CATALOGUE
OF
MOLLUSCA
IN
The Indian Museum,
CALCUTTA.

BY
GEOFFREY NEVILL.

FASCICULUS E.

Also re Collecting Spiders,
and re Koseinsko flies.

CALCUTTA:
PRINTED BY ORDER OF THE TRUSTEES.
1877.
NATURE STUDIES.

A WINGLESS WASP.

W. L. Carter writes:—There is a very pretty, wingless wasp that is often mistaken by bushfolk for a kind of bull-dog ant. I have known men to watch them, hoping to track them to their home, but of course the wasp, as far as my observation goes, is always alone, and the wasp’s nest was so far from being. The formidable, horned, barbed pincers of the ant are missing in the wasp, whose thoracic region is much thicker and shorter than the ant’s; in the former, consisting of two, in the latter, five subsections.

The wasp’s abdomen is longer and more tapering than the ant’s. His head is differently shaped, and he misses the bulging bull-dog eyes of the fierce Queensland black cock. In colour the wasp is of lovely purple, with tints of green and violet. Upon “chloroforming” him in my flask bottle for handling purposes, I saw him vigorously sting himself at what he deemed the approach of death, but, on releasing him, he slowly came round, apparently suffering no ill-effects from the cyanide or the self-inflicted stings. The wasp’s sting is severer than that of the bull-dog ant.

HOW TO COLLECT SPIDERS.

The equipment of the collector of spiders should be a moderately large preserving bottle containing some methylated spirit, some chip or glass-topped pill-boxes of assorted sizes, a piece of card or tin, a pair of fine-pointed forceps, a camel-hair brush, a net, and a lead pencil. According to Mr. W. J. Rainbow, F.L.S., F.R.E., editor of the journal of the Naturalists’ Club, the bottle should be attached to the waist by a cord so as to allow the hands to remain free. The lid should also be tied to the bottle. A spider with an interesting web should be taken in a box and a note made on the bottom of the box for future reference. The box is held in one hand and its lid in the other, and the two are brought sharply together over the spider in its haunt. All notes on the bottom of the box should be in shorthand or abbreviated long-hand. Mr. Rainbow quotes a typical note of two, for instance:—“Irreg. w. t. h. red. co. sus. p. tubular retreat. cocoon suspended.” No two living specimens should be placed in the one receptacle, as spiders are cannibals. Fast-moving spiders should be taken by clapping a chip box over them, then running the card or tin under the box, inverting it, placing the lid in its relative position on top of the card, and withdrawing it quickly so as to let the lid drop into its proper place. Spiders may be shaken from trees into an open and inverted umbrella. The large ones should then be secured with the forceps and the small ones by dipping the camel-hair brush into spirit and touching them with it, when they may be easily picked up. In making a collection, single specimens should be placed in glass tubes of various sizes with a small slip giving name, etc. The tube should then be filled to the top with spirit, and the cork forced in so as to exclude all air bubbles. Each end can be sealed with melted paraflin wax.

KOSCIUSKO FLIES.

Most visitors to Jindabyne, Adaminaby, Kiandra, and other populated centres in the Kosciusko country have remarked upon the enormous number of blow-flies there. The persistent little bush flies that are such a perpetual annoyance in many other parts of the country are conspicuous by their absence or rarity, while the blow-flies loom large in the houses, and away up in the rare air of the mountain peaks. Professor David noted the immense number of blow-flies known locally as dead-sheep-bees on Kosciusko. The unpleasant insects do not seem to be so vigorous or active for meat in the cold regions as they are in the houses of the coast district. Those who desire to know more of the flies may study the admirable brochure issued by Mr. W. W. Froggatt, F.L.S., under the title “The Shy Fly, with Notes on Other Common Flies.” From this it is noted that the principal blow-flies of the State are the sheep maggot fly (Caliphora orientalis), the common blow-fly (Caliphora villana), the richly-coloured blue or green bottle fly (Lucilia sericata), the red-bottle fly (Lucilia caesar), and the large blue-bottle fly (Lucilia formicaria). Other flies dealt with in this practical brochure are the common house fly (Musca domestica), the smaller house fly (Musca corrada), the stable fly (Stomoxys calcitrans), the small locust fly (Sarcophaga pachyhalia), the golden-headed fly (Sarcophaga aurivillia), the larger locust fly (Tachina aedipoda), and the native silkworm moth fly (Witimithia latifrons). The ordi- nary natural history books do not give the student much detailed information regarding the different species of flies, and Australian kinds are rarely noted. It is fortunate that the State does not yet harbour the dreaded Tsetse fly (Glossina morbilis), of South Africa. Mr. Froggatt recommends Persian insect powder to be scattered on the window-sills or window grooves to destroy blow-flies. The writer recently found that blow-flies quit- ted rooms in which a dilute preparation of water and permanganate of potash—a cheap chemical crystal—was placed. The solution is almost odourless, but is a most useful dis- infectant.
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NOTE.

As this portion, Fasciculus E, of the Catalogue of the Mollusca in the Indian Museum is the first to be published, a few words are necessary in explanation of the circumstances which have led to its appearance in anticipation of what will ultimately constitute the beginning of the work.

It had been originally contemplated to produce a complete Catalogue of the Mollusca, with critical remarks, on the same plan as this Fasciculus. The Collection, however, being so extensive, it was found that if this course were followed, many years would necessarily elapse before the Catalogue could be brought out in its entirety.

Mr. Nevill having had his attention particularly directed to the difficult Families, Ampullariaceae, Valvatidae, and Paludinidae, and having worked out the materials in the Museum relating to them, the Trustees have considered it desirable to publish the result of his labours, without waiting for the completion of the other sections, and it is intended that these shall appear as circumstances permit.

The portion of the Catalogue prior to that now published will appear in Fasciculi, ranging from A to D, and the remainder will be issued in parts bearing letters after E.

It will be observed that a large proportion of the specimens enumerated in this Fasciculus have been presented; a list, therefore, of the donors to whom the Trustees are indebted for these valuable contributions to the Museum is herewith given.

JOHN ANDERSON, M.D.,
Superintendent.

INDIAN MUSEUM, 
CALCUTTA,
The 1st July 1877.

NAMES OF CONTRIBUTORS MENTIONED IN THIS FASCICULUS.*

BALL
Mr. V. Ball, Geological Survey of India.

BEANFORD
Mr. W. T. Beanford, F.R.S., Geological Survey of India.

BEADLE
Reverend E. C. Beadle, Philadelphia, America.

BOYCE
Colonel Boyce.

Caldwell
Mr. J. Caldwell, Mauritius.

DUPONT
Mr. Edward Dupont, Mauritius.

Fritsch
Dr. G. A. Fritsch, Berlin, Germany.

Godwin-Austen
Major H. H. Godwin-Austen, Deputy Superintendent, Topographical Survey of India.

HUNGERFORD
Dr. Hungerford, British Medical Service.

MAINWARING
Colonel G. Byres Mainwaring, Bengal Staff Corps.

MARTENS
Dr. Ed. von Martens, Berlin Museum.

MORELET
M. Arthur Morelet, Dijon, France.

NEVILL
Mr. H. Nevill, Ceylon Civil Service.

NEWCOMB
Professor W. Newcomb, Cornell University, America.

OLDHAM
Dr. T. Oldham, F.R.S., Geological Survey of India.

PEAL
Mr. S. E. Peal, Sebaugur, Assam.

SHEPHERD
Professor C. Semper, Würzburg, Germany.

SPEARS
Professor Shepherd, America.

Stolarska
The late Dr. F. Stolarska, Geological Survey of India.

THEOBALD
Mr. W. Theobald, Geological Survey of India.

TOWNSEND
Dr. Edmond Townsend, British Medical Service.

WILSON
Mr. J. Wilson, Bengal Educational Department.

WILMER
Major L. Worthington Wilmer, H. M.'s 10th Regiment.

* The contraction oft, when prefixed to a donor's name signifies that the specimen presented were collected by himself.
Sub-class GASTEROPoda, Cuv.

Order PROSOBRANCHIA, H. Milne Edw.

Sub-order II. CTENOBREANCHIA, Schweigger.

[PECTINIBRANCHIA, Cuv.]

Group: TÆNIOGLOSSA, Gray.

A. Holostoma, Blainv.

1. Family AMPULLARIACEA, Guild.


1. Ampullaria globosa, Swainson.

A. globosa, Sw., Zool. Ill., 1822, Pl. 119 (Indian rivers).

The typical form, with the spire not exserted, is well represented in Reeve's fig. 47, and Conch. Indica, Pl. 113, fig. 3. The species varies everywhere in the spire being a little more or less exserted; in the former case, it is the var. spherica of Conch. Indica (Moradabad), Pl. 113, fig. 4; and also, I believe, the A. pallens, Phil., Conch.-Cab, Pl. VIII, fig. 4. Morelet records the interesting locality of Bangkok for this species, Ser. Conchil., Livr. IV, p. 289.

The largest specimen in the Museum measures in diameter 69 mil.; it is from the Collection of the Asiatic Society of Bengal, and is marked "Bengal."

A—Typical Section.

(3) Dacca; coll. J. Wilson.

Three young specimens. Possibly this Dacca form may prove to be var. corrugata.

One of these is a reversed specimen from the Botanical Gardens, Calcutta, presented by Dr. Anderson, a very interesting, full-grown though small, specimen with reversed operculum; it is the only one I have seen.

(3) Raniganj; coll. Stoliczka.
(5) Mambhum; coll. Ball.
(3) Junalpur and Gopalpur; coll. Stoliczka.
(7) Sambalpur, in the Central Provinces; coll. Bowie.

An interesting series presented by Colonel Bowie, departing slightly from the true Bengal type in the colouring being more developed, with the outer lip darker and less orange (especially in young specimens); it is very close to, if not identical with, the form figured in the Conch. Indica, Pl. 133, fig. 5, as *fasciata* (Moradalbal); two of these specimens exactly resemble Reeve’s *A. bilineata*, fig. 110, which I have no doubt is only a young *A. globosa*.

(3) Allahabad; coll. Major Wilmer.

