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On the Hymenoptera collected during the "Skeat Expedition" to the Malay Peninsula, 1899-1900

Peter Cameron

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On the Hymenoptera collected during the "Skeat Expedition" to the Malay Peninsula, 1899-1900. By P. CAMERON¹.

The Hymenoptera of the Malay Peninsula are far from well known. In addition to the species of Aculeata from Tenasserim mentioned in Bingham's 'Fauna of British India, Hymenoptera,' our chief, almost our sole, authority on the subject is the late F. Smith, who in 1858 described (Journ. Linn. Soc. ii. pp. 42-130) the species found by Dr. A. R. Wallace at Malacca and Singapore. Including Ants (which are not dealt with in this paper) Mr. Smith enumerated 136 species from the Peninsula. The collection on which this paper is based was formed by Messrs. Annandale, Evans, and Laidlaw, members of the Skeat Expedition, chiefly on the eastern side of the Peninsula, which entomologically is the least known part. Though small, the collection contains examples of several new and interesting forms.

In Bingham's 'Hymenoptera of British India,' out of a total of 995 species of Aculeata (other than Ants) no less than 376 are recorded from Tenasserim, the extreme northern district of the Malay Peninsula; and there can be no doubt that if the Peninsula were adequately explored it would prove to be extremely rich in Hymenoptera.

I have included a few species that were not found by the members of the Skeat Expedition, and also some allied forms from neighbouring regions. As a matter of convenience these are placed in their proper positions and are distinguished by square brackets.

MUTILLIDÆ.

MUTILLA MALAYANA, sp. n.

Nigra, abdomine ferrugineo, basi apiceque nigris; capite thoraceque dense albo-pilosis; alis violaceis. ♂.

Long. 20 mm.

¹ Communicated by Dr. D. SHARP, F.Z.S.

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1901.] HYMENOPTERA OF THE "SKEAT EXPEDITION."

17

Hab. Bukit Besar, Jalor (District of Patani State), Malay Peninsula.

Antennæ black; the flagellum opaque, covered with a pale dull down; the scape on the upperside is covered with pale pubescence; the underside is bare, hollowed in the middle, the outer sides more acutely pointed and narrower than the inner. Front and vertex strongly punctured and thickly covered with white hair, the front being much more thickly covered than the vertex. Face smooth and shining, stoutly keeled down the middle. Over the clypeus are 6 foveæ, close to each other in a row, the outer is the largest; the sides are furrowed. Mandibles aciculated, and not very sharply pointed at the apex. Thorax thickly covered with silvery pubescence; there is a broad band of depressed pubescence on the hinder edge of the pronotum. Mesonotum shining, coarsely, but not very closely, punctured; there is a keel down the centre and a furrow on either side of it; the hair is close and deep black. Scutellum pyramidal; rugosely punctured, except the upper two-thirds of the base in the centre; the base has an oblique, straight slope, as has also the apex from below the smooth top, which slightly projects; the smooth part of the basal slope projects and is clearly separated; the top is almost transverse; below the centre are two small foveæ. Median segment closely reticulated; its base thickly covered with depressed silvery pubescence, the apical slope with long white hair; the basal area reaches to the top of the apical slope; its basal third is dilated; the base of the dilated part has the sides straight, the apex has them obliquely narrowed; the segment has the sides broadly and roundly dilated; the outer side on the basal half is bordered by a smooth keel. The base of the propleuræ is rugosely punctured, the punctured portion being bordered by a row of elongated foveæ, which are narrowed obliquely at the apex on either side and are there clearly separated from each other. Mesopleuræ, except behind, coarsely punctured and densely covered in the middle with silvery pubescence. Mesosternum densely covered with silvery pubescence. Metapleuræ reticulated.

MUTILLA SKEATI, sp. n.

Nigra, thorace femoribusque rufis; abdomine pallide aureo piloso. ♀.

Long. 13-14 mm.

Hab. Kuala Aring, State of Kelantan, Malay Peninsula.

Antennæ entirely black, short and stout; the scape thickly covered with white hair; the flagellum with white pubescence; the 3rd joint is as long as the 4th and 5th united. Head as wide as the thorax, coarsely rugosely punctured, sparsely covered with long black hair; the upper part of the front bears shorter golden hair, the lower is more thickly covered with longer white hair. Antennal tubercles black, the part between them obscure rufous. Eyes oval. Mandibles longish, becoming gradually narrowed towards the apex; the upperside at the middle grooved. Thorax of nearly uniform width, only very slightly and broadly narrowed

PROC. ZOO. SOC.—1901, VOL. II. No. II.

2

[3]

in the middle; above coarsely, uniformly, and rugosely punctured; the punctation on the lower half of the apical slope is much weaker and the apex itself is almost impunctate. Pleuræ smooth and shining. Legs black, thickly covered with white hair; the spines on the tibiæ are black, on the tarsi bright rufous; the calcaria of a paler rufous colour. Abdomen black; its base bears longish white hair; the basal segment is rather broad at the base and projects laterally in a bluntly triangular smooth and shining tooth; behind the middle of the 2nd segment are two oval marks of pale golden pubescence; the 3rd segment has the apical two-thirds covered with similar pubescence; the 4th has a similar band, but widely interrupted in the middle; the last is thickly fringed on the sides with long pale fulvous hair; it is closely rugose. The ventral keel on the basal segment becomes gradually raised to the apex, which projects roundly, the lower slope being oblique. The ventral segments are all fringed with pale fulvous hair; on the sides of the 2nd segment is a longish longitudinal furrow, covered with pale rufous pubescence. The thorax is fully twice longer than broad; it is rounded in front, transverse behind.

SCOLIIDÆ.

SCOLIA PROCERA Ill.

One example of this fine species from Patalung State.

SCOLIA SPECIOSA Smith.

Bukit Besar.

The male has not been described. Its head is reddish yellow, except behind between the antennæ and at the ocelli, where it is black; above it is smooth and shining; the clypeus is strongly, but not very closely, punctured. Thorax thickly covered with short black pubescence; the mesonotum is closely punctured, except the space on either side of the centre; the scutellum is similarly punctured except at the apex, where it is smooth; the median segment is more closely punctured, and if anything more strongly, the hair, too, on it is longer and thicker. It has the base of the 3rd abdominal segment reddish yellow, as in the female; this yellow line may be interrupted in the centre and is covered with rufous hair.

S. speciosa has hitherto only been recorded from Borneo.

SCOLIA RUBIGINOSA Fab.

One example: Eastern Malay Peninsula, without exact station.

SCOLIA LATHONA, sp. n.

Nigra, thorace abdomineque opalina pulcherrime lavatis; alis fusco-violaceis. ♂.

Long. 22 mm.

Hab. Kuala Aring, Malay Peninsula.

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thorax; black, stout; the scape strongly punctured, sparsely haired; the flagellum opaque. The lower part of the front broadly depressed; the basal part clearly separated, broadly rounded above; the apex transverse, with the sides broadly rounded; the upper third is smooth, impunctate; the lower strongly punctured, except in the middle and at the apex. The front is distinctly keeled; the sides of the keel oblique and punctured; the top smooth. The upper half of the clypeus is deeply punctured; the lower smooth, opaque, except at the apex, which is depressed and shining. Except very slightly on the vertex, the head wants the violaceous tint. Thorax very shining; it has all over very brilliant violaceous and blue shining reflections, and is covered with black pubescence; the upper part is closely and uniformly punctured all over, as is also the upper part of the propleuræ and the greater part of the mesopleuræ; the metapleuræ punctured on the upper edges. The apex of the median segment is transverse in the middle; the sides are oblique. The legs have the violaceous tints of the body; they are thickly covered with black hair; the front tibiae and the tarsi bear dark fuscous pubescence behind; the calcaria black, except the anterior, which are dark piceous and curved. Wings dark fuscous, with a slight violaceous tint, rather dull, without brilliant reflections. Abdomen black, with brilliant violet and blue micaceous reflections and thickly covered with black hair, which is longer and denser on the apex and ventral surface; the basal segment has a distinct neck at the base; the last dorsal segment is smooth and bare on the apex.

Comes near to *S. opalina* Smith, from Borneo. No mention is made of the form of the head in Smith's description, and presumably the front is not depressed: it is said to have only a few scattered punctures, not strongly punctured as in the present species; the disc of the mesothorax has a smooth space, which is not the case here.

ELIS (DIELIS) THORACICA Klug.

This species is in the collection from Singora and from Kota Bharu in Raman (District of Patani). All belong to the form with the pubescence on the collar and mesonotum red, this being also the case with all the specimens I have seen from Singapore and Java. In India the red-haired form is very rare compared with the white.

ELIS (DIELIS) AGLAEA, sp. n.

Nigra, flavo-maculata; femoribus tibiisque anterioribus femoribusque posticis subtus flavis; alis fusco-violaceis. ♂.

Long. 20 mm.

Hab. Biserat in Jalor, Malay Peninsula.

