

XVI. *Descriptions of new species of Tenthredinidæ, Ichneumonidæ, Chrysididæ, Formicidæ, &c. of Japan.* By FREDERICK SMITH.

[Read 6th April, 1874.]

THE majority of the insects described in the present paper were collected by Mr. George Lewis during his residence in Japan, the rest are in the collection of the British Museum; among these are species collected by Mr. Henry Whiteley at Hakodadi, and others by Mr. R. Fortune in North Japan, probably from Hakodadi also. The general aspect of the collection is that of an European one, a single exotic form only being found among them in the genus *Thyreodon*. Several of the species of the genus *Ichneumon* very closely resemble well-known English ones: *Ichneumon cognatorius* is the counterpart of the British species *T. Proteus*; *Trogus arrogans* very closely approaches *T. pepsoides* of North China.

The *Tenthredinidæ* are very interesting; many of them also closely resemble European ones: *Hylotoma nigratarsis* is extremely like *H. violacea* of Klug; *Hylotoma imperator* greatly resembles *H. enodis*; indeed, of the six species of this genus described, five are close representatives of British ones, whilst I have been unable to separate the sixth from the *Hylotoma pagana* of Panzer. *Tenthredo erratica* appears to be identical with specimens from Siberia, both probably being mere climatal varieties of *T. flavicornis* of Fabricius. The common *Tenthredo scalaris* is found in Japan, only differing in being rather larger. Of three species of the genus *Lyda* one is almost identical with *L. inanita* of Villiers, a common British insect.

All the *Ichneumonidæ* are from Hiogo in South Japan; the *Tenthredinidæ* are partly from Hiogo and partly from Hakodadi, in North Japan.

Fam. TENTHREDINIDÆ, Leach.

Genus HYLOTOMA, Fabr.

1. *Hylotoma nigratarsis*.

Female.—Length $5\frac{1}{2}$ lines. Blue-black; the palpi rufo-testaceous; the antennæ black. Thorax shining, and covered with a fine hoary pile, observable in certain lights; the wings flavo-hyaline, the nervures fuscous, the costal nervure yellow; a brown fascia crosses the anterior wings from the stigma, the latter dark brown; the tibiæ yellowish-white, the intermediate and posterior pairs black at their apex; the anterior tarsi pale, the two apical joints blackish. Abdomen shining, the apex more or less pilose.

Hab.—Hiogo.

This species most closely resembles the *Hylotoma violacea* of Klug.

2. *Hylotoma imperator*.

Female.—Length 4 lines. Shining blue; the antennæ black; the wings dark fuscous, with a blue iridescence, palest at their apical margins; the legs obscurely blue.

Male.—Differs in having the antennæ longer than the head and thorax, extending to the middle of the abdomen, and having a fringe of fine pubescence beneath.

Hab.—Hiogo.

This species closely resembles the *Hylotoma enodis*, but in both sexes the antennæ are considerably longer and thicker. This must be a common species, twelve examples having been received.

3. *Hylotoma humeralis*.

Female.—Length $3\frac{1}{2}$ lines. The head, and the two lateral divisions of the mesothorax, black, with more or less of a blue or green tinge; the pectus is of the same colour; the thorax otherwise reddish-yellow; the abdomen yellow; the legs black, with the femora tinged with blue; tibiæ and tarsi black; wings subhyaline, and clouded with fuscous towards their base, where they are darkest.

Var. The yellow central space on the mesothorax blackish in the middle.

Male.—Smaller, and with the head and thorax entirely nigro-æneous; the legs yellow, with the base of the femora, the apical joints of the anterior and intermediate tarsi, the

apex of the posterior tibiæ and the tarsi black; abdomen yellow, the segments above have transverse fuscous bands in the middle.

Hab.—Nagasaki; Hiogo.

4. *Hylotoma ephippiata*.

Female.—Length $3\frac{1}{2}$ lines. Shining blue-black, with the sides of the prothorax, and the two lateral divisions of the mesothorax, orange-red; the orange colour extends beneath the anterior wings to the sides of the pectus; the antennæ black; the anterior tibiæ obscurely ferruginous within; wings fuscous and iridescent, darkest towards their base.

Male.—Differs in having the mesothorax entirely blue-black.

Hab.—Hiogo.

This species is most closely allied to *Hylotoma thoracica* of Spinola, but that insect has the thorax entirely red above.

5. *Hylotoma simillima*.

Female.—Length 4 lines. Blue-black, shining; the antennæ black; the tibiæ and tarsi obscurely blue; wings fusco-hyaline, the anterior pair dark fuscous at their base, shading off towards the apex of the wings; the nervures black.

Male.—This sex is of the same colour as the female, and only differs in being rather smaller, and in the usual characteristics of the sex.

Hab.—Hiogo.

This species is readily distinguished from *H. imperator*; it is of a duller blue, and the antennæ in both sexes are much shorter; the second apical cell is longer in both sexes.

6. *Hylotoma similis*.

Female.—Length $4\frac{1}{2}$ lines. Head and thorax blue-black; the abdomen yellow. The sides of the thorax, beneath the wings, yellow; the wings fuscous, palest towards their apical margins, and with a blue or violet iridescence; the nervures black.

Hab.—Hiogo.

The only essential difference between this insect and

H. pagana of Europe is its having a large yellow patch beneath the wings.

7. *Hylotoma pagana*, Panz.

Female.—Length 4 lines. Head and thorax blue-black; the abdomen yellow; wings fuscous, their apical portion palest.

Hab.—Hakodadi.

I consider this identical with the European species.

8. *Hylotoma trinotata*.

Female.—Length 4 lines. Head black; thorax and abdomen yellow. Head shining and with a thin, short, cinereous pubescence on the face; antennæ black. Thorax: a large ovate black spot on the mesothorax in front and an oblong one on each side between the tegulæ; wings slightly fuscous, darkest towards their base, the nervures black; the posterior coxæ, trochanters and tibiæ yellow. Abdomen very shining bright yellow.

Hab.—Hiogo.

9. *Hylotoma captiva*.

Female.—Length 5 lines. Purple, with the thorax ferruginous above. Head shining and having a little short, fine, pale pubescence on the face. The prothorax entirely ferruginous; the mesothorax is ferruginous above and half-way down the sides beneath the wings; the scutellum ferruginous, with a purple spot behind; the wings fuscous, the posterior pair and apical portion of the anterior wings palest. The abdomen very glossy and having tints of blue and purple.

Hab.—Hiogo.

Genus SELANDRIA, Leach.

1. *Selandria nigriceps*.

Female.—Length 3 lines. Luteous; the head black, wings fuscous. The apex of the tibiæ, and the tarsi, black; the region of the scutellum dusky; the nervures of the wings and the stigma black, the wings palest towards their apical margins.

Hab.—Hiogo.

Genus *STRONGYLOGASTER*, Dahlb.

1. *Strongylogaster iridipennis*.

Female.—Length 4 lines. Black, wings hyaline and brilliantly iridescent, nervures and stigma fuscous; legs pale. Head black, with the palpi pale. Thorax: the tegulæ, and a minute spot on each side of the post-scutellum, white; legs pale ferruginous, the coxæ and trochanters, the apex of the posterior tibiæ above, and the tarsi, black; the base of the posterior tibiæ white. Abdomen: above, subcarinate in the middle, longitudinally; the apical margins of the third, fourth and fifth segments narrowly ferruginous; beneath, the third and three following segments ferruginous.

Hab.—Hakodadi.

Genus *PACHYPROTASIS*, Hartig.

1. *Pachyprotasis erraticus*.

Male.—Length 4 lines. Black, pale yellow beneath. Head: antennæ pale testaceous beneath, and as long as the body; the face, as high as the insertion of the antennæ, the mandibles, cheeks, and an interrupted narrow line on the vertex, testaceous. Thorax: two longitudinal oblique lines on the mesothorax, the tegulæ, scutellum and two minute spots behind it, testaceous; wings hyaline and iridescent, the nervures black; the legs with a black line above, the pectus with two ovate spots, and a longitudinal line beneath the wings (which unites with two perpendicular lines), testaceous. Abdomen: a triangular spot on the first segment, and a short transverse line in the middle of the apical margins of the third and fourth segments, white.

Hab.—Hakodadi.

This species is extremely like the European *P. simulans*.

Genus *MACROPHYA*, Dahlb.

1. *Macrophya nigropicta*.

