44. *Hodgsonius phoenicuroides* (Gray).

6 ♂♂, 3 ♀♀ ad., 1 ♂ juv., Lichiang Range, 10,000–11,000 ft., August–September 1922.

45. *Luscinia davidi* (Oust.).

Calliope davidi Oustalet, *Bull. Mus. Paris*, p. 222 (1892) (Ta-t sien-lu).

Forrest sent in this collection 3 fine adult ♂♂ and 2 ♀♀, which are most welcome, for the only specimens of this beautiful bird in England before were 2 very defective ♂♂ at Tring and the 1 moulting and not fully adult ♂ skin sent by Forrest in his first collection.

3 ♂♂, 2 ♀♀ ad., Lichiang Range, 10,000–11,000 ft., August–September 1922 (1 ♀ minus label).

*46. *Luscinia calliope* (Pall.).

Motacilla calliope Pallas, *Reise versch. Prov. Russ. Reich*, iii. p. 697 (1776) (Yenisei to Lena Rivers).

This is the first of this species obtained by Forrest.

1 ♂, eastern flank, Lichiang Range, 9,000 ft., October 11, 1922.

46a. *Luscinia brunnea* (Hodgs.).

2 ♂♂, 1 ♀ ad. (marked ♂ err.), Lichiang Range, 10,000–11,000 ft., July–September 1922.

46b. *Notodela leucura* (Hodgs.).

1 ♀ juv., Lichiang Range, 9,000–10,000 ft., July 1922.

47. *Phoenicurus frontalis sinæ* Hart.

2 ♂♂, 1 ♀ ad., Lichiang Range, 10,000–11,000 ft., June 1922; 1 ♂, 1 ♀ ad., eastern flank, Lichiang Range, 9,000–12,000 ft., October 1922; 2 ♀♀, hills round Tengyueh, 6,000 ft., March 1922. (The rufous colour of the underside of ♂ is variable, but the ♀ is always much greyer and less suffused with orange.)

48. *Phoenicurus schisticeps* (Gray).

1 ♂, 2 ♀♀ ad., 1 ♂ juv., 4 ? juv., Lichiang Range, 10,000–11,000 ft., August–October 1922.

49. *Phoenicurus hodgsoni* (Moore).

1 ♂, vicinity of Tengyueh, 5,000–6,000 ft., March 1922; 1 ♂, Lichiang Range, 9,000 ft., July 1922.

50. *Phoenicurus aureus leucopterus* (Blyth).

2 ♂♂, 1 ♀ ad., vicinity of Tengyueh, 6,000–7,000 ft., March 1922; 2 ♂♂, eastern flank Lichiang Range, 10,000 ft., October 1922; 1 ? juv., Lichiang Range, 9,000 ft., July 1922.

51. *Chaimarrornis fuliginosa fuliginosa* (Vig.).

1 ♂ ad., vicinity of Tengyueh, 6,000 ft., March 1922; 2 ♂♂ ad., Lichiang Range, 9,000–10,000 ft., August–September 1922.

52. *Tarsiger rufilatus practicus* (Bangs & Phill.).

This form is very doubtfully distinct; all the ♂ characters are of no value, as both in Indian and N. Chinese examples the blue varies enormously in shade and brilliancy, and the white bases of the superciliary line are purely individual, as the ♂♂ in the second collection have dusky bases, while the present one has more white than any of the 18 adult Indian and Tsin-Ling ♂♂ at Tring, and those in the first collection have very white bases. The ♀♀, however, appear to be darker and more olive above.

1 ♂ ad., eastern flank Lichiang Range, 10,000 ft., October 1922; 1 ♀ ad., vicinity of Tengyueh, 7,000 ft., March 1922; 1 ? juv., Lichiang Range, September 1922.

52a. *Tarsiger indicus yunnanensis* Rothsch.

1 ♂ juv., eastern flank Lichiang Range, 12,000 ft., October 1922.

53. *Tarsiger chrysaeus* Hodgs.

2 ♂♂ juv., 1 ♀ ad., Lichiang Range, 10,000 ft., September–October 1922.

54. *Copsychus saularis saularis* (Linn.).

2 ♂♂, 1 ♀ ad., vicinity of Tengyueh, 6,000 ft., March 1922.

55. *Oreicola ferrea haringtoni* Hart.

6 ♂♂ ad., 2 ♀♀ ad., 5 ? juv., Lichiang Range, 9,000–10,000 ft., September–October 1922; 2 ♂♂ ad., vicinity of Tengyueh, 7,000 ft., March 1922.

56. *Saxicola torquata indica* Blyth.

1 ♂ ad., 1 ♀ ad., vicinity of Tengyueh, 6,000 ft., March 1922; 1 ♂ ad., 1 ♀ juv., eastern flank Lichiang Range, 9,000–10,000 ft., October 1922; 1 ♀ ad., Lichiang Range, 9,000 ft., May 1922.

57. *Myiophonus eugeniae* Hume.

1 ♂, 1 ♀, Lichiang Range, 10,000 ft., July, 1922; 1 ♂, vicinity of Tengyueh, 6,000-7,000 ft., March 1922.

58. *Monticola solitarius pandoo* (Sykes).

1 ♂ ad., Tengyueh, 5,000-6,000 ft., March 1922; 1 ? juv., Lichiang Range, 11,000 ft., August 1922.

59. *Monticola erythrogaster* (Vig.).

I unfortunately identified the adult ♂ from Lichiang Range in Forrest's first collection as *philippensis*. Both the present specimen and the former one appear more shining blue than my 4 Sikkim ♂♂, but it requires fresh moulted specimens to make certain if the Yunnan birds are a new race.

