

Apteryx Haasti is "Roa-Roa" and it is not known by the name of "Kiwi." The name "Roa-Roa," however, is applied to several species of *Apteryx*, and specially to *Apteryx maxima* of Stewart Island. I would, however, again refer Mr. Rothschild to Sir Walter Buller's second volume, p. 330, where he will find that the native names for the *South-Island* types in Christchurch, N. Z., are both "Roa" and "Roa-Roa" as well as "Kiwi Karuai."

To the best of my knowledge *Apteryx Haasti* has hitherto been found *only* in the *South Island*, and in that district alone in which *Apteryx australis* and *A. Oweni* both occur, which so far seemed very significant. Its occurrence in the North Island is to me a new and most interesting fact, and, if substantiated, would certainly go far to upsetting the opinion I at present hold that *Apteryx Haasti* is a hybrid. Is Mr. Rothschild quite certain of the localities of his specimens and of the accuracy and *bona fides* of his collector? I shall look forward with much interest to learn the actual localities whence have come his specimens, also if the young specimens of *A. Haasti* which Mr. Rothschild has had alive at Tring were reared by him, or if he has had eggs from a pair of these birds when confined by themselves. Does *Apteryx Haasti* occur in the localities in which *A. Bulleri* (= *A. Mantelli*) is found? Or can Mr. Rothschild himself have mistaken large west-coast specimens of *A. Oweni* for *A. Haasti*?

HENRY O. FORBES.

1 Philbeach Gardens,
Jan. 6, 1893.

XXII.—*Natural History Notes from H.M. Indian Marine Survey Steamer 'Investigator,' Commander R. F. Hoskyn, R.N., commanding.*—Series II., No. 1. *On the Results of Deep-sea Dredging during the Season 1890-91.* By J. WOOD-MASON, Superintendent of the Indian Museum, and Professor of Comparative Anatomy in the Medical College of Bengal, and A. ALCOCK, M.B., Surgeon I.M.S., Surgeon-Naturalist to the Survey.

[Continued from vol. ix. p. 370.]

[Plates X. & XI.]

Family Pasiphaïdæ.

PASIPHAË, Savigny.

52. *Pasiphaë sivado* (Risso).

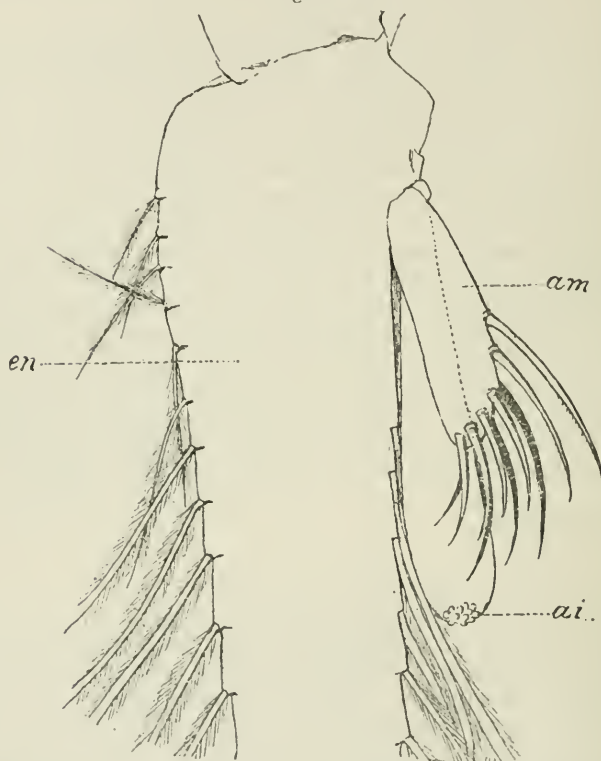
Pasiphaë sivado, Savignyi, et *brevirostris*, Milne-Edwards, Hist. nat. des Crust. vol. ii., 1837, p. 426, et Atlas du Règne Anim. de Cuvier.

Crust. pl. xxii. fig. 3; Bell, British Stalk-eyed Crust. 1853, p. 312, woodcut; Heller, Crust. Südl. Europ. 1863, p. 243, pl. viii. figs. 4-6; Wood-Mason, Ill. Zool. 'Investigator,' pt. i., Crust. pl. iii. fig. 6, ♂*.

Two males were taken on November 29th, 1888, north of Port Blair, Andaman Sea, in 200 fathoms.

They differ from a Mediterranean specimen of the female

Fig. 1.