Female.—Length $5\frac{1}{4}$ lines. Yellow, with black markings. Head: the antennæ, a somewhat irregular circular spot on the vertex, enclosing the ocelli, a semicircular spot behind the eyes, and the head behind the vertex, black. Thorax: the mesothorax has above a triangular spot

anteriorly, and an oblong one on each side, black; wings hyaline, faintly tinged with yellow towards their apex, with the nervures fuscous; the posterior femora with a black line towards their apex within; the tibiæ and tarsi black, with the base of the former pale. Abdomen: a black fascia at the base of all the segments above; the entire insect yellow beneath, excepting a circular black spot on the pectus.

Hab.—North Japan.

2. *Macrophya vexator*.

Female.—Length $4\frac{1}{4}$ lines. Shining black, with white markings. Head: the clypeus, the inner orbits of the eyes and the lower portion of the hinder orbits, white; the sixth, seventh and eighth joints of the antennæ white, the apical joint black. Thorax: the anterior tibiæ and tarsi in front, the posterior coxæ, trochanters and base of the femora, white; the apical half of the first joint of the posterior tarsi and the second and third joints white. Wings subhyaline, the nervures fuscous, the stigma white at the base.

Hab.—North Japan.

3. *Macrophya apicalis*.

Female.—Length 5 lines. Black, with the scutellum and four apical joints of the antennæ white, the tip of the ninth black. Head: the labrum and base of the mandibles white. Thorax: two minute spots on the post-scutellum, a large oblong-ovate spot on the posterior coxæ exteriorly, their extreme apex and the trochanters white; wings hyaline, with a faint yellow tinge, and brightly iridescent; the nervures black. Abdomen glossy black.

Hab.—Hakodadi.

4. *Macrophya pacifica*.

Female.—Length $4\frac{3}{4}$ lines. Black, with an orange fascia near the base of the abdomen. Head: the antennæ reddish-yellow, the two basal joints black at their extreme apex. Thorax: two minute yellow spots below the scutellum; the anterior and intermediate femora above, and all the tarsi, reddish-yellow; the extreme base of the posterior femora yellow; the apical third of the posterior tibiæ, and the tips of the joints of the tarsi black; wings flavo-hyaline, the nervures fuscous, the stigma pale tes-

taceous. Abdomen: the second segment reddish-yellow above, slightly interrupted in the middle.

Male.—This differs in having the base of the antennæ, to nearly the apex of the third joint, black; it has also the second and third segments of the abdomen yellow, and slightly interrupted.

Hab.—North Japan.

5. *Macrophya ferox*.

Female.—Length $5\frac{3}{4}$ lines. Black, with the four basal segments of the abdomen yellow. Head: antennæ orange-yellow; the clypeus anteriorly, the labrum, mandibles and palpi, white; the scape of the antennæ black in front. Thorax: the posterior margin of the prothorax laterally, the tegulæ, scutellum and posterior margin of the metathorax narrowly reddish-yellow; a minute spot on each side of the post-scutellum white; the anterior and intermediate legs reddish-yellow; the posterior tarsi, and rather more than the basal half of the posterior tibiæ of the same colour; the apex of the posterior coxæ and the trochanters whitish; wings hyaline and iridescent, faintly tinged with yellow, the nervures fuscous, the costal nervure and the stigma reddish-yellow.

Hab.—Hakodadi.

6. *Macrophya ignava*.

Female.—Length 4 lines. Black; the head, legs and thorax with white markings. Head: the clypeus, labrum and mandibles white. Thorax: the margins of the prothorax, a spot on the tegulæ in front and two minute spots behind the scutellum, white; the apex of all the coxæ, the trochanters, and extreme base of the femora, and all the tibiæ, white; the extreme apex of the intermediate and posterior pairs black. The head and thorax are thinly covered with pale down, and the abdomen has a silky pile, only observable in certain lights.

Hab.—Hiogo.

This species closely resembles the *Allantus albicinctus*, of Klug, but in four examples not a trace of the white narrow fascia on the basal segment is to be seen, or of the white tip of the abdomen.

7. *Macrophya irritans*.

Male.—Length $5\frac{1}{2}$ lines. Head and thorax black, with yellow markings, the abdomen reddish-yellow. Head: antennæ reddish-yellow; the anterior margin of the clypeus, the labrum and mandibles, white; the palpi, and a stripe behind the eyes, yellow. Thorax: the posterior margin of the prothorax laterally, the tegulæ, the tips of the coxæ and the legs, reddish-yellow; wings hyaline, iridescent, having a faint yellow tinge, the nervures fuscous, the costal nervure and stigma yellow. Abdomen: the fourth and three following segments have each two quadrate fuscous spots, more or less distinctly marked, the apical one darkest.

Hab.—North Japan.

8. *Macrophya carbonaria*.

Female.—Length 5 lines. Shining-black, head and thorax strongly punctured, the abdomen with finer shallow punctures. The head, thorax and legs have a short pale silky pubescence. A spot on each side of the clypeus, its anterior margin, the base of the mandibles, the anterior tibiæ in front and the tip of the femora, a large oblong-ovate spot on the posterior coxæ, and the middle of the posterior tibiæ above, white; wings hyaline, faintly tinged with yellow, the nervures and stigma black.

Hab.—Hakodadi.

9. *Macrophya timida*.

Female.—Length $4\frac{1}{2}$ lines. Black, punctured and shining. The head and thorax strongly punctured, the abdomen with fine shallow punctures; the base of the mandibles, a large ovate spot outside the posterior coxæ, their extreme apex and the trochanters, white; the apex of the anterior femora in front, the tibiæ in front and the apex of the intermediate pair in front, pale testaceous; the anterior tarsi pale beneath; the wings hyaline, their nervures black.

Hab.—North Japan.

10. *Macrophya luctifera*.

Female.—Length $3\frac{1}{2}$ lines. Shining-black; the tips of the anterior femora in front, and the tibiæ also in front,

white; the posterior trochanters and the base of the tibiæ outside, white; two minute white spots beneath the scutellum; the wings fuscous, the nervures black, the stigma white at the base.

Hab.—Hiogo.

11. *Macrophya flavipes*.

Female.—Length 4 lines. Black; the antennæ, legs and two basal segments of the abdomen pale yellow. Head: the clypeus, mandibles and palpi pale; the vertex brown. Thorax: the scutellum and disk of the mesothorax obscurely testaceous; the tegulæ, and a short line before them, pale testaceous; the wings hyaline and tinged with yellow towards their base; the nervures fuscous, the costal nervure pale testaceous, the stigma black. Abdomen: rather more than the basal half beneath pale testaceous.

Hab.—Hiogo.

Genus TENTHREDO, Linn.

1. *Tenthredo erratica*.

Female.—Length $7\frac{1}{2}$ lines. Reddish-yellow, with a spot on the vertex, which encloses the ocelli, three spots on the mesothorax and the four apical segments of the abdomen, black. Head: the clypeus, labrum and mandibles pale yellow, the tips of the latter black. Thorax: the sides and also the pectus black; the base of the anterior and intermediate coxæ black; a yellowish-white spot before the posterior coxæ; a triangular black spot on the mesothorax anteriorly, and an oblong one on each side; wings flavo-hyaline, nervures fuscous; the costal nervure and the stigma yellow. The male has the antennæ, beyond the second joint, black.

Hab.—Hakodadi; Siberia.

This species is, in my opinion, identical with one received from Trans-Baikal and Angara, in Siberia; it closely resembles the *Tenthredo flavicornis* of Europe, and will probably be considered a climatal variety by some Hymenopterists. Thomson describes *T. flavicornis* as having the posterior femora black; it may be so in Sweden, but it is only a variety in Germany.

2. *Tenthredo providens*.

Female.—Length 7 lines. Black, the three basal joints of the antennæ, the scutellum, and base of the abdomen, pale yellow. Head: the clypeus, labrum, mandibles and palpi yellowish-white; the cheeks at the base of the mandibles testaceous; the tips of the mandibles black. Thorax: the margin of the prothorax in front of the tegulæ pale testaceous; the scutellum and legs yellow; the posterior tibiæ black towards their apex; a white spot above the posterior coxæ; all the coxæ black, with their apex yellow; wings hyaline and iridescent, the apex of the anterior pair dark brown at their apex beyond the stigma; the nervures black, except the costal one and the stigma, which are testaceous. Abdomen black, with the three basal segments pale yellow.

Hab.—North Japan.

3. *Tenthredo scalaris*, Klug.