Exactly similar to Calcutta specimens of the form, with more produced spire; the peristome is bright orange.


There is no shell in the Museum exactly agreeing with the original figure; the nearest is a form recorded as from Assam, with exerted whorls, but smooth and polished; it is admirably figured by Reeve, Pl. X, fig. 46. There are also two specimens agreeing exactly with the figure in the Conch. Indica, Pl. 113, fig. 2; unfortunately there is no record of the locality of the former, nor does Hanley give an exact “habitat” for the shell he figures.

(4) Assam; ex c. Oldham.

This locality requires confirmation.

(2) Locality (?); ex c. Stoliczka.

These are the two specimens mentioned above. I incline to believe they are from Assam also.

(1) Benares; coll. Mainwaring.

Several very fine specimens, with the spire of nearly the same length as the aperture, presented by Colonel Mainwaring.


A. *A. Conch.-Cab., Pl. VII, fig. 8 (Ceylon).
A. *Malabarica*, Phil., Zeits. Mal. (Malabar).
A. *Layardi*, Rv., fig. 27 (Ceylon).
A. *paludinoides*, Lüst., not Phil., Conch.-Cab., Pl. VII, fig. 4 (Mangalore).

(2) Red Hill Lake, near Madras (typical); coll. ex c. Madras Museum.
(2) Kasapah, Madras Presidency (do.); coll. ex c. Stoliczka.
(5) Madras; coll. Nevill (do.)

These agree exactly with Madras specimens.

(7) Madras; ex c. Stoliczka.

I cannot separate from var. *carinata*, even as a variety, this smaller form with slightly more exerted spire which was called *A. Malabarica*, Phil. Reeve’s figure, as justly pointed out by Hanley, is not at all typical; none of my Madras specimens are as large as the one so well figured in the Conch. Indica, Pl. 114, fig. 2.


This form, the *A. Layardi*, Rv., is as common in parts of Ceylon as *A. globosa* in Bengal; it varies in having the spire more or less produced, with the canaliculated suture more or less distinct. In the former case it agrees exactly with Reeve’s fig. 97, in the latter with Pl. 114, fig. 2, Conch. Indica (A. *Malabarica*, Phil.*).

(4) Ceylon; coll. E. L. Layard; ex Asiatic Soc., Bengal.

These four specimens agree exactly with Küster’s Pl. VII, fig. 8 (*A. Malabarica*, Phil.); they scarcely show any signs of the many bands often so distinctly marked in specimens of var. *Layardi*.

* I kept alive, for some little time in Calcutta, a Ceylon specimen of var. *Layardi* and a typical Calcutta *A. globosa*. There was certainly a marked difference in the coloration of the animals, but not so great as to preclude, in my opinion, their eventually proving to graduate from one to the other; the sole of the foot in both has a light-coloured centre with a darker border all round at the margin, but that of the Ceylon form is of a light-yellow centre with light-brown border, while the Calcutta one has a yellowish-green centre with dark-purple border; the siphon in the former is green, only very sparingly spotted, whilst in its ally it is yellow, minutely, regularly and thickly mottled with black; the head in typical *A. globosa* is yellowish-green mottled with short black dashes, not so thickly as in var. *Layardi*, but more linear and more regular.
D.—Var. incrassata, nov.

This interesting small variety is well distinguished by its greater relative thickness, by its (in living specimens) pure white peristome, slightly more exerted spire, absence of coloured bands, and by the unusually small umbilicus; it somewhat resembles the shell called A. dira by Reeve (locality?), and also the Pegu A. saxea, Rv., fig. 108 (locality?).

Long. 32, diam. 28½; apert. alt. 22, lat. 17 mil.

(14) Dum-Dum and Calcutta; coll. Nevil and Wilmer.

I found this small form abundantly in a single tank near Calcutta only, and have never seen any specimens at all resembling it until recently, when Major L. W. Wilmer presented the Museum with exactly similar specimens, which he found very locally in a single paddy swamp at the village of Koakally, close to Dum-Dum.

E.—Var. minor, nov.

This is a very interesting small variety, the most aberrant form of any I know. Its discoverer informs me that the 20 or 30 specimens he found were all constant in the peculiar characteristics of the variety; it almost appears to be intermediate between A. globosa and A. maura. The spire is more produced, and the aperture at base considerably more produced, than in any other specimen I have seen of A. globosa. The columellar margin is widely expanded and stained of a rich dark chestnut-brown, the interior of the aperture being similarly coloured; besides the above differences, it is of a thinner and more delicate texture than var. incrassata; long. 38, diam. 30½ mil.

(8) Near Dum-Dum; coll. Major Wilmer.
(2) Siliguri; coll. Mainwaring.

2. Ampullaria nux, Reeve.

A. nux, Rv., fig. 132 (Bombay).

The Khandalla specimens agree exactly with the typical form well figured in the Con. Indica, Pl. 115, fig. 1.

The remarkable specimens recorded below as from Tranquebar (which locality can only be accepted with considerable reserve) are considerably larger than the typical form—about twice the size; the spire in all of them is remarkably corroded; the umbilicus is completely closed; the suture is scarcely, if at all, excavated; there are eight or nine narrow bands discernible within the aperture; it is lighter and less solid than the Bombay shell, but with the same peculiar spire and ovately oblong whorls and aperture; the epidermis also appears to be darker and rougher.

A.—[Typical.]


B.—Var. (? n. sp.)

(8) " Tranquebar " (? n. sp.); coll. Captain Lewis, ex e. A. S. B.

3. Ampullaria maura, Reeve.

A. maura, Rv., fig. 57 (Loc.?).

This form seems to take the place of A. globosa throughout Assam, and in fact to be the connecting link between it and A. conica of Burma and the Peninsula; it is extremely abundant, and, as one would expect, varies considerably. Hanley, in the Systematic List of Con. Indica, appears to identify the species with A. maura; it certainly agrees very fairly with the figure, except that in all full-grown Assam specimens I have seen, the umbilicus is decidedly more open in most specimens the spire is more produced, and the aperture at base more produced and angulate. The species seems to be separable from all the Bengal and Southern Indian protein varieties of A. globosa by the wider umbilicus, more contracted aperture with dark-coloured margins, more produced spire and thinner shell. There is no figure in Küster, or the Con. Indica, which represents it well; Reeve’s figs. 12, 30, 57, 60, 66, and 121, all bear some resemblance, but none represent it at all characteristically.

(30) Tezapore (Assam); ex e. Stoliczka.

There are two forms: one a large produced form, the other a smaller, more contracted, and more richly marked variety.

(30) Sibsagar (Assam); coll. S. E. Peal: Ganhatti; coll. Museum Collector.
(2) Darrang and Narainpur (Assam); coll. H. H. G. Austen.

One of these latter is the largest specimen I have seen of the species: long. 53, diam. 51 mil.; the other is smaller and less openly umbilicated, resembling somewhat closely Reeve’s fig. 21 (A. liveceae).
Var. Theobaldi, Hanley.

*A. Theobaldi*, Hanley.—Con. Indica, Pl. 115, fig. 2 (Loc. ?).

(6) Bhamó; coll. J. Anderson.

I suspect the magnificent shell figured above will prove to have been obtained by Mr. Theobald from the Shan States. None of the specimens brought by Dr. Anderson appear to be quite full-grown, the outer lip in all of them being thin and sharp; in the depressed spire all of them agree with Reeve's figure of *A. maura* and Hanley's of *A. Theobaldi*; the umbilicus is open, agreeing exactly with the latter, as it does also in coloration and in the shape of the aperture.

I am quite unable to separate it specifically from the Assam form, from which it seems to differ only by larger size, less produced spire, slightly more open umbilicus, and in the coloration being a trifle more vivid; in the two latter respects, however, some few Assam specimens equal it.

4. **Ampullariacea aperta**, Phil.

*A. aperta*, Phil., Zeits. Mal., 1849, and Conch.-Cab., Pl. III, fig. 5 (Loc. ?).

*A. saxea*, Rv., fig. 108 (Loc. ?).

A single specimen in the Museum from Bassein agrees exactly with the excellent figure in Con. Indica, Pl. 115, fig. 3, both differing slightly from Reeve's original figure of *A. saxea* in having the umbilicus completely covered.

In many respects the species closely resembles *A. nez* of Reeve, differing, however, in the compressed, angulate whorls, sharper and more produced spire, with much more excavated sutures and contracted aperture.

It is even nearer my *A. globosa*, var. *increscata*, which, however, has the whorls more globose, the spire not so sharp, the umbilicus more open, and the aperture much less contracted.

The three Pegu specimens are old, worn, and much-thickened specimens of the form, a young shell of which is figured in the Con. Indica, Pl. 115, fig. 4 (Pegu); they differ in showing a distinct, though very small, umbilicus, as in the typical figure, the body-whorl is more produced laterally; the characteristic acute spire, with excavated suture, and the compressed aperture are the same; they agree exactly with the above figure in Kuster; indeed, the figure might have been taken from one of them.

Almost undistinguishable from the last, only in perfectly fresh condition with their opercula, are the Akyab specimens; they agree exactly with Pl. 115, fig. 4, of the Con. Indica; the largest is a very old and thickened shell, about one-third larger than the above figure; a very young specimen (long. 17, diam. 14 mil.) shows all the characteristics of the species, the closed umbilicus, pink operculum, rounded and contracted aperture, &c.; two of the specimens are peculiarly eroded and contorted (from the effects of brackish water?). The opercula differ from those of *A. conica* and *A. maura* by their greater thickness, pink colour, in being rounded and not pointed at the apex, the granulation of the scar of a coarser and bolder texture.

(1) Bassein; coll. Theobald (*A. saxea* of Reeve and Con. Indica).

(3) Pegu; coll. Stoliczka (*A. aperta*, Phil., of Kuster).

(6) Akyab; coll. Stoliczka (*A. saxea*, var. of Con. Indica).

These Akyab specimens were mixed up with numerous specimens of the next species from the same locality.

(3) Cachar; ex c. Stoliczka.

