SIBOGA-EXPEDITIE.

Siboga-Expeditie

UITKOMSTEN

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VERZAMELD IN

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AAN BOORD H. M. SIBOGA ONDER COMMANDO VAN

Luitenant ter zee 1e kl. G. F. TYDEMAN

UITGEGEVEN DOOR

Dr. MAX WEBER

Prof. in Amsterdam, Leider der Expeditie

(met medewerking van de Maatschappij ter bevordering van het Natuurkundig Onderzoek der Nederlandsche Koloniën)

BOEKHANDEL EN DRUKKERIJ

VOORHEEN

E. J. BRILL

LEIDEN

Siboga-Expeditie
XLIX[1] f

THE PROSOBRANCHIA, PULMONATA AND OPISTHOBRANCHIA TECTIBRANCHIATA
Tribe BULLOMORPHA
OF THE SIBOGA EXPEDITION

BY

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Bosch en Duin near Utrecht (Holland)

PART VI

PULMONATA and OPISTHOBRANCHIA TECTIBRANCHIATA
Tribe BULLOMORPHA

With 2 plates

LATE E. J. BRILL
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PART VI

PULMONATA

AND

OPISTHOBRANCHIA TECTIBRANCHIATA

Tribe BULLOMORPHA.

Though the mollusks dealed with in this part, do not belong to the *Prosobranchia*, Prof. WEBER thought it would be fit, that I should record them. It was not without hesitation that I have undertaken this task, as far as concerns the *Opisthobranchia Tectibranchiata*, Tribe *Bullomorpha*, the *Nudibranchiata* and other tribes of *Tectibranchiata*, even one species belonging to the Tribe *Bullomorpha*, having already been treated by R. BERGH (monograph L); but with the kind assistance of Mr. SMITH, who compared many of the small species, with the numerous forms which are described, but not figured by ADAMS and other authors, I have now accomplished it. The present part contains 19 species of land- and freshwatermollusks, of which 2 are new to science, and 41 species of *Opisthobranchia Tectibranchiata Bullomorpha*, with 15 n. sp. and a few varieties.

PULMONATA.

Suborder GEOPHILA.

Fam. ZONITIDAE.

Xesta Albers.

1. *Xesta citrina* Linné.

LINNE. Syst. Nat. Ed. X, p. 771, N° 595.
RUMPH. Amb. Rariteitkamer, p. 92, Pl. 27, fig. 2.
REEVE. Conch. Ic. Vol. VII, Helix, fig. 482.
v. MARTENS. Ostas. Landschn. p. 193, Pl. 6, fig. 2.
TRYON PILSBRY. Man. of Conch. 2d Series, Vol. II, p. 72, Pl. 20, fig. 89.

Stat. 180. North coast of Pulu Kelang. 1 Spec.

The specimen is of rather typical shape, not quite adult, light redbrown, with a dark brown band accompanied by a white zone, it agrees moderately well with the figure of v. MARTENS (l. c.), which seems however to have no white zone. PILSBRY's figure is what v. MARTENS calls "mut. *dimidiata*".

2. *Xesta aulica* Pfeiffer.

PFEIFFER. Monogr. Heliceorum, Vol. III, p. 61.
REEVE. Conch. Ic. Vol. VII, Helix, fig. 481.
v. MARTENS. Ostas. Landschn. p. 199, Pl. 8, fig. 2, 3.
TRYON PILSBRY. Man. of Conch. 2d Series, Vol. II, p. 73, Pl. 20, fig. 96—100.

Stat. 155. Piapis-bay, (Telok Sapira) Northwest coast of Waigeu-island. 1 Spec.

This specimen is violet-brown, with a dark brown band just above the periphery, a whitish zone below it, with a faint, very narrow, brown band, accompanying the large one and a narrow, brownish line below the suture, bordered by whitish. Fig. 96 of TRYON is the nearest ally in colour.

Hemiplecta Albers.

1. *Hemiplecta peascana* Pfeiffer.

PFEIFFER. Proc. Zool. Soc. Lond. 1864, p. 603.
—— Monogr. Heliceorum, Vol. V, p. 77.

v. Martens. Ostas. Landschn. p. 204, 206, (*rareguttata* var.?).
Tryon/Pilsbry. Man. of Conch. 2d Series, Vol. II, p. 69, (*rareguttata* var.?).

Stat. 296. Near Noimini, South coast of Timor and in the river-bed. 4 Spec.

One young specimen has been taken alive, 3 specimens from the river-bed are dead, bleached shells, of which 1 or 2 full-grown. As the specimens agree with my stronger sculptured ones, from more than one locality, I have kept them separate from *Nanina rareguttata* Mousson.

2. *Hemiplecta kangeangensis* n. sp. Pl. XXXI, fig. 1.

Stat. 16. Bay of Kankamaraän, South coast of Kangeang. 2 Spec.

Shell depressedly-conoid, umbilicated, carinated, horn-coloured, with a whitish keel, accompanied by a narrow red-brown zone or line. Whorls $4^1/_3$, slightly convex. Nuclear whorls with very fine, radial striae or riblets, becoming stronger on subsequent whorls, where they are more like curved ribs, the ribs being crossed by spiral striae, interstices smooth; near aperture these striae are again fainter, on the 3d and subsequent whorls, the keel is perceptible as a slightly depressed, white zone, just above the shallow suture; last whorl moderately depressed, angular by the prominent keel, its basal surface convex, much smoother, shining, of a lighter colour, slightly darker round the pervious umbilicus; aperture depressedly ovate, scarcely angular by the keel, moderately oblique, its upper and basal margins regularly convex; peristome slightly thickened, more so at its insertion near the umbilicus, where it is dilated and partly covers the umbilicus.

Diam. maj. 26, alt. $15^1/_2$; apert. alt. 9, diagonally 10; lat. 13; umb. lat. 2 Mill.

Of this species one specimen is adult but not intact, having a large hole in its spire and the peristome is slightly broken at its upper part, the other specimen is not fullgrown, however they are sufficient for description and comparison. The species may be distinguished from its allies *H. bataviana*, *arguta* etc., by its regularly convex shape, by its smaller size, scarcely perceptible umbilical darker spots and much finer sculpture, which is decidedly riblike in the allied species.

Fam. Helicidae.

Chloritis Beck.

1. *Chloritis argillacea* Ferussac.

Ferrusac. Prodr. N° 38, Hist. Nat. Moll. Pl. 26, fig. 1—3.
Reeve. Conch. Ic. Vol. VII, Helix, fig. 415.
v. Martens. Ostas. Landschn. p. 273.
Tryon/Pilsbry. Man. of Conch. 2d Series, Vol. III, p. 210, Pl. 48, fig. 78, 79.

Stat. 296. Noimini, South coast of Timor. 1 Spec.

A very common species on Timor and some other islands.

2. *Chlorites conjecta* Smith.

Smith. Ann. and Mag. Nat. Hist. Ser. 7, Vol. III, 1899, p. 410.

Stat. 53. Waingapu, Sumba. 6 Spec.

The specimens differ from Smith's description in being smaller, not surpassing 1.4 Mill. in their largest diameter, but otherwise they perfectly agree.

Rhagada Albers.

1. *Rhagada colona* v. Martens.

v. Martens. Monatsbericht der Konigl. Ak. der Wissensch. zu Berlin, 1877, p. 272, Pl. 1, fig. 4, 5.
Tryon Pilsbry. Man. of Conch. 2d Series, Vol. VI, p. 190, Vol. IV, Pl. 36, fig. 37, 38.

Stat. 58. Seba, Savu. 9 Spec.

The majority of the specimens is slightly larger than v. Martens' type, the largest having a diameter of $12^1/_2$ Mill. instead of 11, an altitude of $8^1/_2$, instead of 7 Mill. and is less depressed in shape; only 2 specimens have the bands quite hyaline, in the other ones a conspicuous brown peripheral band and a narrow subsutural one of the same colour, distinguish them from a specimen formerly received of v. Martens; as however these differences are more gradual, as a few specimens are of the typical size, shape and colour of bands, and the characteristic sculpture, consisting of strong ribs on the upper surface, with a nearly smooth base, agree with v. Martens' description, there is, I think, no doubt that they belong to the same species, which came from Dana, an island southwest-wards from Savu.

Plectotropis v. Martens.

1. *Plectotropis kangeangensis* n. sp. Pl. XXXI, fig. 2.

Stat. 16. Bay of Kankamaraan, South coast of Kangeang. 2 Spec.