Pasiphaë sivado (Risso), ♂.—Basal portion of endopodite of second abdominal limb of the right side from in front. *en*, endopodite; *ai*, appendix interna; *am*, appendix masculina; the spines of the hinder row are shaded to distinguish them more clearly from those of the front row. Magnified.

* 'Illustrations of the Zoology of H.M. Indian Marine Surveying Steamer 'Investigator,' under the command of Commander A. Carpenter, R.N., D.S.O., and of Commander R. F. Hoskyn, R.N.'—Part I., Fishes, Plates I.-VII., under the direction of A. Alcock; Crustaceans, Plates I.-V., under the direction of J. Wood-Mason. Published under the authority of the Director of the Royal Indian Marine. Calcutta: printed and sold by the Superintendent of Government Printing. 1892.

in the collection of the Indian Museum in their slenderer form, in the minuteness of the postfrontal spine, which is only about as large as the apical half of that of the female, and in their shorter abdominal pleura. In the female these are longer and squarer, and those of opposite sides are abruptly bent inwards near the lateral margins so as to overlap one another ventrally, completely closing the subabdominal cavity at all events when the abdomen is partially flexed, and entirely concealing from view the four intermediate pairs of appendages, which are laid forwards upon the sternal region, thus forming, there is little doubt, an incubatory cavity for the eggs. In our specimens of the male, which are preserved with the abdomen and its appendages fully extended, the pleura are not bent inwards, being kept straight by the extended limbs, but at each end of some of them a short longitudinal crease is distinctly to be made out, indicating that the male, in common with the female, possesses the power of closing the subabdominal cavity.

The *appendix masculina* is armed at the extremity with two curvilinear rows of slender and moderately curved spine-like setæ, one row slightly in front of the other; the front row, consisting of six spines, commences about the middle of the inner margin and extends to the inner apex of the part; the hinder row, consisting of four, commences opposite to the interval between the third and fourth spines of the front row, extending to the same level.

Total length, from anterior end of carapace to tip of telson, 48 millim.; of carapace, from middle of anterior to middle of posterior margin, 15 millim.; of antennal scale 6·25 millim.; of abdomen, from base to tip of telson, 32 millim.; of its sixth tergum 7·75 millim.; of telson 5 millim.; breadth of thorax across branchial regions 3·5 millim.; of abdomen across hump 3 millim.

53. *Pasiphaë unispinosa*, sp. n.

Pasiphaë unispinosa, W.-M., Ill. Zool. 'Investigator,' pt. i., 1892, Crust. pl. iii. fig. 7, ♀.

Differs from *P. sivado* in the following points:—The body is not quite so strongly compressed. The carapace is longitudinally convex in the mid-dorsal line and is furnished on each side with a blunt lateral carina, which commences just behind the eye and extends downwards and backwards to the hepatic region, whence, after giving off a branch obliquely downwards and backwards towards the inferior margin, it is

continued in a nearly straight line along the branchial region almost to the posterior margin; its sides bulge so as to throw the narrow dorsal region into relief as a blunt carina, and its postfrontal spine is rather larger. The abdominal hump appears to be more strongly developed; the sixth abdominal tergum is deeper, more strongly arched both above and below, and is not produced to a spine in the middle of its posterior margin, which, when viewed from above, appears quite straight. In the first pair of legs the basipodite is furnished at the apex with one spine, but the meropodite is unarmed; in the second pair there is also a spine at the apex of the basipodite, but only one on the lower margin of the meropodite. Both eye-peduncles and corneae are more elongated.

Length, from anterior end of carapace to tip of telson, 57 millim.; of carapace, from middle of anterior to middle of posterior margin, 16·5 millim.; of antennal scale 7·0 millim.; of abdomen, from base to tip of telson, 40·0 millim.; of its sixth tergum 9·2 millim.; of telson 7·0 millim.; breadth of thorax across branchial regions 6 millim.; of abdomen across hump 4 millim.

Two females were taken on April 11th, 1888, 7 miles S.E. by S. of Ross Island, Andaman Sea, in 265 fathoms.

PHYE*, gen. nov.

Differs from *Pasiphaë* in the carapace and abdomen being more or less extensively and distinctly carinated dorsally, in the former being armed in front with a pair of branchiostegal spines, and in the telson being forked at the extremity.

