

XXXIX. MOLLUSCA, III:

CYCLOPHORIDÆ (*In part*).

By LT.-COLONEL H. H. GODWIN-AUSTEN, F.R.S.

(Plates xxxviii-xl).

I now continue the descriptions of species recently collected in the Abor Hills by Mr. Kemp, commenced in this Journal in March, 1914.

The list of interesting new species has been much increased, for during the cold weather of 1913-14 Lt. G. F. T. Oakes, R.E. has again been conducting survey operations in the Tsanspu Valley, and has added largely to the collection of land-shells. He reached a point on the Great River about Lat. 29°15' and Long. 95°15'; and I have here to thank him for finding time to add to our knowledge of the molluscan fauna of this portion of the Eastern Himalayan Range.

In the Helicidae I submit the descriptions of the seven species of *Plectophylis* that have come to hand, a most interesting set in many respects and all new. Two species were found by Mr. Stanley Kemp, the rest by Lt. G. F. T. Oakes, R.E. These I have entrusted to our best authority on the group, Mr. G. K. Gude, well known by his past work on the genus in "Science Gossip", 1898-99. The remainder of this second contribution I devote to the Prosobranchia or operculated land-shells; the collection contains a most interesting series. It is quite apparent we have as yet only a foretaste of what lies hidden in the depths of the valleys and on the forest-clad ridges and peaks many thousand feet above them, and what a harvest awaits the man knowing how to look for and how to deal with the material that would come to hand. I envy that man who may have the good fortune to go there.

LIST OF GENERA IN THE COLLECTION.

PROSOBRANCHIA.

Fam. CYCLOPHORIDÆ.

Sub-fam. CYCLOPHORINÆ.

Cyclophorus.

Myxostoma.

Pterocyclos.

Spiraculum.

Raphaulus.

Lagocheilus.

Sub-fam. *ALYCEINAE.*

Alycaeus.

Dioryx.

Cycloryx.

Sub-fam. *DIPLOMMATININAE.*

Diplommatina.

Sub-fam. *POMATIASINAE.*

Pomatias.

***Cyclophorus aborensis*, n. sp.**

(Pl. xxxviii, figs 1, 1a, 1b, 1c).

Locality: Rotung, 2000 ft., near Eggar stream (S. W Kemp); Kalek and Renging, 2000 ft. (Oakes).

Shell globose turbinate, openly umbilicated, solid. Sculpture, carinate spiral, lirae wide apart, 5 conspicuous, the last peripheral, with much finer intermediate liration, not distinctly seen in old specimens. Colour (specimen from Renging) a rich ruddy brown over most of the surface, beneath pale ochraceous, a few splashings of same colour next the suture; in the type and in most old shells much bleaching takes place. Spire fairly high, conic, apex fine. Suture impressed.

Whorls 5, rather rapidly increasing, rounded.

Aperture circular, suboblique.

Peristome white, solid, continuous, very slightly reflected. Columellar margin sub-vertically curving.

Size: major diam. 5.60; alt. axis 24.0; alt. aperture 28.0 mm.

Type No. ⁶⁰¹⁰₁ (figs 1b-1c) in *Ind. Mus*; No. ⁶⁰⁰⁹₁ I.M.

Mr. Oakes sent specimens from Kalek No. 3048 B.M. and Renging No. 3051 B.M. (figs. 1, 1a), and from Rami Lambang two specimens of a dwarf variety only 33 mm. in major diameter No. 3049 B.M.

***Cyclophorus (Glossostylus) bapuensis*, n. sp.**

(Pl. xxxviii, figs. 2, 2a, 2b, 2c).

Locality: Abor Hills, vicinity of Bapu, 4-i-13 (Oakes).

The description of this species follows that of *sidiensis* in many particulars, but it is not nearly so keeled. It has a distinct peripheral band. The umbilicus is more open and not so con-

cealed. The spire is lower, sides less flat, and first 3 whorls much smaller. Suture more impressed. Whorls, aperture and peristome the same.

Size: major diam. 33·0; alt. axis 16·0 mm.

Type No. 3108 *Brit. Mus.*

***Cyclophorus (Glossostylus) sidiensis*, n. sp.**

(Pl. xxxviii, figs. 3, 3a, 3b, 3c).

Locality: On Sidi River, Abor Hills (*I. H. Burkill*).

Shell conoidly turbinata, sharply keeled, umbilicus narrow and much concealed by the peristome. Sculpture, 3 distinct spiral lirae above the keel, distant with finer liration intermediate, underside lirae fine and close together. Colour madder brown. Splashing and spotting near the suture, giving a beautiful mottled pattern. Spire high, conical, sides flat, apex pointed. Suture moderately impressed. Whorls 5, side flatly convex. Aperture circular, suboblique. Peristome white, not much thickened, reflected and expanded. Columellar margin curving vertically.

No. 6002. Size: major diam. 25·0; alt. axis 14·0 mm.

No. 6001 Rotung (*Kemp*). Bleached, older, major diam. 30·0; alt. axis 14·5 mm.

Type No. 6002 *Ind. Mus.*

Mr. Oakes also found one specimen of this species (3095 B.M.) in the Tsanspu Valley.

The Sidi River is in the outer hills north of the Trigonometrical Station "Nari" (Siwalik) 2490.

***Cyclophorus (Glossostylus) koboensis*, n. sp.**

(Pl. xxxviii, figs. 4, 4a, 4b, 4c, 4d).

Locality: Abor Hills, Kobo, on right bank of Tsanspu or Brahmaputra (*Kemp*).

Shell turbinata, keeled, umbilicus open, not concealed by the peristome. Sculpture carinate, as described, splashes and zig-zags of darker tint, giving a mottled appearance. Colour madder brown, with a distinct dark brown band below the keel, ochraceous white beneath. Spire conic, depressed, apex very fine. Suture impressed. Whorls nearly 6. Aperture circular. Peristome double, inner lip continuous, together thick and reflected. Columellar margin vertically rounded. Operculum flat, multi-spiral, the whorls about 6, defined by a raised thread-like spiral.

Type No. 6015 (fig. 4) *Ind. Mus.* Size: major diam. 30·0; alt. axis 12·0 mm.; Rotung (*Kemp*) No. 6019-20 *Ind. Mus.*

No. 3579 B.M. (figs. 4a, 4b, 4c, 4d), Rotung (*Oakes*). Size: major diam. 32·5; alt. axis 12·25 mm.

No. 3117 B.M. Yamne Valley and 3045 B.M. Ponging.

No. 3581 B.M., between N. $28^{\circ} 15'$ — $29^{\circ} 15'$ L. $94^{\circ} 50'$ — $95^{\circ} 10'$, is not so solid a shell, smoother and higher in the spire. It comes very close to this species. Major diam. 33.0; alt. axis 15 mm.

Spiraculum oakesi, n. sp.

(Pl. xxxix, figs. 3, 3a).

Locality: Abor Hills, 4-i-13 (*Oakes*).

Shell depressedly discoid, widely umbilicated. Sculpture close, fine transverse lines of growth in the epidermis, no spiral ribbing. Colour: ground, grey white, crossed by regular bands of brown, zigzag below, merging into a narrow dark peripheral band, from which zigzag lines are given off on the basal side. Spire scarcely raised above the last whorl. Suture well impressed, the sutural tube very long, 7 mm., narrow, set obliquely backward, nearly reaching to the apical whorl. Whorls 5, regularly increasing. Aperture circular. Peristome continuous, thickened, reflected at the upper inner angle, expanded forward from above and below, horizontally upon the median line of the penultimate whorl forming a narrow slit. Columellar margin rounded. Operculum multispiral, slightly concave, smooth at centre, edges of the outer whorls distinct and slightly raised.

Operculum multispiral, edges of suture slightly raised, concave in centre.

Size: major diam. 26.0; alt. axis 5.5 mm.

Five specimens of this beautiful species came to hand; it does not recall any species as yet found in Assam or Burma.

Type No.: 3081 *Brit. Mus.*

Two specimens to Indian Museum.

Spiraculum kempi, n. sp.

(Pl. xxxix, figs. 4, 4a and 5, 5a).

Locality: Abor Hills, 4-i-13 (*Oakes*).

Shell flatly discoid, widely umbilicated. Sculpture close, epidermal lines of transverse growth both above and below, conspicuous close spiral lirae with every 2nd or 3rd somewhat stronger—in the type 2nd much more conspicuous on the central line of the last whorl, producing an angulate upper surface. Colour rich umber brown, very indistinct transverse colouring, and a broad peripheral band. Spire very low, only just raised above the last whorl. Suture deeply impressed; the sutural tube is 9 mm. behind the peristome, extremely short, and does not appear to grow longer, it is of small diameter. Whorls 5, rounded on periphery. Aperture circular. Peristome white, thickened, double, reflected, the outer lip above forming a low ridge behind the expanded inner lip, thus forming the short open descending wing. Columellar margin rounded. Operculum roundly convex, the whorl in double filaments distantly raised, close and smooth at centre.

