ANNOTATED LISTS OF ACULEATE HYMENOPTERA (EXCEPT HETEROGYNA) AND CHRYSIDS RECENTLY COLLECTED IN MESOPOTAMIA AND NORTH-WEST PERSIA.

BY

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(*With eight Text Figures.*)

(*Continued from p.* 828, *Vol. XXVII.*)

29. *Andrena bimaculata*, Kirby var.—1 ♂, Resht (P), 18th February.

According to Schmiedeknecht's tabulation in *Apid. Europ.* This should be *basalis*, Sichel, and it is coloured exactly according to Sichel's description. It can, however, have nothing to do with *albicrus*, of which Sichel supposed *basalis* to be a variety.

Having examined the genitalia, I feel sure that this specimen (and probably *basalis* also !) is merely one of the many highly coloured forms of *bimaculata* which are common in most Mediterranean districts, and occur exceptionally even in England (*decorata*, Sm., etc.) though there they seem to appear only in the second brood. (I have taken one at Wisley (Surrey) in August, which is very nearly as red as Captain Buxton's specimen). *Magrettiana* Schmied. which I found abundant near Naples in March and April, and a ♂ given to me (I believe by Perez) as *atrorubricata*, Dours, seem to be also local varieties of *bimaculata*. I have met with still more highly coloured forms in Tunisia but I do not doubt that these also may be referred to *bimaculata*, K.

30. *Andrena thoracica*, F.—8 ♂♂, Resht (P), 1 ♀, 11th-18th February.
1 ♂, 1 ♀, Enzeli (P), 14th-19th June.

31. *Andrena gwynana*, Kirby.—2 ♀♀, Resht (P), 25th-27th February.

32. *Andrena lucens*, Imboff.—5 ♂♂, Resht (P), 11th-18th February.

33. *Andrena dorsata*, Kirby.—1 ♂, Resht (P), 18th February.

34. *Andrena flavipes*, Pauzer. (=*fulvicrus*, K.), 1 ♂, Resht (P), 18th Febr.,
1 ♂, 1 ♂, Menjil (P), 30th March, 7th April.
8 ♂♂, 8 ♀♀, Amara (M), 24th March to 18th April.
13 ♀♀, Amara (M), 14th May to 19th June.

The March-April Amara specimens are smaller than either those from Persia or the May-June Amara ♀♀, but their ♂♂ have the peculiarly "notched" stipites of the genital armature by which a *flavipes* ♂ may, I believe, always be identified. (cf. Tr. Ent. Soc. Lond., 1899, p. 237, where the species is called "*fulvicrus*.") The Persian ♂♂ shew the same character, but unluckily no ♂♂ were taken with the May-June Amara ♀♀, and some (but not all) of these differ from normal *flavipes* ♂♂ in having the hind femora and tibiæ more or less testaceous. But I believe this character is not specific. Something like it occurs with the "second broods" of other *Andrena* spp. (*e.g. dorsata*) In my opinion all the specimens here recorded should be referred to one species, viz., *flavipes*.

Of all *Andrena* spp. *flavipes* is perhaps the most widely distributed, and its main distinguishing characters seem to be exceedingly constant in all districts. Unless a specimen is badly 'rubbed' there can be little difficulty in determining it.

35. *Andrena hypopolia*, Pérez.—3 ♀♀, Qazvin (P), 7th July.

36. *Andrena*, sp ?—2 ♂♂, 2 ♀♀, Amara (M), 24th March-April.

I had thought that these specimens also were *hypopolia*, but after examining the ♂ genitalia I now doubt it. Unfortunately all the specimens are more or less rubbed and faded, so I think it most prudent to leave them nameless.

37. *Andrena cyanescens*, Nyl.—1 ♀, Amara (M), 24th March.

I think this determination is correct, but the specimen has met with an accident and the femora, tibiæ and tarsi of both hind-legs are missing!

38. [*Andrena vetula*, Lep.—1 ♀, Basrah (M), 6th April 1919.—Captain Evans.

39. *Andrena cordialis*, Morawitz.— 1 ♀, Basrah (M), 31st March 1919.—Captain Evans.]

I know this species only from the author's description, but the latter seems to agree well with the characters of the specimen before me.

40. *Cilissa leporina*. —1 ♀, Qazvin (P), 17th July.

41. *Nomia diversipes*, Latr.—1 ♂, Qazvin (P), 27th July.

42. *Nomia edentata*, Moraw.—22 ♂♂-17 ♀♀, Amara (M), 1st June to 9th September.
1 ♀, Khaniqin (M), 1st July.
1 ♂, 1 ♀, Baquba (M), 27th July.

The integument in these specimens varies greatly in colour; it may be entirely black, or the abdomen and propodeum may be largely, or even entirely red. The most highly coloured examples before me are males, but at least one ♀ has the whole abdomen dark red. I believe this is merely a matter of individual aberration. It does not seem to be accompanied by any structural differences.

43. *Nomia rufiventris*, Spim.—1 ♀, Amara (M), April.

Spinola's description suits this specimen perfectly. I believe that Morawitz's *rufescens* is the same species. The puncturation is very sparse and feeble, and the basal pilosity of the abdominal tergites consists of long, thin, (not at all scale-like), hairs. The abdomen (but not the propodeum) is entirely red, except the apical margins of the tergites, which are bright yellow.

44. *Eucera dentata*, Klug.*—1 ♂, Enzeli (P), 14th June.

45. *Eucera malvæ*, Rossi.—1 ♂, 1 ♀, Talish (P), 10th July.
1 ♂, Enzeli (P), 14th June.

46. *Eucera radoszkovskyi*, Morawitz.—1 ♂, 1 ♀, Qazvin (P), 17th-24th July.

47. *Eucera distinguenda*. Morawitz.—1 ♂, Amara (M).
[1 ♂, Beit-Na'ama near Basrah (M), 12th April 1919.—Captain Evans.]

48. *Eucera longicornis*, L.—1 ♂, Amara (M), 15th February.
3 ♀♀, Amara (M), 24th March.
1 ♀, Amara (M), 30th March.

These appear to me to belong to the true *longicornis*, L., having the thorax punctured just as in specimens from Britain and other North European countries.

49. *Eucera tuberculata*, F.—1 ♂, Resht (P), 20th March.
1 ♀, Resht (P), April.

This species is the *longicornis*, L., of Friese in *Bienen Europa's*, but apparently not that of Linné. In calling it *tuberculata* I am following the opinion of Herr Alfken, *Bienenfauna von Bremen* (1913).