These would appear to be a distinct variety of the species; unfortunately they are all young specimens, and the locality is doubtful; they agree fairly with Reeve's fig. 102, *A. otea* (Loc. ?), and are very likely the form alluded to under that name in the very useful Systematic List attached to Con. Indica.

5. **Ampullariacea conica**, Gray.

*A. conica*, Gray, Sup. Wood's Index Test., Pl. VII, fig. 22.

*A. scutata*, Mouss., Moll. Java, Pl. VIII, fig. 2 (Java).

*A. paludinoides* of the Con. Indica (Pegu, &c.).

*A. compacta*, Rv., fig. 62 and 71 (Malacca).

*A. orientalis*, Phil., Zeits. Mal., 1848.

The Akyab specimens appear to me to agree sufficiently exactly with the figure of the type shell, as represented on Pl. III, fig. 13, of Hanley's Conchol. Misc.; they are all rimate, can scarcely be called umbilicate; the spire varies in being a trifle more or less produced, rather more so than in typical figure; they are all in perfect condition with their opercula and in all stages of growth; Pl. 114, fig. 6, of the Con. Indica also well represents the back view of this form; the aperture is much more contracted than in the figures in Con. Indica of *A. paludinoides*, in this respect agreeing better with figures 8 and 13 of the Conchol. Misc. (*A. conica* and var.).

The Pegu specimens exactly resemble Pl. 115, figs. 3, 5, and 6, and also fairly well Reeve's figs. 9, 10, 61, and 71.
As I have before remarked, Küster’s Pl. VII, fig. 4 (\emph{A. paludinoides} from Mangalore, Southern India), represents quite a distinct species; the umbilicus alone shows this at a glance. Pl. VIII, fig. 3 (\emph{A. Bornensis}), appears, however, to be this species.

The ten Moulmein specimens are a slightly smaller, more produced and more vividly banded form of the Akyab variety; it apparently only differs from \emph{A. gracilis}, Lea, from Siam, by its more rounded body-whorl; this latter, indeed, represents one extreme form of \emph{A. conica}, the other extreme approaching (or identical with) \emph{A. turbinis}.

From Tenasserim there is only one full-grown specimen, agreeing fairly with Con. Indica, Pl. 114, fig. 5; the yellow colurnellar margin is, however, remarkably callous and broad. I entertain some doubts whether the locality of this specimen has been correctly recorded; it requires confirmation. The other five specimens from this locality are, I fancy, all young; they are very different from the Mandalay specimens, but resemble in shape of the spire and slight umbilicus the Akyab and Moulmein specimens; the coloration appears, however, to be much more vivid than that of the former; Reeve’s fig. 62, though of an older shell and one-third larger, well represents these five Tenasserim specimens.

The three Bassein specimens are all young shells; they show no trace of any umbilicus. Pl. 114, fig. 7, of the Con. Indica exactly represents the form, but is about one-third larger than the Museum specimens.

The four Chinese specimens agree well with Küster’s Pl. I, figs. 4 and 5, doubtless figured from Chinese examples (which are not of the umbilicated form called \emph{A. scutata} by Mousson), and also with the typical figure in Conch. Missed. They are very close to some Mandalay specimens and not unlike others from Akyab; but the umbilicus is quite closed in all the Chinese specimens. The two Singapore examples are well represented by Pl. 114, fig. 6, of the Con. Indica; they are of lighter texture, more openly umbilicated, less produced in shape than any of the preceding; Reeve’s fig. 71 (\emph{A. compacta}, var.) also agrees fairly well, though in the Museum specimens the aperture is not so contracted, and the margins are darker coloured and a shade more effused at the base.

Two of the Borneo Straits specimens are young and closely resemble the above Singapore shell; the third, though not full-grown, is an older shell, and is remarkably close to \emph{A. turbinis} of Lea by its depressed spire, expanded aperture, and narrow rimation; the epidermis of all three specimens is of a peculiarly dark brown, the interior of aperture stained with the same colour, scarcely showing any traces of bands. Very close to the large specimen from Borneo Straits is the single Bhamo specimen; the epidermis is of a different nature, and the aperture more rounded (especially less produced at base) than in any of the other forms.

Apparently closely connected with the preceding is the series from Mandalay, widely differing from type by depressed spire, expanded aperture, which is slightly produced and angled at base; the young specimens (one specimen, long. 37, diam. 26 mil., another long. 33, diam. 30½) agree very closely with a single specimen (long. 32, diam. 31 mil.) sent me by M. Morelet as \emph{A. turbinis}, Lea, from Cambodia, which, though a young shell, agrees very well with typical figure, in Journ. Acad. N. S. Philad., Vol. VI, Pl. XXII, fig. 2. I hope to get other specimens both of the Upper Burmese and Cambodian forms, before deciding whether \emph{A. turbinis} must form merely an extreme variety of \emph{A. conica}, or whether the Mandalay form must be separated as a slight variety of a distinct species (\emph{A. turbinis}).

Morelet records \emph{A. conica} as an inhabitant of Cambodia, Ser. Conch., Livr. IV, p. 290, and notes the apparent identity of the \emph{A. conica} of Grav with Mousson’s \emph{A. scutata}.

\section{Near type form.}

(11) Akyab; coll. Stolzka. Intermediate between type form and \emph{A. conica}, var. \emph{orientalis}; Long. 43, diam. 35 mil.

(10) Moulmein; coll. Stolzka and Richtofen. Close to the above, more openly umbilicated, and with more effused aperture than var. \emph{orientalis}; it approximates to the Siam \emph{A. gracilis}.

\section{Var. expansa, nov.}

\emph{A. paludinoides}, Con. Indica, Pl. 114, fig. 5.

(7) Pegu; coll. Theobald.

(1) Tenasserim? No history.

(1) Mandalay? No history.

This is the form figured in Con. Indica for the \emph{A. paludino}-
\emph{ides} of Phil., which, however, from Küster’s figure appears to be a variety of \emph{A. globosa} from Southern India, near the
forms known as *A. Malabarica* and *A. carinata*. The Pegu shell is well worthy of a distinguishing name, on account of its size, massiveness, expanded and rounded aperture, with uniform yellow-tinged peristome; it is the nearest approach I have seen in the species to any of the numerous varieties of *A. globosa*.

Type of var. *expansa*, in Indian Museum, long. 57, diam. 48 mil.; another and remarkably aberrant specimen, reminding one strongly of *A. globosa*, measures long. 52, diam. 47.

C—**Var. compacta**, Reeve.
*A. compacta*, Rv., figs. 62 and 71.
(5) Tenasserim; coll. Stoliczka.

A remarkable form; apparently all the specimens are young.

D—**Var. orientalis**, Philippi.
*A. orientalis*, Phil., Zeits. Mal., 1848.
(4) China; ex c. Morelet.
Exactly agreeing with Philippi's description, which I have no doubt was taken from the Chinese specimens he speaks of.
(3) Bassin; coll. Blanford.
All young unfortunately; they appear to nearest resemble the above Chinese form.
(1) Luzon (8) ex c. Stoliczka.

This shell was sent to Dr. Stoliczka from Germany, labelled as "*Luzonica*, Rv., from Luzon." This identification certainly is incorrect, it being totally unlike the original figure, whereas it is quite undistinguishable from the above recorded Chinese specimens, and I expect in reality came from China.

*B. Bornensis*, Phil., Conch.-Cab., Pl. VIII, fig. 3.
(2) Singapore; purchased.
Larger series of this and the next are required for satisfactory classification.
(3) Borneo Straits; coll. Stoliczka.

*A. turbinis*, Lea, J. Acad. N. S. Philad., Vol. VI, Pl. XXII, fig. 2 (Siam).
(1) Cambodia; ex c. Morelet.

A young shell, agreeing exactly with the original figure. I have already remarked, under the preceding species, on the extremely close resemblance of some young Mandalay specimens, which, however, I have been unable to separate from *A. conica*.

Morelet gives an excellent description of this species in *Ser. Conchil.*, Livr. IV, p. 288.

*A. gracilis*, Lea, loc. cit., Pl. XXII, fig. 1 (Siam).
(1) Siam; ex c. Morelet.

A fine, full-grown specimen, agreeing with the original figure, except that the body-whorl in the Museum specimen is a little more angulate, and the suture sub-canaliculate. Under *A. conica* I have remarked on the affinity of the Akyab and Moultmein specimens (especially the latter) to this Siam species.

8. **Ampullaria Stoliczkanana**, n. sp.

Though I very much doubt if the Penang form can be really distinct from the many described species, still I find it impossible to class it even as a variety of any of the species I know. Its substance, shape of the whorls, &c., distinguish it at a glance from all the forms I have grouped together as *A. conica*. It a good deal resembles Reeve's fig. 37, *A. turbinoides* (Australia); it is, however, more oblong, ovate and contracted in shape, with sombre-brown, polished coloration. In these latter respects it closely resembles *A. polita*, from which its shape and produced spire easily distinguish it. *A. callistoma*, Morl., *Ser. Conch.*, Livr. IV, Pt. 18, fig. 7 (Cambodia), is still closer, though indeed this seems to me to be scarcely more than a small variety of *A. polita*. Reeve's fig. 96 of his *A. javanaica* (Java) may perhaps prove to belong to one and the same species; the typical figure is apparently taken from an immature shell, and it is therefore impossible to decide without actual comparison.

Ovately oblong, with six regularly produced whorls, the last not swollen (or subangulate) above as in *A. polita* and *A. callistoma*; scarcely umbilicate; aperture contracted and
produced, marked interiorly with faint interrupted bands, slightly effused at base; epidermis polished, brown.

Long. 54, diam. 41, long.: apert. 36, diam. 23.5 mil.  
(7) Penang; coll. Stoliczka. Three full-grown and four young specimens.

(1) Cambodia; ex c. Morelet.  
Morelet gives further information concerning this striking and handsome species, Ser. Conch., Livr. IV, p. 292.  
(1) Loc.?; a smaller specimen than the preceding ex c. Stoliczka, marked as “labios, Brasil.”