Size: major diam. 26.5; alt. axis 7 mm. (Largest 30.0 Ponging).

This is very close to the next species *Sp. planum* found by Mr. Kemp, but which in a few minor characters differs too much to be considered the same; unfortunately there are only two very old bleached specimens of it.

Type No. 3105 (figs. 4, 4a) *Brit. Mus.*; No. 3047 B.M. from Ponging (figs. 5, 5a).

Two specimens to Indian Museum.

Spiraculum planum, n. sp.

(Pl. xxxix, figs. 6, 6a, 6b).

Locality: Upper Rotung, Abor Hills; No. 5992, Upper Rotung; No. 5992a, Yembung (*Kemp*).

Shell similar to *S. kempi*. Sculpture, rather coarser spiral ribbings. Colour bleached. Spire very low, the apex scarcely showing above the last whorl. Suture deeper. Sutural tube only 6.5 from the peristome, it is 4 mm. long and sharply recurved backward. Whorls 5. Aperture circular. Peristome double, thickened, outer lip expanding into a somewhat lengthened open wing, ascending on the whorl next it, not descending as in previous species.

Size: major diam. 30.0; alt. axis 6.0 mm.

A single small variety, bleached, only 28 mm. in major diameter, was sent to me from the Miri Hills. No. 3596 B.M.

Type No. 5992 *Ind. Mus.*

Spiraculum nevilli, G.-A. var.

Locality: Luyor, Abor Hills, 21-vii-13 (*Oakes*).

The wing or spout is not so long in typical *nevilli* from the Dafla Hills, and the last whorl near the aperture descends much more than in this Abor shell, otherwise they are very close in form. The Abor shells are not so very much mottled, but have a distinct band, and they are much smaller.

Size: major diam. 23.25; alt. axis 4.8 mm.

Type No. 3531 *Brit. Mus.*

Spiraculum nevilli, G.-A. var. (large).

Locality: Abor Hills, 3 young specimens and one fully grown put up alive, 4-i-13.

Shell very openly umbilicated, discoid. Sculpture, close spiral liration, accentuated at the middle half of the whorl looking at it from above. Colour dark madder brown, mottled or rather streaked closely with ochre bands which, as they approach the apex, are closely zig-zagged, beneath plain. A distinct black band on the periphery. Spire very flat. Suture impressed. Whorls 5, regularly increasing. Aperture circular, oblique. Peristome double, thickened, much reflected, expanding forward near suture into a spout-like shape, which continues as a raised, pronounced

narrow ridge on the reflected whorl, the epidermis being peculiarly shining. A little further development would constitute this a tube, such is its appearance. Operculum multispiral, about 10 whorls, the edges slightly raised and furred on outer margin.

Size: major diam. 21.5; alt. axis 5.0 mm. (Type immature, 1st received). Major diam. 22.5; alt. axis 9.5 mm. (full-grown example).

Type No. 3089 Brit. Mus.

***Pterocyclos aborensis*, n. sp.**

(Pl. xxxix, figs. 1, 1a).

Locality: Abor Hills, No. 3104 B.M. Type; 3046 B.M. Ponging; 3050 B.M. Rami Lambang, 4-i-13 (*Oakes*).

Shell subdepressedly turbinata, very openly umbilicated. Sculpture, epidermal lines of growth strong. Well raised distant spiral lirae, both on upper and lower side. The one next the suture the most conspicuous, with two less pronounced intervening, about 14 altogether. Colour a rich umber brown. Spire subconoid, apex small. Suture deep. Whorls 5, regularly increasing, angulately rounded on periphery. Aperture circular. Peristome double, not thickened, slightly reflected, inner lip continuous, the outer expanded forward at inner angle into a half closed spout-shaped wing. Columellar margin sub-vertically curved. Operculum not seen.

Size: major diam. 26.0; alt. axis 10.0 mm.

Type No. 3104 Brit. Mus.

***Pterocyclos miriensis*, n. sp.**

(Pl xxxix, figs. 2, 2a, 2b, 2c).

Locality: Miri Hills. Four specimens obtained.

Shell depressedly discoid, very widely umbilicated. Sculpture very strong, regular spiral lirae, above and below. Colour rich burnt sienna brown. Spire very flatly conic. Suture well impressed. Whorls 5, subangularly rounded on the periphery. Aperture circular, sub-vertical, just shows above the last whorl. Peristome double, not thickened, slightly reflected, inner lip thin, continuous, the outer expanded into a wing, openly spout shaped. Columellar margin well rounded.

Size: major diam. 30.0; alt. axis 8.0 mm.

Type No. 3580 Brit. Mus.

Three specimens to Indian Museum.

***Pterocyclos spiramentum*, n. sp.**

(Pl. xl, figs. 4, 4a, 4b).

Locality: Abor Hills, only one specimen obtained but that is in perfect condition (*Oakes*).

Shell (fig. 4a) openly umbilicated, depressedly orbiculate, somewhat globose. Sculpture, only fine epidermal lines of growth. Colour dark sienna brown, crossed by dark bands, running from the suture to the narrow black periphery band. Spire slightly raised, very depressedly conoid. Suture deep. Whorls 4, the last rapidly increasing. Aperture circular, sub-vertical. Peristome slightly reflected, not much thickened, the outer lip is expanded near the suture, with sides turned in forming a spout-like projection. Close behind this and adjacent to the suture is an apparent tube (fig. 4), but it is rather of gutter form, semi-circular in section, and is given off from a cleft on the columellar side just within the aperture (fig. 4b), which is not an orifice—if it were so the gutter would be a true tube and the shell a *Spiraculum*. It illustrates how the sutural tube in that genus has originated. This species is on the borderland of the two genera *Pterocyclos* and *Spiraculum*. It must be put in *Pterocyclos*, because the tube is close to the aperture, almost a part of the peristome. In *Spiraculum* the tube is remote from the aperture. Operculum concave



TEXT-FIG. 1.—*Pterocyclos brahmakundensis*, n. sp.

in centre, multispiral, suture not raised.

Size: major diam. 15.0; alt. axis 4.75 mm.

Type No. 3082 *Brit. Mus.*

Pterocyclos brahmakundensis, n. sp.

Locality: Brahmakund, Eastern Assam (*M. T. Ogle*). Three specimens were found.

Shell very depressedly discoid, smooth throughout, very widely umbilicated; sculpture fine and close, transverse lines of growth on the epidermis; colour sienna brown, more ochraceous below, indistinctly mottled, passing into zig-zag markings on the apical whorls, a narrow black peripheral band; spire very flat, scarcely raised above the last whorl; suture well impressed; whorls 5, rounded on periphery, narrowing rapidly, rather closely wound, the last descending; aperture circular, oblique; peristome double, fairly strong, reflected, inner lip continuous, shallowly sinuous on the upper inner margin next the wing, this is spout shaped,

directed upwards; columellar margin rounded; operculum not seen.

Size: maj. diam. 2.1; alt. axis 1.4 mm.

Type No. 713 B.M.

I have had this species for many years; it was given me by Mr. Ogle, collected when he was surveying in Eastern Assam. The opportunity now occurs of bringing it to notice, with the fine series from the contiguous Abor Country. It is interesting to compare its form with *Pterocyclos miriensis*, and to note the differences, particularly in the sculpture of the latter.

Pterocyclos magnus, G.-A. var.

A single specimen, with peristome not quite perfect and surface in poor condition, was sent me by officers of the Survey with the Miri Mission. It comes nearest to the above Dafla Hill shell in general form, the markings differ considerably. Major diameter 24.75. It should be looked for again. No. 3599 B.M.

? *Spiraculum luyorensis*, n. sp.

(Pl. xl, figs. 5, 5a, 5b).

Locality: Luyor, Abor Hills (Oakes).

Shell openly umbilicated, orbiculate, very depressed. Sculpture, a smooth epidermis, lines of growth very fine and close. Colour a very rich dark madder brown, broad dark bands close set, cross the third whorl transversely. There is a narrow peripheral band. Spire very low, apex just showing above the plane of the last whorl. Suture impressed, the sutural tube close behind the aperture, 3 mm. distant, 3 mm. in length and curving backwards. Whorls 4, the last expanding rapidly. Aperture circular, sub-vertical. Peristome double, not very thickened, slightly reflected, at the suture, the outer lip is extended forward into a long spout resting on the periphery.

Size: major diam. 18.75; alt. axis 4.8 mm.

Type No. 3530 Brit. Mus.

This is close to *Pterocyclos spiramentum*, but is distinct in its much flatter apex, and far wider umbilicus. The peristome presents a stage further towards, and has reached the development of *Spiraculum*, rendering it a more than usually interesting species.

Spiraculum putaoensis, n. sp.

(Pl. xl, figs. 3, 3a, 3b).

Locality: Putao, Upper Burma, May 1914, 3 specimens (Capt. C. E. Morris).