50. *Nomada fucata*, Panzor.—1 ♂, Amara (M), April.

51. *Nomada tigridis*, n. sp.—1 ♂, Amara (M), 30th March.
4 ♀♀, Amara (M), 28th May-8th June.

This is a fairly large and conspicuously coloured species, but I can find no description to suit it, though several more or less similar forms are recorded by Morawitz (*robusta*, *regalis*, etc.)

The antennæ in both sexes are short and thick with the 3rd joint somewhat shorter than the 4th and the joints near the apex about as broad as long. The mandibles are acuminate; the labrum has a very slight central tuberculation (hardly to be called a tooth) at its apex. The ♀ hind tibiæ have incrassate apices with a sort of small black knob-like projection at each corner (as viewed from behind), between which projections three or four pale subequal spines may be

* This and the next three spp. belong to the *Macrocera* division of *Eucera*.

seen among the fringing hairs. The apical tergite of the ♂ abdomen is deeply incised, so that its apex is bifid or might even be called bispinose.

The general colour of the ♀ is reddish or ferruginous-orange, with the tips of the mandibles, the propodeum, and the apices of the intermediate abdominal tergites, generally also the breast and pleuræ (partly) black. The head and mesonotum either entirely ferruginous, or with more or less blackening of the ocellar area, and some ill defined vittæ on the mesonotum. The pronotum humeral tubercles tegulæ and scutellum are paler (yellowish), the two last abdominal segments have broad fasciæ of a brighter yellow, and there may be taces of similar fasciæ (or at least of lateral spots) on the preceding segments but these, if present at all, are almost obsolete. The antennæ and legs, including the coxæ, are ferruginous or yellowish, with no black marking except at the extreme apex of the hind tibiæ. The punctuation of the head, thorax, and propodeum is close, rather coarse, and more or less reticulate. That of the abdomen is very minute and close, making the tergites look quite dull, except their extreme apices which are impunctate and very slightly shining. The wings are darkened almost throughout, but darkest along their apical margins. The pilosity is short and very scanty, hardly noticeable except, of course, at the apex of the abdomen.

The ♂ has the head (except the face) and the thorax except the pronotum, tubercles, tegulæ, scutellum, and a small spot on the post scutellum black. The abdomen is coloured as in the ♀, except that its extreme base is occupied by a black mark (triangularly produced in the middle). The antennæ are streaked with black over a few of the intermediate joints behind, and the coxæ of all the legs are black. The pilosity of the head and thorax in this sex is pretty long, and much more conspicuous than in the ♀.

Length 9 to 11 mm.

52. *Lasius* (=*Anthophora*) * *albigenus*, Lep.—2 ♂♂, Amara (M), 4th-9th Sept.
1 ♀, Baquba (M), 27th July.

53. *Lasius quadrifasciatus*, Vill.— 1 ♀, Qazvin (P), 17th July.

54. *Lasius farinosus*, Kl.—3 ♂♂, Baquba (M), 27th July; 2 ♂♂, Amara (M), 18th-20th July.
3 ♀♀, Amara (M), 10th June (on *Capparis*), 18th-20th July.
[1 ♀, "at or near Amara", 27th August 1918—Captain Evans.]

The specimens before me agree well with Klug's description, and seem to me distinguishable from the commoner *quadrifasciatus* by the much smaller black markings on the face, the testaceous underside of the antennæ (the scape is also lined beneath with whitish-yellow), and the somewhat broader abdominal white fasciæ which are not simply linear, but distinctly dilated in the middle. (In another form belonging to the same group, *viz.*, *wegeneri*, Friese, these fasciæ are on the contrary dilated *at their sides*!) The integument of the abdomen beneath in all these specimens is more or less rufescent at least at the base.

55. *Lasius garrulus*, Rossi.—1 ♂, Talish (P), 10th July; 3 ♀♀, Enzeli (P), 30th June and July.

56. *Lasius Kessleri*, Morawitz.—1 ♀, Beit Na'ama, near Basrah (M), 31st March 1919.—Captain Evans.

57. *Lasius* (*Saropoda*) *byssinus*, Klug.—1 ♀, Amara (M), 7th July.

I have not seen this species before, but feel sure that it is the true *byssinus*. Almost the whole body, except the black triangle at the apex is clothed with white (or whitish), subsquamose, decumbent hairs. The antennæ beneath, the coxæ, trochanters, and femora of all the legs, and the ventral side of the abdomen are testaceous. The front trochanters and femora are fringed on both sides with

* *Lasius*, Jurine (1801) has priority over *Anthophora* (Latr) 1802 and invalidates *Lasius* F et auctt (1804).

a row of slightly curving, suberect, white hairs. Of the hind-legs the femora are nearly naked; but the knees, tibiæ, and bases of the metatarsi have a beautiful snow-white scopa externally, while the other hairs of these joints are absolutely black. The present ♀ (like Klug's type) is 11 mm. long.

58. *Lasius pilipes*, F.—7 ♂♂, Resht (P), 18-25th February; 1 ♀, Enzeli (P), 24th April.

The ♀ is that common Continental form which has its pilosity coloured like that of the ♂, (not black as in British specimens).

59. *Melecta armata*, Pauzer.—1 ♀, Resht (P), 25th February.

60. *Crocisa ashabadensis*, Radosz.—1 ♀, Amara (M), 14th June.

61. *Xylocopa olivieri*, Lep.—1 ♂, 1 ♀, Baquba (M), 30th July.

I have noticed, both in Greece and in Syria, that the ♂♂ of this species have the curious habit of suddenly visiting flowers in great numbers about the time of sunset. Earlier in the day that sex is usually nowhere to be found.

62. *Xylocopa fenestrata*, F.—3 ♂♂, Amara (M), 10th-19th June, 1st September.

3 ♀♀, Amara, 1st May, 10th June (visiting *Capparis*), 19th June.

[1 ♂, Beit Na'ama near Basrah (M), 23rd March 1919 "at *Papaver somniferum*."—Captain Evans.]

This is a common "Oriental" species, only exceptionally reaching Palearctic districts!

63. *Xylocopa violacea*, L.—4 ♀♀, Enzeli (P), 8th, 14th, and 17th June.

64. *Ceratina tibialis*, Morawitz.—1 ♂, Amara (M), 8th June; 1 ♂, Baquba (M), 21st July.

2 ♂♂, 9 ♀♀, Amara (M), 12th September

[3 ♀♀, near Basrah, 31st March 1919—Captain Evans].

