XLVIII MOLLUSCA, VIII

MACROCHLAMYINAE (*In part*).

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

(Plates LI—LIV.)

This contribution to the Abor land-mollusca collected by Mr. S. W. Kemp and Capt. G. F. T. Oakes, R E., treats of species belonging to the subfamily Macrochlamyinae, of which only one species, *Sarama kempi*, was described in my first short paper.[1] The very large number of species collected on the expedition, and the majority of them proving new, has been the chief reason that publication of the results has been so slow; I have also been occupied in other work. I have considered it as well to deal with the larger shells first leaving the very minute species (appertaining to *Macrochlamys*) from the Abor Hills, Brahmakund and the neighbourhood of Sadiya for future examination. The latter are very difficult to determine; they often prove to be young shells and their generic position is always very doubtful.

Where we are to look for a molluscan fauna allied to that of the Abor Hills and the eastern end of the Assam Valley has considerable interest. The Mali Hka and N'mai Hka head tributaries of the Irrawady as well as to the Salween looks to be the most likely direction. At present we know nothing of the land shells in that northern area, only a *Spiraculum* from Putao has been received—*S. putaoensis*, which is very close to one from the Abor Hills—*S. minimum*. For further knowledge of the anatomy and range of the new genera described in this contribution specimens in spirit are much wanted, and I trust before long they may be collected.

In the sub-family Macrochlamyinae, it is curious to say that from Pegu and the Shan States, although a good number of species are known by shell character, we are in complete ignorance of the animal, until we reach Tenasserim where Stoliczka and Theobald collected years ago and the former began his anatomical researches.

From Pegu many species occur to me of which the generic position assigned is not at all certain.

In the *Fauna of British India*, 1908, p. 115, there is *M ? consepta*, Bs. This should be transferred to p. 279, to the genus

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[1] *Rec. Ind. Mus.*, VIII, pp. 362-363, pl. xxiii, figs. 6-8; pl. xxiv, fig. 6-7 (1914).

Sarika. Hemiplecta theodori, Phil. from Mergui, by dissection, also belongs to this same genus, and very probably *Hemiplecta textrina*, Bs. also, p. 292. I consider *auriettae*, Tapp. Canefri., p. 293, should be included. The following:—*chaos*, W. Blf.; *causia*, Bs.; *salweenensis*, G.A.; *noxia*, W Blf.; *nebulosa*, W Blf.; *notha*, W. Blf., and *hypoleuca*, W Blf., with a number of smaller species, all require examination. From the Shan States I have a number of undescribed species in this sub-family collected long ago by my active assistant in the Survey Department, Colonel R. Woodthorpe, R.E. This collection I have delayed taking in hand in the hope of getting material preserved in spirit from Burma; now that the Abor Mollusca are nearly all worked out these become of greater interest, and will be taken in hand.

Macrochlamys hardwickei, G.-A. var. **politulus**, G.-A.

(Plate li, figs. 9, 9*a*; pl. liii, figs. 6-7.)

Locality.—Kobo, on north bank of Brahmaputra, Eastern Assam, No. 5914 (*S. W Kemp*). Two specimens also from Rotung, Abor Hills, No. 5967 (*S. W. Kemp*).

Shell flatly globose, closely umbilicated, smooth; sculpture extremely fine close regular longitudinal striation, the specimens from Rotung with regular rather strong longitudinal striation; colour very pale ochraceous; spire depressedly conoid, apex rounded; suture moderately impressed; whorls 5, well rounded on the periphery; aperture broadly lunate, nearly vertical; peristome thin; columellar margin sub-oblique and very slightly reflected near the umbilicus.

Size: major diameter 16·25, minor 14·0, alt. axis 6·0 mm. The larger specimen from Rotung: major diam. 18·0, minor 16·0, alt. axis 9·0 mm.

There were only two specimens in the collection preserved in spirit, one I dissected, the other I took out. It is interesting to see the animal of this variety of *M. hardwickei* and to be able to compare it with the Calcutta typical form. I have shells in my collection (now in the Natural History Museum) from a near locality to Kobo, namely Brahmakund, and other places in Eastern Assam (see *Land and Freshwater Mollusca of India*, Vol. I, p. 107), but I never found the animal alive.

The visceral sac is white with a pale grey tinge, a bar of black follows the mantle edge, not continuous, sparsely spotted along the side of the rectum up to near the heart, this becoming closer continuous towards the apex; the first apical whorls are pale ochre; the black markings show through the shell. Foot divided, the peripodial margin broad, closely segmented, mucous gland with a hooked projection over it. The animal is very similar to *M. indica*, G.-A. (*Faun. Brit. Ind., Moll.*, p. 95).

The right shell lobe is short, its length equal to the breadth of the right dorsal lobe; the left shell lobe is very small, short

and triangular, just overlapping the peristome; the left dorsal lobes are quite separate one from the other.

The generative organs are comparable to those of *M. hardwickei* of Calcutta; the penis with the short retractor muscle, the coiled caecum and the kalc-sac or flagellum are all exactly similar.

The radula is like that of the Calcutta species, 40.2.13.1.13. 2.40 or 55.1.55.

The general similarity of structure in the animals of the Calcutta species of *M. hardwickei* and its variety *politulus* of Eastern Assam is notable; it is an extended range of some 750 miles from the delta of the Ganges in one direction keeping to the valley of the Brahmaputra, and up into the gorge of the Tsanspu one feeder up the Lohit to Brahmakund another.

It may be also noted that neither *M. hardwickei* nor its variety have as yet been recorded from the Teesta Valley, nor from the Gangetic side, nor from Sylhet and Cachar that is on the Surma tributary of the Brahmaputra. There we can follow another species common in Calcutta, *M indica.*

We may take it for granted that the course of distribution has been from the north eastward, with the flow of the rivers to the delta; that long after *M. h. politulus* was developed the waves of the Indian Ocean were beating on the beach line where Calcutta now stands, and may be even far further up the delta. This carries us a step further back to the development of *M. hardwickei* in the North-Eastern Himalayan Range, where so many great rivers marking ancient valleys all unite to form the Brahmaputra, and from whence it spread along the base of the mountains, on the north to the Miri and Dafla and Bhutan, on the south to the Singpho and Naga.

Macrochlamys bapuensis, n. sp.

(Plate li, figs. 1, 1*a*.)

Locality.—Abor Hills, near Bapu, H.S. (*Capt. G. F. T Oakes*). Shimang, Abor Hills, young shells (*Capt. G. F. T Oakes*). Abor Hills, in spirit (*Capt. G. F. T Oakes*).

Shell depressedly conoid, rather flat below, perforate, a strong epidermis; sculpture coarse regular well-defined striation, in the Shimang specimen sculpture rather strong and very regular striation, in the Abor Hills specimen in spirit sculpture coarse wavy regular parallel striation; colour umber brown; spire depressed, apex flatly rounded; suture shallow; whorls 5, well rounded on the periphery, flattened above; aperture widely lunate, subvertical; peristome thin; columellar margin short, reflection near umbilicus, very oblique.

Size: major diameter 23·0, minor 20·0, alt. axis 8·0 mm. The young shells from Shimang have the following dimensions: maj. diam. 17·0, minor 14·0, alt. axis 6·0 mm.

Macrochlamys shimangensis, n. sp.

(Plate li, figs. 2, 2*a*).

Locality.—Abor country (*Captain G. F. T Oakes*).

Shell globosely conoid, perforate, with an epidermis; sculpture none; colour dull umber brown; spire subconoid, apex bluntly rounded; suture shallow; whorls 5, rather rapidly increasing, the last ample; aperture oval, subvertical; peristome thin; columellar margin subvertical, just reflected at umbilicus.

Size: major diameter 20·25, minor 17·25, alt. axis 8·0 mm.

This is a close ally of *M. bapuensis*, but is a much more globose shell, and I have four examples of it.

Macrochlamys hippocastaneum, n. sp.

(Plate li, figs. 3, 3*a*.)

Locality.—Luyor, Abor country (*Capt. G. F. T Oakes, R.E.*).

Shell globosely conoid, finely perforate, polished; sculpture none, quite smooth and glassy; colour rich dark chestnut; spire conic; apex blunt; suture impressed; whorls 5, rather rapidly increasing, rounded on the periphery; aperture broadly lunate, nearly vertical; peristome thin; columellar margin thin, scarcely reflected near umbilicus.

Size: major diameter 20·0, minor 17·75, alt. axis 9·25 mm.

