

very difficult to shoot. I found two nests. One was placed in the roots of a large upturned pine, and was globular with entrance at the side. It was profusely lined with feathers and composed of moss and fibres. The eggs were white, sparingly and minutely spotted with red; rather oval in shape, measuring .66 by .5. A second nest was placed in the thick foliage of a moss grown fir tree, and was about 7 feet above the ground. It was similarly composed to the other nest, but the eggs were rounder, and plain white, without any spots.

NOTES ON BARMESE AND ARAKANESE LAND SHELLS, WITH DESCRIPTIONS OF A FEW SPECIES,—by W. THEOBALD, ESQ., and DR. F. STOLICZKA.

(Received and read 7th August, 1872.)

(With plate XI.)

The accompanying notes were suggested by the recent discovery of several new species of landshells, chiefly in the Arakan hills and in the neighbourhood of Moulmain. In addition to these a few species were found which proved to be identical with those formerly described from Sikkim, the Khasi hills, and Upper Pegu; the slight variations and the geographical distribution of these species will be noticed in connection with the descriptions of the new species.

CYCLOSTOMACEA.

RAPHAULUS PACHYSIPHON, n. sp. Pl. XI. Fig. 1.

R. testa cylindraceo ovata, anguste perforata, solida, fusca; spira obtusa, apice ad latus inclinato, excentrico; anfractibus $5\frac{1}{2}$ convexiusculis, transversim confertissime striolatis, ad suturam simplicem adpressis; anfractu penultimo sensim, ultimo valde, descendente, primo supra aperturam deplanato, altero ad suturam paulo constricto, ad basin convexiusculo; apertura fere verticali, circulari, peristomate pallide fucescente, plane expanso atque crasso, supra ad anfractum penultimum labio attenuato et fere horizonli adnato, postice (aut supra) ad suturan tubulo crasso, deflexo instructo. Long. 12.6, lat. anf. penult. 7.6, diam. apert. cum perist. 6.2, apert. int. 3.6 m.m.

Hab. Prope Moulmain, valle Ataran fluminis.

A rare and very distinct from any of the other known species by its distorted spire and externally bent down sutural tube. The figures 1 and 1a are of the natural size, 1b and 1c are the corresponding figures, enlarged twice the natural size.

Genus, ALYCÆUS.

Of this genus several species were found which were previously only known to occur in Sikkim, and in the Khasi and Garo hills. *A. pusillus* was met with at Nattoung in the Mendon district, Pegu; *A. urnula*, and a small variety of *A. Ingrami*, at Mai-i in the Arakan hills; *A. crispatus* at Maianoung and near Moulmain; at this last named locality also occurred a large, red-lip'd variety of *A. urnula*, and several specimens of *A. Richthofeni*, the shells slightly vary in the height of the spire, but all are of exactly the same character.

ALYCÆUS KURZIANUS, n. sp. Pl. xi. Fig. 2.

A. testa subglobose conoidea, late umbilicata, pallide rubescente; anfractibus 4, valde convexis, sublævigatis, transversim distanter obsolete costellatis, ultimo anfractu medio ambitus modice inflato, confertim costulato, tum valde constricto lævigatoque, in constrictione costâ obtusâ transversâ instructo, rursusque expansiusculo atque paulo deflexo; apertura magna, obliqua, subrotundata, supra obtuse angulata, infra anguste canaliculata; preritremate modice incrassato, duplici, externo paulum expanso, labro interno plicatulo, labio sublævigato. Diam. maj. specim. maximi 3.5, minor 3, alt. 2.7 m.m.

Hab. Nattoung in provincia Barmana, Prome dicta.

The peculiarly formed aperture with the lower canal and its internal plication on the outer lip readily distinguish this species from *A. polygona*, which besides differs by more rounded and higher whorls. Mr. Kurz brought some years ago a specimen of this interesting species from Pegu; more recently Mr. Theobald collected it near Nattoung in the Western Prome district. The measurements above given are those of one of the largest specimens.