65. *Ceratina nigrolabiata*, Friese.—1 ♂, Amara (M), 9th September; 1 ♀, Baquba, 27th July.

The ♀ is very small, and may possibly be some species unknown to me. The clypeus is almost impunctate on its disc, and the frontal area and mesonotum are very sparsely punctured and shining. But in coloration it exactly matches a *nigrolabiata* ♀ named for me by the author of the species.

66. *Ceratina laevifrons*, Morawitz.—1 ♀, Shahroban (M), 21st July; 1 ♀ Baquba (M), 27th July.

67. *Ceratina cyanea*, Kirby.—1 ♂, 2 ♀♀, Enzeli (P), 6th June.

One of the ♀♀ is not quite a normal specimen, having a very small yellow spot in the middle of its clypeus. But I believe this is merely an individual aberration.

68. *Chelostoma emarginatum*, Ngl.—1 ♀, Enzeli (P), 1st May.

I give this name with some little doubt, because I only know the species in literature, and the present specimen has no less than 10 alar hooks, which does not agree with Schletterer's statement in Zool. Jahrb., 1889 (p. 619). But its other characters suggest *emarginatum*, and that species has been previously recorded from N. W. Persia.

69. *Osmia cœrulescens*, L.—1 ♀, Qazvin (P), 17th July.

70. *Osmia indigotea*, Morawitz (?)—1 ♂, 1 ♀, near Basrah (M), 31st March 1919.

71. *Osmia panzeri*, Morawitz.—1 ♂ near Basrah (M), 12th April 1919.

These specimens (70 and 71) were all taken by Captain Evans in the same locality and I thought at first that they were conspecific. But the very different ventral segments of the two ♂♂ shew that this is not so, and I believe the

determinations given of them above are probably correct. It is almost impossible, however, to name, for certain, ♂♂ of this section without special preparation of the specimens, the actual apex of the abdomen being nearly always imperfectly exposed.

72. *Osmia dimidiata*, Morawitz.—4 ♂♂, Enzeli (P), 8th-14th June.
73. *Anthidium florentinum*, F.—2 ♂♂, Enzeli (P), 10th-23rd July.
2 ♀♀, Talish (P), 5th-10th July.
1 ♀, Qazvin (P), 17th July.
74. *Anthidium strigatum*, Panzer.— 1 ♀, Baquba (M), 27th July.

The specimen is below the usual size, and its ground colour, instead of being simply black, is partly rufescent both on the thorax and abdomen. Probably this may be an individual aberration, but it may again be characteristic of a special local race. I do not think the peculiarity is "specific." [Captain Evans took a ♂ near Basrah on 12th April 1919.]

75. [*Anthidium tessellatum*,Kl.—1 ♂,Tanooma (M),Lieut. Harwood,"October."]
76. *Stelis phœoptera*, Kirby.—1 ♀, Talish (P), 10th July.
1 ♀, near Basrah (M), 6th April 1919.

The Persian specimen was very much larger than the Mesopotamian.

77. [*Stelis signata*, Latr.—1 ♂,near Basrah, 10th April 1919.—Captain Evans.]
78. *Lithurgus chrysurus*, *Fonsc.*—3 ♂♂, 4 ♀♀, Enzeli (P), 15th-17th June.
79. *Lithurgus tibialis*, Morawitz.— 1 ♂, Khaniqin (M), 1st August.

This specimen agrees exactly with Morawitz's description. In May 1896 I took at Dakrur in Egypt a ♂ which was determined for me by Prof. Friese, no doubt correctly, as belonging to this species. But it was a much smaller specimen than that here recorded, and the paradoxical characters of its hind legs (perhaps only for that reason) appear to me not quite so well developed. In the Figure below (Fig. 5) I have tried to give the exact outline of the right hind leg in Captain Buxton's specimen, when so placed that its *inner* side almost directly faces the object glass of the microscope. (The legs are clothed, rather thinly, with white hairs, which are very long and fine in the angle between the femora and tibiæ, much shorter and more bristle-like on the metatarsus, but I have not attempted to show this pilosity in the Figure.)

As usual in *Lithurgus* spp., the ♂ genitalia are extremely small for the size of the insect. I notice that in this species the interval which separates the posterior ocelli from each other is at least twice as great as that between each of them and the nearest compound eye. This is not the case in *chrysurus*, where the difference in length between the corresponding spaces is very slight.

When viewed from behind the hind tibiæ are seen to be not only *dilated*, but very *incrassate*, only, however, about half as much so as the femora.