With the exception of this insect being considerably larger than the European species, I am unable to point out any difference; only a single example has been received. The cabinet specimens are pale yellow, when living they are green; the antennæ black, with the scape yellow in front; a transverse ovate black spot on the vertex, enclosing the ocelli, with a line on each side of the anterior ocellus. The mesothorax black above, with two oblique yellow lines on each side, in the middle; the scutellum yellow. Abdomen: a longitudinal broad black stripe extending from the base to apex; in European examples, the apical margins of the segments are sometimes narrowly yellow; a narrow black line on the femora and tibiæ, and the tips of the joints of the tarsi, black.

Length of Japanese specimens $6\frac{1}{2}$ lines; of European ones $4\frac{1}{2}$ to 5 lines.

Hab.—Hakodadi.

4. *Tenthredo hilaris*.

Female.—Length 7 lines. Black, with the extreme lateral margins of the abdomen yellowish-white; the anterior and intermediate legs pale ferruginous, with the posterior tibiæ and tarsi black. Head: the clypeus, labrum and mandibles pale yellow, the tips of the latter black.

Thorax: the posterior margin of the prothorax pale yellow, narrowly so in the middle; the tegulæ yellow; a transverse narrow line on each side of the scutellum, two minute spots on each side of the post-scutellum, and the hinder margin of metathorax, narrowly yellowish-white; wings hyaline and iridescent, the nervures fuscous, the costal one pale ferruginous; the posterior coxæ black towards their base, with a white spot above them. Abdomen smooth and shining, with the apical margins of the two basal segments narrowly whitish.

Hab.—North Japan.

5. *Tenthredo volatilis*.

Female.—Length $4\frac{1}{2}$ lines. Black, with the four apical joints of the posterior tarsi white; the apex of the claw-joint shining black; the labrum white. The scutellum white, wings hyaline, the nervures and stigma black; the anterior tibiæ at their apex in front, a large ovate spot on the posterior coxæ at their base outside, and the posterior trochanters, white.

Hab.—Hiogo.

Genus *DOLERUS*, Leach.

1. *Dolerus ephippiatus*.

Female.—Length $5\frac{1}{2}$ lines. Head and thorax black, the pro- and meso-thorax ferruginous; abdomen shining black, with an obscure green tinge; the insect has a thin hoary pubescence, most observable on the head, thorax and towards the apex of the abdomen; the middle of the pectus black; wings clear hyaline; the nervures and stigma black; the head rugose.

Hab.—Hakodadi; Hiogo.

2. *Dolerus fuscipennis*.

Female.—Length $3\frac{3}{4}$ lines. Black, and having a thin, short, hoary pubescence; two white minute spots behind the scutellum; the wings fuscous; the anterior tibiæ in front, the posterior trochanters, and the tibiæ outside, white. Abdomen: the fourth and fifth segments have a short white line at their lateral margins.

Hab.—Hiogo.

3. *Dolerus subfasciatus*.

Female.—Length $4\frac{3}{4}$ lines. Black, the head and thorax closely punctured, the abdomen smooth and shining, the fourth segment obscurely reddish-brown; the head and thorax have a thin, short, tawny pubescence, there is a thinly scattered similar pubescence on the abdomen; the tips of the anterior femora, and the tibiæ, pale ferruginous; wings hyaline, the nervures and stigma black.

Hab.—Hiogo.

4. *Dolerus nigro-cæruleus*.

Male.—Length 3 lines. Blue-black, variegated with white. Head: wider than the thorax, slightly narrowed behind the eyes, which are large, globose and extend to the base of the mandibles; the clypeus and mandibles white. Thorax: the anterior and intermediate legs, the posterior coxæ, trochanters and the base of the tibiæ beneath, white; wings subhyaline and iridescent, the nervures black. Abdomen: the middle of the second and third segments above, a spot in the middle of the seventh segment and the apical segment above, white; beneath, the middle of two or three of the basal segments white.

Hab.—Hiogo.

Genus LYDA, Fabr.

1. *Lyda volatilis*.

Female.—Length 4 lines. Black, variegated with white; the legs white, wings hyaline, their nervures and stigma black. Head: below the antennæ, a minute spot above them, on each side of which is a narrow curved line that touches the eyes and unites with the anterior part of the face, white; the cheeks, mandibles and palpi white. Thorax: a spot on each side of the posterior margin of the prothorax, a spot on the tegulæ, a triangular one on the mesothorax anteriorly, the scutellum and an oblique stripe beneath the wings, white. Abdomen: the posterior margins of the segments, except one or two of the basal ones, white.

Hab.—North Japan.

2. *Lyda venustus*.

Female.—Length $5\frac{1}{2}$ lines. Head, thorax, base and apex of the abdomen, black; the intermediate segments

of the latter orange-yellow ; the head and thorax with yellowish or white markings. Head : before the antennæ, the mandibles, palpi, a broad stripe, notched at its outer margin, curves backwards from the summit of the eyes to their posterior margin, and two minute longitudinal spots between the stripes, pale yellow ; the scape of the antennæ yellow ; the tips of the mandibles, the antennæ and the cheeks ferruginous. Thorax : the posterior margin of the prothorax, the scutellum, post-scutellum and the legs pale yellow ; wings flavo-hyaline, the nervures fuscous, towards the base of the wings they are pale ferruginous, as is also the costal nervure ; beneath, three of the apical segments have their apical margins yellowish-white.

Hab.—Hakodadi.

This species resembles the *Lyda inanita* of Europe.

3. *Lyda latifrons*. ✓

Female.—Length $4\frac{1}{2}$ lines. Black, variegated with pale yellow, the legs yellow. Head : the anterior portion below the insertion of the antennæ, a spot above the antennæ, a narrow curved line each side of it, which touches the margin of the eyes, and unites with the yellow margin of the face, a broader line behind the eyes, which passes up to the margin of the vertex and unites with a line that runs from the summit of the eyes, and two minute spots, situated in deep excavations on the vertex, yellow ; antennæ black. Thorax : an interrupted line on the elevated posterior margin of the prothorax, a triangular spot on the mesothorax anteriorly, a spot on the tegulæ, the tubercles and two oblique lines beneath the wings, the scutellum and post-scutellum, yellow ; the wings hyaline, the nervures black. Abdomen beneath and three of the apical segments with a narrow fascia on their posterior margins ; beneath yellow, with two or three of the basal segments black.

Hab.—Hakodadi ; Hiogo.

This species is most closely allied to the *Lyda pratensis* of Europe.

Genus CEPHUS, Latr. ✓

1. *Cephus viator*. ✓

Female.—Length 6 lines. Shining black, the thorax and abdomen with yellow bands. Head : a minute yellow spot between the posterior ocelli and the eyes, situated in

deep pits. Thorax: the posterior margin of the prothorax, which is deeply incised, yellow; the posterior coxæ above, the tips of the femora, the tibiæ and tarsi yellow; the wings hyaline, the nervures ferruginous. Abdomen: a triangular spot on the first segment; a yellow band on the posterior margin of the third segment laterally, and an entire one on the fourth, sixth and seventh segments; beneath black.

Hab.—Hakodadi.

I have given this insect a distinctive specific name, but I believe it to be the same species as Stephens' *Cephus quinque-fasciatus*; it only differs in wanting a minute spot or two on the face, in having the first marginal band widely interrupted, and in wanting the two apical ones, a variety I should expect to occur in a series of British specimens.

2. *Cephus agilis*.

Male.—Length $5\frac{1}{4}$ lines. Shining black; the face and the abdomen spotted with pale yellow. Head: the face as high as the insertion of the antennæ, and the mandibles, yellow, the latter tipped with black. Thorax: the anterior and intermediate femora in front, and their tibiæ, yellow, the latter slightly fuscous behind; the tarsi fuscous; the posterior tibiæ yellow at their base; wings hyaline, the nervures fuscous. Abdomen: a triangular patch on the first segment, the third segment with its apical margin laterally, and the fourth with the entire margin narrowly, yellow in the middle, and more widely so laterally.

Hab.—Hiogo.

Genus SIREX, Linn.

1. *Sirex japonicus*.

Female.—Length $9\frac{1}{2}$ —14 lines. Black, the head yellow; between the eyes black, and a narrow line from thence to the posterior margin of the vertex; sometimes the head is entirely yellow as well as the antennæ and mandibles. Thorax: the prothorax above, the femora, tibiæ and tarsi yellow; the posterior pair more or less fuscous; wings flavo-hyaline, with a fuscous cloud at their apical margins; the nervures ferruginous. Abdomen: the first, second

and eighth segments yellow, the posterior margin of the latter black; the apical spine yellow.

Hab.—Hiogo.

