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XXIV.—*Natural History Notes from H.M. Indian Marine Survey Steamer 'Investigator,' Commander T. H. Heming, R.N.*—Series III., No. 1. *On Mollusca from the Bay of Bengal and the Arabian Sea.* By EDGAR A. SMITH.

THE present paper contains merely descriptions of some of the new species obtained by the 'Investigator' during the season 1897-98. It seems advisable to publish them now, as Dr. Alcock, Superintendent of the Indian Museum at Calcutta, wishes the types to be returned as soon as possible for the purpose of figuring them in the 'Illustrations of the Zoology of the 'Investigator'.'

The continuation of this paper will contain a complete list of all the Mollusca collected during the above-mentioned season, with descriptions of additional new species.

I regret to say that examples of only seventeen of the thirty-five species now described can be retained for the collection of the British Museum, as all unique specimens have to be returned to the Indian Museum.

The following stations are frequently quoted:—

Station 229.—Lat. $9^{\circ} 29' 34''$ N., long. $75^{\circ} 38'$ E.:
360 fath.; green mud.

Station 232.—Lat. $7^{\circ} 17' 30''$ N., long. $76^{\circ} 54'$ E.:
430 fath.; grey mud.

Station 233.—Lat. $13^{\circ} 17' 15''$ N., long. $93^{\circ} 10'$ E.:
185 fath.; sand.

1. *Pleurotoma optata*.

Testa fusiformis, albida, epidermide tenui grisea induta; spira turrita, acuminata; anfractus circiter 10, in medio concavi, infra tuberculati, et serie tuberculorum minorum infra suturam instructi, transversim plus minus obsolete striati, ultimus infra seriem tuberculorum distinctius transversim striatus, lineisque incrementi flexuosis tenuibus sculptus; apertura alba, longit. totius $\frac{1}{2}$ paulo minor; labrum tenue, ad angulum subprofunde sinuatum; columella rectiuscula; canalis obliquus, leviter recurvus.

Longit. 36 millim., diam. 10; apertura 15 longa, $4\frac{1}{2}$ lata.

Hab. Station 232, off South India, 430 fath.; and St. 229, off Travancore, in 360 fath.

Remarkable for the concave whorls and the row of tubercles just above the suture.

2. *Pleurotoma (Bathytoma) Oldhami*.

Testa breviter fusiformis, alba; spira acute pyramidalis; anfractus circiter 10, sutura profunde canaliculata sejuncti, leviter concavi, infra suturam zona sublævi sed margine inferiore crenulato cincti, supra suturam cingulo, tuberculis numerosis gracilibus ornato, instructi, circa medium lira tenui crenulata cincti, ultimus liris transversis confertis tenuibus granosis ornatus, superne convexiusculus, antice contractus; apertura elongata, longit. totius $\frac{1}{2}$ æquans; labrum tenue, in medio prominens, curvatum, paululum infra suturam mediocriter profunde sinuatum; columella leviter obliqua, inferne reflexa, incrassata, in medio plus minus prominens.

Longit. 43 millim., diam. 15; apertura 21 longa, 5 lata.

Hab. Station 229, off Travancore coast, in 360 fath.

A very beautiful and interesting species closely allied to *P. attractoides*, Watson. Only a good figure could convey an idea of the detailed sculpture. A conspicuous feature is the broad smoothish band with the deeply channelled suture above and a narrow deep furrow beneath it; also the more prominent tuberculated zone on the lower part of the whorls is very striking. The small tubercles on the transverse liræ of the body-whorl are incurved longitudinal rows, following the lines of growth.

Named after Commander C. F. Oldham, R.N., of the 'Investigator.'

3. *Pleurotoma (Surcula) breviplicata*.

Testa albida, gracilis, fusiformis; spira turrita, acuminata; an-

fractus 10, supremus subglobosus, lævis, cæteri in medio angulati, supra concavi, infra contracti, oblique plicati, plicis supra angulum haud productis, infra medium liris tenuibus transversis filiformibus ornati, supra lineis incrementi tenuissimis curvatis sculpti, ultimus antice rostratus, oblique tenuiter liratus; apertura cum canali longit. totius $\frac{1}{2}$ æquans; labrum tenue, in medio arcuatim prominens, prope suturam haud profunde sinuatum; columella lævis, subrecta; canalis parum obliquus, angustatus. Longit. 26 millim., diam. 8; apertura cum canali 13 longa, 3 lata.

Hab. Station 233, off Andaman Islands, in 185 fath.