Includes *P. princeps*, S. I. Smith ('Albatross' Crust. 1884, p. 37, pl. v. fig. 2, ♀, et 1886, p. 78, ♂ ♀, Western Atlantic, 444–1342 fathoms); *P. acutifrons*, Sp. Bate ('Challenger' Macrura, 1888, p. 871, pl. cxli. fig. 3, South of Japan, 775 fathoms, and Coast of Patagonia, 245 fathoms); *P. forceps*, A. M.-Edw. (Miss. Sc. du Cap Horn, Crust., 1891, p. 51, pl. vi. fig. 2, Straits of Magellan, 326 metres); and the following:—

54. *Phye Alcocki*, W.-M.

Parapasiphaë Alcocki, W.-M., Ann. & Mag. Nat. Hist. (6) vii., 1891, p. 196, ♂; et Ill. Zool. 'Investigator,' pt. i., 1892, Crust. pl. iii. fig. 5.

From *P. princeps* and *P. acutifrons* it differs in the form of the postfrontal spine (which is thin and foliaceous, terminates abruptly in front in a strongly sinuous and almost vertical edge, and extends nearly to the posterior slope of the carapace

* Ορητταν ἡ ὄνομα Φύη.—Arist., Ath. Pol. 14.

as a backwardly diminishing carina, which is sharp and foliaceous in its anterior half and blunt in its posterior half); in the pigment of the eyes being brown instead of black; in the sixth abdominal tergum alone being distinctly carinated; and probably in the relative proportions of its different parts.

From *P. princeps* it differs in the telson being shorter than the sixth abdominal somite and in the meropodites of the first pair of legs being armed with three spines upon their lower margin.

From *P. acutifrons* it differs very markedly in the form of the postfrontal spine, and, according to Spence Bate's figure, in the strongly arched outer margin of the antennal scale.

From *P. forceps* it differs no less markedly than from *P. acutifrons* in the form of the postfrontal spine, and, besides, in its more unequal and absolutely much longer antennular flagella; in the notch at the extremity of the telson being acutangular and fringed to the bottom on each side with minute spinules; in the point of the fixed arm of the claws of the first pair of legs being simple; and probably in other details.

Of the three, *P. princeps* is the one to which it is most nearly related.

Length, from middle of frontal margin to tip of telson, 59 millim.; of carapace, from middle of frontal to middle of posterior margin, 18 millim.; of abdomen, from base to tip of telson, 41 millim.; of telson 8 millim.; of sixth abdominal somite 9.75 millim.; of antennal scale 8 millim.

PARAPASIPHAË, S. I. Smith.

a. Antennal and branchiostegal spines absent. Sect. *Parapasiphaë*.

The following species come into this section:—

1. *Parapasiphaë sulcatifrons*, S. I. Smith, 'Albatross' Crust., 1884, p. 40, pl. v. fig. 4, pl. vi. figs. 1-7, ♂ ♀. Western Atlantic, 515 to 2949 fathoms.
2. *Parapasiphaë cristata*, id. ibid. p. 44, pl. v. fig. 3, ♀. Western Atlantic, 1628 fathoms.

b. Antennal and branchiostegal spines present Sect. *Eupasiphaë*.

To this section belong the following:—

55. *Parapasiphaë (Eupasiphaë) latirostris*, W.-M.

Parapasiphaë latirostris, Wood-Mason, Ann. & Mag. Nat. Hist. (6) vii. 1891, p. 196, ♀.

We give a figure of this fine species the size of nature (fig. 2, p. 166).

56. *Parapasiphaë* (*Eupasiphaë*) *Gilesii*, sp. n.

Parapasiphaë Gilesii, Wood-Mason, Ill. Zool. 'Investigator,' Crust.
pl. iii. fig. 8, ♀, $\times 2$.

Rostrum slender, acute, awl-shaped, slightly compressed, slightly curved, ascendant, extending by rather more than

Fig. 2.

*Parapasiphaë lativostriis*, nat. size.

one third of its length beyond the extremities of the eye-peduncles. Postfrontal ridge cristiform, armed throughout from the base of the rostrum to the posterior slope of the carapace with minute forwardly-inclined denticles, the first of which is placed well on the base of the rostrum and is more than double the size of any of the rest, which are subequal ;

it is divided by a distinct cervical groove into two lobes, the anterior of which is somewhat the higher and longitudinally somewhat the more convex of the two.

