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SYSTEMATIC NOTES ON AUSTRALIAN LAND SHELLS.

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Museum routine necessitates the determination of any molluscan material submitted, and many land shells and slugs are included. These have been a continual source of trouble, as Australian land shells have not been systematically studied recently. My predecessor, Mr. Charles Hedley, began his conchological career by the examination of molluscous animals, but at that time with very little knowledge of their shells and their importance. He soon found that the latter must be given much more value than had been anticipated, and began accumulating systematic data for the elucidation of our land molluscan fauna. It was a long and tedious task, and, unfortunately, when his goal was in sight his work was terminated by his death. The preparation of an illustrated monographic account was left as a legacy to me, and I hope to complete the work in the near future.

Unfortunately in the past it has been traditional to depreciate or entirely discount shell features, and utilize imperfectly understood anatomical features in order to group land mollusca. Modern malacologists now agree that shells, when correctly studied, are of great value, and that until the shell is accurately distinguished the anatomical data cannot be properly valuated. It is now necessary to separate a large number of small groups in which the shells may be ranged, and then, from a study of these restricted series, animal characters may be carefully examined and a sound classification formulated.

There are many pitfalls in the study of Australian land shells, and it has been a difficult matter to unravel the literary history of many of the species. The data collected will be published in full at the earliest opportunity, the present essay being merely an attempt to clear some of the difficulties out of the way. The most important works of reference are the following:—Pilsbry, Manual of Conchology, series 2, vol. ix; Cox's Monograph of Australian Land Shells; May's Mollusca of Tasmania and Illustrated Index; Hedley's Essays in the Records of the Australian Museum and in the Proceedings of the Linnean Society of New South Wales; Hedley's West Australian List; Tate's Report of the Horn Scientific Expedition; Cox and Hedley's Victorian Index, and now Gabriel's Catalogue of Victorian Land Shells. Other minor papers are referred to in the following pages.

Genus **Helicarion.**[1]

All Australian Vitrinid molluscs have been classed in this genus, and its range has now been extended into other countries, so that the name *Helicarion* has become almost as meaningless in systematic usage as *Vitrina*. Fortunately the type of Helicarion is the Tasmanian species *H. cuvieri* Ferussac,[2] so that in this respect we are on sound ground. From this species the magnificent Queensland species *H. superba* Cox[3] differs in the tenuity of the shell, the coiling, and the large size, and is here separated with the subgeneric name *Fastosarion*.

[1] Ferussac.—Tabl. Syst. Fam. Limac. 1821, p. 20 (16), June.
[2] Ferussac.—Tabl. Syst. Fam. Limac. 1821, p. 20 (16), pl. ix, fig. 8, June: Austr.
[3] Cox.—Proc. Zool. Soc. (Lond.), 1871, p. 54 (June 12); Port Denison, Q'ld.

Anatomical investigation may show that a greater distinction is indicated, as very slight shell differentiation has been accompanied by great anatomical variation in this group. Thus from North Queensland Odhner[4] has named *Helicarion bullacea,* and has reported somewhat different animal characters, though the only superficial shell feature is the closer coiling, recalling more a Zonitoid. Subgeneric rank may, for the present, be allowed to this species, with the new name *Vercularion.* It will be remembered that Smith,[5] cataloguing the land shells of West Australia, observed that Vitrinids were absent from that part of our continent, but was corrected by Hedley,[6] who drew his attention to the species *Helicarion thomsoni* described by Ancey.[7] This species, which, theoretically, might be most closely related to the Tasmanian *H. cuvieri* Ferussac, differs from that species in its globose form, small mouth, and golden coloration, and may be proved very different anatomically, but here is only separated subgenerically as *Luinarion.*

Genus **Hedleyella.**[8]

The two magnificent shells, formerly known as *Panda,*[9] were lumped into one species by Hedley early in his conchological studies, but later research suggested revision. Not only are there two species, *falconeri* Gray[10] and *maconelli* Reeve,[11] but there are geographical races to be distinguished. Thus many years ago Cox noted that the most southern shells were much smaller, and gave a MS. name to these shells coming from the foot of Mount Royal, north-east of Singleton, N.S. Wales. In addition to their smaller size they are more conical, the umbilicus narrower, the mouth less expanded than specimens from the Richmond River, N.S. Wales, which are very large, the mouth much expanded, the umbilicus correspondingly broader; the latter may be named *H. falconeri jacksoniana* nov., the type being a shell from near Booyong, measuring 90 mm. in width by 80 mm. in height, the coloration generally being darker than that of the typical series.