Head covered with pale hair; black, the clypeus yellow, except the middle at the apex, where it is black; the lower part of the front is strongly and closely punctured; the vertex below and on either side of the ocelli sparsely punctured; the eye-incisions are more closely but not so strongly punctured; the part above the antennæ has

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[5]

an oblique slope. Clypeus smooth and shining; the base of the mandibles is broadly yellow; they are fringed with long pale hair. Thorax black; the edge of the pronotum broadly, two large marks in the centre of the scutellum, and a mark in the centre of the post-scutellum—transverse in front, rounded behind—yellow. Mesonotum minutely and not very closely punctured all over; this is also the case with the scutellum, except behind, where it is smooth and impunctate. Median segment closely, strongly, and uniformly punctured and thickly covered with long white hair and with a silvery down. Pleuræ thickly covered with long pale hair; the hinder part of the meso- and the metapleuræ are thickly covered with silvery pubescence. Legs black; the front coxæ below, the four front femora broadly towards the apex, the four front tibiæ except at the apex in front, and the hinder femora below, yellow; the legs are thickly covered with long white hair; the calcaria black; the tarsal spines pale. Wings fuscous, darker in the middle, where they have a violaceous tinge. Abdomen black, thickly covered with white hair; the basal three segments are banded with yellow at the apex; the band on the basal segment is broader than the others.

POMPIDIDÆ.

[*PSEUDAGENIA MALAYANA*, sp. n.

Nigra, femoribus posticis rufis; alis hyalinis. ♀.

Long. 7 mm.

Hab. Singapore (Mr. George Lewis).

Resembles *P. arethusa* Cam.¹, but is a smaller species, has only the hinder femora red; the wings are clearer; the apex of the clypeus rounded, not transverse; the 2nd transverse cubital nervure is roundly and distinctly curved; the transverse anal nervure in the hind wings is not interstitial, but received distinctly in front of the transverse cubital. It also resembles *P. tincta* Smith; but that is a larger and stouter species, has the head more hairy, the hair being longer and thicker, and the hinder tarsi are shorter compared

¹ [*Pseudagenia arethusa* Cam., above alluded to, is an undescribed species from Khasia represented in Mr. Rothney's collection.

Nigra, femoribus tibiisque anterioribus late rufis; abdominis apice supra albo; alis hyalinis. ♂.

Long. 8 mm.

Comes into Bingham's Section "C" (Fauna of India, Hymenopt. i. p. 108): "Wings clear hyaline"; and *b, b'*. Scape of antennæ densely clothed with short white hair; the flagellum with a close, black, microscopic down. Vertex closely punctured and sparsely covered with longish fuscous hair; the front more strongly punctured than the vertex and obscurely transversely striated; it projects immediately over the antennæ; the projection is keeled down the middle; the keel becomes wider towards the apex. The cheeks, the part below the antennæ, and the clypeus thickly covered with silvery pubescence; the clypeus strongly and closely punctured; roundly dilated, the sides at the apex oblique; the apex transverse; the silvery hair is mixed with some longer golden hair; on either side near the middle is an obscure yellowish-white spot; palpi pale testaceous; the mandibles reddish before the middle. Pronotum rounded,

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HYMENOPTERA OF THE "SKEAT EXPEDITION."

21

with the length of the tibiae; the tarsi, too, in *tincta* are distinctly spined, which is not the case with *P. malayana*.

Head opaque; the cheeks and clypeus covered with silvery pubescence, the front and vertex sparsely covered with longish pale hair; the apex of the clypeus rounded, the sides at the base not sharply oblique; the palpi testaceous; the hinder ocelli are separated from the eyes by a distinctly greater distance than they are from each other. Thorax thickly covered with a silvery pile; the scutellum and median segment more sparsely with fuscous hair. The median segment has a gradually rounded slope, is closely obscurely transversely striated in the middle; the oblique furrow on the mesopleuræ is narrow but distinct; its lower part at the base is depressed, clearly separated from the rest, and more strongly punctured. Legs pruinose, the four anterior femora more or less obscure reddish beneath, the hinder femora bright ferruginous, except at the extreme apex; the hinder tarsi are much longer than the tibiae, which are almost spineless. Wings clear hyaline; the stigma fuscous; the nervures darker; the 2nd cubital cellule at the top and bottom is distinctly, but not much, shorter than the third; the first and second transverse cubital nervures are roundly curved, the first is distinctly, the second scarcely oblique; the first recurrent nervure is received in the middle, the second distinctly in front of the middle of the cellule; in the hind wings the transverse anal nervure is received distinctly in front of the cubital. Abdomen pruinose, shining; the segments are testaceous at the apex.]

[*POMPILUS SINGAPORENSIS*, sp. n.

Niger, dense argenteo-pruinosis; alis hyalinis, apice fumato. ♀.

Long. 10 mm.

Hab. Singapore.

Antennæ densely pruinose, like the body. The eyes distinctly converge above, where they are separated by nearly the length of the 3rd antennal joint; the hinder ocelli are separated from each other by the same distance as they are from the eyes; the front

thickly covered with silvery pubescence. Mesonotum closely punctured, the middle in front slightly raised; from the base of the tegulae runs an oblique narrow furrow. The postscutellar region is closely and finely, at the base towards the apex more strongly transversely striated. Median segment with a gradually rounded slope; opaque, finely transversely granular; the middle and apex thickly covered with long white hair. The middle of the propleuræ raised; the lower part triangularly depressed; the mesopleuræ granular, opaque; the apex on the lower part and the sternum thickly covered with long white hair; the base of the metapleuræ obscurely obliquely striated. Legs longish; the apex of the fore femora, the fore tibiae, and the greater part of the tarsi, the apical two-thirds of the middle femora except at the extreme apex, the middle tibiae except behind, the hinder femora except at the base, and to a less extent at the apex, red. Wings hyaline, but with a uniform fuscous tinge; the 2nd and 3rd cubital cellules are subequal at the base and apex above and beneath; the first recurrent nervure is received near the middle, the second shortly before the basal third of the cellule. Abdomen pruinose; the apical segment above white, fuscous at the apex.]

[7]

has a narrow furrow down the centre. Clypeus transverse in the middle; its sides broadly rounded. Mandibles black; the base thickly covered with greyish pile; the middle rufous. Palpi black, covered with a grey pile. The sides of the pronotum behind are straight and oblique. The median segment is distinctly furrowed down the middle. The cloud in the fore wings commences at the end of the radial cellule; the radial cellule is wide in the middle; the apical abscissa of the radius is oblique; the apical half has a different angle from the basal. The spines on the tibiae and tarsi are black; the calcaria are two-thirds the length of the metatarsus. The first and third transverse cubital nervures are roundly curved; the second straight and slightly oblique; at the top the second cubital cellule is not quite half the length of the first.

Comes near to *P. pulverosus* Sm., which may be known from it by the cloud commencing "beyond the first submarginal cell," and the calcaria are nearly as long as the metatarsus. The description of *P. pulverosus* is not very complete. A revision of the Hymenoptera collected by Dr. A. R. Wallace in the Malay region, and now in the Hope Museum, Oxford, is a great desideratum. At present the determination of many of the species from the description is mere guesswork. With the *Larridae*, for example, one is never certain whether the species described belongs to *Larra*, *Notogonia*, *Tachysphex*, or *Tachytes*.]

[*SALIUS MISERUS*, sp. n.

Niger, capite, pronoto, apice mesonoti scutelloque flavo-testaceis; pedibus rufo-testaceis; coxis posticis nigris; alis fusco-flavis, apice fusco-violaceis. ♂.

Long. 22 mm.

Hab. Singapore.

Antennae rufous; the scape hollowed on the underside; the outer edge is much sharper than the inner; the apical joints are roundly curved above. The head fulvous; the face pale yellow; the vertex (especially at the ocelli) fuscous black. Eyes large, slightly converging above; the lower part parallel; the ocelli large, placed in a triangle, the hinder are separated from each other by a slightly greater distance than they are from the eyes; there is a narrow shallow furrow in the middle of the front. Prothorax rufo-fulvous; the lower and hinder parts of the pleurae darker coloured. The apical half of the mesonotum, the scutellum, and postscutellum are rufo-fulvous; the black on the mesonotum is triangularly narrowed at the apex. Median segment, except at the apex, transversely striated; it is covered with a golden down and some longish pale fulvous hairs. The scutellum is thickly covered with long pale fulvous hair. Legs rufo-fulvous; the hinder coxae black; the inner tooth of the claws is half the length of the outer. Wings fulvo-hyaline at the base; the apex with an obscure violaceous-fuscous tinge, which is deeper in the radial and cubital cellules; the discoidal cellule is hyaline, with an elongated

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HYMENOPTERA OF THE "SKEAT EXPEDITION."

23

fuscous cloud in the centre; this cloud is sharply narrowed towards the apex; the apical abscissa of the radius is curved; the first cubital cellule is shortly but distinctly shorter than the second; the third transverse cubital nervure is roundly curved. Abdomen black; the apical dorsal segment rufous.

Belongs to Bingham's Section B a (Fauna of India, p. 124).]

[*SALIUS TAPBROBANÆ*, sp. n.

Niger, antennis, pedibus, apice pronoti, mesonoto, scutello post-scutelloque rufis; coxis trochanteribusque nigris; alis flavis, apice fumatis. ♀.