1 ♂, N.W. flank Lichiang Range, 11,000 ft., August 1922.

60. *Turdus castaneus gouldi* (Verr.).

7 ♂♂, 3 ♀♀ ad., N.W. flank Lichiang Range, 12,000 ft., September 1922; 1 ♀ ad., 1 ? juv., Lichiang Range, 11,000 ft., September 1922.

61. *Turdus eunomus* Temm.

Turdus eunomus Temminck, pl. col. pl. 514 (1830) (Japan).

This is the bird hitherto either quoted as *dubius* Bechst. or *fuscatus* Pall. I myself quoted it as *fuscatus*, as the description of *dubius* does not agree entirely. Now, however, it has come to light that *fuscatus* Pall. is antedated by *fuscatus* Vieill., an American species, so that henceforth this bird must be called *eunomus*.

2 ♂♂, 1 ♀, vicinity of Tengyueh, 5,000-8,000 ft., March 1922; 1 ♂, eastern flank Lichiang Range, 10,000 ft., October 1922.

62. *Turdus eunomus* × *Turdus naumanni*.

1 ♂, west flank Lichiang Range, 10,000 ft., July 1922. This bird on the breast is nearer *naumanni*.

63. *Turdus dissimilis* Blyth.

2 ♂♂, 1 ♀ (labelled ♂), vicinity of Tengyueh, 6,000-7,000 ft., March 1922.

64. *Turdus obscurus* Gm.

1 ♂, eastern flank Lichiang Range, 12,000 ft., October 1922.

65. *Turdus auritus conquisitus* Bangs.

1 ♀ ad., 2 ♂♂, 1 ? juv., Lichiang Range, 12,000 ft., August-September 1922.

66. *Turdus mollissimus* Blyth.

1 ?, Lichiang Range, 12,000 ft., October 1922; 1 ?, east flank, Lichiang Range, 10,000-12,000 ft., October 1922.

67. *Turdus dauma dauma* Lath.

1 ♂, Lichiang Range, 12,000 ft., October 1922.

68. *Pomatorhinus ruficollis bakeri* Har.

Pomatorhinus ruficollis bakeri Harington, *Journ. Bomb. Nat. Hist. Soc.* xxiii. p. 336 (1914) (Shillong).

The series sent by Forrest this time is very uniform in coloration, except as regards the extent of white on the underside.

5 ♂♂, 1 ♀, Tengyueh district, 6,000–7,000 ft., March 1922; 1 ♂, hills east of Lichiang Plain, 11,000 ft., October 12, 1922; 4 ♂♂, 2 ♀♀, 1 ♀, Lichiang Range, 9,000–10,000 ft., September 1922.

I erroneously referred this form to *stridula* in my two previous articles, owing to some extra red examples.

69. *Pomatorhinus maclellandi odicus* Bangs & Phill.

5 ♂♂, 6 ♀♀, 1 ♀, Lichiang Range, 9,000–10,000 ft., September 1922.

70. *Ianthocincla affinis oustaleti* Hart.

1 ♀, east flank Lichiang Range, 10,000–11,000 ft., October 1922; 4 ♂♂, 3 ♀♀, Lichiang Range, 10,000 ft., September 1922.

71. *Ianthocincla ellioti ellioti* (Verr.).

16 ♂♂, 12 ♀♀, Lichiang Range, 10,000–11,000 ft., June–October 1922.

72. *Ianthocincla ellioti yunnanensis* (Rippon).

Trocholopteron yunnanense Rippon, *Bull. B.O.C.* xix. p. 32 (1906) (Yangtze River, Yunnan).

This is the same bird as *e. bonvaloti* Oust. = *e. horonipeta* Hart.

1 ♀, east flank, Lichiang Range, 12,000–13,000 ft., October 1922. (Most of those recorded NOVITATES ZOOLOGICAE, xxx. p. 43, are this form.)

73. *Ianthocincla cineracea styani* (Oust.).

4 ♂♂, 1 ♀, N.W. flank Lichiang Range, 9,000–11,000 ft., May–October 1922.

74. *Ianthocincla bieti* Oust.

1 ♀, N.W. flank Lichiang Range, 10,000 ft., August 1922.

75. *Ianthocincla lanceolata bonvaloti* (Oust.).

1 ♀, east flank Lichiang Range, 10,000–11,000 ft., October 1922; 1 ♂, 1 ♀, Lichiang Range, 9,000–11,000 ft., July 1922.

76. *Ianthocincla lanceolata lanceolata* (Verr.).

1 ♂, 1 ♀, N.W. flank Lichiang Range, 10,000 ft., August 1922.

77. *Ianthocincla maxima* (Verr.).

3 ♂♂, 2 ♀♀, east flank Lichiang Range, 10,000–12,000 ft., October 1922; 2 ♂♂, 2 ♀♀, 5 ?, N.W. flank Lichiang Range, 10,000–13,000 ft., September–October, 1922; 6 ♂♂, 7 ♀♀, 2 ?, Lichiang Range, 10,000–11,000 ft., September 1922.

78. *Ianthocincla sennio* (Swinh.).

3 ♂♂ (1 very dark), vicinity of Tengyueh, 6,000 ft., March 1922; 5 ♂♂, 1 ♀, 2 ?, Lichiang Range, 10,000–11,000 ft., August–October 1922; 1 ♂ ?

79. *Moupinia poecilotis sordidior* Rothsch.

5 ♂♂, 3 ♀♀, 1 ?, Lichiang Range, 9,000–11,000 ft., July–October 1922; 1 ♂, hills east of Lichiang Valley, 11,000 ft., October 1922.

80. *Schoeniparus genestieri* (Oust.).

