

ledge of the habits of these insects is still in its infancy. The few facts we know are perhaps crude and imperfect; and it is much to be desired that many of the members of this society, who are so well qualified for the task, would turn their serious attention to a branch of natural history where so much that is new and interesting remains to be carefully learned and investigated.

XLIV.—*Diagnoses of new Forms* of Mollusks collected at Cape St. Lucas by Mr. J. Xantus.* By PHILIP P. CARPENTER, B.A., Ph.D.

[Continued from p. 315.]

15. *Nacella peltoides*.

N. testa parva, lævi, cornea, subdiaphana, ancyliformi, apice elevato, valde inæquilaterali, strigis pallide castaneis radiata; intus nitidissima, subaurantia. Long. .14, lat. .11, alt. .05 poll.

= *Nacella*, sp. ind., Maz. Cat. no. 262, p. 202.

16. *Acmaea* (? var.) *atrata*.

A. testa solida, rugosa, conica, apice paulum antrorsum sito; extus costis crebris rotundatis irregularibus, hic et illic majoribus sculpta, haud apicem versus discordanter corrugatis; interstitiis minimis; intus alba, castaneo et nigro varie maculata; margine latiore, nigro tessellato. Long. 1.3, lat. 1.0, alt. .5 poll.

Variat margine nigro-punctato, punctis plerumque bifidis. Variat quoque costis parvis, creberrimis; margine nigro.

Intermediate between "*P. discors*," Phil., and "*P. floccata*," Reeve.

17. *Acmaea strigatella*.

A. testa *A. mesoleucæ* simili, sed minore, haud viridi; striolis minimis, confertissimis, plerumque erosio tenuissime sculpta; albida,

* As this expression appears to have been misunderstood, I beg to state the reason for its adoption. It is no longer believed on all hands that every object in nature belongs to some genus or species sharply defined. As a working naturalist, I find many intermediate forms which are constant in certain characters, and which (for the sake of reference) it is desirable to name. I do not choose to profess certainty where I do not feel it, and have therefore adopted the formula "*A.* (? *b.* var.) *c*"—thus leaving it to the judgment of others, or to the certainty obtained by further research, to decide whether *c* be a variety of *b* or a distinct species. I have found "detail" (not necessarily "portentous") far more useful than those loose descriptions which may include many widely dissimilar forms, my rule always being so to describe that I may recognize the shell at a future time without access to the original specimen. Though I cannot acknowledge the accuracy of some of the statements in Mr. Reeve's letter (p. 440), I do not wish to encumber the valuable pages of the 'Annals' by a discussion of them.—P. P. C.

strigis olivaceo-fuscis, plerumque radiantibus, interdum confluentibus picta; apice sæpius nigro; intus albida, margine satis lato, strigis tessellato. Long. .9, lat. .74, alt. .3 poll.

Variat colore hic et illic aurantiaco tincto: strigis omnino tessellatis.

According to Darwin, this might be regarded as a cross between the northern forms *A. pelta* and *A. patina*, about to change into the Gulf species, *A. mesoleuca*. The dark variety resembles *A. cantharus*, but the very delicate crowded striæ well distinguish it when not abraded.

18. *Glyphis saturnalis*.

G. testa G. inæquali simili, sed minore, latiore, altiore, tenuissime cancellata; striis radiantibus plus minusve propinquis, plus minusve nodulosis; fissura prope trientem longitudinis sita, minima, lineari, medio lobata; intus callositate albida, truncata. Long. .38, lat. .24, alt. .18 poll.

The minute hole resembles the telescopic appearance of Saturn when the rings are reduced to a line.

Subgenus EUCOSMIA*.

Testa solida, nitida, variegata, haud nacrea: apertura et anfractus rotundati: conspicue umbilicata: peritrema vix continuum, haud callosum.

The shells here grouped are like small, round-mouthed, perforated *Phasianellæ*. The animal and operculum of the Cape St. Lucas species are unknown. The *Phasianella striolata*, Maz. Cat. no. 283 *b* (= *Turbo phasianella*, C. B. Ad. Pan. Sh. no. 282), and even the *Lunatia tenuilirata*, Maz. Cat. no. 572, are perhaps congeneric.

