

Arm-spines subequal. Under arm-plates very regular, rather wider than long.

The upper arm-plates are of a dark colour with a lighter proximal margin; the spines and the lower plates are much paler.

*Hab.* Itamaraca, Brazil.

L.—*Descriptions of new Species of Oriental Cicadidae.*  
By W. L. DISTANT.

*Leptopsaltria picturata*, n. sp.

♂. Body above brownish ochraceous; head, excluding base, much suffused with piceous, the ocelli red, the eyes castaneous. Pronotum with a central, longitudinal, fuscous fascia, the margins of which are black, amplified anteriorly and notched and narrowed posteriorly; and an oblique piceous fascia near each lateral margin. Mesonotum with a central, longitudinal, linear fascia, on each side of which is a curved, linear, discal fascia extending to anterior margin; a broad fascia on each lateral area, and a spot at each anterior angle of the cruciform basal elevation, piceous. Abdomen sparingly greyly pilose, with a double discal series and a more continuous series of piceous spots on each lateral margin; base of anal segment also piceous. Body beneath ochraceous; bases of anterior femora, bases and apices of the tibiae, apices of the tarsi, abdominal tubercles, and anal segment of the abdomen piceous; anal appendage luteous. Tegmina and wings pale hyaline, the venation fuscous; the tegmina with a small costal ochraceous and fuscous spot at base of the upper ulnar area, and the transverse veins at the bases of the first, second, and third apical areas infuscated.

The rostrum has the apex piceous and just passing the posterior coxae, and the face is depressed and somewhat flattened.

Long. excl. tegm. 15 millim., exp. tegm. 44 millim.

*Hab.* Nilgiri Hills, northern slopes, 5000 feet (*Harrison*).

*Leptopsaltria andamanensis*, n. sp.

♂. Body above reddish ochraceous, ocelli reddish. Pronotum with the centre of the anterior margin and the whole of the posterior margin (widest at centre) blackish. Meso-

notum with two linear, blackish, obconical spots at anterior margin and a greenish fascia near each lateral margin. Abdomen with the segmental margins darker. Body beneath ochraceous, the abdominal tubercles blackish. Legs *mutilatae*.

Tegmina and wings pale hyaline, the venation fuscous. Tegmina with the costal membrane brownish ochraceous, a small costal fuscous and ochraceous spot at base of upper ulnar area, the transverse veins at the bases of second, third, and fifth apical areas infuscated, and a series of small fuscous marginal spots situated on the apices of the longitudinal veins of apical areas.

The rostrum has the apex piceous and just passing the posterior coxae.

Long. excl. tegm. 21 millim., exp. tegm. 58 millim.

*Hab.* Andaman Islands (*J. Wood-Mason*). Calc. Mus.

*Cosmopsaltria Pygællæ*, n. sp.

♂. Body above brownish ochraceous; head with the whole frontal margin and a transverse fascia between the eyes black. Pronotum with two central, longitudinal, linear fasciæ, on each side of which are two or three oblique, short, linear spots, and a broader fascia on each lateral margin black. Mesonotum with five linear fasciæ; the central crossing disk, on each side of this a shorter and curved fascia, and a broken fascia on each lateral area, black. Abdomen pilose, with some black spots at base. Body beneath brownish ochraceous; face with a central black fascia, not reaching anterior margin, and a transverse series of black linear spots on each lateral margin; some scattered spots on head, apex of the rostrum, some femoral streaks, the tarsi, and a transverse fascia at base of abdomen black. Wings pale hyaline, the venation greenish or fuscous, the first with a small ochraceous costal spot at base of upper ulnar area, the transverse veins at bases of second, third, fifth, and seventh apical areas infuscated, and a marginal series of small fuscous spots, situate on the apices of the longitudinal veins to apical areas.

The rostrum reaches the posterior coxae; the opercula are ovate and extend to the third abdominal segment.

Long. excl. tegm. 26 millim., exp. tegm. 84 millim.

*Hab.* Ternate (coll. Dist.), Bono (Brussels Mus.).  
This species is allied to *C. impar*, Walk.

*Pomponia cellina*, n. sp.