Shell widely umbilicated, orbicularly depressed. Sculpture, fine regular transverse striae of growth. Colour, bleached, and epidermis gone; zig-zag streakings at regular intervals cross the

whorls from the suture outwards. Spire scarcely raised above the last whorl. Suture impressed, the tube $4\frac{1}{2}$ mm., behind the aperture, a mere orifice, but in the perfect shell there may be a tube. Whorls 4, increasing regularly. Aperture circular, oblique. Peristome double, inner and outer lips continuous, the inner with a slight notch near sutural margin, the outer expanded into a wing or spout.

Size: major diam. 14.0; alt. axis 4.0 mm.

The habitat of this species at the head of the Irrawady valley (not a very far distant one from the Tsanspu) is interesting and I have introduced it here because in the sutural tube it approaches a species found in the Abor Hills, which I next describe as *Spiraculum minimum*, and is much smaller. It also recalls *Spiraculum andersoni*, Blf., from Bhamao, but this is more openly umbilicated, the wing similar. My best thanks are due to Capt. C. E. Morris.

Spiraculum minimum, n. sp.

(Pl. xl, figs. 2, 2a, 2b, 2c).

Locality: Jeku, Abor Hills, two specimens (*J Coggin Brown*).

Shell orbiculate, depressed, widely umbilicated. Sculpture, fine transverse lines of growth on the epidermis. Colour dull ochraceous, with a green tinge, 3rd and last whorls crossed by irregular broadish brown bands, indication of a band just below the periphery. Spire depressed, but apex well above last whorl. Suture impressed, the tube short, close behind the aperture, only 2 mm. distant. Whorls 4, regularly increasing. Aperture circular, with very slight angulation at sutural margin. Peristome double, both inner and outer lips continuous, moderately thickened and slightly reflected.

Size: major diam. 9.2; alt. axis 3.25 mm.

Type No. 6142-43 *Ind. Mus.*

Lt. G. F. T. Oakes, R.E. has sent me seven examples of this species from Sibbum, far finer in size; four are bleached. The largest measures 10 mm. in major diameter, No. 3147 B.M. Three are perfect (No. 3145 B.M.), with strong epidermis. Colour sienna brown in tint with ochraceous mottling, with an indistinct peripheral band. Major diam. 11.5 mm.

This is a close ally of *Spiraculum kempfi*, but the closely mottled zig-zag pattern and black peripheral band is not seen in that species; in this respect it is similar to *Spiraculum nevilli* of the Dafla Hills; it is smaller and rather flatter than that shell.

It is hardly possible to find better examples showing the development of the sutural tube in *Spiraculum* than in the species figured on Plate xl. Although it is not from the Tsanspu Valley but from the source of the Irrawady, *Spiraculum putaoensis* has been introduced in order to show how close is the relationship and how beautiful evolutionary stages have been. In having a tube on the suture behind the peristome and a simple peristome, both

belong to the genus *Spiraculum*. In figures 2c and 3b, within the aperture may be seen the little orifice having a connection with the branchial sac. In *Spiraculum minimum* this is very close to the aperture, in *Spiraculum putaoensis* it is more remote. In the first the inner and outer lips of the peristome are united and thickened at the upper inner margin next the suture, while in the second there is further development; a clear separation of the lips has taken place, the inner has a slight nick on the line of the suture, shown by a sort of cicatrice up to the branchial orifice, and the outer lip is expanded forward into a short scoop-like process corresponding to the wing, as it has been called, of *Pterocyclos*. The next species (fig. 4) might be placed in this genus and is a true link with it. The tube is so far forward, it still forms a part of the peristome, a complete isolated orifice has not yet been formed—it is a slit; the process of its further development would be the growing more forward of the whorl itself. In fig. 5, *Spiraculum luyor-ensis*, we find this stage reached, and in fig. 5b the internal orifice has been left behind, and externally a perfect tube is seen on the suture (fig. 5a) behind the aperture and completely separate from it. While this evolution has been in progress, another change has taken place: the scoop in fig. 4 has grown forward considerably into the elongated gutter of fig. 5, with its edges growing inwards and nearly touching, corresponding in life, in all probability, with a sharp fold of the mantle edge, which with further growth might become more and more tube-like.

Cyclophorus oakesi, n. sp.

(Pl. xl, figs. 1, 1a).

Locality: Tsanspu Valley, Abor Hills, 2 specimens (*Oakes*).

Shell globosely conoid, umbilicated, not widely. Sculpture, a strong epidermis, fine lines of growth. Colour strong sienna brown, mottled, broadish splashes of black. No peripheral band. Spire somewhat depressed, apex broad and blunt. Suture impressed. Whorls $4\frac{1}{4}$, well rounded. Aperture circular, suboblique. Peristome simple, not thickened, very slightly expanded, in the best specimen it is not fully formed. Operculum horny multi-spiral, smooth in front and concave.

Size: major diam. 9.4; alt. axis 4.8 mm.

Type No. 3083 *Brit. Mus.*

The subgeneric position of this species is very doubtful; the animal has not been seen.

Genus *Alycaeus*.

Lieutenant, now Captain Oakes, R.E. was most fortunate to secure some very interesting species of this genus. They all proved to be new, one representing a new subgenus *Raptomphalus*.

When these species were received, I was compiling a Monograph of the Indian Alycaei for "Land and Freshwater Mollusca

of India" Part XII, published in December 1914, thus the Abor species will be found described and figured in that work as follows:—

ABOR HILLS AND TSANSPU VALLEY.

- aborensis*, n. sp., p. 364, pl. CXLIX, fig. 9.
chanjukensis, n. sp., p. 364, pl. CLVII, figs. 5, 5a.
 (Cyclorix) sp. near *costatus*, p. 369.
duoculmen, n. sp., p. 365, pl. CLVII, figs. 2, 2a.
 (Dioryx) *globulosus*, n. sp., p. 368, pl. CLVII, figs. 1, 1a.
luyorensis, n. sp., p. 365, pl. CLVII, figs. 6, 6a.
 (Raptomphalus) *magnificus*, n. sp., p. 366, pl. CLVI, figs. 1, 1a, 1b.
oakesi, n. sp., p. 366, pl. CLVII, figs. 4, 4a.
panggihana, n. sp., p. 367, pl. CLVI, figs. 3, 3a.
sibbumensis, n. sp., p. 367, pl. CLVI, figs. 4, 4a.
 (Dioryx) *urceolus*, n. sp., p. 369, pl. CLIII, figs. 9, 9a.
vesica, n. sp., p. 368, pl. CXLIX, fig. 10.
yamneyensis, n. sp., p. 368, pl. CLVI, fig. 2.

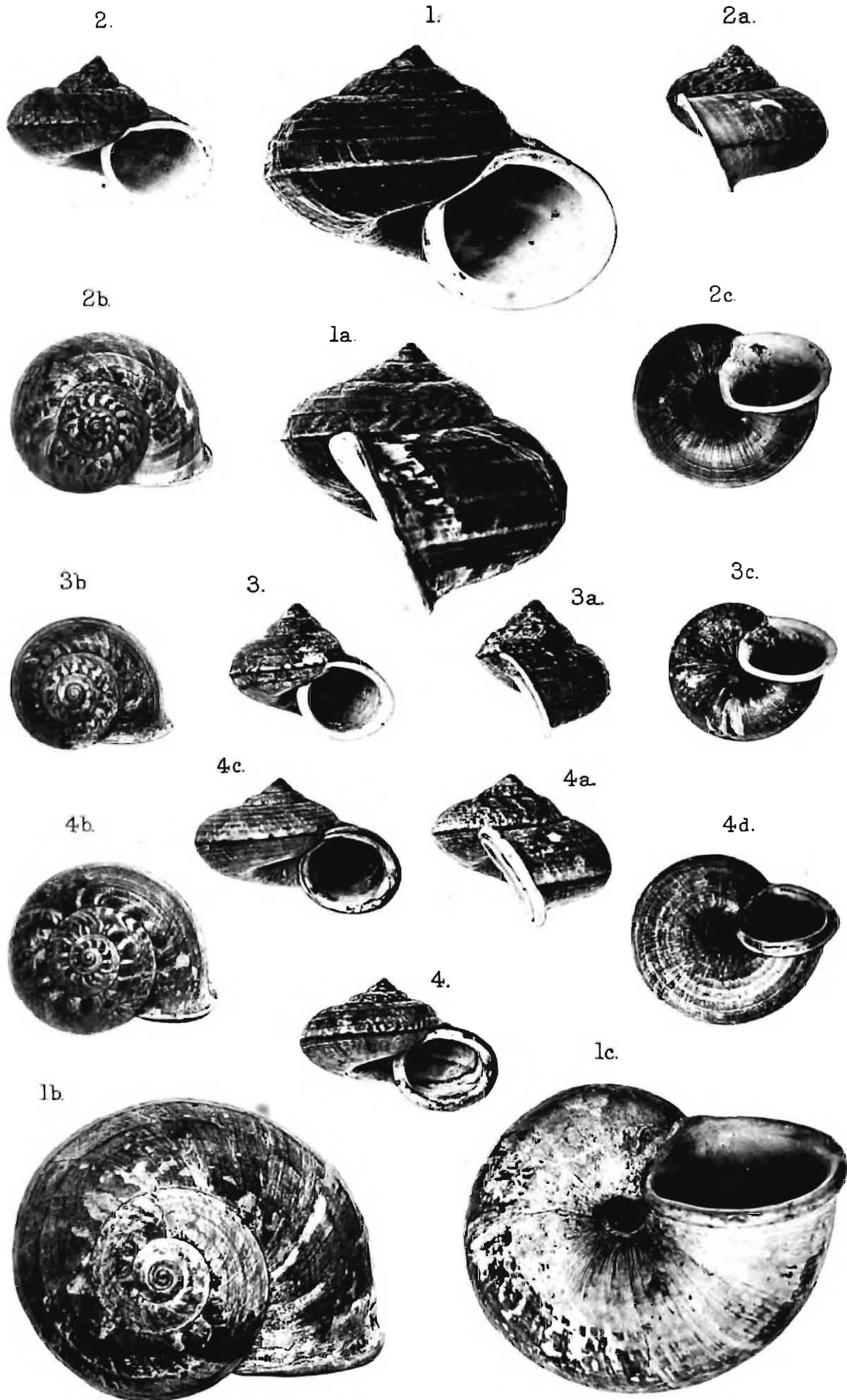
I also give a list of Alycaei known to me, from Eastern Assam, which includes Sadiya and the Lohit River to the eastward. This may be useful to those interested in the Molluscan fauna of this part of India.