Long. 25 mm.

Hab. Trincomali, Holraputtana, Ceylon (*Colonel Yerbury*).

Belongs to the section with one tooth on the claws, and comes near to *S. flavus*.

Antennæ stout, bare, ferruginous; the scape darker. Head ferruginous, sparsely covered with long black hair; the vertex thickly covered with depressed golden pile. The apex of the clypeus is almost transverse in the middle; the apex of the labrum is slightly rounded and is densely fringed with reddish hair. Thorax black; the apical half of the pronotum, the mesonotum, scutellum, and postscutellum densely covered with silky depressed golden pubescence. The depressed belt behind the postscutellum is dark testaceous, is furrowed down the middle, and is transversely but not closely striated. The median segment is coarsely transversely striated, except on the apical third; the striæ have a brownish hue. The upper part of the metapleuræ is obliquely striated; the apex of the propleuræ is brownish above. Legs ferruginous; the coxæ and trochanters are black. Wings yellowish; the apical margin distinctly smoky all round. Abdomen entirely black, shining; the pygidium and the epipygium velvety and thickly covered with long black hairs.]

SALIUS SYCOPHANTA Grib.

An example from Patalung (*Evans*) is the usual form; one from Kuala Aring has the wings much darker, the fulvous tinge being much darker at the apex; the apex itself is not clouded, and the darker colour of the basal region extends nearer to the apex; the hind wings want the basal tint entirely.

SALIUS MALAYENSIS, sp. n.

Long. 16 mm.

Hab. Kuala Aring.

This species has the coloration of the body and wings of *S. peregrinus* Sm., with which it is closely related. *S. peregrinus* may readily be known from it by the 3rd cubital cellule on the top being, if anything, longer than the 2nd, whereas in the present species it is not much more than one-half its length; there is also a marked distinction in the shape of the 2nd transverse cubital nervure, which in *peregrinus* is straight, whereas in *malayensis* it is, on the

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lower side, obliquely bent backwards towards the base of the wing, while the upper two-thirds are roundly curved towards the apex. The same character separates it from the closely-allied Khasia species, *S. subfervens* Cam.

Head fulvous, yellowish along the eye-orbits; the ocellar region and the middle of the front are black; this black mark extends behind the ocelli to the end of the eyes, where it is roundly narrowed; it is roundly incised at the sides of the ocelli, below which it is roundly and broadly dilated; the lower part is incised. The eyes distinctly converge above; the hinder ocelli are separated from each other by about the same distance they are from the eyes. The clypeus is broadly rounded at the apex; the labrum is broadly black in the middle, its apex fringed with bright fulvous hair. Mandibles broadly black at their apices. Thorax black; the prothorax (except the lower half of the pleuræ), the sides of the mesonotum, its centre largely from near the base to the apex, the scutellum, and postscutellum, rufo-fulvous. The apical two-thirds of the pronotum are furrowed in the centre; this furrow is widest at the base. Wings uniformly fuscous-violaceous; the stigma is pale fulvous in the middle; the first cubital cellule is about twice the length of the second; the first and third transverse cubital nervures are oblique and roundly curved, the second is straight and oblique on the lower third, the rest roundly curved towards the upper apex of the cellule; the first recurrent nervure is received near the base of the apical fourth, the second near the base of the apical third of the cellule. Legs coloured like the thorax; all the coxæ and trochanters, the base of the four anterior femora, and almost the basal half of the hinder pair black; the apical joint of all the tarsi black. Abdomen black, except the upper part of the last segment, which is pale fulvous.

POMPILUS ANALIS Fab.

One example, without special locality, of this widely distributed Eastern species.

SPHEGIDÆ.

SPHEX LOBATUS Fab.

Patalung, Biserat, Gunong Inas (Perak), and Bukit Besar.
A common Indian species.

SPHEX UMBROSUS Christ.

Bukit Besar.

SPHEX AURULENTUS Fab.

The form of this species agrees with the description of *Sphex flavo-vestita* Sm., a species placed by Kohl, in his monograph of the genus, among the unidentified species. According to some specimens in the Cambridge Museum from North Borneo, it stores its nests with young grasshoppers, and spins a cocoon, which is

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1901.] HYMENOPTERA OF THE "SKEAT EXPEDITION."

25

smooth, bare, brown, and shining on the inner side; on the outer side it is thickly covered with pale, long, woolly yellow hair.

AMMOPHILA ATRIPES Smith.

The female example is very large and has bright red legs; the males are not much more than half its size and have the legs almost entirely black. Special locality not stated.

SCELIPHRON JAVANUM Lep.

Singora. Several examples of this fine species.

SCELIPHRON MAFRASPATANUM Fab.

Singora. One example.

[*BEMBEX LACTEA*, sp. n.

Long. 22 mm.

Hab. Khasia (coll. Rothney).

This species wants the U-shaped yellow mark on the mesonotum, and comes into Bingham's Section B near to *B. latitarsis* (Fauna of India, Hymenopt. p. 285).

♀. Antennæ black; the scape of the antennæ yellow, except the apical half above, the 2nd joint, and the base of the 3rd beneath, which are black. The yellow colour has a distinct pale olive tint; on the head, the clypeus, the labrum, the front, except for two large oblique marks on the top continued from the black on the vertex, the inner orbits to near the ocelli, the outer orbits more narrowly from near the top, and the mandibles are yellow. The eyes slightly diverge below; the front and vertex are thickly covered with long fuscous hair; the front is broadly keeled; on the top of the clypeus are two oblique, large, irregular black marks. Mesonotum black; the scutellum black, except for a large transverse line in the centre, which is dilated behind at the sides; the base of the post-scutellum is broadly yellow at the base. Median segment yellow, except broadly in the middle at the base and two oblique lines—broad at the base, becoming gradually narrowed towards the apex—across the middle and one across the apex, black. The base of the pronotum, an irregular mark on the propleuræ behind, the upper two-thirds of the mesopleuræ at the base, the sutures narrowly, and an irregular large mark on the apex of the meta-pleuræ, black. Legs of the yellow colour of the body; the femora and tibiæ broadly lined with black—the former in front and behind, the latter behind only. The ventral surface of the abdomen entirely, the basal segment except for a large oblique line on either side extending near to the middle of the segment and becoming gradually narrowed from the outer to the inner side, black; the second and third segments are broadly black at the apex, the black bands triangularly dilated in the middle at the apex; near the centre of these segments are two transverse black marks; on the base of the fourth segment is a large black mark, which projects obliquely broadly at the apex and to a less extent on the inner

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side; the black band between these marks triangularly projects in the middle; two larger black marks, not projecting at the sides, are on the fifth segment; the sixth is entirely black.

The male is similarly coloured to the female, except that the black marks on the clypeus are much smaller, the yellow line on the scutellum is narrower and is interrupted in the middle, the abdominal segments have only their apices narrowly black, and the marks on the 2nd, 3rd, and 4th segments are much narrower; the last segment is yellow, black round the edges, and more broadly and irregularly at the base, where the black band projects broadly in the middle. The 8th, 9th, and 10th joints project and are minutely spined below; the 11th and 12th joints are broadly hollowed, smooth, bare, and brownish below; the last has the apex obliquely rounded. The anterior tarsi are broader than usual; the metatarsus is of almost uniform width and has its lower edge slightly irregularly waved; the 2nd joint is not much narrowed at the base; the 3rd and 4th become gradually wider towards the apex; the middle femora are irregularly, minutely, and closely spined or serrate on the lower edge, the outer two serrations are wider, more regularly rounded than the others. The spine on the 2nd ventral segment is large, becomes gradually wider from the base to the top; its apex has an oblique slope; on the penultimate segment is a distinct rounded tubercle.

A distinct species related to *B. pinguis* and *B. latitarsis*.]

BEMBEX MELANCHOLICA Sm.

Except that the yellow lines on the mesonotum are indistinct and very short, an example from Singapore agrees very well with the description of this species. In the male the incised apex of the last abdominal segment is a characteristic feature.

[*BEMBEX BORNEANA*, sp. n.

Long. 22 mm. ♂.

Hab. Borneo.

This species has the pale lacteous colour of *B. melancholica*, and is closely related to it; but it may be at once separated by the fact that the last abdominal segment is not incised in the middle.

Antennæ black; the scape yellow below; the apical two joints are hollowed below; the last has its apex obliquely truncated and is broadly, roundly incised; the 12th is more obliquely and slightly incised; the 11th is obliquely narrowed at the base; the 10th is slightly spinose in the middle; the 9th is sharply spinose; the 8th has a less distinct spine. Head thickly covered with long, soft, white hair; black, the inner orbits to near the top, the clypeus, labrum, and mandibles, except at the apex, livid yellow; below the antennæ are two black marks, longer than broad, rounded above, obliquely narrowed on the inner side. Mesonotum black; an interrupted U-shaped yellow mark in its centre, and there is a wider line alongside the tegulæ. Scutellum black, yellow round the apex; postscutellum for the greater part yellow. Median segment yellow; a somewhat triangular black mark on

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[*PISON FUSCIPES*

Niger, nitidus

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Long. 6 mm.