Genus, DIPLOMMATINA.

Several remarkable varieties of formerly described species occurred with other known forms, both in Arakan and at Moulmain. Among these the following deserve special notice.

1. *D. sperata*, Blf., was found at Mai-i in the Sandoway district. It is a very rare shell.

2. *D. polypleuris*, Bens., occurs abundantly in the Sandoway district and at Nattoung, more rarely near Moulmain.

3. *D. olygopleuris*, Blf. Very fine specimens, measuring 3 m.m. in length and 1.5 m.m. in thickness, were collected on the Kumah hill in Arakan, and a solitary specimen was found at Baom, also in Arakan. The latter exactly agrees in form and size (length 2 m.m.) with typical Cachar specimens, but while in these the costulation generally becomes obsolete on the two last whorls, the same is well developed and comparatively slightly closer

on all the whorls of the Arakanese specimen; the difference is, however not sufficient to indicate a specifically distinct shell from the one above named.

4. *D. exilis*, Blf., was found on the limestone hills at Damotha and at the Farm-caves near Moulmein. Most of the specimens somewhat exceed in size those from Upper Barma; the costulation of the whorls also is a shade finer, though variable in different specimens, and the outer lip of the aperture a little more expanded; however, the general form, character and proportion of the whorls is exactly the same. One of the largest specimens measures: total length 3·2, diameter of penult. whorl 1, diam. of apert. with perist. 0·9 m.m.; it has nine whorls.

5. *D. nana*, described by Mr. W. T. Blanford from Pegu, also occurs near Moulmein; the specimens only are a trifle smaller than the type shell, but they are very distinctly transversely costulated.

6. *DIPLOMMATINA ANGULATA*, n. sp. Pl. xi. Fig. 3.

D. testa ovato elongata, dextrorsa, vix rimata, sordide albida, anfractu penultimo latissimo, apice obtusiusculo, pallide rubido, submammillato; anfractibus sex, primis duobus lævigatis, cæteris valde convexis, ad peripheriam plus minusve distincter angulatis, transversim confertissime costellatis aut acute striatis; ultimo basi contracto; sutura profunda, simplice; apertura late circulari, peristomate undique expanso, bilabiato, interno subrecto, ad marginem columellarem dente obliquo instructo, externo ad anfractum penultimum constrictum modice ascendente. Long. 2, lat. maxima 0·8, diam. apert. 0·6 m.m.

Hab. Prope Moulmain, provincia Martaban.

The peculiar angulation of the whorls, combined with the very close transverse costulation, or almost striation, and the proportionately large aperture readily separate this species from any other as yet known. Mr. Theobald obtained numerous specimens on the limestone hill near Damotha, and also south of Moulmain, together with *D. carneola*, Stol.

7. *DIPLOMMATINA RICHTHOFENI*, n. sp. Pl. xi. Fig. 4.

Dipl. testa ovate elongata, turrata, dextrorsa, albida, rimata; spira conoidea; anfractibus septem, convexis, ad medium subangulatis, sutura simplici junctis, penultimo ultimo latiore: primis duobus apicem formantibus lævigatis, cæteris transversim conferte costellatis, ultimo basi convexo, angustato, supra ad anf. penultimum ascendente; apertura parva, circulari, peristomate duplici: interno tubuliforme modice producto atque dilatato; labio ad basin dente obliquo et magno instructo. Long. 2·5, lat. maxima 0·8, diam. aperturæ 0·5 m.m.

Hab. Prope Moulmain; (testa rarissima).

A species closely allied to *D. angulata*, but more slender, with less distinctly angulated whorls, non-mammillated apex, with a slightly more distant costulation and with a comparatively smaller aperture.

Only the solitary figured specimen of this shell was obtained on the limestone hill at the so-called Farm-caves.

Genus, GEORISSA.