Only one specimen of this beautiful shell was sent home, it is unlike any I have as yet seen from either Assam or from Burma. It was put up alive, but arrived in a state I could only make out a well-developed right shell lobe and a small left shell lobe.

Macrochlamys psittacinus, n. sp.

(Plate li, figs. 6, 6*a*.)

Locality.—Abor Hills, only one specimen (*Capt. G. F. T. Oakes, R.E.*).

Shell globosely conoid, perforation concealed, smooth, shining; sculpture fine regular longitudinal striation, stronger near and below the suture; colour dark olive green; spire flatly conic; apex blunt and rounded; suture impressed; whorls 5, the last rounded on the periphery, increasing rather rapidly; aperture widely lunate, oblique; peristome thin; columellar margin oblique, with scarcely any reflection above.

Size: major diameter 14·5, minor 12·5, alt. axis 5·75 mm.

I have placed this in *Macrochlamys* as the most likely genus, from the look of the shell. The animal may prove to differ nevertheless.

Macrochlamys? rotungensis, n. sp.

(Plate li, figs. 7, 7*a*; pl. liv, figs. 6, 7.)

Locality.—Rotung, Abor Hills, spirit specimen, No. 5991 (*S. W Kemp*).

Shell very depressedly conoid, flat on the base; sculpture none, very glassy; colour with animal inside dark umber brown; spire low; apex flatly rounded; suture rather shallow; whorls 5, closely wound; aperture rather narrowly lunate; peristome thin; columellar margin very oblique.

Size: major diameter 11·75, minor 11·25, alt. axis 5·0 mm.

The animal has a short right shell lobe and a very minute left shell lobe, black in colour. The foot is divided, the central area narrow, a broad peripodial margin, a hooked-like lobe over the mucous gland. The visceral sac from the mantle edge backward very darkly mottled grey black. The buccal mass very globose.

Jaw very straight, narrow, with a slight central projection. Central and admedian teeth as usual, the marginals unevenly bicuspid, the longest point much exceeding the short one.

In a spirit specimen collected by Capt. Oakes the teeth are arranged 18.2.9.1.9.2.18 or 29.1.29.

The generative organs of No. 5991 (pl. liv, fig. 6) were well extracted and mounted. The close wound shell leads them to be much drawn out and elongate, particularly the penis as well as the spermatheca, which contained several broken spermatophores. These were mixed together and rather broken, having very long flumes, with a single hook on the basal end (pl. liv, fig. 7). The retractor muscle is given off from the junction of the long penis sheath and the long epiphallus where there is an indication of a coiled caecum, the retractor muscle is very short, given off not direct from the circumference of the coil as is usually the case, but from the end of a short appendage attached to it.

The following is the description of another example from Rotung, Abor Hills, No. 5996 (*S. W Kemp*).

Shell depressedly conoid, narrowly perforate, base flat, glassy; sculpture none; colour ochraceous, brown on peristome; spire low, conic, flatly convex, apex rounded; suture shallow; whorls 6, closely wound; aperture narrowly lunate, oblique; peristome thin; columellar margin oblique.

Size: major diameter 12·0, minor 11·0, alt. axis 5·0 mm.

Only two specimens were obtained, but they are in excellent condition and fully grown. The species also occurred among the shells collected by Captain Oakes at the same place (No. 3156 B.M.).

Macrochlamys? rotungensis, n. sp., var.

(Plate liv, fig. 10).

Locality.—Abor Hills, near the foot (*G. F. T Oakes, R.E.*).

The shell is similar to No. 5991, but the spire is higher and more conic, being 5·5 mm. high. On first seeing this species I thought it would prove to be a true *Macrochlamys*. Mr. Oakes had very kindly packed some shells in a "bamboo chunga" or tube (as I had suggested to him), and several, including a *Sivella*, three *Glessulas* and two of *Cyclophorus*, were found to be living after being put in wet moss near the fire. Five other specimens had

succumbed. I put these last in spirit at once and examined the anatomy. It was somewhat surprising to find that the genitalia were not exactly like those of true *Macrochlamys*, the jaw and radula also differing.

Animal: foot dark coloured with a distinct overhanging small lobe above the mucous gland; close black mottling on the mantle zone and wall of the branchial cavity, paler on the line of the rectum.

Right shell lobe small, dark coloured; left shell lobe very small. No amatorial organ and only an indication of the coiled caecum to the penis. One spermatophore was found in this first specimen examined, only the long flume, with numerous bifid spines on one side.

Radula (pl. liv, fig. 10). The median and admedian teeth very elongate, the laterals curved with outer notch much below the point, the outermost minute, narrow and aculeate. Formula: 50.2.13.1.13.2.50, it may be noted this differs from No. 3156. Jaw (fig. 10) narrow with a slight curve, no central projection.

Macrochlamys burkilli, n. sp.

(Plate li, figs. 13, 13*a*; pl. liv, figs. 8, 9.)

Locality.—Sadiya, Eastern Assam, No. 6125. No. 5917, Kobo, in spirit (*S. W Kemp*).

Shell globosely conoid, flat on base, imperforate; sculpture none, smooth, glassy; colour very pale ochraceous; spire high; apex rounded; whorls 5, closely wound; aperture semilunate; columellar margin very oblique.

Size: major diameter 7·25. minor 7·0, alt. axis 3·5 mm. The largest specimen in spirit (No. 5917) measures maj. diam. 9·0, minor 8·75, alt. axis 4·25.

I have named this after Mr. Burkill, who was Botanist with the expedition, and who I note collected some shells for Mr. Kemp.

The animal, removed from the shell, has a band of black extending from the rectum backwards, and on the mantle margin the apical whorls pale ochraceous. There is a very small right shell lobe, situated low on the right side of the right dorsal lobe; the left shell lobe was not made out, it is probably very small as in *M. rotungensis* and easily broken off.

In the generative organs (pl. liv, fig. 8), the retractor muscle is very short, attached to the circumference of the coiled caecum, the epiphallus is long as is also the kalc-sac or flagellum, the sheath of the penis is also much lengthened. The spermatheca and amatorial organ greatly developed, the first bulbous towards the free end; it contained a single spermatophore with a long flume.

The radula central tooth and admedians of typical shape, the marginal long narrow unevenly bicuspid, outermost very minute, also bicuspid. Formula: 24.2.9.1.9.2.24 or 35.1.35.

Jaw (pl. liv, fig. 9) very straight in front, narrow, slightly convex above.

Macrochlamys albulus, n. sp.

(Plate liii, figs. 8, 9.)

Locality.—Abor Hills (*S. W Kemp*).

Shell narrowly umbilicated, depressedly globose, smooth shiny; sculpture microscopic longitudinal striation, stronger near the suture; colour dull ochre with animal inside, colourless otherwise; spire low; suture shallow; whorls 5, rather rapidly increasing; aperture lunate; peristome thin; columellar margin suboblique.

Size: major diameter 5·5, minor 4·0 mm.

There were two specimens, the shell of one was broken extracting the animal, the second shell is in spirit, animal not removed.

Animal (pl. liii, fig. 8) in spirit about 10 mm. long, quite white, no markings of any kind, elongate; right shell lobe very long on side of shell the left also long and tapering from a broad base. A long lobe over the mucous gland. The generative organs were hardly developed, there appeared to be an amatorial organ.

I managed to get the radula in a very complete state. The centre and admedian teeth have blunt rounded points with a small outer basal cusp, the marginals nearly evenly bicuspid. Formula: 60.3.9.1.9 3.60 or 72.1.72, it was almost impossible to count the marginals they are so minute.

Jaw (pl. liii, fig. 9) strongly convex on the cutting edge, very narrow, with a very small central projection.

Macrochlamys murdochi, n. sp.

Locality.—Renging, Abor country, No. 6131; No. 6125*a*, Sadiya (*S. W Kemp*).

Shell perforate, almost discoid, base flat, smooth; sculpture none; colour pale ochraceous; spire flat, the apex just raised above the last whorl; suture impressed; whorls 5, rather closely wound and regularly increasing; aperture lunate horizontally, oblique; peristome thin.

Size: major diameter 8, minor 7·5, alt. axis 3·0 mm.

A distinct species, unfortunately represented by only two immature shells, easily recognizable again.

Macrochlamys ? luyorensis, n. sp.

(Plate li, figs. 11, 11*a*.)

Locality.—Luyor, Abor country (*Capt. G. F. T Oakes, R.E.*).