Hab. Singapore

Scape and p pubescence; the lower part of the clypeus are the part of the front and punctured; the centre. The palpi are fusco silvery pubescent basal part of middle; a stout segment; the upper half is a striæ. Wings nervures and lower two trans the second rect the cellule; the apical cubital densely pruned abdomen is separated.

The tegulæ of the abdomen of the pronotum part; both have

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[May 7,

1901.]

HYMENOPTERA OF THE "SKEAT EXPEDITION."

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[PISON FUSCIPALPIS, sp. n.

Niger, nitidus, dense argenteo-pilosus; alis hyalinis, stigmatibus nervisque nigris. ♀.

Long. 6 mm.

Hab. Singapore.

Scape and pedicel of antennæ densely covered with silvery pubescence; the flagellum less densely with a pale pile. The lower part of the front and of the eye-incision, the face, and the clypeus are densely covered with silvery pubescence; the upper part of the front and the vertex with short silvery pubescence; the front and vertex are shagreened and can hardly be called punctured; the front has a shallow but distinct furrow down its centre. The mandibles are broadly rufous in the centre; the palpi are fuscous. Thorax shagreened and thickly covered with silvery pubescence. Pronotum clearly separated behind. The basal part of the median segment has a distinct keel down the middle; a stout keel runs from the spiracles to the apex of the segment; the apex of the segment has an oblique slope; on the upper half is a deep furrow; on either side of this are five curved striae. Wings clear hyaline; the apex slightly infuscated; the nervures and stigma are black; the pedicel is longer than the lower two transverse cubital nervures, which are roundly curved; the second recurrent nervure is received almost in the middle of the cellule; the first recurrent about the length of the top of the apical cubital cellule from the transverse cubital nervure. Legs densely pruinose; the calcaria pale. The basal segment of the abdomen is as long as the second segment; the two are clearly separated.

The tegulae are piceous on the outer side; the basal two segments of the abdomen have their margins depressed; the anterior part of the pronotum is distinctly separated from the larger posterior part; both have oblique slopes.

A distinct species from *P. suspiciosus* Sm., which is also from Singapore.]

[13]

CRABRONIDÆ.

[CRABRO IMPETUOSUS, sp. n.]

*Niger, abdomine maculis flavis sex; geniculis tibiisque flavo-lineatis; alis hyalinis, nervis stigmatæque nigris. ♀.**Long. 6-7 mm.**Hab. Singapore.*

Head black; the front and vertex almost bare, alutaceous; the ocelli are in a curve, the hinder are separated from each other by a slightly less distance than they are from the eyes, which, on the inner side above, are obliquely narrowed. The sides of the clypeus are thickly covered with silvery pubescence; the middle has a distinct keel. The basal half of the mandibles is yellow. Thorax black, opaque; yellow are two lines on the pronotum, two marks on the scutellum, and the tubercles. The postscutellum is longitudinally striated. The base of the median segment is depressed and bears stout keels; the basal area is defined by a wide furrow, which is traversed by the striæ; the apical half has a deep furrow in the centre; the sides of the segments are bounded by a stout keel, at the base of which, on the inner side, are two small areæ. Propleuræ strongly aciculated; the hinder part is striated. Mesopleuræ alutaceous; the furrow is crenulated; the apex is obliquely narrowed, with a keel at the base, behind which is a narrow crenulated furrow. Metapleuræ closely and minutely striated, except at the base above, where there is a strongly striated part, bordered behind by a furrow. Wings clear hyaline; the nervures black; the radial cellule is slightly infuscated. Legs black; the four anterior knees, the tibiæ (except broadly behind), the hinder tibiæ behind (except at the apex), and the calcaria yellow. The petiole is nearly as long as the following three segments united; it is opaque and dilated at the apex; there are two yellow oblique lines in the middle of the 2nd segment, two longer ones on the base of the 3rd, and a broad one on the base of the 4th; the latter is slightly incised in the middle at the apex.]

[TRYPOXYLON VARIPILOSUM, sp. n.]

*Nigrum, abdomine rufo, petiolo nigro; pedibus testaceis, tarsis posticis nigris; facie clypeoque dense aureo-pilosis; alis hyalinis, nervis nigris, stigmatæ fusco. ♀.**Long. 16 mm.**Hab. Singapore.*

Antennæ testaceous, paler towards the base. The front and eye-incisions are covered with golden pubescence; on the face and clypeus the pubescence is denser and more silvery in hue. The apex of the clypeus is rufo-testaceous; its middle broadly but not very much projects, the projection is slightly waved in the centre. Mandibles testaceous, paler, more yellowish towards the apex. The upper part of the front is broadly but not deeply furrowed; the lower is stoutly keeled. The hinder part of the head is thickly covered with golden-silvery pubescence. Thorax smooth

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and shining, thickly covered with longish silvery hair; on the mesonotum the hair has a golden tinge. The basal half of the median segment has a wide shallow furrow, which becomes gradually wider towards the apex; the furrow on the apical slope is wide on the basal two-thirds, much narrower and shallower on the apical. Legs testaceous; the four front femora are more rufous in colour; the posterior darker in tint and are lined with black on the inner and outer sides; the apex of the hinder tibiae and the hinder tarsi black. Abdomen ferruginous; the petiole, except at its apex, black.

Comes nearest, apparently, to *T. coloratum* Smith. The legs probably vary in tint; the hinder coxae are black at the base behind. The pleurae have a plumbeous tint. There are curved lateral furrows on the base of the median segment, but they are not deep or very distinct.]

VESPIDÆ.

VESPA CINCTA Fab.

Biserat. The common Indian form, not the Malayan var. *affinis*. In most of the workers the rufous colour of the abdomen extends on to the basal segment.

POLISTES SAGITTARIUS Sauss.

One specimen of this common species from Biserat.

ICARIA LEPTOGASTER, sp. n.

Flava, capite supra, mesonoto medioque pronoti nigris; alis hyalinis, nervis stigmatæque testaceis. ♀.

Long. 14-15 mm.

Hab. Patalung, Malay Peninsula.

♀. Antennæ dark rufous; the scape darker in colour. On the head the vertex, the front (except near the eyes and immediately above the antennæ), and the part below the antennæ and above the clypeus, and bordered on the outer side by the sutures, are black; there is an obscure line down the clypeus, which does not extend quite to the apex. The mandibular teeth are black. Mesonotum black. On the apex of the scutellum is a triangular black mark; its central furrow is deep, and does not extend to the base. The furrow on the median segment is narrow at the base; the rest of it is much wider, with the sides obliquely sloped; the centre has a narrow keel. Legs coloured like the body; the apices of the four posterior tibiae and their tarsi black. Abdomen elongate, without black; the petiole is nearly as long as the 2nd and 3rd segments united.

This is a larger species than *S. sulciscutis*; the femora want entirely the black colour so conspicuous in the last-named species; the abdomen is distinctly longer compared with the thorax, and the rest of the abdomen is clearly longer compared with the petiole; the second segment itself is longer compared with its width at the apex.

[15]

[ICARIA SULCISCUTIS, sp. n.]

Pallide flava, supra late nigro-maculata; pedibus pallide flavis, tarsis nigris; scutello sulcato; alis hyalinis, stigmatibus nervisque nigro-fuscis. ♀.

Long. 13 mm.

Hab. Bukit Tomah, Singapore.

Antennæ deep black, stout; the joints of the flagellum clearly separated. Head pale yellow; brownish black are the front, except the orbits of the ocelli and a mark above the antennæ, the outer orbits broadly, and the clypeus, except for a black line down its middle on the basal two-thirds, the line becoming wider towards the apex. The black mark on the front is dilated outwardly on the lower edges; there is a narrow but distinct furrow extending from the ocelli to the antennæ; on the black mark between the antennæ are two small yellow marks. The apex of the clypeus is acutely pointed in the middle. Mandibles pallid yellow, except that the teeth are black. The prothorax is black, except the hinder edges narrowly, the upper edges and a broader, more irregular line before the middle. The scutellum is broadly furrowed down the middle; it is yellow, except the middle, narrowly behind, and a large triangular mark behind. The median segment is edged with brown behind and more narrowly down the centre; this central line is much narrowed on the top. The basal line extends obliquely to the spiracles; the pleural furrows are clearly defined; the furrow on the centre of the median segment is keeled. The middle femora are brownish on the basal two-thirds above; the hinder are entirely black, as are also the four hinder tarsi and the apices of the four hinder tibiae. The petiole is brown, its apex and sides pallid yellow; the other segments are brownish, with the apices and the ventral surface pallid yellow.]

EUMENES CIRCINALIS Fab.

Hab. Patalung, Singora, Malay Peninsula.

The three examples are very dark-coloured, and all differ from each other in coloration.

[ODYNERUS MEPHITIS, sp. n.]

Niger, flavo-maculatus; abdominis basi rufa; pedibus flavis, femoribus rufis, tibiis posticis nigris; alis hyalinis, stigmatibus fusco. ♀.

Long. 6 mm.

Hab. Ceylon.

Belongs to the section without a suture on the petiole, and comes close to *O. miniatus* and *O. diffinis*.