Shell widely umbilicated, carinated, convexly depressed, thin, fragile, opaque, white. Whorls 4, rapidly increasing, slightly convex above, with a slight depression near the suture, which is conspicuous, more so as the keel is prominent on penultimate whorl. Nucleus not convex, nearly smooth, but under the lens with very fine wrinkles; on the second and subsequent whorls, the sculpture consists of stronger, radial striae, nearly riblike in some parts, crossed by fine, spiral striae: last whorl with a conspicuous, though not sharp, compressed keel, fainter near the aperture, basal part of last whorl much more convex than upper part, with the same sculpture, though a little less coarse. Aperture oblique, angularly lunar, its upper and basal margins convex, columellar margin nearly straight (damaged), joined with the basal one by an obtuse angle; peristome rather thin above, slightly expanded, thicker and narrowly expanded near base. Umbilicus rather large, pervious, funnel-shaped, bordered by an obtuse angle.

Diam. maj. $17^1/_2$, alt. 10: apert. alt. 5: diagonally 7, lat. $6^1/_2$, umb. lat. $6^1/_2$ Mill.

Unfortunately this interesting new species is not represented by an intact specimen, one

of them is still young, the other one is adult, but has a large hole in the spire and the columellar margin is broken; it is allied to *P. rotatoria* v. d. Busch, *leucomphala* Mlldff. and *epiplatia* Mlldff., but may be at once distinguished by its very convex base. If placed on a level surface, the new species has its upper surface much more inclined than any of the allied forms, it has two worls less (*epiplatia* has even $6^1/_2$ whorl).

Cochlostyla Ferussac.

1. *Cochlostyla (Corasia) puella* Broderip var. *subpuella* Pilsbry.

Tryon Pilsbry. Man. of Conch. 2d Series, Vol. VII, p. 121, Pl. 24, fig. 19—21, 24, 26.
Pfeiffer. Nov. Conch. Vol. IV, p. 114, Pl. 126, fig. 6, 7, (*lais* var.).
Fulton. Proc. Mal. Soc. Lond. Vol. III, 1899, p. 214, (*lais*).

Stat. 133. Lirung, Salibabu-island. 12 Spec.

Of the 12 specimens, there is but one that possesses only the peripheral band, the other specimens have a larger or smaller number of narrow lines of lighter colour, as in Pfeiffer's figure (l. c.) and as those of Pilsbry. The variety, originally recorded from Tukan Besi by Pfeiffer, has already been recorded by Fulton as *lais*, from Talaut, by Pilsbry from the Philippines. A specimen from Fulton in my private collection is multifasciate, but otherwise perfectly agrees with the Siboga-specimens.

2. *Cochlostyla (Crystallopsis) najas* Pfeiffer.

Pfeiffer. Symb. Vol. III, p. 71.
—— Monogr. Heliceorum, Vol. I, p. 261.
Philippi. Abb. u. Beschr. neuer od. wenig gekannter Conch. Vol. II, p. 185, Pl. 9, fig. 5.
Reeve. Conch. Ic. Vol. VII, Helix, fig. 484.
v. Martens. Ostas. Landschn. p. 330, Pl. 18, fig. 4.

Stat. 133. Lirung, Salibabu-island. 4 Spec.

The only species hitherto known from the Talaut-isles, belonging to the same section, is, as far as I am aware, *C. physalis* Pf.; the Siboga-specimens however, do not agree with Pfeiffer's description or figure of the latter species, but very well with his *najas*, especially with Philippi's figure, they have the fine spiral striae, mentioned by the last named author, but not by Pfeiffer or v. Martens. The narrow, yellowish, subsutural band, figured by Philippi, which v. Martens could not find, is present in some of the specimens; it seems to be more a layer of enamel below the suture, visible by the transparency of the shell, than a true colour-band.

Amphidromus Albers.

1. *Amphidromus interruptus* Müller var. *infraviridis* v. Martens.

v. Martens. Ostas. Landschn. p. 344, 347, Pl. 20, fig. 2, 5, 8.
Tryon Pilsbry. Man. of Conch. 2d Series, Vol. XIII, p. 151, Pl. 52, fig. 59—65.

Stat. 16. Bay of Kankamaraän, South coast of Kangeang. 5 Spec.

Only one of the specimens is dextral; v. MARTENS records dextral and sinistral specimens for his var *infraviridis*. The Siboga-specimens mainly agree with the figures of that author, being less elongate than his fig. 5, but more so than fig. 8.

Suborder GEMYDROPHILA.

Fam. AURICULIDAE.

Pythia Link.

1. *Pythia undata* Lesson.

LESSON. Voy. de la Coquille, Vol. II, p. 336, Pl. 10, fig. 6.
KÜSTER. Martini-Chemn. Conch. Cab. Ed. II, Vol. I, Auriculacea, p. 65, Pl. 9, fig. 8, 9.
REEVE. Conch. Ic. Vol. XII, Scarabus, fig. 17.
v. MARTENS. Suss- u. Brackw. Moll. des Ind. Archipels, p. 139.

Stat. 131. Beo, Karakelang-islands. 2 Spec.

The specimens are small, more or less young, but especially the largest one is easily recognizable by the waved sculpture, which is only partly visible in the smallest specimen. This latter agrees with REEVE's words "obscurely freckled with chestnut". I find these freckles in many specimens from other provenience, particularly if seen by translucent light.

Auricula Lamarck.

1. *Auricula Judae* Linné.

LINNÉ. Syst. Nat. Ed. X, p. 728, N° 345.
KÜSTER. Martini-Chemn. Conch. Cab. Ed. II, Vol. I, Auriculacea, p. 15, Pl. 3, fig. 1, 2.
REEVE. Conch. Ic. Vol. XX, Auricula, fig. 16.
v. MARTENS. Suss- u. Brackw. Moll. des Ind. Archipels, p. 154, Pl. 8, fig. 6—11.

Stat. 19. Bay of Labuan Tring, West coast of Lombok. 1 Spec.

The specimen, which seems to have been inhabited by a hermit-crab, having lost its columellar folds, agrees in shape of spire with fig. 7 of v. MARTENS, but its aperture is broader below, nearly as in his fig. 11, though the peristome is thinner.

Melampus Montfort.

1. *Melampus fasciatus* Deshayes.

DESHAYES in Lamarck. An. s. vert. Ed. II, Vol. VIII, p. 337.
KÜSTER. Martini-Chemn. Conch. Cab. Ed. II, Vol. I, Auriculacea, p. 33, Pl. 5, fig. 9—11.
v. MARTENS. Suss- u. Brackw. Moll. des Ind. Archipels, p. 161, Pl. 8, fig. 4.

Stat. 259. Kei-islands. 1 Spec.

The specimen is uniformly yellowish, without bands.

2. *Melampus nucleolus* v. Martens?

v. Martens. Monatsber. d. Akad. d. Wissensch. Berlin, 1865, p. 55.
—— Süss- u. Brackw. Moll. des Ind. Archipels, p. 164, Pl. 8, fig. 21.

Stat. 306. Flores, near mount Lobetobi. 1 Spec.

I am not certain about the identification; the specimen is a strongly worn shell, which agrees in many respects with the description of v. Martens, but has 15 instead of 10 folds or denticles in the interior of its peristome, v. Martens (l. c. p. 165) records a specimen from the Pelew-isles with only 7 folds, so this character proves to be variable.

Suborder Hygrophila.

Fam. Limnaeidae.

Limnaea Lamarck.

1. *Limnaea javanica* Mousson.

Mousson. Land- u. Süsswasser-Moll. v. Java, p. 42, Pl. 5, fig. 1. (*succineus* v. *javanica*).
Reeve. Conch. Ic. Vol. XVIII, Limnaea, fig. 50.
v. Martens. Süss- u. Brackw. Moll. des Ind. Archipels, p. 3, Pl. 1, fig. 3—7.

Stat. 4. Djangkar (Java). 2 Spec.

The specimens are young, so I am unable to make out, to which of the forms, distinguished by v. Martens, it ought to be ascribed.

Isidora Ehrenberg.

1. *Isidora stagnalis* v. Martens.

v. Martens. Süss- u. Brackw. Moll. des Ind. Archipels, p. 11, Pl. 1, fig. 32—34.

River near Tondano, Celebes. 2 Spec.

This species was originally only known from Sumatra; the largest specimen perfectly agrees in shape with the figure of v. Martens, but is larger, 12 instead of $8^1/_2$ Mill.; the smallest one, which nearly agrees in size, has the spire slightly more elongated. As *Isidora sumatrana* v. Marts. has been found by P. & F. Sarasin in Celebes (Die Süssw.-Moll. von Celebes, p. 78), the fact that the present species should have been found in Celebes, is not surprising; these authors (l. c. p. 78) have observed some variability in *I. minahassae* v. Marts.