♂. Body above ochraceous brown; head with the margin

of the front and the vertex much suffused with blackish. Pronotum with two central longitudinal fasciae, which are most widely separated at anterior margin; on each side of disk is a curved linear spot, and a large, oblique, semi-oval, linear spot on each lateral area, black. Mesonotum with five black fasciae; the central crossing disk and widened anteriorly and posteriorly, one on each side of this short and curved, and one on each lateral area crossing the whole of disk, and a spot in front of the anterior angles of basal cruciform elevation black. Abdomen with the segmental margins somewhat broadly black. Body beneath ochraceous; head, excluding face, blackish; bases of tibiae, the tarsi, and basal segment of abdomen fuscous; apical segment of abdomen somewhat infuscated.

Tegmina and wings pale hyaline, the venation fuscous or ochraceous; the first with the costal membrane ochraceous.

The face is moderately tumid and not centrally and longitudinally sulcated; the rostrum reaches the posterior coxae; the opercula are small, wide apart, and somewhat angulated.

Long. excl. tegm. 16-17 millim, exp. tegm. 47-54 millim.  
*Hal.* N. Klansia Hills. Calc. Mus.

*Pomponia Ranssonneti*, n. sp.

♂. Head and thorax above ochraceous; head with two converging black lines in front, and the anterior area of vertex (enclosing ocelli), the hinder margin of eyes, and a small spot at same region black. Pronotum with a broad, central, double, longitudinal fascia, on each side of which are two curved linear spots and a large oblique, semi-oval, linear spot on each lateral area black. Mesonotum with a central longitudinal fascia broadening at base into a large crescentic spot in front of basal cruciform elevation, on each side of this fascia, starting from anterior margin, is a short curved fascia followed by a spot and again by a long, broad, and slightly curved fascia and a small oblique spot on each lateral margin black. Anterior angles of basal cruciform elevation black. Abdomen above brownish ochraceous, pilose, the segmental margins narrowly piceous. Head beneath, sternum, and legs ochraceous; an oval fascia on face, a transverse spot on each side, posterior margin of head, a transverse spot on mesosternum, apices of the femora, and bases of the tibiae black. Abdomen beneath brownish ochraceous, its base and apex piceous.

Tegmina and wings pale hyaline, with a pale creamy bluish reflexion, venation castaneous or fuscous; tegmina with a small ochraceous costal spot at base of upper uhlar

area, transverse veins at bases of second, third, fifth, and seventh apical areas infuscated, and a marginal series of fuscous spots situated on the longitudinal veins of apical areas.

The rostrum reaches the posterior coxae; the opercula are small and widely separated.

Long. excl. tegm. 22 millim, exp. tegm. 59 millim.

*Hal.* Ceylon, Colombo. Calc. Mus.

*Tylicen amussitatus*, n. sp.

♀. Head and thorax above dull ochraceous; head with two central oblique spots on front and a spot at base of each antenna black; vertex with a large oblique spot before each eye and with two central longitudinal lines, enclosing the ocelli and continued across and to posterior margin of pronotum, black; two black curved lines on each lateral area of pronotum. Mesonotum with a central longitudinal line, on each side of which at anterior margin is a short, somewhat oblique line, a linear fascia across each lateral area and a spot in front of each anterior angle of basal cruciform elevation, all black. Abdomen above castaneous, with a central black spot at base, and a series of marginal black spots widening to apex. Body beneath and legs ochraceous; the abdomen darker, with some apical black spots.

Tegmina and wings pale hyaline, their bases narrowly ochraceous, the venation ochraceous. Tegmina with some faint fuscous submarginal spots situate on the longitudinal veins of the apical areas.

The pronotum is large and subquadrate; the face is moderately globose, with a wide, central, longitudinal sulcation and strong transverse lateral striations; the rostrum about or almost reaches the posterior coxae.

Long. excl. tegm., ♀ 12 millim, exp. tegm. 35 millim.

*Hal.* Darjiling. Stockholm Mus.

*Tylicen Acleri*, n. sp.

♂. Head black, the ocelli red, eyes brownish ochraceous. Pronotum black, with a central longitudinal fascia and the hind margin yellow, and two large discal reddish spots. Mesonotum black, with two faint yellowish central fasciae extending a short distance from anterior margin. Abdomen black, the lateral areas and apex more or less reddish. Face, sternum, and femora yellow; central longitudinal fascia to face, head beneath (excluding face), apices of femora, the tibiae and tarsi black. Abdomen beneath dull reddish.