The anterior margin of the carapace bears on each side two spines—the one smaller, situated just behind the edge of the orbital sinus, and answering in all probability to the antennal spine of the *Penaeidea*; the other larger, which arises from the margin itself, opposite to the insertion of the antenna, and is, there is little doubt, a true branchiostegal spine. About midway between the branchiostegal spine and the obtuse extra-orbital angle on each side the anterior margin projects a process of about the same size and shape as the latter, and hence presents an angularly sinuous or zigzag outline between the two spines. The branchiostegal spine is continued backwards along the side of the carapace as a well-defined slightly upwardly concave ridge; this is subacute nearly as far as the hepatic region, and thence blunt to its abruptly upcurved extremity near the hinder end of the carapace; it curves upwards for a short distance from its origin, then descends almost imperceptibly to about the middle of its length, whence it rises by a no less gentle ascent to its upturned extremity; it emits three branches—one, faint, from the hepatic region, upwards and forwards towards a point in the anterior margin which is just internal to the antennal spine; a second, as well-defined as itself, from the point at which it is intersected by the cervical groove, straight downwards and backwards towards the inferior margin; and a third, equally well-defined, from a point a little to the rear of that from which the second is given off, upwards, inwards, and backwards, so as to mark out the upper boundary of the subjacent branchial chamber.

The terga of the abdominal somites are increasingly carinate from the second to the fourth; the carina of the fourth is faintly notched, as in *Acanthephyra*, and terminates posteriorly in a strong spine. Those of the remaining somites are transversely rounded.

The telson, which wants its extreme tip, agrees, as far as it is preserved, with the description of that of *Parapasiphaë sulcatifrons*, S. I. Smith.

The eye-peduncles are compressed from above downwards and bear on the inner and upper margin, at a short distance from the edge of the cornea, a small conical tubercle, which is directed inwards and slightly forwards; the compressed hemispherical and distinctly faceted cornea occupies the whole width of their apex, upon which it is somewhat obliquely set; and their pigment is bright brown in spirit.

The peduncle of the antennules agrees with Prof. S. I.

Smith's description of that of *P. sulcatifrons*; but the inner flagellum of these organs is only about one half the length of the carapace measured from the apex of the rostrum to the middle of the hinder margin in a straight line, and less than one third the length of the outer flagellum; this is much stouter than the inner and expanded at the base in the usual manner.

The thoracic limbs differ in the relative proportions of their parts and in armature from those of *P. sulcatifrons* to an extent and in a manner which will be best appreciated by comparison of the figures of the two species.

Length, from apex of rostrum to end of caudal appendages, 49 millim.; of carapace, from apex of rostrum to middle of hinder margin, 19·5 millim.; of outer flagellum of antennules 34·5 millim., of inner 9·5 millim.; of antennal scale 7·25 millim.; length of abdomen from base to end of telson 27·5 millim., of its sixth somite 5·5 millim., of telson (tip wanting) 6·5 millim.

A single female was taken on Jan. 15th, 1888, off Cinque Island, Andaman Sea, in 650 fathoms.

PSATHYROCARIS, gen. nov.

Psathyrocaris, Wood-Mason, Admin. Rep. Marine Survey of India, 1890-91, p. 19.

Integument thin and delicate; all appendages and processes of extraordinary fragility.

Body moderately compressed.

Carapace shortly rostrate, longitudinally carinate for a longer or shorter distance in backward continuation of the dorsal crest of the rostrum; its anterior margin unarmed—antennal and branchiostegal spines being absent,—at first broadly arched, then narrowly emarginate between the blunt triangular extraorbital angle and the antero-lateral angle on each side; its sides distinctly ridged, the ridging varying with the species; the efferent portion of the branchial chamber relatively spacious.

Antennules and antennæ broken off in all the specimens near the base.

Eye-peduncles and corneæ depressed, the latter hemispherical, occupying the whole width of the extremities of the former, on which they are set quite square. The usual papilla is present close to the edge of the corneæ on each side.

Mandibles (Pl. XI. fig. 1) of typical Pasiphaïdean form, with a very large two-jointed palp.

First maxillæ (Pl. XI. fig. 2) with the inner lacinia (*cx*)

pointed and recurved towards the outer (*bp*), and with a small triangular process on the inner margin of the endopodite (*en*) as in *Parapasiphaë*.

Second maxillæ (Pl. XI. fig. 3) with well-developed inner (*ex*) and middle (*bp*) lacinia, the latter of which is bilobed, thus differing from those of all* previously described genera, in which both lacinia are reduced to a quite rudimentary condition; and with a relatively very large and powerful scaphognathite, in correlation to the spacious efferent branchial channel.

