

The Secretary exhibited on behalf of Mr. F. E. Blaauw, C.M.Z.S., specimens of some Long-tailed Tits shot by him last year in Holland and belonging to the museum of the Royal Zoological Society "Natura Artis Magistra." They had been sent to this country for the purpose of ascertaining whether they belonged to the British form *Acredula rosea* or the white-headed Continental form *A. caudata* (see Dresser's 'Birds of Europe,' vol. iii. pp. 63-67). There could be no doubt that these birds belonged rather to the British form with striped head; but Mr. Blaauw stated that the white-headed form was also met with in Holland, and that he had occasionally observed examples of the two forms paired together.

Mr. Frank Finn, B.A., exhibited a male hybrid between the Chilian Pintail (*Dafila spinicauda*) ♂ and Summer Duck (*Æx sponsa*) ♀, bred in the Gardens, and pointed out that it differed from both parents, though it was to a certain extent intermediate.

The following papers were read:—

1. On the Land and Freshwater Shells of Perak.

By O. F. von MOELLENDORFF, Ph.D.

[Received April 15, 1891.]

(Plate XXX.)

Since the publication of my paper on the Land-Shells of Perak (Journ. As. Soc. Beng. lv. pt. ii. no. 4, 1886), Dr. R. Hungerford has been kind enough to supply me with some more materials from that hitherto very imperfectly known region. Mr. J. de Morgan, who collected in Perak in 1884, published descriptions of some new species in 'Le Naturaliste' (vii. 1885, no. 9, pp. 68-70), and gave a more extensive memoir on the conchological fauna of the Malacca peninsula in the Bulletin Soc. Zool. de France (x., 1885), with figures of his novelties. This latter work I did not know of when I wrote the above-mentioned paper, and the study of it now enables me to rectify some of my former classifications, and at the same time to correct a number of errors contained in de Morgan's work. I think it therefore advisable to give now a revised catalogue of all the Land and Freshwater Shells at present known from Perak, with descriptions of some further new species.

Fam. STREPTAXIDÆ.

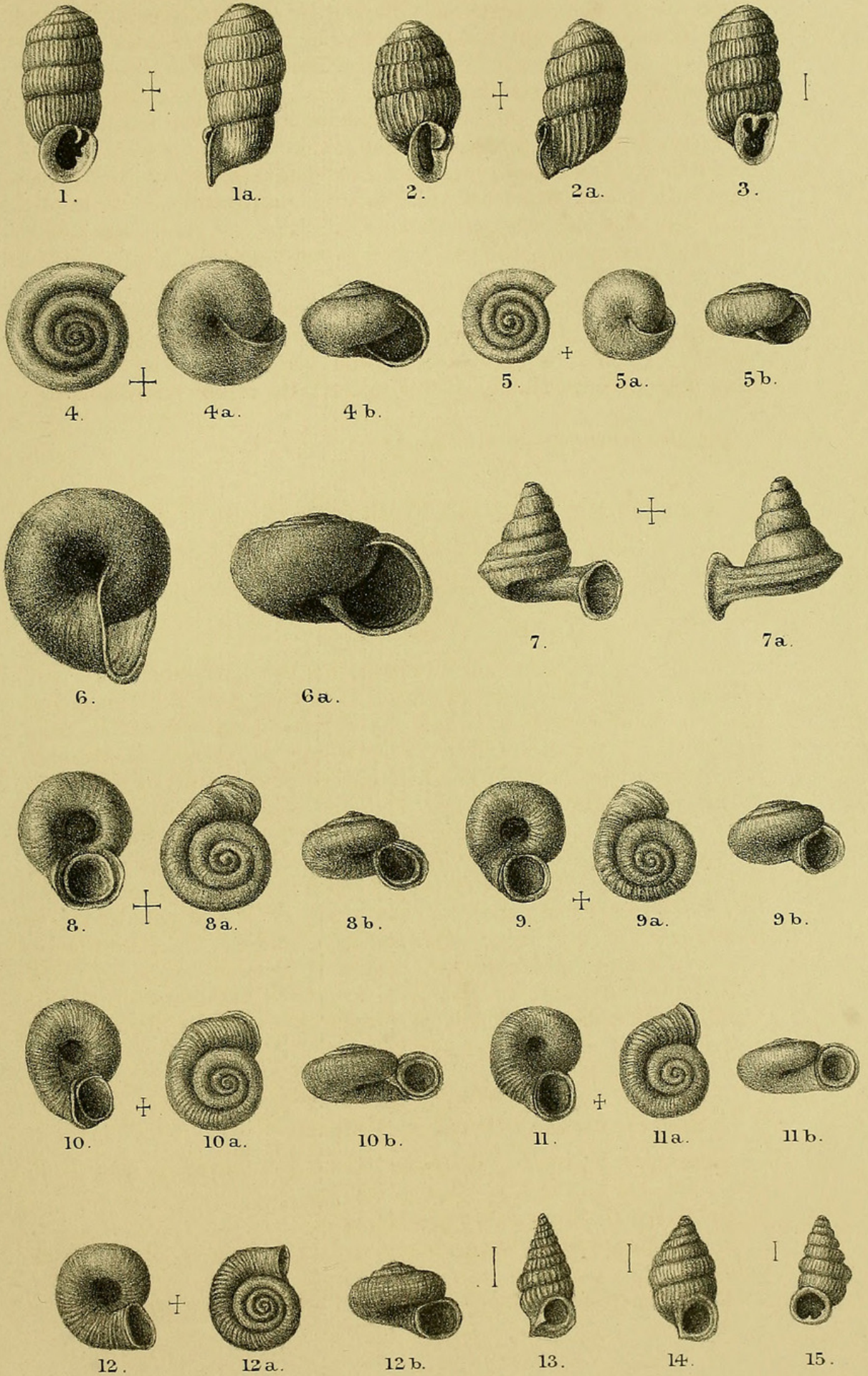
1. STREPTAXIS PLUSSSENSIS, de Morgan.

Streptaxis plussensis, de Morgan, Le Nat. 1885, p. 68; Bull. Soc. Zool. Fr. x. 1885, p. 23, t. i. fig. 1.

Mt. Tchehel, Pluss valley (*de Morgan*).

A good new species, somewhat related to *S. lemyrei*, Morel., from Cambodia.

Dr. Hungerford obtained at Bukit Pondong a few specimens o



a small white *Patula*-like shell, which from its fine and regular striation, the silky aspect, and the inner varices must be an immature *Streptaxis*, but not identical with the above species. It has a diameter of only 3 mm. and shows already $5\frac{1}{2}$ whorls.