The plicæ are delicate, oblique, about thirteen in number, and very short, commencing at the median angle and scarcely reaching the suture below.

4. *Pleurotoma (Surcula) eurina*.

Testa breviter fusiformis, alba, epidermide tenui sordide lutescente induta; anfractus normales 9-10, supra medium concavi, infra convexi, et nodose costati, undique spiraliter tenuiter striati, lineisque incrementi flexuosis sculpti, in anfr. ultimo costis leviter obliquis circiter 16 infra subito attenuatis et fere evanidis; apertura alba, longit. totius $\frac{3}{4}$ adæquans; columella rectiuscula, vix arcuata, alba, lævis; labrum tenue, superne late et profunde sinuatum; canalis anterior brevis, latus, obliquus. Longit. 44 millim., latit. 15; apertura 18 longa, 6 lata.

Hab. Station 232, off South India, in 430 fath.

The whorls are bordered below the suture with a thickened margin.

5. *Pleurotoma (Surcula) præcipua*.

Testa fusiformis, albida, spira acuminata; anfractus 9, superne oblique declives, infra oblique subdistanter plicati, et spiraliter tenuiter striati, lineisque incrementi flexuosis sculpti, ultimus lævis, convexus, haud plicatus; apertura longit. totius $\frac{1}{2}$ fere æquans; labrum tenue, prominens, curvatum, ad suturam medio-criter profunde sinuatum; columella obliqua, recta, callo tenui reflexo induta. Longit. 38 millim., diam. 15; apertura 18 longa, 6 lata.

Hab. Station 229, off Travancore coast, in 360 fath.

Remarkable for the smooth convex body-whorl, which contrasts with the plicate spire. Two dead specimens.

6. *Pleurotoma (Surcula) arcana*.

Testa fusiformis, sordide albida, epidermide tenui olivacea induta; spira acuminata, turrita; anfractus circiter 10, supra declives,

concavi, infra angulati, supra angulum tuberculati, tuberculis subacutis, in anfr. ult. circa 12, lineis incrementi tenuibus flexuosis striati, striis spiralibus exilibus sculpti, ultimus antice angustatus, rostratus, transversim striatus; apertura antice canaliculata, longit. totius $\frac{1}{2}$ haud æquans; columella paulo obliqua, alba, callosa; labrum tenue, superne late sed mediocriter profunde sinuatum, in medio arcuatim prominens.

Longit. 25 millim., diam. 9; apertura cum canali $10\frac{1}{2}$ longa, $3\frac{1}{2}$ lata.

Hab. Station 233, off Andaman Islands, in 185 fath.; and Station 229, off Travancore coast, in 360 fath.

The transverse striæ upon the upper concave portion of the whorls are finer and less conspicuous than those below the row of tubercles. Two specimens only.

7. *Drillia investigatoris*.

Testa fusiformis, rufo-fusca, zona pallida supra medium anfractuum cineta, longitudinaliter fortiter rotunde costata, undique spiraliter tenuiter lirata; anfractus 12, supremi duo (nucleus) læves, albi, globosi, cæteri supra prope suturam leviter concavi, dein obtuse subangulati, lateribus inferne contractis, convexiusculis, ultimus elongatus; apertura angusta, longit. totius $\frac{1}{2}$ fere æquans; labrum prope suturam sinuatum; columella rectiuscula, obliqua. Longit. 65 millim., diam. 20; apertura 31 longa, 7 lata.

Hab. Station 233, off Andaman Islands, in 185 fath.

The costæ do not extend beyond the middle of the body-whorl. One specimen obtained.

8. *Drillia captiva*.

Testa breviter fusiformis, pallida; spira elongata, acuminata; anfractus circiter 10, supra concave excavati, infra vix convexiusculi vel subplani, infra sed ad suturam carinati, costis obliquis tenuibus circiter 14–16, lirisque spiralibus 3–4 nodose cancellati, costis in anfr. ultimo infra medium evanidis, liris transversis circa 16, inferioribus paucis haud nodulosis; apertura obliqua, irregularis, antice breviter canaliculata, longit. totius $\frac{1}{3}$ paulo superans; labrum extus varicosum, supra valde sinuatum; columella callo tenui superne subtuberculato induta.

Longit. 21 millim., diam. $6\frac{1}{2}$; apertura $7\frac{1}{2}$ longa, $2\frac{1}{2}$ lata.

Hab. Station 233, off Andaman Islands, 185 fath.