South Queensland shells approximate more in size to the typical form and show no signs of intergrading with *maconelli* Reeve, the elevated non-umbilicate species described from Brisbane, Moreton Bay, with which it was lumped by Hedley.[12] The South Queensland form of *falconeri* is reduced in size almost to that of the extreme southern form, but it is more elevated, with the mouth not so patulous, measuring 60 mm. in height and 55 mm. in breadth, the colouration being generally paler than that of typical shells. The Queensland subspecies may be named *H. falconeri imitator* subsp. nov. As no definite type locality was assigned to the species, the Clarence River is here arbitrarily selected. Hedley introduced two varietal names *azonata* and *tigris* for his conception of variations of the complex species (*falconeri* + *maconelli*) and as they were for simple colour variations, their type localities are here fixed as that of typical *falconeri,* and they will cause no further concern. In the same place Hedley gave an account of the anatomy of *Bulimus atomatus* Gray,[13] and concluded that it should be placed in *Panda* = *Hedleyella.* As the features he depended upon he also found present in

[4] Odhner.—Kungl. Sv. Vet. Akad. Handl. 52, 1917, p. 87, pl. 3, figs. 97-98, text fig. 4 (Sept. 19): Cedar Creek, N. Q'ld.
[5] Smith.—Proc. Malac. Soc. (Lond.), I, 1894, p. 85 (June).
[6] Hedley.—Proc. Malac. Soc. (Lond.), I, 1895, pp. 259-60 (July).
[7] Ancey.—Le Naturaliste, 1899, p. 19: Geographe Bay, South W.A.
[8] Iredale.—Proc. Malac. Soc. (Lond.), xi, 1914, p. 174, Sept.
[9] Albers.—Die Heliceen, 2nd ed., 1860, p. 149.
[10] Gray.—Proc. Zool. Soc. (Lond.), 1834, p. 63 (Nov. 25): New Holland.
[11] Reeve.—Proc. Zool. Soc. (Lond.), 1851, p. 98, pl. xii, June 29, 1853: Brisbane, Qld.
[12] Hedley.—Rec. Austr. Mus., ii, 1892, pp. 26-31 (Aug.).
[13] Gray.—Proc. Zool. Soc. (Lond.), 1834, p. 64, Nov. 25: near Fort (?) Macquarie, N.S.W.

such diverse groups as *Pedinogyra*[14] and *Caryodes,* and he was not averse to including therewith *Anoglypta,* it is obvious that he was not dealing with a feature of merely generic value. Hedley also named two varieties of this species, *elongata* and *azonata,* the latter being nullified by his prior *azonata* above noted. The type locality of *atomatus* is the same as the type locality of *falconeri,* and this is named as the type locality of the two variations named by Hedley. At the same time Hedley discounted the specific value of *kershawi* Brazier,[15] described from the Snowy River, Gippsland, Victoria. In this he has been followed by Gabriel,[16] but on account of the great hiatus in their distribution, and the differences when series are contrasted, I would allow specific nomination. The shells are elongate, quite unlike *Hedleyella* in form, with no umbilicus at any stage of life, the columella almost truncate, the mouth narrow, the apex not planate, so that I propose the new generic name *Pygmipanda, atomatus* Gray being named as type. It may be noted that, although *Hedleyella maconelli* Reeve appears to be non-umbilicate when adult, the juvenile shows a narrow umbilicus exactly like that of the widely umbilicated adult *falconeri* Gray. Still more different is the exquisite little shell (little in comparison with *Hedleyella*) named *Bulimus larreyi* by Brazier,[17] which Hedley also placed in *Panda* without much comment. This species has a delicate thin texture, the mouth rather expansive but not umbilicate, and a major difference can be seen in the exsert incurved tip, quite unlike that of the planate protoconch of *Hedleyella.* It is therefore designated as the type of the new genus *Brazieresta* in honour of that great conchological collector, John Brazier, who discovered the species.

One of the outstanding discoveries of recent years was that of *Panda whitei* Hedley.[18] S. W. Jackson found this delightful little shell near Mackay, Queensland, and Hedley, instead of giving it at once a new generic name, placed it in *Panda* on account of its probable relationship. The shell is very small and thin, somewhat ear-shaped, with a short spire and a patulous aperture. The new generic name *Pandofella* is here provided for it, and thus the group *Hedleyella* is made available for correct appreciation. When *Panda* was used the distribution would have read "From Snowy River, Victoria, to Mackay, Queensland," which gave quite an erroneous impression of the facts. True *Panda, i.e., Hedleyella,* ranges only from northern New South Wales into southern Queensland, while *Pandofella* is only found north of that range, and *Pygmipanda* only found southwards, the curious *Brazieresta* being restricted to northern New South Wales, in the Bellengen River district.

Genus **Paryphanta.**[19]

This Neozelanic genus has been utilized for the reception of certain Australian shells, found in Victoria and Tasmania. Superficially there are conchological characters that will enable distinction, and their anatomy has been investigated by both Neozelanic and Australian students, and many differential features recorded. As land snails are commonly cited in connection with zoogeographical problems it causes confusion if the generic names be loosely applied. Recent study by Powell[20] has brought to light many species and subspecies of *Paryphanta* in New Zealand, and even there generic distinction has been

[14] Albers.—Die Heliceen, 2 ed., 1860, p. 162.
[15] Brazier.—Proc. Zool. Soc. (Lond.), 1871, p. 641, May 2, 1872: Gippsland, Vic.
[16] Gabriel.—Proc. Roy. Soc. Vict., xliii (n.s.), 1930, p. 66, pl. iii, figs. 1-8; Sept. 11.
[17] Brazier.—Proc. Zool. Soc. (Lond.), 1871, p. 321, Aug. 16: Bellengen River, N.S.W.
[18] Hedley.—Proc. Linn. Soc. N.S.W., xxxvii, 1912, p. 254, pl. iv, figs. 1-4, Dec. 13: near Mackay, Qld.
[19] Albers.—Die Heliceen, 1st ed., 1850, p. 129.
[20] Powell.—Rec. Auckl. Mus. i, 1930, pp. 17-56.

proposed. The Victorian species, *Nanina atramentaria* Shuttleworth,[21] has only a small umbilicus and is separable from the Neozelanic type of *Paryphanta, H. busbyi* Gray,[22] by its size, shape, and sculpture, the latter consisting of concentric wrinkles on the upper surface, the lower being smooth. While tentatively allowing the grouping of this species under *Paryphanta,* the differences require the introduction of a new subgeneric name, *Victaphanta* for the Victorian species, the second Victorian species, *P. compacta* Cox and Hedley[23] being placed with it.