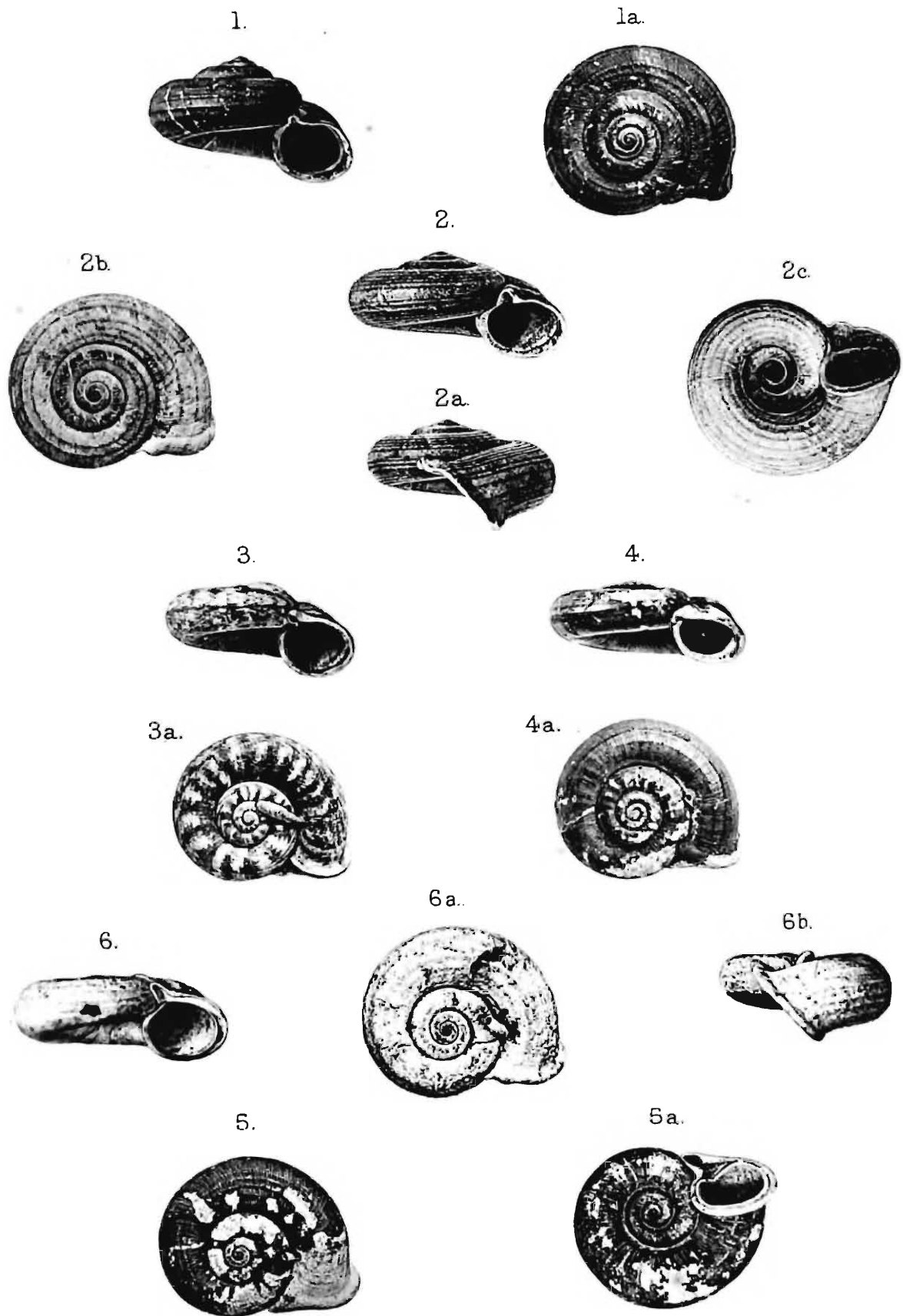
EASTERN ASSAM.

- brahma*, G.-A., p. 363, pl. XLVIII, fig. 3.
brahma, G.-A., var., p. 363.
distinctus, G.-A., p. 363, pl. CXXXVII, figs. 2, 2a, 2b.
 (Diaryx) *globosus*, n. sp., p. 363, pl. CLIII, fig. 8.
 (Cyclorix) *granum*, G.-A., p. 364, pl. LXIII, fig. 6.
graphicus, var. *dihingensis*, n. s. s., p. 363, pl. CXLVI,
 figs. 6, 6a.
lohitensis, n. sp., p. 362, pl. CXXXVII, figs. 1, 1a.
oglei, n. sp., p. 362, pl. CXLVIII, fig. 2.

EXPLANATION OF PLATE XXXVIII.

FIGS.	1, 1a.—	<i>Cyclophorus aborensis</i> , n. sp.	Renging.
„	1b, 1c.—	„	„ Type, Rotung (<i>Kemp</i>).
„	2, 2a, 2b, 2c.—	„	<i>bapuensis</i> , n. sp. Type.
„	3, 3a, 3b, 3c.—	„	<i>sidiensis</i> , n. sp. Type.
„	4a, 4b.—	„	<i>koboensis</i> , n. sp. 1st specimen, Rotung (<i>Oakes</i>).
„	4c, 4d.—	„	2nd specimen.
„	4.—	„	„ Type, Kobo (<i>Kemp</i>).





EXPLANATION OF PLATE XL.

- FIGS. 1, 1a.—*Cyclophorus oakesi*, n. sp. × 4·5. Type.
,, 2, 2a, 2b, 2c.—*Spiraculum minimum*, n. sp. × 3·4. Type.
,, 3, 3a, 3b.— ,, *putaoensis*, n. sp. × 3·4. Type.
,, 4, 4a, 4b.—*Pterocyclos spiramentum*, n. sp. × 3·4. Type.
,, 5, 5a, 5b.—? *Spiraculum luyorensis*, n. sp. × 3·4. Type.

X L M O L L U S C A, I V: H E L I C I D A E.

G E N U S P L E C T O P Y L I S.

By G. K. GUDE.

(Plates xli, xlii).

A small number of shells of the genus *Plectopylis* from the Abor country has been kindly entrusted to me for examination. They were collected for Lt.-Col. Godwin-Austen by Lieut. G. F. T. Oakes, R.E., who accompanied the Abor Expedition as officer in charge of the Survey Party, and all proved to be new to science. Although the number of shells is small, they comprise no less than seven species, two of them, unfortunately, being represented by unique specimens. One species is of special interest owing to the fact that it is a member of the section *Sinicola*, not previously known to occur within the limits of the Indian region.

***Plectopylis*, Benson (1860).**

***Plectopylis (Endothyra) oakesi*, sp. n.**

(Pl. xli, figs. 1, 1a, 1b, 1c, 1d).

Shell sinistral, discoid, corneous, widely umbilicated, finely and regularly ribbed, the ribs decussated by raised spiral lines. Whorls 7, increasing slowly and regularly, the last not dilated towards the mouth, slightly constricted behind the peristome, shortly and rather suddenly deflexed in front, angulated above and around the umbilicus, rounded at the periphery. Suture linear, apex slightly raised. Aperture oblique, subrotundate; peristome slightly thickened and reflexed, the margins united by a slightly raised sinuous ridge, which has a slight notch at the junctions with the peristome above and below.