In addition to the sculpture described above, very fine spiral striæ, crossed by equally fine lines of growth, are observable under a powerful lens. Attached to *Xenophora pallidula*.

9. *Drillia capta*.

Testa breviter fusiformis, sordide albida; spira turrita, acuminata;

anfractus 11-12, costis leviter obliquis circiter 12, paulo infra suturam sulco haud profundo bisectis, instructi, undique tenuiter spiraliter striati; apertura parva, longit. totius $\frac{1}{3}$ haud æquans; labrum tenue, prominens, arcuatum, supra profunde sinuatum; columella callo conspicuo soluto, ad suturam prominente et labro juncto induta; canalis anterior brevis, recurvus.
Longit. 19 millim., diam. 6; apertura 6 longa, 2 lata.

Hab. Station 233, off Andaman Islands, 185 fath.

This species is remarkable on account of the fine transverse striæ which cover the entire surface, also for the prominent columellar callus and the deep rounded sinus of the labrum. The upper ends of the costæ are cut off by a shallow groove or depression. Found attached to *Xenophora pallidula*.

10. *Trophon tenuirostratus*.

Testa fusiformis, albida; spira acuminata, turrita; anfractus circiter octo, infra medium angulati, supra declives, paulo concavi, longitudinaliter tenuiter plicati (plicis in anfr. ult. 12-13 inferne attenuatis), lineis incrementi tenuibus striati, ultimus liris tribus subobsoletis transversis cinctus, infra angulum convexus, antice tenuiter rostratus; apertura superne ovata, antice canaliculata; columella rectiuscula, callo tenui induta.
Longit. 28 millim., diam. $10\frac{1}{2}$; apertura cum canali 15 longa, $4\frac{1}{2}$ lata.

Hab. Station 233, off Andaman Islands, in 185 fath.

The plicæ become slightly acutely nodose at the angulation, and the three feeble transverse ridges upon the body-whorl give it a faintly clathrate appearance. One example only.

11. *Trophon indicus*.

Testa late fusiformis, alba, epidermide tenui subolivacea induta; spira turrita, conica; anfractus 8?, supra declives, subconcavi, in medio angulati, plicis obliquis tenuibus (in anfr. penult. circiter 18) instructi, spiraliter tenuiter striati, ultimus amplus, plicis antice tenuioribus; apertura alba, longit. totius $\frac{1}{2}$ adæquans; labrum tenue, supra angulum late haud profunde sinuatum, infra arcuatim prominens; columella callo albo induta, leviter incurvata.
Longit. 35 millim., diam. 18; apertura 18 longa, 8 lata.

Hab. Station 233, off Andaman Islands, in 185 fath.

In addition to the plicæ, the surface exhibits fine lines of growth. A single specimen only.

12. *Fusus captivus*.

Testa fusiformis, parva?, sordide albida, rufo lirata; anfractus 8, convexi, supremi duo læves, globosi, cæteri costis 10-11 tenuibus obliquis arcuatis instructi, liris transversis duobus circa medium cincti, lineisque spiralibus filiformibus paucis ornati, incrementi lineis striati, ultimus liris præcipuis circiter 12 succinctus; apertura alba, longit. totius $\frac{1}{2}$ æquans; labrum tenue, intus liris intransantibus 8-9 munitum; columella callo tenui induta, superne arcuata; canalis anterior obliquus, subrecurvus, haud elongatus. Longit. $22\frac{1}{2}$ millim., diam. $8\frac{1}{2}$; apertura 11 longa, 3 lata.

Hab. Station 233, off Andaman Islands, 185 fath.

The fine thread-like spiral lines being crossed by rather distinct lines of growth, give to the surface a finely latticed appearance. Allied to *F. niponicus*, Smith.

13. *Nassaria lævior*.

Testa ovato-fusiformis, sordide albida; spira conica; anfractus 8, duo superiores læves, sequentes sutura canaliculata sejuncti, costis tenuibus obliquis lirisque spiralibus inæqualibus gracilibus tuberculatim cancellata, varicibus duobus magnis convexis instructi, in ultimo costis fere evanidis; apertura obliqua; canalis anticus obliquus, recurvus; labrum extra varicosum, intus liris intransantibus circiter 14 instructum; columella in medio arcuata, callo tenui iuduta, supra et infra transversim lirata, et supra marginem canalis tuberculis paucis parvis munita. Longit. 26 millim., diam. 16.

Hab. Station 237, lat. $13^{\circ} 17'$ N., long. $93^{\circ} 7'$ E., off Andaman Islands, 90 fath.