The Tasmanian species recently allotted to *Paryphanta* was described as *Vitrina milligani* by Pfeiffer,[24] and its conchological features approximate much more closely to those of *Helicarion* than they do to any group near *Paryphanta.* The shell is thin, scarcely calcareous, of few whorls, the last one very large with an open mouth, and the surface shining black. Were it not for this last feature, which is in disaccord with all Vitrinid shells, it would scarcely have been separated. Nevertheless anatomical research indicated its closer relationship with the group *Paryphanta,* though Murdoch,[25] who studied the anatomical features, pointed out certain important differences. The new generic name *Melavitrina* is here proposed for *V. milligani* Pfeiffer.

A curious reference to this genus by Petterd and Hedley[26] is that of *Helix dyeri* Petterd,[27] a very small shell of three millimetres only in major diameter. It has been well figured by these writers, but there seems little justification in attaching this minute shell to this group, and the new generic name *Prolesophanta* is proposed. The spire is a little elevated, the apical whorls roughened, the surface sculpture consists of fine radial growth lines only, the mouth is somewhat oblique, and there is no umbilicus.

Genus **Bothriembryon.**

This generic name was introduced by Pilsbry[28] to replace *Liparus,*[29] which had been incorrectly used for West Australian Bulimuloid snails. In his monographic account Pilsbry[30] pointed out that the nepionic sculpture, which he relied upon and indicated as the most valuable of shell features, varied appreciably in this series. Moreover he gave a key recording this variation as follows:—

Apex with close, waved, subvertical wrinkles—*gunni, onslowi.*
Apex with spaced subvertical wrinkles—*spenceri.*
Apex with wrinkles anastomising to form a network—*gratwicki.*
Apex with regular pitting—*kingi, dux.*

The lastnamed was the character of the type upon which *Bothriembryon* was based. Pilsbry did not emphasize the fact that the above noted variation coincided with geographical separation, which consequently increased its group value greatly. As a beginning we may grant them subgeneric value, though in

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[21] Shuttleworth.—Mitth. Nat. Gesell. Berne, p. 194, 1853: Port Phillip, Vic.
[22] Gray.—Ann. Mag. Nat. Hist. (1), vi, 1840, p. 317.
[23] Cox and Hedley.—Mem. Nat. Mus. Melb., No. 4, 1912, p. 8, pl. i, figs. 3-5, Feb.: Otway Ranges, Vic.
[24] Pfeiffer.—Proc. Zool. Soc. (Lond.), 1852, p. 56, March 22, 1854: Macquarie Harb., Tas.
[25] Murdoch.—Trans. New Zeal. Inst., xxxviii. 1906, pp. 313-316, pl. xx.
[26] Petterd and Hedley.—Rec. Austr. Mus., vii, 1909, p. 287, pl. lxxxvi, figs. 38-40, Aug. 30.
[27] Petterd.—Mon. Land Shells, Tasm., 1879, p. 40, Apl.: Launceston, Tas.
[28] Pilsbry.—Nautilus, viii, 1894, p. 36, July.
[29] Albers.—Die Heliceen, 1st ed., 1850, p. 172.
[30] Pilsbry.—Man. Conch. (2), xiii, 1900, pp. 1-19.

some cases this will doubtless be enhanced later. The true *Bothriembryon* is restricted to South-west Australia, and new names are introduced thus:

Tasmanembryon: type *tasmanicus* Pfeiffer[31]—Tasmania.
Hartogembryon: type *onslowi* Cox[32]—Shark's Bay, West Australia.
Larapintembryon: type *spenceri* Tate[33]—Central Australia.
Satagembryon: type *gratwicki* Cox[34]—East of West Australia.

In connection with these species the shells also show distinctive characters, and it is necessary to criticise these very closely in order to produce definite valuable data. Thus the Tasmanian shell has been called *gunnii* Sowerby,[35] a name given to an internal cast of a fossil which was found with another land shell which is certainly not living. The exact relationship of the fossil with the living species is therefore problematical in this case, and consequently Pfeiffer's name *tasmanicus* is preferred. It is further possible that the Tasmanian species is more nearly related to *Hedleyella,* or even *Placostylus* (s.l.), than to *Bothriembryon* typical, though it must be remembered that Hedley suggested that *Bothriembryon* and *Placostylus* were related. In the lastnamed group we have solid earth-living forms and thin, tenuous, tree living species. A curious item is the fact that May,[36] following Petterd and Hedley, give as the distribution East Tasmania only, though Legrand[37] definitely stated that he had received it from West Tasmania, and the statement has, as far as I can trace, never been denied.