Shell globosely, depressedly conoid, narrowly perforate, smooth; sculpture no striation of any kind; colour umber brown with ruddy tinge; spire rather high, flat, apex rounded; suture very slightly impressed; whorls 5, close wound, regularly increas-

ing, last well rounded; aperture narrowly lunate, vertical; peristome thin; columellar margin oblique.

Size: major diameter 11·0, minor 9·5, alt. axis 5·0 mm.

Unfortunately there is only one example of this species and that is not fully grown, the shell is new to me and of peculiar form, and would readily be recognized when found again.

Tadunia, gen. nov.

Shell globosely conoid, whorls numerous, narrow, closely wound and regularly increasing.

Animal: foot with broad peripodial margin, a small lobe above the mucous gland. In the generative organs, no amatorial organ, no caecum to the penis, spermatheca very long.

Tadunia oakesi, n. sp.

(Plate li, figs. 10, 10*a*.)

Locality.—Abor Hills, Assam (*G. F. T Oakes, R.E.*).

Shell globosely conoid, scarcely perforate, rather flat on base; sculpture very fine longitudinal striation only to be seen with a high power, this is divided up at very regular intervals by stronger striae, this is also seen on the base; colour pale umber brown; spire high, rather flatly conoid, apex rounded; suture very impressed; whorls 7, narrow, closely wound and regularly increasing; aperture semilunate, nearly vertical; peristome thin; columellar margin suboblique.

Size: major diameter 9·0, minor 8·5, alt. axis 5·0 mm.

Three specimens were found by Capt. Oakes and put up alive, but they died *en route*. One was put to soak and the radula was secured and mounted but much broken The centre tooth and admedians are rather small on nearly square plates, the laterals are curved with a minute cusp some way below the point. The formula is +20.7.1.7.20+.

The foot showed a very broad peripodial fringe, and an overhanging lobe above the mucous pore. The genitalia are preserved, but not in a very good state. The penis is simple, no caecum, the spermatheca very long and containing a single spermatophore, which is very elongate with many bifid spines on the flume.

Although belonging in all probability to the Macrochlamyinae, the shell of this species differs so very much in every way from typical *Macrochlamys*, on conchological grounds it cannot be placed in that genus, and I am obliged to create yet another one for its reception, naming it *Tadunia* after one of the Abor Tribes of the outer hills. What has been seen of the animal bears this out also.

Tadunia? muspratti, n. sp.

Locality.—Eastern Naga Hills, a single specimen, Beddome collection, B.M. (*Muspratt*).

Shell finely perforate, turbinately conoid, flat on base; sculpture none, a glassy surface; colour pale greenish ochre; spire raised, flatly conic, apex rounded; suture impressed; whorls 6, closely wound, regularly increasing; aperture narrow and widely lunate, subvertical; peristome thin, thickening to the umbilicus; columellar margin oblique.

Size: major diameter 8·0, minor 8·5, alt. axis 4·3 mm.

This species comes very close to *Tadunia oakesi* of the Abor Hills, but is more conical in form and flatter on the base. For this reason I take the opportunity of describing it here. It is No. 392 of the Beddome collection, and was collected for Colonel Beddome by Mr. Muspratt who was in the Assam Police, after whom it is named and who discovered many interesting new species principally in the Eastern Naga Hills.

Bapuia, gen. nov.

Shell globose, thin. Animal with both right and left shell lobes and short lobe above the mucous gland; peripodial margin broad. Amatorial organ present in the genitalia, no coiled caecum at the retractor muscle of the penis; spermatheca short, globose. In radula the marginals are curved and aculeate. Jaw straight in front with a central projection.

The name is derived from the Peak of Bapu, 6290 ft. in height, and a trigonometrical station which dominates Rotung and Renging lying on the banks of the Tsanspu River on the North.

Type: B. rengingensis, n. sp.

Bapuia rengingensis, n. sp.

(Plate li, figs. 8, 8*a*; pl. liv, figs. 4, 5.)

Locality.—Renging, No. 6134 (*S. W Kemp*).

Shell flatly globose, flat on base, perforate; sculpture strong regular striation, stronger below the suture; colour dark ochraceous; spire low, apex flatly convex; suture shallow; whorls 5, rapidly increasing; aperture broadly lunate, subvertical; peristome thin; columellar margin subvertical.

Size: major diameter 12·25, minor 11·0, alt. axis 3·5 mm.

There are two specimens, one in spirit with no number, which I used for dissection, neither are quite mature. The species closely resembles *M rotungensis*, but the shell is not so closely wound.

Animal (pl. liv, fig. 5): foot indistinctly divided, lobe over the mucous gland well developed; a good-sized right shell lobe low down below the periphery, and a long narrow left shell lobe. The animal is pale coloured with a black band from rectum on edge of mantle, which gradually merges into fine black spots. I was unfortunate with the genitalia, particularly as this was the only specimen. The penis was broken and could not be put together with certainty. The amatorial organ was clearly made out, also the spermatheca which is short and globose.

The jaw is straight in front with a central projection not very convex above, and not unlike that of *Khasiella dinoensis*, n. sp. Central tooth and admedians of usual form, but the marginals are noticeable, being long, curved and scimitar-shaped, an important character. The dental formula is 22.7.1.7.22 or 29.1.29 No transitional teeth, the seventh admedian is followed by a curved unicuspid tooth.

This radula in the form of the teeth is similar to that of *M.? beata*, G.-A., from the Dafla Hills (shell figured in *Moll. Ind.*, plate cviii, figs. 1, 1*a*, 1*b*). This locality is interesting being not far distant, 150 miles to the west. The shell lobes also are similar (vide *Moll. Ind.*, p. 263, plate cxxv, figs. 6*b*, 6*c*), and the jaw is of the same type, not arched but straight in front. Neither in *beata* were the generative organs seen entire, only the amatorial organ. There is consequently a doubt regarding the male organ, judging from the broken parts of it, of which I made careful drawings, there was no sign of the coiled caecum, a typical character and always present in true *Macrochlamys*. In consideration of this and the teeth of the radula it cannot be placed in that genus. If anatomy is to prevail in classification and the great variation in more than one internal organ be considered of greater weight than mere shell form, a new sub-genus is a necessity.

Rotungia, gen. nov.

Shell globose, thin and membranaceous, last whorl ample, subangulate on the periphery, much flattened above and excavated, whorls rapidly increasing. Animal: linear mucous gland, right and left shell lobes present. Extremity of foot on the dorsal side much flattened and leaf-like, a central groove with lobes on right and left.

Radula like *Macrochlamys*.

Generative organs: penis simple with short flagellum, spermatheca short, amatorial organ large.

Type: R. williamsoni, n. sp.

Rotungia williamsoni, n. sp.

(Plate li, figs. 5, 5*a*; pl. liii, figs. 1-5.)

Locality.—Upper Rotung, Abor Hills, 6-i-12, No. 5934-37 (*S. Kemp*).

Shell very thin, horny, smooth and shining, imperforate, flatly globose; sculpture: on the flat large whorl above are indistinct transverse regular lines of growth; colour ochraceous brown with a golden sheen when animal fills the shell; spire very flat, apex scarcely raised above the last whorl; suture deeply depressed, excavated; whorls 5, apex closely wound, increasing rapidly, periphery sinuately rounded, flattened next the keel above it, which commences on the 3rd whorl; aperture broadly ovate, sub-

vertical; peristome thin; columellar margin nearly vertical, then suddenly oblique, not reflected.

Size: major diam. 15·0 mm. (specimen dissected and also of typical spirit specimen).

,, ,, ,, 12·8 mm. (No. 5999, 7-i-12, small).

Mr. Kemp thus describes the living animal.

"Gastropod C" 7—9-i-12. "Shell with upper part of each "whorl flattened. Under leaf-stems of plantain, very scarce. Shell, "when animal is extended, beautifully marbled, owing to the "body-colouring showing through. For the most part black with "large flecks of pale buff and maroon, some of the flecks on the "inner whorl having a yellowish tinge. Anterior part of the "animal of a colour similar to B (described as *Sarama kempi* G.-A.), "with similar arrangement of granules, but the ground colour is "greyish and not so pale as in that species. Eye-stalks dark grey "with a bluish tone. Mantle lobes dark rich sepia closely flecked "with pale buff. Hind part of foot much flattened, square in "section; beneath the shell pale with minute orange-brown flecks. "Further back the colouring is a curious mixture of orange-brown "flecks and dull dark purple. In general effect the hind-body is "dull purple with pale dull orange, brown in the median line and "a tinge of the same colour at the sides. Under surface of foot "dull maroon, greyish in front and more crimson behind. Dorso-"lateral margin of the sole of the same colour as the sole with in "addition very minute white flecks; a dark grey dividing line be-"tween this margin and the upper part of the body."