The large swollen varices, two upon each whorl, are very faintly tinted with rose. The longitudinal costæ, which are only feebly indicated upon the body-whorl, become more pronounced and fewer upon each whorl as they advance towards the apex. The transverse liræ are about eight in number upon the penultimate whorl, and the whole surface is marked with fine lines of growth.

Closely allied to *N. nivea*, Gmelin, *N. turrata*, Sow., and *N. multiplicata*, Sow., and chiefly distinguished by the smoother body-whorl and the swollen varices. All four forms might well be regarded as varieties of one and the same species.

14. *Tritonidea delicata*.

Testa fusiformi-ovata, epidermide plus minus setosa induta, rufescens, circa medium anfract. ultimi zona pallida cincta, longitudinaliter plicata et spiraliter tenuiter lirata; anfractus 9, convexi,

sutura profunda sejuncti, plicis arcuatis numerosis (in anfr. penult. circiter 18, in superioribus minus numerosis) instructi, liris spiralibus (in anfr. penult. circiter 7, lineis filiformibus intercalatis) supra plicas continuis ornati, ultimus pone labrum varice valido munitus; apertura alba, longit. totius $\frac{1}{2}$ adæquans, antice oblique canaliculata; labrum ad marginem tenue, intus tenuiter liratum, antice tuberculo conspicuo munitum; columella superne arcuata, callo albo, circumscripto, supra labro juncto, induta. Longit. 31 millim., diam. 17; apertura 16 longa, 8 lata.

Hab. Station 237, lat. $13^{\circ} 17'$ N., long. $93^{\circ} 7'$ E., off Andaman Islands, 90 fath.

15. *Pisania angusta*.

Testa angusta, rufo-fuscescens, circa medium anfr. ultimi albo cincta, lineis transversis paucis albo et rufo punctatis ornata; anfractus 8?, superiores longitudinaliter costati et spiraliter tenuiter lirati, convexiusculi, tres ultimi haud costati, leviter convexi, striis transversis lineisque incrementi arcuatis sculpti; apertura angusta, ovalis; labrum extra incrassatum, intus album, liratum, ad marginem denticulatum; columella arcuata, callo valido albo induta, superne tuberculo gracili munita; canalis anterior brevis, obliquus, recurvus.

Longit. 21 millim., diam. $8\frac{1}{2}$; apertura 9 longa, 4 lata.

Hab. Off south coast of Ceylon, 34 fath.

In form rather like *P. crenilabrum*, A. Adams.

16. *Nassa aracanensis*.

Testa minima, oblique costata, costis superne acute nodosis, alba, infra suturam inter tubercula et circa basin anfr. ultimi purpureo-fusco tincta, et circa medium fusco-picta; spira turrita, haud acuta; anfr. 7, superiores tres læves, nitidi, cæteri inter costas obliquas arcuatas transversim striati; apertura alba; labrum extra costa valida alba incrassatum, intus liris circiter 7 munitum; columella callo tuberculato induta.

Longit. 7 millim., diam. 4; apertura $2\frac{1}{2}$ longa, $1\frac{1}{2}$ lata.

Hab. Reef Island, Kyuk Phyon, off Aracan coast.

The costæ are thirteen upon the body-whorl, which also has a few of the striæ around the lower part stronger than those above. The columellar callus exhibits about six or seven small tubercles, of which the uppermost is the largest.

17. *Nassa diluta*.

Testa ovata, superne acuminata, albida, epidermide tenuissima olivacea induta; anfractus 7, primus lævis, cæteri costis 11-12

longitudinalibus supra nodosis et paulo infra suturam constrictis, in medio angulatis instructi, inter costas læves, ultimus penultimo vix latior, costis versus labrum tenue sensim evanidis, tuberculis infra suturam solum manentibus, circa basin liris paucis instructus; apertura parva, longit. totius $\frac{1}{3}$ subæquans; columella infra rectiuscula, callo lævi tenui induta, antice callo spirali intrante instructa.

Longit. 12 millim., diam. 7; apertura 4 longa, 3 lata.

Hab. Off Colombo, 597 fath.; also off Kistna coast, 753 fath.

The name *diluta* has reference to the absence of colour-markings.

18. *Columbella (Mitrella) supraplicata*.