Genus **Papuina.**

This large extra-limital group is represented in Australia by only a few species, each of which offers discordant features, suggesting that they are not closely related, but rather that they represent species derived from different groups. Hedley forty years ago also came to the above conclusion, but had not reviewed the forms subsequently. Mollendorff,[38] when dealing with New Guinea species, proposed to use *Insularia* Tapparone-Canefri[39] as well as *Papuina,*[40] but both were introduced with the same type, *lituus* Lesson, so the former cannot be maintained. At the same time Mollendorff suggested the name *Rhynchotrochus* for species of the *tayloriana* group, and therein appears to be included the Australian *H. macgillivrayi* Forbes,[41] but no other local species. Superficially *Helix bidwilli* Pfeiffer[42] recalls this group, but the shorter shell with more rounded whorls and the more open mouth, with only slight contraction of the outer lip, easily distinguishes it, and the subgeneric name *Papuexul* is proposed for Pfeiffer's species. There is a series of shells with a more elongate whorling and the mouth still more open with scarcely any contraction of the outer lip, and this is represented in Australian waters by *H. poiretiana* Reeve[43] and *Papuina nuensis* Hedley.[44] There does not appear to be any differential name available, so *Noctepuna* is here given, the Reevean species being named as type.

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[31] Pfeiffer.—Proc. Zool. Soc. (Lond.), 1851, p. 260, Dec. 7, 1853: Van Diemen's Land.
[32] Cox.—Cat. Austr. Land Shells, 1864, p. 24: Dirk Hartog 1, West Aust.
[33] Tate.—Trans. Roy. Soc. South Austr., xviii, 1894, p. 192, Nov.: Central Austr.
[34] Cox.—Proc. Linn. Soc. N.S.W., xxiv, 1899, p. 435, figs. in text, Dec. 9: East of Israelite Bay, S.W.A.
[35] Sowerby.—Phys. Descr. N.S.W. (Strzelecki), 1845, p. 298, pl. xix, fig. 5 (6): Fossil, Tas.
[36] May.—Illus. Index Tasm. Shells, 1923, pl. xlii, fig. 7.
[37] Legrand—Coll. Mon. Tasm. Land Shells, 1871.
[38] Mollendorff.—Proc. Malac. Soc. (Lond.), i, 1895, p. 237, Mch.
[39] Tapparone-Canefri.—Ann, Mus. Civ. Genov., xix, 1883, pp. 115, 138.
[40] Martens.—Die Heliceen (Albers), 2nd ed., 1860, pp. xiv, 166.
[41] Forbes.—Narr. Voy. "Rattlesnake" (Macgillivray), ii, 1852, p. 278, pl. iii, fig. 1, Jan. 1: Frankland Is., Q'ld.
[42] Pfeiffer.—Proc. Zool. Soc. (Lond.), 1853, p. 49, July 25, 1854: Wide Bay, Q'ld.
[43] Reeve.—Conch. Icon., vii, 1852, pl. lxxix, sp. 419, Mch.; Port Essington error—Night I., Q'ld.
[44] Hedley.—Rec. Austr. Mus., viii, 1912, p. 154, pl. xlix, figs. 44-45, May 6: Mua I., Torres Strait.

While these three groups may be regarded at present as of subgeneric value only, the Australian group typified by *H. fucata* Pfeiffer[45] must be considered as of generic value, the species being smaller and shorter and having rounded whorls and an open mouth with no constriction. It has a more southern range than the others, and four species may be included, *fucata* Pfeiffer, *conscendens* Cox,[46] *P. mayana* Hedley,[47] and *turneri* Shirley.[48] The genus *Posorites* is proposed, the first-named being the type.

There lives in South Queensland a very curiously coloured shell which Cox named *Bulimus bidwilli.*[49] Hedley referred this to *Papuina,* and, as Pfeiffer had named a shell *Helix bidwilli,* which he also placed in *Papuina,* Hedley renamed Cox's species *Papuina folicola.*[50] A very similar shell lives in New Caledonia, *H. mageni* Gassies, and, if this should prove congeneric (which appears probable), it provides some ground for speculation in connection with zoogeographical problems. In form and colouration these two closely mimic members of the East African genus *Rachis,* so that the generic name *Rachispeculum* is introduced, the type being *Bulimus bidwilli* Cox, that specific name being now revived. The species bears so little resemblance to typical *Papuina* that it need scarcely be differentiated, but it may be noted that it is more elongate, with an entirely different mouth and quite rounded whorls. Almost as peculiar a reference to *Papuina* is the very thin, unicolor, brown shell, with rounded whorls like the preceding, which was described from Yule Island, New Guinea, as *Bulimus macleayi* by Brazier,[51] who reported it as being found in the dry season in crevices of coral rock. According to all other collectors, *Papuina* is essentially a tree-living group, a feature stressed by Hedley in connection with *P. folicola* above noted. Brazier later named an Australian shell *B. beddomei,*[52] but soon discarded it as equivalent to the New Guinea *macleayi.* There are differences, however, and a third form lives near Port Essington.

It may be noted that Kobelt[53] referred the species *macleayi* to *Bothriembryon,* a worse selection than *Papuina,* so the new generic name *Amimopina* is proposed, the Australian *B. beddomei* Brazier being the type.