The parietal armature consists of a single strong, slightly oblique transverse plate which gives off a short horizontal ridge posteriorly above, the lower extremity is somewhat dilated and notched, and gives off posteriorly a short ridge and anteriorly a long thin fold, which runs parallel with and close to the lower suture, joining the parietal ridge at the aperture. The palatal armature is very complicated and consists of: 1°, a short slight horizontal sinuous fold close to the upper suture; 2°, a short stout transverse fold with posteriorly a slight denticle and anteriorly an elongated slender horizontal fold, raised in the middle; 3°, a stout transverse fold, concave posteriorly and giving off

anteriorly from the upper extremity a thin horizontal fold, which is provided below its anterior extremity with an elongate sinuous denticle; 4°, a similar transverse concave fold with an anterior horizontal fold, notched at the junction and curving upwards, the denticle more distant from the anterior extremity; 5°, a sinuous transverse fold, its upper extremity deflexed posteriorly and its lower extremity deflexed anteriorly, with a short horizontally elongated denticle close to the lower extremity and provided on the anterior side, in a line with its upper extremity, with an elongated denticle, slightly curved downwards anteriorly, below the latter occurs a short curved fold, its anterior end descending, and below this again another horizontally elongated denticle in a line with the denticle below the lower extremity of the transverse fold; 6°, a slight sinuous horizontal fold close to the lower suture, its posterior extremity slightly ascending.

Major diam. 12.5, minor 11 mm.; alt. 5 mm.

Hab.—Yamne Valley, Abor Hills and Sibbum (Oakes).

Type No. 3125 *Brit. Mus.*; Nos. 6128 and 6130 Renging and Rotung (*Kemp*) in *Ind. Mus.*

This new species greatly resembles *P. pinacis*, but the last whorl of the latter is more sloping towards the umbilicus and does not descend in front, while the umbilicus is also more perspective. In the armature considerable difference exists, more especially in the palatal barriers, which are very complicated in the new species. Five specimens, bleached and much worn, were collected. A single specimen taken between Riu and Singging, on the Dihang River, I refer to the same species. It is in much better condition and is larger than the Yamne Valley shells, measuring 14.5: 12.75: 5.5 mm. The species is named after Lieutenant G. F. T. Oakes, the officer in charge of the Survey Party, who collected the shells.

Plectopylis (Endothyra) gregorsoni, sp. n.

(Pl. xli, figs. 2, 2a, 2b, 2c, 2d).

Shell sinistral, depressed conoid, almost discoid, dark corneous, polished below, widely and perspectivevely umbilicated, the last quarter of the last whorl receding still further below, exposing half the width of the penultimate whorl; finely and regularly ribbed, the ribs decussated by spiral ribs, giving the shell a reticulated appearance on the upper side, the spirals being less distinct at the side and disappearing at the periphery, below which the transverse ribs also begin almost to disappear. Whorls 5, increasing slowly and regularly, flattened above, a little convex at the side, steeply sloping towards the base, the last whorl scarcely dilated at the mouth, very shortly and slightly deflexed in front, angulated above, subangulated around the umbilicus, the portion between the upper angulation and the periphery encircled by three, about equidistant spirals. Spire depressed, suture linear, apex a little raised. Aperture oblique, subhastate, peristome white, thickened, and slightly reflexed; margins approximat-

ing, the upper horizontal and slightly arched, the outer straight and obliquely descending, basal curved, columellar straight, ascending.

The parietal armature consists of a single, slightly oblique, transverse plate, truncate below, where it is also slightly dilated anteriorly, with a very slight anterior support at its upper extremity, and posteriorly with two slight very low ridges, one each near its two extremities, the upper obliquely descending and the lower obliquely ascending towards the transverse plate. Below the latter occurs a very short, slight, horizontal fold with a second, still shorter fold posteriorly to it. The palatal armature consists of six spiral folds; the first short and slight, horizontal, near the upper suture; the next four stouter and more elevated, the second obliquely descending backwards, its posterior extremity bifurcate; the third nearly horizontal, its anterior extremity slightly bifurcate; the fourth and fifth obliquely descending backwards, their anterior extremity also slightly bifurcate; the sixth short, slight, horizontal, near the lower suture.

Major diam. 7.25, minor 8.5 mm.; alt. 3.5 mm.

Hab.—Yamne Valley, Abor Hills (*Oakes*).

Type No. 3124 *Brit. Mus.*

Its nearest relative is *P. macromphalus*, but it differs from, that species in having the palatal barriers in one series, instead of two, and it therefore stands in the same relation to its ally as does *P. sowerbyi* to *P. plectostoma*. It is also considerably larger. The new species is named in commemoration of Dr. Gregorson, Medical Officer, with Mr. Noel Williamson, who were both murdered in 1911 in the Abor country.

***Plectopylis (Endothyra) miriensis* (G.-A. MS.), sp. n.**

(Pl. xli, figs. 3, 3a, 3b, 3c, 3d).

Shell sinistral, discoid, pale yellowish-corneous, widely umbilicated, the 3 nepionic whorls nearly smooth and shining, the remainder covered with raised spiral lyrae, the interstices finely and closely transversely striated. Whorls $6\frac{1}{2}$, increasing slowly and regularly, the last slightly dilated towards the mouth, not constricted behind the peristome, slightly descending and shortly deflexed in front, angulated above, slightly compressed below the angulation, the underside convex. Spire almost plane, apex projecting, suture channelled. Aperture oblique, rhomboid-auriculate; peristome white, thickened and reflexed, the margins united by a thin callus on the parietal wall, without a ridge, but with the edge crenulated, owing to the prominent spiral lyrae; slightly notched at the lower junction with the peristome.

The parietal armature consists of a short transverse plate, its lower extremity a little obliquely deflexed towards the mouth, provided anteriorly with a short, almost horizontal ridge below, and an obliquely descending ridge above, a little stouter and longer than the lower; below the plate occurs a short thin bilobed

fold, close to, and parallel with the lower suture and continued posteriorly and anteriorly into a very slender fold, the posterior portion about 3 mm. in length, but the anterior part running as far as the edge of the parietal callus. On the posterior side of the plate occur two denticles, one in a line with the upper, and the other even with the lower extremity.

The palatal armature consists of: 1°, a short, low, horizontal fold near to and parallel with the upper suture; 2°, a longer; stouter fold, its anterior portion horizontal, next curving downwards in a semicircle, and its posterior portion again horizontal, terminating in a bifurcation; between the first and second folds occurs a slight denticle, elongated horizontally; 3° and 4°, two similar folds, but only their anterior portion nearly horizontal, their posterior portion deflexed obliquely downwards, with an obtuse angle; 5°, a fold similar to the preceding two, but shorter; and 6°, a short, slight, nearly horizontal fold, close to the lower suture; a low, transverse, callous ridge connects these folds.

Major diam. 12, minor 11 mm.; alt. 5 mm.

Hab.—Miri Hills, Upper Assam (*Officers, Miri Mission*).

Type No. 3205 Brit. Mus.

The raised lyrae differentiate *Plectopylis miriensis* from all other known species of the genus. These appear only on the post-embryonic $3\frac{1}{2}$ whorls, the earlier ones of which are furnished on the upper side with 4 lyrae, but about the beginning of the last half of the penultimate whorl their number gradually increases to 5. Owing to the fact that the inner one of these is at some distance from the suture, the latter appears channelled, the same condition obtaining as regards the suture in the umbilicus. On the outer and the lower side of the whorls—from the upper angulation to the umbilical suture—I have counted 21 such lyrae, making 26 in all.

The species has its nearest ally in *P. pinacis* from Darjeeling, but the latter is dark brown and larger and is only striated spirally, the spirals being also more crowded, while at the sides they are almost obsolete. *P. pinacis*, moreover, is angulated around the umbilicus, which is more open and perspective than in its ally. In their barriers the two species are also closely related, but the parietal transverse plate in *P. miriensis* has no posterior support at its upper extremity, and the anterior support is obliquely deflexed downwards at an acute angle, while in *P. pinacis* this support is much shorter and directed upwards. In the palatal armature likewise considerable differences are met with, the second fold in *pinacis* being straight, instead of curving downwards in the middle. The latter species, moreover, does not possess the transverse callous ridge connecting the horizontal and oblique folds in *P. miriensis*, a feature it shares with *P. muspratti*, and a few other species which, however, belong to a different section. Finally, the additional median denticle between the first and the second fold is lacking in *pinacis*, it is, in fact, a character which I have not observed in any other species of *Plectopylis*.

***Plectopylis (Chersaecia) williamsoni*, sp. n.**

(Pl. xlii, figs. 1, 1a, 1b, 1c, 1d).