This is certainly the most interesting species discovered by Mr. Kemp in the Abor Hills, both as regards the animal and the shell, and it is the type of a new genus. I name this species in honour and in memory of Mr. Noel Williamson of the Indian Civil Service, who lost his life (30th March, 1911) penetrating into wilds of the Abor country, keen on their exploration and the desire of getting on friendly relations with the tribesmen. Williamson had already distinguished himself as a pioneer on the frontier in this way further to the East on the Lohit or Zellu River towards Rema in 1907-08, when he made a good plane table survey of the country, and wrote an interesting account published in the "Geographical Journal," Octr. 1909. I was in correspondence with but never had the pleasure of meeting him. His murder led to the expedition up the Tsanspu, to the subjection of the Abors, and the accurate mapping by the officers of the Indian Survey of a vast area of unknown country in this part of the Eastern Himalaya, while the zoological collections have proved of extraordinary value and interest. I have named the new genus "*Rotungia*" after the village in which it was found, also because the men of Rotung had a large share with the men of Kebang in the massacre of the Civil Officer and all the party.

Animal: foot elongate, narrow when extended, with an indistinct central area on the sole. A long overhanging or curved

lobe above the mucous gland having a vertical narrow slit. The peripodial margin is well marked with the usual two parallel grooves above it, from which 5 lateral distant grooves run upwards to the dorsal ridge of the foot and meet in a central main groove. The extremity of the foot is bluntly keeled but only for a short distance, it then flattens out very broadly from the central groove above mentioned, the posterior part of the shell resting upon it. This wing-like expansion is bordered on both sides by four, well developed, contiguous, fleshy, pale coloured protuberances (plate liii, figs. 2 and 4), a very conspicuous and novel character in this subfamily and one intimately connected with the segmental divisions of the foot, which usually meet on the keel for its whole length.

The right shell lobe (plate liii, fig. 3) is fairly large, broad at its base and narrowing to a fine point and lays up on the under side of the body whorl. The left shell lobe (pl. liii, fig. 2) is narrow and long; the right dorsal lobe fairly large, the left in two distinct parts and the anterior the shortest.

Generative organs. A large amatorial organ is present, thickened considerably at the distal end, the dart is muscular. The penis is a simple tube terminating in an oval mass which is indistinctly spiral and on the side of which the retractor muscle is attached. The flagellum is short and somewhat thick. The spermatheca is also short and elongately oval in form. The radula is quite like that of *Macrochlamys*, with a formula 52.14.3.1.3.14.52 or 69.1.69.

The central tooth and admedians elongate and sharp-pointed, the marginals all bicuspid.

The shell of this species is of striking and unusual shape, but the character possessing the greatest interest is the wonderful development of the foot. Looking for similar evolution in this part of the animal in terrestrial molluscs, we find in true *Helicarion helenae* from Sydney introduced there from Queensland something similar. The dorsal side of the foot is flattened out, with a central groove running down it (vide *Moll. India*, vol. I, pl. xli, fig. 4).

In *Pseudaustenia ater*, G.-A., of Southern India (*Moll. Ind.*, vol. I, pl. lvii, figs. 1, 1*b*), the hinder part of the shell rests between fleshy wings, with, in this case, straight and sharp, not a serrate edge, a bifurcation of the keel. This particular development of the hinder part of the foot may be termed "the segmental lateral processes," in contradistinction to "segmental central processes," as seen in the foot of *Helicarion idae* of Drs. Paul and Fritz Sarasin in their fine work: "Die Land Mollusken Von Celebes," p. 121, plate xvii, fig. 151; in this case the spiked edge is produced by the elongation of epidermal granules.

The genus *Eurypus* of Semper is distinguished by its peculiar foot (*Reisen Archi. d. Philippinen*, pl. i, figs. 16 and 17), shown respectively in *E. cascus* of Viti, and *E. similis* of Fiji. Unfortunately the figures are so small, it is difficult to make out the exact form. Interesting modification of foot structure in the mollusca

is met with in other and very distinct families, for instance in *Streptostele* (*Elma*) *nevilli* var. *dubia*, Von Martens and Wiegmann in *Mitt. Zoolog. Samml. Berlin*, 1898. They describe and figure the foot, flattened out above in a manner somewhat similar but not quite the same as in the Abor mollusc, a form of foot they designate as "*fuss wulst.*"

Recently Mr. Guy C. Robson has described and figured an interesting shell from Madagascar (*Jour. Linn. Soc.* vol. XXXII, p. 382, pl. xxxv, figs. 11, 12, 13), for which he has created a new genus *Bathia*, type *madagascariensis*, Robson. It has a remarkable resemblance to this Abor shell in the flat apex, particularly when viewed from above, but a great difference is seen when looked at in front in the far larger aperture of the Abor mollusc, an indication of a very different animal to the one which would occupy the narrow whorls of *Bathia*. Mr. Robson associates the Mauritian species *praetumida* with *Bathia*.

Khasiella? dinoensis, n. sp.

(Plate li, figs. 12, 12*a*; pl. liv, figs. 1-3.)

Locality.—Dino, Abor Hills (*Capt. G. F. T Oakes, R.E.*).

Shell imperforate, flatly conoid, shiny on base, membranaceous; sculpture fine transverse striation above, with irregular wavy ridges of growth under a high power; colour dark ochraceous; spire depressedly conic, sides flat, apex blunt; suture shallow; whorls 5, subangular on the periphery, regularly increasing; aperture lunate, subvertical; columellar margin scarcely reflected.

Size: major diameter 9, alt. axis 4·5 mm.

There were three specimens, the largest about 10 mm. in major diameter was dissected and was an immature shell. It is difficult to say what genus this species should be placed in. "*Khasiella*" seems the most appropriate, looking at the shell characters. More specimens are required to settle this.

Animal. The visceral sac quite plain, a pale ash colour, only some short and long black streaks, in the second specimen these took the form of regular dots on the branchial cavity with a black line along the side of the rectum. *Shell lobes are absent*, the dorsal lobes and all up to the mantle edge a very dark brown, in sharp contrast to the pale colour of the visceral sac The foot (pl. liv, fig. 3) is short, pointed, folded along the centre of the sole (pl. liv, fig. 2) and segmented. The mucous gland is small and much hidden by the contraction of the animal and might be considered absent at a cursory glance, but the drawings I give will show it is present.

The radula has the central and admedian teeth with a cusp low down on the outer side as usual, the marginals are nearly evenly bicuspid, arranged thus 25.2.12.1.12.2.25 or 39.1.39.

Jaw (pl. liv, fig. 1) solid, rather straight in front with a prominent central projection.

Oxytes oglei, n. sp.

(Plate lii, figs. 1, 1*a*, 1*b*.)

Locality.—Upper Assam, near Sadiya (*M T Ogle*).

Shell lenticular depressed, very openly umbilicated, solid; sculpture close rather coarse ribbing, more distant on base and much smoother; colour dull ochraceous; spire flatly conoid, sides flatly convex, apex rounded; suture linear; whorls 5, regularly increasing, flat; aperture subquadrately lunate, oblique; peristome well thickened below together with the columellar margin which is suboblique.

Size: major diameter 41·0, minor 34·0, alt. axis 12·75 mm.

This species was found and sent to me by Mr. M. Ogle when he was surveying in the neighbourhood of Sadiya and towards Brahmakund. Compared with typical *Oxytes oxytes* from the S.W. Khasi Hills it can be distinguished at once by the more open and excavated umbilicus. When compared with *O. oxytes* of the Dafla Hills this difference in the umbilical region is still more marked.

It may be distinguished from *O. cycloplax*, Bs., from Darjiling, with which I have compared it with specimens in the Blanford collection, in the open umbilicus and general shape. It is however larger, darker coloured, higher in the spire, more sharply keeled and there is absence of the peripheral band, visible both externally and internally in *O. cycloplax*. It is also deeper below the keel, making the aperture larger.

Oxytes oglei, n. sp., var.

(Plate lii, figs. 4, 4*a*, 4*b*.)