Genus **Hadra.**

A very large and handsome shell was named *Helix bipartita* by Ferussac,[54] and this was made the type of *Hadra by* Albers.[55] Previously *Thersites* had been introduced by Pfeiffer,[56] and later[57] *H. richmondiana* Reeve[58] was utilised as its type, but the tautonymic type of *Thersites* must be *H. thersites* Broderip. The latter is not an Australian form at all, so *Thersites* must be dismissed from Australian malacological study. Unfortunately Pilsbry[59] used *Thersites* in place

[45] Pfeiffer.—Zeitsch. für Malak., x, 1853, p. 56, Mch.: Wide Bay, Q'ld.
[46] Cox.—Proc. Zool. Soc. (Lond.), 1866, p. 374, Sept. 5: Richmond River, N.S.W.
[47] Hedley.—Rec. Austr. Mus., iii, 1899, p. 151, pl. xxviii, figs. 10-11, Dec. 11: Cooktown, N.Q.
[48] Shirley.—Queensl'd Naturalist, iii, 1921, p. 36, fig. in text, Oct.; National Park, Q'ld.
[49] Cox.—Mon. Austr. Land Shells, p. 72, pl. xiii, fig. 11, 1868: Burnett R., Q'ld.
[50] Hedley.—Nautilus, vii, 1893, p. 73/4, Nov.
[51] Brazier.—Proc. Linn. Soc. N.S.W., i, 1876, p. 108.
[52] Brazier.—Proc. Linn. Soc. N.S.W., i, 1876, p. 127, nom. nud.; iv, 1880, p. 394, May: Torres St.
[53] Kobelt.—Conch. Cab. (Mart and Chemn.), ed. Kuster, Bd. i, Abth. 13, p. 767, *ante* Sept., 1901.
[54] Ferussac.—Hist. Nat. Moll. (1825), pl. 75A, fig. 1; pl. 107A, figs. 1-3.
[55] Albers.—Die Heliceen, 2nd ed. (Martens), 1860, p. 165.
[56] Pfeiffer.—Zeitsch. für Malak., 1855, p. 141.
[57] Martens.—Die Heliceen (Albers), 2nd ed., 1860, p. 157.
[58] Reeve.—Conch. Icon. vii, 1852, pl. lxx, sp. 365, Jan.: Richmond River, N.S.W.
[59] Pilsbry.—Man. Conch. (2), ix, 1894, p. 125.

of *Hadra,* and the usage of such a master has been illegitimately sanctioned without investigation. The true *Hadra* is so unlike the majority of the shells with which the name has been associated that for the present it must be rigidly restricted to close allies of *bipartita* Ferussac, such as *webbi* Pilsbry.[60] In this connection it becomes necessary to fix a type locality for Ferussac's species, and Cooktown seems to be the most likely place. The Cairns shell proves to be *webbi* Pilsbry, and from the Atherton tableland the shells are even more strongly keeled, much less elevated, and apparently a little smaller, and may be distinguished as *Hadra webbi incallida* subsp. nov.

An extraordinary essay on some allies of this species has been published by W. B. Marshall[61] who ignored Pilsbry's *webbi* as a relation, and then introduced many species and subspecies for Torres Straits Island forms. It is somewhat difficult to follow his treatment, as, unacquainted with the collection and variation of the shells, he allows many subspecies from an islet a couple of miles long. An attempt will be made later to reconcile his results with local material, but at first sight it will not be an easy matter.

The beautiful triangular *H. richmondiana* Reeve[62] was wrongly cited as type of *Thersites,* and is therefore here made the type of the new genus *Annakelea.* The shell is very strongly keeled peripherally, and the mouth is contorted a little, and there is no umbilicus showing in the adult, though the immature shell is perforate. Two other species may be included. *H. novaehollandiae* Gray,[63] with its subspecies *H. dupuyana* Pfeiffer,[64] and *H. mitchellae* Cox.[65] This little group is restricted to the northern New South Wales and southern Queensland region coinciding with that of *Hedleyella* as now restricted, while the well known *Pedinogyra* has extended its range a little north but is worthy of note in this connection, these three groups being the largest and most distinctive of Australian snails.

Sphaerospira Morch[66] was introduced for the *Helix fraseri* Gray[67] series, and Fulton,[68] arranging long series of specimens, gave the results as an improvement of the arrangement provided by Pilsbry[69] in his monographic display of the species. Though Pilsbry's association could be amended there is no greater merit in Fulton's. These workers honestly dealt with the material they had available, but I am convinced that no useful classification of Australian land shells can be proposed by extra-limital conchologists however gifted they may be. The varied types of country are unknown to them and they are unfamiliar with local geographical barriers. As one result species are lumped the local range of which demands separation, and on the other hand species have been admitted whose distribution negatives their distinction. Contrary to extra-limital opinion the members of this group have limited ranges and the species and subspecies may be exactly defined when accurately localized series are examined. To particularize,