Scape of antennæ bright yellow below; the base of the flagellum rufous. Head closely and uniformly punctured; black; the oblique sides of the clypeus, a mark above the antennæ, roundly dilated on either side below the middle, the lateral, the upper, and lower portions being not clearly separated, the end of the eye-incisions,

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HYMENOPTERA OF THE "SKEAT EXPEDITION."

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and the outer upper half of the eye-orbits, pale yellow. The central part of the clypeus is flat and strongly punctured; the sides are oblique; the apex transverse. Pro- and mesothorax closely and strongly punctured, as are also the scutellum and postscutellum; the postscutellum has an oblique slope, and does not project at the apex. Median segment opaque, rugose, and thickly covered with silvery pubescence. Legs pallid yellow; the femora rufous; the middle tibiæ are lined behind with black; the posterior are entirely black. On the thorax there are two yellow marks on the pronotum, which become gradually wider outwardly; the tegulæ are yellow at the base and apex; the sides of the scutellum and of the postscutellum more widely are also yellow. Wings clear hyaline, the stigma fuscous; the nervures are darker coloured. The basal half of the petiole is rufous; its apex and the apex of the second segment are yellow; the apical three segments are marked with yellow in the middle; on the sides of the second segment behind the middle is a small yellow mark.]

[*RHYNCHIUM TAPROBANÆ*, sp. n.

Nigrum, abdomine flavo-lineato; femoribus rufis; alis violaceo-hyalinis, nervis stigmatæque nigris. ♀.

Long. 9 mm.

Hab. Ceylon.

Antennæ black, brownish beneath. Head black, a line on the lower side of the eye-incision, a small triangular mark over the antennæ, and a large curved mark on either side of the top of the clypeus, yellow. Front and vertex closely and strongly punctured; the lower part of the front, of the eye-incision, and the face and clypeus covered with silvery pubescence; there is a stout keel between the antennæ. Clypeus obliquely narrowed towards the apex, where it is roundly but not deeply incised; the sides are triangular. Pro- and mesothorax closely and strongly punctured; the median segment is more deeply, more rugosely, punctured; the postscutellum has a sharp edge behind and is slightly depressed in the centre there; the sides of the median segment, seen from above, are straight and oblique. The base of the thorax is transverse; in the centre are two small yellow marks; the tegulæ are black. Wings fuscous-violaceous; the violaceous tint is more distinct at the apex and base; the nervures and stigma are deep black. Legs black; the four posterior femora are rufous; the anterior and the anterior tibiæ in front are of a darker rufous colour. The abdomen is closely and rather strongly punctured; the basal segment is cup-shaped, and behind is clearly separated from the 2nd, which becomes distinctly narrowed towards the base; the basal two segments are banded with yellow all round; the 3rd is banded with yellow above; the transverse suture on the base of the second ventral segment has a blistered appearance and is not punctured. The sides of the median segment are broadly rounded, not angular or toothed; the postscutellum is more distinctly raised than usual and is broadly rounded behind.

[17]

This species looks not unlike, at first sight, a small example of *R. flavomarginatum*, but is abundantly distinct; e. g. the sides of the median segment do not angularly project.]

APIDÆ.

[XYLOCOPA MALAYANA, sp. n.

Nigra, thorace supra abdominisque basi dense fulvo-pilosis; tarsis anterioribus longe albo-pilosis; alis fusco-violaceis. ♂.

Long. 25-26 mm.

Hab. Singapore.

Antennæ black; the scape and the fourth and following joints rufous beneath; the scape is only rufous in the middle. Head distinctly narrower than the thorax; black, closely punctured; the vertex behind is covered with yellowish-fulvous pubescence; the sides of the face to the middle of the clypeus with shorter white pubescence; the hair on the upper part of the outer orbits is black, on the lower piceous. In the middle of the clypeus is a pale yellow streak, which reaches near to the apex, which is smooth and shining and is clearly separated; below it is fringed with rufous hair. The mandibles are widely grooved above, narrowly below; the tooth is long and becomes gradually narrowed towards the apex; there is no subapical or upper tooth; the space above the lower tooth is roundly curved. The entire upper part of the thorax is thickly covered with bright yellow pubescence; the pro- and metapleuræ are shining and only sparsely haired; the mesopleuræ black, closely punctured and thickly covered with black, mixed with pale, hair; the hair on the breast is much shorter; the apex of the metapleuræ may be piceous. The four anterior tarsi are thickly fringed with very long white hair; the hair on the four front tibiae is black, white on the top in front and on the apex behind; on the posterior legs the hair is entirely black. The hair on the basal segment of the abdomen is yellow, passing gradually on the 2nd and 3rd segments into olive colour; on the other segments it is black. The basal ventral segments are more or less rufous; the sides of the 2nd segment bear yellowish hair; those of the 3rd, 4th, and 5th white, the others black hair; the hair on the last segments is long and black. The wings are uniformly deep fuscous-violaceous; the stigma and nervures are deep black.

The ocelli are in a curve . . .; the hinder are separated from each other by about the same distance they are from the eyes.]

[XYLOCOPA CEYLONICA, sp. n.

Dense ferrugineo-pilosa, thorace supra abdominisque basi olivaceo-pilosis; alis fusco-violaceis. ♂.

Long. 27-28 mm.

Hab. Ceylon.

This species closely resembles *X. rufescens*, but is more slenderly built; the head is narrower compared with the mesothorax, it wants entirely the yellow markings on the face and clypeus; the hair on

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Hab. Singa

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Proc. Zool.

the top of the thorax and base of abdomen has a distinct olive tint; the 2nd recurrent nervure is not broadly and roundly curved, but has the upper and lower parts straight and oblique, and the face and clypeus are much more densely covered with rufous hair.

The underside of the scape is pale yellowish; the lower part of the flagellum rufous; the third joint darker coloured than the others. Head densely covered with rufous pubescence, which is shorter on the face and clypeus than on the front and vertex. The clypeus is closely and distinctly punctured, except in the centre, where it is smooth, which is also the case with the apex, where it is very smooth and shining; the labrum is more projecting than usual and is keeled in the middle. The ocelli are in a curve; the hinder are separated from each other by a distinctly greater distance than they are from the eyes. Thorax covered with olive-yellow pubescence; the olive tint is more noticeable above than on the pleuræ. The pubescence on the base of the abdomen has a slight olive tint; on the rest it is bright rufous above and below. The pubescence on the legs is long, dense and bright rufous; the apices of the tarsi are piceous. Wings fuscous, with bronzy tints.

The anterior femora are brownish in front; the front trochanters triangularly project at the apex.]

XYLOCOPA COLLARIS Linn.

XYLOCOPA FICTIFRONS Smith.

♂. One example of what agrees fairly well with Bingham's description of this species in his Fauna of India, Hymenop. p. 538; but not with Smith's original description, Trans. Ent. Soc. ii. (1852) p. 42, and in his Monograph of the genus, Trans. Ent. Soc. 1874, p. 275.

XYLOCOPA GRANDICEPS, sp. n.

Nigra, dense fulvo-pilosa; tarsi ferrugineo-pilosis; alis fulvo-hyalinis, nervis nigris. ♀.

Long. 20 mm.

Hab. Singapore.

Head large, nearly as wide as the thorax. Ocelli larger than usual, they are placed in a triangle; the hinder are separated from the eyes by one-half the distance they are from each other. Clypeus closely and strongly punctured; its apex has a depressed margin; in the centre is a stout, shining, smooth tooth. The apical tooth of the mandibles is large, triangular; the subapical distinctly projects, is large and rounded at the apex. The front distinctly projects between the antennæ; it is, as is also the vertex, closely, uniformly, and distinctly punctured. The thorax is thickly covered with long rufo-fulvous hair; the mesonotum is smooth and shining; the scutellum is strongly, but not very closely punctured, as is also the median segment, except the basal area, which is alutaceous; the segment has a semiperpendicular slope and is rounded at the top. Wings fulvo-hyaline; rufous in tint along the fore margin;

PROC. Zool. Soc.—1901, Vol. II. No. III.

3

[19]

the 1st recurrent nervure is not interstitial, but is received shortly beyond the 2nd transverse cubital. Tegulae rufous, black round the inner edges. The hair on the legs is dense, long and bright rufous; the tooth on the apex of the fore tibiae is short, blunt, and hollowed on the outer side. The hair on the abdomen is similarly coloured to that on the thorax; it is sparse on the back; the ventral segments are fringed with long hair; unless the segments are distorted, the 4th is distinctly longer than the 3rd.

A distinct species; the rufous colour of the pubescence makes it resemble *rufescens* Smith; but, apart from other differences, that species is a *Koptorthosoma*, whereas the present species is a *Xylocopa* s. str. It is a well-marked species, through its head being larger and more particularly wider, compared with the thorax, than usual, most of the species having the head very perceptibly narrower than the mesothorax; the ocelli too are larger and are placed in a triangle, while with most of the species, e. g. *rufescens*, they are placed in a curve; they are also placed nearer to the eyes than in the typical species of *Xylocopa*.]

KOPTORTHOSOMA CAERULEUM Fab.

One example from Kuala Aring.

KOPTORTHOSOMA ESTUANS Linn.