First maxillipedes (Pl. XI. fig. 4) with well-developed endopodite (*en*) and middle (*bp*) and inner (*ex*) lacinia, the latter of the two last of which, though decidedly weaker, is nevertheless produced inwards to the same level as the former, and is fairly well fringed, thus also differing from all previously described genera, in which indeed little besides the exopodite of these jaws remains, the lacinia being both reduced to a more or less scanty fringe of weak setæ and the endopodite to a minute projection of the inner margin of the exopodite, whilst the epipodite when present is smaller (*Parapasiphaë*) or altogether wanting (*Pasiphaë*). The exopodite gives off from its inner margin just below the true apex a pedunculated oval plate, which serves as the ocluser apparatus of the efferent branchial aperture and, in correlation with the large size of that aperture, is much larger than in any other genus.

Second maxillipedes (Pl. XI. fig. 5) almost exactly as in the Penæidea, seven-jointed, the division between the second and third joints being still quite distinct at the edges; furnished with a short tapering exarticulate exopodite (*ex*), which scarcely exceeds the third joint in length; and with a complete podobranchia (*ep + br*), thus contrasting strongly with those of previously described genera, in which the corresponding appendages are weaker and but six-jointed, the second + third being indistinguishably fused into one, there is never any trace of an exopodite, and the podobranchia is represented at most by a small epipodite and may be entirely wanting.

Third maxillipedes (Pl. XI. fig. 6) four-jointed†, as in *Pasiphaë*, *Phye*, and *Parapasiphaë*, furnished at the base with a rudimentary epipodite, and, quite close to the base of the second joint (2 + 3 + 4), with a minute tapering exarticulate exopodite, similar to, but much smaller than, that of the second maxillipedes, and lodged in a groove in the side of the joint.

* Except *Leptochela*, which would appear to have fully developed second maxillæ.

† *Leptochela* has five, and is so far less modified than any other genus.

The first and second pairs of legs are dissimilar both in form and structure.

The first pair is the shorter, and their claws are shaped much as in *Pasiphaë*. The inner edge of the dactylopodite is unarmed, but is raised into a sharp lamellar cutting-edge; that of the prolonged part of the propodite, on the other hand, is armed throughout with minute acicular spines of tolerably uniform size and all slanting towards the apex of the joint.

The second pair is much the longer, and their claws differ in form in the different species and would appear to be unequal on the two sides. The inner edge of both dactylopoditic and propoditic elements of these claws is armed with minute spines similar to those of the first pair, and, in addition, at intervals with much longer ones (three or four times as long) of the same form.

The third and fourth pairs of legs are alike. They are greatly reduced in thickness, but little if anything in length, forming long setaceous filaments of excessive tenuity and fragility.

The fifth pair of legs is the shortest of all and is much stouter than the third and fourth and much slenderer than the first and second; it is, in fact, in point of thickness about intermediate between the two sets of legs. They are set on and directed in the manner which seems characteristic of the family. Their propodite bears at the distal end of the lower surface a conspicuous whisp of longish setæ, which is directed towards the apex of the joint, while the dactylopodite is covered below with a dense brush of short spiny setæ, and is evidently intended to fold back against the propoditic whisp, so as to form therewith a sort of prehensile subchela.

All the legs possess the full number of joints and all are furnished with exopodites. The exopodites of the first pair of legs are small and inconspicuous, but those of the second to the fifth pairs are long and excessively fine articulated setaceous filaments, which form a gradually increasing series to the fourth, the fifth being suddenly much longer and fully equalling in length the third or fourth pairs of legs. They are all very sparsely clothed with long, lax, obsoletely plumose setæ, and are all produced at the base into a little tongue-shaped spur.

The first to fifth pairs of abdominal appendages are remarkable for the enormous inequality of their two branches, as well as for the excessive tenuity of the outer branch, which, in the case of the second pair, is in one species no less than twenty-four times the length of the inner, which is quite minute; the exopodites of the abdominal appendages, in fact,

closely resemble those of the legs, differing therefrom only in being somewhat stouter, more distinctly articulated, and more richly provided with more strongly plumose setæ.

Abdomen transversely rounded, not carinate, dorsally.

Telson quadrangular, tapering gradually from base to apex, terminating in a minute fixed median spine and two unequal pairs of articulated lateral spines; its dorsal spines obsolescent.