Tegmina and wings pale hyaline, the venation blackish or olivaceous; costal membrane to tegmina olivaceous.

The face is moderately broad and strongly striated laterally; the rostrum has the apex pitchy and about reaching the intermediate coxæ. The opercula are yellowish, short, and broad, obliquely rounded, and not meeting at centre.

Long. excl. tegm., ♂ 25 millim., exp. tegm. 72 millim.

Hab. Cashmere Valley, 6300 feet (*Leach*). Coll. Dist.

*Twicea reticulatus*, n. sp.

♀. Head black; apex of front, anterior lateral margins of vertex, and a narrow, central, longitudinal line dull reddish; eyes brownish ochraceous. Pronotum black, the margins and two large contiguous spots on each side of disk dull reddish. Mesonotum black, the margins, the basal cruciform elevation, and two irregular subconical spots on anterior margin dull reddish. Abdomen black. Body beneath and legs black, somewhat greyishly pilose; margins of the face, under surfaces and apices of femora, tibiae and tarsi, excluding bases and extreme apices, spots and markings on sternum and abdominal segmental margins dull reddish.

Tegmina and wings pale hyaline, the venation blackish, their bases narrowly reddish, outwardly shaded with black; costal membrane to tegmina dull reddish.

The face is laterally much compressed and moderately striated; the rostrum about reaches the intermediate coxæ; the legs are robust, and the anterior femora have a strong spine both at base and apex. The tegmina in the specimen described have a small additional cell at base of second apical area, caused by the presence of a short abnormal transverse vein.

Long. excl. tegm., ♀ 29 millim., exp. tegm. 70 millim.

Hab. Gilgit. Calc. Mus.

*Twicea casyapa*, n. sp.

♀. Head black, margins of front, ocelli, and a small central basal spot dull reddish; eyes ochraceous. Pronotum dull reddish, the margins and two central longitudinal lines black. Mesonotum black; two central "anterior"-shaped fasciæ, the lateral margins, and the basal cruciform elevation dull reddish, the anterior angles of the last black. Abdomen above black. Body beneath black, somewhat greyishly pilose; face red, its central longitudinal sulcation black; rostrum black; legs reddish, the femora streaked with black beneath.

Tegmina and wings pale hyaline, their bases dull reddish, the venation blackish; the costal membrane of tegmina ochraceous.

The face is large, but laterally compressed and strongly striated, with a profound central longitudinal sulcation. The rostrum about reaches the intermediate coxæ; the legs are robust and the anterior femora have a strong spine beneath at apex and a similar spine near base.

Long. excl. tegm., ♀ 35 millim., exp. tegm. 90 millim.

Hab. Cashmere Valley, 6300 feet (*Leach*). Coll. Dist.

*Cicadella continuata*, n. sp.

♀. Head and thorax above dull blackish, sparingly covered with short grey pilosity. Head with the anterior margin, the ocelli, and a central, linear, longitudinal fascia continued across the pronotum, where it is widened, dull ochraceous, the pronotal margins of the same colour. Mesonotum with two longitudinal discal fasciæ, the lateral margins and basal cruciform elevation dull ochraceous, the last with its centre blackish. Abdomen above pale castaneous, greyishly pilose, the posterior segmental margins paler in hue and with an obscure, central, narrow, longitudinal, blackish fascia. Body beneath and legs dull reddish ochraceous; head beneath and the discal area of face blackish.

Tegmina and wings pale hyaline, their bases narrowly reddish ochraceous, the venation more or less olivaceous. The rostrum about reaches the intermediate coxæ, and the face is very broad and tumid.

Long. excl. tegm., ♀ 15-18 millim., exp. tegm. 38-45 millim.

Hab. Quetta. Calc. Mus.

*Cicadella literata*, n. sp.

♀. Head and pronotum dull blackish, somewhat palely pilose, both crossed by a narrow, obscure, longitudinal, ochraceous line; ocelli red, eyes black and shining. Pronotum shining black, with the lateral margins and a large, discal, "anterior"-shaped spot ochraceous. Abdomen above dull blackish, the posterior segmental margins narrowly and obscurely dull reddish. Body beneath ochraceous, the sternum much shaded with dull blackish. Abdomen with a central longitudinal row of blackish spots; legs ochraceous, femora and tibiae streaked with blackish.