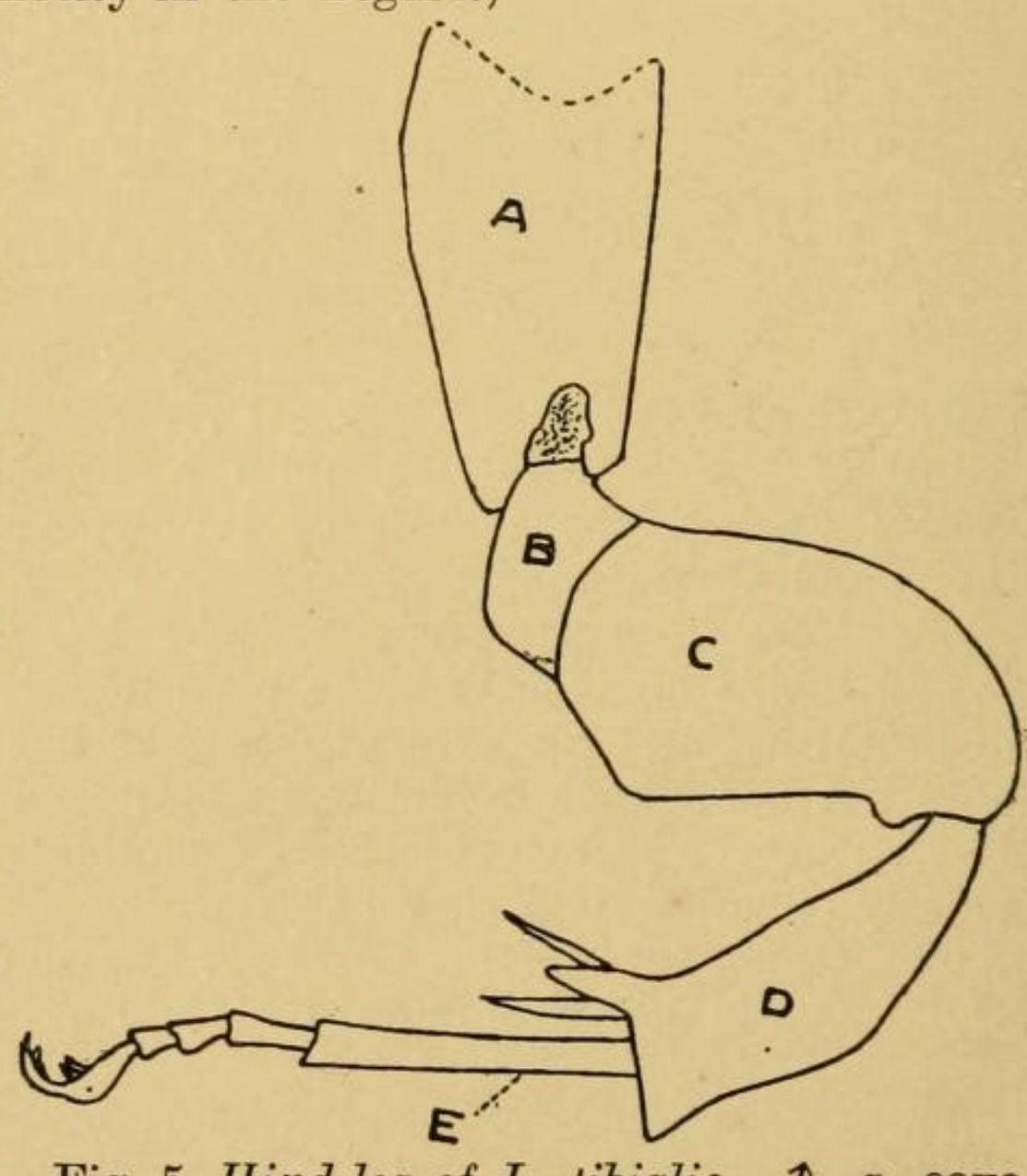

Fig. 5. *Hind-leg of L. tibialis* ♂, *a.* coxa. *b.* trochanter, *c.* femur, *d.* tibia, *e* metatarsus.

80. *Megachile argentata*, F.—1 ♂, Amara (M), 20th July: 2 ♂♂, Baquba (M), 27th July.
1 ♀, Shahroban (M), 31st July.
[1 ♂, below Amara (M), "about Tamarisk" 31st August.—Captain Evans.]

About 20 specimens, smaller than the above, but apparently all *argentata* ♂♂ and ♀♀ were also taken at or near Amara by Captain Buxton in June, July, and September. Some of those taken in September were visiting Sunflowers, others *Zizyphus*.

81. *Megachile minutissima*, Radosz (?)—13 ♂♂, 14 ♀♀, Amara (M), 28th May to 14th June.
1 ♂, 2 ♀♀, Shahroban (M), 31st July.

I have named these chiefly in consequence of having compared them with ♂♂ which I took in Egypt in 1899, and which were determined for me as *minutissima* by Professor Friese. But except in size (and not very much even in that!) they differ very little from *argentata* ♂♂. Captain Buxton's ♀♀, however, certainly differ from *argentata* ♀♀ in having no silvery pilosity on the last abdominal segment. All these specimens, both ♂♂ and ♀♀, are small, but they vary considerably in size, and it is curious that the smallest of them all are ♀♀! One of these is only 6 mm. long, while another measures fully 8 mm. (Radoszkowsky gives 7 mm. as the length of the ♀, and 6 as that of the ♂).

82. *Megachile rotundata*, F.—6 ♂♂, Astara (P), 2nd July, 1 ♀, Enzeli (P), 6th June.
1 ♀, Talish (P), 10th July.

83. *Megachile schnabli*, Rad.—3 ♂♂, Amara, 14th and 17th June, 6th September.
[1 ♀, 6th September, "garden below Amara."—Captain Evans.]

All these ♂♂ agree with Radoszowsky's description, except that the colour of the abdomen seems to be altogether variable. In one specimen (June 17th) it is completely reddish, and the scutellum is red also! In the other two the antennæ, legs, and venter are red, but the dorsal surface of the body shews hardly any tendency to rufescence. The pilosity of all three specimens is very dense and silvery, giving them that peculiar sheen which characterizes so many desert-frequenting Hymenoptera.

84. *Megachile flavipes*, Spin.—13 ♂♂, 8 ♀♀, Amara (M), 28th May to 9th August.
2 ♀♀, Qazvin (P), 17th July.

85. *Megachile maritima*, K.—1 ♀, Enzeli (P), 30th June.

86. *Megachile centuncularis*, L.—1 ♂, Talish (P), 10th July; 1 ♀ Enzeli (P), 20th June.

87. *Cœlioxys conoidea*, Klug.—2 ♂♂, 1 ♀, Talish (P), 5th-10th July.

88. *Cœlioxys elongata*, Lep.—1 ♀, Enzeli (P), 8th June; 1 ♀, Talish (P), 10th July.

89. *Cœlioxys decipiens*, Spin.—1 ♂, 8 ♀♀, Amara (M), 10th-14th June. (visit flowers of *Acacia*.)

90. *Cœlioxys argentea*, Lep.—1 ♂, Qazvin (P), 17th July.

91. *Cœlioxys brevis*, Eversm.—1 ♂, Talish (P), 11th July.

92. *Cœlioxys afra*, Lep.—1 ♂, Amara (M), 12th September.

93. *Cœlioxys hæmorrhoa*, Forst.—2 ♂♂, Amara (M), 18th July, 9th September
1 ♀, Baquba (M), 27th July.

94. *Cœlioxys coturnix*, Pèrez (?)—1 ♀, Amara (M), June 26th (also, between June 19th and 22nd at Amara a ♂ which seems to belong to the same form).

In both these specimens the abdomen is practically unicolorous, rosy-testaceous throughout! Otherwise the ♀ appears to have exactly the characters by which Pérez separated his *coturnix* from *hæmorrhoa*. (He was not acquainted with the ♂). There is the same 'powdering' over of the vertex, mesonotum, etc., etc., with silvery scales (mostly oval in form, but some of the smaller ones almost circular!) the same fine close puncturation, and the same sort of "caréne" which Pérez describes as running into the "premarginal depression" of the 6th abdominal dorsal-plate.