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[60] Pilsbry.—Proc. Nat. Sci. Philad., 1899, p. 473, fig. in text Jan. 11, 1900; Solomon Is. error—Cairns, Q.
[61] Marshall.—Proc. U.S. Nat. Mus., vol. 72, art. 15, 1927, pp. 1-16, pls. 1-3.
[62] Reeve.—Conch. Icon, vii, 1852, pl. lxx, sp. 365, Jan.: Richmond River, N.S.W.
[63] Gray.—Proc. Zool. Soc. (Lond.), 1834, pl. 7, Nov. 25: near River Macquarie, N.S.W.
[64] Pfeiffer.—Conch. Cab. (Chemnitz), ed. Kuster, ii, pl. 124, figs. 15-16: Bellingen R., N.S.W.
[65] Cox.—Cat. Austr. Land Shells, p. 19, 1864: Clarence River, N.S.W.
[66] Morch.—Journ. de Conch., xv, p. 256, July 1, 1867.
[67] Gray.—Proc. Zool. Soc. (Lond.), 1834, p. 64, Nov. 25: New Holland.
[68] Fulton.—Journ. Malac., xi, 1904, pp. 2-11, pl. i, Apl. 25.
[69] Pilsbry.—Man. Conch. (2), ix, 1894, pp. 132-124.

one species only was determined by Fulton thus: *incei*[70] = *challisi*[71] = *appendiculata*[72] = *thatcheri*[73] = *hanni*[74] = *hilli*[75] = *johnstonei*[76] = *bayensis*[77] = *praetermissi*[78] = var. *yeppoonensis*.[79] As here determined, Fulton did not recognize the type of *incei*, but that is of little matter in this connection: *challisi* is in a different group as is *appendiculata*, of which *thatcheri* is a subspecies, and there are other subspecies to be named: *hanni* may be Fulton's *incei*, while *hilli* and *johnstonei* appear to belong to an entirely different series: *bayensis* is very distinct in every detail, and *multifasciata* Cox, which the latter claimed was the same as *bayensis* Brazier, is a different species again: *praetermissi* was described from Cape Direction, and, if it came from there, cannot be classed near the *incei* group, whose range is far south of that point. However, the small groups indicated, but not named by Fulton, are not natural when the species are locally studied; thus *informis*[80] was separated from *frazeri* (sic) into a different group, but at present they appear to be so closely related that they may be merely geographical representatives. Here again subspecies of both *informis* and *fraseri* are recognisable, the type locality of the former being Mackay, Queensland, and of the latter nothing definite was given at its earliest introduction; at present the matter is too complicated to determine, Toowoomba being the most likely place. Moreover, two very different series are represented by *H. oconnellensis* Cox[81] and *H. macleayi* Cox[82] though these were grouped together by Fulton. The former has a flattened base with a wide umbilicus, and the latter is more elevated, the base very rounded, and the umbilicus closed. The presence or absence of an umbilicus is in itself not an essential feature, but becomes of importance when accompanying other characters as in these cases. Thus similar in general structure to *macleayi* Cox are the closely allied *gratiosa* Cox and *etheridgei* Brazier, while to be associated, though more distant, are *croftoni* Cox, *coxi* Crosse, and *blomfieldi* Cox. Subspecies of the last named show an umbilicus not quite closed. For this group the subgeneric name *Bentosites* is proposed, the type being *macleayi* Cox. This species was described from the mainland and Mr. Melbourne Ward collected specimens from Hayman Island, one of the Whitsunday Group, which differ at sight in their much greater elevation and size, and may be distinguished as *Bentosites macleayi wardiana* subsp. nov. The specific name *gratiosa* Cox[83] is preoccupied, so that the new name *Bentosites gavisa* is proposed to replace it, the type locality being Whitsunday Island.

Brazier described *H. etheridgei* from the Andromache River, near Bowen, Queensland, but a MS. note in this collection reads "Hydrometer River not Andromache River" in Brazier's handwriting. A very beautiful little shell closely allied from the Proserpine River, Queensland, is here named *birchi*, a name in the collection. It is smaller than *etheridgei*, and unicolour dark red-brown, with the peristome similarly coloured, not white as in that species. As other workers have reported there are many shells in collections labelled with names by Brazier which have never been published, and these will be legitimised

[70] Pfeiffer.—Proc. Zool. Soc. (Lond.), 1845, p. 126, Feb., 1846: North Austr. (Ince)—Bowen, Q'ld.
[71] Cox.—Proc. Zool. Soc. (Lond.), 1873, p. 565, pl. xlviii, fig. 3, Nov.: L. Island, Broad Sound, Q.
[72] Reeve.—Conch. Icon., vii, pl. cxciii, sp. 1353, Aug, 1854: Australia.
[73] Cox.—Proc. Zool. Soc. (Lond.), 1870, p. 170, pl. xvi, fig. 2, Nov.: Mt. Bersaker, Rockhampton, Q'ld.
[74] Brazier.—Proc. Linn. Soc. N.S.W., i, 1876, p. 97, July: Bowen, Port Denison, Q.
[75] Brazier.—Proc. Zool. Soc. (Lond.), 1875, p. 32, pl. iv, fig. 3, June 1: Mt. Elliott, Townsville, Q.
[76] Brazier.—Pros. Zool. Soc. (Lond.), 1875, p. 32, pl. iv., fig. 2, June 1: Bowen, Q'ld.
[77] Brazier.—Proc. Linn. Soc. N.S.W., i, 1875, p. 2, May: Wide Bay, Q'ld.
[78] Cox.—Mon. Austr. Land Shells, p. 111, add. pl. xx, fig. 13, 1868: Cape Direction, N. Q'ld.
[79] Beddome.—Proc. Linn. Soc. N.S.W., xxii, p. 123, fig. in text, Sept. 17, 1897: Yeppoon, Q'ld.
[80] Mousson.—Journ. de Conch, xvii, p. 54, pl. iv, fig. 3, Jan., 1869: Port Mackay, Q'ld.
[81] Cox.—Proc. Zool. Soc. (Lond.), 1871, p. 55, pl. iii, fig. 4, June 12: O'Connell River, Port Denison, Q.
[82] Cox.—Proc. Zool. Soc. (Lond.), 1864, p. 486, text figs., May 2, 1865: Port Denison, Q'ld.
[83] Cox.—Proc. Zool. Soc. (Lond.), 1871, p. 53, pl. iv, fig. 1, June 12: Whitsunday I., Q'ld.