Common, as elsewhere in the Oriental Region.

KOPTORTHOSOMA LATIPES Drury.

Common.

MEGACHILE ERYTHROPODA, sp. n.

Nigra, pedibus rufis; capite dorsoque thoracis dense rufo-pilosis; scapo antennarum rufo; alis fulvo-hyalinis, apice fere fumatis, stigmatibus nervisque fulvis. ♀.

Long. 14-15 mm.

Hab. Singapore.

The scape of the antennae rufous; the flagellum black, brownish beneath. Except on the clypeus the head is thickly covered with bright fulvo-rufous hair; the face is strongly punctured: the clypeus is more closely rugosely punctured and is strongly keeled on the upper two-thirds; it is covered (but not so thickly as the front) with longish dark rufous hair; on its sides there is a patch of thick fulvous hair, which is obliquely narrowed towards the apex. The apical tooth of the mandibles is bluntly rounded; the subapical tooth is short, broad, bluntly rounded, and is furrowed broadly, but not deeply, in the middle. The entire upper part of the thorax is thickly covered with bright rufous hair, except in the centre of the median segment. The pleurae are also thickly covered with similar pubescence. Mesosternum closely rugosely punctured and covered with pale fulvous hair. Legs rufous; the coxae and the four anterior trochanters black; the hair is thick, stiff, and dark rufous; the tarsi are darker in colour, especially towards the apex. Wings fulvo-hyaline, the apex slightly smoky; the stigma

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Long. 21 mm

Hab. Kuala

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[*MEGACHILE*

Long. 23-24

Hab. Borneo

[May 7,

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and nervures are fulvous. The base of the basal segment of the abdomen and its sides are covered with fulvous pubescence; its apex and the apex of the second are fringed with similarly coloured hair; the hair on the rest of the segment and the ventral scopa deep black. Tegulae rufous.

The apex of the clypeus is transverse in the middle and has the sides rounded; the central part has an irregular margin, almost toothed on the outer side; the hinder ocelli are separated from each other by twice the distance they are from the eyes.

Comes near to *M. dimidiata* Sm.

MEGACHILE FREDERICI, sp. n.

Long. 21 mm. ♀.

Hab. Kuala Aring, Malay Peninsula.

This species closely resembles one from Borneo which is also undescribed. They both agree in being large, in having the pubescence black, except on the apex of the abdomen (where it is pale) and the scopa (which is bright red). The differences between the two may be expressed thus:—

Head and thorax closely and strongly punctured; the apical segment of the abdomen clothed with pale pubescence; the mesonotum not furrowed laterally. Length 21 mm. *frederici*.

Head and thorax sparsely punctured; the apical two segments of the abdomen clothed with pale pubescence; the mesonotum with a wide, deep furrow on either side. Length 23–24 mm. *bicanaliculata*.

Head strongly and closely punctured; the face is not so strongly or regularly punctured and in the middle is shagreened only; it is distinctly separated from the face. The inner part of the mandibles is irregularly punctured; the outer side has the punctures smaller and more widely separated; the apical tooth is bluntly triangular; the subapical is a bluntly rounded small tubercle. Mesonotum with the scutellum closely, uniformly, and strongly punctured; the postscutellum is closely and minutely punctured: the basal area of the median segment is smooth and shining; the rest of it is closely and minutely punctured; the base of the segment is fringed with long white hair. Pro- and mesopleurae closely punctured, the metapleura coarsely shagreened. Legs deep black, with deep black pubescence; the pubescence on the underside of the basal joint of the tarsi is bright rufous; the calcaria dull red, almost brown. Wings hyaline, slightly suffused with fulvous tints; the nervures are fuscous black, the stigma darker coloured. Abdomen black; the back almost bare to the last segment, which is thickly covered with greyish-white pubescence; the segments are sparsely punctured at the base and apex; the scopa is bright rufous; the basal ventral segment is for the greater part reddish brown.

[MEGACHILE BICANALICULATA, sp. n.

Long. 23–24 mm.

Hab. Borneo, Matang, 3000 feet (*Shelford*).

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[21]

Vertex shining, sparsely punctured; the punctures shallow, irregular. Below the anterior ocellus is a V-shaped hollow, bordered with stout keels; the sides have an oblique slope. The part of the face below the antennae is roundly convex and bordered on its lower edge by a keel; the clypeus is keeled down the middle and is more strongly and regularly punctured than the face, its apex is alutaceous, opaque, and impunctate, its sides are roundly, but not very much, dilated. Mandibles opaque, their basal half sparsely punctured; their apical tooth is bluntly rounded, the subapical is indistinct and rounded. Mesonotum shining, sparsely punctured, and having a blistered appearance; its central part is bordered by two shallow, wide furrows; outside these is a narrow, deeper, and more clearly defined one; the outer edge is distinctly and sharply raised and furrowed on the inner side. The scutellum is irregularly punctured like the mesonotum. Median segment closely, distinctly, but not very strongly, punctured; the basal area is smooth and shining, except at the edges (where it is opaque) and at the base on the outer side (where it is punctured); the middle is furrowed; the sides are thickly covered with long white hair. Pleurae and sternum rugosely punctured; under the wings, below the tegulae, is a thick patch of white pubescence. Wings hyaline, the apex slightly smoky; the nervures and stigma black. Legs black, thickly covered with stiff black hair. Abdomen black; the dorsal segments closely and minutely punctured; the basal slope is covered with longish, white, soft hair; the apices of the basal four segments are fringed with white hair; the apical two are thickly covered with short white pubescence and with longer white hair; the ventral scopa is bright rufous.]

TRIGONA COLLINA Sm.

Patalung. Described by Smith from Mount Ophir, Malacca.

TRIGONA TESTACEITARSIS, sp. n.

Nigra, capite thoraceque dense albo-pilosis; scapo antennarum apiceque tarsorum testaceis; alis hyalinis, nervis stigmaleque piceis. ♀.

Long. fere 4 mm.

Hab. Patani, Malay Peninsula.

Scape of antennae and the second joint testaceous; the flagellum dark testaceous, black on the upperside. Head smooth and shining; densely covered with short white pubescence; the edge of the clypeus is testaceous; the labrum dark testaceous. Mandibles obscure testaceous, darker in the middle. Thorax densely covered with short pale pubescence, except on the median segment; on the pleurae and sternum it is denser and longer than it is on the mesonotum. Legs black, the tarsi testaceous, the basal joint of the hinder black; the hair on the legs is black, paler on the apical joints of the tarsi. Wings hyaline, highly iridescent; the stigma and nervures are testaceous or piceous. Abdomen smooth and shining; the basal segment may be brownish.

Patani. Several workers.

[277]

Antennae short, and compressed beyond the face by a suture slightly and roundly projecting. Face the tooth much smaller incised. Scutellum Median segment deeply areolated. Gastrocoxae the apex. Areolet is received in its center upwards at the base deeply incised; the length of the two segments unite are placed near the extends to the apex laterally at the apex and form a sharp, so The middle segment

In Ashmead's collection, Museum, xxiii. p. 1. genus *Lindigja*, Kröner in form. The chaetotaxy strongly dilated antennal segments sharply distinct strongly keeled scutellum

[ATANYJOPPA FLA.]

Nigra, promesothorax mine late albo-ligata basi tibiis longioribus.

Long. 17-18 mm.

Hab. Borneo (Singapore).

Antennae short, basal two segments basal joints of the flagellum less white; the scutellum Head large; the face orbits (widest in the orbits (narrow above yellow; the black of the front and vertex obscurely punctate. Labrum thickly fringed

[May 7,

1901.]

HYMENOPTERA OF THE "SKEAT EXPEDITION."

37

ICHNEUMONIDÆ.

JOPPINI.

ATANYJOPPA, gen. nov.

Antennæ short, distinctly shorter than the abdomen, thickened and compressed beyond the middle. Clypeus not separated from the face by a suture; a fovea on either side of it above; its apex slightly and roundly incurved in the middle; the labrum distinctly projecting. Face flat. Mandibles bidentate at the apex; the lower tooth much smaller than the upper. Occiput margined, roundly incised. Scutellum flat, broader than long, its sides keeled. Median segment depressed in the middle at the base; it is distinctly areolated. Gastrocœli not very distinct, elongate, narrowed towards the apex. Areolet 5-angled, narrowed above, the recurrent nervure is received in its centre; the apical abscissa of the radius is curved upwards at the base. Legs stout; the base of the front tibiæ deeply incised; the claws are simple. Abdomen long, three times the length of the thorax, which is not much longer than the basal two segments united. Petiole curved at the apex; its spiracles are placed near the base of its apical fourth; the ventral fold extends to the apex of the 4th segment; the segments are produced laterally at the apex; there are 7 segments, the last two are large and form a sharp, somewhat triangular point. Ovipositor short. The middle segments of the abdomen are longitudinally striated.

In Ashmead's classification of the *Joppini* (Proc. U.S. Nat. Museum, xxiii. p. 13) this genus comes nearest to the American genus *Lindigia*, Kreichbaumer, which is, however, very different in form. The characteristics of the genus are the very short, strongly dilated antennæ, the very long abdomen, with its middle segments sharply dilated at the apex, projecting labrum, and flat, strongly keeled scutellum.