Fam. Planorbidae.

Planorbis Guettard.

Planorbis tondanensis Quoy & Gaimard.

Quoy & Gaimard. Zool. Voy. Astrol., Vol. II, p. 209, Pl. 58, fig. 39.
v. Martens. Suss. u. Brackw. Moll. des Ind. Archipels, p. 14, Pl. 1, fig. 23—25.
Kobelt. Abh. Senckenb. Naturf. Gesellsch. Bd. XXIV, 1897, p. 82, Pl. 11, fig. 3.

River near Tondano, Celebes. 2 Spec.

As Kobelt has stated (l. c.), this species, since more materials have been collected, proves to differ sufficiently from *P. compressus* Hutton.

Fam. Siphonariidae.

Siphonaria Sowerby.

1. *Siphonaria exigua* Sowerby.

Sowerby. Gen. of Shells. Pl. 143, fig. 4.
Reeve. Conch. Ic. Vol. IX, Siphonaria, fig. 29, (*luzonica*).

Stat. 7. Near reef of Batjulmati (Java). 15 M. Coral and stones. 5 Spec.
Stat. 33. Bay of Pidjot, Lombok. 22 M. and less. Mud, coral and coralsand. 3 Spec.
Stat. 240. Banda. 9—45 M. Black sand, coral, Lithothamnion. 2 Spec.

Four of the five specimens from Stat. 7 are much more raised than the other ones, and mainly of darker colour.

Order OPISTHOBRANCHIA.

Suborder Tectibranchiata.

Fam. Actaeonidae.

Solidula Fischer de Waldheim.

1. *Solidula solidula* Linné.

Linne. Syst. Nat. Ed. X, p. 728, N° 346.
Kiener. Coq. Viv. Vol. IX, Tornatella, p. 4, Pl. 1, fig. 2.
Reeve. Conch. Ic. Vol. XV, Tornatella, fig. 3.
Pilsbry. Man. of Conch. Vol. XV, p. 142, Pl. 20 A, fig. 37, 38, 44, 45.

Stat. 4. Near Djangkar (Java). 9 M. Coarse sand. 1 Spec.
Stat. 58. Seba, Savu. Up to 27 M. Sand. 1 Spec.
Stat. 64. Kambaragi bay, Tanah Djampeah. Up to 32 M. Coral, coralsand. 1 Spec.
Stat. 65. 5° 43'.5 N., 119°40 E. Sulu-archipelago. 522 M. Stony bottom. 1 Spec.

Stat. 133. Lirung, Salibabu-island. Up to 36 M. Mud and hard sand. 1 Spec.
Stat. 240. Banda. 9—45 M. Black sand, coral, Lithothamnion. 1 Spec.
Stat. 313. East of Dangar Besar, Saleh-bay. Up to 36 M. 1 Spec.

The specimens are smaller than usual, some of them are very young, that from Stat. 4 is small and bleached, the identification of this specimen remains doubtful, as well as the depth recorded for the specimen from Stat. 95, which is a fresh but empty shell.

var. *coccinata* Reeve.

REEVE. Proc. Zool. Soc. Lond. 1842, p. 60.
—— Conch. Ic. Vol. XV, Tornatella, fig. 1.
PILSBRY. Man. of Conch. Vol. XV, p. 143, Pl. 20 A, fig. 40, 41.

Stat. 258. Near Tual, Kei-islands. 22 M. Lithothamnion. 1 Spec.

The specimen is rather small (15 Mill.), white under a yellowish epidermis, with more spaced red dots than in REEVE's figure.

2. *Solidula sulcata* Gmelin?

GMELIN. Syst. Nat. Ed. XIII, p. 3436.
REEVE. Conch. Ic. Vol. XV, Tornatella, fig. 4, (*glabra*).
PILSBRY. Man. of Conch. Vol. XV, p. 143, Pl. 20 A, fig. 39, 46—48.

Stat. 78. Lumu-Lumu-shoal, Borneo-bank. 34 M. Coral and coralsand. 1 Spec.

The only specimen, only 10 Mill. in length, evidently young, with a rather strongly enamelled columellar side, but without smaller denticles (on account of youth?) and uniformly yellowish-white, seems to belong to *S. sulcata* by its sculpture.

3. *Solidula pusilla* A. Adams.

A. ADAMS. Proc. Zool. Soc. Lond. 1854, p. 61.
PILSBRY. Man. of Conch. Vol. XV, p. 139.

Stat. 139. 0° 11′ S., 127° 25′ E. Near Batjan. 397 M. Mud, stones and coral. 1 Spec.

The specimen is a dead shell, which, by its slightly grooved basal fold, seems to belong to *S. pusilla*, rather than to *Actaeon oryza* Reeve, but the specimen is rather obscure.

4. *Solidula cinerea* Watson var.

WATSON. Challenger Report, Gastropoda, p. 631, Pl. 47, fig. 5.
PILSBRY. Man. of Conch. Vol. XV, p. 140, Pl. 20 A, fig. 49, 50.

Stat. 33. Bay of Pidjot, Lombok. 22 M. and less. Mud, coral and coralsand. 1 Spec.
Stat. 58. Seba, Savu. Up to 27 M. Sand. 3 Spec.

Mr. SMITH, who had the kindness to compare the specimens with WATSON's type, says about them: "near *S. cinerea* Wats. but grooved deeper and broader. Markings rather different".

As the Siboga specimens vary considerably in both respects, I thought it may be safe to consider them as a variety, rather than to describe them as a new species, on inconstant characters.

Actaeon Montfort.

1. *Actaeon flammeus* Gmelin.

GMELIN. Syst. Nat. Ed. XIII, p. 3435.
KIENER. Coq. Viv. Vol. IX, Tornatella, p. 3, Pl. 1, fig. 1.
REEVE. Conch. Ic. Vol. XV, Tornatella, fig. 2.
PILSBRY. Man. of Conch. Vol. XV, p. 151, Pl. 20 A, fig. 58, 59.

Stat. 184. Near Kampong Kelang, South coast of Manipa-island. 36 M. Coral, sand. 1 Spec.
Stat. 240. Banda. 9—45 M. Black sand, coral, Lithothamnion. 1 Spec.
Stat. 313. East of Dangar Besar, Saleh-bay. Up to 36 M. Sand, coral and mud. 1 Spec.

Fam. TORNATINIDAE.

Tornatina A. Adams.

1. *Tornatina voluta* Quoy & Gaimard.

QUOY & GAIMARD. Voy. Astrolabe, Zool. Vol. II, p. 359, Pl. 26, fig. 33—35.
ADAMS. Thes. Conchyl. Vol. II, p. 566, Pl. 121, fig. 24.
WATSON. Challenger Report, Gastropoda, p. 656.
PILSBRY. Man. of Conch. Vol. XV, p. 195, Pl. 22, fig. 29—31.

Stat. 58. Seba, Savu. Up to 27 M. Sand. 1 Spec.

ADAMS describes the species as smooth, WATSON and PILSBRY mention fine, remote, spiral striation; the Siboga-specimen is in very fine condition, it very well agrees with PILSBRY's figure, but I should not call the striae remote, though they are narrower than the interstices, they are not visible on that figure. KOBELT has given a coloured figure of the species, on plate B of his *Bullacea*, in the second edition of the Conchylien-Cabinet; this dorsal view, with the animal, but without description, shows a more remote striation, but is less characteristic than the beautiful plates, representing the empty shells in KOBELT's monograph.

Retusa Brown.

1. *Retusa Sibogae* n. sp. Pl. XXXI, fig. 3.

Stat. 52. 9° 3'.4 S., 119° 56'.7 E. Savu-sea. 959 M. Globigerina ooze. 1 Spec.

Shell rather large for the genus, oval, thick, white, with raised spire. Nuclear whorls broken, remaining whorls about 3, (worn), separated near the aperture and probably higher on, by a narrow, channelled suture; last whorl contracted below the suture, then flatly convex, rounded near the base. Sculpture consisting of very fine radiating or growth-striae, stronger at intervals, more conspicuous on upper part of last whorl, and numerous spiral striae, which are raised on the upper part, impressed on the lower part of body-whorl, the interstices are con-

siderably broader than the striae, even near the base, where they are more crowded. I see about 13 raised striae, of which the upper ones are fainter, and, I think 40—50 impressed ones, the condition of the shell not allowing a regular counting. Aperture elongately-pear-shaped, narrow above, sharply angular at the summit, rounded below, peristome broken, its contour in accordance with the body-whorl, contracted above; columellar side with a (partly removed) layer of enamel, the columella concave, thick, reflected over the umbilicus, as a thick enamelled plait, nearly concealing an umbilical slit.