This species closely resembles *Sirex flavicornis* of North America; it differs from that insect in some important particulars,—the yellow band, in the American species, occupies the seventh and half of the eighth segment; this insect has the apical margin yellow.

Fam. ICHNEUMONIDÆ.*

Genus ICHNEUMON, Linn.

1. *Ichneumon generosus*.

Male.—Length $7\frac{1}{4}$ lines. Black, scutellum pale, abdomen red, black and yellow. Head: the face and antennæ, mandibles and palpi pale yellow. Thorax: the tegulæ and a short line in front of them, the scutellum and legs, yellow; the posterior coxæ and trochanters beneath, and the apex of the femora and tibiæ, black; the wings flavo-hyaline, the nervures fuscous, with the stigma yellow. Abdomen: the first segment, the basal half of the third, and the fourth and fifth segments, black; a yellow spot on each side of the apex of the first segment; a broad yellow band on the third segment notched in the middle; beneath, the second, third and fourth segments reddish-yellow.

2. *Ichneumon cognatorius*.

Female.—Length 11 lines. Black, the scutellum white; the antennæ have the joints nine to fourteen white beneath; the face has a narrow line at the inner margin of the eyes towards their summit yellowish-white; the anterior tibiæ in front and the tips of the femora of the same colour; the wings dark fuscous.

Male.—Length $9\frac{1}{2}$ lines. Black: the face, below the antennæ, and a narrow line at the inner margin of the eyes, an abbreviated line behind the eyes at the base of the mandibles and the palpi, white. Thorax: the lateral margins of the prothorax above, the outer margin of the tegulæ, a spot beneath the wings, the scutellum, and a minute spot on each side of the metathorax posteriorly, white; the anterior and intermediate coxæ and trochanters

* All the *Ichneumonidæ* are from Hiogo

spotted with white, their femora and tibiæ in front, and the three basal joints of the tarsi, white; the joints tipped with black; the posterior legs have the tips of the trochanters and basal half of the tibiæ white. Abdomen: the posterior margin of the first segment and a minute spot on each side of apical margin of the second segment, white.

Var. 1, ♂. Only differs in having the face black, with only a narrow line at the inner margins of the eyes.

Var. 2, ♂. The face black and the spots on the second segment of the abdomen wanting.

Var. 3, ♂. Has the face white, with the abdomen entirely black.

Var. 1, ♀. Black, with the apical third of the antennæ and the anterior tibiæ in front obscurely pale yellow.

This species is almost identical with the European one, *Ichneumon Proteus*, the male of which is *I. laminatorius*; indeed, it would be difficult to point out a specific difference; on examining a series of ten males and eight females in the British Collection at the Museum, both sexes are constant in having the scutellum white; all the males have the face white below the insertion of the antennæ. The Japanese specimens have the wings much darker than *Ichneumon Proteus*.

3. *Ichneumon doliturus*.

Male.—Length $4\frac{1}{4}$ lines. Black: the face, and scape of the antennæ in front, white. The anterior femora in front, the apex of the intermediate pair and the tibiæ and tarsi of both pairs, white; the basal half of the posterior tibiæ, and the spines at their apex, white; wings subhyaline, their nervures and stigma black. Abdomen shining.

4. *Ichneumon cursorius*.

Female.—Length 6 lines. Head and thorax black, abdomen red and black, scutellum yellow. Head: the face below the antennæ and a line at the inner margin of the eyes ferruginous; antennæ obscurely ferruginous, with five or six of the middle joints white. Thorax: the legs rufo-piceous, with the coxæ, and posterior femora above, black; wings subhyaline, the nervures black, the stigma yellow. Abdomen: the first segment and the apical margins of the following segments black.

Male.—Differs in having the head entirely black; the

thorax has a minute yellow spot in front of the tegulæ; the abdomen has the three basal segments ferruginous, the rest black.

5. *Ichneumon flavitarsis*.

Male.—Length $7\frac{1}{4}$ lines. Black, with the scutellum and the legs partly yellow. Head: the face and scape of the antennæ in front pale yellow; the palpi white. Thorax: the margins of the prothorax towards the tegulæ, the latter in front and a line beneath the wings, pale yellow; wings hyaline and iridescent; the anterior femora in front fulvous; all the tibiæ and tarsi yellowish-white, the posterior tibiæ at their apex and the tips of the two first joints of the tarsi fuscous; the insect very closely punctured; the apical half of the abdomen with an obscure blue tinge.

This species closely resembles *Ichneumon multiannulatus* of Europe, but the latter has the posterior tarsi black, except the base of the first joint.

6. *Ichneumon virulentus*.

Female.—Length 4 lines. Black, with the two apical segments of the abdomen white. Four or five of the middle joints of the antennæ white beneath. The thorax and legs have a fine, short, hoary down; the anterior and intermediate tibiæ white outside; the spines at the apex of all the tibiæ white; the wings subhyaline; the metathorax has two central enclosed spaces, the first half the size of the second; on each side of these are two enclosures. The entire insect is closely punctured and semi-opaque, with the three apical segments of the abdomen shining.

7. *Ichneumon improvidus*.

Male.—Length $4\frac{1}{2}$ lines. Black, with the face below the antennæ and the scape in front white. The flagellum of the antennæ fulvous beneath; the mandibles and palpi white. The anterior and intermediate femora towards their apex, and their tibiæ and tarsi, rufo-testaceous; the wings subhyaline; the enclosed space at the base of the metathorax horseshoe-shaped, with two oblique carinæ, also two lateral carinæ, the intermediate spaces rugose. Abdomen elongate, shining, and finely punctured towards the base.

8. *Ichneumon incanescens*.

Female.—Length $6\frac{1}{2}$ lines. Black; with the margins of the two apical segments of the abdomen broadly yellowish-white; the thorax and legs covered with a short hoary down, particularly at the sides and beneath the former. Five or six of the middle joints of the antennæ white beneath. Thorax: the metathorax has above, at its base, an oblong space enclosed by a carina, from the apex of which an oblique carina runs to the lateral margins, which are also carinated; the usual carina, which crosses the space between the lateral margins and the oblong space, is obsolete in this species; all the tarsi, and the anterior, and intermediate tibiæ in front, rufo-testaceous, the tarsi more or less dusky above; the entire insect very closely punctured and opaque, except the three apical segments of the abdomen, which are shining; wings subhyaline.

9. *Ichneumon vexator*.

Female.—Length 5 lines. Black; the scutellum yellow; the apex of the abdomen white above. Head: two yellow spots on the anterior margin of the face; five of the middle joints of the antennæ white beneath; a narrow yellow line at the inner margin of the eyes, near their summit. Thorax: on the metathorax above, close to the post-scutellum, a minute transverse space is enclosed by a carina, and immediately beyond is a larger, somewhat horseshoe-shaped, space, from which the usual oblique carinæ run, and between the lateral marginal carinæ and the horseshoe-shape, the space is crossed by a transverse carina; wings fusco-hyaline; the anterior femora in front, the tibiæ, and also the intermediate pair in front, more or less rufo-piceous; their tarsi rufo-piceous beneath. Abdomen: a large white spot on the two apical segments above; the entire insect closely punctured and semi-opaque, except the four apical segments, which are shining.

10. *Ichneumon irritator*.

Female.—Length 6 lines. Black; with the scutellum and apex of the abdomen white. Head: four of the middle joints of the antennæ white beneath. Thorax: a horseshoe-shaped space, enclosed by a carina, at the base of the metathorax, from which an oblique carina runs

towards the apex ; between these, two longitudinal carinæ run from the horseshoe-shape to the apex ; a longitudinal carina at the lateral margins, the space between these and the horseshoe-shape is crossed by a carina in the middle ; wings fusco-hyaline ; legs black. The entire insect closely punctured and semi-opaque ; the first segment of the abdomen above, and two or three of the apical segments, slightly shining.

✓
11. *Ichneumon rufitarsis*.

Female.—Length $7\frac{1}{4}$ lines. Black ; the scutellum, and apex of the abdomen above, yellow. Head : six or seven of the joints of the antennæ, in their middle, yellowish-white beneath ; a narrow yellow line at the inner margin of the eyes, above the insertion of the antennæ. Thorax : an oblong enclosed space at the base of the metathorax, from which, on each side, a carina runs obliquely towards the apex ; the wings fusco-hyaline ; the tips of the femora, the tibiæ and tarsi ferruginous, all more or less fuscous above. The entire insect closely punctured and semi-opaque, except the four apical segments of the abdomen, which are shining.

This species closely resembles *Ichneumon relucens* of Europe.

✓
12. *Ichneumon dentatus*.