1 ♂, 1 ♀, 1 ?, vicinity of Tengyueh, 6,000 ft., March 1922; 2 ♂♂, 2 ♀♀, 9,000–10,000 ft., September–October 1922.

81. *Schoeniparus intermedius* (Rippon).

Again I have only two young birds of this very closely allied form. 2 ♂♂, Lichiang Range, 9,000–10,000 ft., August–September 1922.

82. *Proparus ruficapillus sordidior* Rippon.

3 ♂♂, 1 ♀, 1 ?, Lichiang Range, 10,000–12,000 ft., June–October 1922.

83. *Proparus vinipectus bieti* Oust.

6 ♂♂, 5 ♀♀, 3 ?, Lichiang Range, 9,000–10,000 ft., August–September 1922; 1 ♀, hills east of Lichiang Valley, 11,000 ft., October 1922.

84. *Lioptila desgodinsi* (Dav. & Oust.).

11 ♂♂, 5 ♀♀, 1 ?, Lichiang Range, 9,000–10,000 ft., June–October 1922.

85. *Brachypteryx cruralis* Blyth.

♂♂, 1 ? juv., Lichiang Range, 10,000–11,000 ft., July–August 1922.

86. *Siva strigula yunnanensis* Rothsch.

Eggs, four in clutch, turquoise blue, sparsely spotted with black spots, mostly on upper half of egg; hard-set, three unmeasurable, fourth egg 21 × 15 mm. Nest cup-shaped, 4 in. = 102 mm. across by 2½ in. = 63 mm. deep. Main body of nest composed of closely woven black fibrous roots, covered outside with moss and pieces of bamboo strippings.

20 ♂♂, 11 ♀♀, 2 ?, Lichiang Range, 12,000 ft., August 1922; 1 ♂, N.W. flank Lichiang Range, 12,000 ft.; 2 ♂♂, 1 ♀, vicinity of Tengyueh, 7,000–8,000 ft., March 1922.

87. *Siva cyanuroptera wingatei* Grant.

1 ♂, 3 ♀♀, Lichiang Range, 10,000 ft., August 1922; 3 ♂♂, 1 ♀, N.W. flank, Lichiang Range, 9,000–10,000 ft., August 1922; 3 ♂♂, vicinity of Tengyueh, 7,000 ft., March 1922.

88. *Pteruthius aerolatus ricketti* (O. Grant).

Forrest has this time sent 2 ♀♀; he sent 4 ♂♂ in his first collection. 2 ♀♀, Lichiang Range, 10,000–11,000 ft., July and September 1922.

89. *Suya crinigera yunnanensis* Har.

1 ♂, vicinity of Tengyueh, 5,000–6,000 ft., March 1922.

90. *Suya superciliaris* Anders.

1 ♂, vicinity of Tengyueh, 6,000 ft., March 1922; 1 ♀ north of Tali, 7,000 ft., May 1922.

91. *Yuhina gularis griseotincta* Rothsch.

2 ♂♂, 1 ♀, Lichiang Range, 10,000–13,000 ft., June–September 1922.

92. *Yuhina diademata* Verr.

Yuhina diademata Verreaux, *Nouv. Arch. Mus. Paris*, v, *Bull.*, p. 35 (1869) (East Thibet).

Colonel Rippon, in *Bull. B.O.C.*, xi. p. 12 (1900), described from east of Bhamo examples of this species as a new species under the name of *Yuhina ampelina*. He gave as the distinguishing characters that it was deeper in colour and that it was grey-brown where *diademata* was vinaceous brown or yellowish brown. In the present very fine series of 27 skins, every gradation from deep grey brown to yellowish wood brown is found, and it is quite evident, as Mr. Kinnear pointed out to me, that the so-called *ampelina* is only the freshly moulted *diademata*.

12 ♂♂, 10 ♀♀, 1 ?, Lichiang Range, 12,000–13,000 ft., July–October 1922; 1 ♀, east flank Lichiang Range, 11,000–13,000 ft., October 1922; 2 ♂♂, 1 ♀, hills east of Lichiang Plain, 11,000 ft., October 1922.

93. *Yuhina occipitalis obscurior* Rothsch.

13 ♂♂, 19 ♀♀, 1 ?, Lichiang Range, 12,000 ft., August–October 1922.

94. *Alcippe nipalensis yunnanensis* Har.

3 ♂♂, 1 ♀, 1 ?, hills east of Tengyueh, 6,000–8,000 ft., March 1922; 1 ♂, 1 ♀, Lichiang Range, 11,000 ft., August 1922.

95. *Cisticola cisticola tintinnabulans* (Swinh.).

1 ♂, Tali Valley, 7,000 ft., May 1922.

96. *Lusciniola thoracica* (Blyth).

6 ♂♂, 2 ♀♀, Lichiang Range, 10,000–12,000 ft., August–September 1922.

97. *Horeites brunneifrons* (Hodgs.).

2 ♂♂, 1 ♀, Lichiang Range, 11,000–12,000 ft., August–September 1922.

98. *Phylloscopus arandii* (Milne-Edw.).

1 ♀, Lichiang Range, 10,000 ft., October 1922.

99. *Phylloscopus subaffinis* (Grant).

1 ♀, vicinity of Tengyueh, 7,000 ft., March 1922.

100. *Phylloscopus magnirostris* Blyth.

6 ♂♂, 1 ♀, Lichiang Range, 9,000–14,000 ft., August–September 1922.

101. *Phylloscopus proregulus forresti* Rothsch.

1 ♀, hills east of Tengyueh, 7,000 ft., March 1922.

102. *Phylloscopus davisoni* (Oates).

1 ♂, Lichiang Range, 9,000–12,000 ft., October 1922.

103. *Cryptolopha burkii tephrocephala* (Anders.).