I took at Biskra in Algeria 2 ♀ ♀ which seem to differ from Captain Buxton's specimen only in being much smaller, and these were recorded by Edward Saunders in *Trans. Ent. Soc., Lond.*, 1908, p. 241 as "*coturnix*, Pérez(?)." I have also taken a ♀ at Jericho which is slightly larger than the Amara ♀, and has two of its abdominal segments (the 4th and the 5th) blackish above. Otherwise this also agrees with the Mesopotamian form.

The ♂ so much resembles the ♀ in colour and general appearance, and was taken so nearly at the same time, that I can scarcely doubt that the two are conspecific. Apart from colour and pilosity I have not succeeded in finding any substantial difference to distinguish it from *hæmorrhoa* ♂. The "eight teeth" on the apex of the abdomen seem to be very similar and arranged in the same way. (Fig. 6. Outlines of the 6th abdominal tergite viewed from above. I have not attempted to represent the fovcation, pilosity, etc., of the segment. As in *hæmorrhoa* it is deeply and widely sulcate down the middle, and clothed with scale-like hairs at its base.)

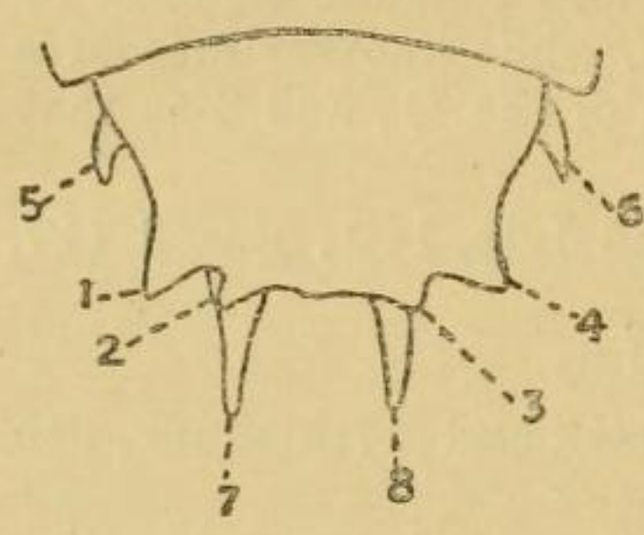

Fig. 6. *Outlines of 6th abdominal tergite in C. coturnix.*

(Fig. 7 represents the apex of the ♀ abdomen viewed from above. The dotted lines are meant to give an idea of the "premarginal depression" and what Pérez calls its "interruption" by the carina which projects into it.

The apex of the 6th ventral plate seems to be quite pointed, not narrowly truncate and very slightly emarginate, as usually in *hæmorrhoa*.)

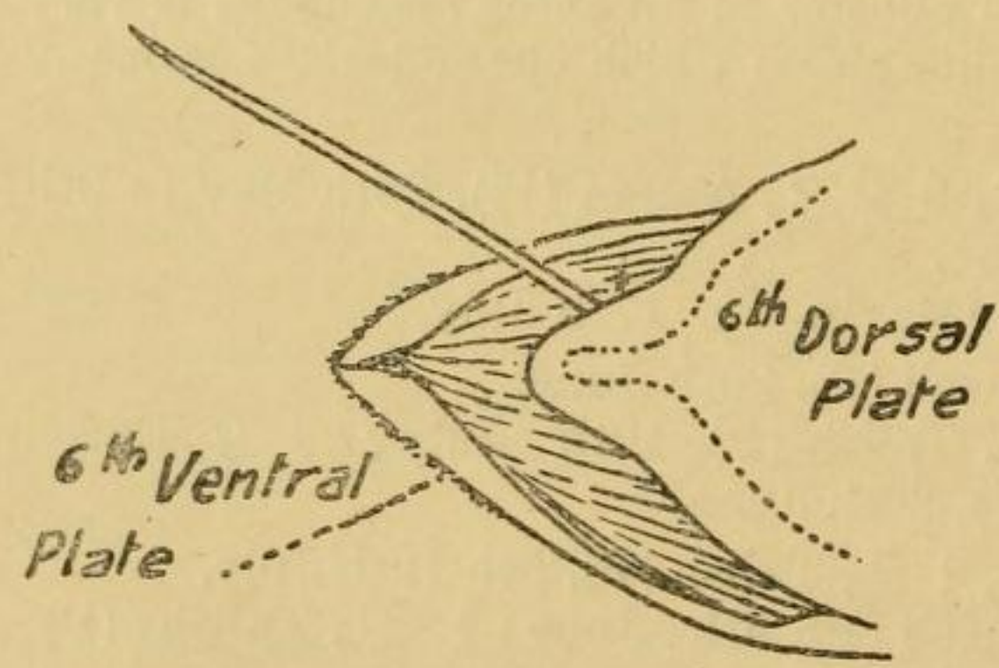

Fig. 7. *Apex of abdomen in C. coturnix.*

95. *Cœlioxys obtusa*, Pérez.—2 ♂ ♂, Amara (M), 14th-15th June.

One specimen has the first 3 abdominal segments red, in another there is only a touch of that colour at the base of segment 1. (In a ♂ from Gibraltar given to me by E. Saunders the abdomen is entirely black, and it seems to have been so in the specimen described by Pérez.)

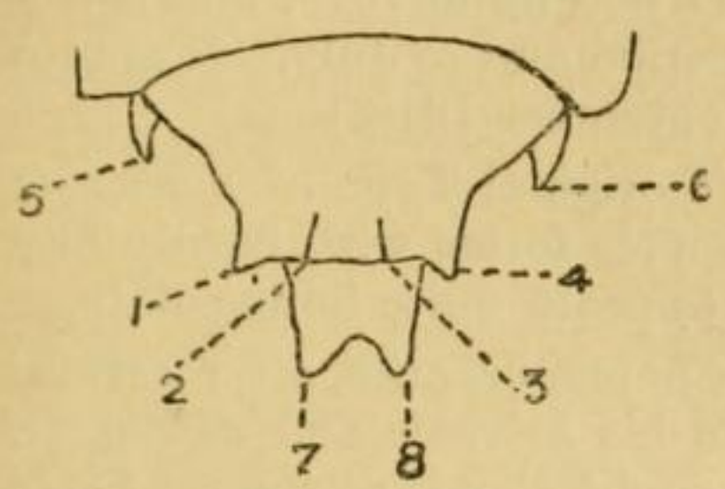

Fig. 8.
96. *Apis mellifera*, L.

The 'teeth' which form the actual apex of the abdomen (Nos. 7 and 8 in the Figure) are very unlike those of *hæmorrhoa* and "*coturnix* (?)."