Shell sinistral, depressed conoid, dark corneous, the earlier whorls lighter and shining, moderately umbilicated, closely plicate-striate. Whorls 6, closely coiled, increasing slowly and regularly, flattened above, convex at the side, tumid below, the last slightly dilated at the mouth, slowly descending for some distance in front, angulated above and around the umbilicus, subangulate at the periphery. Spire depressed, suture linear, apex obtuse. Aperture oblique, crescent-shaped, peristome white, slightly thickened, scarcely reflexed, the margins united by a raised flexuous ridge on the parietal wall, slightly notched at the junctions with the peristome above and below.

Parietal armature consisting of a low vertical plate, both extremities giving off a slight support posteriorly with a slight denticle behind the upper support; above the vertical plate occurs a short slender horizontal fold and on the anterior side are two stout horizontal folds, one very short, in a line with the upper extremity, the other nearly median in position and much longer, terminating at about 1 mm. from the parietal ridge at the aperture; below the vertical plate rises a filiform fold running parallel with the lower suture and united to the parietal ridge at the aperture. The palatal armature may be said to be in two series; the anterior set consisting of six horizontal folds, the first short and slender, near the upper suture, the next three longer and stouter, bilobed; the fifth still stouter, and almost bisected, its posterior portion deflexed; the sixth short and slight, near the lower suture; the posterior series consists of a vertical row of five minute denticles, one each between the second, third, fourth, and fifth folds, and two below the latter; with the exception of the sixth fold, which is placed further forward, all the folds terminate posteriorly in a line with the denticles.

Major diam. 6, minor 5.5 mm.; alt. 3.25 mm.

Hab.—Abor Hills, exact part not indicated (*Oakes*).

Type No. 3087 *Brit. Mus.*

This new species, of which 8 specimens were collected, resembles a small *P. sowerbyi* or *P. plectostoma* in outward appearance, but it is related to *P. brahma*. That species, however, besides being larger, may be readily separated by the fact that the parietal vertical plate gives off anteriorly from its lower extremity a short horizontal fold, while the palatal barriers consist of only four horizontal folds, as against six in the new species; on the other hand, in the posterior series it possesses 13 or 14 denticles and *P. williamsoni* only 6.

With this new species is associated the name of Mr. Noel Williamson of the Indian Civil Service, an active explorer on the far Assam Frontier, whose murder in 1911 led to the expedition against the hill tribes.

Plectopylis (Chersaecia) bedfordi, sp. n.

(Pl. xlii, figs. 2, 2a, 2b, 2c, 2d).

Shell sinistral, depressed conoid, almost discoid, dark corneous, moderately umbilicated, finely and closely plicate-striate, decussated on the upper side with very close raised spirals, giving it a closely and finely reticulated appearance; in addition there are at more or less regular, distant intervals, coarser transverse ribs; at the sides the reticulated appearance is less distinct, and there the shell is encircled by four distant fimbriae of cuticular processes, resembling coarse hairs, and a similar fringe of cuticular processes occurs at the top near the outer edge of the whorls; these processes are readily rubbed off. Whorls $6\frac{1}{2}$, closely coiled, increasing slowly and regularly, flattened above and at the side, becoming convex towards the base, tumid below, the last not dilated at the mouth, shortly and rather deeply deflexed in front, angulated above. Spire depressed, suture linear, apex prominent. Aperture oblique, auriculated; peristome white, slightly thickened and shortly reflexed, the margins approximating and united by a raised flexuous ridge on the parietal wall, notched at the junctions with the peristome above and below.

The parietal armature consists of a simple curved transverse plate, giving off posteriorly above a short support and rather strongly deflexed backwards at its lower extremity, where it gives off anteriorly a filiform fold running parallel with and close to the lower suture and joining the flexuous ridges at the aperture. The palatal armature is very complicated, being in two series; the anterior set consisting of six more or less horizontal folds; the first rather thin and short, parallel with and close to the upper suture; the next four stouter and longer, the second slightly curved, the third curving downwards in the middle and bifurcated at the posterior extremity; the fourth at first curves upwards and then downwards; the fifth similar to the fourth but, like the third, bifurcate at the posterior extremity; the sixth is parallel with and near the lower suture. The posterior series consists of a large number of more or less elongated denticles, all more or less in a line with the posterior terminations of the folds; three of these between the first and second folds, the centre one shortest; one, moderately long, between the second and third folds; three between the third and fourth folds, the middle one longest; one short one between the fourth and fifth folds; two, the upper one short and the lower one triangular, posteriorly to the fifth fold; two short ones between the last triangular denticle and the sixth fold, with a short denticle anteriorly and close to the posterior termination of the fifth fold; and lastly a minute denticle below the sixth fold.

Major diam. 9, minor 8 mm.; alt. 4.5 mm.

Hab.—Abor country, Tsanspu Valley, on the Dihang, about 50 miles above the junction of the Sigon River, alt. 2800 ft.

Type No. 3584 *Brit. Mus.*

This new species is evidently related by its palatal armature to *P. brahma*, these barriers being even more complicated than in the latter form. In its simple parietal armature, however, it stands rather isolated in the group, coming nearest to *P. oglei*, but that shell is much larger and is dextral. The species is associated with the name of Captain Bedford, who appears to have been the first officer to go into that part of Assam, *viz.* in 1826.

***Plectopylis (Endoplon) aborensis* (G.A. MS.), sp. n.**

(Pl. xlii, figs. 3, 3*a*, 3*b*, 3*c*, 3*d*).

Shell sinistral, solid, stoutly discoid, ochraceous, with a deciduous cuticle, widely openly umbilicated, finely and rather regularly striated, dull, the protoconch glossy and rather distantly faintly ribbed. Whorls $6\frac{1}{2}$, closely coiled, increasing slowly and regularly, the last a little dilated towards the mouth, deeply descending in front, the upper side flattened, bluntly keeled above, the keel disappearing near the aperture, convex at the side, angulated around the umbilicus, spire sunken, but the upper side of the whorls horizontal, not sloping, so that the whorls are terraced; suture impressed above, but channelled in the umbilicus; apex a little raised, being about on a level with the outer whorl. Aperture nearly horizontal, broadly lunate; peristome thickened and reflexed, the margins united by a slight raised ridge on the parietal wall, notched at the junctions with the peristome above and below; upper margin slightly ascending, outer depressed at first, basal arcuate, columellar ascending and slightly impinging upon the umbilicus.

Parietal armature consisting of: 1°, a transverse plate, obliquely curving downwards and backwards, with a short posterior support at the upper extremity, where it gives off anteriorly a horizontal fold, running parallel with the upper suture; 2°, a much shorter vertical plate, placed anteriorly to the first, its lower extremity having a short support on either side, its upper extremity simple and terminating about the periphery; a very slender fold rises some distance behind the first plate, running close to and parallel with the lower suture, joining the parietal ridge at the aperture. The palatal armature consists of five folds; the first, near the upper suture, slight and obliquely descending backwards; the next three transverse, very stout, short, elevated, and rather square in outline, the second having a short obliquely ascending support at its upper, and an obliquely descending one at its lower extremity; the third and fourth with a short support anteriorly above and below, giving that side a concave appearance, and posteriorly with a short obliquely descending support at its lower extremity; the fifth is near the lower suture, slight and horizontal, a little stouter and more elevated than the first.

Major diam. 14, minor 11.5 mm.; alt. 6.5 mm.

Hab.—Between Renging and Rotung, 2200 ft., Abor country.

Type No. 5998 *Ind. Mus.*; also No. 6135 I.M.

This new species is a very interesting addition to the Indian fauna, a single full-grown specimen and one immature of which were collected by I. H. Burkill and sent home by Mr. Kemp, who accompanied the expedition. It is the first sinistral form of the section *Endoplon* I have seen. In its parietal armature it is nearest to *P. brachyplecta*, but lacks the median horizontal fold of that species, while the anterior vertical plate is only about half the length of that in its ally; in addition it possesses a short horizontal fold proceeding from the upper extremity of the posterior plate, while the horizontal fold below the two plates—which in *P. brachyplecta* is very short and rather stout—is here very slender and, running parallel with the lower suture, reaches the aperture. In its palatal armature it differs in having only five folds—against six in *brachyplecta*—the median ones, moreover, being placed more vertically, and the third and fourth having the anterior side concave, instead of sloping backwards as in *brachyplecta*. In outward appearance it strikingly differs from all other known species of *Plectopylis*, the terraced upper sides of the narrow whorls and the channelled sutures in the umbilicus being features I have not observed in any other species, and which, without previous examination of the armature, enabled me at a glance to recognize this as an undescribed form.

Fig. 3*a* shows the parietal armature, fig. 3*b* the palatal folds as they would appear from the inside if the outer wall were removed, while fig. 3*c* gives the posterior aspect of both parietal and palatal barriers, only the posterior plate of course being visible in this view.

Plectopylis (Sinicola) babbagei, sp. n.

(Pl. xlii, figs. 4, 4*a*, 4*b*, 4*c*, 4*d*).