2. ENNEA (MICROSTROPHIA) PERAKENSIS, Godw.-Aust. & G. Nev. (Plate XXX. figs. 1, 1 a.)

Ennea perakensis, Godw.-Aust. & G. Nevill, P. Z. S. 1879, p. 735, t. lix. fig. 2 (juv.); v. Mölldff. J. As. Soc. Beng. lv. 1886, p. 300; Ancey, Bull. Soc. Mal. Fr. v. 1888, p. 341.

Bukit Pondong (*Hungerford*).

In the remarks on the name of the subgenus to which this species belongs, I have committed the error of writing *Martensia*, Nevill, instead of *Nevillia*, Martens. The latter name has been given by Prof. von Martens to a group of Mascarene Enneas (Beitr. Faun. Maur. 1880), but it was preoccupied by H. Adams (P. Z. S. 1868, p. 289) for a genus of the Rissoidæ. The group, which comprises a number of Indian, Chinese, and Mascarene species, I have renamed *Microstrophia* (Jahrb. deutsch. malakoz. Ges. xiv. 1887, p. 22). The Perak species is closely allied to *E. stenopylis*, Bens.

3. ENNEA (MICROSTROPHIA) HUNGERFORDIANA, v. Mölldff. (Plate XXX. figs. 2, 2 a.)

Ennea hungerfordiana, v. Mölldff. l. c. p. 301.

Bukit Pondong (*Hungerford*).

4. ENNEA (MICROSTROPHIA) SUBCYLINDRICA, v. Mölldff. (Plate XXX. fig. 3.)

T. anguste perforata, fere cylindracea, albido-hyalina; spira superne conoideo-convexa, apice obtuso, tum cylindracea. Anfr. 7, convexiusculi, costulis verticalibus subdistantibus—36 in anfractu penultimo—regulariter sculpti, ultimus angustior, basi subcompressus, paullum ascendens. Apertura verticalis, rotundato-tetragona; peristoma latiuscule expansum, albo-callosum, superne continuum, subsolutum, sinuatum, margo dexter ad insertionem subito attenuatus. Lamella parietalis valida, longe intrans.

Alt. 2.75, *diam.* 1 mm.

Hab. ad Bukit Pondong leg. cl. R. Hungerford.

Fam. VITRINIDÆ.

5. VITRINA NUCLEATA, Stol.

Vitrina nucleata, Stol. J. As. Soc. Beng. xlii. 1873, p. 23, t. i. fig. 12, t. ii. figs. 4–6.

Helicarion nucleatus, Tryon, Man. Pulm. i. p. 177, t. 41. figs. 49–51.

Bukit Pondong (*Hungerford*); Penang (*Stoliczka*).

Tryon places this species in *Helicarion*, whilst Stoliczka distinctly states it to be a *Vitrina*.

6. ? *VITRINOPSIS DOUVILLEI*, de Morg.

Gaeotis douvillei, de Morgan, Bull. p. 40, t. iv. fig. 9.

Mt. Tchabang (*de Morgan*).

The figure of the animal shows no trace of a mucous pore, so that the species cannot be a *Parmarion* or *Girasia*. In *Gaeotis* (= *Peltella*) the mantle covers the shell entirely; besides, the occurrence of a West-Indian and South-American genus on the Malay Peninsula would be inconsistent with all our experience of the distribution of land-shells. I believe that this interesting discovery of de Morgan will prove to be a *Vitrinopsis*, hitherto not found outside the Philippine Islands. The shell agrees perfectly with the Philippine species, and the figure of the animal, at least, does not oppose this classification.

Fam. NANINIDÆ.

7. *HELICARION LOWI*, de Morgan.

Helicarion lowi, de Morg. Bull. p. 25, t. 1. fig. 3.

Mt. Kerbou, 2200 metres altitude (*de Morgan*).

A fine large species, of 32 mm. diameter.

8. *MACROCHLAMYS STEPHOIDES*, Stol.

Helix (*Macrochlamys*) *stephoides*, Stol. J. As. Soc. Beng. xlii. 1873, p. 17, t. i. fig. 9, t. ii. figs. 19, 20.

Macrochlamys stephoides, de Morgan, Bull. p. 27.

Kinta valley (*de Morgan*); Penang (*Stoliczka*).

9. *MACROCHLAMYS HATCHONGI*, de Morgan.

Macrochlamys hatchongi, de Morg. Bull. p. 28, t. i. fig. 6.

Between Lahat and Ipoh, Kinta valley (*de Morgan*).

10. *MACROCHLAMYS JOUSOUFI*, de Morgan.

Macrochlamys jousoufi, de Morg. l. c. p. 29, t. i. fig. 7.

Ipoh, Kinta valley (*de Morgan*).

This and the preceding *Macrochlamys* seem to be varieties of one and the same species, closely allied to *M. kumahensis*, Theob. & Stol., from Aracan.

11. *MACROCHLAMYS BARTONI*, de Morgan.

Macrochlamys bartoni, de Morg. l. c. p. 30, t. 1. fig. 8.

Mt. Tchöra, Kinta valley (*de Morgan*).

Somewhat like *M. consepta*, Bens., in outline, but very much smaller and less striated.

12. *EUPLECTA BIJUGA*, Stol.

Rotula bijuga, Stol. J. As. Soc. Beng. xlii. 1873, p. 14, t. i. figs. 4-7, t. v. figs. 16-18; Tryon, Man. Pulm. ii. p. 22, t. iv. figs. 56-59.

Rotularia bijuga, de Morgan, Bull. p. 30.

Euplecta bijuga, v. Mölldff. l. c. p. 302.

Bukit Pondong (*Townsend, Hungerford*); Penang (*Stoliczka*).

13. *EUPLECTA PATANIENSIS*, de Morgan.

Macrochlamys pataniensis, de Morgan, Bull. p. 28, t. i. fig. 5.

Rhaman, Patani (*de Morgan*).

Certainly of the same group as the last species, and, so far as can be judged from the figure, not very different from *E. anceps*, Gld., Tenasserim.

14. *SITALA CARINIFERA*, Stoliczka.

Sitala carinifera, Stoliczka, J. As. Soc. Beng. xlii. 1873, p. 16, t. i. fig. 8; Godw.-Aust. Land & Freshw. Moll. Ind. ii. 1882, p. 35; v. Mölldff. l. c. p. 302; Tryon, Man. Pulm. ii. p. 54, t. xxv. fig. 16.

Bukit Pondong (*Hungerford*); Penang (*Stoliczka*).

15. *KALIELLA PERAKENSIS* (G. Nevill).