Instead of being long slender spines, they are short and broad, with broadly subtruncate apices and their inner margins converging rapidly almost at right angles. (All the 'teeth' in this species seem liable to vary somewhat in shape. They are even sometimes distinctly asymmetrical. Notwithstanding this, their general appearance is so far uniform and unlike that of those in *hæmorrhoa* that specimens of the two can always be distinguished at a glance by the characters of this segment only !)

The figure above (Fig. 8) is drawn from the redder of the two ♂♂, and the so-called teeth are numbered as in the corresponding figure (Fig. 6) of the ♂ apex in "*coturnix* ?"

Several specimens were sent by Captain Buxton's from N. W. Persia (Resht, Enzeli, Kermanshah,) but none from Mesopotamia. All were workers, and belonged to the var. *fasciata*, Latr.

List 3, Wasps.

1. *Vespa crabro* L. var. *crabroniformis*, Smith.—1 ♀, Enzeli (P), 25th June.

This specimen is exactly like the Type (at S. Kensington !) of Smith's *crabroniformis* described from N. China as a new species. It only differs from normal examples of *V. crabro* in having very narrow—in fact almost linear—yellow bands on the 3rd and 4th abdominal tergites.

2. *Vespa orientalis*, L.—1 ♀, Amara (M), 25th June.
2 ☿☿, Amara (M), 6th July.
[1 ☿, Amara (M), "from nest in roof of building" 17th August 1918.—Captain Evans.]
1 ☿, Shahroban (M), 31st July.

All these belong to the bright red and yellow typical form of the species. The darker variety *ægyptiaca*, André, occurred in N. W. Persia (1 ♀, Qazvin, 25th July.)

3. *Vespa germanica*, F.—Many ♀♀ from Persia (Kermanshah, Enzeli, Qazvin, etc.) also 3 ♂♂, Kermanshah, 3rd and 4th December, 1 ♀, Enzeli, 20th June.

No specimens have been sent to me from Mesopotamia, nor is that country cited in the list of Asiatic localities given for *germanica* in R. du Buysson's *Monogr. des Guepes ou Vespa* (1904).

4. *Polistes gallicus*, L.—Many ♀♀ and ♀♀ were taken by Captain Buxton in Persia, but no ♂♂, [Captain Evans also sent a ♀, one of "three found under a stone," 22nd January 1919, from Harunabad (P).] In Mesopotamia the species seems to have been completely anticipated—or evicted ?—by *P. hebræus*. At any rate none have reached me from thence.

It may be that I am including under the Linnean name *gallicus* more than one of several forms which have been separated by Kohl on account of differences in their ♂♂. There are certainly, there as elsewhere, two easily distinguishable types of coloration. Specimens taken at Resht and Enzeli between February and June were much darker and generally larger than others which occurred at Qazvin and Menjil (July-September). But the Harunabad ♀ "hibernating under a stone" in January was of the light form.

5. *Polistes hebræus* (*macœnsis* ?), F.—Of this species Captain Buxton took several ♀ ♀ at Amara (M) between November 1917 and June 1918, and seven ☿ ☿ at Amara and Baghdad (M) during the same period and in July. [Captain Evans found ☿ ☿ later also, *viz.*, in August and September 1918.]

I have compared these specimens with Fabricius's original Type of *macœnsis* in the Banks Collection ; and, like it, they are very pale forms with hardly any black markings. In most of them the mesonotum appears quite immaculate.

But I prefer to call them *hebræus* which is the older name, because, after careful consideration of all Fabricius's many descriptions of his *hebræus* and *macœnsis*, I can find absolutely nothing to shew why he thought them distinct. Some authors hold that the two differ in colour, *hebræus* being a darker insect. It is true that some so-called *hebræus* and *macœnsis* specimens differ in this respect. But all the many specimens of both that I have seen appear to be mere individual aberrations from a single specific Type, and both forms certainly occur together in most of their Oriental habitats, together with many others which are intermediate between them. The original descriptions are to all intents and purposes identical ; and though Fabricius names one from Palestine (*hebræus*), and the other from China (*macœnsis*,) he cannot have meant to distinguish them as differing in 'habitat.' For he gives " India orientalis " as the habitat of *hebræus*, and " Macao Indiæ " (sic !) as that of *macœnsis* ! On the whole I believe that the two names should be treated as synonymous, and that of the two *hebraeus* has " priority " over the other.

6. *Eumenes coarctata*, L.—1 ♀, Qasr-i-Shirin (P), 24th November 1918.

This is the *mediterranea* of Kriechbaumer, the common form in most southern districts. Both *mediterranea* and *pomiformis*, F, are probably only varieties (local races) of the Linnéan species.

7. *Eumenes esuriens*, Pauzer.—2 ♂ ♂, Shahroban (M), 31st July; Amara (M), 17th September.
1 ♀, Amara (M), 9th September.
1 ♀, Kurna (P), 20th May.
[1 ♂, Amara (M), 17th August.
1 ♀, Amara (M), 27th August—Capt. Evans.]

8. *Odynerus simplex*, F.—1 ♂, 2 ♀ ♀, Talish (P), 10th July.

9. *Odynerus parietum*, L.—1 ♀, Qazvin (P), 20th September.

10. *Odynerus melanocephalus*, Gmel.—6 ♂ ♂, 1 ♀, Amara (M), 3rd March to 19th June.

In the ♀ and in four of the six ♂ ♂ the scutellum bears two distinct yellow spots, in another ♂ they are almost invisibly small, and in the June ♂ the scutellum (as in normal *melanocephalus*) is immaculate. (I do not suppose this character to have any systematic significance, but it is as well to mention it.)

11. *Odynerus chloroticus*, Spin.—1 ♂ and 1 ♀ Amara, (M), September.
[1 ♀, Beit-Na'ama near Basrah (M), 12th April 1919.—Captain Evans.]

12. *Odynerus crenatus*, Lep. (?)—1 ♂, Amara (M), 28th May.
[1 ♂ " Four miles below Amara, 17th September.—Captain Evans.]

These are very highly coloured specimens, but I think they do not differ specifically from specimens determined as *crenatus* by Professor Pérez.

13. *Odynerus transitorius*, Morawitz.—9 ♂ ♂ and 11 ♀ ♀ of this exceedingly pretty little species were taken by Captain Buxton at Amara and Shahroban (M). [Captain Evans also found it at Beit-Na'ama (M) on April 12th, 1919.] Many specimens, apart from their 'pictura pallida,' were largely or even entirely red. They were flying in April, May and June, and frequented the flowers of an Acacia. [Captain Evans's specimen occurred " about Tamarisk."] The

species as Morawitz has remarked, much resembles the Algerian *blanchardianus*, specially in the peculiar carinated base of the 1st abdominal tergite (the carina distinctly interrupted in the middle !)