There are twelve functional branchiæ and two epipodites on each side distributed as follows in *Psathyrocaris fragilis*:—

Somites and their appendages.	Podo- branchiæ.	Arthro- branchiæ.	Pleuro- branchiæ.	
VII.	0 (<i>ep.</i>)	0	0	= 0+ <i>ep.</i>
VIII.	1	0	0	= 1
IX.	0 (<i>ep.</i>)	2	0	= 2+ <i>ep.</i>
X.	0	1	1	= 2
XI.	0	1	1	= 2
XII.	0	1	1	= 2
XIII.	0	1	1	= 2
XIV.	0	0	1	= 1
	<hr/>	<hr/>	<hr/>	
	1+2 <i>ep.</i> +	6	+	5 = 12+2 <i>ep.</i>

Psathyrocaris has hence one more gill—and that a complete podobranchia consisting of plume and epipod attached to the second maxillipedes—than in *Parapasiphaë*, the least modified of the genera so far described, in which the corresponding gill is reduced to a rudimentary epipod.

57. *Psathyrocaris fragilis*, sp. n. (Pls. X., XI.)

Colour in spirit very dark reddish purple or wine-red above, the ventral surface and legs lighter, the thoracic and abdominal exopodites and antennæ colourless.

Thirteen specimens, all more or less broken, though admirably preserved as to their soft tissues, were taken at Station 120, 240 fathoms.

In dealing with a single species it is impossible satisfactorily to define the specific characters, and, as the results of the dredgings carried out during the season 1891–92 contain several additional species, including a fine ovigerous female of one of them, we have thought it better to defer the specific description of the present species until we shall have thoroughly examined our new material. Meantime the characters of the genus will suffice for those of the species, especially as they are accompanied by detailed figures.

EXPLANATION OF THE PLATES.

PLATE X.

- Fig. 1.* *Psathyrocaris fragilis*, ♀, from the left side. Nat. size. Both the legs of the second pair are figured, to show their inequality.
Fig. 2. Rostrum of the same. Enlarged.
Fig. 3. The caudal swimmeret of another specimen, from above. $\times 3$.
Fig. 4. A leg of the fourth pair of another specimen. $\times 4$.
Fig. 5. An abdominal appendage of the second pair of another specimen. $\times 5$.

PLATE XI.

- Fig. 1.* *Psathyrocaris fragilis*. Mandible. $\times 9$.
Fig. 2. First maxilla. $\times 9$.
Fig. 3. Second maxilla. $\times 9$.
Fig. 4. First maxillipede. $\times 9$.
Fig. 5. Second maxillipede. $\times 9$.
Fig. 6. Third maxillipede. $\times 4.5$.

[To be continued.]

XXIII.—*Aglia tau*, a connecting-link between the *Ceratocampidæ* and *Saturniidæ*, and the Type of a new Subfamily, *Agliinæ*. By ALPHEUS S. PACKARD.

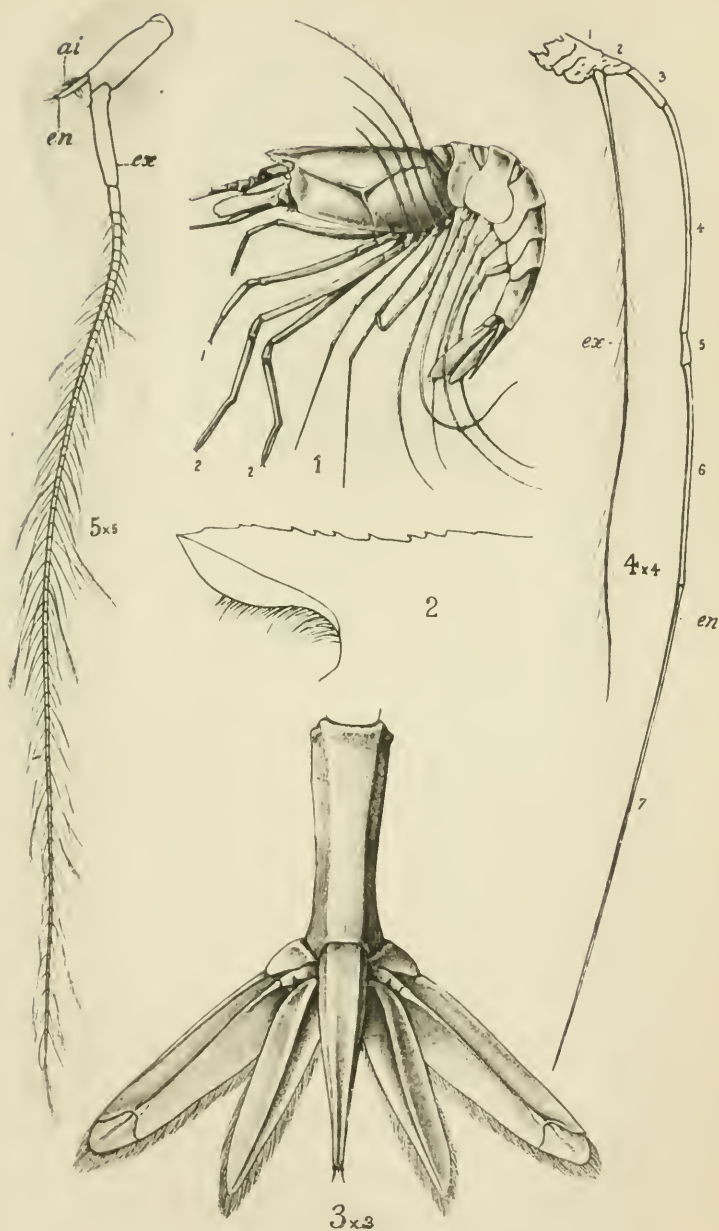
IN this European Bombycine moth we have a most interesting form surviving side by side with *Saturnia*, which seems to be the most generalized form of its family. *Aglia* appears to be a *Ceratocampid* in its earlier larval stages, the caterpillar in its final stage, however, and the moth being closely related to the *Saturnians*. It seems quite reasonable to suppose that the *Saturnians* have directly descended from a form like *Aglia*, and we could scarcely expect a clearer demonstration of the origin of one family from another by direct genetic descent.