when available, as in this case. Hedley and Musson described a variety of *H. blomfieldi* Cox from Warro, Queensland, with the name *warroensis,* but it seems to be the typical subspecies from Miriam Vale, and cannot be maintained at present, but there are two subspecies to be named as follows:—A long series from Coolabunia, Kingaroy, shows a consistently broader shell, the upper whorls more rounded and the outer lip dark coloured, not pale as in the typical shell. These were collected by Mr. S. W. Jackson, who noted that the microscopic sculpture was coarser, so that I call them *B. blomfieldi sidneyi* subsp. nov. From the Mary River the shells are much broader still, the breadth exceeding the height, and in some cases leaving the umbilicus uncovered, the outer lip pale. These are named *B. blomfieldi latior* subsp. nov.

The openly umbilicated forms ranging from the very beautiful *H. rainbirdi* Cox to the almost imperforate *H. andersoni* Crosse will later be much split up and many more species and subspecies discovered. The delightful little *H. oconnellensis* Cox is here taken as type of the genus *Varohadra,* and as synonymous of the typical form from the Bowen district may be cited *albofilata* Mousson and *albomarginata* Mousson, names omitted by Fulton. From Finch Hatton, 50 miles west of Mackay, a series of shells was collected by S. W. Jackson, and these are much smaller, more depressed, with the umbilicus less open, and the angulation of the periphery less pronounced; these are named *Varohadra oconnellensis jacksoni* subsp. nov. From Lindeman Island Hedley brought back specimens in which there is less angulation still and the umbilicus is more closed, showing an approach to *H. arthuriana* Cox[84] from L. Island, Broad Sound (not Torres Strait). These may be called *Varohadra oconnellensis caroli* subsp. nov., and it may be that *H. arthuriana* Cox[84] will be regarded later as a subspecies only.

On the other hand we have *H. rockhamptonensis* Cox, which is differently coloured, much more elevated, but which still shows the flattening of the base so pronounced in the true *oconnellensis. H. yulei* Forbes is closely related, with a very distinct and beautiful colouration, which is enhanced in the larger subspecies *H. rainbirdi* Cox.

Another series which may be regarded as a subgenus of *Varohadra,* with the name *Figuladra,* is typified by *H. curtisiana* Pfeiffer,[85] which seems to be the species commonly known as *H. lessoni* Pfeiffer, the latter name being anterior. It appears to be the common shell at Port Curtis, and is represented on Boyne Island by a subspecies with a dark lip, not white. This may be named *Varohadra curtisiana exedra* subsp. nov., as it recalls *H. concors* Fulton from Gayndah, Queensland, in that feature. The form, *parsoni* Cox, also from Gayndah (according to its author), has the white outer lip of the true *curtisiana.* Although recently *H. bala* Brazier was reported as synonymous with *curtisiana,* the type locality of the former was originally given as Castle Hill, Townsville, which would make it a representative species. The island representative is *aureedensis* Brazier, which was described from Aureed Island, Torres Strait, an error which was corrected to "about Port Denison," but it lives on the islands off Rockhampton according to the series here. The mainland shell recently known as "*aureedensis*" is a relative of "*lessoni,*" but is more elevated, darker coloured, with a broad, pale, circum-umbilical patch. It is here named *Varohadra bernhardi* for Mr. H. Bernhard, of Rockhampton, who has sent me good series and excellent field notes, rendering possible the solution of many problems.

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[84] Cox.—Proc. Zool. Soc. (Lond.), 1873, p. 564, pl. xlviii, fig. 1A, Nov.: L. Island, Q'ld.
[85] Pfeiffer.—Proc. Zool. Soc. (Lond.), 1863, p. 528, Apl. 20, 1864: Port Curtis, Q'ld.