1. *Georissa Blanfordiana*, Stol., (J. A. S. B., 1871, vol. xl, pt. ii, p. 158, pl. vi, fig. 6,) described from a single specimen, occurred abundantly both at the Farm-caves and South of Moulmain. The type specimen is rather a young shell, which, when adult, attains a very distinct ovately conoid form, the whorls being in proportion somewhat less convex; the inner lip is strongly thickened. One of the largest specimens measures: total length 2·8, greatest width of the last whorl 2, height of aperture 2·2, its width 1 m.m.

When alive, the shell is rather deep succineous and semi-transparent; old specimens become white. The operculum is of the usual form, very thin, with a long internal process, pale coloured, becoming blackish towards the centre.

2. *G. Rawesiana*, Bens., also known from a single specimen, found at the Farm-caves near Moulmain, occurred in numerous examples on two limestone hills in the Ataran valley. The shell differs from *G. liratula** by a more conoid shape, particularly in the adult, and by a much finer spiral striation, there being on the penultimate whorl as many as seven or eight of these spiral striæ, while in *liratula* there are only five of them. Young specimens of both species are equally globose, and of a succineous structure. One of the largest specimens of *G. Rawesiana* measures: length 2·4, largest diam. 1·8, height of aperture 1, its width 0·8 m.m. In adults the fine sculpture wears off remarkably easily, and such specimens closely resemble *G. Blanfordiana*, but have the whorls more convex, and the aperture proportionately smaller.

3. *G. pyxis*, Bens., a species common about Prome, also occurs on the Kumah hill in the Sandoway district.

4. GEORISSA FRATERNA, n. sp. Pl. xi. Figs. 5 and 6.

G. testa cylindraceo conoidea, solidula, pallida, imperforata, regione umbilicali paulo impressa; anfractibus 3½, convexis, supra modice subtruncatis, sutura per-profunda junctis, spiraliter crasse liris, liris in anfractu penultimo quinque, supera a sutura remotiuscula; apice valde mammillato; ultimo anfractu spirâ brevior, basi convexiusculo, spiraliter

* J. A. S. B. vol. xl, pt. ii, 1871, p. 157, pl. vi, fig. 5.

striato ; apertura fere semicirculari, labro simplici, antice modice recedente, margine subobtusos instructo, labio recto, incrassato ; operculo testaceo, tenui, subdiaphano, paucispirato. Alt. testæ 1.4, diam. max. 0.95 m.m.

Hab. In valle fluminis Ataran, prope Moulmain.

Allied to *G. pyxis* in having the uppermost spiral ridge on the whorls somewhat remote from the suture, but the ridges themselves are stronger, the whorls somewhat less numerous, the apex very distinctly mammillate, and the entire form of the shell more slender and cylindrical. Only three specimens were discovered by Mr. Theobald.

The slight variation in the shape is indicated by the figures given of two specimens.

ACMELLA HYALINA, n. sp. Pl. xi. Fig. 7.

Ac. testa ovato conica, modice perforata, hyalina, sordide albida ; spira obtusa ; anfractibus $4\frac{1}{2}$ convexiusculis, sutura simplici et profunda junctis, ad suturam subtruncatis, lævigatis, ultimo spirâ paulo brevior, basi convexo ; apertura regulariter ovata, supra (vel postice) subangulata, haud obliqua, peristomate tenui fere continuo. Long. 1, lat. 0.7 m.m. (Operculum deest).

Hab. In collis calcareis prope Moulmain.

Of the two known species of the genus, *A. tersa* and the doubtful *milius*, both described by Benson from the Khasi hills, the present new form closely agrees in the shape of the shell with the first, and in the smoothness of the surface with the second.

Acmella, Blanf., is evidently quite distinct from *Georissa*, or *Hydrocena*, the latter being one of the *HELICINIDÆ*, while the former is most likely a Cyclophorid, or possibly one of the intermediate forms close to *Assimineæ* and *Omphalotropis*, connecting the *CYCLOPHORIDÆ* with the *RISSOIDÆ*. (Comp. Blanford in Ann. and Mag. N. H. for March 1869).