Kaliella perakensis, Godwin-Austen, l. c. i. 1882, p. 8, t. ii. fig. 7; Tryon, Man. Pulm. ii. p. 61, t. xxvi. fig. 59.

Perak (*Townsend*); Bukit Pondong (*Hungerford*).

16. *MICROCYSTINA TOWNSENDIANA*, G. Nev. & Godw.-Aust.

Microcystina townsendiana, G. Nevill & Godw.-Aust. P. Z. S. 1879, p. 736, t. lix. fig. 1; v. Mölldff. l. c. p. 302.

Nanina (Microcystis) townsendiana, Tryon, Man. Pulm. ii. p. 120, t. 40. figs. 49-51.

Bukit Pondong (*Townsend, Hungerford*).

17. *LAMPROCYSTIS MALAYANA*, v. Mölldff. (Plate XXX. figs. 4-4 b.)

T. semiobtectae perforata, depressa, tenuis, subpellucida, corneo-lutescens, nitens; spira humilis, depresso conica, apice obtuso. Anfr. 5, levissime convexiusculi, sutura appressa submarginata disjuncti, lente accrescentes, tenuissime striatuli, ultimus basi convexus. Apertura parum obliqua, rotundato-elliptica valde excisa; peristoma simplex, acutum, margine columellari superne breviter reflexo, subcalloso.

Diam. max. 3.66, alt. 2 mm.

Hab. ad Bukit Pondong leg. cl. R. Hungerford.

Allied to *L. molecula*, Bens., from Burmah, but smaller and much flatter.

18. *LAMPROCYSTIS CONULINA*, v. Mölldff. (Plate XXX. figs. 5-5 b.)

T. anguste perforata, depresso globoso-conica, tenuis, pellucida, nitens, corneo-flavescens; spira conoidea, lateribus subconvexis. Anfr. 4½, sat convexi, sutura impressa discreti, microscopice striatuli, ultimus basi inflatus. Apertura sat obliqua, exciso-subcircularis; peristoma simplex, acutum, margine columellari brevissime reflexo.

Diam. max. 1.66, alt. 1.25 mm.

Hab. ad Bukit Pondong leg. cl. R. Hungerford.

19. *HEMIPLECTA STRIATA*, Gray, var. *LEECHI*, de Morg.*Hemiplecta leechi*, de Morgan, Bull. p. 31, t. i. fig. 9.Abundant all over Perak (*de Morgan*).

The author compares his form with *H. crossei* and *H. weinkauffiana*; I think, however, that it will prove to be a variety of the common species of Singapore and the Straits generally, *Nanina striata*, Gray, or *Helix naninoides*, Benson.

20. *HEMIPLECTA SAKAYA*, de Morg.*Oxytes sakaya*, de Morg. Bull. p. 32, t. ii. fig. 1.

Mt. Kerbou, 1200 metres altitude.

Allied to *H. cymatium*, Bens., of which it is perhaps a variety. The specimen collected by Dr. Hungerford and mentioned by me (*l. c.* p. 302) as *H. cymatium*, probably belongs to this form.

21. *RHYSOTA* sp. aff. *pluto*, Pfr.*Cf.* v. Mölldff. *l. c.* p. 302.Perak (*Hungerford*).22. *ARIOPHANTA KINTANA*, de Morgan.*Ariophanta kintana*, de Morg. Bull. p. 33, t. ii. fig. 2.Kinta district (*de Morgan*).

This was probably mentioned by Nevill (*Handl. Moll. Ind. Mus.* 1878, p. 20) as *Ariophanta*, n. sp. (prox. *A. interruptæ*), from Qualla Kangsa, Perak.

Ariophanta lahatensis, de Morgan, Bull. p. 34, t. ii. fig. 4, between Lahat and Ipoh, Kinta valley, seems to be based on an immature specimen, which might very well be the young of the present species.

Fam. TROCHOMORPHIDÆ.

23. *TROCHOMORPHA TIMORENSIS*, v. Mart.*Trochomorpha timorensis*, de Morgan, Bull. p. 35.Mt. Tchöra, Kinta valley (*de Morgan*); Penang (*Stoliczka*).

Helix swettenhami, de Morgan, *Le Naturaliste*, 1885, p. 68, and *H. thieroti*, de Morgan, *ibid.* p. 68, both belonging to either *Trochomorpha* or else *Plectotropis*, do not appear in his second memoir. The latter species probably is the one now mentioned as *T. timorensis*.

Fam. HELICIDÆ.

24. *SALISUMA PERAKENSIS*, Crosse.

Geotrochus perakensis, Crosse, *J. de Conch.* xxvii. 1879, p. 199, t. viii. fig. 4; de Morgan, Bull. p. 38.

Helix perakensis, v. Mölldff. *l. c.* p. 303.Perak (*Townsend*); Kinta valley (*de Morgan*).

Most decidedly not a *Geotrochus*, but one of the conical *Fruticicola*-like shells, for which Adams created the subgenus *Satsuma* (= *Fruticotrochus*, Kob.). This group is widely spread over Eastern Asia,

from Japan, China, the Malay Peninsula, to the Philippine Islands and the Malay Archipelago.

25. ? *HELIX BOURYI*, de Morgan.

Helix bouryi, de Morg. Bull. p. 35, t. ii. fig. 3 (*Petasia*).

Mt. Tchöra, Kinta valley.

The author classes this small snail, 3 mm. in diameter and height, as a *Petasia*. I should have thought it to be a form of *Naninidæ*, if the peristome were not described as slightly reflexed. It will prove to be a *Satsuma*.

26. *CHLORITIS PENANGENSIS*, Stol.

Trachia penangensis, Stoliczka, J. As. Soc. Beng. xlii, 1873, t. iii. figs. 1, 18-20.

Fruticicola penangensis, de Morgan, Bull. p. 36.

Bukit Pondong (*Hungerford*); all over Perak (*de Morgan*); Penang (*Stoliczka*).

27. *CHLORITIS MALAYANA*, v. Mölldff. (Plate XXX. figs. 6, 6 a.)

Helix (Trachia) malayana, v. Mölldff. l. c. p. 303,—an = *Planispira breviseta*, Crosse, J. de Conch. xix. 1876, p. 336 (nec Pfr.)?

Perak (*Hungerford*).

28. *CHLORITIS WRAYI*, de Morgan.

Philidora wrayi, de Morgan, Bull. p. 36, t. ii. fig. 5.

Lahat, Ipoh, Kinta valley (*de Morgan*).

29. *CHLORITIS HARDOUINI*, de Morgan.

Helix hardouini, de Morgan, Le Naturaliste, 1885, p. 68.