Shell dextral, discoid, dark brown above, olivaceous corneous below, widely and perspectively umbilicated, closely and rather coarsely plicate-striate, the striae decussated by raised spiral lines. Whorls 6, increasing slowly at first, then more rapidly, the upper side a little flattened and sloping towards the suture, slightly convex at the side, tumid below, encircled by three fimbriae of deciduous cuticular processes, like coarse hairs, the first near the upper side, the second at the periphery, the third around the umbilicus; the last whorl dilated towards the mouth, not constricted behind the peristome, shortly descending in front. Suture impressed, spire slightly sunken, apex a little raised. Aperture oblique, elliptic-subovate, the margins distant; peristome white, thickened and reflexed, the margins united by a slightly raised, flexuous ridge on the parietal wall; the upper margin shortly ascending, curved, outer margin straight, basal margin widely curved, columellar margin ascending, slightly impinging upon the umbilicus.

Parietal armature consisting of a simple, stout, curved, obliquely ascending, transverse plate. The palatal armature is composed of six spiral folds: the first short, horizontal, near the upper suture; the next four longer and stouter, their posterior terminations notched; the second horizontal; the third, fourth and fifth obliquely descending backwards; the sixth short, horizontal, near the lower suture; between the posterior ends of the fifth and sixth folds occurs a slight denticle.

Major diam. 14, minor 12 mm.; alt. 6 mm.

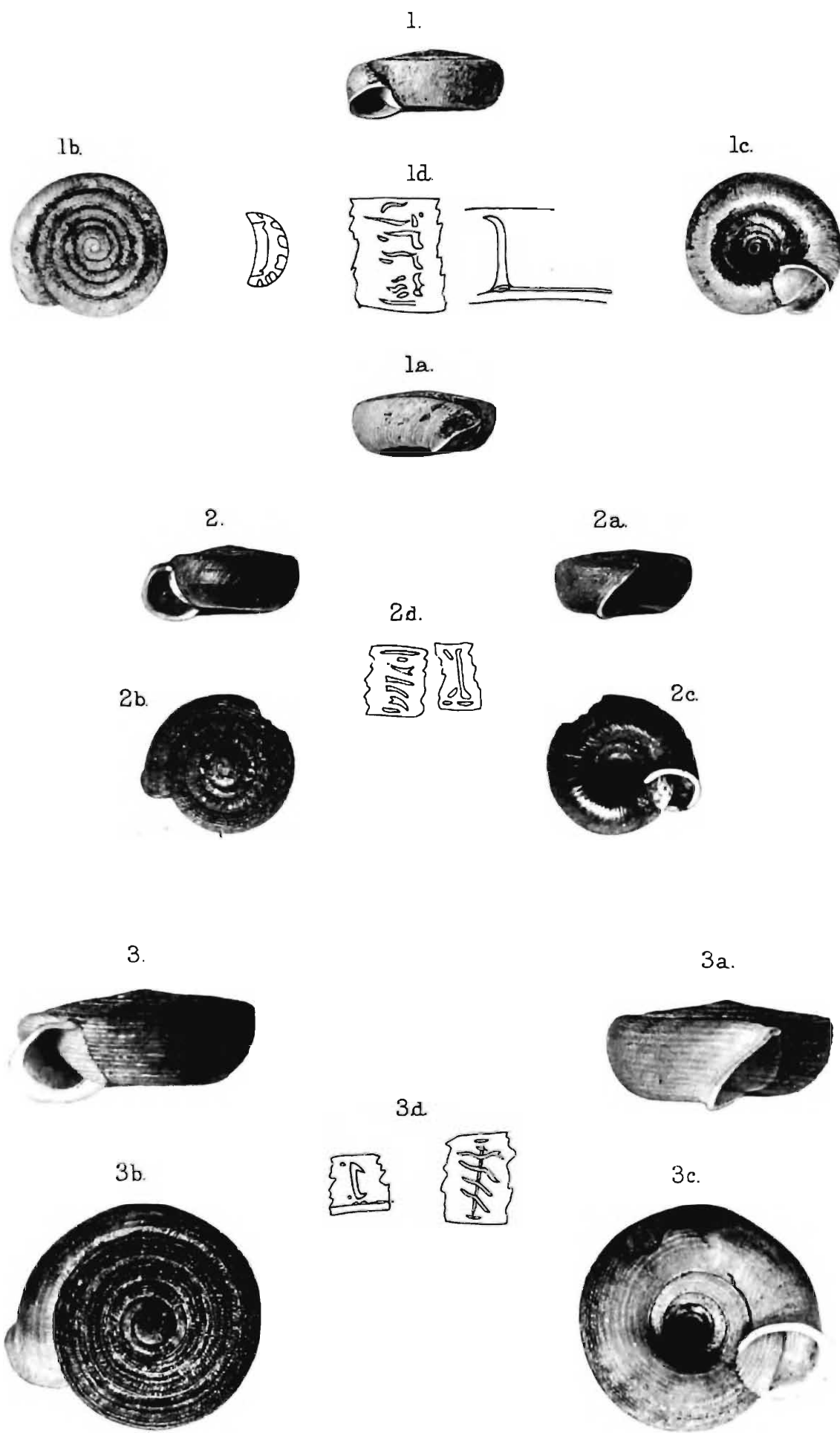
Hab.—Luyor Peak, Abor Hills, alt. 7200 ft. Lat. 28°45': Long. 95°45'

Type No. 3529 *Brit. Mus.*

When in 1899 the writer established the section *Sinicola* (*Science Gossip*, new series, VI, p. 148) it was believed to be confined within the limits of the Chinese Empire. Two species belonging to this group were subsequently discovered in Tonkin (*P. emigrans* and *P. fruhstorferi*), while a third (*P. hirasei*) was taken in the Loo Choo Group, but, until the present species was found, no member of the section was known to occur to the south of the Himalayas. *P. babbagei*, therefore, constitutes a very interesting and important addition to the Indian fauna. It appears to be nearest in affinity to *P. pulvinaris*, which, however, possesses 7 palatal folds and is not, like the present species, decussated by spirals. The name of Major-General Babbage, who led an expedition against the Abor tribes in 1847, suggested by Lt.-Col. Godwin-Austen, is associated with this new species.

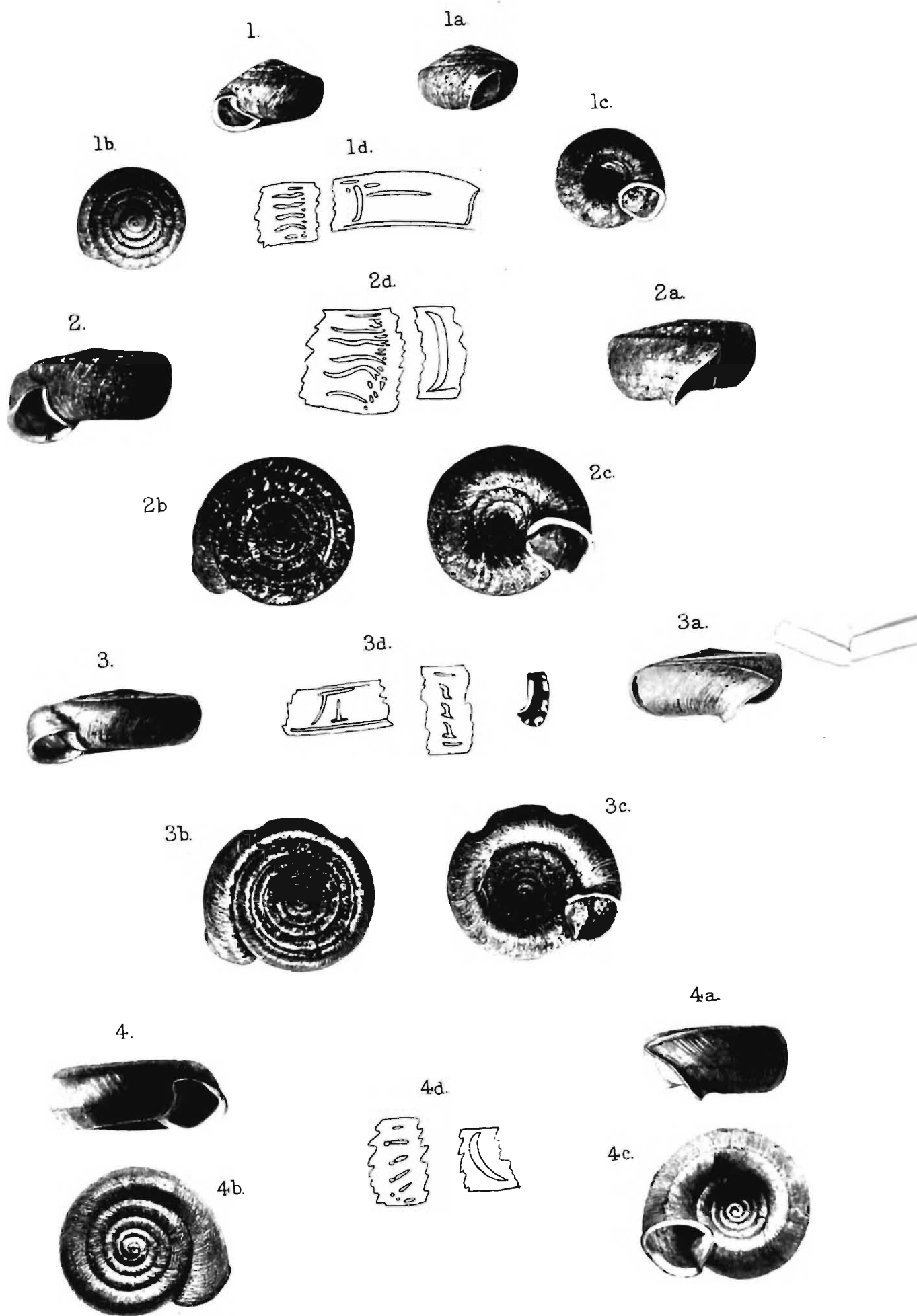
EXPLANATION OF PLATE XLI.