Alt. 6, lat. $3^1/_4$; apert. alt. $4^1/_2$, lat. $1^3/_4$ Mill.

Though this specimen is in bad condition, its large size and particular characters, moreover the great depth at which it has been dredged, induced me to describe it. I know no species which is like it.

Volvulopsis n. gen.

Shell elongately-ovate, conically pointed above, rounded and but little contracted below, last whorl forming practically the whole shell; spire a small, apparently not pervious pit, nearly concealed by enamel.

Type: *V. ancillarioides* Schepm.

This new genus has some resemblance with *Volvula*, but the spire is much less pointed, the base more rounded; unfortunately the soft parts are wanting, so the systematic position could not be ascertained as well as might be desirable. Under these circumstances I have located the genus near the place occupied by *Volvula*.

1. *Volvulopsis ancillarioides* n. sp. Pl. XXXI, fig. 4.

Stat. 52. 9° 3′.4 S., 119° 56′.7 E. Savu-sea. 959 M. Globigerina ooze. 1 Spec.
Stat. 88. 0° 34′.6 N., 119° 8′.5 E. Makassar-strait. 1301 M. Fine grey mud. 1 Spec.

Shell elongately-ovate, upper part much contracted, forming a short cone, with convex sides, white, only one whorl visible, forming nearly the whole shell, but for a scarcely visible top of the spire, which is encircled by a sharp margin, enclosing a small hole in one specimen, nearly and probably always concealed by enamel, in the adult. Sculpture consisting of rather remote lines of growth and crowded spiral striae, raised near the upper part, impressed near the base and on the median part, where they are much fainter in one specimen (perhaps by erosion). Aperture as long as the shell, ending above in a narrow canal; peristome broken, slightly convex at the upper part, nearly straight lower on, running uninterruptedly in the broadly rounded basal margin. Columellar side convex, with a conspicuous layer of enamel; columella nearly straight, thickly enamelled, probably slightly truncated.

Alt. 17, lat. $7^1/_2$; apert. lat. 4 Mill.

The two specimens are somewhat different, that from Stat. 52 being a little more convex, with somewhat stronger sculpture; as both specimens are more or less defective, this latter character may depend on the state of preservation. Though it was impossible clearly to define every character, the species is too remarkable to be neglected.

Fam. Scaphandridae.

Meloscaphander n. gen.

Shell ovate, convex in its upper part, attenuated below, with low, exserted spire; aperture shorter than the shell, large; columella moderately curved, thick. Sculpture consisting of spiral rows of pits. Type: *M. Sibogae* Schepm.

This shell has the sculpture, but not the shape of *Scaphander*, which is on the contrary narrower above than below and has a sunken spire.

1. *Meloscaphander Sibogae* n. sp. Pl. XXXI, fig. 5—9.

Stat. 221. 6° 24 S., 124° 39' E. Banda-sea. 2798 M. Solid bluish grey mud with foraminifera. 1 Spec.

Shell ovate, broadest in its upper half, obliquely attenuate below, rather strong, yellowish under a brown epidermis. Whorls $3^1/_2$, forming a short spire, slightly eroded, separated by a deep suture, probably a little convex, but the characters of upper whorls are obliterated by erosion; last whorl large, strongly rounded in its upper part, more straightish in its median part, narrower below. Sculpture consisting of spiral lirae in upper part, (about 16 in number), which are often double and are crossed by riblets, giving a cancellated appearance to that upper part; lower on the lirae disappear and have the character of a smooth surface, with about 60 spiral rows of rounded pits, the basal part again with a few (about 5) lirae. Some of the spiral rows of median zone are very fine, the majority is rather coarse. Aperture pear-shaped, with a rather acute angle above, becoming soon broader, much so below, slightly compressed at the base; peristome rather thin, regularly curved, though more above and below, than in median part; body-whorl with a conspicuous layer of enamel on its moderately convex columellar side. Columella concave, thick, not angular below, thickly reflected and quite covering the umbilical region.

Alt. 16, lat. $10^1/_2$: apert. alt. 15, lat. $6^3/_4$ Mill.

Of the three gizzard plates, two are large, subquadrate, with strongly rounded angles, rather thick, calcareous, broadly rounded at the largest extremity, where they are yellowish-white and thinner, one of them nearly straight at the opposite margin, where it is dark brown and thick, lateral sides slightly undulated; the other plate has the front- and backsides more rounded, but otherwise it is similar; the interior of these plates is convex, with a nearly smooth, subcircular centre and a broad, concentically striated margin, exteriorly these plates are concave in their broadest part. The third plate is much narrower, elongate, strongly compressed, brown with darker growth-striae, and has much the appearance of a gaping, equal-sided *Unio pictorum*. Length of largest plates about $4^1/_2$, their greatest breadth $4^1/_4$, narrowest part $3^1/_4$ Mill., smallest plate, long $3^1/_2$ high $1^1/_4$ Mill.

The radula has given only a poor result; as the soft parts seemed to be decayed, I obtained only a few separate lateral teeth, I could find no median ones, probably they were lost, as, according to Bergh, is often the case; one of the laterals (1), in a favorable position,

has the shape of a curved sword, with a rounded knob, and is finely serrated at one of its margins, a little behind the top. The shape and disposition, as well of the gizzard-plates as of the lateral teeth, four of which are *in situ*, displayed the appearance of the ribs of a quadruped, as in *Scaphander*, and are in accordance with my locating the species amongst the *Scaphandridae*, though, if this be right, the family-characters ought to be altered in accordance with the slightly raised spire in the new genus.

Scaphander Montfort.

1. *Scaphander Sibogae* n. sp. Pl. XXXI, fig. 10.

Stat. 18. 7° 28′.2 S., 115° 24′.6 E. Bali-sea. 1018 M. Fine grey mud. 18 Spec.
Stat. 45. 7° 24′ S., 118° 15′.2 E. Flores-sea. 794 M. Fine grey mud. 2 Spec.
Stat. 208. 5° 39′ S., 122° 12′ E. Between Buton and Kabaëna. 1886 M. Solid green mud. 1 Spec.

Shell oval, rather thick for the genus, white, under a light-brown epidermis. Sculpture consisting of more or less unequal growth-striae, having at intervals the appearance of folds, and numerous spirals, which, on the ventral side, have often the appearance of rows of impressed punctures; on the back and near the aperture, they are more like impressed spiral grooves, with faint punctures; towards the base the grooves are deeper and partly distinctly punctured, however this sculpture varies considerably in different specimens, the punctures being more distinct in some specimens than in other ones. Spire concave, but the spiral perforation is quite concealed by the enamel and bordered by a sharp keel. Body whorl moderately convex. Aperture wide, especially below, where it is dilated; its upper margin forms a large, rounded wing, much surpassing the spire, outer margin slightly convex, basal margin regularly rounded. Columellar side of body-whorl not very convex above, strongly concave below, the body with a strong layer of enamel.

Alt. (from apex to base of apert.) 23, lat. 18, apert. alt. with wing 26, lat. above $6^1/_2$, below 12 Mill.

Alt. (from apex to base of apert.) 25, lat. 20, apert. alt. with wing 28, lat. above 7, below $14^1/_2$ Mill.

This species has some resemblance with *S. mundus* Wats., but the wing of the aperture is much larger, the aperture is much broader in its lower half, the columella of the new species being much more concave, the basal part of peristome is more regularly curved in *S. mundus*, dilated in *S. Sibogae*, the sculpture is different, though variable, as stated above; the specimen from Stat. 208 is very small (young) and strongly punctured. Perhaps it is different, but I would not describe another new species on a rather similar specimen, the differences of which may depend on age; the first recorded measurements are of a fine specimen with epidermis, which has served for description, the other ones of the largest, somewhat bleached specimen.

2. *Scaphander attenuatus* n. sp. Pl. XXXI, fig. 11.

Stat. 52. 9° 3′.4 S., 119° 56′.7 E. Savu-sea. 959 M. Globigerina ooze. 5 Spec.

Shell oval, upper part rather much attenuated, moderately strong, white under a yellowish

or brownish epidermis. Sculpture consisting of more or less conspicuous growth-striae and more or less close set spiral rows of rounded punctures, which are especially conspicuous on the ventral side, and, in most cases, much less so towards the aperture, where they have in many instances the appearance of slightly punctured spiral striae; near the base the interstices have nearly the character of lirae. Spire concave, concealed by an enamellous deposit, bordered by an obtuse keel. Body-whorl not very convex. Aperture wide, especially in its lower part, which is much dilated; its upper margin scarcely winged, elevated only a little above the body-whorl; outer margin nearly straight, basal margin regularly rounded. Columellar side of body-whorl not very convex above, covered by a thin layer of enamel, very concave below.