[ATANYJOPPA FLAVOMACULATA, sp. n.

Nigra, promethoraceæque albo-maculatis; metathorace rufo; abdomine late albo-lineato; pedibus anterioribus albis, posticis nigris, basi tibiarum late alba; alis hyalinis, stigmatibus testaceo. ♀.

Long. 17-18 mm.

Hab. Borneo (Shelford).

Antennæ short, scarcely longer than the thorax. Thorax and basal two segments of the abdomen black; the scape beneath, the basal joints of the flagellum at the apex, and the 7th to 15th more or less white; the scape smooth, thickly covered with long pale hair. Head large; the face, labrum, clypeus, mandibles, palpi, the inner orbits (widest in the middle and behind the ocelli), and the outer orbits (narrow above and becoming wider towards the bottom) yellow; the black on the front and vertex has a plumbeous hue; the front and vertex are very smooth and shining; the face is obscurely punctured in the middle, the clypeus at the base. Labrum thickly fringed with long hair. Thorax: the edge of the

[23]

pronotum all round above and slightly wider at the apex, a short line on either side of the mesonotum, the sides of the scutellum broadly, its apex more narrowly, the postscutellum, the edge of the propleurae broadly, the lower half of the mesopleurae, the tubercles, the edge of the apex of the mesopleurae, and the sides of the metanotum at the apex, yellow. The mesonotum at the base and sides obscurely punctured; the middle with large deep punctures: it is thickly covered with short black hairs, especially at the base. Scutellum flat, large, slightly narrowed towards the apex; the sides with a stout keel, which extends from the base to near the apex; except along its edges it bears large deep punctures; the apex is longitudinally striated; the depression at the base is narrow and shallow. Postscutellum smooth and shining. The base of the median segment is coarsely shagreened; the rest strongly punctured; the areas are not distinctly indicated, the keels being faint; the supramedian is longer than broad, and obliquely narrowed at the base; there are no teeth; the apex in the middle is depressed, shining, and finely transversely striated; the keels on the apex of the segment are more distinct than they are on the base; the posterior median area is triangularly narrowed at the base. Propleurae shining; the upper part strongly obliquely striated; the apex furrowed; the mesopleurae punctured, more strongly below than above; the middle behind smooth, plumbeous; the apex is crenulated. Metapleurae strongly and closely punctured. Legs stout, thickly covered with white hair; the four anterior tibiae and the femora are lined above with black; the hinder coxae are black, except in the middle behind; the basal joint of the trochanters and the basal half of the hinder tibiae yellow; the tarsi spinose; the metatarsus and the base of the 2nd joint are testaceous. Wings hyaline, the nervures blackish; the areolet narrowed above, being there somewhat less in length than the space bounded by the first transverse cubital and the recurrent nervures; the latter is received nearly in the middle; the wings are rather short, and hardly reach to the apex of the 4th abdominal segment. The petiole becomes gradually widened from the middle to the apex; yellow, the dilated part blackish, and obscurely longitudinally shagreened; the 2nd, 3rd, and 4th segments are broadly yellowish at the base; the apical three are entirely white; the 2nd and 3rd segments punctured and longitudinally striolated in the middle; the gastrocoeli are shallow, and not very clearly indicated; the ovipositor projects, its sheath is black.]

[*ATANYJOPPA RUFOMACULATA*, sp. n.

Long. 22 mm. ♀.

Hab. Khasia (*Rothney*).

Agrees closely with the preceding species, from which it may be known by the median segment being broadly black at the base and in the middle, while the metapleurae are also broadly black at the base.

Antennae black; the scape beneath and the 7th joint to the [24]

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commencement of the dilatation white; the dilated apex has a brownish hue. Head pale yellow; the middle of the front and of the vertex broadly, the occiput, and the hinder part of the outer orbits to shortly below the middle, black. Face and clypeus shining, flat, sparsely and indistinctly punctured; the face is covered with short, the clypeus with longer pale, hair; the apex of the clypeus is more distinctly punctured than the rest; the projecting labrum is smooth and is fringed with long hair. Mandibles yellow, black at the apex. Thorax black; the edge of the pronotum, two short marks, narrowed at the base and apex, the sides of the scutellum broadly and of its apex more narrowly, the postscutellum, an irregular mark behind the metathoracic spiracles, the apex of the segment from behind the middle and extending obliquely on to the pleuræ, the lower edge of the propleuræ and slightly less than the lower half of the mesopleuræ, yellow. Mesonotum smooth, closely punctured in the middle, where the yellow spots are. Scutellum strongly, but not very closely, punctured. Postscutellum sparsely punctured. Propleuræ closely and distinctly punctured; in the middle are some curved keels, at the apex short striae; the yellow, lower part of the mesopleuræ closely punctured. Median segment closely, rugosely punctured all over; the posterior median area coarsely, closely, transversely striated. The four front legs are yellow; the femora and tibiae are black behind; the hinder coxæ are yellow, black below and at the base above; the hinder femora entirely, and the apical part to near the middle and the base narrowly, black; the hinder tarsi are blackish behind. Wings clear hyaline; the stigma testaceous; the apical nervures fuscous. Abdomen black; the basal four segments to near the middle and the apical two segments entirely yellow; the postpetiole is closely shagreened and closely striated; the middle segments are closely punctured; the 2nd and 3rd segments are longitudinally striated at the base.]

MESOSTENINI.

SKEATIA, gen. nov.

♂. Antennæ shorter than the body; the basal joints of the flagellum elongated, the middle ones roundly and broadly dilated on the lower side; the apical ones dilated, about three times broader than long. Thorax three times longer than broad; the parapsidal furrows deep, reaching to shortly beyond the middle. Median segment, except at the base, coarsely, irregularly reticulated; the basal smooth part is bounded by a stout transverse keel; in its centre is a small square area. Metapleural keel distinct, long. Areolet small, square; the apical nervure is faint; the transverse median nervure is received behind the transverse basal; the hind wings as in *Mesostenus*. Legs slender, long; the fore tarsi nearly twice the length of the tibiae; their claws are small; the hinder coxæ elongate, about three times longer than

[25]

wide. Petiole of abdomen long, slender, curved, not much dilated towards the apex.

The malar space is moderate; the eyes reaching to the end of the clypeal foveæ, which are deep. Clypeus roundly convex; not separated by a suture above. Mandibles large, bidentate; the upper tooth is slightly smaller than the lower. Mesopleural furrow wide and deep. Scutellum roundly convex, only keeled at the base; postscutellum bifurcate at the base. Median segment armed with two long teeth; it is moderately long. Palpi long; the second joint of the maxillary is dilated towards the apex. The propleuræ are stoutly keeled laterally in front. The head is wider than the thorax; it is obliquely narrowed behind the eyes; the occiput is sharply keeled. The scutellar depression is large, deep, and bears two keels in the middle.

The female has the antennæ stouter than in the male, and they are slightly thickened beyond the middle; the abdominal petiole is shorter and broader towards the apex; the apex of the abdomen is bluntly pointed; the last segment (the 8th) is very short above, below it is much more largely developed; the ovipositor is not one-half the length of the abdomen.

The metathoracic spiracles are small, oval, about twice longer than they are broad; the median segment is depressed at the base, the scutellar and postscutellar furrows are deep and crenulated. The last joint of the hinder tarsi is about equal in length to the third.

SKEATIA ALBISPINA, sp. n.

Nigra, facie, clypeo, mandibulis tarsisque albis; coxis trochanteribusque anterioribus pallide flavis; alis fere hyalinis, nervis stigmatibusque nigris. ♂.

Long. 13 mm.

Hab. Bukit Besar, Malay Peninsula.

Antennæ black; the 7th to 24th joints white beneath; the scape pale yellow in the middle below; the scape is covered with short pale pubescence. Head smooth and shining; black; the face, clypeus, mandibles, and palpi pale yellow. Ocelli large. Front depressed; a stout keel runs down its centre from the ocelli. Eyes large, parallel. Mesonotum and scutellum smooth and shining. Propleuræ stoutly longitudinally keeled behind. Mesopleuræ opaque and closely longitudinally striated, except on the upper part behind. Metapleuræ above closely, below more stoutly, irregularly, and not so closely, reticulated. The mesosternal furrow is wide and deep, especially at the base, and is closely striated. The base of the median segment is smooth and shining; there are a few narrow irregular striæ on either side of the central area; the basal keels in the middle are curved and end in a squarish area, which is stoutly keeled down the middle; the rest of the segment is stoutly reticulated; the spines are long, curved, and white. All the coxæ are pale yellow (actually they are testaceous yellow, but this may be owing to discoloration);

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[May 7,

the front legs, the middle femora at the base, and the greater part of the middle tibiae are testaceous; the basal joint of the middle tarsi and the basal third of the posterior and the hinder trochanters, the femora, tibiae, and calcaria are black. Abdomen black, except the apical segment, which is white.

SKEATIA NIGRISPINA, sp. n.

Nigra, coxis, trochanteribus et femoribus anterioribus, basi femorum posticorum late tarsisque posticis flavis; alis hyalinis, nervis stigmatique nigris. ♀.