This variety was found by Mr. S. Kemp at Kobo on the Brahmaputra. The specimens are rather small, maj. diam. 39·0 mm. Finer specimens were sent me by Captain Oakes, from the foot of the hills near Bapu, H.S. The largest measures major diameter 43·5, minor 37·5, alt. axis 14·8 mm. The variation lies in the sculpture which is finely decussate both above and below, fine solid shells.

Young shells of this species are very difficult to determine for they have such a different shape to those fully grown. The following is a description of one collected by Captain Oakes with three others, and put up together.

Locality.—Abor Hills (*Capt. G. F. T Oakes, R.E.*).

Shell openly umbilicated, very depressedly conoid, sharply keeled; sculpture strongly decussate; colour dark umber brown; spire low, flatly conoid, apex obtuse; suture somewhat shallow; whorls 5, flat above; aperture semiovate, oblique; peristome thin; columellar margin oblique.

Size: major diameter 20·0, minor 17·5, alt. axis 7·0 mm.

Oxytes aborensis, n. sp.

(Plate lii, figs. 2, 2*a*, 2*b*.)

Locality.—Between Silli and Dukku, Yamne Valley, 2000 ft.; Rotung, No. 3121 B.M. coll., young, with 5 whorls (*Capt. G. F. T Oakes, R.E.*).

Shell very depressedly lenticular, more convex below than above, openly umbilicated, fragile, very sharply keeled; sculpture very finely and closely decussate, oblique to the whorl; colour rich ochraceous; spire very flatly conoid, apex flatly rounded; suture linear; whorls 6, regularly increasing; aperture oblique, semilunate, upper margin sinuate and descending; peristome thin; columellar margin subvertical.

Size: maj. diam. 31·25, minor 27·0, alt. axis 7·0 mm.

,, ,, ,, 24·0, ,, 20·75 ,, ,, 6·0 ,, (small var. of 5 whorls).

This species (all immature) was also collected by Captain Oakes at the furthest point he reached on the Dihang R. (Siang of the Abors) near where the Sigon R. joins it, and between Long. 94°55′ and 95°15′ and Lat. 29° and 29°15′ The keel is slightly compressed on both sides and the shell is duller in colour.

This species recalls *O. blanfordi*, Th., from Darjiling, but the umbilicus is much wider and open and the sculpture is finer in the Abor shells.

In general form it is similar to *O. pollux* of the Khasi Hills, but openly umbilicated. It is very close to *O. shanensis*, G.-A., of the Shan States, types in the Blanford collection (36.06.3.3 B.M. coll.), collected by Mr. Feddon of the Geological Society. The Abor shell is more openly umbilicated, sharper keeled and the sinuate margin of the peristome between suture and keel is very distinctive.

Oxytes siyomensis, n. sp.

(Plate lii, figs. 3, 3*a*, 3*b*.)

Locality.—Siyom Valley, Abor Hills (Long. 94° 40′ and Lat. 28° 30′) high up (*Capt. Oakes, R.E.*).

Shell openly perspectively umbilicated, rather solid, lenticular depressed, sharply keeled; sculpture fine close transverse striation, on base close pitting; colour bleached in type, pale umber in a second specimen; spire fairly high, apex rounded, sides flatly convex; suture linear; whorls 5, regularly increasing; aperture semilunate, subvertical; peristome: upper margin sinuate, compressed towards keel so as to be concave, lower margin oblique.

Size: major diameter 25·0, minor 21·5, alt. axis 7·0 mm.

This differs from *O. aborensis*, a close ally, in being more solid and not so extremely flat. A smaller specimen from the same valley has the peristome much thickened. Major diam. 24·0, alt. axis 6·8 mm.

Bensonia? aborensis, n. sp.

(Text-fig. 1.)

Locality.—Yamne Valley, Abor Hills (*Capt. G. F. T Oakes, R.E.*).

Shell perforate, depressedly conoid, flattened both above and below; sculpture rather close transverse lines of growth; colour rich dark umber brown, narrowly black on peristome, internally very white, with a callous on the inner side of the body whorl; spire much flattened, apex showing just above the last whorl; suture well impressed; whorls 6, regularly increasing, well rounded on the periphery, seasonal arrest of growth and hybernation is shown by black transverse stripes of old apertures; aperture subvertical, semilunate; peristome moderately thickened; columellar margin oblique.

Size: major diameter 40·05, minor 36·0, alt. axis 14·5 mm.

The generic position of this shell, a single specimen, is very doubtful; its form and colouration is very noticeable. I had asked Captain Oakes to put up living specimens he came across in bamboo tubes, "choongas" as they are called in Assam. They must be cut green and are easily made. A bamboo of suitable diameter being selected 5 or 6 inches in length is simply cut off at a knot and plugged. Specimens alive travel better in this than in any box. In this instance many specimens were living when the tube reached me by post. Unfortunately not enough moss had been put in and the prisoners had suffered in consequence, the helicoids most and among them this single shell of which the animal had recently died and was unfortunately not in a state to see anything of its anatomy, not even the radula. I place it in *Bensonia* with considerable doubt, but it is the nearest genus I can think of. It is such a remarkable shell, it will not be long before it is found again by the first naturalist who may visit the valley of the Tsanspu.

Pseudokaliella annandalei, n. sp.

(Plate lii, figs. 5, 5*a*, 5*b*.)

Locality.—Abor Hills, exact locality not stated (*Capt. G. F. T. Oakes*).

Shell lenticular, fragile, very openly umbilicated, fringed on the sharp keel, each fringe is a triangular sharply pointed layer of epidermis; sculpture finely decussate, irregular transverse, fine ribbing, crossed by fine close-set longitudinal striae, this is finer on the lower side; colour ochraceous; spire flatly convex, low; suture linear; whorls 6, very regularly increasing, flat above, the last arcuate above at aperture; aperture widely lunate, oblique; peristome thin, sinuate on upper margin, reflected slightly but decidedly on the lower; columellar margin oblique.

Size: major diameter 17·0, minor 15·25, alt. axis 4·75 mm.

Only two specimens of this very beautiful species were found, and one is immature. I name it in honour of Dr. N. Annandale, Director of the Zoological Survey of India, to whom I am very much indebted for valuable assistance in procuring species of Mollusca from many parts of India, and who since he has been in charge of the collections has raised the zoological work in India both in Vertebrates and Invertebrates to a high standard of excellence.

We do not know at all the position of this genus founded on shell characters. This particular species except for the very open umbilicus is very similar, especially in the aperture, to *Oxytes aborensis*. Now that the number of species is increasing in this genus, it is a desideratum to obtain and examine the animal of one so large as this. Although *P. nevilli* was quite abundant among material from Sikhim preserved in spirit, in no single instance could I find one that still contained the animal.

Pseudokaliella? sadiyaensis, n. sp.

Locality.—Sadiya (*M Ogle*).

Shell scarcely perforate, flatly turbinate, sharply keeled; sculpture fine, close regular costulation above, decussate below; colour dull ochraceous; spire flatly conic, apex subacute; suture shallow; whorls 5, regularly increasing, not fully grown; aperture semilunate, rather large for size of shell; peristome thin; columellar margin oblique.

Size: major diameter 7·0, alt. axis 3·25 mm.

There is only one example of this shell, its generic position is very doubtful. As it comes from Sadiya, a large and easily accessible station, it will I trust sooner or later be found again.

Rahula aborensis, n. sp.

(Text-figs. 2 A, B.)

Locality.—Sibbum, Yamne Valley, Abor Hills, 3 specimens (*Lt. G. F. T Oakes, R.E.*).

Shell deeply umbilicated, border sharply defined, trochiform, base flat; sculpture quite strongly and distantly costulated, smooth on base, angular on periphery, with a well marked lirate edge; colour pale ochraceous; spire high, sides slightly convex, apex blunt; suture impressed; whorls 6, sides convex; aperture small, narrowly quadrate; peristome thin, angulate on the lower outer margin.

Size: major diameter 3·5, alt. axis 2·5 mm.

The strong costulation, convex sides, and small aperture distinguishes this from all forms at present known. From Sibbum there was also a single specimen more globose than *R. aborensis*, with no keel but with the costulation extending to the basal side somewhat as is seen in *R. dihingensis*. Most unfortunately this shell was broken after being photographed and can only be thus briefly recorded.

Rahula dihingensis, n. sp.

(Text-fig. 2 D)

Locality.—Dihing Valley, Eastern Assam (*M. Ogle*).