Tegmina and wings pale hyaline, the venation olivaceous or fuscous.

The rostrum does not extend beyond the intermediate coxæ and the face is laterally coarsely striated.

Long. excl. tegm., ♀ 12 millim., exp. tegm. 37 millim.  
*Hab.* Cashmere Valley, 6300 feet (*Leech*). Coll. Dist.

LI.—*Remarks on Shell-growth in Cephalopoda.*  
 By Prof. J. F. Blake, M.A., F.G.S.

The structure of the "shell" of a Sepia is so unlike that of the Nautilus that any serious attempt to work out their homologies must be heartily welcomed by all who are interested in Cephalopoda. The Sepia is much the harder of the two to understand, and well deserves the study that has recently been bestowed upon it by Riefstahl\* and Bather†. Unfortunately these descriptions of the soft parts within it do not agree, though the difference is not on a point of very great importance.

It does not appear, however, that these studies throw much light on the question from a geological point of view. That is to say, we get no nearer understanding how a Nautilus- or Ammonite- or Belemnite-shell is actually formed. When I was writing the Introduction to my 'British Fossil Cephalopoda,' some six years ago, I examined the structure of the Sepia with a view to obtaining light from it, and got as far as the above-named writers have in the knowledge of the hard parts, yet found no means of homologizing them with those of a Nautilus or Belemnite with any approach to conviction. Nor do I find that these writers have anything definite to add, but help themselves along by theory, even without testing it by available facts. I wish to deprecate this method in the interests both of the subject and the workers. In the first place, it is not *inductive* science; and in the second the author of a supposed genealogy will find it very awkward when further knowledge—and that not hard to acquire—shows the facts to be dead against him. But most of all it is to be deprecated for the damage it does to the credibility of what are meant to be stated as facts by such writers, as we never can tell whether what they say is from autopsy or from mental conception.

\* Paleontographica, Bd. xxxvii, 1886.  
 † Annals, April 1888, p. 298. See also Geol. Mag. 1887, p. 446.

Whether the successive layers of the spongoid-tissue or "pad" of the Sepion is formed by intussusception, as Riefstahl says, or by successive formation of chitinous membranes by the epithelium of the shell-sac, as Bather says, is, after all, only a matter of argument, in which the latter seems to me to have the best of it. If we are to get any further, we must have some *evidence* of the homology between these layers and the parts of any other Cephalopod. It is assumed that these layers correspond to the septa of a Nautilus or of the phragmocone of a Belemnite. But do they? They have no siphuncle, and they are not even perforated. Yet a siphuncle and neck are present in Nautilus, Ammonite, Belemnite, and Spirula, and, what is more remarkable, though the Nautilus commences with a cap and the other three have a well-marked nucleus, nothing of this sort has yet been discovered in Sepia. I specially looked for it, but could find no representative of such a structure. On the other hand, if Mr. Bather had availed himself of my observations of the shell of Nautilus, of which he seems to be ignorant, or had made observations for himself, he could not have written as he does, nor could M. Riefstahl have supposed for a moment that the Nautilus-shell grows by intussusception between the septa. On page 17 *et seq.* of my work I give a very detailed description of the structure of this shell.

I there show that the shell proper is composed of three layers: the outer, a porcellaneous one, is formed of large radiating crystalline particles set in a dark ground-mass, which, if they show any orientation, are perpendicular to the surface; and this layer is not at all divisible into laminae. It shows lines of growth on the surface, and these pass marginally, and not superficially, into any fractures that may have taken place in the growing edge of the shell. These characters leave little doubt that this layer is formed by secretion at its bounding edge. Very different is the middle layer. It has, as Hyatt pointed out, an imbricated structure, a structure which might very well suggest the pad of the Sepion as its homologue. This imbrication is in truth excessively fine, as about a thousand fine laminae may be counted in its thickness; the outcropping edges of these, being about 20,000 to the inch, diffract the light and give rise to the nacreous lustre, when the innermost layer is absent or worn away. The direction of these laminae is outwards in the direction of the aperture of the shell. Their obliquity is very slight, so that in tracing them from their commencement inside to their termination against the outer layer of the shell, they pass more than one septum, and must therefore have been