Testa ovato-fusiformis, pallide roseo-fuscescens, nitida; anfractus normales 7?, leviter convexiusculi, superiores quatuor plicis arcuatis tenuibus obliquis instructi, inferiores 2-3 haud plicati, lineis incrementi tenuissimis striisque spiralibus tenuibus sculpti, ultimus antice oblique sulcatus; apertura angusta, concolor, longit. totius $\frac{1}{2}$ haud æquans; labrum arcuatum, extra incrassatum, intus liris brevibus albidis circiter duodecim armatum; columella obliqua, curvata, callo crassiusculo induta, intus tuberculis 2-3 munita; canalis anterior brevis, obliquus.

Longit. 13 millim., diam. 5; apertura 5 longa, 2 lata.

Hab. Station 232, off Travancore coast, in 430 fath.

A single specimen. This species in some respects resembles *C. Pacei**, but differs in its somewhat more robust form, in colour, the presence of longitudinal riblets or plicæ upon the upper volutions, the thicker ridge-like callus upon the columella, and the somewhat less pronounced labral varix. The spire is less tapering and the whorls are not so turreted and have not the upper edge margined by a spiral groove.

19. *Coralliophila indica*.

Testa breviter fusiformis, alba, costis longitudinalibus circiter decem et liris transversis squamosissimis (squamis supra costas productis) instructa; anfractus normales quatuor, supra medium angulati, superne oblique tubulati, infra leviter convexi, squamis supra costas ad angulum cæteris longioribus sursum erectis, ultimus infra medium contractus, antice breviter caudatus et rimatus; apertura piriformis, antice canaliculata, cum canali longit. totius $\frac{1}{2}$ paulo superans; columella rectiuscula, callo

* Ann. & Mag. Nat. Hist. 1895, vol. xvi. p. 5, pl. i. fig. 7.

tenui labro juncto induta; labrum intus leviter incrassatum et liratum; canalis anterior obliquus, recurvus.
Longit. 28 millim., diam. 14; apertura cum canali 17 longa, intus 7 lata.

Hab. Station 232, off South India, 430 fath.

In this very pretty species the transverse ridges are covered with close-set scales, those upon the longitudinal costæ being longer than the rest and giving to the ribs a frilled appearance. The ridges are alternately large and slender, being about three in number above the angle and four below. Upon the body-whorl there is a broad ridge at the base, with very large scales, which forms the rimation. Only in adult examples is the labrum thickened and lirate within, the liræ being rather inconspicuous and eight or nine in number. Reeve's figure of *Murex squamulosus* (Con. Icon. iii. fig. 184) very closely represents this species; indeed the two forms are scarcely separable.

20. *Cancellaria cretacea*.

Testa ovata, vix rimata, oblique plicata et spiraliter confertim lirata, liris supra et inter plicas continuis, sordide albida, cretacea; anfractus circiter 5, convexi, sutura profunda sejuncti, celeriter accrescentes, ultimus magnus, plicis 13 obliquis mediocriter validis instructus; apertura albida, ovata, antice haud canaliculata, longit. totius $\frac{1}{2}$ superans; labrum mediocriter tenue, intus liris circiter decem intransitibus munitum; columella callo reflexo, superne labro juncto, induta, triplicata, suprema aliis paulo validiore.

Longit. 25 millim., diam. maj. 19; apertura 14 longa, 10 lata.

Hab. Station 229, off Travancore coast, in 360 fath.

Remarkable on account of the absence of an anterior canal and of colour.

21. *Ancilla leucospira*.

Testa angusta, cylindræa, superne acuminata, alba, circa medium anfractus ultimi zona lata pallide olivacea cincta; spira convexe conoidea, callo albo induta; anfractus 5, planiusculi, sutura vix conspicua sejuncti, primus corneus, convexus, ultimus elongatus, cylindricus, lineis incrementi tenuissimis sculptus, striisque transversis minute decussatus; apertura angusta, superne acuta, alba; columella callo tenui induta, inferne plicis 4-5 obliquis instructa; labrum intus paulo incrassatum, ad marginem acutum, superne subsinuatum.

Longit. 13 millim., diam. 5; apertura $6\frac{1}{3}$ longa, 2 lata.

Hab. Station 240, lat. $11^{\circ} 32'$ N., long. $92^{\circ} 46'$ E., off Andaman Islands, 194 fath.

The colour-band on the body-whorl upon close examination is seen to be longitudinally streaked.

22. *Ancilla glans*.