Shell globosely conoid, openly perforate, rounded on the periphery; sculpture regular costulation, well marked, extending to the under side; colour very pale ochraceous; spire conoidal, apex rounded; suture impressed; whorls 6, regularly increasing; aperture semilunate; peristome slightly thickened, columellar margin suboblique.

Size: major diameter 4·0, alt. axis 2·3 mm.

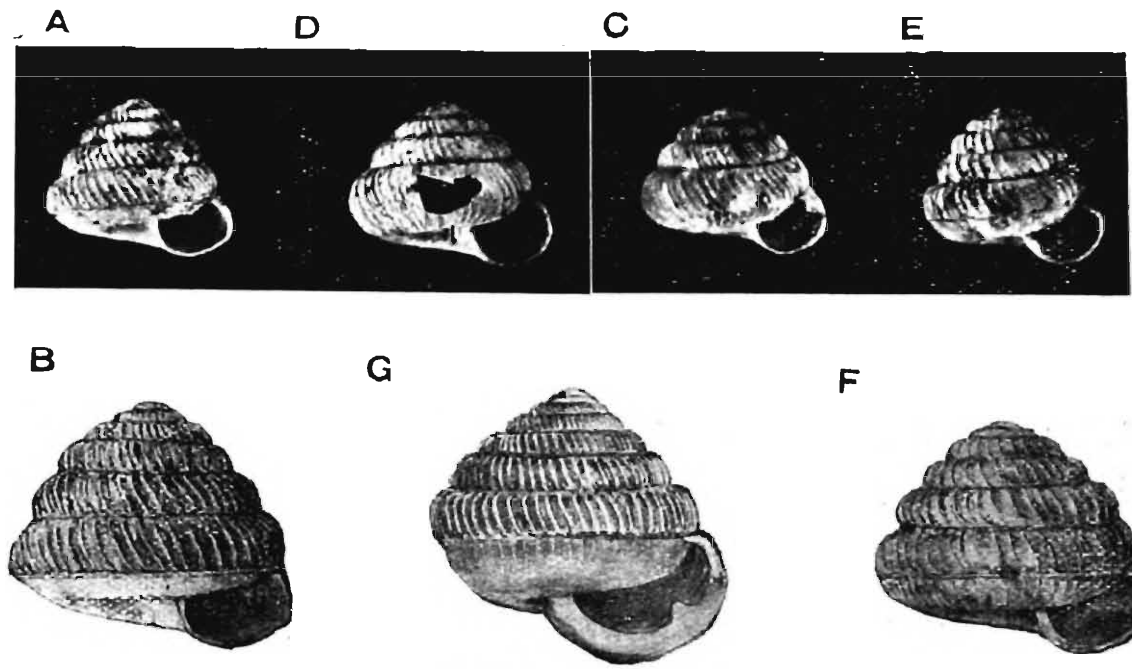


FIG. 2 A.—*Rahula aborensis*, n. sp. × 5.
,, 2 B.— ,, ,, × 8.
,, 2 C.— ,, *koboensis*, n. sp. × 5.
,, 2 D.— ,, *dihingensis*, n. sp. × 5.
,, 2 E.— ,, *burrailensis*, n. sp. × 5.
,, 2 F.— ,, ,, × 7.
,, 2 G.—*Sesara globosa*, n. sp. × 4.

Two specimens were obtained. I take the opportunity of describing and figuring this species, as the habitat is contiguous to the Abor Hills, although south of the Brahmaputra Valley.

Rahula burrailensis, n. sp.

(Text-figs. 2 E, F.)

Locality.—Yemai, Lahupa Naga, N. E. Manipur (*Godwin-Austen*).

Shell globosely turbinate, openly perforated; sculpture strong distant costulation, extending to the basal side; colour stony white; spire moderately high, apex blunt, sides very slightly converse; suture impressed; whorls 6, sides convex, rounded on the

periphery which is marked by a raised fine line; aperture semilunate, vertical; peristome simple, very slightly inflected on the columellar margin; collumellar margin oblique, thickened.

Size: major diameter 3·4, alt. axis 2·4 mm.

This a single specimen is very close to *R. munipurensis*, but it is not so broad and the base is more conoid and flatter on the apex Being also close to the Abor *Rahula* I introduce it here.

Rahula koboensi, n. sp.

(Text-figs. 2 C; 3 A-C.)

Locality.—Kobo, on the north bank of the Brahmaputra River, December, 1911; 2 specimens only in spirit found broken (*S. W Kemp*). No. 5930, *Ind. Mus.*

Shell (fig. 3 A) globose, apical whorls not seen; sculpture: costulation on last whorl distant, strong, sinuous, oblique, terminating on the periphery, which has no keel, on basal side costulation also occurs equally strong; colour pale ochraceous; whorls: the last well rounded at the periphery.

Major diameter 2·5 mm.

This species is distinguished at once from *R. aborensis* by the well rounded last whorl, and the absence of the lirate keel, shown in the photograph made of it. It is one of the most interesting molluscs obtained by Mr. Kemp. The animal of this genus had never been preserved before. Of the two specimens the first examined was imperfect, the head had been destroyed apparently by some predaceous insect, with the second I was more fortunate.

Animal white, spotted and banded distantly with black on the visceral sac (fig. 3 C). In the second specimen this was much closer together. Foot short, mucous pore at extremity of foot distinct, and a broad peripodial margin.

Generative organs were not got out satisfactorily. More than two specimens are required for an animal so small as this

Radula (fig. 3 B), centre tooth on a narrow elongate plate, tricuspid, the centre one well developed; admedian also elongate with a single small cusp on the outer side; marginals noticeable by being tricuspid, the shortest cusp on the outer margin, the centre the longest. The formula is 30.1.7.1.7.1.30, or 38.1.38. The number of marginals is only approximate, they are on the outer side very minute and clustered together; being a unique specimen it was not safe to try and spread them.

Jaw (fig. 3 B) rather straight in front with a subdued central projection.

Sesara globosa, n. sp.

(Text-fig. 2 G.)

Locality.—Between Renging and Rotung (*S. W Kemp*). No. 6129, *Ind. Mus.*

Shell imperforate, globosely conoid, solid; sculpture smooth below, very strongly costulated above, but not on the apex; colour pale ochraceous; spire high conic, side flat; suture impressed; whorls 8, very closely wound, convex; aperture narrowly lunate; peristome strongly thickened, with a single strong tooth on the lower outer margin; columellar margin very oblique.

Size: major diameter 7 0, alt. axis 5·0 mm.

The single specimen found by Mr. Kemp has been figured and is the type; three other examples were sent me by Captain Oakes of this very beautiful species.

It would be very interesting to see the animal of this species.

[The blocks for figs. 1 and 3 (of *Bensonia aborensis* and *Rahula koboensis* respectively) have apparently been lost in transit and cannot therefore be utilized in the present instalment of Col. Godwin-Austen's account of the Abor Molluscs. It is hoped that arrangements may be made for their reproduction in a later instalment.—*Ed.*]

EXPLANATION OF PLATE LI.

FIGS. 1, 1*a*.—*Macrochlamys bapuensis*, n. sp. × 1·5.

,, 2, 2*a*.— ,, *shimangensis*, n. sp. × 1·5.

,, 3, 3*a*.— ,, *hippocastaneum*, n. sp. × 1·5.

,, 4, 4*a*.—*Sarama kempi*, G.-A. (described *Rec. Ind. Mus.* Vol. VIII, pp. 362-63, 1914). × 1·5.

,, 5, 5*a*.—*Rotungia williamsoni*, n. sp. × 2.

,, 6, 6*a*.—*Macrochlamys psittacinus*, n. sp. × 1·5.

,, 7, 7*a*.— ,, *rotungensis*, n. sp. × 2.

,, 8, 8*a*.—*Bapuia rengingensis*, n. sp. × 2.