Philidora hardouini, de Morgan, Bull. p. 37, t. i. fig. 10.

Between Lahat and Ipoh, Kinta valley (*de Morgan*).

Both Stoliczka and de Morgan have placed true species of *Chloritis* into different genera. The former accepted *Trachia* as a separate genus, and classed *H. penangensis*, *procumbens*, Gld., *delibrata*, Bens., and *gabata*, Gld., with it; but whilst he was quite right in establishing a genus for these species, the name *Trachia* should not have been applied to it. The type of *Trachia* is *H. asperella*, Pfr., and the group should be restricted to those Indian species with almost circular apertures and very approximate margins of the peristome, as *H. asperella*, *fallaciosa*, Fér., *ruginosa*, Fér., and others. The chief characteristic of *Chloritis* is the sculpture, which consists of impressed points, placed in quite regular quincunx, bearing short hairs or setæ, always present in young specimens, often also in the adults. Besides this typical sculpture, there is always a keel or angle round the umbilicus which disappears at the basal margin of the peristome, effecting at that place a slight production of the lip. The general form of the shell is variable, most species showing very

narrow whorls. Taken in this sense, the genus *Chloritis* includes to my knowledge the following species:—

Solomon Islands: *C. hombronis*, Pfr., *erinaceus*, Pfr., *gaimardi*, Desh.

Torres Strait: *C. buxtoni*, Braz., *brevipila*, Pfr.

Philippine Islands: *C. sanziana*, Hombr. & Jacq., *spinosissima*, Semp., *quieta*, Reeve, *leytensis*, v. Mölldff., *brevidens*, Pfr., *caliginosa*, Ad. & Rve., *malbatensis*, Hid.

Malay Archipelago: *C. tomentosa*, Pfr., *crassula*, Phil., *gruneri*, Pfr.

Malay Peninsula: *C. deliciosa*, Pfr., *breviseta*, Pfr., *malayana*, v. Mölldff., *penangensis*, Stol., *delibrata*, Bens., *gabata*, Gld., *procumbens*, Gld., *hardouini*, de Morg., *wrayi*, de Morg., *samuiana*, v. Mölldff.

China: *C. herziana*, v. Mölldff., *hungerfordiana*, Nev., *franciscanorum*, Gredl., ? *submissa*, Desh.

Fossil: *C. lepidotricha*, Alph. Br.

I have no doubt that there are many more species to be placed in this interesting genus, but I have purposely only mentioned those examined by myself.

The name *Philidora*, de Morgan, is to be entirely rejected, although Prof. von Martens has rendered it the unmerited honour of adopting it for *H. gabata* (J. Linn. Soc., Zool. xxi. 1887, p. 162). As the author says himself (*l. c.* p. 36, note), the name is meant to replace *Philina*, Albers, the latter being preoccupied by *Philina*, Ascanius (1772). Now *Philina*, Albers (Hel. 1st ed. 1850, p. 119) contains mostly species of *Obba*, a few *Planispiræ*, and only one *Chloritis* (*brevidens*, Pfr.), and was already in the second edition referred to the synonymy of *Obba*. There was therefore not the slightest reason to revive and to rename it. To create a new group for the species in question was also unnecessary, as they without any doubt belong to *Chloritis*. Only if it was thought advisable to make a special subgroup or section of all carinated forms of *Chloritis*, the name might be retained; but as we have species of *Chloritis* with rounded, subangulate, angulate, and keeled periphery, such subdivision would be artificial and unscientific.

Fam. BULIMIDÆ.

30. AMPHIDROMUS PERVERSUS, Linn.

Perak (*Townsend*); all over Perak and Patani (*de Morgan*).

31. AMPHIDROMUS MELANOMMA, Pfr.

Mt. Tchöra, Mt. Tchhel (*de Morgan*). Otherwise known from Singapore, Penang, Borneo.

32. ? AMPHIDROMUS CHLORIS, Reeve.

Larut plain and Kinta valley (*de Morgan*).

Described from the Philippine Islands, so that its occurrence in Perak is somewhat surprising. I cannot but doubt the correctness of the identification.

Fam. STENOGYRIDÆ.

33. HAPALUS JOUSSEAUMI, de Morgan, Bull. p. 24, t. i. fig. 2.
Ipoh, Kinta valley (*de Morgan*).

34. PROSOPEAS TCHEHELENSE, de Morgan.

Stenogyra tchehelensis, de Morgan, Le Natural. 1885, p. 69 ;
Bull. p. 40, t. ii. fig. 7.

Stenogyra (Subulina) tchehelensis, v. Mölldff. l. c. p. 304.

Stenogyra (Opeas) ? terebralis, Theob. (? n. sp.), G. Nevill,
Handl. Moll. Ind. Mus. 1878, p. 166.

Bukit Pondong (*Townsend, Hungerford*); Mt. Tchehel, Pluss
valley (*de Morgan*).

The Perak species does not, as I have stated formerly, belong to
Subulina, the columella only being slightly twisted, not truncated,
but to the genus or subgenus *Prosopneas*, constituted by Moerch for
S. haughtoni and *S. roepstorfi* of the Andamans.

Stenogyra swettenhami, de Morgan, Bull. p. 41, t. ii. fig. 6, seems
to me only a slight variation of *T. tchehelense*.

35. OPEAS GRACILE, Hutt.

Bukit Pondong (*Hungerford*).

36. RHODINA PERAKENSIS, de Morgan.

Rhodina perakensis, de Morgan, Le Nat. 1885, p. 68 ; Bull. p. 42,
t. ii. fig. 9 ; v. Mölldff. l. c. p. 305.

Mt. Tchöra, Kinta valley (*de Morgan*).

I must confess that even the more complete description and the
figure given by the author in his second memoir has not enabled me
to form a decided opinion on this alleged new genus. De Morgan
calls the "columellar lip" spiral, reflex, and very prominent ; the
figure shows a sort of spiral lamella obliquely running from the
columella into the aperture, a formation which indeed resembles
somewhat the columellar lamella of *Rhodea*. This is, however, the
only resemblance to the American genus which this curious shell
presents.

Fam. PUPIDÆ.

37. PUPA (BOYSIDIA) PALMIRA, Stol.

Pupa (Scopelophila) palmira, Stoliczka, J. As. Soc. Beng. xlii.
1873, p. 32, t. ii. fig. 3.

Pupa palmira, Pfr. Mon. Hel. viii. p. 409.

Scopelophila palmira, de Morgan, Bull. p. 43.

Penang and Province of Wellesley (*Stoliczka*).