14. *Nortonia deceptrix*, n. sp.—4 ♂♂, April ; 1 ♂, 28th May ; 1 ♀, 14th May, Amara (M).

In many respects, and especially in the form of its 1st and 2nd abdominal segments, this species much resembles one which I described from several ♂♂ taken on February 12th, 1901, at Abba Eiland, by the Swedish Expedition to Egypt and the White Nile (See Ann. and Mag. N. H., December 1903).* This no doubt was also a *Nortonia*, but I wrongly referred it to "Odynerus (Ancistrocerus ?)" and called it *aberraticus*.

The Mesopotamian species however seems to be certainly different from the Egyptian in several characters of specific value. (*a*) The scutellum is transverse and not almost quadrate, (*b*) the excision of the strongly bidentate ♂ clypeus is not triangular, but semi-circular, (*c*) the lateral angles of the pronotum are distinctly subspinose, (*d*) the costæ at the base of the 2nd ventral segments are fairly long, (*e*) the mandibles of the ♂ appear to be simply acuminate and not tridentate.

I notice also that the very coarse rugosities of the mesonotum, when viewed from behind, appear as definite longitudinal strigæ. I do not remember that the specimens I examined in 1903 shewed any such character, and I find no mention of it in the description of Kohl's *N. moricei*.

The scutellum and postscutellum are both entirely yellow in *deceptrix* : the former in the Egyptian species is black, and the latter only shews two small spots of yellow. The colour of the abdomen varies to some extent in the specimens now before me, but in most of them there is certainly more yellow and less black than in the types of "*aberraticus*."

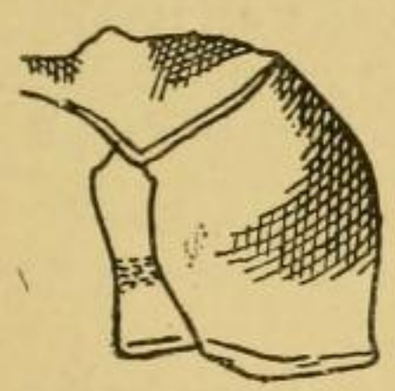

Fig. 9 A.

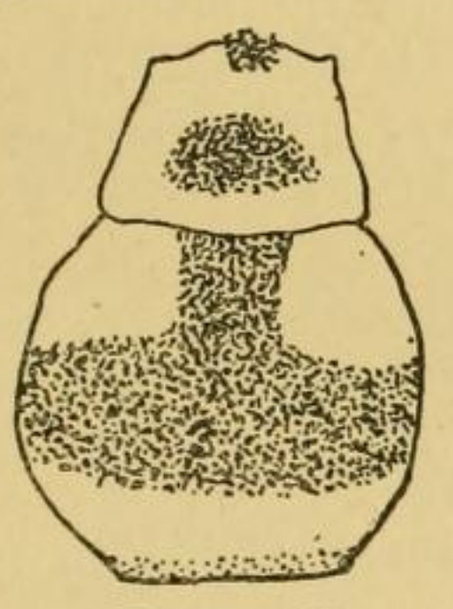

Fig. 10 B.

First and second segments in N. deceptrix.

The accompanying sketches (Figures 9 and 10) representing the 1st and 2nd segments (viewed A *laterally* and B *dorsally*) in the brightest of the ♂♂, will give an idea of this. In the only ♀ there is a larger black triangle on the disc of segment 1, but on its 2nd segments there is more yellow still, the yellow lateral maculæ at its base being all but actually confluent !

The lateral margins of the propodeum are very spinulose throughout, as is also the crest of the postscutellum which resembles those of *O. blanchardianus* and *transitorius*.

List 4. Chrysids.

1. *Hedychrum rutilans*, Vahlb.—1 ♂, Kazvin (P), 17th July.
2. *Hedychridium hilare*, n. sp.—1 ♂, Amara (M), 25th June.

At first sight this might be taken for an extreme variety or aberration of the common *H. roseum*. The colour of the abdomen much resembles that which characterizes the latter, and contrasts in the same way with the prevailing greenness of the head and thorax. But the postscutellum and propodeum (except

* One of the same specimens, or one taken at the same place and on the same day, was described three years later by Kohl in his admirable work on Hymenoptera from South Arabia and Socotra, Wien, 1906, as *Nortonia moricei*, n. sp. He accredits the capture to me, but I never visited Abba Eiland, and was not in Egypt at all in 1901.

its lateral angles) are not green at all, the former being violaceous and the latter testaceous. Again, though in certain aspects the pronotum appears to be green, its real ground colour seems to be testaceous, as is also that of the antennæ, the mandibles, the sides of the face, and the whole of all the legs. The vertex, however, and the tempora are distinctly green, like the mesonotum and scutellum, but there is a slight touch of a warmer colour (reddish-golden) between the ocelli and the compound eyes. Seen from beneath the whole body appears testaceous and polished, except the green mesopleures, and occasional reflections of the same colour playing over the legs which become visible only in certain lights.

But apart from mere colour, it seems to be certainly distinct from *roseum* by more important characters.

(1) The antennæ are shorter and stouter, with joints 2, 3, and 4 subequal but joint 4 slightly longer than the others. (In *roseum*, joint 3 is evidently longer than 4, and fully twice as long as 2.)

(2) The green areas of the thorax are very shining, and their puncturation irregular and mostly very sparse. (In *roseum* the whole thorax is almost opaque, its puncturation being uniform and close.) This difference is apparent even to the naked eye.

(3) The abdomen, especially its basal segment, is also much more sparsely punctured than that of *roseum*, the punctures being everywhere separated by intervals much larger than themselves.

(4) The face, which is bright metallic green in the middle, but testaceous at the sides and below the antennæ, is clothed with very short silvery pubescence, conspicuous in some lights, but in others quite invisible, and not concealing the sculpture of the integument. This is very small and shallow (sub-coriaceous) and contrasts strongly with the much coarser rugose puncturation of the vertex. (In *roseum* ♂ the face is deep-blue, the few hairs on its surface are fairly long but quite inconspicuous, not appearing silvery (so far as I can see) in any aspect, and the integument is punctured very much in the same style as that of the vertex.)