Female.—Length 6 lines. Black ; opaque, with the abdomen only shining ; the antennæ fulvous beneath, with the tenth and two following segments white beneath. The lateral margins of the scutellum sharply elevated ; a semicircular enclosed space at the base of the metathorax, from which a raised carina passes obliquely to the apical lateral margins, and is there produced into a stout blunt tooth ; the anterior femora in front, the tips of the intermediate pair, the tibiæ and tarsi of both pairs, ferruginous, all more or less dusky above ; the posterior tarsi, ferruginous beneath ; the wings subhyaline.

✓
13. *Ichneumon intrudens*.

Female.—Length $5\frac{1}{2}$ lines. Black, semi-opaque, very closely and finely punctured. Five of the middle joints of the antennæ white beneath. The scutellum, and the basal half of the tibiæ, yellow ; the tarsi ferruginous, and more

or less dusky above; the wings fulvo-hyaline, the nervures fusco-ferruginous. The two apical segments of the abdomen have a large yellow spot, and the fourth and fifth segments shining.

Genus CRYPTUS, Fabr.

1. *Cryptus ambulator*.

Female.—Length 7 lines. Scutellum pale; the legs red, black and white. Head: the clypeus in front, the labrum, the scape in front, and a narrow line at the inner margin of the eyes, yellowish-white; three joints of the antennæ, a little beyond the middle, white. Thorax: the scutellum, apex of the metathorax, and a spot on the posterior coxæ behind, pale yellow, the tegulæ are of the same colour; the femora and basal half of the posterior tibiæ fulvous; the apex of the posterior femora, to about one-third of their length, black; the tarsi, and the anterior and intermediate tibiæ, yellowish-white, the claw-joint of the tarsi black; wings subhyaline, their apical margins slightly fuscous. Abdomen black and shining.

2. *Cryptus carbonarius*.

Female.—Length 4 lines. Black and punctured, with the abdomen smooth and shining. Head: four joints in the middle of the antennæ white above. The anterior femora in front, the tibiæ and tarsi, obscure ferruginous; the intermediate tibiæ in front and the tarsi obscure ferruginous; wings subhyaline, with the nervures and stigma black; scutellum shining; the metathorax rugose and obliquely truncate.

3. *Cryptus basalis*.

Female.—Length 3 lines. Black; head and thorax closely punctured and semi-opaque, the abdomen smooth and shining; four joints in the middle of the antennæ white. The tibiæ and tarsi fusco-ferruginous, darkest behind; wings subhyaline, their extreme base yellow, their nervures and stigma black; the metathorax rugose, the posterior lateral angles produced into a short tooth. The basal segment of the abdomen longitudinally striated.

4. *Cryptus penetrator*.

Female.—Length $4\frac{1}{2}$ lines. Black; head and thorax punctured and opaque; abdomen smooth and shining, the

apical segment with a pale spot. The four middle joints of the antennæ white above. The metathorax has a small quadrate enclosed space at its base, and attached to it a larger hexagonal one, from which an oblique carina runs on each side and joins the lateral ones; a transverse carina runs from the middle of the hexagonal space to the lateral carinæ; the anterior spaces thus formed are finely punctured, the posterior ones are rugose; wings fusco-hyaline.

5. *Cryptus punctator*.

Female.—Length $3\frac{1}{4}$ lines. Black; head, thorax and abdomen punctured and semi-opaque. The eighth and three following segments of the antennæ white above. Thorax: the metathorax strongly punctured; the enclosed space at its base large and somewhat horseshoe-shaped, and having the usual lateral and transverse carinæ not very strongly marked; wings subhyaline, the nervures black; the anterior and intermediate femora, towards their apex in front, their tibiæ and tarsi, fulvo-ferruginous; the posterior tibiæ ferruginous at their base to half their length; the second and third joints of the tarsi white.

6. *Cryptus maculipes*.

Female.—Length $3\frac{1}{4}$ lines. Black; the scutellum pale yellow; the apical segment of the abdomen and the trochanters white. Five joints, about the middle of the antennæ, white above. Thorax: the wings fusco-hyaline; the nervures fuscous, the stigma yellow; the anterior femora in front, towards their apex, the tibiæ and tarsi, rufo-testaceous; the intermediate tibiæ and tarsi more obscurely so; the extreme base of the posterior tibiæ pale.

Genus TROGUS, Grav.

1. *Trogus arrogans*.

Female.—Length 13 lines. Head, mesothorax above, and legs, reddish-yellow, otherwise black; wings fulvo-hyaline, the superior pair dark fuscous beyond the areolet, and having a violet iridescence. The antennæ more or less fuscous above; the vertex with a black spot behind the eyes. The mesothorax with a central longitudinal black stripe, which terminates opposite the tegulæ, a broad black stripe on each side of it; the scutellum yellow, much

elevated and conical; the metathorax has at its base, near the post-scutellum, a small shining tubercle, from which, on each side, two divergent carinæ run to the lateral margins, which are also edged with an elevated carina; all the coxæ, the intermediate femora beneath, and the posterior pair, black, tip of the latter yellow; abdomen black, smooth and slightly shining.

This species resembles *Trogus pepsoides*, from North China, described by myself in the Transactions of the Entomological Society of London, vol. ii. (1852); it is, I consider, on a careful comparison of the two insects, distinct; the areolet of the anterior wing is much larger, the metathorax longer, and the basal segment of the abdomen narrower, and differently sculptured; its abdomen is not variegated with ferruginous colour.

Genus PIMPLA, Fabr.

1. *Pimpla destructor*.

Female.—Length 6 lines. Black; scutellum and legs pale. Head: below the antennæ yellow, the clypeus with a central black line, which is swollen near its apex; a narrow line in the emargination of the eyes; the labrum and the scape in front yellow; the flagellum fulvous beneath. Thorax: the scutellum, post-scutellum and tegulæ, pale yellow; wings subhyaline, their nervures black; the legs yellow; the posterior femora ferruginous, their tips black; the tibiæ white, their apex, as well as the tarsi, dark fuscous; the anterior and intermediate coxæ behind and the posterior pair entirely black; the abdomen finely and very closely punctured, and thinly covered with a fine hoary pile.

Var. The labrum, clypeus and the coxæ entirely black; the entire inner margin of the eyes with a narrow yellow line.

Male.—Length $6\frac{1}{2}$ lines. Black; the palpi pale testaceous; the flagellum fulvous beneath. Thorax: the tegulæ and scutellum white; the anterior and intermediate femora, tibiæ and tarsi yellowish-white; wings subhyaline; abdomen as in the female.

2. *Pimpla luctuosa*.

Female.—Length $6\frac{1}{2}$ lines. Black, with the anterior and intermediate femora in front, their tibiæ and tarsi

yellow, the tibiæ dusky behind; wings fusco-hyaline, the nervures black. Abdomen closely punctured, the four basal segments most strongly so.

This species very closely resembles the *Pimpla æthiops* of Europe, but I have never seen an example of that insect with pale intermediate tarsi: this is the principal distinction.

Genus THYREODON, Brullé.

1. *Thyreodon purpurascens*.

Female.—Length 13 lines. Obscure blue-black, with bright purple tints, particularly brilliant on the mesothorax and abdomen; the antennæ yellow, with two or three of the basal joints black. The head closely punctured. The mesothorax closely punctured and with two impressed lines in the centre, which run from the anterior margin and converge at the middle of the disk, the slightly impressed single channel running backward to the scutellum; the scutellum and metathorax both coarsely rugose, the latter having a deep central longitudinal channel; the wings dark fuscous, and with brilliant tints of violet and purple, their base and apical margins dark fuscous; the coxæ and trochanters purple. Abdomen smooth, shining, and having bright purple tints.

Hab.—Hiogo.

The description given by Brullé of *Thyreodon morio* would, to some extent, apply to this species, but it would not distinguish the *morio* of Fabricius, the type of which is in the Banksian Collection, now deposited in the British Museum. That insect is nine lines in length, is black, has the face variegated with yellow; a spot on the mandibles, the scape in front, and the anterior legs, also yellow; the antennæ orange-yellow; wings dark fuscous and with violet iridescence.

Genus ANOMALON, Grav.

1. *Anomalon flavifrons*.

Female.—Length 5 lines. Head and thorax black; legs and abdomen reddish-yellow, with black markings. Head: the face, mandibles and cheeks yellow, as well as the scape in front; the antennæ fulvous beneath and fuscous above; a minute yellow spot at the summit of each

eye. Thorax: the anterior and intermediate coxæ and trochanters bright yellow; the posterior trochanters and femora dusky above; the posterior tibiæ black at their apex; wings hyaline and brightly iridescent, the nervures fuscous, the stigma pale yellow. Abdomen: the base of the first segment above, the second segment above, and the fifth and two following segments, black above.