38. HYPSELOSTOMA HUNGERFORDIANUM, v. Mölldff. (Plate
XXX. figs. 7, 7 a.)

T. sat aperte umbilicata, turbinata, tenuis, corneo-brunnea, opaca.
Anfr. 4½, angulato-convexi, sutura valde impressa disjuncti,

parum striatuli, supremi spiram concave turrito-conicam, apice mammillari subexcentrico, efficientes, ultimus carina exserta rotundata ad peripheriam, altera ad umbilicum obtusiore, supra et infra carinam periphericam sulco spirali leviter impresso cinctus, a quarta parte solutus, porrectus, leviter ascendens, in parte soluta fere tetragonus, basi spiraliter lineolatus. Apertura fere verticalis, aliquantulum sursum spectans, rotundato-quadrangularis, intus dentibus 7 lamelliformibus coarctata, quorum 4 majores, ad modum crucis oppositi, parietalis validus longe intrans, bipartitus, inter illum et columellarem 3 minoribus interpositis. Peristoma liberum, simplex, tenue, sat late expansum, inter binas lamellas profundiuscule sinuatum. Diam. max. 3, alt. $2\frac{1}{2}$, apert. diam. cum perist. 1 mm.

Hypselostoma bensonianum, v. Mölldff. l. c. p. 306 (nec Blanf.).

Hab. ad Bukit Pondong leg. cl. R. Hungerford.

Although I have not yet been able to compare authentic specimens of *H. bensonianum*, Blfd., from Ava, I am convinced that the Perak form cannot be combined with it, and that it constitutes a good new species. It is somewhat more conical and comparatively higher than the Ava form, the upper whorls are more convex, not "planulati" as Blanford has it, the last whorl is more detached and stretches to the right; facing the shell the whole aperture is visible in *H. bensonianum*, only part of it in *H. hungerfordianum*. There are seven instead of four teeth, I suppose that the additional fifth tooth mentioned by Blanford means that the parietal tooth or lamella is divided as in the Perak species, but the latter possesses three more between the parietal and columellar lamellæ.

The following species of *Hypselostoma* are now known:—

1. *H. tubiferum*, Bens.—Ava.
 2. *H. bensonianum*, Blfd.—Ava.
 3. *H. dayanum*, Stol.—Moulmein.
 4. *H. hungerfordianum*, v. Mölldff.—Perak.
 5. *H. transitans*, v. Mölldff.—Samui Island, Gulf of Siam.
 6. *H. crossei*, Morl.—Tonking.
 7. *H. luzonicum*, v. Mölldff.—Luzon.
- } Philippine Islands.
- , var. *imbricata*, v. Mölldff.—Cebu.

The genus is connected by *H. transitans* with *Boysidia*, Ancy, a subgenus of *Pupa* created for *P. hunanensis*, Gredl., *P. strophostoma*, v. Mölldff., and others from China, to which I believe some Indian species, as *P. palmira*, Stol., *plicidens*, Bens., *salwiniana*, Theob., likewise belong. *Hypselostoma* is an extreme development of the *Boysidia* type.

Fam. CLAUSILIIDÆ.

39. *CLAUSILIA* (PSEUDONENIA) *FILICOSTATA*, Stol., var. *TENUICOSTA*, G. Nevill.

Clausilia (*Pseudonenia*) *felicostata*, var. *tenuicostata*, G. Nevill,

Handl. Moll. Ind. Mus. 1878, p. 183; H. Crosse, J. de Conch. xxvii. 1879, p. 337; v. Mölldff. l. c. p. 306.

Phaedusa filicostata, de Morgan, Bull. p. 43.

Bukit Pondong (*Townsend, Hungerford*).

The type was described from Penang.

40. CLAUSILIA (PSEUDONENIA) KAPAYANENSIS, de Morgan.

Pseudonenia kapayanensis, de Morgan, Bull. p. 43, t. ii. fig. 8.

Gounang Lano (*de Morgan*).

De Morgan cites two "genera" of Clausiliidæ, *Phaedusa* and *Pseudonenia*. To begin with, we have not sufficient reasons as yet to consider *Phaedusa* to be a separate genus, but even if such were the case, *Pseudonenia* would anyhow be only a section of *Phaedusa*, not another genus. The worst of it is that *C. filicostata* and *penangensis*, which de Morgan quotes as *Phaedusa*, belong certainly to *Pseudonenia* as well as his new species. The latter is, in fact, very closely allied to *C. filicostata*, especially to its Perak variety; and I would not hesitate to identify it with the latter, if the author did not speak of a third "tooth" on the columellar margin, meaning an emerged columellar lamella, which is not visible in *C. filicostata*.

Fam. AURICULIDÆ.

41. CASSIDULA MUSTELINA, Desh.

Prov. of Wellesley (*de Morgan*).

42. CASSIDULA AURIS-FELIS, Brug.

Bukit Tambun, mouth of Perak river (*de Morgan*).

43. AURICULA AURIS-JUDÆ, Linn.

Bukit Tambun, Prov. of Wellesley (*de Morgan*).

44. AURICULA AURIS-MIDÆ, Linn.

Estuary of Krian river (*de Morgan*).

45. PYTHIA BORNEENSIS, Ad.

Telok-Anson, Bukit Tambun (*de Morgan*).

Fam. LIMNÆIDÆ.

46. PLANORBIS EXUSTUS, Desh.

Wellesley (*de Morgan*).

Fam. CYCLOPHORIDÆ.

47. CYCLOTUS (PLATYRHAPHE) HUNGERFORDIANUS, v. Mölldff.

Cyclotus hungerfordianus, v. Mölldff. l. c. p. 306.

Cyclotus, n. sp., G. Nevill, Handl. 1878, p. 256.

? *Aulopoma lowi*, de Morgan, Le Nat. 1885, p. 69; Bull. p. 59, t. iii. fig. 6.

The comparison of de Morgan's figure makes it all but certain that

his "*Aulopoma*" *lowi* is the same as my *Cyclotus hungerfordianus*. It is decidedly a *Cyclotus* and belongs to my group *Platyrrhapha* (Jahresb. Senckenb. 1890, p. 267 = *Cycloti suturales*, v. Mart.); how it could have been mistaken for an *Aulopoma* is hardly to be comprehended. I still think that the publication of a *Cyclotus* as an *Aulopoma* does not entitle the name to priority, besides the description is not sufficiently detailed and lucid.

48. *OPISTHOPORUS SOLUTUS*, Stol.

Opisthoporus solutus, Stoliczka, J. As. Soc. Beng. xli. 1872, p. 266, t. x. figs. 8-10; Crosse, J. de Conch. xxvii. 1879, p. 337; v. Mölldff. l. c. p. 307; de Morgan, Bull. p. 51.