Alt. (from apex to base of apert.) 23, lat. $16^1/_2$, apert. alt. with wing $24^1/_2$, lat. above $4^1/_2$, below $12^1/_2$ Mill.

Alt. (from apex to base of apert.) $25^1/_2$, lat. $18^1/_2$, apert. alt. with wing 27, lat. above $4^1/_2$, below $13^1/_4$ Mill.

This species, by its shape and short wing, may be the nearest ally of *S. cancellatus* v. Martens (Die beschalten Gastropoden der deutschen Tiefsee-Exped. 1898—99, p. 131, Pl. 5, fig. 19), but it is considerably more attenuated above, the body-whorl is much less convex than in the figure of v. Martens, the sculpture seems to be different; however sculpture scarcely seems to be a very constant character, as will be seen in the description of my new species, the development of the punctures differing considerably in some parts of the shell; in some specimens very fine intermediate rows of punctures are perceptible, scarcely present in other ones, the colour varies from yellow-brown to rather dark brown, even though being quite fresh and containing the soft parts; however these differences can only be individual, otherwise nearly every specimen should be a species. The same observations about sculpture have been made in the preceding species. Likewise the different measurements have been made after the same rule as in *S. Sibogae*.

3. *Scaphander subglobosa* n. sp. Pl. XXXII, fig. 1.

Stat. 45. 7° 24′ S., 118° 15′.2 E. Flores-sea. 794 M. Fine grey mud. 1 Spec.
Stat. 178. 2° 40′ S., 128° 37′.5 E. Ceram-sea. 835 M. Blue mud. 1 Spec.

Shell broadly oval, attenuated above, rather thin, white under a reddish-brown epidermis. Sculpture consisting of folds, more crowded at the beginning of last whorl, more remote near the aperture, and spiral rows of relatively large punctures, occupying a large part of the shell, but less conspicuous towards the aperture and separated by narrow interstices, which are narrower and more raised on the basal half, with true lirae near the base. Spire concave, concealed by a deposit of enamel, bordered by a very low, rounded, white margin. Body-whorl rather convex. Aperture wide, dilated below, upper margin with a small (broken) wing, outer margin regularly but not strongly convex, basal margin regularly rounded, columellar side strongly convex along the body, which is covered by an orange layer of enamel; lower part or true columella strongly concave.

Alt. (from spire to base of apert.) 28, lat. 22; apert. alt. with wing 30, lat. above 6, below 15 Mill.

This species agrees by the small wing with the preceding one, but its margin round the impressed spire is still much blunter, the shell is more convex; the new species is much more convex than in *S. cancellatus*, the columella much more curved, the peristome more convex; moreover the shell is considerably larger and the sculpture much coarser than any of the species described above or otherwise described from the Indic. The specimen from Stat. 45 is very young and doubtful.

4. *Scaphander* sp.

Stat. 321. 6° 5'.5 S., 113° 30' E. Java-sea. 82 M. Fine, grey mud. 1 Spec.

The specimen long about $5^1/_2$ Mill., probably belongs to the genus *Scaphander;* as its peristome is very fragile, the basal margin broken, and the shell has been broken and repaired during life, I think it is preferable not to name or describe it, as it is too young and obscure.

5. *Scaphander* sp.?

Stat. 260. Near North point of Nuhu Jaan, Kei-islands. 90 M. Sand, coral and shells. 2 Spec.

The specimens are small and decidedly young; though the sculpture resembles that of the preceding specimen, I think they do not belong to the same species; they are still less worth describing.

Atys Montfort.

1. *Atys naucum* Linné.

Linné. Syst. Nat. Ed. X, p. 726, N° 332.
Rumph. Amb. Rariteitkamer, p. 91, Pl. 27, fig. H.
Adams. Thes. Conchyl. Vol. II, p. 584, Pl. 124, fig. 107—109.
Reeve. Conch. Ic. Vol. XVII, Atys, fig. 1.
Pilsbry. Man. of Conch. Vol. XV, p. 263, Pl. 28, fig. 11—13.
Kobelt. Martini-Chemn. Conch. Cab. Ed. II, Vol. I, Bullacea, p. 13, Pl. 2, fig. 13, 14.

Stat. 47. Bay of Bima near South fort. 55 M. Mud with patches of fine coralsand. 1 Spec.
Stat. 240. Banda. 9—45 M. Black sand, coral, Lithothamnion. 1 Spec.

Both specimens of this common species are very young.

2. *Atys* sp.

Stat. 33. Bay of Pidjot, Lombok. 22 M. and less. Mud, coral and coralsand. 1 Spec.
Stat. 133. Lirung, Salibabu-island. Up to 36 M. Mud and hard sand. 1 Spec.

Both specimens have the appearance of being young; as both are moreover defective and the shape has no prominent characters, I think it not advisable to name them; the shells are much more elongated than the young specimens of *A. naucum* and have only a very faint columellar fold. The species much resembles *A. hyalina* Watson, but seems not to be identical, as Mr. Smith, who compared it in the British Museum, has not identified it.

3. *Atys multistriata* n. sp. Pl. XXXII, fig. 2.

Stat. 37. Salus ketjil, Paternoster-islands. 27 M. and less. Coral and coralsand. 1 Spec.

Shell elongated, with slightly convex sides, attenuated above, thin, transparent white; sculpture consisting of growth striae, which are rather coarse in some parts of the shell and especially towards the spire, where they are more crowded, being more remote and fold-like on the rest of body-whorl; the whole shell is covered with fine spiral striae, very fine and nearly microscopic on the central part, more conspicuous towards the extremities. Spire umbilicated, enamelled, with a rounded border. Aperture very narrow above, larger below, lip rising from the vertex, arched but not contorted, forming a regular sinus above, outer margin slightly convex, thickened interiorly; basal margin forming a compressed sinus, columellar side scarcely enamelled on the slightly convex body; columella short, slightly concave, with a small, contorted fold at its base, making it slightly truncated; behind the columella an elongated, narrow, umbilical slit is bordered by a rounded margin.

Alt. from spire to base of aperture $10^{3}/_{4}$, lat. $5^{1}/_{4}$, apert. alt. $11^{3}/_{4}$, lat. above $^{1}/_{2}$, below 2 Mill.

This specimen, on account of its thickened peristome, seems to be adult; in shape it much resembles *A. cylindrica* Helbl. v. *elongata*, but it differs from that and most other species, by its spiral striae over the whole shell, it is not allied to that species; the folded columella locates it in the section *Atys* s. str.

4. *Atys tortuosa* A. Adams.

Adams. Thes. Conchyl. Vol. II, p. 587, Pl. 125, fig. 120.
Reeve. Conch. Ic. Vol. XVII, Atys, fig. 15.
Pilsbry. Man. of Conch. Vol. XV, p. 264, Pl. 23, fig. 66, 67.
Kobelt. Martini-Chemn. Conch. Cab. Ed. II, Vol. I, Bullacea, p. 25, Pl. 8, fig. 7, 8.

Stat. 184. Near Kampong Kelang, South coast of Manipa-island. 36 M. Coral, sand. 1 Spec.
Stat. 260. Near North point of Nuhu Jaan, Kei-islands. 90 M. Sand, coral and shells. 1 Spec.

5. *Atys subtortuosa* n. sp. Pl. XXXII, fig. 3.

Stat. 4. Djangkar (Java), 9 M. Coarse sand. 4 Spec.
Stat. 172. Gisser, Reef. 1 Spec.
Stat. 193. Sanana-bay, East coast of Sula Besi, 22 M. Mud. 1 Spec.
Stat. 285. South coast of Timor. 34 M. Limit between mud and coral. Lithothamnion. 1 Spec.

Shell convexly-oval, attenuated and contracted above, narrow below, thin, fragile, white. Sculpture consisting of very fine growth-striae and at both ends, strong spiral striae, which are not crowded, though a little closer at the extremities; a median zone, scarcely a third part of the total dorsal length, remaining smooth, except for excessively minute, spiral striae, traceable on nearly the whole shell, under a very strong lens. Spire concave, with a small enamellous centre, bordered by a rounded, opaque, white rim; below this rim the shell is slightly contracted. Lip from its inferior to upper part, slightly contracted, forming an angle at its junction with the outer margin, by the ending of the circum-apical rim; the outer margin at first concave

for a short space, then rather convex, until the compressed basal margin; columellar side strongly convex along the body-whorl, which is rather ventricose and covered by a very thin layer of enamel; columella slightly concave above, slightly reflected over an umbilical slit, which is bordered by a very faint rim; columella slightly truncate below.