2. *Anomalon insidiator*.

Female.—Length 15 lines. Head and thorax black; antennæ and legs yellow, the posterior pair variegated with black; wings flavo-hyaline. Head: the face, as high as the antennæ, the cheeks, mandibles and palpi, yellow; the scape above, as well as two or three of the basal joints of the flagellum, black above. Thorax: three longitudinal impressed lines on the mesothorax; the metathorax coarsely rugose, and having a deep central longitudinal channel; wings faintly clouded at their apical margins, the tegulæ and nervures ferruginous; the posterior coxæ, the femora above, and the tibiæ towards their apex, black. Abdomen: the two basal segments, and the two apical segments above, black.

Genus PANISCUS, Grav.

1. *Paniscus unicolor*.

Male.—Length 7 lines. Pale rufous; the face yellowish-white, as well as the scape of the antennæ in front. The mesothorax with two oblique pale impressed lines, which converge towards the scutellum, which is also paler than the mesothorax; wings hyaline, the nervures fuscous, the stigma yellow. The claws of the tarsi ferruginous.

Genus OPHION, Fabr.

1. *Ophion pungens*.

Female.—Length 9 lines. Rufous: the face and also the cheeks yellow; the thorax palest on the sides and beneath; the metathorax slightly rounded at the sides; the wings hyaline and iridescent, the nervures fuscous, the stigma ferruginous.

This species only differs from the *Ophion merdarius* of Europe in the form of the metathorax, which is broader,

the sides being rounded: it has the apex of both the first and second segments of the abdomen swollen as in *O. merdarius*.

2. *Ophion flavopictus*.

Female.—Length 7 lines. Rufous: the head, four narrow lines on the thorax, the scutellum, the sides of the thorax and of the abdomen, pale yellow. The eyes, ocelli, and tips of the mandibles, black; antennæ rufous. Thorax: the two central yellow lines on the mesothorax unite with a quadrate spot before the scutellum; the pectus, and sutures of the thorax, rufous; the coxæ yellow outside; wings subhyaline and iridescent, the nervures fuscous, the stigma pale. The first segment of the abdomen pale.

3. *Ophion unicolor*.

Female.—Length $4\frac{1}{2}$ lines. Rufous; eyes and ocelli black; wings hyaline and iridescent, nervures ferruginous, stigma pale; the tegulæ and scutellum pale.

Genus *XYLONOMUS*, Grav.

1. *Xylonomus investigator*.

Female.—Length 7 lines. Black: the head shining, finely punctured, the vertex nearly impunctate; the thorax and abdomen very closely punctured and semi-opaque. The face and cheeks with a thin griseous pubescence; the palpi pale testaceous. Thorax pubescent, the pubescence short, thin, and most observable on the sides and beneath; the mesothorax with two oblique impressed lines, which converge to the base of the scutellum; the intermediate space transversely rugulose posteriorly; the metathorax has, at its base, a short central carina terminating at a subtriangular enclosed space, from which two carinæ branch off laterally on each side; the apex of the metathorax has a series of radiating striæ between two arched carinæ, these carinæ terminate laterally in short spines or teeth; wings subhyaline, their nervures black, the tegulæ pale testaceous; the four anterior legs ferruginous, the anterior coxæ being yellowish outside; the posterior tibiæ and tarsi obscurely rufo-piceous. The first and second segments of the abdomen punctured, the following segments very delicately so.

This insect very closely resembles a species from Amoor in Siberia, but must be considered distinct, the latter having the thorax more elongate before the wings; it has also a deep longitudinal channel on the first segment, and it has also two or three joints of the antennæ towards their apex, white.

Fam. BRACONIDÆ.

Genus AGATHIS, Latr.

1. *Agathis atricornis*.

Female.—Length $3\frac{1}{4}$ lines. Rufous: the antennæ and the vertex black; the head deeply concave behind the ocelli. Thorax: the mesothorax with a central and two oblique longitudinal channels; the metathorax with six longitudinal carinæ; the spaces between them are transversely carinate; the tips of the posterior tibiæ, the tarsi above, and the valves of the ovipositor, black; the wings fuscous; the space between the apex of the externo-medial cell, and that of the marginal cell of the anterior wings, dark fuscous; this is crossed by a hyaline fascia at the base of the stigma, it also passes a short way across the posterior wings; the base of the anterior wings subhyaline, and a small hyaline spot at the apex of the marginal cell.

Fam. CHRYSIDIDÆ.

Genus STILBUM, Spin.

1. *Stilbum amethystina*.

Chrysis amethystina, Fabr. Syst. Ent. 539; Ent. Syst. ii. 243; Syst. Piez. 176.

Stilbum splendidum, Dahlb. Hym. Europ. ii. 358 (nec Fabr.).

Hab.—Hiogo.

All authors who have quoted the *S. splendidum* of Fabricius have mistaken his species, although, in his first description, he commences, “Magna. Caput viride, &c.,” a term he does not apply to any other species. It is true that he quotes Malabar as one of the localities, but that is evidently an error, since he adds, “In nova Hollandia, Mus. Dom. Banks;” and the description applies to the

Australian insect. *Stilbum amethystina* is also described in his first work, and is readily distinguished as belonging to the genus *Stilbum*, as he describes the scutellum as "prominulo, concavo;" the habitat given is Australia, the type being in "Mus. Dom. Banks." The Banksian Collection is now in the British Museum; I have compared the type with other examples from Australia, and also with Asiatic ones, and cannot detect any specific differences.

Genus CHRYSIS, Linn.

1. *Chrysis Daphne*.

Female.—Length $3\frac{1}{4}$ lines. Head and thorax green, abdomen purple, with shades of gold and coppery brilliancy. Head and thorax, as well as the extreme base of the abdomen, very coarsely punctured, the second segment of the abdomen much more finely and closely punctured, and the third more finely punctured than the second, the apical segment armed with four angular acute teeth; the lateral angles of the apical margin acute, not toothed. A dark blue spot encloses the ocelli; the antennæ black; the head posteriorly dark blue. Thorax: the prothorax with three dark blue spots, and the central division of the mesothorax also obscurely blue; wings hyaline, the nervures testaceous; the legs green, the tarsi fuscous. Abdomen: the apical margin of the first segment golden-green, the lateral margins bright green, with a coppery brilliancy in certain lights; the apical margins of the second and third segments have a similar green and coppery brilliancy; beneath of a steel-blue, with the base of the segments black.

Hab.—Hidgo.

The following four species of *Chalcididæ* are described by Mr. Francis Walker, whose works on that family of insects are so well known to Entomologists; he also kindly described the new species of *Epyris* belonging to the family *Proctotrupidæ*.

Fam. CHALCIDIDÆ.

Genus CHALCIS, Fabr.

1. *Chalcis obscurata*.

Male.—Length $2\frac{3}{4}$ lines. Nigra, abdomen apicem versus cinereo-tomentosum; femora, apicis tibiæ tarsisque flava;

tibiæ subtus nigro-vittatæ; tibiæ postice basi nigræ; alæ cinereæ.

Male.—Body, antennæ and legs black, with the usual structure. Body convex. Head and thorax scabrous, dull. Antennæ stout, nearly filiform. Prothorax about four times as broad as long. Sutures of the parapsides distinct. Abdomen smooth, shining, subsessile, with cinereous tomentum towards the tip. Femora yellow at the tips, hind femora minutely denticulated beneath. Tibiæ yellow, striped beneath with black; hind tibiæ black at the base. Tarsi yellow, tips black. Wings cinereous; squamulæ yellow; veins black; ulna about half as long as the humerus.

Hab.—Hiogo.

Perhaps a variety of *C. inclinator*, a native of Ceylon, Celebes and Aru; the black hue predominates a little more on the legs, and the wings are cinereous, not pellucid. The Chinese specimens included with *C. inclinator* belong to *C. obscurator*.

Genus EPITRANUS, Walk.

1. *Epitranus albipennis*.

Female.—Length $1\frac{1}{2}$ line. Niger; petiolus gracilis, elongatus; abdomen fusiforme subcompressum, thorace brevius et multo angustius; pedes quatuor anteriores lutei; pedes postici picei, femoribus inermibus; alæ albæ.