*A. dolioides*, Rv., fig. 75 (Bombay).  
(1) Ceylon; coll. H. Nevill.  
This large, thin, and ventriose specimen is evidently a young shell; it is quite unlike all the figures in Con. Indica, but agrees very fairly with Reeve’s description and figure of *A. dolioides*, which, however, Hanley suggests in the Systematic List (Con. Indica) in reality came from South America. I hope to obtain a larger series of this form so as to settle the question. Long. 46, diam. 41 mil.

11. **Ampullaria moesta**, Reeve.  
*A. moesta*, Rv., fig. 92 (Ceylon).  
(4) Ceylon (near Balapiti); coll. G. Nevill.  
Three of these are quite young specimens, and the fourth apparently not quite mature; they do not agree very well with figures in Con. Indica and Reeve’s Monog.; the whole shell apparently being more angular, imperforate, and of a brown colour; more specimens are necessary for proper identification. Reeve’s fig. 5 of *A. crassa* from Brazil is almost exactly like this shell, except that in *A. crassa* the aperture is a trifle more expanded and the body-whorl slightly less produced.

12. **Ampullaria speciosa**, Philippi.  
(1) Loc. (?); ex c. Nevill.

(2) Madagascar; ex c. Morelet.  
This shell figured in Küster, Pl. XIII, fig. 6, appears to have been altogether omitted by Reeve.  
Long. 23 (spire eroded), diam. 21 mil.  

14. **Ampullaria Hanleyi** (?), Reeve.  
*A. Hanleyi*, Rv., fig. 113 (Loc. ?).  
(3) Madagascar; coll. Caldwell and Dupont.  
I took this shell at first for *A. Largillierti*, Phil.; it is, however, smooth, with the spire much more produced and the aperture more descending. It may prove to be only a variety of the preceding; it is, however, so much larger and more elegantly convoluted that I hesitate to join them. Two specimens resemble Reeve’s fig. 113; the third has the spire a trifle less produced, and somewhat resembles his fig. 90A, but with the coloration altogether different.

15. **Ampullaria Hopetonensis**, Reeve.  
(2) Georgia; coll. Shepherd.  
Agreeing exactly with Lea’s original figure. Both Reeve’s and Küster’s figures appear to me to be of a different species.

(3) Cartagena; coll. Beadlee.  
These three shells sent me as *A. flagellata*, Say., are of the large form with orange peristome well figured by Swainson,
17. **Ampullaria Hondurasensis**, Reeve.

*A. Hondurasensis*, Rv., fig. 15 (Honduras).

(1) Guatemala; ex c. Morelet.

Sent by M. Morelet as *A. reflexa*; it differs, however, from the typical figure by its brownish-white lip, slightly more angular last whorl, stouter substance and more contracted aperture; the form may, however, prove to be only a variety of *A. reflexa*.

(1) Loc.?; ex c. Nevill.

This appears to be a young specimen of the preceding; it would resemble Pl. XIV, fig. 3 of Küster, if the body-whorl of the latter were subangulate.


*A. canaliculata*, Lam.

(1) Rio Plata; ex c. Morelet.

Sent by M. Morelet as *A. insularum*, Orb.; it is a very fine specimen, with the aperture more everted than in Orbigny's figure; it agrees exactly with Küster's Pl. XIV, fig. 1.

(1) R. Paraná; ex c. Morelet.

Sent by M. Morelet as *A. canaliculata*, Lam. I can see no specific difference from the preceding, of which it seems to be a small variety; it is doubtless the form figured by Orbigny, Pl. L, figs. 5 and 6, as *A. canaliculata*, var. It appears to me quite different from the less openly umbilicated shell figured as Lamarck's species by Delessert, Pl. XXXI, fig. 3 (Guadaloupe).


(1) Loc.?; ex c. Nevill.

Agrees with typical figure. The species is not mentioned by Reeve, nor does he represent the form. As far as I can see, his figure of *A. gigas*, Spix., may be from a very old and fine specimen.

20. **Ampullaria adusta** (?), Reeve.

*A. adusta*, Rv., fig. 11 (Loc.?).

(1) Loc.?; ex c. Nevill.

Of very thick texture; the aperture is more everted than in the above figure of Reeve.


(1) Cuba; ex c. Stoliczka.

Does not agree well with any figure in Reeve; it is nearest his figure 41B of *A. fasciata*, but the spire is more depressed and the umbilicus more open; it closely resembles Küster's Pl. XX, fig. 1.

22. **Ampullaria urceus**, Müll.


(1) New Granada; ex c. Morelet.

Apparently a young shell; it is of thicker substance and more angular at base of aperture than the next specimen. In both of them the umbilicus is not nearly so open as in Reeve's figure, in this respect agreeing better with Küster's figure. Reeve's fig. 70 and Swainson's Pl. 136 are apparently still younger specimens of the same.

(1) Loc.?; ex c. Nevill.

23. **Ampullaria testudinea**, Reeve.

*A. testudinea*, Rv., fig. 114 (Loc.?).

(1) Rv. Amazon; ex c. Morelet.

Sent under the above name, by M. Morelet; it is rather a young shell, but agrees fairly with Reeve's figure.

(1) Loc.?; ex c. G. Nevill.

A fine full-grown specimen, with widely expanded aperture; certainly identical with preceding specimen, but nearer even Reeve's fig. 75.

*A. dolioideus* (Bombay).
This is doubtless the form which has induced Mr. Hanley to class A. dolioidea as South American and not Indian, in which he may very likely prove to be correct.

*A. Columbiensis*, Rv., fig. 25 (Verruga).
(1) Loc. ?; ex c. G. Nevill.
Purchased amongst a lot of South American *Ampullaria*; a rather young shell, agreeing well with the above figure.

25. Ampullaria naticoides, Orb.
(Fide, Rv., should be *A. Plate*, Maton, Trans. Lin. Soc., 1809, Pl. XXIV, figs. 16, 17.)
(1) R. Plata; ex c. Morelet.
Agrees fairly well with Reeve's fig. 130.

*A. pulchella*, Ant.
*A. Roissyi*, Orb.
(3) R. Plata; ex c. Morelet.

27. Ampullaria elegans, Orb.
*A. elegans*, Orb., Amer. Mer., Pl. LII, figs. 4—6.
*A. peristomata*, Orb.
(4) Bolivia; ex c. G. Nevill.

28. Ampullaria sordida, Swainson.
(2) Loc. ?; ex c. Nevill.
Agrees with Reeve's fig. 72.

*A. scalaris*, Orb., Amer. Mer., Pl. L, figs. 1—3.
(3) Bolivia; ex c. Stearns, as "*A. canalis*, Orb."

30. Ampullaria nubila, Reeve.
(1) Loc. ?; ex c. Nevill.
Agreeing exactly with the above typical figure, but only half the size. Is not Reeve's figure magnified?

31. Ampullaria erronea, n.sp.
(1) Loc. S. America; ex c. Nevill.
This is the form given by Reeve, fig. 90, as the *A. aperta* of Phil.; it does not agree with the type form as given in Küster's *Conch. Cab.*, Pl. III, fig. 5, which, as already stated, is, I believe, a Burmese shell. I suggest the name of *A. erronea* for the American shell, distinguished at once from true *A. aperta* by more prominent spire, more contracted aperture, less open umbilicus and transverse bands. Type of *A. erronea*, Indian Museum, Calcutta: long. 28, diam. 24; apert. long. 19, diam. 15 mil.

32. Ampullaria glauca, Linn.
Var. *A. crocostoma*, Phil., Küster, Pl. XII, fig. 3 (Caracas).
(2) Loc. ?; ex c. Nevill.
Agreeing exactly with Pl. XII, fig. 4, of Küster (*A. glauca*, L.).

Var. Guianensis, Lamk.
(1) British Guiana; ex c. Morelet.
Sent as "*A. Guianensis*, Lamk." It has the spire slightly higher than the preceding specimens, and the columella more rounded and produced, tinged with yellow, instead of being pure white. I dare not, however, separate it without further knowledge; it is probably the form figured in Küster, Pl. XII, fig. 2, as *A. luteostoma*, Sw., var. crocostoma, Phil.
(2) Caracas; ex c. Morelet.
Sent as "*A. effusa*, Lamk." Umbilicus a trifle more open than the preceding; smaller, with shorter and straighter columella, which is also of yellow colour; it is too close
however, to be specifically separated; it is undoubtedly Philippi's *A. crocostoma*.

33. **Ampularia Geveana**, Desh.

*A. Geveana*, Desh. (emend. Phil.) Hist. Nat., VIII, p. 541 (as *P. Gevesensis*) Loc.?  
(1) Loc.?; ex c. Nevill.

Agrees exactly (only one-third smaller) with Pl. VII, fig. 2, of Küster. The exceedingly open umbilicus distinguishes it at a glance from the preceding; it does not appear to be figured by Reeve.


*Marisa*, Gray, Phil. Mag., Vol. 63.  

1. **Marisa cornu-arietis**, Linn.

(1) Loc.; c. Stoliczka.

Sent as from "Senegal"—surely a mistake? It agrees exactly with Küster’s Pl. XVIII, fig. 1 (*A. cornu-arietis* from R. Parana).

2. **Marisa Chiquitensis**, Orb.

*Marisa Chiquitensis*, Orb. Amer. Mer., Pl. XLVIII, figs. 10, 11; Chiquitos, in Bolivia.  
(1) Bolivia; ex c. Stearns.  
(1) New Grenada; ex c. Nevill (? Morelet).

Differs from the preceding and from all the figures in Küster and Nov. Conch. by the extreme narrowness of the last whorl at its junction with the aperture.


1. **Laniestes Lybicu**, Morl.

(1) Côte de Guinée; ex c. Morelet.

2. **Laniestes olivaceus**, Sow.  
(1) Loc.; ex c. Nevill.

A young shell, and, therefore, identification doubtful.

3. **Laniestes Boltenianus**, Chemn.

*L. carinata*, Oliv., 1804, and Olivieri, Montf., 1810.

Chemnitz most clearly calls this shell, on the last line but one of page 89, “*Helix Bolteniana*,” this specific name must therefore stand for the shell; Dr. von Martens, evidently, could not have noticed this,—see Nov. Conch. II, page 288.