Alt. from apex to base of apert. 6, lat. neary $4^1/_2$; apert. alt. 7, lat. above $^3/_4$, below $1^1/_2$ Mill.

The species seems to be allied to the preceding one, but differs in colour, being white instead of yellowish; the spiral sculpture, which occupies only the extremities of body-whorl in *tortuosa* but extends over more than $^2/_3$ in the new species; above and still more below, the shell is less attenuated, the umbilicus is smaller and less sharply bordered in the latter species, though some specimens seem to be less ventricose than other ones, the least ventricose ones are still more inflated than f. i. *A. attenuata* and other allied species. The differences between the specimens in this respect, may be due to age or to the state of preservation, some of them being more or less broken at the peristome; the measurements are those of the most complete specimen. Nearest, even perhaps too nearly allied, is the recently described *A. chelidon* (Proc. Mal. Soc., Vol. X, p. 253, Pl. 11, fig. 16; Oct. 1912), but that species is more slender, and, according to figure, the aperture is more rounded above.

6. *Atys (Alicula) cylindrica* Helbling.

HELBLING. Abh. Prov. Ges. Böhmen, Vol. IV, p. 122, Pl. 2, fig. 30, 31.
ADAMS. Thes. Conchyl. Vol. II, p. 585, Pl. 125. fig. 114.
REEVE. Conch. Ic. Vol. XVII, Atys, fig. 7.
PILSBRY. Man. of Conch. Vol. XV, p. 265, Pl. 33, fig. 60, 61.
KOBELT. Martini-Chemn. Conch. Cab. Ed. II, Vol. I, Bullacea, p. 16, Pl. 2, fig. 15, 16.

Stat. 7. Near reef of Batjulmati (Java), Coralreef. 2 Spec.
Stat. 37. Sailus ketjil, Paternoster-islands. 27 M. and less. Coral and coralsand. 20 Spec.
Stat. 58. Near Seba, Savu, Up to 27 M. Sand. 2 Spec.
Stat. 133. Lirung, Salibabu-island. Up to 36 M. 7 spec.
Stat. 184. Near Kampong Kelang, South coast of Manipa-island. 36 M. Coral, sand. 1 Spec.
Stat. 240. Banda. 9—45 M. Black sand, coral, Lithothamnion. 6 Spec.
Stat. 313. East of Dangar Besar, Saleh-bay. Up to 36 M. Sand, coral, mud and reef. 66 Spec.

To this form I have united the more or less angular specimens; none of them reaches the recorded length, scarcely surpassing 20 Mill.

var. *elongata* A. Adams.

ADAMS. Thes. Conchyl. Vol. II, p. 587, Pl. 125, fig. 121.
REEVE. Conch. Ic. Vol. XVII, Atys, fig. 8.
PILSBRY. Man. of Conch. Vol. XV, p. 266, Pl. 33, fig. 2.

Stat. 279. Rumah-Kuda-bay, Roma-island. 36 M. Mud and sand. 1 Spec.
Stat. 301. Pepela-bay, East coast of Rotti-island. 22 M. Mud, coral and Lithothamnion. 1 Spec.

This is the more elongated form, without trace of an angle. Both specimens are small.

7. *Atys (Alicula)* sp.

Stat. 4. Djangkar (Java). 9 M. Coarse sand. 1 Spec.

Probably a young specimen, (total length 7 Mill.) without prominent characters, resembling the preceding species, but the part of peristome, near vertex, not or scarcely contorded. I can not identify it, but think it is not advisable to describe it as new.

8. *Atys (Alicula) supracancellata* n. sp. Pl. XXXII, fig. 4.

Stat. 102. 6° 4.1 N., 120° 44 E. 535 M. 1 Spec.

Shell oval, ventricose, rather solid, yellowish-brown. Sculpture consisting of some spiral lirae, about 12 in number on the upper part of shell, occupying also the upper umbilical pit, and of which the lower 2 are considerably flatter; these lirae and not less their interstices are crossed and consequently cancellated, by finer, but still sufficiently conspicuous, radiating riblets; below the last of the lirae, run 2 spiral rows of fine punctures. Near the base run a few spiral rows of strong punctures, the 2 most basal ones accompanied by lirae, then follow higher on 3 rows of larger punctures, with nearly flat interstices and still higher up 2 spiral rows of small punctures; at last near the base of the otherwise nearly smooth median zone, still one row of very small punctures; this smooth space is crossed by irregular, sometimes fold-like growth-striae. Spire concave, with a small patch of enamel at its bottom, otherwise lirate, as described above, with a rounded rim. Aperture elongate, moderately narrow above, wider below; peristome strongly contorted near the vertex, then produced in a narrow wing; outer margin regularly convex, basal margin rounded; columellar side of body very convex, with a rather thick layer of enamel, which is rugose (perhaps abnormal), columella concave, broadly spread over the umbilical space.

Alt. from vertex to base of apert. $5^1/_2$, lat. 4; apert. alt. 6, lat. above $^1/_2$, below 2 Mill.

This species is remarkable for its prominent sculpture of upper part of body-whorl. I find no nearly allied species.

9. *Atys (Alicula) Pacei* Preston.

Preston. Records of the Indian Museum. Vol. II, p. 188, Pl. 16, fig. 52.

Stat. 37. Sailus ketjil, Paternoster-islands. 27 M. and less. Coral and coralsand. 5 Spec.
Stat. 240. Banda 9—45 M. Black sand, coral, Lithothamnion. 1 Spec.

I can find no differences with Preston's description and figure of specimens from the Andaman Islands, only one of the specimens from Stat. 37 has a length of $13^1/_2$ Mill. instead of 11.

Dinia H. & A. Adams.

1. *Dinia dentifera* A. Adams.

Adams. Thes. Conchyl. Vol. II, p. 588, Pl. 125, fig. 124.
Reeve. Conch. Ic. Vol. XVII, Atys, fig. 13.
Tryon. Man. of Conch. Vol. XV, p. 276, Pl. 27, fig. 81.
Kobelt. Martini-Chemn. Conch. Cab. Ed. II, Vol. I, Bullacea, p. 27, Pl. 8, fig, 15.

Stat. 43. Pulu Sarassa, Postillon-islands. Up to 36 M. Coral. 10 Spec.
Stat. 144. North of Salomakiee-(Damar-)island. 45 M. Coralbottom and Lithothamnion. 1 Spec.

The specimens are more convex than the allied *D. monodonta* from Borneo.

2. *Dinia truncatula* n. sp. Pl. XXXII, fig. 5.

Stat. 95. 5°43'.5 N., 119°40' E. Sulu-archipelago. 522 M. Stony bottom. 2 Spec.

Shell small, elongately-oval, narrower at its upper part, strongly truncated above, moderately strong, white, smooth. Sculpture consisting of very fine growth-striae and a few spiral striae which are rather faint and not crowded, near the base. Spire umbilicated, rather wide and deep, showing the whorls, about 3 in number, not enamelled, bordered by a rounded margin, divided by a single spiral groove; body-whorl nearly straight above, then convex. Aperture elongated, narrow above, large below; upper margin of peristome forming a small, rounded sinus, outer margin nearly straight, even slightly contracted above the middle, then slightly dilated; basal margin rounded. Columellar side of body-whorl convex, covered with a thin layer of enamel, columella short, concave, with a tooth-like fold at its basal part; no trace of umbilicus.

Alt. from margin of spire to base of apert. $3^1/_2$, lat. 2; apert. alt. $3^3/_4$, lat. above $^1/_4$, below $2^1/_4$ Mill.

This species may be distinguished from *D. dentifera* and *monodonta*, by its strongly truncated spire and by being attenuated at the upper part, *monodonta* being more cylindrical, *dentifera* regularly oval. One specimen is slightly worn, but has the tooth-like fold more conspicuous, than that which has served for description. Both specimens are empty shells, consequently it is not certain that they have lived at the recorded depth.

Cylichna Loven.

1. *Cylichna javanica* n. sp. Pl. XXXII, fig. 6.

Stat. 4. Djangkar (Java). 9 M. Coarse sand. 1 Spec.

Shell subcylindrical, slightly narrower above then below, truncated above, upper part of sides and base rounded; rather strong, white, partly covered by a dark brown epidermis. Sculpture consisting of hair-like growth-striae, stronger at irregular intervals, and of numerous, irregular, waved, spiral striae, more crowded at some places, stronger near the base, where they have the appearance of lirae. Spire deeply umbilicated, bordered by a sharp keel. Aperture elongated, narrow above, dilated below, its upper margin being the continuation of the umbilical keel, a little ascending, outer margin at first rounded above, then nearly straight, broadly rounded below and at the base of shell. Columellar side nearly straight at body-whorl, rounded above, with a narrow but conspicuous layer of enamel; columella thick, rounded, slightly contorted, nearly straight above, concave below, with an umbilical slit behind it.