19. *Eucosmia variegata*.

E. testa parva, lævi, turbinoidea, nitente, marginibus spiræ valde excurvatis; rosaceo et rufo-fusco varie maculata; anfr. nucleosis regularibus, vertice mamillato; normalibus iv., valde tumentibus, rapide augmentibus, suturis impressis; anfr. ultimo antice producto; basi rotundata; umbilico carinato; apertura vix a pariete indentata; peritremate pene continuo, acuto. Long. .1, long. spir. .05, lat. .07 poll., div. 70°.

Variat interdum rugulis incrementi ornata.

20. *Eucosmia* (? *variegata*, var.) *substriata*.

E. testa E. variegatæ simillima, sed anfr. circa basin et supra spiram (nisi in anfr. nucl. lævibus), interdum tota superficie tenuiter et crebre striatis; striis anfr. penult. circ. x.

21. *Eucosmia punctata*.

E. testa E. variegatæ simili, sed multo majore, multo magis elon-

* Th. εῖ, well; κοσμία, adorned.

gata, angustiore, Phasianelloidea; plerumque fusco creberrime punctata; umbilico parvo. Long. .22, long. spir. .11, lat. .15 poll., div. 50°.

22. *Eucosmia cyclostoma*.

E. testa parva, valde obtusa, lata, regulari, valvatoidea; marginibus spiræ vix excurvatis; pallide cinerea, fusco-olivaceo dense punctata seu maculata; anfr. nucleosis pallidis, mamillatis; normalibus iii., valde tumentibus, suturis valde impressis; apertura vix a pariete indentata; umbilico magno, subspirali. Long. .05, long. spir. .025, lat. .05 poll., div. 90°.

Curiously like a small depressed *Valvata obtusa*, but with the texture of *Phasianella*.

Genus HAPLOCOCHLIAS*.

Testa *Colloniam* simulans, sed haud margaritacea: apertura circularis, varicosa: columella haud callosa.

The animal and operculum are unknown. Its affinities may be with *Ethalia*.

23. *Haplocochlias cyclophoreus*.

H. testa compacta, parva, solidiore; albida, seu pallide aurantiaca; anfr. v., rapide augmentibus, suturis impressis; tota superficie minutissime spiraliter striolata, nitida; apertura rotundata; peritremate continuo, incrassato, extus varicoso; labio distincto; axi t. jun. umbilicata, adultæ lacunata. Long. .19, long. spir. .06, lat. .2 poll., div. 100°.

When laid on its base, this shell resembles *Helicina*; but the mouth is more like *Cyclophorus*. The young shell is semi-transparent, and resembles a *Vitrinella* with thickened lip.

24. *Narica aperta*.

N. testa parva, inflata, tenui, alba; anfr. nucl. ?....; norm. rapide augmentibus, lirulis crebris spiralibus, in spira hic et illic majoribus, a striolis creberrimis radiantibus minutissime decussatis; suturis valde impressis; apertura subcirculari; umbilico maximo, carinato, anfractus intus monstrante. Long. .28, long. spir. .08, lat. .3 poll., div. 110°.

25. *Fossarus parcipictus*.

F. testa parva, solidiore, spira plus minusve elevata; albida, rufo-fusco varie maculata; carinulis spiralibus acutioribus, quarum circ. vi. majores, striolisque crebris cincta; anfr. ultimo tumidiore; labro acuto, haud intus incrassato; umbilico satis magno, ad marginem carinato: operculo normali. Long. .24, long. spir. .06, lat. .2 poll., div. 90°.

The few specimens found are very variable in outline.

* *Th. ἀπλούς*, unadorned; *κοχλίας*, snail.

26. *Fossarus purus*.