(3) Loc.; ex c. Asiatic Society of Bengal.

This is a form with a produced spire, with a nearly rounded periphery, and with a very faint keel round the umbilicus. They belong, I think, to *L. Boltenianus*, though apparently intermediate between that species and *L. Guinaea*, Lamk.

(3) Birket Kora and Dongola; ex c. G. Fritsch.

Spire depressed, distinctly angulate at periphery; sharply keeled round umbilicus.

4. **Laniestes ovum**, Peters.


Does not agree well with typical figures.

5. **Laniestes purpureus**, Jonas.

(1) Zanzibar; sent by M. Morelet as “*A. triestis*, Jay.”  
(3) Loc.?; ex c. Asiatic Society of Bengal.
2. Family VALVATIDÆ, Gray.

1. Genus Valvata, Müll.


The arrangement of the genera of this family in Adams' Gen. Recent. Müll. is quite untenable; species of the type of V. piscinalis being made typical for the genus Valvata, whereas this very species was described in the same work by Müller, but as a member of the genus Nerita. Müller's unique type for his genus Valvata was V. cristata, which the Messrs. Adams place in a separate sub-genus under the name of Gyrorbis, Fitz.

1. Valvata cristata, Müll.

V. cristata, Müll. loc. cit., p. 198 (type of the genus).

(4) Middlesex (England); coll. Nevill.

2. Valvata piscinalis, Müll.

Nerita piscinalis, Müll. l. c., p. 172.


(6) Pyrmont (Germany); ex c. Stoliczka.

(30) Pangong Lake (Ladak); coll. Stoliczka.

These last are perfectly undistinguishable from English specimens.

3. Valvata contorta, Müll.

Nerita contorta, Müll. l. c., p. 188.

(12) Luscher See (Germany); coll. G. Nevill.

4. Valvata Stoliczka, m.s.

Yarkand; coll. Stoliczka.

This species will be described in the forthcoming work on the Zoology of the regions visited by the second Yarkand Expedition, to which Dr. Stoliczka was Naturalist.

5. Valvata virens, Tryon.

Clear Lake, California; ex c. Newcomb.


(30) New York; ex c. Beadle and Newcomb.


7. Valvata sincera, Say.

(Fide, Newc. = V. humberosa, Tryon).

(6) California; ex c. Newcomb.

8. Valvata unicarinata, Say.


9. Valvata (?) microscopica, n. sp.

(12) Port Canning; coll. Nevill.

Major Godwin-Austen has been good enough to extract for me the exceedingly minute operculum of this interesting little shell, and to help me to examine it under the microscope.

Shell exceedingly minute, orbicular, moderately thin, depressed, and discoidal; four whorls, moderate, convex, with distinct suture, the last whorl increasing rapidly; the shell, both above and below, rugosely and distinctly spirally striated, deeply umbilicated, with rounded and proportionately rather large aperture; the specimens were coated with some thick black deposit; when cleaned the shell presents a brownish-red appearance; the operculum examined under the microscope is horny and circular, of comparatively rather thick substance; it appears to be multi-spiral, but we were not able to make out the structure quite satisfactorily.

This is the shell mentioned on page 13 of Theobald's Catalogue, Land, &c., Shells of India (1876); it was not, however, first discovered by Dr. Stoliczka, but by myself. I found about thirty specimens in a brackish-water pond at Port Canning, about a quarter of a mile from the river, in company with two new species of Sphincta, a new Pharella, Martesia virgata (?), a species of the family Terebrinidæ, &c. Nothing like it has hitherto been described from India; it is very doubtful if it can remain in the Valvata; probably it will prove to be a new section of the genus Hydobia, or even possibly a tropical Skenea. It certainly resembles most closely the figure of the shell of Skenea planorbus, in Ad. Gen., only differing by more depressed shape and the remarkable spiral sculpture. Diam. 1 ½ mil.
3. **Family PALUDINIDÆ, Gray.**

1. **Genus Larina, A. Adams.**

*Larina*, A. Ad. Gen. Moll., p. 624 (type *L. strangei, A. Ad.*).

On my representing to Mr. Wood-Mason that we were not yet able to classify with certainty the shell described as *Larina (?) Burmana* by Mr. Blanford, as no one had been able to positively state whether it possessed an operculum or not, he asked to see a specimen. On my showing him one, he immediately remembered that years ago his native collector had brought him a living specimen, which he put at once into a jar of spirit containing other small Port Canning Mollusca; search having been made for the bottle, it was at last found, and true enough contained a fine specimen of *Larina Burmana*. Major Godwin-Austen was good enough to assist me to examine the animal; we found an exceedingly thin membraeous, concentrically ribbed operculum, as in Pl. 137, fig. 9A, Ad. Gen. (*L. strangei*), requiring the closest examination to detect. This at once settles all doubt on the generic characters of the Burmese shell, confirming Mr. Blanford's original views. An examination of the animal showed the eyes on small pedicels at the base of the elongate tentacles, much as in *L. c.;* Pl. XXXVI, fig. 1 (*Paludina fasciata*). Major Austen is of opinion that there is little doubt but that there exists a small lappet on each side of the neck; unfortunately the specimen is much contracted, and this point requires further confirmation. The teeth have not yet been examined. I think the position of the genus may now be placed in the Paludinidae with certainty, confirming the original idea of the Messrs. Adams, which was considered as still doubtful by Carus and Gerstaecker in their Handbuch der Zoologie (1875). Dr. Hungerford informs me that the animal is "jelly-like and almost transparent."

Mr. Blanford found his original specimens in a brackish-water creek, in company with *Iraea dioonata, &c.;* curiously enough, Mr. Mason's shell was found with the same species (*Iraea, Assiminea, &c.*). I can add a fourth species to this interesting genus—*Larina granum, Mk.,* Moll. Nov. Holland, figured in Phil. Abb., Pl. I, fig. 16, as *Paludina granum, Mk.,* from Swan Rv., Australia. Like my *Larina cineta,* this shell is also banded. Menz's observations evidently lived in salt water, as a species of *Serpula* was attached to it. It is beyond doubt also an estuarine form.

1. **Larina Burmana, Bif.**

*L. Burmana, Bif. J. A. S. B., 1866, Pl. II, fig. 1.*

As above stated, the position of this shell in the genus *Larina* is now definitely fixed. The shell must be exceedingly local or rare, as we have collected in a most exhaustive way at Port Canning for years and never found a specimen but the one above mentioned. It had not been found again in Burma until Dr. Hungerford succeeded in obtaining it in the Rangoon River. He informs me he was unable to detect any operculum—a matter of little surprise, considering its extreme thinness.

(5) Rangoon River; coll. Hungerford.
(1) Port Canning (Calcutta, Sunderbundy); coll. Wood-Mason.

The animal of this specimen is the one that has enabled me to fix with certainty the position of the species.

2. **Larina cineta, n. sp.**

Shell small, thin, horny, ovate oblong, imperforate and sculptureless, spire produced, nearly half the entire length; whorls five, the first two nucleolar and colourless, pyramidelliform in character, the last whorl swollen, light-horn colour, with an indistinct, sub-obsolete brown belt immediately below the suture, and a very broad well-marked one a little lower down; the antepenultimate whorl has this broad band in its centre and more or less suffused below; aperture ovate oblong, the brown transverse band showing distinctly through in the middle; columnella slightly reflected, short, perfectly rounded below, joined above to the sharp outer lip by a thin callus. Long. 5 1/2, diam. 3 1/2; apert. : long. 2 1/2, diam. 2 1/2 mil.

(2) Pooree; coll. Raban.

This is an estuarine form, like the preceding.

2. **Genus Paludina, Lamarr.**

1. **Paludina vivipara, Linn.**

(4) Potdam; ex o. Martens, sent as "P. porrecta."
(3) Austria; ex o. Stoliczka.

2. **Paludina fasciata, Müller.**

(2) Potdam; ex o. Martens.

(5) Indiana; ex c. Beadle.


*P. intertexta*, Say., Amer. Con., Pl. XXX, fig. 3.

(3) Arkansas; ex c. Beadle.

5. *Paludina*, sp. (?)

(1) Bermuda; ex c. Stoliczka, labelled "P. Bermudiana."


*P. Chinensis*, Gray, Griff. Cuvier, 1834, Pl. 1, fig. 5.

*P. lycythoides*, Bens., A. M., IX, 1842, p. 488 (Chusan).


*P. ampulliformis*, Soul., Voy. Bonite, 1852, Pl. 31, figs. 25-27; and T. R. S. B., 1855, p. 130 (Cochin China).

Should our Indian, or rather Burmese, form be separated from the Chinese? After a long and careful scrutiny, I think they cannot be specifically separated; the two main varieties can be best distinguished by the less convex whorls in the Chinese species, especially noticeable in the last whorl, which is relatively considerably higher; the aperture always corresponds, being more or less higher than broad in *P. Chinensis*, about equal in *P. lycythoides*.

The Museum possesses the actual types of Benson's *P. lycythoides* from Sylhet, as also typical specimens presented by Dr. Cantor of *P. lycythoides*, from Chusan, besides countless specimens from Yunnan and Upper Burma, so that I have particularly favourable opportunities of judging. Typical *P. lycythoides* are not so smooth, are wider umbilicate, of thinner substance, and with more excavated suture than the Chinese forms; as, however, I find these characters are not constant in the species, many individual varieties differing more from the type form than does *P. Chinensis*, they cannot be relied upon as specific characters.

(5) Chusan; coll. Cantor.—see J. A. S. B., 1855, p. 119.

The only character given by Benson to distinguish his *P. lycythoides* from *P. Chinensis* is the rounded and less oblique aperture in the former; as this is not sufficient by itself to constitute even a distinct variety, I cannot with my present knowledge separate the form at all.

(1) China (?) ; purchased from Mr. Damon as "P. lycythoides from China."

The form is remarkable for its rounded whorls and very open umbilicus. I hope shortly to obtain further information concerning the specimen.

(1) China; ex c. Morelet; sent me as "P. lycythoides, Bens."