Alt. from margin of body-whorl to base of apert. $6^1/_4$, lat. $2^1/_4$; apert. alt. $6^3/_4$, lat. above nearly $^1/_2$, below $1^1/_4$ Mill.

I know no East-Indian species which is nearly allied.

2. *Cylichna* sp.

Stat. 2. Madura-strait. 67 M. Grey mud with some radiolariae. 1 Spec.

This species is still allied to the preceding one, but as the upper part of aperture has been broken and repaired during life, it is impossible to give a sufficient description, the spiral sculpture is much finer than in the preceding species.

3. *Cylichna Sibogae* n. sp. Pl. XXXII, fig. 7.

Stat. 193. Sanana-bay, East coast of Sula Besi. 22 M. Mud. 1 Spec.

Shell cylindrical, rounded at both ends, slightly truncated above, rather solid, opaque, white. Sculpture consisting of hair-like growth-striae, a few rather coarse, groovelike, spiral striae above, and some more superficial ones below, these latter occupying a larger space than the upper ones, about one third of the shell is not spirally striated. Spire narrowly but deeply umbilicated, the upper part of the umbilicus enamelled, bordered by an acute keel. Aperture narrow above, larger below, its upper margin scarcely ascending, outer margin rounded at first, then nearly straight, slightly contracted, a little dilated below, basal margin regularly rounded. Columellar side, along the body, convex at the ends, straight in the median part, enamelled; columella scarcely concave, formed by a thick, scarcely contorted fold, covering the umbilical slit.

Alt. from margin of spire to base of apert. 5, lat. 2; apert. alt. $5^1/_2$, lat. above $^1/_3$, below 1 Mill.

Same observation as for N° 1: it is no agreeable task, to describe new species in such a large genus, the danger of redescribing known species is not small, but I have in vain tried to identify them; from *C. javanica* it is easily separable by its smooth median part.

4. *Cylichna* sp.

Stat. 139. 0° 11' S., 127° 25' E. Near Batjan. 397 M. Mud. stones and coral. 1 Spec.

This specimen is incomplete, part of the columellar side is wanting, so I have not named it, though probably it will be new.

5. *Cylichna (Mnestia) bizona* A. Adams.

Adams. Thes. Conchyl. Vol. II, p. 595, Pl. 125, fig. 148.
Pilsbry. Man. of Conch. Vol. XV, p. 323, Pl. 27, fig. 84.
Kobelt. Martini-Chemn. Conch. Cab. Ed. II, Vol. I, Bullacea. p. 62, Pl. 11, fig. 10.

Stat. 261. Elat, West coast of Great-Kei-island. 27 M. Mud. 1 Spec,

The brown zones are rather narrow and less deeply coloured, but otherwise I see no differences with the descriptions and figures, quoted above.

6. *Cylichna (Mnestia?)* sp.

Stat. 105. 6° 8' N., 121° 19' E. Sulu-archipelago. 275 M. Coralbottom. 1 Spec.

The only specimen seems to be allied to the preceding species, but it is a worn shell,

without any trace of dark colour-markings; the spiral striae are as far as they are persisting, considerably closer-set than in *C. bizona*, but the shell is not fresh enough for description.

7. *Cylichna* (*Mnestia*?) sp.

Stat. 105. 6° 8′ N., 121° 19′ E. Sulu-archipelago. 275 M. Coralbottom. 1 Spec.

A young specimen, seems to belong to the section *Mnestia*, but is too incomplete for description.

Fam. Bullidae.

Bulla Linné.

1. *Bulla ampulla* Linné.

Linné. Syst. Nat. Ed. X, p. 727, N° 334 (pars).
Rumph. Amb. Rariteitkamer, p. 91, Pl. 27, fig. G.
Adams. Thes. Conchyl. Vol. II, p. 575, Pl. 122, fig. 59—62.
Reeve. Conch. Ic. Vol. XVI, Bulla, fig. 3.
Pilsbry. Man. of Conch. Vol. XV, p. 343, Pl. 34, fig. 1—3.
Kobelt. Martini-Chemn. Conch. Cab. Ed. II, Vol. I, Bullacea, p. 72, Pl. 1, fig. 5—7.

Stat. 4. Near Djangkar (Java). 9 M. Coarse sand. 1 Spec.
Stat. 66. Bank between islands of Bahuluwang and Tambolungan, South of Saleyer. 8—10 M. Dead coral, Halimeda, Lithothamnion. 1 Spec.
Stat. 89. Pulu Kaniungan ketjil. Reef. 5 Spec.
Stat. 179. Kawa-bay, West coast of Ceram. Shore. 2 Spec.
Stat. 193. Sanana-bay, East coast of Sula Besi. Reef. 6 Spec.
Stat. 282. Between Nusa Besi and N.E.-point of Timor. 27—54 M. Sand, coral and Lithothamnion. 1 Spec.
Stat. 299. Buka- or Cyrus-bay, South coast of Rotti-island. 34 M. Mud, coral and Lithothamnion. 4 Spec.

None of the specimens of this common species attains the usual size.

Fam. Akeridae.

Haminea Leach.

1. *Haminea*? sp.

Stat. 4. Near Djangkar (Java). 9 M. Coarse sand. 1 Spec.

The specimen is a small, dead, slightly broken shell, spirally striated above and below, median part smooth, the vertex resembles that of some species of *Haminea*; if it possessed a contorted upper apertural margin near the vertex, it might be an *Atys*, but Mr. Smith thinks it is a *Haminea*; under these circumstances I have only mentioned it with this generic name, but it is too poor and doubtful to describe it, or to give it a specific name.

2. *Haminea dubia* n. sp. Pl. XXXII, fig. 8, 9.

Stat. 37. Saulus ketjil, Paternoster-islands. 27 M. and less. Coral and coralsand. 5 Spec.

Shell ovate, roundedly-truncated above, more contracted below, thin, pellucid, white. Sculpture consisting of rather strong, radiating striae and a few conspicuous, impressed, spiral striae, at the upper and basal part of body-whorl, the median part of that whorl being covered with very fine, close-set spirals, only visible under a strong lens. Spire concave, but scarcely umbilicated, quite or nearly concealed by the enamellous point of junction of the peristome, the border of the spiral excavation is rounded, the space within that border is opaquely-white, by an internal layer of enamel, visible at the peristome. Aperture elongate, with raised, rounded upper margin, somewhat contorted at its insertion; outer margin thin (broken), moderately curved, more so above and below, narrow, compressed, gutter-like at the base. Columellar side of body-whorl convex, with a thin layer of enamel; columella concave, forming a strongly contorted fold at its lower part, ending below in the basal gutter, reflected over the umbilical region, which is bordered by a blunt rim of the same opaquely-white colour as the spire.

Alt. from vertex to base of apert. $11^1/_2$, lat. 7; apert. alt. $12^1/_2$, lat. $3^1/_2$ Mill.

Alt. from vertex to base of apert. $10^1/_2$, lat. $6^7/_8$; apert. alt. $11^1/_8$, lat. 3 Mill.

This species has much puzzled me; at last I asked the opinion of Mr. Smith, who thought it might be a *Haminea*; as however the base of aperture was quite different, I was by no means certain. The preservation of the specimens was rather bad, nevertheless I got a defective radula and 3 gizzard-plates. I found many rows of teeth, the laterals (1) have a subquadrate base and a simple, long cusp; as median tooth (M) I may consider a triangularly rounded object, but I see no cusp. The gizzard plates are brownish, with a median keel, they are many-articulated, having the appearance of a contracted, many-valved chiton; length of gizzard-plates about 1, breadth about $^3/_4$ Mill. These plates and the laterals are in accordance with what is known of *Haminea*, and so I have left the species in that genus, though with some doubt, as the simple shape, of what I consider to be the median tooth, is more that of *Hys*, as figured by Bergh in Semper's "Reisen im Archipel der Philippinen". The measurements of latitude of shell are not quite trustworthy, as the peristome is more or less broken, especially in the largest specimen.

Fam. Hydatinidae.

Hydatina Schumacher.

1. *Hydatina* sp.

Stat. 193. Sanana-bay, East coast of Sula Besi. 22 M. Mud. 1 Spec.