(5) The wings are perfectly clear. (In *roseum* they are distinctly infuscated.)

3. *Chrysis fuscipennis*, Brullé.—1 ♀, Amara (M), 28th October.
4. *Chrysis palliditarsis*, Spin.—3 ♂♂, 4 ♀♀, "on *Acacia*," Amara (M), 10th June.
   2 ♀♀, Amara, 13th-17th June.
5. *Chrysis blanchardi*, Luc.—1 ♂, Amara (M), 6th September.
6. *Chrysis maculicornis*, Kl—3 ♂♂, Amara (M), 10th June "on *Acacia*," 14th June, 18th August.
7. *Chrysis exigua*, Mocs.—1 ♂, Amara (M), April.
   5 ♀♀, Amara, 10th and 13th June "on *Acacia*."
8. *Chrysis ignita*, L.—2 ♀♀, Talysh (P), 18th July.
9. *Chrysis scutellaris*, F.—1 ♀, Amara (M), "on Sunflower" 12th September.
10. [*Chrysis cyanopyga*, Dahlb.—1 ♀, Beit-Na'ama (M), 10th April 1919.—Captain Evans.]

The last 8 species (3 to 10) all belong to the Section "*Tetrachrysis*."

11. [*Chrysis* (*Hexachrysis*) *stilboides*, Spin.—1 specimen taken "at or near Amara," 18th August 1918. I omitted to take note of the sex.—Captain Evans.]
12. *Chrysis buxtoni*, n. sp.—1 ♂, Amara (M), 10th June.

This must also, no doubt, be reckoned as a *Hexachrysis*, though four of its so-called "teeth" only are really tooth-like. The outermost pair are *lateral*, situate one at each end of the series of foveæ. The intermediate pair are *apical*,

these are sharp and spine-like. The innermost pair are merely obtuse undulations of the margin (See figure 11). By its coloration it belongs to the Section known as *Viridis.*

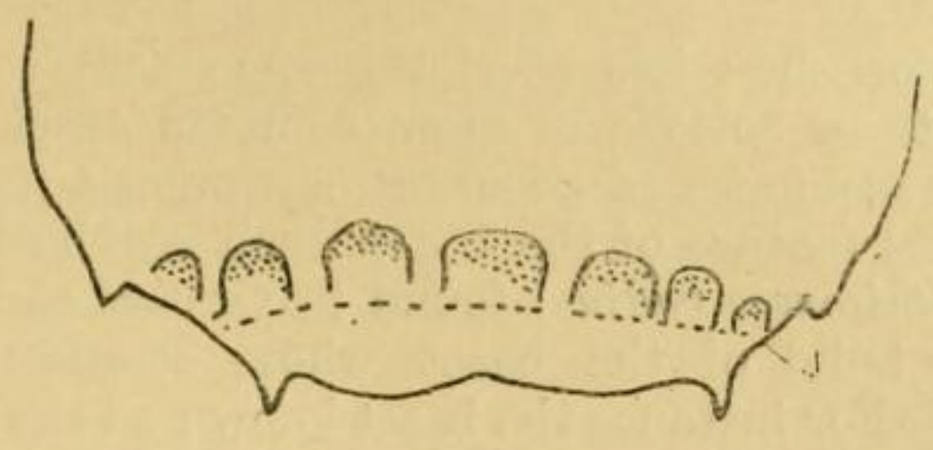

Fig. 11. *Apex of abdomen in Chrysis buxtoni* ♂.

Body above almost entirely bright metallic green, but with a more fiery (reddish-golden) tinge at the sides of the mesonotum, and with the tegulæ deep dark blue. Venter partly concolorous with the dorsum, partly blue, indigo, violet, etc. (the colours blending where they meet, and as in many other species with a pair of large rounded spots (black with violet reflections) at the base of its 2nd segment. Antennæ fuscous, densely clothed with minute, white sub-erect hairs : joints 1, 2, and a part of joint 3, green. Legs green, with yellowish (non-metallic) knees and tarsi. Wings clouded in the middle, but quite clear at base and apex. Face and genæ (between eyes and mandibles), clothed with silvery hairs. Pilosity of dorsal surface short and inconspicuous, but the femora and tibiæ are fringed with rather long pale hairs.

Head about as wide as the pronotum. Third antennal joint about as long as the second and fourth together. Least length of the cheeks about equal to that of the second antennal joint. From near each end of the rather vaguely carinated brow which overhangs the facial cavity a very distinct carina runs backward into the ocellar area, nearly isolating the anterior ocellus from the others. (Fig. 12.)

The apical half of the pronotum is sulcate longitudinally, and its lateral angles (=shoulders) subspinose. The dorsum of the abdomen is evidently but not strongly carinated longitudinally. The head is closely punctured (this is not shewn in the Figure) : the thorax and abdomen less so, and much more coarsely (about as in *C. micans,* Dahlb.). On the sides of the mesonotum the punctures are especially large and sparse.

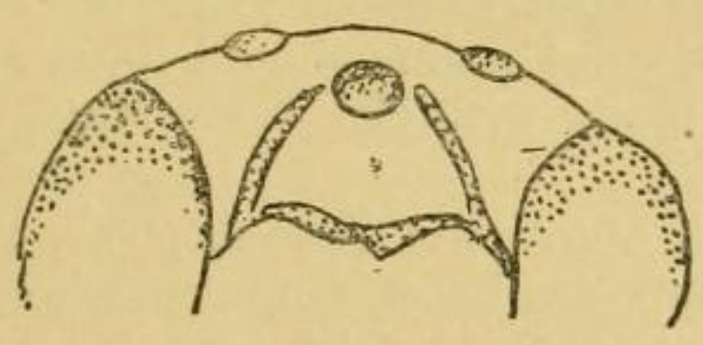

Fig. 12. *Upper part of head Chrysis buxtoni* ♂ *Viewed from in Front.*

Length of body about 7 mm.

[I have not attempted to shew the puncturation of the head, which would have made the 'characters' I desired to illustrate more difficult to see.]

13. *Stilbum cyanurum,* Forster.—One specimen of the typical form was taken "at or near" Amara by Captain Evans. I forgot to take note of the sex.

14. *Parnopes grandior,* Pall. (=*Carnea,* F.)—1 ♂, Enzeli (P), 30th June.

Nearly all the Mesopotamian Chrysids mentioned above occur also in R. du Buysson's List of Egyptian forms (*Mem. Soc. Ent. d'Egypte,* Cairo, 1908.)