F. testa F. angulato simili, sed alba, subdiaphana; anfr. nucl. ii., fuscis, ut in *F. tuberoso* cancellatis; norm. ii. et dimidio, altis, valde tumentibus, carinatis; carinis iv., validissimis, acutissimis, quarum ii. in spira monstrantur; carinulis aliis antice et postice plus minusve expressis; tota superficie minute spiraliter striata; carinularum basalium interstitiis subobsolete decussatis; apertura late semilunata; labro a carinis valde indentato; labio recto, angusto; umbilico magno, carinato; operculo fusco, valde paucispirali, minutissime ruguloso, nucleo antico. Long. .08, long. spir. .03, lat. .08 poll., div. 90°.

27. *Litorina pullata*.

L. testa parva, solidiore, luctuosa; spira satis exserta; nigrescente, seu livido-fusco tincta, lineis spiralibus exilissimis pallidioribus ornata; interdum obscure tessellata; anfr. v., subplanatis, suturis parum impressis; sublævi, striolis spiralibus tenuiter insculpta; columella intus incrassata; pariete haud excavato. Long. .4, long. spir. .18, lat. .29 poll., div. 60°.

= *Litorina*, sp. ind., Maz. Cat. no. 399, p. 350.

28. *Litorina (Philippii, var.) penicillata*.

L. Ph. testa parva, lineis radiantibus, variantibus, delicatulis, rarius ziczacformibus, et cingulis duobus spiralibus, quorum unum in spira monstratur, elegantissime penicillata. Long. .33, long. spir. .14, lat. .2 poll., div. 50°.

Closely resembling the West-Indian *L. ziczac*, var. *lineata*, D'Orb. Intermediate specimens, however, clearly connect it with the common Mazatlan form.

29. *Rissoa albolirata*.

R. testa parva, alba, crystallina, normali; marginibus spiræ undatis; anfr. nucl. iii., lævibus, mamillatis; norm. iv., medio subconvexis, postice supra suturas planatis; basi subplanata, effusa, haud umbilicata; lirulis spiralibus crebris, obtusis, quarum circ. x. in spira monstrantur; apertura subovata, peritremate continuo; labro arcuato, vix antice et postice sinuato, calloso; labio valido. Long. .1, long. spir. .08, lat. .04 poll., div. 25°.

30. *Fenella crystallina*.

F. testa alba, subdiaphana, turrita, rudiore; marginibus spiræ rectis, parum divergentibus; anfr. nucl. ?... (decollatis); norm. v., valde rotundatis, suturis impressis; costis radiantibus circ. xvi., valde rotundatis, haud extantibus, interstitiis latis; striis spiralibus regularibus, in anfr. penult. xvi.; apertura rotundata; basi rotundata; peritremate continuo; labro extus varicoso; labio calloso. Long. .14, long. spir. .11, lat. .05 poll., div. 20°.

31. ? *Hydrobia compacta*.

?*H.* testa lævi, curta, compacta, latiore; marginibus spiræ vix excurvatis; anfr. nucl. normalibus, apice mamillato; norm. iv., tumidis, suturis distinctis; spira curtior; basi rotundata; apertura subovata; peritremate continuo; labio definito. Long. .04, long. spir. .02, lat. .03 poll., div. 70°.

This unique shell may be a *Barleeia*.

32. *Hyala rotundata*.

H. testa (quoad genus) magna, tenui, alba, diaphana; anfr. nucl. normalibus, apice mamillato; norm. iv., globosis, rapide augmentibus, suturis valde impressis; basi rotundata; apertura subrotundata, ad suturam subangulata; peritremate continuo; labio a pariete separato, rimulam umbilicalem formante; columella valde arcuata. Long. .18, long. spir. .09, lat. .1 poll., div. 40°.

A unique shell, resembling a marine *Bithinia*.

33. ? *Diala electrina*.