The shell of the only specimen has been destroyed by formol, and cannot be identified; its epidermis reminds that of *H. physis* Lin., but the brown spiral lines are so much more crowded, that it seems to be quite different; however the specimen is too much shrunken for description.

Fam. Ringiculidae.

Ringicula Deshayes.

1. *Ringicula caron* Hinds.

Hinds. Voy. Sulphur. Vol. II, p. 47, Pl. 16, fig. 15, 16.
Morlet. Journal de Conch. 1878, p. 121, Pl. 5, fig. 7.
Pilsbry. Man. of Conch. Vol. XV, p. 407, Pl. 47, fig. 63, 64, 68.

Stat. 47. Bay of Bima, near South fort. 55 M. Mud with patches of fine coralsand. 1 Spec.
Stat. 52. 9° 3′.4 S., 119° 56′.7 E. Savu-sea. 959 M. Globigerina ooze. 2 Spec.
Stat. 260. Near North-point of Nuhu Jaan. Kei-islands. 90 M. Sand, coral and shells. 1 Spec.

The specimens from Stat. 47 and 260 have the body-whorl entirely striated, though that from Stat. 260 less close than in the figures of Morlet and Pilsbry; one from Stat. 52 has a smooth zone at upper part of that whorl, but otherwise I can find no important differences; the striation seems to be variable, no 2 specimens being quite equal in this respect.

2. *Ringicula propinquans* Hinds. Pl. XXXII, fig. 10.

Hinds. Proc. Zool. Soc. Lond. 1844, p. 96.
Morlet. Journ. de Conch. 1878, p. 122.
Pilsbry. Man. of Conch. Vol. XV, p. 408.

Stat. 116. West of Kwandang-bay-entrance. 72 M. Fine sand with mud. 1 Spec.

As this species has not been figured, as far as I am aware, I thought it desirable to give a figure of the specimen identified by Mr. Smith.

3. *Ringicula titanica* n. sp. Pl. XXXII, fig. 11.

Stat. 45. 7° 24′ S., 118° 15′2 E. Flores-sea. 794 M. Fine grey mud with some radiolariae and diatomes. 1 Spec.
Stat. 178. 2° 40′ S., 128° 37′.5 E. Ceram-sea. 835 M. Blue mud. 12 Spec.

Shell large, ovate, with a rather high, conical, pointed spire, smooth, rather thin, with spiral striae near the base; whorls $6^1/_2$, rather convex, separated by a conspicuous, but not deep suture. Nuclear whorl somewhat tumid. Sculpture consisting of very fine growth-striae, with a few exceptions only visible under a strong lens, and about 10 impressed, spiral striae below the periphery of last whorl, which is ventricose and occupies at least $^2/_3$ of the length of shell. Aperture moderately large, with an acute angle above. Outer lip thick, strong, with an external rib, regularly arcuate, nearly tooth-like in the middle, in quite developed specimens. Inner lip thickly enamelled, forming a thickened rim at its upper part, from upper angle until the conspicuous entering fold near the middle. Upper columellar fold not very strong at its exterior extremitry, much more raised in the interior, separated by a deep sinus from the much stronger, contorted lower fold, which forms at the base a deep sinus in joining the basal part of peristome.

Alt. $8^1/_2$, lat. 6; apert. alt. 4, lat. $2^1/_2$ Mill.

A not quite developed specimen is 8 1/4 Mill. in length, one of the smallest ones 7 1/4 Mill. This species may be readily distinguished by its large size; in shape it resembles *R. peracuta* Watson, but differs by its armature of aperture.

4. *Rugiaula plicifera* n. sp. Pl. XXXII, fig. 12.

Stat. 52. 9° 3.4 S., 119° 56.7 E. Savu-sea. 959 M. Globigerina ooze. 1 Spec.

Shell small, ovate, with short, conical spire, rather smooth, whitish. Whorls about 5, of which about 1 1/2 form a smooth, inflated nucleus, post-nuclear whorls scarcely convex, separated by a conspicuous suture. Sculpture consisting of 3 spiral, infrasutural lirae, the lower one accompanied by a rather conspicuous groove, and of about 13 grooves from periphery to base; the infrasutural lirae are crossed by numerous, fine plicae, occupying also the upper part of otherwise smooth median zone. Aperture pear-shaped, angular above; peristome not developed, columellar side of body-whorl enamelled, without teeth, columella with 2 folds.

Alt. 4 1/2, lat. 3 1/4; apert. alt. 2 1/4, lat. 1 1/2 Mill.

Though this specimen is not full-grown and consequently the characters of the aperture and even the measurements, have in part no great value, the very peculiar sculpture may serve to recognize this species, if more complete materials might be procured. This sculpture seemed to be too remarkable, not to describe and name the species.

Fam. Philinidae.

Philine Ascanius.

1. *Philine quadripartita* Ascanius.

Ascanius. K. Vetensk. Ak. Stockh. Handl., 1772, p. 329, Pl. 10, fig. A., B.
Adams. Thes. Conchyl. Vol. II, p. 599, Pl. 125, fig. 159.
Pilsbry. Man. of Conch. Vol. XVI, p. 10, Pl. 9, fig. 1—7, Pl. 3, fig. 47—56, (*aperta*).
Kobelt. Martini-Chemn. Conch. Cab. Ed. II, Vol. I, Bullacea, p. 138, Pl. 3, fig. 1—6.

Stat. 251. 5° 28'.4 S., 132° 0'.2 E. Arafura-sea. 204 M. Hard coralsand. 2 Spec.

I have applied the name of Ascanius, in accordance with Bergh, in his monograph L of the Siboga-Expedition. By examining the gizzard-plates, I found that the specimens under consideration, agree with those of *Ph. quadripartita*, and not with those of *Ph. rubra* Bergh, which that author has recorded from Stat. 251.

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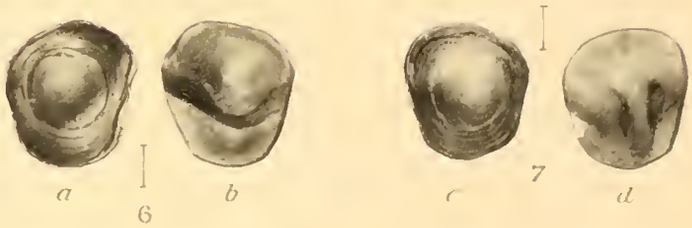

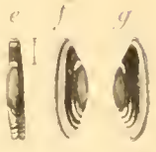

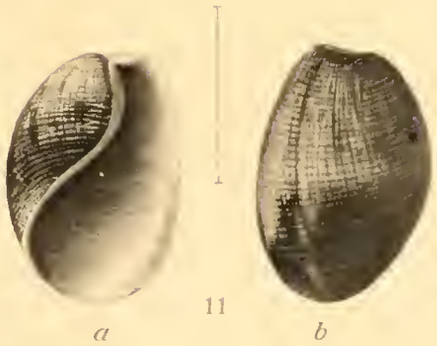

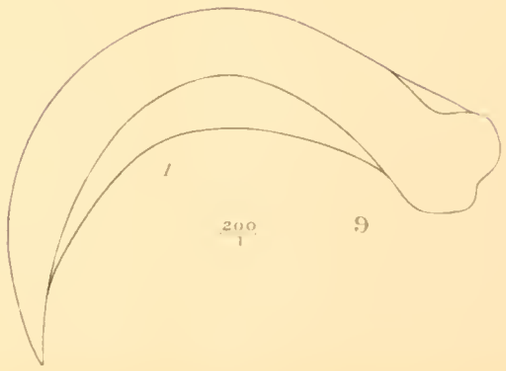

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HELIOTYPIE L. VAN LEER & Cie AMSTERDAM

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SIBOGA-EXPEDITIE.

Siboga-Expeditie

UITKOMSTEN

OP

ZOOLOGISCH, BOTANISCH, OCEANOGRAPHISCH EN GEOLOGISCH GEBIED

VERZAMELD IN

NEDERLANDSCH OOST-INDIË 1899—1900

AAN BOORD H. M. SIBOGA ONDER COMMANDO VAN

Luitenant ter zee 1e kl. G. F. TYDEMAN

UITGEGEVEN DOOR

Dr. MAX WEBER
Prof. in Amsterdam, Leider der Expeditie

(met medewerking van de Maatschappij ter bevordering van het Natuurkundig Onderzoek der Nederlandsche Kolonien)

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VOORHEEN
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Siboga-Expeditie
XLIX[1]

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Tribe BULLOMORPHA

OF THE SIBOGA EXPEDITION

BY

M. M. SCHEPMAN
Bosch en Duin near Utrecht (Holland)

With 32 plates and 4 textfigures

LATE E. J BRILL
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