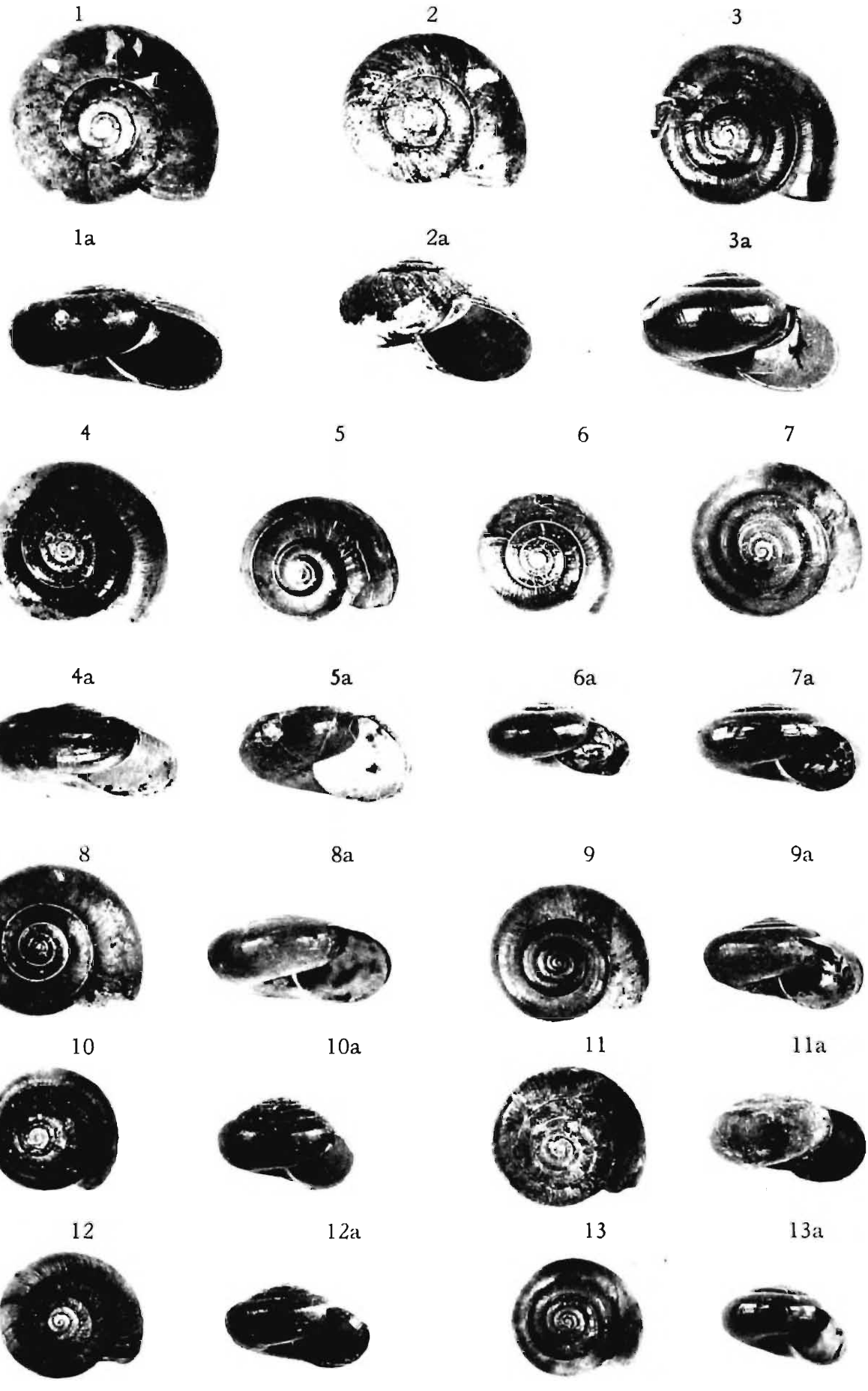
,, 9, 9*a*.—*Macrochlamys hardwickei*, G.-A. var. *politulus*, G.-A. × 1·5.

,, 10, 10*a*.—*Tadunia oakesi*, n. sp × 2.

,, 11, 11*a*.—*Macrochlamys? luyorensis*, n. sp. × 2.

,, 12, 12*a*.—*Khasiella? dinoensis*, n. sp. × 2.

,, 13, 13*a*.—*Macrochlamys burkilli*, n. sp. × 2.

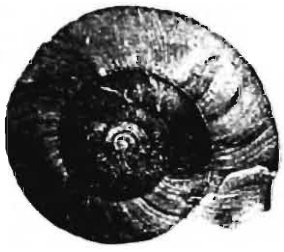


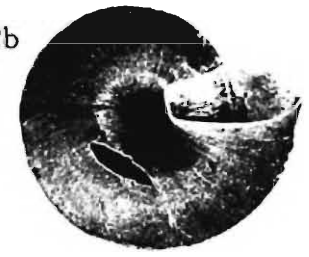
J. S. Gladstone. Photo. Watford Engraving Co. Ltd

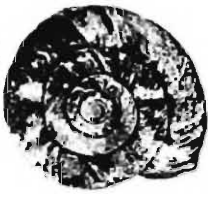
ABOR MOLLUSCA.

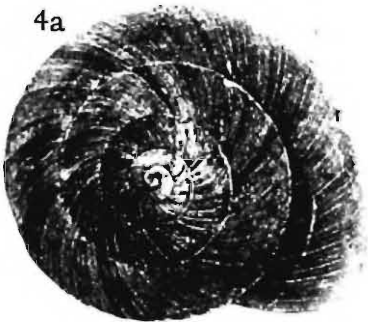
EXPLANATION OF PLATE LII.

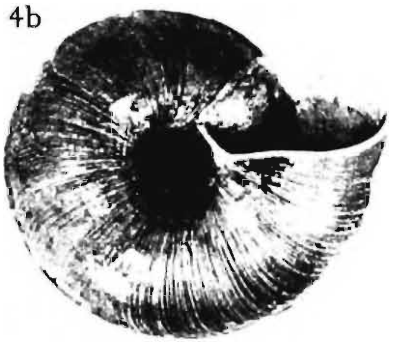
FIGS. 1, 1*a*, 1*b*.—*Oxytes oglei*, n. sp., nat. size.
,, 2, 2*a*, 2*b*.— ,, *aborensis*, n. sp., nat. size.
,, 3, 3*a*, 3*b*.— ,, *siyomensis*, n. sp., nat. size.
,, 4, 4*a*, 4*b*.— ,, *oglei*, n. sp., var., nat. size.
,, 5, 5*a*, 5*b*.— *Pseudokaliella annandalei*, n. sp. × 1·5.

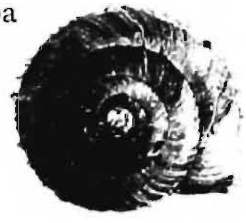












S. Gladstone. Photo.

Watford Engraving Co. Ltd.

ABOR MOLLUSCA.

EXPLANATION OF PLATE LIII.

Rotungia williamsoni, n. sp.

FIG. 1.—Shell, front view. × 4·5.

,, 2.—Animal, the left side, showing protuberances on keel of the foot. × 2.

,, 3.—Animal, view of right front side, showing the right shell lobe and dorsal lobes. × 2.

,, 4.—Dorsal view of extremity of the foot. × 4·5.

,, 5.—Generative organs. × 6.

Macrochlamys hardwickei, G.-A. var. *politulus*, G.-A.

FIG. 6.—Generative organs, the penis is drawn twice to show the flagellum. × 4·5.

,, 7.—The edge of the visceral sac, right and left sides, showing the shell and dorsal lobes. × 4·5.

Macrochlamys albulus, n. sp.

FIG. 8.—Animal, right and left sides, showing shell lobes. × 4·5.

,, 9.—Jaw. × 30.