Testa gracilis, acuminato-ovata, grisea, supra callo rufo-fuscescente induta, circa basin rufescens; spira acuminata, ad apicem submamillata; anfractus 8, planiusculi, sutura callo plerumque obscurata sejuncti, ultimus elongatus, convexiusculus, longitudinaliter tenuiter striatus; apertura angusta, longit. totius $\frac{4}{7}$ adæquans; labrum tenue, antice ad basin leviter incrassatum, supra prope suturam haud profunde sinuatum; columella inferne alba, reflexa, crassa, oblique sulcata.

Longit. 34 millim., diam. 12; apertura 20 longa, 5 lata.

Hab. Station 233, off Andaman Islands, 185 fath.

A very distinct species on account of its slender form, recalling somewhat that of a narrow pointed acorn.

23. *Scalaria subcasta*.

Testa elongata, gracilis, alba, imperforata; anfractus normales decem convexi, sutura obliqua profunda sejuncti, lamellis numeros tenuibus acutis reflexis, superne prope suturam productis vel subspinosi instructi, inter lamellas transversim tenuissime striati; apertura subcircularis; peristoma expansum, reflexum, antice haud profunde subsinuatum.

Longit. 22 millim., diam. 7; apertura intus 4 longa.

Hab. Station 232, off Travancore coast, 430 fath.

Closely related to *S. casta*, A. Adams, from Japan, but with more slowly increasing whorls, more numerous lamellæ, finer spiral striæ, &c. The lamellæ are closer together upon the upper than upon the last two whorls, numbering about twenty-four upon the former and sixteen upon the latter. One example.

24. *Scalaria bengalensis*.

Testa subulata, turrita, imperforata, alba; anfractus perconvexi, sensim accrescentes, sutura obliqua sejuncti, lamellis numeros tenuissimis leviter obliquis et reflexis instructi, in interstitiis spiraliter striati; peristoma paulo incrassatum, expansum, et reflexum.

Longit. 30 millim., diam. 11; apertura intus 6 longa.

Hab. Station 229, off Travancore coast, in 360 fath.

From some broken fragments it is evident that this species attains larger dimensions than those here given of a specimen consisting of twelve whorls. It is rather less slender than *S. subcasta* and the lamellæ become more numerous instead of fewer as the shell increases. The spiral striæ are a little coarser in the present species.

25. *Astralium bathyrhaphe*.

Testa imperforata, turbinata, lilacea, seriebus granulorum ornata, ad suturam late et profunde canaliculata; spira conica, ad apicem alba, obtusa, planata; anfractus 9, apicales quinque supra planulati, cæteri ad latera declives, plani, lineis incrementi tenuibus obliquis sculpti, supra ad suturam late et profunde canaliculati, seriebus granulorum 4-5 (quarum suprema maxima, infima squamata) cincti, ultimus convexus, infra seriem squamatam ad peripheriam sitam, seriebus granulorum 9-10 pallidiorum ornatus, inter granula purpureo punctatus; apertura irregulariter rotundata, intus lineis intrantibus quasi sulcata; labrum leviter expansum; columella incrassata, callo expanso labro juncto induta.

Diam. maj. 34 millim., min. 29; alt. 33. Operculum rotunde ovatum, convexum, crassum, album, olivaceo tinctum, fere læve, concentrice obsolete sulcatum.

Hab. Station 218, N. Maldivé Atoll, in 210 fath.

This species, of which only a single specimen was obtained, is most remarkable on account of the deep broad canaliculation beneath the suture. The periphery, instead of being marked by a row of granules, is formed of a squamose keel which is spirally irregularly striated. It ascends the spire above the sutural furrow, and between it and the suture there is a series of very small white granules. Of the rows of granules upon the lower half of the body-whorl, the third from the periphery is a little larger than the first and second and much larger than those below. Both above and below this third row a few spiral elevated lines are noticeable. The aperture, although quite smooth within, has the appearance of being sulcated, the pseudo-sulci corresponding to the rows of granules.

26. *Turbo (Cantrainea?) incoloratus*.

Testa parva, turbinata, imperforata, alba; anfractus quinque, celeriter accrescentes, convexiusculi, superiores liris spiralibus 3-4 cincti, ultimus et penult. fere læves, supra prope suturam oblique nodose plicati, lineisque incrementi obliquis striisque spiralibus sub-obsoletis sculpti; apertura leviter obliqua, subrotundata, albo-

margaritacea; labrum externum ad marginem acutum, intus incrassatum; columella incrassata, tuberculo obliquo instructa; operculum ignotum.

Longit. 10 millim., diam. maj. 10.

Hab. Station 232, off South India, in 430 fath.