?*D.* testa subdiaphana, rufo-cornea, nitida; marginibus spiræ parum excurvatis; vertice nucleoso, helicoideo; anfr. iii., tumidis, suturis haud impressis, apice magno mamillato; anfr. norm. iii., subplanatis, suturis distinctis; sculptura haud expressa; tota superficie costulis obscuris, latis, spiralibus, quarum vi.—viii. in spira monstrantur, et iii.—v. circa basim rotundatam, interdum obsoletis, cincta; costulis radiantibus circ. xviii., subobsoletis; apertura regulariter ovata, ad suturam angulata, peritremate continuo; basi haud umbilicata; columella regulariter arcuata. Long. .09, long. spir. .07, lat. .03 poll., div. 30°.

34. *Acirsa Menesthoides*.

A. testa nitida, turrita, majore, solidiore, pallide fusca; anfr. nucl. lævibus; norm. vi., subplanatis, suturis distinctis; lineis crebris spiralibus insculpta, quarum circ. viii. in spira monstrantur; testa adolescente lirulis radiantibus obsoletis decussata; apertura subovali; columella solida, imperforata. Long. .42, long. spir. .3, lat. .16 poll., div. 25°.

35. *Cythnia asteriaphila*.

C. testa *C. tumentis* simillima, sed umbilico minore, haud carinato; tenuissima, diaphana; anfr. iv., tumidis; vert. nucl. normali, haud stylineo, apice mamillato; operculo tenuissimo, elementis concentricis, nucleo submediano sinistrorsum sito. Long. .03, long. spir. .015, lat. .025 poll., div. 60°.

A solitary specimen was found by Dr. Stimpson, imbedded in a star-fish, like *Stylina*; from which genus the vertex and operculum distinguish it.

36. *Bittium nitens*.

B. testa regulari, rufo-fusca, hic et illic pallida, maxime nitente;

anfr. nucl. iii., lævibus, tumidis, apice submamillato, subdeclivi; norm. vi., tumidis, suturis impressis; costis radiantibus circ. xiv., haud contiguīs, angustis, interstitiis undatis; costulis rotundatis, spiralibus, in spira iv., quarum postica multo minor, supercurrentibus, ad intersectiones subnodosis; costulis circa basim subrotundatam iv., haud decussatis; apertura subquadrata; columella haud truncata, obtuse angulata; labro acuto, a costulis indentato; labio inconspicuo. Long. .21, long. spir. .16, lat. .06 poll., div. 20°.

[To be continued.]

XLV.—*Histological Researches on the Formation, Development, and Structure of the Vegetable Cell.* By Prof. H. KARSTEN.

[Continued from p. 435.]

§ VII.

The Development of Pollen.—Historical notes.—Origin of pollen, in *Althæa rosea*, from endogenous free cells with prolongations inwards of the thickened walls of the mother cell.—Development of aculei on the surface of pollen-grains.

THERE is scarcely a vegetable tissue whose development has been more frequently investigated than pollen. Adolphe Brongniart (*Annales des Sciences Naturelles*, 1827; *Génération et Développement de l'Embryon*, 1827) was the first to observe that, in the congeries of cells in the anthers of *Cobæa*, the pollen-cells originated in fours. Mirbel made a more special study of the development of the pollen of *Cucurbita* (*Recherches sur la Marchantia*, 1833). He found that the granular contents of the mother cell of the pollen became divided into four portions by the inward growth of ridges from the sides of the cell towards the centre, and that subsequently the outer surface of each segment became hardened so as to form a smooth skin, within which a second membrane was in process of time produced. The very similar construction of spores and their development occupied the attention of Mohl the same year (*Entwicklung und Bau der Sporen der kryptogam. Gew., Flora*, 1833). The first appearance of the spores of *Riccia* and *Anthoceros* was recognized by Mohl under the form of four small collections of granules, each of which became enveloped by a delicate membrane. These four masses contained in each cell assumed by mutual pressure a three-sided, obtusely pyramidal form, whilst their fourth side, lying in contact with the parent cell-wall, acquired a convex outline.

Subsequently, Nägeli (*Zur Entwicklungsgeschichte des Pollens*, 1842) having extended and tested the application of Schleiden's theory of cell-formation to the development of the pollen-cell, and Unger (*Ueber merismatische Zellenbildung bei*



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