Bukit Pondong (*Townsend, Hungerford*); Mt. Tchöra and Lano, Kinta valley (*de Morgan*).

Cyclotus dautzenbergi, de Morgan, l. c. p. 50, t. iv. fig. 1, from Mt. Tchöra near Ipoh, is, according to the figure given, undoubtedly an *Opisthoporus*, and most probably identical with *O. solutus*, Stol., which de Morgan quotes from the same locality.

49. *OPISTHOPORUS PENANGENSIS*, Stol.

Opisthoporus penangensis, Stoliczka, l. c. p. 265, t. x. fig. 7; H. Crosse, l. c. p. 338; de Morgan, Bull. p. 51; v. Mölldff. l. c. p. 307.

Bukit Pondong (*Townsend, Hungerford*); Perak generally (*de Morgan*).

Cyclophorus lahatensis, de Morgan, Bull. p. 61, t. iv. fig. 7, from the Kinta valley, is apparently a young shell, of 11 millim. diameter. The author compares it to "*Cyclophorus*" *penangensis*, Stol., meaning probably *Opisthoporus penangensis*, which species he had mentioned 10 pages before.

50. *RHIOSTOMA JOUSSEAUMI*, de Morgan.

Rhiostoma jousseaumi, de Morgan, Bull. p. 52, t. iv. fig. 2.

Kinta valley.

According to the description and the very meagre figure, the classification of this species as a *Rhiostoma* is not quite beyond doubt. The detached last whorl and the tube connecting it with the penultimate whorl render it rather probable, but the description of the operculum does not mention the curious cup-shaped formation characteristic of *Rhiostoma*.

51. *PTEROCYCLUS REGELSPERGERI*, de Morgan.

Cyclophorus regelspergeri, de Morgan, Le Naturaliste, 1885, p. 69.

Pterocyclus regelspergeri, de Morgan, Bull. p. 52, t. iv. fig. 3.

? *Spiraculum regelspergeri*, v. Mölldff. l. c. p. 308.

Upper Kinta valley (*de Morgan*); Larut (*coll. Ind. Mus.*).

De Morgan's mention of a tube behind the aperture is misleading and made me suppose that the species belonged to *Spiraculum*. It is not a proper tube, but only an enlarged "wing" typical of *Pterocyclus*. The species is very much like *P. albersi*, Pet.

52. *CYCLOPHORUS BORNEENSIS*, Metc.

Cyclophorus borneensis, de Morgan, Bull. p. 60.

Kinta valley (*de Morgan*).

As this Bornean form has been found also in Sumatra, by Prof. von Martens, at Bukit Tima, Singapore, and by Stoliczka in Penang, it may very well range into Perak. Still, a revision of de Morgan's identification would be desirable in this very difficult group.

53. *CYCLOPHORUS SEMISULCATUS*, Sow.

Bukit Pondong (*Townsend*); Perak generally (*de Morgan*).

54. *CYCLOPHORUS AURANTIACUS*, Schumacher.

Cyclophorus aurantiacus, E. von Martens, Shells of Mergui, Journ. Linn. Soc., Zool. xxi. 1887, p. 157, t. xiv.

Cyclophorus lowi, de Morgan, Le Nat. 1885, p. 69.

Cyclophorus malayanus, de Morgan, Bull. p. 62; v. Mölldff. l. c. p. 309.

Larut (*coll. Ind. Mus.*); Perak generally (*de Morgan*).

From the able paper of Prof. von Martens I have convinced myself that the large Perak *Cyclophorus* does not belong to *C. malayanus*, but to *C. aurantiacus*, Schum. *C. lowi* of de Morgan's first paper is not mentioned in the second; he seems to have entirely ignored his former publication in the latter.

Whether *C. malayanus*, mentioned by G. Nevill, Handl. 1878, p. 267, as brought from Bukit Pondong by Dr. Townsend, is the true species of Benson or likewise a form of *C. aurantiacus*, I am unable to say.

55. *CYCLOPHORUS EXPANSUS*, Pfr.

Cyclophorus expansus ? var., G. Nevill, Handl. 1878, p. 269. ("Appears to be new; it is near *C. cybeus*.")

Bukit Pondong (*Townsend*).

56. *LAGOCHILUS TOWNSENDI*, Crosse.

Lagochilus townsendi, Crosse, J. de Conch. xxvii. 1879, p. 208, t. viii. fig. 3; de Morgan, Bull. p. 63; v. Mölldff. l. c. p. 309.

Bukit Pondong (*Townsend, Hungerford*); Perak generally (*de Morgan*).

57. *LAGOCHILUS SWETTENHAM*, de Morgan.

Lagochilus swettenhami, de Morgan, Bull. p. 64, t. iv. fig. 8.

Kinta and Pluss valleys (*de Morgan*).

It does not appear whether "*Cyclophorus baylei*," de Morgan, Le Nat. 1885, p. 69, is identical with the first or the second of these species.

58. *LEPTOPOMA ASPIRANS*, Bens., Ann. Mag. N. H. 2nd ser. xvii. 1856, p. 229.

Bukit Pondong (*Townsend, Hungerford*).

Fam. ALYCÆIDÆ.

59. ALYCÆUS (ORTHALYCÆUS) GIBBOSULUS, Stol.

Alycæus (Orthalycæus) gibbosulus, Stoliczka, J. As. Soc. Beng. xli. 1872, p. 268, t. x. fig. 14; Crosse, J. de Conch. xxvii. 1879, p. 339, t. xii. fig. 8; de Morgan, Bull. p. 54; v. Mölldff. l. c. p. 310; = *A. chaperi*, de Morgan, Le Nat. 1885, p. 70 (olim).

Bukit Pondong (*Townsend, Hungerford*); Mt. Tchöra, Kinta valley (*de Morgan*). Penang (*Stoliczka*).

60. ALYCÆUS (ORTHALYCÆUS) PERAKENSIS, Crosse.

Alycæus (Orthalycæus) perakensis, Crosse, J. de Conch. xxvii. 1879, p. 206, t. xii. fig. 7; de Morgan, Bull. p. 54; v. Mölldff. l. c. p. 310.

Bukit Pondong (*Townsend, Hungerford*).

61. ALYCÆUS (ORTHALYCÆUS) KAPAYENSIS, de Morgan.

Alycæus (Orthalycæus) kapayensis, de Morgan, Bull. p. 55, t. iv. fig. 5.

Mt. Lano, Kinta valley.

A small species, $4\frac{1}{2}$ millim. in height.