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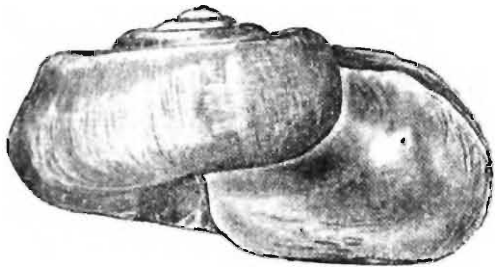

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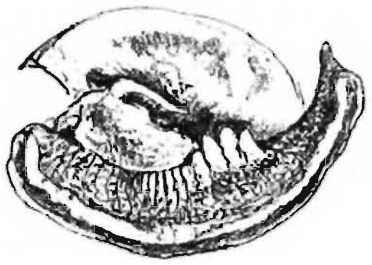

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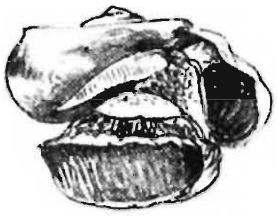

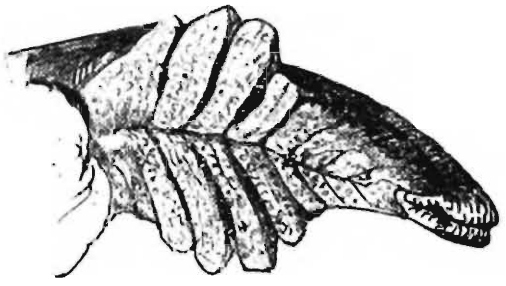

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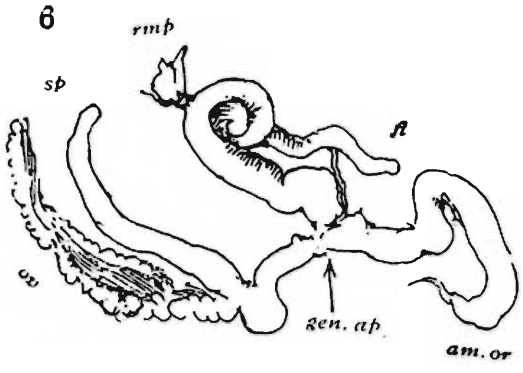

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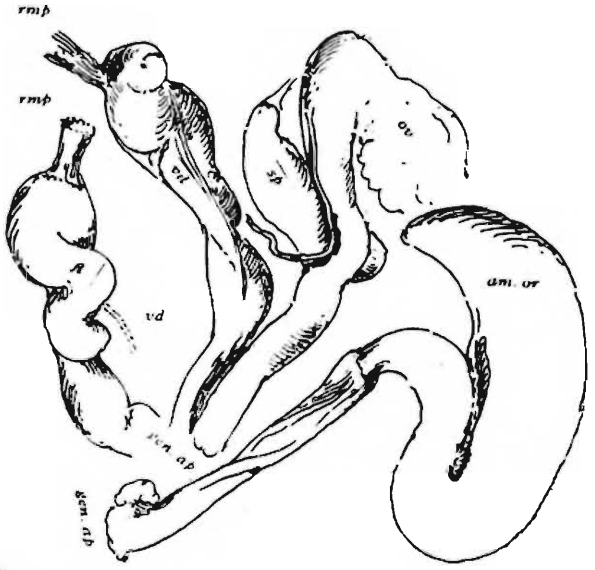

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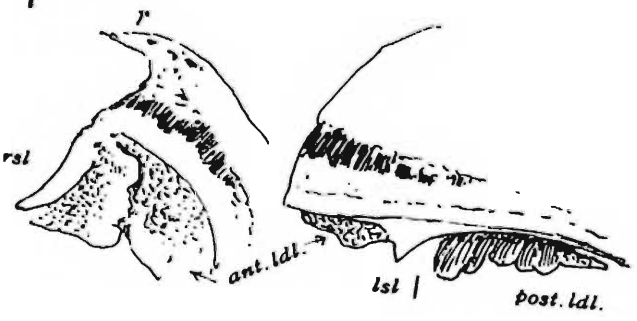

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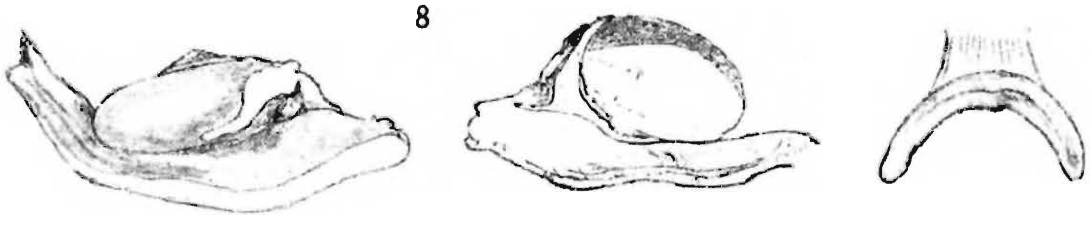

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EXPLANATION OF PLATE LIV

Khasiella ? dinoensis, n. sp.

FIG. 1.—Jaw. × 30.

,, 2.—Sole of foot, contracted in spirit specimen. × 4·5.

,, 3.—Extremity of the foot. × 12.

Bapuia rengingensis, n. sp.

FIG. 4.—Jaw. × 24.

,, 5.—Edge of mantle with left shell lobe and extremity of foot. × 4·5.

Macrochlamys rotungensis, n. sp.

FIG. 6 —Generative organs. × 8.

,, 7.—Portion of spermatophore.

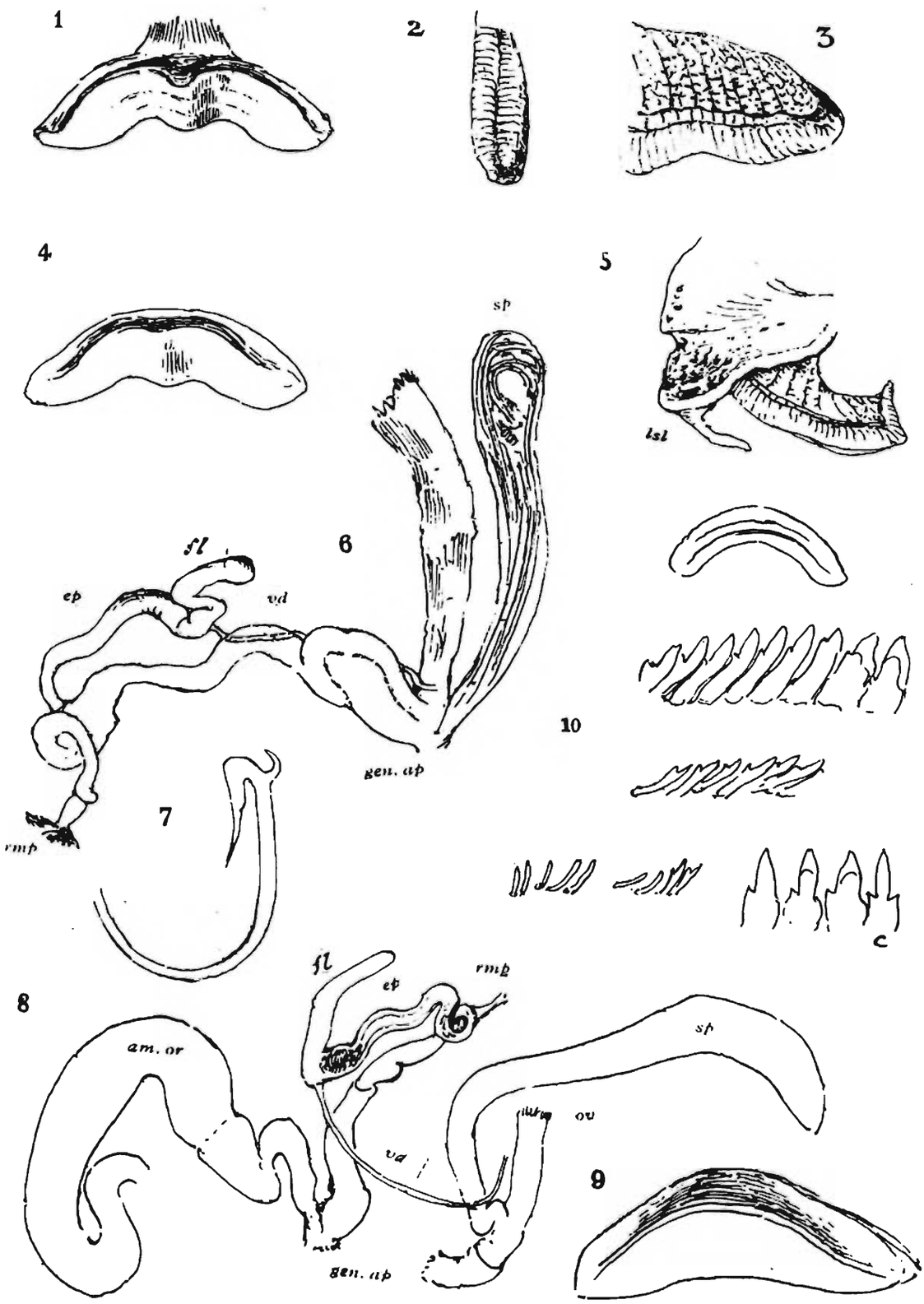
Macrochlamys burkilli, n. sp.

FIG. 8.—Generative organs. × 8.

,, 9.—Jaw. × 58.

Macrochlamys rotungensis, n. sp., var.

FIG. 10.—Jaw, × 24, and teeth of radula in different parts of the row, × 360.



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