5 ♂♂, 2 ♀♀ ad., Lichiang Range, 10,000–12,000 ft., July–September 1922 ;
1 ♂ juv., vicinity of Tengyueh, 7,000–8,000 ft., March 1922.

104. *Culicicapa ceylonensis* (Swains.).

2 ♂♂, 5 ♀♀, 2 ?, Lichiang Range, 9,000–11,000 ft., August and October 1922 ;
2 ♀♀, 1 ?, hills east of Tengyueh, 7,000–8,000 ft., March 1922.

105. *Chelidorynx hypoxantha* (Blyth).

3 ♂♂, 3 ♀♀, Lichiang Range, 10,000 ft., July–September 1922 ; 1 ♂, vicinity
of Tengyueh, 8,000 ft., March 1922.

106. *Muscicapa melanops melanops* Vig.

3 ♂♂ ad., 3 ♀♀ ad., 1 ♂ juv., 1 ? juv., Lichiang Range, 9,000–10,000 ft.,
August–October 1922 ; 1 ♂ ad., 2 ♂♂ juv., east of Tengyueh, 6,000–7,000 ft.,
March 1922.

107. *Muscicapa tricolor tricolor* (Hodgs.).

The use of *leucomelanura* is ruled out and the species must stand as *tricolor*,
but I find after all Yunnan examples must be considered to belong to the typical
race and not to *cerviniventris*.

7 ♂♂, 1 ♀ ad., 2 ♂♂ juv., Lichiang Range, 10,000–12,000 ft., August–
September 1922.

108. *Muscicapa parva albicilla* (Pall.).

1 ♂, 2 ♀♀, hills north and east of Tengyueh, 6,000–8,000 ft., March 1922 ;
1 ♂ juv., Lichiang Range, 10,000 ft., October 1922.

109. *Muscicapa hodgsoni* (Verr.).

1 ♂, 1 ? juv., Lichiang Range, 10,000 ft., September 1922.

109A. *Muscicapa strophciata* (Hodgs.).

The birds marked as ♀ by Forrest are probably young ♂♂, as they are much greyer than my Sikkim ♀, but the adult ♂♂ from Yunnan appear whiter below and smaller than Sikkim birds, but I do not venture to separate them on the material available, as all the Yunnan examples are much worn.

6 ♂♂ ad., 1 ♂ juv., 2 sexed ♀♀ (but ?), Lichiang Range, 10,000–11,000 ft., August 1923.

110. *Muscicapa sibirica fuliginosa* Hodgs.

1 ♂, 4 ♀♀, 4 juv., Lichiang Range, 10,000–12,000 ft., August–September 1922.

*111. *Muscicapa latirostris* Raffl.

Muscicapa latirostris Raffles, *Trans. Linn. Soc. Lond.* xiii. 2, p. 312 (1821) (Sumatra).

This has not been sent before by Forrest.

4 ♀♀, Lichiang Range, 10,000–11,000 ft., May–September 1922.

112. *Muscicapa rubeculoides dialilaema* (Salvad.).

4 ♂♂, Lichiang Range, 9,000–11,000 ft., June–October 1922.

*113. *Hypothymis azurea styani* (Hartl.).

Siphia styani Hartlaub, *Abh. Nat. Ver. Bremen*, vol. xvi. pt. ii. p. 248 (1898) (Hochow & Nodonha, Hainan).

This is the first example sent by Forrest.

1 ♂, vicinity of Tengyueh, 6,000 ft., March 1922.

114. *Niltava sundara* Hodgs.

8 ♂♂ ad., 2 ♂♂ juv., Lichiang Range, 10,000–11,000 ft., July–September 1922; 1 ♀, N.W. flank Lichiang Range, 10,000 ft., September 1922.

115. *Rhipidura albicollis albicollis* (Vieill.).

3 ♂♂, 4 ♀♀ ad., 1 ♂, 1 ♀ juv., Lichiang Range, 9,000–10,000 ft., June–October 1922.

116. *Pericrocotus roseus* (Vieill.).

3 ♂♂ ad., 1 ♀ ad., Lichiang Range, 9,000–11,000 ft., May–June 1922; 3 ♂♂ ad., 1 ♂ juv., vicinity of Tengyueh, 7,000–8,000 ft., March 1922.

117. *Pericrocotus brevirostris ethologus* Bangs & Phill.

2 ♂♂ ad., 1 ♀ juv., Lichiang Range, 9,000–10,000 ft., September 1922; 1 ♀ ad., vicinity of Tengyueh, 7,000 ft., March 1922.

118. *Campephaga melanoptera* (Rüpp.).

1 ♀, Lichiang Range, 9,000 ft., July 1922.

119. *Microscelis leucocephalus* (Gm.).

3 ♂♂, Lichiang Range, 8,000–10,000 ft., July and October 1922; 2 ♂♂, N.W. flank Lichiang Range, 9,000–10,000 ft., May–June 1922.

120. *Microscelis perniger sinensis* (La Touche).

2 ♀♀ ad., 1 ♀ juv., west flank Lichiang Range, 9,000–10,000 ft., May–July 1922.

121. *Spizixos canifrons* Blyth.

12 ♂♂, 9 ♀♀, Lichiang Range, 10,000 ft., June–August 1922.

122. *Pycnonotus xanthorhous* And.

1 ♂, Lichiang Range, 8,000–9,000 ft., September 1922.

123. *Molpastes nigripileus* (Blyth).

1 ♀, Lichiang Range, 9,000 ft., August 1922.

124. *Molpastes burmanicus* (Sharpe).

1 ♂, Lichiang Range, 9,000 ft., August 1922; 2 ♂♂, 2 ♀♀, vicinity of Tengyueh, 5,000–6,000 ft., March 1922.