62. ALYCÆUS (ORTHALYCÆUS) THIEROTI, de Morgan.

Alycæus (Orthalycæus) thieroti, de Morgan, Bull. p. 55, t. iv. fig. 6.

Mt. Lano (*de Morgan*); Bukit Pondong (*Hungerford*).

Another small species, with which I identify an *Alycæus* collected by Hungerford at Bukit Pondong.

As the description of the author is rather incomplete and somewhat vague, I give a new diagnosis from my specimens obtained at Bukit Pondong.

T. peranguste perforata, globoso-conica, ? luteo-brunnea; spira regulariter conica, apice acuto. Anfr. $4\frac{1}{2}$ –5, convexi, regulariter et confertim costulato-striati, ultimus inflatus, gibber, circiter $2\frac{1}{2}$ millim. ab apertura constrictus, tum ad aperturam glabratus, tubulus suturalis brevis. Apertura sat obliqua, subcircularis; peristoma duplex, externum late expansum, companulatum, interruptum, internum continuum, expansiusculum, superne appressum.

Diam. max. $4\frac{3}{4}$ –5, alt. $4\frac{3}{4}$ –5 mm.

63. ALYCÆUS DIPLOCHILUS, v. Mölldff. (Plate XXX. figs. 8–8 b.)

Alycæus diplochilus, v. Mölldff. l. c. p. 310.

Bukit Pondong (*Hungerford*).

64. ALYCÆUS OLIGOPLEURIS, v. Mölldff. (Plate XXX. figs. 9–9 b.)

Alycæus oligopleuris, v. Mölldff. l. c. p. 310.

Bukit Pondong (*Hungerford*).

65. *ALYCÆUS MICRODISCUS*, v. Mölldff. (Plate XXX. figs. 10-10 b.).

Alycæus microdiscus, v. Mölldff. l. c. p. 311.

Bukit Pondong (*Hungerford*).

66. *ALYCÆUS PARVULUS*, v. Mölldff. (Plate XXX. figs. 11-11 b.).

Alycæus parvulus, v. Mölldff. l. c. p. 311.

Bukit Pondong (*Hungerford*).

67. *ALYCÆUS MICROCONUS*, v. Mölldff. (Plate XXX. figs. 12-12 b.).

Alycæus microconus, v. Mölldff. l. c. p. 311.

Bukit Pondong (*Hungerford*).

68. *ALYCÆUS JOUSSEAUMI*, de Morgan.

Alycæus jousseaumi, de Morgan, Le Nat. 1885, p. 70 ; Bull. p. 54, t. iv. fig. 4 ; v. Mölldff. l. c. p. 312.

Mt. Lano, Kinta valley (*de Morgan*).

This fine species, the largest *Alycæus* known to me, is allied to *A. umbonalis*, Bens., and *A. physis*, Bens., but at once to be distinguished by the formation of two peristomes rather distant from each other, somewhat in the manner of *Cyclophorus foliaceus*, Chemn.

Fam. DIPLOMMATINIDÆ.

69. *OPISTHOSTOMA PAULUCCIÆ*, Crosse & Nevill.

Opisthostoma paulucciæ, Crosse & Nevill, J. de Conch. xxvii. 1879, pp. 197, 205, 339, t. viii. fig. 1 ; Godw.-Aust. & G. Nev. P. Z. S. 1879, p. 738, t. lx. figs. 2, 2a, 2b ; v. Mölldff. l. c. p. 313.

Bukit Pondong (*Townsend*).

70. *OPISTHOSTOMA PERAKENSE*, Godw.-Aust. & G. Nev.

Opisthostoma perakense, Godw.-Aust. & G. Nev. P. Z. S. 1879, p. 738, t. lx. figs. 1, 1a, 1b ; v. Mölldff. l. c. p. 313.

Bukit Pondong (*Townsend, Hungerford*).

71. *DIPLOMMATINA (SINICA) CANALICULATA*, v. Mölldff. (Plate XXX. fig. 13.)

Diplommatina (Sinica) canaliculata, v. Mölldff. l. c. p. 312.

Bukit Pondong (*Hungerford*).

72. *DIPLOMMATINA (SINICA) NEVILLI*, Crosse.

Palaina nevilli, Crosse, J. de Conch. xxvii. 1879, pp. 203, 339, t. viii. fig. 2.

Diplommatina nevilli, v. Mölldff. l. c. p. 313.

Bukit Pondong (*Townsend, Hungerford*).

73. *DIPLOMMATINA (SINICA) VENTRICULUS*, v. Mölldff. (Plate XXX. fig. 14.)

T. dextrorsa, *vix rimata*, *ventricosso-conica*, *lutescens*. Anfr. 7½,

convexi, striati, supremi spiram regulariter conicam efficientes, penultimus magnus, ultimus angustior, sat distortus, initio constrictus, tum inflatulus, ad aperturam paulum ascendens, basi subcristatus. Apertura fere verticalis, angulato-subcircularis; peristoma subduplex, sat expansum, incrassatum, albolabiatum, superne appressum, margine basali cum columellari angulum fere rectum calcaris instar prominentem formante. Lamella columellaris fere immersa, oblique intuenti conspicua, spiraliter recedens, palatalis interna, modica, crassiuscula, supra columellam conspicua.

Longit. 3, diam. max. 1.75 mm.

Hab. ad Bukit Pondong leg. cl. R. Hungerford.

74. DIPLOMMATINA (SINICA) DIMINUTA, v. Mölldff. (Plate XXX. fig. 15.)

T. sinistrorsa, vix rimata, gracilis, turrita, corneo-flavescent: spira turrito-conica, apice obtusiusculo brunnescente. Anfr. $7\frac{1}{2}$, perconvexi, medio subangulati, oblique costulato-striati, 2 ultimi paulum distorti, ultimus penultimo angustior, initio constrictus, tum inflatulus, antice ascendens. Apertura parum obliqua, angulato-subcircularis; peristoma duplex, externum campanulatum, expansum, internum sat porrectum, expansiusculum, margine columellari cum basali angulum subacutum formante. Lamella columellaris modica, obliqua, palatalis longiuscula, supra rimam translucens.

Longit. 2, diam. max. 0.9 mm.

Hab. ad Bukit Pondong leg. cl. R. Hungerford.

The four preceding species have, besides a very strongly developed columellar lamella, which is produced into the interior up to the constriction at the beginning of the last whorl, an inner parietal and palatal plait; the latter is shining through just above the mouth. Breaking up the shell just before the constriction, we see the three plaits like teeth placed in a triangle; they serve as a kind of rails for the operculum, which rests behind them on the constricted part of the whorl when the animal is retired. This development of the closing apparatus is typical for my section *Sinica* (Jahrb. deutsch. malak. Ges. xii. 1885, p. 369); as secondary character may be considered the angle formed by the columella with the basal margin of the peristome often ending in a spur-like projection. "*Sinica*" is rather a misnomer, as species of this group have since been found on the Philippine Islands and the Malay Peninsula; some Indian species, e. g. *D. gracilis*, Bedd., likewise belonging to it.