HELICACEA.

PUPA FILOSA, n. sp. Pl. xi. Fig. 8.

P. testa ovato cylindræa, cornea, pellucida, apice obtusiuscula, rimate umbilicata ; anfractibus $4\frac{1}{2}$ convexiusculis, sutura simplici junctis, transversim striis cuticularibus, obliquis, filiformibus ornatis ; ultimo spirâ brevior, basi vix angustato, convexiusculo ; apertura subquadrangulari, recta, intus dentibus quinque instructa, labro undique paulo expansiusculo, atque incrassato, infra suturam subangulato, ad latus dentibus duobus parvis profunde sitis instructo ; labio tenuissimo, prope medium dentibus pliciformibus duobus approximatis, anteriore multo minore, prædito ; columella unidentata. Long. 2, diam. max. 1 m.m. ; apert. cum perist. 0.75 longa, antice 0.55, postice 0.75 m.m. lata.

Hab. In littore Arakanense ; satis frequens.

A well marked species, both by its peculiarly subcylindrical shape and by the denticulations of the apertural margins; it is not uncommon on the Arakan coast.

MACROCHLAMYS [DURGELLA] KUMAHENSIS, n. sp. Pl. xi. Fgs. 9 and 10.

Macr. testa convexiuscule orbiculata, polita, tenui, cornea, anguste perforata, spira modice elevata; anfractibus $4\frac{1}{2}$ convexis, regulariter accrescentibus, sutura simplici adpresssa junctis, infra suturam distincte depressis atque subcanaliculatis, transversim exilissime obsoleteque striolatis; ultimo anfractu ad ambitum regulariter convexo, ad basin convexiusculo, in spatio umbilici rugulose spiraliter striato; apertura ampla, semilunata, paulo obliqua, margine externo simplici, columellari supra reflexiusculo, umbilicum partim tegente. Diam. maj. 9.6, min. 8.3. alt. 6; lat. apert. perist. incl. 5.4, ejusd. alt. 4.3 m.m. Speciminis secundi ejusdem magnitudinis altitudo testæ est 6.5 m.m., apertura 5.2 lata, et 4.5 m.m. alta.

Hab. 'Kumah hill' in montibus Arakanensibus, regione Sandoway.

Only the two figured specimens of this shell were found by Mr. Theobald at the above named locality. The species is intermediate between Blanford's *compluvialis* and *nebulosa*, differing from the former by being somewhat depressed, by a comparatively slight sutural depression and larger umbilicus; from the latter it differs by its polished surface, less numerous and regularly convex whorls, particularly at the periphery of the last. These differences also apply in a comparison with *M. honesta* of Gould.

Besides the above described new species, *Glessula Peguensis*, *Gless. hastula*, (somewhat larger than the Sikkim type shell), *Succinea semicerica*, *Sesara Basseinensis*, *Helicina Arakanensis*, *Pupina Blanfordi*, *Pterocyclus parvus*, several *Alycæi* and *Diplommatinæ* occurred on the Kumah hill and near Mai-i in the Sandoway district of Arakan.



ON THE OSTEOLOGY OF SOME SPECIES OF BATS,—by G. E. DOBSON, B. A.,
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Having lately obtained additional specimens of *Macroglossus spelæus*, from Mr. Theobald,* I have been enabled to have a complete skeleton made from an adult male.

As previously remarked by me, the index finger possesses no trace of a claw, but has instead a small, but distinct third phalanx connected with the

* Collected at the Farm Caves near Moulmain where the specimens, from which the description of the species was taken, were obtained by Dr. Stoliczka. (See Journ. As. Soc. Beng. Vol. xl, p. 261.)



Theobald, W. 1872. "Notes on Barmese and Arakanese Land Shells, With Descriptions of a Few Species." *The journal of the Asiatic Society of Bengal* 41(IV), 329–334.

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