- FIGS. 1, 1a, 1b, 1c, 1d.—*Plectopylis (Endothyra) oakesi*, sp. n.
,, 2, 2a, 2b, 2c, 2d.— ,, ,, *gregorsoni*, sp. n.
,, 3, 3a, 3b, 3c, 3d.— ,, ,, *miriensis*, sp. n.



EXPLANATION OF PLATE XLII.

- FIGS. 1, 1a, 1b, 1c, 1d.—*Plectopylis (Chersaecia) williamsoni*, sp. n.
,, 2, 2a, 2b, 2c, 2d.— ,, ,, *bedfordi*, sp. n.
,, 3, 3a, 3b, 3c, 3d.— ,, (*Endoplon*) *aborensis*, sp. n.
,, 4, 4a, 4b, 4c, 4d.— ,, (*Sinicola*) *babbagei*, sp. n.



J. Green, Photo. del.

Bemrose, Collo, Derby

ABOR MOLLUSCA. (PLECTOPYLIS).

XLI COLEOPTERA, VIII:
PASSALIDAE AND LUCANIDAE.

By F. H. GRAVELY, M.Sc., Assistant Superintendent, Indian
Museum.

PASSALIDAE.

The Passalidae collected during the Abor Expedition of 1911-12 were mostly found either in trees felled by troops at Kobo, where they could not have been on the ground for more than a few months, or in trees felled by Abors when preparing land for cultivation.

Five of the species found—*Taeniocerus bicuspis*, *Aceraius grandis*, *Macrolinus sikkimensis*, *Leptaulax dentatus*, and *Leptaulax bicolor*—have a wide distribution round the Abor country. It is, however, uncertain how far beyond the Abor country the typical Himalayan form of *Macrolinus sikkimensis* extends, this form being replaced in a great part at least of Burma by a local race of the same species.

All the remaining species are Himalayan, except *Leptaulax roepstorfi*, which is only known outside the Abor country from Burma and the Andamans. Of the Himalayan species *Tiberioides austeni* is only known, outside the Abor country, from the Dafla Hills; *Aceraius himalayensis* extends into the Naga Hills and *Leptaulax cyclotaenius* subsp. *himalayae* extends into Tonkin. The typical form of the last named species is Malaysian, and no form is known between the Himalayas and Tonkin on the one hand, and Perak in the Malay Peninsula on the other.

The collection, which has already been referred to in my "Account of the Oriental Passalidae" (*Mem. Ind. Mus.* III, 1914, pp. 177-353, pl. xi-xiii), is as follows:—

Genus **TAENIOCERUS**, Kaup.

This genus includes species found in all parts of the Oriental Region except the Indian Peninsula and Ceylon.

Taeniocerus bicuspis, Kaup.

Kobo, 400 ft., 1-xii-11—4-ii-12.

Rotung, 1400 ft., 1-i-12.

Upper Rotung, 2000 ft., 5-i-12.

Renging, 2150 ft., 19-xii-11.

This is the only species of the genus found north of the Malay Peninsula. It is recorded from the Malay Peninsula, Siam,

Cachar and the whole length of the E. Himalayas, so probably occurs throughout the hill ranges of Burma and Assam,

Genus **TIBERIOIDES**, Gravely.

Confined to the E. Himalayas, Assam, and Burma (probably Upper Burma).

Tiberioides austeni, Gravely.

Kalek, 3800 ft., 29-xii-11.

Previously known only from specimens collected in the Dafia Hills.

Genus **ACERAIUS**, Kaup.

This genus is recorded from the Philippines, Sunda Islands, Malay Peninsula, Burma, Assam, E. Himalayas, Southern China, and Formosa but not from the Indian Peninsula or Ceylon.

Aceraius grandis (Burmeister), subsp. *hirsutus*, Kuwert.

Kobo, 400 ft., 31-xi-11—8-xii-11.

Janakmukh, 600 ft., 18-xii-11.

Rotung, 1400 ft., 26-xii-11 and 1-i-12.

Upper Rotung, 2000 ft., 5-i-12.

Renging, 2150 ft., 4-xi-11.

Kalek, 3800 ft., 29-xii-11.

Aceraius grandis is found over the whole range of the genus. Its subspecies *hirsutus* is the form characteristic of continental Asia (excluding the Malay Peninsula), the Philippines and Formosa.

Aceraius himalayensis, Gravely.

Sirpo River nr. Renging, March 1912.

Although the species apparently occurs throughout the Eastern Himalayas and southwards into the Naga Hills, it does not seem to be very common. Only a single specimen was obtained during the Abor Expedition; this was collected by M. de Courcy.

Genus **MACROLINUS**, Kaup.

The section of this genus to which the Abor species belongs is known only from the Andamans, Nicobars, Burma and the Eastern Himalayas.

Macrolinus sikkimensis, Stoliczka.

Kobo, 400 ft., 30-xi-11—9-xii-11.

Janakmukh, 600 ft., 15-xi-11.

Rotung, 1400 ft., 25-xii-11—1-i-12.

This species occurs throughout the Eastern Himalayas, and a local race of it is known from Burma. One of the specimens from Kobo approaches this race somewhat in character.

Genus **LEPTAULAX**, Kaup.

Widely distributed over the Indo-Australian Region.

Leptaulax dentatus (Fabr.) s. str.

Kobo, 400 ft., 2-xii-II and 8-xii-II.

Janakmukh, 600 ft., 18-x-II.

Rotung, 1400 ft., 28-xii-II.

Upper Rotung, 2000 ft., 9-i-12.

Renging to Rotung, 2600 ft., 20-xii-II.

Kalek, 3800 ft., 29-xii-II.

A very variable and widely distributed species. Its range appears to coincide with that of the genus.

L. cyclotaenius, Kuwert, subsp. *himalayae*, Kuwert.

Renging, 2150 ft., 19-xii-II.

This form is only known in addition from the Dafla Hills and Tonkin. *L. cyclotaenius*, s. str., the only other known form of the species, is a Malaysian insect and is not known to occur north of Perak.

Leptaulax bicolor, Fabr., s. str.

Janakmukh, 600 ft., 18-xii-II.

This species, like *L. dentatus*, is very variable, and has the same zoogeographical range as the genus.

Leptaulax roepstorfi, Kuwert.

Yembung, 1100 ft., 8-ii-12.

Rotung, 1400 ft., 24-xii-II.

This remarkably flat insect was originally described from the Andamans, and has since been described from Tenasserim. This record extends its known range northward very considerably.

LUCANIDAE.

Very few Lucanids were collected. They are as follows :—

Metapodontus impressus, Waterhouse.

Kobo, 400 ft., 6-xii-II, under log (♂).

The Indian Museum possesses a female from the Darjeeling District. No other precise records appear to have been made.

Eurytrachelus sp. ♀

Janakmukh, 600 ft., 18-xii-II, in rotten wood. .

Gnapholoryx velutinus, Thomson.

Kobo, 400 ft., 30-xi-11, in rotten wood (♂).

The Indian Museum possesses a female from Darjeeling, 7000 ft., and one from 1000-3000 ft. in the Darjeeling District. No other precise records appear to have been made.

Aegus labilis, Westwood.

Upper Rotung, 4-i-12, under leaf-stem of plantain (♀).

The Indian Museum possesses specimens from the Dafia Hills, Southern Shan States, and Andaman Islands. The species has also been recorded from Darjeeling.

? *Cardanus* sp.

Rotung, 1400 ft., 23-xii-11, in rotten wood.

ERRATA.

- P. 561, line 18 from top of page, for "*Paronela*" read "*Paronella*".
- P. 563, line 9 from bottom of page, for "top of middle" read "tip of middle" and for "base and top" read "base and tip".
- P. 564, last line of page, for "a genus of which" read "a genus which".
- P. 565, line 8 from top of page, for "gales" read "galea", and line 21 from bottom of page, for "segments black-tipped" read "segments black".