*125. *Molpastes atricapillus* (Vieill.).

Musicapa atricapilla Vieillot, *N. Dict. d'Hist. Nat.* xxi. p. 489 (ex Sonn.).

2 ♂♂, 1 ♀, N.W. flank Lichiang Range, 9,000–10,000 ft., July–August 1922. (First time sent by Forrest.)

126. *Alcurus striatus* (Blyth).

1 ♂, vicinity of Tengyueh, 8,000 ft., March 1922.

127. *Lanius schach tephronotus* (Vig.).

2 ♂♂, 1 ? ad., 1 ♀ juv., east flank Lichiang Range, 10,000 ft., October 1922; 5 ♂♂ ad., 1 ♂, 1 ♀ juv., 5 ♂♂, 2 ? juv., Lichiang Range, 9,000–10,000 ft., August–September 1922; 1 ♂, vicinity of Tengyueh, 5,000–6,000 ft., March 1922.

128. *Lanius nigriceps nigriceps* (Frankl.).

1 ♂, Lichiang Range, 10,000 ft., August 1922; 1 ♂, vicinity of Tengyueh, 6,000 ft., March 1922.

129. *Lanius cristatus cristatus* Linn.

1 ♀ juv., east flank Lichiang Range, 10,000 ft., October 1922.

130. *Lanius collurioides* Less.

1 ♂ ad., vicinity of Tengyueh, 6,000 ft., March 1922.

131. *Paradoxornis unicolor saturator* Rothsch.

8 ♂♂, 7 ♀♀, Lichiang Range, 10,000–11,000 ft., September–October 1922.

132. *Paradoxornis brunnea* (Anders.).

In my account of the two previous collections, I followed Hartert (*Vog. Pal. Faun.*, i, p. 411, footnote) and treated this bird as a race of *webbiana*. I now find it occurs alongside my *webbiana ricketti*, and moreover differs conspicuously from the other forms, put by Hartert as races of *webbiana*, by its deep chestnut cheeks. I therefore consider it is an undoubted species and not a race of *webbiana*.

1 ♂, 1 ♀, vicinity of Tengyueh, 6,000–7,000 ft., March 1922.

133. *Paradoxornis webbiana ricketti* Rothsch.

1 ♂, 4 ♀♀, Lichiang Range, 9,000–12,000 ft., May–October 1922.

134. *Paradoxornis fulvifrons cyanophrys* (Dav.).

5 ♂♂, 2 ♀♀, Lichiang Range, 9,000–11,000 ft., July–August 1922.

135. *Paradoxornis guttaticollis* A. David.

1 ♂, 2 ♀♀, Lichiang Range, 9,000–10,000 ft., August 1922; 1 ♂, hills east of Lichiang Valley, 9,000–11,000 ft., June 1922.

136. *Aegithaliscus bonvaloti* (Oust.).

1 ♀, Lichiang Range, 10,000 ft., August 1922.

137. *Aegithaliscus concinnus talifuensis* Ripp.

8 ♂♂, 5 ♀♀, Lichiang Range, 10,000–12,000 ft., May–September 1922.

138. *Parus modestus saturator* (Ripp.).

1 ♀, hills east of Tengyueh, 8,000 ft., March 1922.

139. *Parus ater aemodius* Hodgs.

1 ♂, 1 juv. ?, Lichiang Range, 10,000–12,000 ft., August–September 1922.

140. *Parus dichrous wellsii* Baker.

5 ♂♂, 2 ♀♀, 1 ?, Lichiang Range, 10,000–12,000 ft., July–September 1922;
1 ♂, eastern flank, Lichiang Range, 13,000 ft., October 14, 1922.

141. *Parus monticolus yunnanensis* La Touche.

Parus monticolus yunnanensis La Touche, *Bull. B.O.C.*, vol. xlii. p. 51 (1921) (S.E. Yunnan).

In my first article I listed this bird as *monticolus insperatus* in error, and in the second article I quoted it as *m. monticolus*. As Mr. La Touche has separated the Yunnan birds, I quote them under his name, but I consider them very feebly distinct, if at all.

2 ♂♂, 1 ♀, Lichiang Range, 9,000–10,000 ft., July–October 1922.

142. *Parus major tibetanus* Hart.

Parus major tibetanus Hartert, *Vög. Pal. Faun.* i. p. 346, N. 544 (1905) (Chaksam).

I described this bird as a new form under the name of *m. longipennis* (*Bull. B.O.C.*, xliii. p. 11 (1922)) (Lichiang Range); but Dr. Hartert and I, in spite of the bad condition of his type, have come to the conclusion that it cannot be separated from *m. tibetanus*.

3 ♂♂, 1 ♀, Lichiang Range, 9,000–11,000 ft., July–October 1922; 1 ♂, 1 ♀, hills round Tengyueh, 6,000–7,000 ft., March 1922.

*143. *Cephalopyrus flammiceps olivaceus* subsp. nov.

♂ differs from *f. flammiceps* in less extent of red on forehead, much deeper green above, being dark olive, not olivaceous golden green. Below it differs in the golden orange being confined to the throat; the chest and upper abdomen being golden olive green and the flanks and lower abdomen buffish grey, slightly washed with yellowish green.

1 ♂, vicinity of Tengyueh, 8,000 ft., March 1922.

144. *Sitta europaea nebulosa* La Touche.

Sitta europaea nebulosa La Touche, *Bull. B.O.C.*, vol. xlii. p. 55 (1921) (S.E. Yunnan).

This is the bird I listed as *e. montium*. Mr. La Touche considers it very distinct, but I cannot see that it is very different from *montium*, if at all.