(1) China; purchased from Mr. Damon as "P. Chinensis."

**Var. ampulliformis**, Soul.

(60) Hatha, Mungla, Monoein, Nantin and Mandalay, all in Upper Burma, and Yunnan; coll. J. Anderson.

Several hundred specimens were brought back by Dr. Anderson; they clearly prove the species to be exceedingly variable, even in individuals picked up in the same handful. At Hatha, for instance, there are three principal forms, all running into one another; the commonest has even a shorter, less produced spire than typical *P. lycythoides*; it is a thicker shell with more sombre-coloured epidermis, with decidedly subangulate, instead of rounded, whorls. Another form has a much more produced spire, with more contracted aperture, with or without the same marked subangulation of the whorls; some of these are exceedingly close to typical *P. lycythoides*, and only separable, even as a variety, by the slightly more convex whorls. Reeve's fig. 21 (P. lycythoides) indeed agrees better with Hatha specimens than with Chusan ones. A third dwarf form was always found with the preceding, presenting a curious affinity to shells of the type of *P. cingulata*, *P. aruginosa*, &c.

(5) Basiul (Phillippines); coll. Semper.

Professor Semper sent these as "P. lycythoides;" they are all young shells, with the last whorl decidedly subangulate. They are quite undistinguishable from young specimens from Yunnan; the operculum is identical. The solid and smooth texture at once distinguish them from typical var. *lycythoides* and from var. *Richt Hofenii*; in these respects they agree with Chinese and Yunnan specimens.

**Var. lycythoides**, Benson.

Sylhet; ex c. A. S. B.

These are the actual types of *P. lycythoides*, and are well represented by Reeve's fig. 12 (P. *ampullacea*). I cannot, therefore, agree with Dr. von Martens, who thinks the
specimen figured is merely a gigantic form of *P. vivipara.* One of the three types is slightly subangulate at the periphery.

Long. 44, diam. 38; apert.: alt. 26½, lat. 22½ mil.

(3) Logtak Lake, Manipur; coll. Godwin-Austen.

Not separable from the preceding form, only slightly smaller, more solid, and of a deeper green colour. The last whorl is more or less obsolete subangulate; this last character is important, as removing one of the chief difficulties in united *P. lecythis* and *P. lecythoides.* Long. 37, diam. 34; apert.: alt. 23½, lat. 20½ mil.

Var. Richthofeni, nov.

(3) Java (?); coll. Richthofen.

Unfortunately there is no label with these interesting shells; they were mixed up with some shells from Java. In any case they are a new variety exactly resembling our typical *P. lecythis* in the extreme thinness of texture, the minute, delicate, and regular longitudinal striae, and the rounded convex whorls, and distinguished from it by more produced spire, less swollen last whorl, slightly more open umbilicus and small aperture. It can be at once distinguished from *P. javanaica* by its more swollen form, by the absence of angulation at the periphery, the open and excavated umbilicus, and the total absence of spiral striae, except on the base. This variety is fairly intermediate between *P. chinensis,* var. *lecythis,* and *P. javanaica.*

Long. 33½; diam. 26; apert.: alt. 16½, lat. 15 mil.


A. *(Distinct sp. or var.)* *P. cingulata,* Mart. P. Z. S., 1863, p. 13 (Siam).

B. " " " " *P. polygramma,* Mart. P. Z. S., 1880, p. (Siam).


Typical Section.

Var. *Paludina gigantea,* Busch. ms., Rv. Con. Icon., fig. 7 (Bengal).

*P. elongata,* Swains. Zool., Ill. Ser. II, 1822, Pl. 98 (Bengal).

(5) Midnapore; ex c. Asiatic Society of Bengal.

These agree exactly with Reeve's fig. 5B.

(1) Ganjam (Orissa); coll. V. Ball.

Unfortunately only a single young specimen was brought back; it appears to be rather an unusual form.

(4) Rajmahal; ex c. Oldham.

(60) Calcutta, Chandernagore, &c.; coll. Nevill, Mainwaring, &c.

The commonest form resembles Reeve's fig. 5A. Specimens similar to the preceding are also abundant. A variety close to, or identical with, Gould's *P. dolias* is also found. Several abnormal specimens, or deformities, also occur; one has an acute keel at the periphery, and the aperture correspondingly angulate; another has the last whorl almost disjointed, and is very openly umbilicate, &c.

(2) Siliguri; coll. Mainwaring.

(10) Jamsipur; coll. Stoliczka.

(7) Vizagapatam; ex c. Madras Mus.

(12) Roorkee; ex c. Wood-Mason.

(20) Madras and Tanjore; coll. Ball and Stoliczka.

Amongst the specimens from the latter locality is a single most interesting one, the sutures distinctly and prominently canalicate. If this deformed race had prospered and become at all constant, the form would have presented a striking analogy to the *Ampullaria carinata,* as compared with *A. globosa.*

(5) Bambalpur (Central Provinces); coll. Major Bowie.

The spiral bands are altogether obsolete in one of the specimens. This occurs also occasionally in Calcutta examples.

(4) Salt Range (Punjab); ex c. Stoliczka.

A shortened angulate form, almost undistinguishable from some of the Burmese var. *dolias*.

(2) Madras; ex c. Madras Mus. Typical.

(5) Derbend (Punjab); ex c. Stoliczka.

A small typical form.

(3) Sind; coll. W. T. Blanford.

Like the preceding.

(2) Beerbloom; coll. J. Wood-Mason.

A peculiarly attenuated, produced form, with small contracted aperture and unusually open umbilicus.

(5) Hazarajpur (Jessore district); coll. Nevill.
Var. gigantea, Reeve.

_Paludina gigantea_, Busch. ms., Rv. Con. L., fig. 7 (Bengal).

(7) Dinapore (near the railway station); coll. Mainwaring.

This very interesting variety has been lately re-discovered by Colonel Mainwaring. All the full-grown specimens found differ from the original figure by the more open umbilicus and peculiarly everted aperture; two of the young specimens are, however, essentially of the same form as the figure. Though a well-marked form, it has not equal claims to distinction as the _P. polygramma_ and _P. cingulata_ of von Martens, or the _P. doliaris_ of Gould.

Long. 53, diam. 37; apert.: lat. 21½, alt. 25 mil.

Young specimen, agreeing in form with Reeve's figure.

Long. 33½, diam. 28½; apert.: alt. 21, lat. 17 mil.

(30) Sibsagar and Tezpur (Assam); coll. Peal and Stoliczka.

Fairly intermediate between typical _P. Bengalensis_ and _P. doliaris._

(6) Dacca; coll. J. Willson.

Like the preceding.

(7) Cachar; coll. Museum Collector.

Like the preceding.

Section A.—Var. doliaris, Gld.


_P. Bengalensis_, var. _digona_, Bll., P. Z. S. 1869 (Bhamó).

(30) Bhamó; coll. J. Anderson.

One of these is the type of the var. _digona_ of Blanford; in some two or three specimens the characteristic angulation of the last whorl is more or less obsolete.

(20) Myadong, Upper Burma; coll. J. Anderson.

A very pretty small contracted form, allied to the preceding, but with the last whorl scarcely, if at all, angulate, with the narrow umbilicus less open (in several specimens altogether closed).

(10) Shwaygoonye, Upper Burma; coll. J. Anderson.

This is one of the most distinct varieties of the species I know, the nearest approach to the _P. cayetropis_, Bens. It resembles the typical Bhamó var. _digona_, but has the concentric and rugose sculpture much more developed; it is also more acutely keeled round the even more open umbilicus, and the whorls are more angulate.

(10) Pegu; ex c. Theobald and Stoliczka.

A small form of var. _doliaris_, with scarcely angulate whorls.

(2) Endawyne Lake, Upper Burma; coll. Hungerford.

A remarkably small variety, otherwise like the preceding.

(3) Pya-shing, Burma; coll. Hungerford.

This form I take to be typical _P. doliaris_, almost undistinguishable from the Bhamó var. _digona_; whorls short, strongly angulate.

(4) Moulmein; coll. Stoliczka.

Like the preceding.

Section B.—Var. polygramma, Mart.


_P. lineolata_, Mss. ms., Rv. Con. I, c. fig. 50 (Simla).

(1) Sian; ex c. Morelet.

Apparently only distinguishable from the preceding variety by its more rounded whorls, less developed sculpture and closed umbilicus; both this and var. _cingulata_ are well-marked and easily distinguishable forms of our _P. Bengalensis_. For convenience sake, both forms might be retained as of specific rank, if thought desirable, but in no case must one be joined to _P. Bengalensis_ and the other separated.

(4) Cochín China; ex c. Morelet.

Like the preceding, but whorls a trifle more subangulate.

(7) Qualla Kangsa (mainland opposite Penang); coll. Townsend.

The whorls are rounded, as in the Sian specimen; umbilicus closed, sculpture obsolete, no bands on base.

Section C.—Var. _cingulata_, Mart.


_P. Cochiniakenensis_, Mord. Rev. Zool., 1866; and Ser. Conch., IV, Pl. XIV, fig. 3 (Cochín China).

7. P. Ingalisiana, Rv., not Lea, Con., &c.

(30) Assam; ex c. Stoliczka.

Most unfortunately no exact locality is recorded for this interesting form, the only one of its kind I have seen from India. It is distinguished at a glance from all other varieties by its acute keel at the periphery, by the distinctly angular aperture, and its unusually developed sculpture; by the general absence of transverse bands on the base, which when present are very faint; on the whorls themselves the bands are sub-obsolete and of only a slightly deeper shade of green than the epidermis; the excavation round the narrow umbilicus is more developed than usual. This Assam form agrees almost exactly with Cochin China specimens of var. polygramma, the marked excavation round the open umbilicus in the former and its more developed sculpture being the only distinguishing characteristics I can see. Reeve's fig. 65 (P. Sumatrensis, Phil.) fairly represents the form; the true P. Sumatrensis of Phil., Zeits. Mal., 1853, p. 123, is, however, quite different from this Assam variety, being described as possessing ovately conoidal, three-keeled whorls with an almost rounded aperture; though acutely angled at the periphery, in only one or two specimens can the form be said to possess a raised keel.