Long. 13, *terebra* 3 mm.

Hab. Bukit Besar, Malay Peninsula.

Antennae as long as the body, thickened towards the apex; the 6th to 13th joints white, except above. Front and vertex shining; the front below the ocelli stoutly, irregularly longitudinally striated; the lower part excavated, smooth except for a stout keel down the middle. Face coarsely aciculated, slightly and broadly projecting in the centre, where it is yellow; clypeus broadly, roundly convex; its lower part projecting and slightly oblique. Mandibles dark testaceous; their lower border keeled. Mesonotum aciculated; the scutellum is more shining, the post-scutellum still more so. The basal region of the median segment has two keels in the centre, which converge towards the apex; the parts nearest to them are smooth and shining; the rest opaque, with some thin oblique striae on the inner portion. The middle part of the propleurae is stoutly striated. Mesopleurae closely striated, except above. Except at the base above, the metapleurae are closely, stoutly, obliquely striated. The mesopleural keel is curved, deep, not very wide, and striated. Mesosternum smooth and shining. The median segment behind the transverse keel is closely reticulated; the apical slope is irregularly transversely striated; the teeth are stout, curved, black, dull testaceous towards the apex. Legs black; the four anterior coxae, trochanters, and femora, the hinder coxae, basal two-thirds of the femora, and the hinder tarsi except the extreme base, yellow. Abdomen black; the apical two segments lemon-yellow above; the 2nd and 3rd segments are shagreened, the others smooth and shining.

VAGENATHA, gen. nov.

Edges of pronotum and median segment stoutly spined. Parapsidal furrows distinct; the first joint of the flagellum distinctly longer than the second. Median segment with one incomplete transverse keel. Middle segments of the abdomen distinctiy separated and narrowed at the base; the edges of the second, third, and fourth on the lower edges at the apex projecting into spines. Petiole broadly dilated at the apex, the postpetiole clearly defined; the spiracles are nearer to each other than to the apex; on the lower side at the base are two sharp, oblique teeth.

[27]

Metapleural keel complete. Head wider than the mesothorax; its front and vertex reticulated, without spines or keels. Scutellar depression large, shallow, and bearing longitudinal keels. Areolet large, about twice longer than wide; the transverse cubital nervures are parallel and only slightly oblique; the recurrent nervure is received near the base of the apical fourth of the cellule; the transverse median nervure is received behind the transverse basal. Both the transverse cubital nervures are distinct.

The eyes largely project; the head behind them is obliquely narrowed and is well-developed there; the occiput is sharply margined; the scutellum is flat and has the sides keeled; on the basal half of the second segment are two oblique, wide, shallow furrows, which enclose a triangular space; at the apex of this is a narrow transverse furrow; there is a similar, but not quite so distinct, furrow on the third segment. The legs are long; the tarsi are spinose, the anterior are twice the length of the tibiae; the median segment is coarsely, irregularly reticulated; the spiracles are about three times longer than wide; in the hind wings the transverse median nervure is angularly broken by the subdiscoidal nervure shortly below the middle.

In Ashmead's system (Bull. U.S. Nat. Mus. xxiii. p. 44) this genus comes near *Mesostenoides* and *Christolia*. Characteristic are the clearly separated middle abdominal segments, spined at their apices, and the spines on the basal ventral segment.

[*VAGENATHA SPINOSA*, sp. n.

Nigra, flavo-maculata, spinis flavis; pedibus flavis, coxis posticis, apice femorum posticorum apiceque tibiae posticarum nigris; alis hyalinis, nervis stigmatique nigris. ♂.

Long. 16 mm.

Hab. Borneo (Shelford).

Antennae as long as the body; black, the scape beneath and the middle of the flagellum broadly white. Head black; the clypeus yellow. Front and vertex smooth and shining, except the front, which is irregularly reticulated in the middle—more broadly above than below. The face is opaque, coarsely shagreened, and sparsely haired; the outer orbits are thickly covered with longish white pubescence. The spines on the pronotum are large. Mesonotum closely, rugosely punctured, opaque; the parapsidal furrows are irregularly striated. The scutellar depression is large; in the centre are two stout longitudinal keels, with a thinner one between them; on their outer side is another narrow keel. Scutellum sparsely punctured at the base. Median segment strongly, closely, rugosely reticulated. Propleurae obliquely, stoutly striated; the striae distinct and clearly separated. Mesopleurae on the base and lower side closely, rugosely punctured; the middle obliquely striated; the apex behind smooth and shining above. Metapleurae strongly, obliquely striated; below thickly covered with white pubescence. Legs yellow; the femora with a more fulvous hue;

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the hinder coxæ, except above, the base of the trochanters, the apex of the hinder femora and of the hinder tibiæ, black. Abdomen black; the base and apex of the petiole and the apical third of the other segments yellow; they are closely and distinctly punctured, the petiole more coarsely than the others.

There is a short broad tubercle on the centre of the median segment; it is joined to the teeth by an oblique broad yellow band; all the thoracic spines are yellow, as are also the tegulæ, scutellum, and tubercle.]

BRACONIDÆ.

IPHIAULAX MALAYANUS, sp. n.

Luteus, capite, antennis tarsisque posticis nigris; facie clypeoque pallide flavis; alis fusco-violaceis, ad basin late flavis. ♀.

Long. 12, *terebra* 4 mm.

Hab. Singora, Malay Peninsula.

Antennæ entirely black, as long as the body; the scape smooth and thickly covered with long fuscous hair; it is more shining than the flagellum. Head black, shining; the face from shortly below the antennæ, the oral region, and the malar space pale yellow. Face smooth; in its centre, below the antennæ, is a deep furrow with oblique sides. The clypeus is surrounded by a keel, which is more distinct on the top, where it forms a semicircle. Thorax smooth and shining; above, and on the sternum, it is thickly covered with long pale hair. The meso- and metapleural furrows are smooth, wide, and deep. Legs coloured like the body, thickly covered with white hair; the hinder tarsi are deep black. Wings to shortly beyond the transverse median nervure yellowish hyaline; the rest deep fuscous, with a violaceous tinge, except the base of the stigma broadly and a narrow oblique mark on the base of the first cubital cellule. Petiole smooth, except the raised central part, which bears large, deep, elongated punctures. The second segment is closely, rugosely punctured; the central basal part is smooth and is not prolonged into a keel; the basal depression is deep; the basal branch is striated in the bottom, the wider apical one is smooth; at its apex are four narrow keels. Securi-form articulation deep, wide, stoutly, but not very closely, longitudinally striated; the apical furrow on the segment is narrow, deep, and smooth; the 2nd and 3rd furrows are deep and closely striated, those on the apices of the segments are smooth and deep.

EVANIIDÆ.

[EVANIA SHELFDI, sp. n.

Nigra, basi flagelli antennarum, trochanteribus anterioribus, basi tibiarum posticarum basique tarsorum posticorum late, albis; alis fusco-violaceis. ♀.

Long. 12 mm.

Hab. Borneo (Shelford).

Antennæ black; the 3rd joint, except at the apex, white. The front and vertex are stoutly, acutely, longitudinally striated; the face is similarly, but more obliquely, striated; the outer parts of the head are obliquely, and not quite so strongly, striated. The hinder ocelli are separated from each other by about the same distance as they are from the eyes. The lower tooth of the mandibles is rufous before the apex; the palpi are dark fuscous. The base of the pronotum is raised; the raised part slightly projects laterally; the sides are oblique; the base is not quite transverse, the edges being rounded; it bears round, deep, clearly separated punctures. The central part of the mesonotum is alutaceous and impunctate at the base; the rest of it irregularly, deeply, but not very closely punctured; this punctured part is bordered by a deep furrow; outside this it is opaque and alutaceous, and bears two thin keels on the outer side. Scutellum in the middle strongly, irregularly punctured; the centre has a longitudinal keel; the sides are stoutly, obliquely striated; on the postscutellum are two stout keels. Propleuræ alutaceous and bearing some scattered, shallow punctures. The upper two-thirds of the mesopleuræ are smooth and shining, except for an oblique, clearly defined, depressed area; this has the bordering keels more distinct in front than behind and bears, except at the base and apex, some stout keels; the lower part is closely, but not very deeply punctured. Sternum smooth. Median segment closely reticulated; the central portion more closely, rugosely, and irregularly than the rest. The basal part of the wings is fuscous, with a distinct violaceous tinge; the apical part below the radial and second cubital cellules is similarly, but more lightly, clouded. The metasternal fork is short and stout, and obliquely diverges at the apex: behind it is a stout, smooth keel. The front tibiæ and tarsi are fuscous; the four anterior trochanters are broadly white at the base, as is also the base of the hinder tibiæ narrowly, the basal joint of the hinder tarsi, and the second joint broadly in the middle. Petiole smooth at the base: its sides bear stout, oblique striæ; the apical half above is irregularly, coarsely punctured. The hinder tibiæ and tarsi are shortly spined. The sides of the median segment are broadly rounded; the middle transverse; the abdomen is very smooth, shining, and piceous.

This comes nearest, of the known species, to the Australian *E. princeps* West.]