2 ♂♂, 1 ♀, Lichiang Range, 9,000–11,000 ft., July and September 1922.

145. *Sitta yunnanensis* O.-Grant.

1 ♂, 1 ♀, 9,000–10,000 ft., Lichiang Range, July–August 1922.

146. *Certhia himalayana yunnanensis* Sharpe.

3 ♂♂ juv., Lichiang Range, 9,000–11,000 ft., August and October 1922.

147. *Certhia familiaris khamensis* Bianchi.

1 ♀, 2 ♀, Lichiang Range, 9,000–11,000 ft., August–October 1922.

148. *Zosterops palpebrosa simplex* Swinh.

3 ♂♂, 2 ♀♀, 1 ♀, Lichiang Range, 8,000–10,000 ft., September–October 1922; 2 ♂♂, hills east of Tengyueh, 8,000 ft., March 1922.

149. *Dicaeum ignipectus ignipectus* (Blyth).

1 ♂, Lichiang Range, 12,000 ft., August 1922; 1 ♂, hills east of Tengyueh, 7,000 ft., April 1922.

150. *Dicaeum minullum olivaceum* Wald.

2 ♀♀, Lichiang Range, 12,000 ft., September–October 1922.

151. *Pachyglossa melanozantha* Blyth.

4 ♂♂, 1 ♀, Lichiang Range, 10,000–11,000 ft., July–August 1922.

152. *Aethopyga dabryi* (Verr.).

12 ♂♂ ad., 1 ♂ juv., 2 ♀♀, Lichiang Range, 11,000–12,000 ft., June–September 1922; 1 ♀, hills east of Tengyueh, 7,000–8,000 ft., March 1922.

153. *Motacilla alba hodgsoni* Blyth.

3 ♂♂, 1 ♀, Lichiang Range, 9,000–10,000 ft., July–October 1922.

*154. *Motacilla alba baicalensis* Swinh.

Motacilla baicalensis Swinhoe, *Proc. Zool. Soc. Lond.*, 1871, p. 363 (Eastern Asia).

1 ♂, Lichiang Range, 9,000–10,000 ft., October 1922.

155. *Motacilla boarula melanope* Pall.

2 ♀♀, Lichiang Range, 9,000–10,000 ft., October 1922.

156. *Anthus berezowskii yunnanensis* Uch. & Kur.

3 ♂♂, 4 ♀♀, Lichiang Range, 12,000 ft., August–October 1922; 2 ♂♂, 3 ♀♀, east flank Lichiang Range, 12,000–13,000 ft., October 1922; 2 ♀♀, Tengyueh, 6,000–7,000 ft., March 1922.

157. *Anthus roseatus* Blyth.

1 ♀, east of Tengyueh, 6,000 ft., March 1922.

158. *Anthus richardi richardi* Vieill.

1 ♂, 1 ♀, vicinity of Tengyueh, 5,000–6,000 ft., March 1922.

159. *Oreocorys sylvanus* (Hodgs.)

1 ♂, Lichiang Range, 10,000 ft., July 1922.

160. *Alauda arvensis japonica* Temm. & Schleg.

1 ♂, 3 ♀♀, Lichiang Range, 9,000–11,000 ft., August 1922.

161. *Melophus melanicterus* (Gm.).

1 ♂, N.W. flank, Lichiang Range, 9,000 ft., August 1912; 2 ♂♂, hills north of Tali, 7,000–8,000 ft., May 1922; 1 ♂, hills east of Tengyueh, 8,000 ft., April 1922.

162. *Emberiza pusilla* Pall.

1 ?, Lichiang Range, 9,000–10,000 ft., September 1922; 3 ♀♀, hills east of Tengyueh, 6,000–7,000 ft., March 1922.

163. *Emberiza cia yunnanensis* Sharpe.

8 ♂♂ ad., 4 ♀♀ ad., 2 ♂♂, 1 ♀ juv. (2 ♂♂ ad. marked ♀, 2 ♀♀ marked ♂), Lichiang Range, 9,000–12,000 ft., August–September 1922; 1 ♀ sexed ♂, east flank, Lichiang Range, 10,000 ft., October 1922.

164. *Emberiza elegans* Temm.

13 ♂♂, 1 ♀, Lichiang Range, 9,000-10,000 ft., June-September 1922.

165. *Fringilla montifringilla* Linn.

1 ♂, 1 ♀, Lichiang Range, 10,000-11,000 ft., June-July 1922.

166. *Loxia curvirostra himalayensis* Blyth.

2 ♂♂, juv., 2 ♀♀, Lichiang Range, 12,000-13,000 ft., July-August, 1922 ;
5 ♂♂ ad., 1 ♂ juv., 2 ♀♀, N.W. flank Lichiang Range, 14,000 ft., August 1922.

167. *Propyrrhula subhimachala intensior* Rothsch.

1 ♀, N.W. flank Lichiang Range, 12,000 ft., July 1922.

168. *Procarduelis rubescens saturator* Rothsch.

1 ♂, 4 ♀♀, Lichiang Range, 12,000-13,000 ft., August-September 1922 ;
1 ♂, east flank, Lichiang Range, 13,000 ft., October 1922.

169. *Procarduelis nipalensis* (Hodgs.).

All the Yunnan examples are very dark, but some Sikkim ♂♂ run them very close.

1 ♂, Lichiang Range, 12,000 ft., July 1922.

170. *Carpodacus erythrinus roseatus* (Hodgs.).

1 ♂ ad., 1 ♂ in ♀ plumage, 1 ♂ juv., 13 ♀♀, Lichiang Range, 12,000-14,000 ft., June-August 1922.

171. *Carpodacus vinaceus* Verr.