Assam form of var. cingulata, long. 30, diam. 21½ mil.

(1) Siam; ex c. Morelet.

An adult, fine, though eroded, specimen, sent as P. Frauenfeldi, Morl., exactly represented by Deshayes's Pl. VI, figs. 15, 16, l. c.; the keel at the periphery is also obsolete in M. Morelet's specimen, otherwise it agrees exactly with Penang and Singapore specimens; it seems to me to be undistinguishable from Morelet's figure of P. Cochinchinensis, l. c. This specimen does not agree very closely with Reeve's fig. of P. Ingalisiana, considered by Morelet as identical.

(1) Singapore; ex c. Nevill.

A very fine, thickened form, with an acutely raised keel at the periphery, in no way differing from the Assam form of this variety, except by its slightly greater size and thickness and more distinctly raised keel. Deshayes's P. obscurata, loc. cit., Pl. VI, figs. 15, 16, is, I believe, identical, though the raised keel in the specimen figured appears to be almost obsolete.

Long. 35, diam. 26½ mil.

8. Paludina oxytropis, Benson.
P. pyramidalata, Busch., Phil. Abb., 1845, Pl. I, fig. 3 (Bengal).

(3) Manipur; coll. Godwin-Austen.

Another of our old Indian species, re-discovered by Major Austen. P. angulata is a small, thickened, imperforate form, scarcely specifically distinct.

P. zonata, Hanl. ms., Rv. Con. 1. c., fig. 34 (Mauritius).


The typical figure represents a poor, dwarf specimen; the species is usually half as large again, and can be distinguished from typical P. Bengalensis by its more rounded whorls, more open umbilicus, broader bands and more obsolete sculpture. I believe, however, it is scarcely more than a local race; young specimens especially are scarcely separable from Burmese var. dolotis; adult specimens are nearest the form of P. Bengalensis previously recorded as var. gigantea, Rv., from Dinapore.

Long. 40½, diam. 30 mil.


P. quadrata, Bens., A. and M., 1842 (Chusan).
P. polygonata, v. Fr. (Philippines).

(30) Canton; ex c. Stoliczka.

Some hundred specimens from the same piece of water prove this species to be most variable, as regards the spiral keels, presenting in this respect a curiously close analogy to
its big ally the *P. naticoides* of Theobald. Though all the specimens agree in being distinctly keeled at the periphery, they vary in every conceivable way, from being otherwise smooth to the typical form with three prominent, nearly equal-sized keels. This form is well represented by Reeve’s fig. 38A, which agrees perfectly with one of these specimens in size and every other respect, but there are no specimens as large as his other figures. I think there can be little doubt Frauenfeld’s specimens came from China and not from the Philippines,—see remarks by von Martens, Malak. Bl., 1865, p. 143; the variety called *P. quadrata* by Benson, fig. 17 of Reeve, appears to be more plentiful than the typical form.

(3) Canton; ex c. Semper.

Sent as “*P. tricarinata*, Ant.” They are the typical Canton form, and do not agree at all with the Philippine shell figured by Philippi, Pl. I, fig. 5, as *P. tricarinata*.

(2) Canton; ex c. Semper.

Sent as *P. quadrata*, Bens. One of the specimens is doubtless correctly identified; the other, however, is slightly rimate, without any keel or angulation at the periphery. This, I think, is the form alluded to by von Martens, l.c., as the *P. aeruginosa*, Rv., and considered as a variety of angularis; indeed, I think Reeve’s figures may represent both forms, his fig. 41 A and B the true *P. aeruginosa*, as below recorded, his fig. 41 C possibly a mere variety of *P. angularis*, and perhaps the same form which induced von Martens to identify *P. aeruginosa* as a variety of *P. angularis*.


*P. aeruginosa*, Rv., fig. 41 (China).

*P. Javanica*, var. *vigorosa* (?), Mart., l.c.

(2) Shanghai; coll. Tommerre.

This is undoubtedly the form alluded to by von Martens, l.c., as *P. Javanica*, var. *vigorosa* (?). I think, however, it is rather a still more characteristic form of the shell as above described and figured by Reeve, than, as von Martens seems to think, a mere variety of *P. angularis*; the lighter substance and peculiar colour, as recorded by Reeve, being distinctive features of the form.

Long. 35½, diam. 24½ mil.


*P. Javanica*, Busch, Phil. Abb., Pl. I, figs. 11, 12, 1844 (Java).

This species is recorded by Morelet, l.c., as found in Cochin China; it is certainly closely allied to the preceding and also to the Assam form, recorded here under *P. Bengalensis*, var. *cingulata*; it is distinguished from both principally by the more developed sculpture.

(1) Samarang; ex c. Morelet.

There is no other specimen in the Museum collection which I can recognize as specifically identical.


*P. costata*, Quoy Voy. Astrol., Pl. 80, figs. 1—3.

*P. angularis*, Auct., not Müll.

The nearest Indian form is *P. oxytropis*; it is, however, impossible to confuse the two.

(1) Java (?); coll. Richthofen.

Amongst undoubtedly Java shells, with a label marked “*Telugu Patengen.*” There is unfortunately just a chance it may have got mixed from the probably Philippine specimens recorded below; it agrees closely with them in size and sculpture, but is more angular, and the epidermis looks to me as if collected from a different locality. Long. 18½, diam. 15½ mil.

(9) Luzon (Philippines); ex c. Morelet and Nevill.

Agreeing with Reeve’s fig. 14; the umbilicus varies in being more or less open.

(8) Zamboanga (Philippines); coll. Semper.

All quite young, imperfect specimens.

(14) Philippines (?); coll. Richthofen.

An interesting small variety, varying very much in sculpture; sometimes many-keeled as in typical form, sometimes only two- or three-keeled, with the intermediate ones quite obsolete, thus resembling Chinese *P. angularis*. The specimens were either from the Philippines or from Java; unfortunately no labels were attached to them.


*P. Shanensis*, Theob., Cat. Ind. Land, &c., Shells, 1876, p. 18.

I do not see any necessity for changing the first name, the *Paludina natricoides* of Férussac being a species of *Lithocyclus* and belonging to a different family. As Theobald justly observes in his original description, the most characteristic feature of this very distinct species is the very callous and broadly reflected columella; the different varieties have been well figured by Theobald and in the *Con. Indica*; they graduate quite imperceptibly from one extreme to the other, in this respect resembling *P. angularis*, which, though so different at first sight, is probably its nearest ally.

(4) Upper Salween; coll. Theobald.

With the keel altogether obsolete, handsomely banded, represented by Pl. 76, fig. 1, *Con. Indica*.

(1) Upper Salween; coll. Theobald.

No traces of bands, a distinct keel.

(8) Upper Salween and Ava; coll. Theobald.

The var. *fasciata* of Theobald, l.c., Pl. 34, figs. 1, 2. Banded, acutely keeled at the periphery, with two or three less developed keels above (sometimes obsolete).

(2) Ava; coll. Theobald.

The var. *carinata* of Theobald, l.c., Pl. 34, fig. 3; also *Con. Indica*, Pl. 76, fig. 4; very prominently keeled at the periphery, with three or four other keels above and below.

15. Paludina Eyriesii, Morl.


(1) Cambodia; ex c. Morelet.

A specimen of the typical form, not of var. *Fischeriana*.


I think it very possible that MM. Croese and Fischer may be correct in their surmise (Journ. Conch., 1876, p. 336) that the animals of this thick-shelled group of Asiatic Paludina, well compared with the American sub-genus Melantho, l.c., p. 317, may prove sufficiently distinct to enable the group to be separated. I would call attention to Hutton's original description, which is excellent. I can confirm fully from my own experience his statements of the habits of the species.

(11) Loc. (?) ex c. Asiatic Soc. of Bengal.

These are probably typical specimens from Captain Hutton; unfortunately no record can be traced.

(30) Hazarpur, Jessore district; coll. Nevill.

I found this shell literally in thousands, buried in "colonies" on the muddy sides of a canal.

Var. *Tezpurensis*, nov.

A very interesting form, almost exactly intermediate between *P. crassa* and *P. Siamesensis*. Spire much shorter than in typical form, and only a little more produced than in the Siam species; whorls more globose; aperture less deflected, umbilicus less open, sculpture more distinctly malleated. I should have been puzzled to know whether the form ought to have specific rank or not, but fortunately one (and one only) of the eight specimens, preserving all the other characters, has the spire twice as much produced as the others, and about the same as the nearest form of the typical set.

Typical *P. Siamesensis* (Siam)—long. 17, diam. 15½ mil.

Type of var. *Tezpurensis* (Tezpur)—long. 17½, diam. 15¾; apert.: lat. 11½, alt. 9½ mil.

Another larger specimen (Tezpur)—long. 19.

Produced form of preceding (Tezpur)—long. 23½, diam. 19 mil.

A typical specimen of *P. crassa* (ex c. A. S. B.)—long. 23½, diam. 19 mil.

Largest specimen of *P. crassa* (Hazarpur)—long. 28½, diam. 20½ mil.

Young ditto (Hazarpur)—long. 16½, diam. 13½ mil.

Another from same locality—long. 16, diam. 14½ mil.

(4) Pegu; ex c. Stoliczka.

These are even nearer the type form than the preceding variety. Apart from the usually more produced spire, it can be distinguished from the latter by its less globose, distinctly subangulate last whorl, in which it resembles typical *P. Hainesiana*; indeed, it might perhaps be as correctly ranked
as a variety of it as of *P. crassa*. It is best distinguished from the latter by its obtuse apex and swollen spire. Deshayes’s Pl. VII, figs. 23, 20, l. c. (P. Moreletii, Cochin China), gives a fair idea of two of the above four specimens. Long. 22\(\frac{1}{2}\) mm, diam. 19\(\frac{1}{4}\) mm.

(1) Frome; coll. Theobald.

Apparently a small form of the preceding. Long. 11, diam. 10 mm.


(1) Siam; ex c. Morelet.