The transformations of this form, originally figured in Duponchel and Guenée's '*Iconographie*'* (tom. ii.), have been more fully elaborated by Mr. Poulton †.

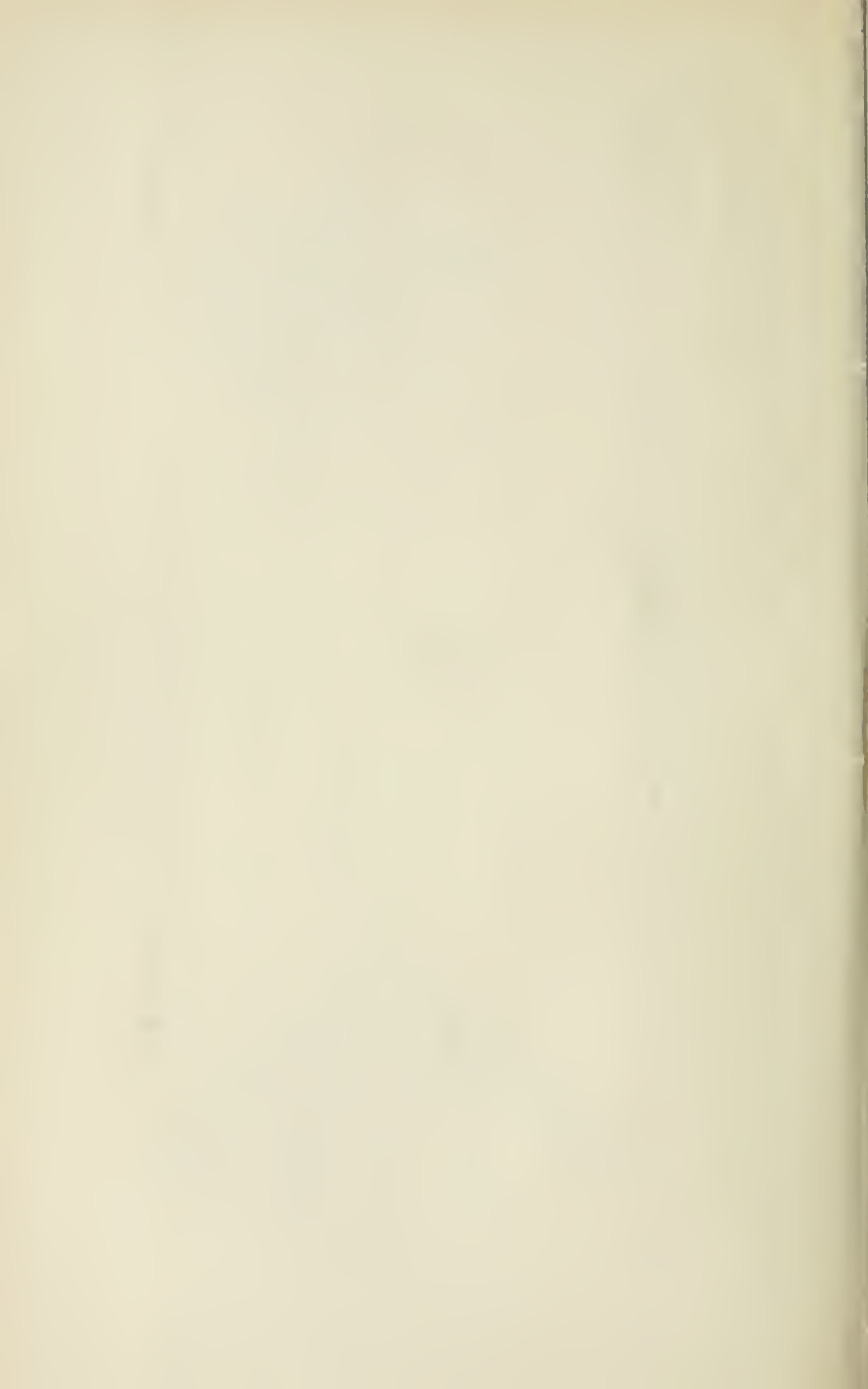
Having received, through the kindness of Dr. Heylaerts, a young larva of *Aglia tau* in its third stage, I have been able