1 ♂ ad., 2 ♂♂ in ♀ plumage, 4 ♀♀, Lichiang Range, 12,000-13,000 ft., July-September 1922 ; 1 ♂ in ♀ plumage, east flank Lichiang Range, 12,000-13,000 ft., October 27, 1922.

172. *Carpodacus ripponi* (Sharpe).

2 ♂♂ ad., 1 ♂ juv., 3 ♀♀, Lichiang Range, 12,000-13,000 ft., August-October 1922 ; 2 ?, east flank Lichiang Range, 12,000-14,000 ft., October 1922.

173. *Carpodacus thura femininus* Ripp.

7 ♂♂ ad., 3 ♂♂ juv., 1 ♀, Lichiang Range, 12,000-14,000 ft., August-September 1922 ; 1 ♀, east flank Lichiang Range, 13,000 ft., October 9, 1922.

174. *Carpodacus trifasciatus* Verr.

1 ♂ juv., Lichiang Range, 12,000-13,000 ft., June 1922.

175. *Pyrrhula erythaca altera* Ripp.

6 ♂♂ ad., 5 ♂♂ juv., 10 ♀♀, Lichiang Range, 12,000-13,000 ft., July-October 1922.

176. *Carduelis ambiguus* (Oust.).

6 ♂♂ ad., 3 ♀♀ ad. (2 sexed ♂ err.), 1 ♀ juv., Lichiang Range, 9,000–10,000 ft., May–September 1922; 1 ♂ ad., vicinity of Tengyueh, 80,00 ft., March 1922.

177. *Mycerobas carnipes* (Hodgs.).

1 ♂ ad., 2 ♂♂ juv., 7 ♀♀ (1 sexed ♂ err.), Lichiang Range, 10,000–12,000 ft., July–October 1922.

*178. *Mycerobas melanozanthus* (Hodgs.).

Coccothraustes melanozanthus Hodgson, *As. Res.* xix. p. 150 (1836) (Himalayas).

5 ♂♂, 2 ♀♀ ad., 1 ♂ juv. (sexed ♀), Lichiang Range, 11,000–14,000 ft., September 1922.

179. *Eophona melanura migratoria* Hart.

1 ♂ juv., vicinity of Tengyueh, 8,000 ft., March 1922.

180. *Perissopiza icteroides affinis* (Blyth).

1 ♂ ad., 5 ♂♂ juv., 1 nestling, Lichiang Range, 10,000–12,000 ft., September–October 1922.

181. *Munia punctulata topela* Swinh.

2 ♂♂ juv. (sexed ♀ err.), south of Tengyueh, 6,000–7,000 ft., March 1922.

182. *Sporaeginthus flavidiventris* (Wall.).

1 ♀, north of Tali, 7,000 ft., May 1922.

183. *Dicrurus leucophaeus nigrescens* Oates.

1 ♀, vicinity of Tengyueh, 5,000–6,000 ft., March 1922; 1 ? juv., Lichiang Range, 10,000 ft., September 1922.

184. *Oriolus indicus tenuirostris* Blyth.

1 ♂ ad., 2 ♂♂ jun., 4 ♂♂ jun., 1 ♀ ad., Lichiang Range, 9,000–10,000 ft., September 1922.

*185. *Oriolus trailli* (Vig.).

Pastor trailli Vigors, *P.Z.S. Lond.*, 1831, p. 175 (Himalayas).

This is new to Yunnan.

1 ♂ juv., 10,000–11,000 ft., Lichiang Range, July 1922.

186. *Spodiopsar nemoricola* (Yerd.).

1 ♂, Lichiang Range, 10,000 ft., September 1922; 1 ♂, 1 ♀, N.W. flank Lichiang Range, 9,000–10,000 ft., August–September 1922.

187. *Acridotheres tristis* (Linn.).

1 ♀, vicinity of Tengyueh, 5,000–6,000 ft., March 1922.

188. *Acridotheres cristatellus* (Gm.).

1 ♀, vicinity of Tengyueh, 5,000–6,000 ft., March 1922.

189. *Pyrrhocorax pyrrhocorax* (Linn.).

1 ♂ ad., 2 ♀♀ ad., 1 ♂, 1 ♀ juv., Lichiang Range, 9,000–11,000 ft., June–September 1922.

190. *Garrulus bispecularis sinensis* Swinh.

2 ♂♂, Lichiang Range, 9,000–11,000 ft., September–October 1922; 1 ♂, 3 ♀♀, east flank Lichiang Range, 11,000 ft., October 1922.

191. *Nucifraga caryocatactes yunnanensis* Ingr.

7 ♂♂, 7 ♀♀, Lichiang Range, 9,000–11,000 ft., July–October 1922; 1 ♀, east flank Lichiang Range, 9,000–11,000 ft., October 22, 1922.

192. *Urocissa erythrorhyncha erythrorhyncha* (Gm.).

2 ♀♀, Lichiang Range, 9,000 ft., July and October 1922; 1 ♂, east flank Lichiang Range, 10,000 ft., October 19, 1922.

193. *Coloeus dauricus* (Pall.).

1 ♂, 2 ♀♀, Lichiang Range, 9,000 ft., September 1922; 1 ♀, east flank Lichiang Range, 9,000–11,000 ft., October 10, 1922.

*194. *Corvus coronoides intermedius* Adams.

Mr. La Touche evidently compared his specimens with Chinese examples and not with Sikkim ones, or he would have seen that this Yunnan Crow belongs to *c. intermedius*, and therefore his *mengtszensis* is a pure synonym.

1 ♀ ad., 1 ? juv., Lichiang Range, 11,000–12,000 ft., July and September 1922.