Body black, convex. Head and thorax scabrous, slightly shining. Head a little broader than the thorax. Antennæ black, subclavate, very much shorter than the thorax. Prothorax about twice as long as broad. Sutures of the parapsides strongly marked. Scutellum small. Metathorax large, obliquely sloping. Petiole slender, cylindrical, as long as the hind coxæ and more than half as long as the abdomen. Abdomen fusiform, smooth, shining, slightly compressed, shorter and much narrower than the thorax. Four anterior legs luteous. Hind legs piceous; coxæ very long; femora incrassated, not denticulated; tibiæ slightly curved. Wings white, veins whitish; ulna shorter than the humerus; radius none; cubitus short; stigma small.

Hab.—Hiogo.

Genus HALTICELLA, Spin.

1. *Halticella apicalis*.

Female.—Length $2\frac{4}{5}$ lines. Nigra; antennæ filiformes; metathorax tricarinatus; abdomen longi-ovatum, subsessile,

thorace æquilongum; femora postica, tibiæ apice tarsisque quatuor anteriores rufa; alæ fuliginosæ.

Body black, convex. Head and thorax finely punctured, slightly shining. Head as broad as the thorax; front deeply excavated as usual. Antennæ black, filiform, inserted near the mouth, shorter than the thorax. Prothorax about four times as broad as long. Sutures of the parapsides distinct. Paraptera and scutellum large. Metathorax with three keels. Abdomen elongate-oval, smooth, shining, subsessile, acute at the tip, about as long as the thorax; first joint as long as the five following together. Legs black; four anterior tarsi, tips of tibiæ and hind femora red, the latter incrassated. Wings smoky-brown; veins black; humerus a little more than half as long as the wing; ulna about one-sixth as long as the humerus; radius and cubitus extremely short.

Hab.—Hiogo.

Genus EURYTOMA, Illig.

1. *Eurytoma antica*.

Female.—Nigra; antennæ subfiliformes, basi luteæ; prothorax longissimus, antice latior; metathorax sulcatus; pedes lutei, femoribus tibiisque apud medium piceis; alæ diaphanæ, corpore multo breviores.

Female.—Length $2\frac{1}{2}$ — $2\frac{3}{4}$ lines. Body black, long, slender, convex. Head slightly shining, finely punctured, somewhat broader than the prothorax. Antennæ black, nearly filiform, much shorter than the thorax; 1st joint luteous, slender, linear; 2nd small, subcyanthiform, mostly luteous; 3rd—8th linear, successively decreasing in length; club fusiform, a little longer than the 3rd joint. Thorax dull, finely scabrous. Prothorax large, subquadrate, slightly widening from the fore-border to the hind-border. Scutum of the mesothorax a little shorter and narrower than the prothorax, with well-defined sutures of the parapsides. Scutellum rather small. Metathorax tapering hindward, with a middle longitudinal furrow. Petiole short, slender, distinct. Abdomen elongate-fusiform, quite smooth, highly polished, a little narrower than the mesothorax, and about as long as the whole thorax; 2nd segment much shorter than the 1st and than the 3rd; 4th larger than the 1st and the 3rd; 3rd as long as the 2nd; 6th longer than the 4th. Legs luteous; femora and tibiæ piceous, except towards each end; fore-tibiæ occasionally wholly luteous; tarsi with piceous tips.

2. *Camponotus japonicus*, Mayr, Diag. neue Formicid. 1, §.

3. *Camponotus vitiosus*. ✓ = *marginatus* subsp.

Worker.—Length $2\frac{3}{4}$ lines. Shining-black; the antennæ and legs rufo-piceous, the tarsi and joints of the legs palest; the mandibles obscure rufo-piceous. Head oblong, subquadrate. Thorax narrowed posteriorly, the metathorax obliquely truncate; the scale of the peduncle narrow, its superior margin rounded and fringed with a few stiff hairs.

Hab.—Hiogo.

This species resembles dark examples of *Camponotus lateralis* of Europe, but is distinct; its thorax is evenly obliquely inclined to the margin of the metathorax, not elevated and abruptly truncate, as in *C. lateralis*; the description is that of a worker minor.

Genus LASIUS, Fabr.

1. *Lasius fuliginosus*, Mayr, Europ. Formicid. 49.
Formica fuliginosa, Latr. Hist. Nat. Fourm. 140;
 St. Farg. Hym. i. 200; Nyl.
 Mon. Form. Bor. 915; Foerst.
 Hym. Stud. Form. 28; Smith,
 Brit. Form. 105; Mayr, Form.
 Austr. 79.

Hab.—Europe; Japan.

2. *Lasius niger*, Fabr. Syst. Piez. 415; Mayr, Europ. Formicid. 49.
Formica nigra, Linn. Faun. Suec. No. 1723; Fabr.
 Ent. Syst. ii. 352; Latr. Hist. Nat.
 Fourm. 156; St. Farg. Hym. i.
 206; Nyland. Mon. Form. Bor.
 920; Schenck, Beschr. Nass.
 Ameis. 49; Smith, Brit. Form.
 109.

Formica fusca, Foerst. Hym. Stud. Form. 33.

Genus POLYRHACHIS, Smith.

1. *Polyrhachis lamellidens*, Mayr, MS.?

Worker.—Length $3\frac{1}{2}$ lines. Head and abdomen black, smooth and shining; thorax opaque, ferruginous. Head:

the clypeus with a sharp central longitudinal carina; the mandibles aciculate and punctured. Thorax: armed anteriorly with two stout divergent spines; the mesothorax has on each side a short stout spine, which curves outwardly and inclines backwards; the metathorax with two short, stout, blunt spines. Abdomen: the peduncle terminates above in two divergent, acute, curved spines, which are inclined over the base of the abdomen, which is highly polished and shining.

Hab.—Hiogo.

This species is most closely allied to *P. bellicosus*; in the British Museum are specimens of the species from Hong Kong.

Genus TAPINOMA, Foerst.

1. *Tapinoma flavipes*. ✓

Female.—Length 2 lines. Fuscous, opaque, sericeous. Antennæ bright yellow, 12-jointed; ocelli placed backward on the vertex, the posterior pair situated at its posterior margin. Thorax short and ovate; wings subhyaline, with a fulvous tinge; with one large marginal cell and one submarginal, the discoidal cells obsolete; legs of a bright golden-yellow. Abdomen oblong-ovate; petiole small and inclined forwards.

Worker.—Length 1 line. Yellow and shining; the head and posterior half of the abdomen somewhat fuscous; the scale of the abdomen inclined forwards.

Hab.—Hiogo.

Fam. PONERIDÆ.

Genus PONERA, Latr. ✓

1. *Ponera solitaria*.

Worker.—Length 2 lines. Black, slightly shining, and having a thin grey pile; the apex of the scape, the flagellum, and the legs ferruginous; the mandibles ferruginous, and denticulate on the inner margin; the metathorax compressed, subcarinate longitudinally above, and obliquely truncate behind; the node of the peduncle incrassate, its superior margin rounded; the apical segments of the abdomen pale rufo-testaceous.

Hab.—Hiogo.

Fam. MYRMICIDÆ.

Genus APHÆNOGASTER, Mayr. ✓

1. *Aphænogaster aciculata*.

Female.—Length 5 lines. Shining jet-black. Head: the mandibles aciculate and somewhat obscurely ferruginous; the extreme apex of the scape and also of the flagellum rufo-piceous; the head aciculate. Thorax: above longitudinally aciculate and having a few scattered punctures; scutellum rounded behind and having a central longitudinal impressed line, the metathorax deeply excavated in the middle, the excavation transversely aciculate; the four apical joints of the tarsi rufo-testaceous. Abdomen: the two nodes of the peduncle rugulose; the segments smooth and shining, and with scattered pale setæ.

Worker.—Length $2\frac{1}{2}$ lines. Jet-black, the head and thorax aciculate, the abdomen smooth and shining, and with scattered pale setæ. The extreme apex of the antennæ, the tips of the femora and of the tibiæ, and the apical joints of the tarsi, rufo-testaceous; the nodes of the abdomen rugose.

Hab.—Hiogo.

Genus ISCHNOMYRMEX, Mayr.

1. *Ischnomyrmex famelicus*. ✓

Worker.—Length 3 lines. Black, nigro-piceous or rufo-piceous, very variable in colour; large workers usually black, with more or less ferruginous-coloured legs; small workers rufo-piceous, with intermediate shades in different examples. Head oblong, eyes lateral, small and prominent, situated about the middle of the length of the head; antennæ nearly as long as the body; mandibles trigonate, prominent and dentate. Thorax: the prothorax produced into a short neck; the metathorax bidentate; above with a longitudinal channel; legs elongate, the intermediate and posterior tibiæ with very short fine spines at their apex. Abdomen: the petiole of the first node long; the node, viewed laterally, of a blunt wedge-shape; the second node subglobose; abdomen smooth, shining and ovate, usually palest at the apex.