To the naked eye this little species has an almost smooth appearance. Under the lens, however, the first two or three whorls are seen to be ornamented with three or four spiral rounded ridges, which gradually fade away on the penultimate whorl. The uppermost, however, is indicated upon this and the last volution by an infra-sutural row of oblique nodose plicæ, from which flow the oblique more or less raised lines of growth. Three out of the four specimens examined have the body-whorl rounded at the periphery, but in the fourth there is a slight angulation.

27. *Leptothyra delecta*.

Testa turbinata, imperforata, albida, roseo-tincta, spiraliter lirata, liris incrementi lineis sublamelliformibus obliquis subgranulatis; anfractus $6\frac{1}{2}$, convexi, supra declives, ultimus antice leviter descendens, ad peripheriam rotundatus, infra paulo planatus, liris concentricis circiter 13, superioribus gracilioribus, instructus, in medio callosus, albus; apertura leviter obliqua, irregulariter circularis; columella incrassata, reflexa, obliqua, parum arcuata; labrum tenue.

Diam. maj. 13 millim., min. 11; alt. $14\frac{1}{2}$.

Hab. Station 237, lat. $13^{\circ} 17'$ N., long. $93^{\circ} 7'$ E., off Andaman Islands, 90 fath.

The protoconch, consisting of a whorl and a half, is smooth and scarcely raised above the next volution, so that a rather obtuse apex is thus formed. The body-whorl has about twenty liræ, seven above the middle and the rest beneath, the penultimate and preceding whorl seven. The lines of growth are closer together and less lamellated upon the spire, and the liræ more granose than those upon the body-whorl. The ground-colour is whitish, and this is varied with oblique stripes of a rosy tint, this colour appearing only on the spiral liræ, and not in the interstices between them. Operculum unknown.

The species, allied to *L. amussitata*, Gould, from Japan, is larger, more elevated in the spire, of a different colour, and remarkable for the lamellated lines of growth.

28. *Solariella oxycona*.

Testa anguste umbilicata, elate conica, albida, submargaritacea;

spira acuminata, pagodiformis ; anfractus 10, sensim accrescentes, duo superiores læves, cæteri supra oblique declives, infra medium angulati, ad angulum tuberculis acutis numerosis parvis ornati, ultimus infra leviter convexus, liris quinque tenuibus tuberculatis instructus ; sutura minute denticulata ; apertura obliqua, subquadrata ; peristoma tenue, margine columellari anguste reflexo. Diam. maj. 17 millim., min. 15 ; alt. 21.

Hab. Off Andaman Islands, in 490 fath.

The tubercles are somewhat scale-like or hollowed out on the anterior side, the third lira from the umbilicus exhibiting only a few anteriorly near the aperture. Belonging to the same group as *S. lissocona*, Dall, and a few other species. One specimen only.

29. *Fissurella delicata*.

Testa ovata, conica, elata, tenuiuscula, sordide albida, costis tenuibus inæqualibus numerosis lirisque concentricis confertis supra costas nodulosis tenuiter cancellata ; foramen apicale rotunde ovatum, paulo ante medium situm ; pagina interna albida, ad marginem tenuiter crenulata.

Longit. 28 millim., diam. 18 ; alt. 13.

Hab. Station 232, off Travancore coast, 430 fath.

Allied to *F. densiclathrata*, Reeve, but more elevated, more delicately clathrate, with the apical foramen more central. Also thinner and without colour-rays.

30. *Puncturella (Cranopsis) indica*.

Testa pileiformis, ovata, alba, tenuis, costellis numerosis tenuibus inæqualibus, alternatim majoribus, lirisque concentricis supra costellas granosis concinne cancellata ; apex valde recurvus, terminalis, sed margine longe remotus ; margo basalis crenulatus, ad latera leviter arcuatim elatus ; foramen elongatum, angustum, medianum.

Longit. 6 millim., diam. 4.5 ; alt. 4.

Hab. Station 232, off Travancore coast, 430 fath.

Scarcely separable from the Japanese *P. pelex*. It is, perhaps, a trifle broader, less produced above, has the apex curved over more terminally, the margin slightly arched at the sides, and the dorsal opening narrower.

31. *Tellina travancorica*.

Testa inæquilateralis, compressa, alba, lamellis concentricis tenuissimis confertis ornata, elongata, antice rotundata, postice subacuminata ; margo dorsi anticus subdeclivis, posticus magis obliquus, subrectus, ventralis late curvatus ; valvæ tenues, fere

æquales; umbones parvi, acuti, postmediani; dentes cardinales duo inæquales in utraque valva, laterales valvæ dextræ elongati, tenues, posterior antico remotior; pagina interna albida, zonis concentricis subcæruleis picta, radiatim tenuissime substriata; cicatrix antica elongata, angusta, postica rotundata; sinus pallii perprofundus.