The collection consists of 1,172 specimens, of 198 species and subspecies. Those marked with a * were not sent before by Mr. Forrest. They number 13.

A NEW SPECIES OF HAWKMOTH FROM BORNEO

BY DR. KARL JORDAN.

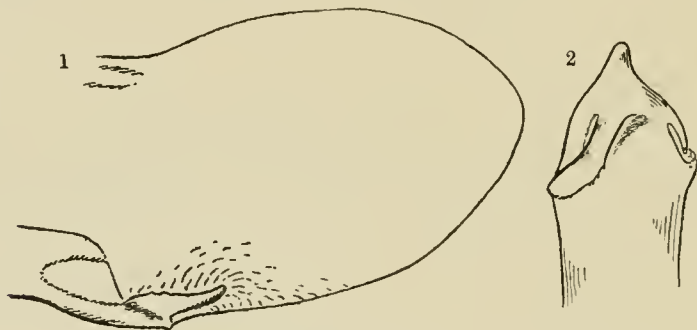
(With two text-figures.)

Panacra psaltria spec. nov. (Text-figs. 1 and 2.)

♂. Near *P. malayana* R. & J. (1903), which we have from Java, Nias (a long series), and Borneo. Larger, more conspicuously coloured.

Frons at each side with a brown stripe edged with grey, similar stripes on the tegula; at base of abdomen there is a brown, dorso-lateral, elongate patch. Scaling in middle of antenna partly blackish; underside of abdomen with two clayish ferruginous lines.

Forewing narrower than in *P. malayana*-♂, the terminal margin half as long again as the wing is broad; brown apical spot continued basad by a straight olivaceous streak, which disappears in the general olivaceous colouring of the disc, from the angle of the termen a broader and darker, diffuse streak runs horizontally costad-basad, the two streaks bounding a narrow pale tri-



angular space, which reaches from the margin about half-way to the upper cell-angle; at hindmargin close to angle a brown spot, and proximally of this spot five brownish black lines, which are much more prominent than the corresponding lines in *P. malayana*, the proximal line the thickest, the last dilated anteriorly, the lines abruptly terminate at lower median vein, but there are four dots of the same colour in front of this vein; the discal lines, of which these five lines are the posterior portions, indistinct and partly broken up into spot on the paler posterior half of the disc, three lines more distinct, but very thin in the before-mentioned dark cloud and the pale triangle, converging in the triangle and here almost united, not extended to costal margin.—Hindwing likewise narrower than in *P. malayana*, abdominal margin much less extended pale, the submarginal band not widened posteriorly, more sharply defined anteriorly than in *P. malayana*.

Underside much more brightly coloured, recalling *P. splendens* Roths. (1894); outer half of forewing, except termen, and submarginal band of hindwing

brick-red. Forewing mummy brown from base to beyond cell-apex, costal edge and termen yellowish buff, a proximal discal line blackish, slightly separated into spots; beyond it two lines of spots, and at apex the two white angle-spots as above; in middle a subterminal greyish cloud. On the basal side of this cloud there is a darkish shadow, which extends basad, joining the darkish proximal area (nearly as in some species of *Rhagastis*); a minute pale discocellular dot.—On hindwing the centre shaded with blackish brown, base with a slightly more greyish tone, costal margin clayish, with the usual small transverse speckles, a pale discocellular spot, just beyond it three black lines, broadish but rather diffuse, the third broken up into spots, at termen below apex a greyish cloud; abdominal margin pale at base, densely speckled with black brown from middle; fringe of termen pale buff yellow, with brown spots at the ends of the veins as on forewing.

Clasper much broader than in *P. malayana*, with four large friction-scales as in that species; harpe much shorter, but of similar shape. Penis-sheath acuminate dorsally, with a large dentate process on the left side (if drawn with the apex pointing upwards) and a narrow process on the right side, the relative size of the processes being the inverse from what they are in *P. malayana*.

Length of forewing: 28 mm.; width, 10 mm.

Hab. Kina Balu, North Borneo (J. Waterstradt), one ♂ in Mus. Berol. ex coll. Standinger.

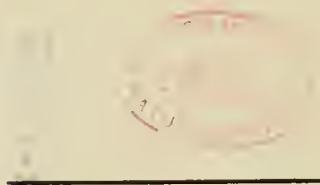
LIST OF THE BUTTERFLIES FIGURED ON PLATE IV

By DR. KARL JORDAN.

IN the *Trans. Ent. Soc. London*, 1913, p. 671 (issued March 1914), Messrs. Rosenberg and Talbot described a number of interesting South American butterflies new to science. The types of these new forms have been presented to the Tring Museum by the senior author, Mr. W. F. H. Rosenberg, to whom we tender also in this place our best thanks.

At Mr. Rosenberg's request we now supplement the descriptions by figuring twelve of the more important forms.

- Fig. 1. *Pierella albofasciata* ♂, l.c., p. 678.
 „ 2. *Antirrhæa watkinsi* ♂, l.c., p. 679.
 „ 3. *Callitaera mimica* ♂, l.c., p. 677.
 „ 4. *Leucothyris polymacula* ♀, l.c., p. 673.
 „ 5. *Lymanopoda umbratilis* ♂, l.c., p. 680.
 „ 6. „ *caudalis* ♂, l.c., p. 681.
 „ 7. „ f. *leucotecta* ♂, l.c., p. 681.
 „ 8. *Napeogenes seminigra* ♂, l.c., p. 672.
 „ 9. *Melinaea orestes clara* ♂, l.c., p. 672.
 „ 10. *Boloria tessellata* ♂, l.c., p. 673.
 „ 11. *Eresia letitia nigra* ♂, l.c., p. 676.
 „ 12. „ *neptoides* ♂, l.c., p. 675.







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