I have already given the measurement of this interesting specimen in the record of the previous species. M. Morelet does not seem to allude to the form, Ser. Conch., IV, p. 308, unless he intends to imply that he considers it a mere variety of *P. Hainesiana*.

(20) Yamleymaw, Upper Burma; coll. J. Anderson.

Unfortunately all young specimens; the spire is evidently quite short. The adult form may possibly prove closer to the preceding species than to *P. Siamensis*.


(2) Siam; ex c. Morelet.


*Verrita dissimilis*, Müll. Hist. Verm., p. 184 (Loc. ?).


B. (Distinct species or var.) *P. heliciformis*, v. Fr., loc. cit., 1865, Pl. XXIII (Central Africa).

This Indian group of *Paludina* is abundant throughout India, including Burma and Ceylon. The ordinary way in Indian collections is to divide the group into two species, calling the South Indian forms *P. dissimilis* and the North Indian *P. pramosa*. From the figure in the Con. Indica Mr. Hanley has evidently noticed that Müller’s type form is the North Indian, as the latter describes *P. dissimilis* as possessing a broad white belt—a character not possessed at all by the Madras form. After a careful examination, I have come to the conclusion that it is impossible to divide the group into two species only; either the various races must be ranked as varieties or sections of one species, or some four to five species at least, of equal claims to distinction, must be created to classify the Museum specimens only.

**Typical Section.**

*Paludina Remossii*, Phil., as of Bens. ms., Abb., 1847, Pl. II, fig. 3 (Meywar in Bengal).

*P. pramosa*, Bens. ms. emend., Rv. Con. Icon., fig. 35, 1863.

*P. Remossii*, Phil., Con. Indica, Pl. 77, figs. 8, 9 (Jounpore, Guopathur, &c.).

*P. dissimilis*, Müll., Con. Indica, Pl. 77, figs. 2, 3 (Calcutta, &c.).


(30) Calcutta and neighbourhood; coll. Stolizca, Nevill, &c.

Agreeing exactly with Philippi’s typical figure of his *P. Remossii*, also with Pl. 77, fig. 3 of the Con. Indica. Young specimens are excellently represented by the above-quoted figure of Swainson; von Martens has already noted this circumstance.

(3) Chandernagore; coll. Mainwaring.

Showing a broad white belt unusually plainly, as in Con. Indica, l. c., figs. 8, 9. This agrees better with Müller’s description than the narrow belted form as above recorded; it is, however, a character that varies in individuals taken up in the same handful, though never or very rarely altogether obsolete.

(5) Benares; coll. Mainwaring.

(6) Chandrapal and Hazarpara (Lower Bengal); coll. Nevill.

(4) Purneah and Bbehbohoom; coll. J. Anderson and Wood-Mason.

(1) Derbend; ex c. Stolizca.

(10) Nager; ex c. Stolizca.

(8) Naim Tal (?) ex c. Oldham.

I have reason to doubt the correctness of this last locality.

(1) Salt Range; ex c. Stolizca.

Almost quite smooth.

(3) Chandally; coll. Nevill.
A remarkably compressed, imperforate and produced form, with the last whorl descending abruptly, so that the outer margin of the aperture is almost at a level with it; the subangulation at periphery and white belt are both obsolete; margins of aperture very broadly reflected and intensely black.

(2) Maaupatam; ex c. Stoliczka.

The largest specimens I have seen; unfortunately in such exceedingly bad condition that I cannot say under which section the form should be classed.

Var. obtusa, Trosch.


Phil. Abb., Pl. I, fig. 14; and Küster, Pl. VI, figs. 8, 9.

Possibly this variety will have to be classed under the next section. A larger series of specimens is required for certain identification.

(2) Sambalpur (Central Provinces); coll. Major Bowie.

Agrees well with the above figures; the variety differs from the typical form by the absence of subangulation and the white belt, but especially by the decidedly more convexly shaped whorls; the aperture is less everted.

(8) Loc. (?); ex c. Asiatic Soc. of Bengal.

A very fine set of specimens of this variety, with the suture remarkably distinct.

(4) Naini Tala; coll. Stoliczka.

All four much eroded, differing from both the preceding by more open umbilicus, more everted aperture, and even more convex whorls; indeed they might be called "globose."

Section A.—Var. variata, V. Fr.


P. variata, v. Fr., Con. Indica, Pl. 115, fig. 8 (from type).

P. carinata, RV. Con. Icon., fig. 61, not of Swains.


Distinguished from typical form by the obsolescence of the white belt at the periphery, by the usually acute keel in its place, often to be traced at the base of the last two or three whorls, as in Reeve's fig. 61, by the more rounded whorls,

more distinct suture, and especially by the considerably more developed sculpture, intermediate in this respect between typical P. dissimilis and P. Javanica.

(60) Madras; coll. Nevill.

I collected very numerous specimens of this form, which show how this shell varies, though always to be distinguished by the above recorded characters. Many of them have the last whorl distinctly biangulate as in P. Ceylonica, but they are of a larger and more humid growth, otherwise undistinguishable; the most common form is, however, one like typical variata, but with the keel a trifle less acute and the whorls slightly more rounded. In some of the adult specimens only the keel becomes almost quite obsolete; in two or three only the keel is prominent, half-way up the spire, as in Reeve's fig. 61.

(4) Trichinopoly; ex c. Asiatic Soc. of Bengal.

A form with compressed whorls and produced spire.

(10) Bangalore (Mysore); coll. Nevill.

A short form with rather open umbilicus, obsolescently biangulate.

(10) Ganjam (Orissa); coll. Ball.

Exactly represented by Pl. 115, fig. 9, of the Con. Indica.

(1) Vizagapatam; ex c. Madras Mus.

A remarkable specimen, only one I have seen which shows clearly 4 or 5 raised ridges on the back of the last whorl, reminding one of P. costata.

(1) Loc. (?); ex c. Asiatic Soc. of Bengal.

Also a remarkable specimen, roughly malleated, distinctly biangulate, very openly umbilicate.

(3) Ceylon; ex c. F. Layard.

Fine large specimens sent as "P. melanostoma, RV." Quite undistinguishable from some Madras specimens.

Var. Ceylonica, Dohrn.

(20) Kandy; coll. Nevill.

Varies very much; in only a few of the specimens is the double keel so distinct as in Pl. 76, fig. 1, Con. Indica; most of them exactly resemble the var. carinata, Pl. 115, fig. 9; the keel is often traceable on the two last whorls, as in Reeve's fig. 61. This form is scarcely separable, even as a variety.
(9) Cebh; coll. Stoliczka.

A very fine, interesting form, with sculpture even more developed than in Madras specimens; no trace of a white band; sharply angulate in young specimens, becoming more or less obsolete in adult ones, no trace of biangulation; imperforate. This race may perhaps prove to be nearer var. P. obtusa, Trosch., than P. variata.

(10) Moeldin; coll. Stoliczka and Richtofen.

A small race, in form more resembling typical P. dissimilis, and with sculpture fairly intermediate between it and var. variata; the absence of the white band and distinct angulation at the periphery distinguish it from typical P. dissimilis.

Section B.—Var. heliciformis, v. Fr.


Var. *P. viridis*, Haul. ms., Rv., Con. Icon., 1862, fig. 30 (Loc. ?).

(12) Pegu; ex c. Stoliczka.

This is the form well represented on Pl. 77, figs. 7—10 of the Con. Indica. Long. 22, diam. 19 mil.

Var. *viridis*, Reeve.

*Paludina viridis*, Haul. ms., Rv., l. c., fig. 20 (Loc. ?).


Very fine striking specimens, one easily distinguishable from the preceding by its produced spire, much less convexly rounded whorls, less excavated suture, and completely closed umbilicus; it is a little smaller than Reeve's figure, but otherwise agrees exactly with it and also the short description. Long. 32½, diam. 23 mil.; another specimen, long. 22½, diam. 22 mil.

Var. *decussatula*, Blf.


This is a very distinct variety, and should perhaps be ranked as a distinct section.

(18) Bhamo; coll. J. Anderson.

One of these and not an Ava specimen is the actual type of Mr. Blanford's var. *decussatula*. In all the numerous specimens found, the light-coloured belt at the periphery is externally almost obsolete; within the aperture, however, it is invariably distinctly traceable. This belt is an excellent character by which the Bhamo and Ava variety can be distinguished at once from the preceding Pegu form, in which no sign of any such belt can be traced, though I have examined numerous specimens of all ages. The spire is perfect, slightly more acuminate than in the preceding form, with the apex not eroded; the last whorl is more produced; the sculpture, epidermis, and aperture are precisely similar. Mr. Blanford describes the form as "imperforate;" full-grown specimens are, however, more or less very narrowly rimate, as in Pegu specimens.

(50) Mandalay (Ava); coll. J. Anderson.

These are mostly not quite so adult as the preceding; they show the band at the periphery more distinctly, and are mostly quite imperforate.

The largest specimen from Mandalay—long. 29½, diam. 18½ mil.

Sub-genus *Melantho*, Bowd., 1822.

Binney seems to join together all the following six species under the name of *Melantho decisa*; I prefer, however, to record them separately, as I am not in a position to properly criticise the forms.


*P. decisa*, Say, Enc. 1817.

(16) Pennsylvania; ex c. Beadle.

(2) Massachusetts; ex c. (?)

(2) Ohio; ex c. (?)


(7) Indiana; ex c. (?)


(30) New York; ex c. Newcomb and Beadle.
3. P. (Melancho) subpurpureus, Say.

*P. subpurpureus*, Say., *Amer. Conch.*, Pl. XXX, fig. 2.

(8) Indiana; ex c.
(4) Ohio; ex c. Newcomb.

4. P. (Melancho) ponderosa, Say.


(20) Indiana; ex c.
(4) Alabama; ex c. Beadle.

5. P. (Melancho) genicula, Conr.

*P. genicula*, Conr., 1834, Pl. viii, fig. 3.

(2) Georgia; ex c.

6. P. (Melancho) subcarinata, Say.


(13) Indiana; ex c.

7. P. (Melancho) rufa, Hald.

*P. rufa*, Hald., 1841.

(2) New York; ex c. Newcomb.