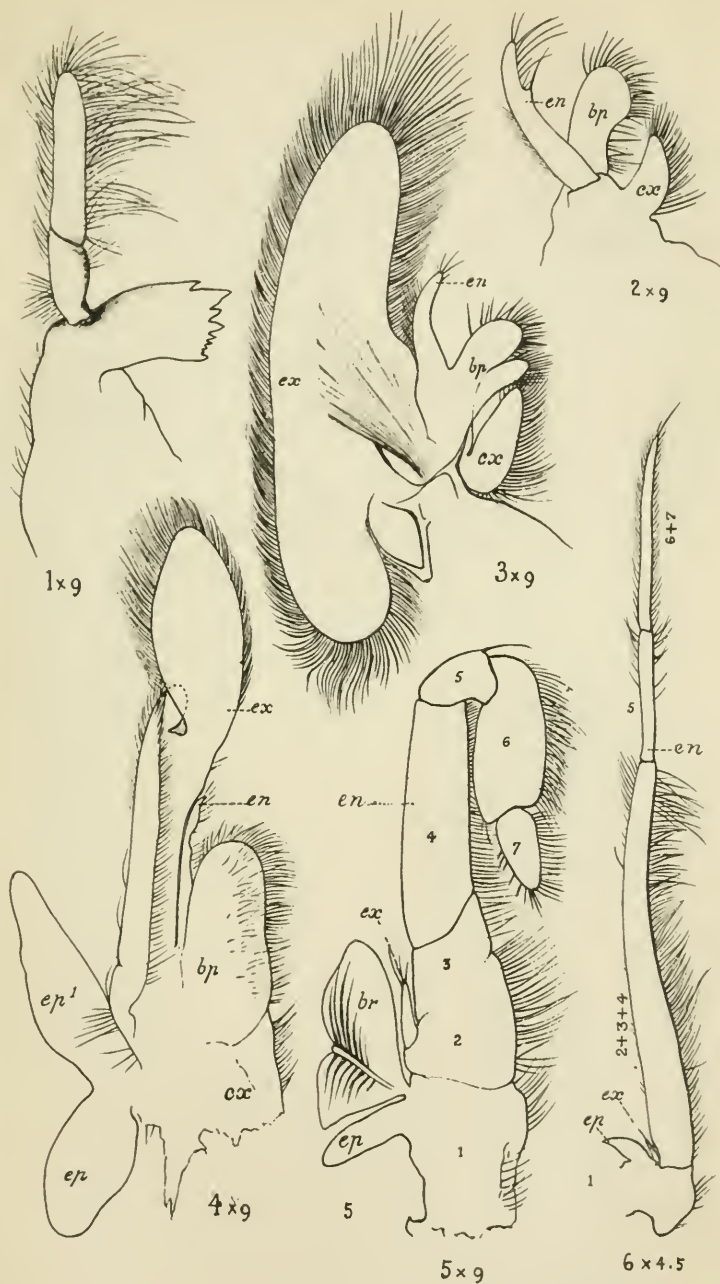
* Guenée states that, after attaining its full size, "elle se retire à la surface de la terre, entre des mousses et des débris de végétaux qu'elle attache avec de la soie, et elle s'y change en une chrysalide grosse, courte, d'un brun foncé saupoudré de grisâtre, et dont l'anus est terminé par un faisceau de pointes recourbées."

† Trans. Ent. Soc. London, 1888, pp. 555-568, pl. xvii. figs. 1-7.



PSATHYROCARIS FRAGILIS.





PSATHYROCARIS FRAGILIS.