75. DIPLOMMATINA (SINICA) SUPERBA, Godw.-Aust. & G. Nev. *Palaina superba*, Godw.-Aust. & G. Nev. l. c. p. 732, t. lx. figs. 5, 5a.

Diplommatica superba, v. Mölldff. l. c. p. 313.

Bukit Pondong (Townsend, Hungerford.).

As I have pointed out, the similarity of this pretty little shell to some species of *Palaina* consists chiefly in the sculpture, on

which, however, generic or subgeneric distinctions should not be based. *Palaina* is to be restricted to those species which have a constriction at the beginning or within the first third of the last whorl, but no plaits or lamellæ. *D. superba* having a strongly developed columellar plait, cannot therefore be classed as a *Palaina*, but is a true *Diplommatina*, and by its short palatal plait visible above the aperture belongs to the same section as the four preceding species.

76. DIPLOMMATINA MIRABILIS, Godw.-Aust. & G. Nev.

Diplommatina mirabilis, Godw.-Aust. & G. Nev. P. Z. S. 1879, p. 739, t. lx. figs. 4, 4a, 4b.

Bukit Pondong (*Townsend*).

Fam. PUPINIDÆ.

77. PUPINA AUREOLA, Stol.

Pupina aureola, Stoliczka, J. As. Soc. Beng. xli. 1872, p. 267, t. x. figs. 11, 12; de Morgan, Bull. p. 66.

Mt. Tchöra, Kinta valley (*de Morgan*).

I received from the late Mr. R. Damon some specimens of a Perak *Pupina* under the name of *P. lahatensis*, de Morgan, apparently collected by that gentleman. The name was probably abandoned by the author, as it does not appear in his paper. One of these examples corresponds exactly with the figure of *P. aureola*, Stol., the others with *P. lowi*, de Morgan.

78. PUPINA LOWI, de Morgan.

Pupina lowi, de Morgan, Bull. p. 66, t. iii. fig. 3.

Lahat, Kinta valley (*de Morgan*).

79. PUPINA ARULA, Bens.

Pupina arula, Benson, Ann. Mag. N. H. 2nd ser. xvii. p. 230; Pfr. Mon. Pneum. Suppl. i. p. 95; Novitat. Conch. ii. p. 141, t. xxxvii. fig. 7-9; Crosse, J. de Conch. xxvii. 1879, p. 340; v. Mölldff. l. c. p. 314.

Bukit Pondong (*Townsend, Hungerford*).

The Perak form is smaller, 8 instead of 9 millim. in length, comparatively more slender, showing a diameter of 4 millim. instead of 5, or a proportion of axis to diameter of 2:1 instead of 9:5; the apex is more pointed. It should therefore be separated as a variety:

Var. PERAKENSIS, v. Mölldff.: *testa minore, graciliore, apice acutiore*; alt. 8, diam. 4 mm.

80. PUPINA ARTATA, Bens.

Bukit Pondong (*Dr. Townsend fide Crosse*); Kinta valley (*de Morgan*).

The small *Pupina* collected by Hungerford at Bukit Pondong, which I took for *P. artata*, Bens., following Crosse, is certainly different from Benson's species. It is smaller, the apex more pointed,

almost mucronate, the mouth much more protracted to the right, the upper parietal lamella much smaller and not, as in *P. artata*, covering the upper canal; the outer margin of the peristome is more receding above, forming a decided, almost tooth-like angle before it recedes. All these differences are quite constant in the dozen of examples which I have examined and entitle the form to specific distinction. Judging from de Morgan's figure, they belong to the following species.

81. *PUPINA TCHEHELENSIS*, de Morgan.

Pupina tchehelensis, de Morgan, Bull. p. 66, t. iii. fig. 4.

Pupina artata, v. Mölldff. l. c. p. 314 (*non* Benson).

Mt. Tchenel (*de Morgan*); Bukit Pondong (*Hungerford*).

82. *COPTOCHILUS SECTILABRUM*, Gould.

Perak (*Townsend*); Larut (*coll. Ind. Mus.*). Known from Penang, Tenasserim.

83. *HYBOCYSTIS ELEPHAS*, de Morgan.

Hybocystis elephas, de Morgan, Le Nat. 1885, p. 70; Bull. p. 56, t. iii. fig. 1; Fischer, J. de Conch. 1885, p. 174, t. x. (anat.); Crosse, *ibid.* p. 183, t. xi.; v. Mölldff. l. c. p. 314.

Valley of Perak river (*de Morgan*); Larut (*coll. Ind. Mus.*).

Hybocystis jousseaumi, de Morgan (Le Nat. 1885, p. 70; Bull. p. 57, t. iii. fig. 2), from the same locality, appears to be based on smaller and dead specimens and is to be suppressed (*cf.* v. Mölldff. l. c. p. 315; Crosse, J. de Conch. 1887, p. 275).

Fam. HYDROCENIDÆ.

84. *GEORISSA MONTEROSATIANA*, Godw.-Aust. & G. Nev.

Georissa monterosatiana, Godw.-Aust. & G. Nev. P. Z. S. 1879, p. 738, t. lix. fig. 6; v. Mölldff. l. c. p. 316.

Bukit Pondong (*Townsend, Hungerford*).

85. *GEORISSA SEMISculpta*, Godw.-Aust. & G. Nev.

Georissa semisculpta, Godw.-Aust. & G. Nev. P. Z. S. 1879, p. 740, t. lix. figs. 3, 3a.

Bukit Pondong (*Townsend*).

Fam. AMPULLARIIDÆ.

86. *AMPULLARIA TURBINIS*, Lea, var. *SUBAMPULLACEA*, G. Nev.

Ampullaria turbinis, var. *subampullacea*, G. Nev. Handl. Moll. Ind. Mus. ii. 1884, p. 6.

Ampullaria sumatrensis, de Morgan, Bull. p. 70.

Perak (*Townsend*). Malay Peninsula generally (*de Morgan*).

Ampullaria perakensis, de Morgan (l. c. p. 70, t. iv. fig. 12), and *A. wellesleyensis*, de Morgan (l. c. p. 71, t. iv. fig. 13), are probably young shells.



1891. "On the Land and Freshwater Shells of Perak." *Proceedings of the Zoological Society of London* 1891, 330–348.

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