Longit. 44 millim.; diam. 11; alt. 25.

Hab. Station 229, off Travancore coast, in 360 fath.

Thinner and narrower than *T. staurella*; without colour-rays, with more delicate finer concentric sculpture, a less prominent posterior ridge in the right valve, and a shallower groove in the left.

32. *Abra affinis*.

Testa *A. maximæ* simillima, sed minor, convexior, postice minus producta vel minus cuneiformis, lunula latiore præsertim parte valvæ sinistræ, sinuque lineæ pallii antice magis acuto.

Longit. 27 millim.; diam. 9; alt. 17.

Hab. Off Travancore coast, in 498 fath.

The differences between *A. maxima**, Sow., *A. convexior* †, Smith, and the present species are quite appreciable on comparison, although resembling one another in some respects.

33. *Myodora quadrata*.

Testa compressa, paulo inæquilateralis, postice latissime truncata, antice obtuse cuneiformis; margo dorsi posticus declivis, fere rectilinearis, anticus valde descendens, subrectilinearis quoque, ventralis late curvatus; valva dextra mediocriter profunda, solidiuscula, intus conspicue margaritacea, extus concentricè sulcata et lamellata, area postica porca haud profunda ad umbone radiante obscure limitata; sinus pallii latissimus, haud profundus; valva sinistra —?

Longit. $12\frac{1}{2}$ millim.; alt. 11.

Hab. Station 229, off Travancore coast, in 360 fath.; also Station 233, off Andaman Islands, in 185 fath.

Remarkable on account of the very broad truncated posterior end and the very pearly interior. It is not anticipated that the left valve would offer any special features. It is probably flat and more feebly sulcated than the right.

* Ann. & Mag. Nat. Hist. 1894, vol. xiv. p. 169, pl. v. figs. 5, 6.

† Op. cit. 1895, vol. xvi. p. 10, pl. ii. figs. 4, 4 a.

34. *Arca (Barbatia) incerta*.

Testa oblonga, postice latior, valde inæquilateralis, costis numerosis tenuibus sulcisque transversis nodose cancellata, alba, epidermide fuscescente plus minus induta; latus anticum angustum, oblique curvatum, posticum magis obliquum, fere rectum, ventrale in medio subincurvum vel subsinuatum; valvæ mediocriter crassæ, impressione levi ab umbone ad marginem ventris radianti notatæ, intus albæ, obsolete radiatim lineatæ; umbones parvi, acuti, haud contigui, longe antrorsum siti; dentes cardinis utrinque umbonem obliqui, posterioribus paucis elongatis; pagina interna alba, radiatim substriata.

Longit. 23 millim.; diam. 8; alt. 11.

Hab. Station 232, off Travancore coast, in 430 fath.

Allied to *A. scabra*, Poli, and *A. nodulosa*, Müller—indeed, perhaps indistinguishable from the latter.

35. *Lima indica*.

Testa *L. excavatæ* peraffinis, sed minus elongata, striis radiantibus tenuioribus et magis numerosis insculpta.

Longit. 75 millim.; latit. 61; diam. 34.

Hab. Station 232, off Travancore coast, in 430 fath.

Two specimens obtained, one 75 millim. in length, the other 51. In all probability the species attains much larger dimensions, perhaps equalling that of the well-known Norwegian *L. excavata*. There are now three so-called species which are very closely related, namely *L. excavata* (Chemnitz), *L. goliath*, Sowerby, and *L. indica*—indeed they might almost be regarded as varieties of one and the same species. The present form appears to be a trifle less elongate, and the radiating striæ are considerably more numerous and finer. The Japanese *L. goliath* was supposed to be the largest species of the genus, the type specimen having a length of 150 millim. and a width of 110. These dimensions, however, are exceeded in an example of *L. excavata* in the British Museum, which is 170 millim. long and 125 broad.

[To be continued.]



Smith, E. A. 1899. "XXIV.—Natural history notes from H.M. Indian Marine Survey Steamer 'Investigator,' Commander T. H. Heming, R.N.—Series III., No. 1. On Mollusca from the Bay of Bengal and the Arabian Sea." *The Annals and magazine of natural history; zoology, botany, and geology* 4, 237–251.
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