Hab.—Hiogo.

Genus LEPTOTHORAX, Mayr.

1. *Leptothorax congruus*. ✓

Worker.—Length $1\frac{1}{4}$ line. Black-brown; head oblong, eyes about the middle, lateral; the base of the scape of the antennæ and the flagellum rufo-testaceous; the three-jointed club dark fuscous; the head longitudinally finely striated. Thorax finely rugulose; the base of the femora and of the tibiæ, and also the tarsi, pale rufo-testaceous; the thorax is narrowed posteriorly, where it is armed with two short spines. Abdomen smooth and shining, truncate at the base.

Hab.—Hiogo.

This insect is like *L. acervorum*, but smaller.

Genus MONOMORIUM, Mayr. ✓

1. *Monomorium intrudens*.

Worker.—Length 1 line. Head yellowish-chestnut, very smooth and shining; eyes minute, placed at the sides of head anteriorly; the club of the antennæ three-jointed and rather darker than the head. The thorax, legs and nodes of the peduncle pale yellow. The extreme base of the abdomen pale, the rest of it nearly black.

Hab.—Hiogo.

This minute ant is probably, like two or three of the species of the genus, found in houses; the common house ant found in many London houses belongs to the same genus. The species are remarkable for not having any suture between the pro- and meso-thorax, and the meta-thorax is not spined.

Genus PHEIDOLE, Westw.

1. *Pheidole fervida*. ✓

Female.—Length $3\frac{1}{4}$ lines. Pale chestnut-colour, the mandibles of a brownish-black, punctured, very stout and with two teeth at their apex; head about the same width as the thorax; longitudinally striated and slightly emarginate behind. Thorax ovate, rather longer than broad, shining and flattened above; the scutellum smooth and shining; legs paler than the body. Abdomen ovate, smooth and shining, the apical margins of the segments pale.

Worker.—Length $1\frac{1}{2}$ lines. Head of a deeper colour than the female, and four times the width of the prothorax; deeply incised behind; longitudinally striated, the striæ becoming obsolete at the margin of the vertex. The thorax widened anteriorly and angulated at the sides; much narrowed posteriorly; the metathorax with two short, erect, acute spines; the legs and abdomen testaceous.

Hab.—Hiogo.

2. *Pheidole nodus*. ✓

Worker.—Length $2\frac{1}{2}$ lines. Obscurely ferruginous; the head anteriorly, the thorax, and the base of the abdomen, brightest. Head longitudinally striated; deeply emarginate behind, where it is deeply and coarsely punctured. The thorax rugose above; the metathorax with two short, acute spines. Abdomen: the first node of the peduncle narrow, its superior margin rounded; the second large, transverse, four times the width of the first, angular at the sides, above having a few transverse striæ. The head twice the width of the abdomen.

Hab.—Hiogo.

Of the same size as, and resembling the *P. bicarinatus* of Mayr, from Calcutta, but distinguished by the enlarged second node of the abdomen.

Genus CREMATOGASTER, Lund.

1. *Crematogaster laboriosa*. ✓

Worker.—Length $1\frac{1}{2}$ lin. Nigro-piceous, occasionally rufo-piceous, being more or less obscure, smooth and shining; the head narrowed behind the eyes, slightly so in front of them, the tibiæ and tarsi paler than the femora; the metathorax with two short acute spines; the base of the abdomen usually paler than the apex, which is acute. ✓

Hab.—Hiogo.

Fam. MUTILLIDÆ.

Genus MUTILLA, Linn.

— 1. *Mutilla pungens*.

Female.—Length 4 lines. Head: anterior margin of the thorax narrowly, and the abdomen, black; thorax otherwise red. A pubescent spot in the middle of the basal segment, and a narrow fascia on the apical margin

of the second segment, and the extreme apex, pale golden-yellow; the rest of the pubescence on the abdomen above black; beneath, the margins of the segments are thinly fringed with pale hairs. The thorax oblong, densely covered with strong confluent punctures, slightly narrowed in middle; the tarsi rufo-testaceous; the calcaria at the apex of the tibiæ pale testaceous.

Hab.—Hiogo.

Var. differs in being smaller, in being more finely punctured, and in having the legs red, with tips of the joints blackish. May possibly be a distinct species.

2. *Mutilla insidiator*.

Female.—Length 3 lines. Black, the thorax red; a transverse glittering silvery-white pubescent spot on each side of the second segment, before the middle, and the apical segment covered with similar pubescence. The head strongly and closely punctured. Thorax oblong, the sides nearly parallel, slightly narrowed about the middle, and covered with large deep confluent punctures, the thinly-scattered pubescence on its disk black; legs black, and with thin pale glittering pubescence; the calcaria at the apex of the tibiæ white; the tarsi obscurely rufo-testaceous. Abdomen with rather distant punctures, and covered with short black pubescence; beneath, the pubescence is pale and glittering.

Hab.—Hiogo.

3. *Mutilla petulans*.

Male.—Length 5 lines. Head and thorax black, basal half of the abdomen red. Head and thorax strongly and closely punctured; the metathorax with large coarse punctures; the tegulæ and a small space on the scutellum smooth and shining; the thinly-scattered pubescence on the thorax and head silvery-white, except a little on the vertex of the latter, which is black; wings slightly fuscous, darkest towards their apex. Abdomen: the first and second segment ferruginous, the others black; the first segment strongly punctured, the second more finely and more distantly so; the other segments finely punctured; the apical margins of the third and fourth segments with narrow silvery-white fasciæ; the pubescence on the other segments black.

Hab.—Hiogo.

LIST OF SPECIES.

Fam. TENTHREDINIDÆ.

Hylotoma nigritarsis.
 imperator.
 humeralis.
 ephippiata.
 simillima.
 similis.
 pagana, Panz.
 trinotata.
 captiva.

Selandria nigriceps.

Strongylogaster iridipennis.

Pachyprotasis erraticus.

Macrophya nigropicta.

 vexator.
 apicalis.
 pacifica.
 ferox.
 ignava.
 irritans.
 carbonaria.
 timida.
 luctifera.
 flavipes.

Tenthredo erratica.
 providens.
 scalaris.
 hilaris.
 volatilis.

Dolerus ephippiatus.
 fuscipennis.
 subfasciatus.
 nigro-cæruleus.

Lyda volatilis.
 venustus.
 latifrons.

Cephus viator.
 agilis.

Sirex japonicus.

Fam. ICHNEUMONIDÆ.

Ichneumon generosus.
 cognatorius.
 doliturus.
 cursorius.
 flavitaris.
 virulentus.
 improvidus.
 incanescens.
 vexator.
 irritator.
 rufitarsis.
 dentatus.
 intrudens.

Cryptus ambulator.

Fam. ICHNEUMONIDÆ—contd.

Cryptus carbonarius.
 basalis.
 penetrator.
 punctator.
 maculipes.

Trogus arrogans.

Pimpla destructor.

 luctuosa.

Thyreodon purpurascens.

Anomalon flavifrons.

 insidiator.

Paniscus unicolor.

Ophion pungens.
 flavopictus.
 unicolor.

Xylonomus investigator.

Fam. BRACONIDÆ.

Agathis atricornis.

Fam. CHRYSIDIDÆ.

Stilbum amethystina.

Chrysis Daphne.

Fam. CHALCIDIDÆ.

Chalcis obscurata. *Walk*

Epitranus albipennis. *Walk*

Halticella apicalis. *Walk*

Eurytoma antica. *Walk*

Fam. PROCTOTRUPIDÆ.

Epyris apicalis. *Walk*

Fam. FORMICIDÆ.

Camponotus ligniperdus, Mayr. —

 japonicus, Mayr.

 vitiosus.

Lasius fuliginosus, Mayr.

 niger, Fabr. —

Polyrachis lamellidens, Mayr. —

Tapinoma flavipes.

Fam. PONERIDÆ.

Ponera solitaria.

Fam. MYRMICIDÆ.

Aphænogaster aciculata.

Ischnomyrmex famelicus.

Leptothorax congruus.

Monomorium intrudens. —

Pheidole fervida.

 nodus.

Crematogaster laboriosa.

Fam. MUTILLIDÆ.

Mutilla pungens. —

 insidiator.

 petulans.