The *"incei"* series is, as the earlier note would suggest, too confused to enable easy discrimination. The names *incei* Reeve, *andersoni* Cox, *tomsoni* Brazier, *hanni* Brazier, *zebina* Brazier, and *challisi* Cox, have all been used indiscriminately. The name *incei* was first published by Philippi with a figure which shows a moderately elevated shell, with a narrow umbilicus, a white lip, and no coloured umbilical patch; as it was collected by Ince the type locality must be Port Denison. The shells from Rockhampton sent by Mr. Bernhard are smaller, much less elevated, with a wider umbilicus, and may be called *Varohadra incei mattea* subsp. nov. *H. andersoni* Cox has the outer lip dark, the umbilicus covered, and a red circum-umbilical patch. As *andersoni* proves to be preoccupied, the species is here renamed *volgiola*. It has been regarded as somewhat variable but the features given are fairly constant. Brazier's *zebina*, separated on account of its microscopic sculpture, may be only a subspecies, while a series from Lindeman Island, Whitsunday Group, collected by Mr. Melbourne Ward, is larger than *andersoni*, with the umbilicus well closed, the outer lip paler and more like *zebina*, but lacking the microscopic sculpture. This subspecies may be called *Varohadra volgiola fortasse* nov. From Hamilton Island in the same group, however, Mr. Ward collected shells similarly coloured above, much more conical in shape, and with the outer lip white, the white columella completely covering the umbilicus and the red umbilical patch absent. This species is here named *Varohadra probleema* nov. The very beautiful shell *H. bellendenkerensis* Brazier[86] has been referred to *Hadra* (s. str.), but is undoubtedly more closely related to the *Sphaerospira* complex, the strong wrinkled sculpture being diagnostic, though the colouration sometimes recalls that of *Hadra*. In the latter the "bipartite" coloration is sometimes missing, the shell becoming unicolor either light or dark. Probably the series *mulgravensis* = *palmensis*, *meridionalis*, *rawnsleyi* = *mazee* are relatives of this, and these may represent *Sphaerospira* in North Queensland. The generic name *Gnarosophia* is proposed, with *H. bellendenkerensis* Brazier as type, and the inter-relationship of the above-mentioned species will later be worked out. Although Fulton degraded *H. beddomae* Brazier to varietal rank under *H. bellendenkerensis* Brazier, it may prove to be of subspecific rank when geographical series are studied, as also *Thersites castanea* Odhner. Again, although *meridionalis* Brazier was given varietal rank without question, it is undoubtedly a subspecies, and as the name is preoccupied may be renamed *Gnarosophia palmensis austrina*. Also *mazee* Brazier from Cardwell would be certainly entitled to be considered to be a subspecies of typical *rawnsleyi* Cox from Townsville, the dark outer lip being easily noted. *H. calamus* Brazier, a *nomen nudum*, is an absolute synonym of *H. mazee* Brazier.

As previously noted *H. bayensis* Brazier from Wide Bay is not the same as the shell figured by Cox as a variety of *H. incei* and which he had varietally named *multifasciata*,[87] but is a very distinct species. The Coxian shell belongs to the *whartoni* Cox series, and as the varietal name given is preoccupied it is here renamed *Gnarosophia mitifica*, but a subgenus *Temporena* must be introduced for these thin-shelled, more flattened shells, *whartoni* Cox, being named as type. Arranging the species into groups we are now left with the species named *H. greenhilli* Cox,[88] which ranges alongside none of the preceding, but seems related to *sardalabiata* Cox, of which *H. stephensoniana* Brazier is a synonym. The thin shell, rounded whorls, pale unicolor shade, umbilical characters, and

[86] Brazier.—Proc. Zool. Soc. (Lond.), 1875, p. 32, pl. iv, fig. 4, June 1: Bellendenker Mts., N. Q'ld.
[87] Cox.—Cat. Austr. Land Shells, 1864, p. 9 (Mch.): "Cape York" (Murphy), error.
[88] Cox.—Journ. de Conch., xiv, p. 46, Jan. 1, 1866: Upper Dawson River, Q'ld.

microscopic sculpture disagree altogether with any of the preceding, and necessitate the introduction of a new generic name *Pallidelix, greenhilli* Cox being the type. The other curious looking shell which has been associated here is *H. barneyi* Cox,[89] localised as from "Barney I., Torres Strait," but which lives at Cape Sidmouth, N. Queensland, and recalls in some ways the *dunkiensis* series. The shell is depressedly globose, somewhat tightly coiled, but with a narrow perspective umbilicus and the columella curved, not flattened across the umbilical area. It has no known relations at present and is therefore generically named *Micardista* nov.

Genus **Badistes.**

This generic name was introduced by Gould[90] for a species supposed to be Australian and the chief reason for so proposing the name was given in a note to the effect that the animal looped like a caterpillar instead of gliding like a snail. Later the shell was shown to be an American species so the animal character was transferred to an Australian species, and thus the generic name saved for Australia. However, it is common knowledge that the Australian snail does not loop, yet the name was retained. In face of such persistence it is satisfactory to record that the generic name is invalid so that there can be no more argument in this matter.

There is much difficulty in distinguishing the species and subspecies of the so-called *"Badistes,"* but there are undoubtedly several to be distinguished. The species *H. jervisensis* Quoy and Gaimard[91] is here named as type of the genus *Meridolum,* the various forms and their status being left for further study. Apparently the group is restricted to the same area as *Hedleyella* and *Pedinogyra,* but extending a little further south and even entering Victoria.

In North Queensland a somewhat similar series of shells group around *H. dunkiensis* Forbes, of which a mainland representative has been called *H. nicomede* by Brazier.[92] The resemblance may be only superficial and these have sometimes been placed under *Hadra* and at others under *Thersites, i.e., Sphaerospira,* with both of which they conchologically disagree. At sight they are much more depressed, more lenticular, with a surface sculpture quite different, consisting of elongate granules, and for these the new genus *Spurlingia* is proposed, the type species being *H. nicomede* Brazier. There have been very few actual martyrs in the cause of conchological science so that the name *Spurlingia* will recall the devoted young Spurling who was murdered on Percy Island, Queensland, while shell collecting with Strange. This genus includes *Planispira praehadra* Odhner, which was described as a subfossil from Chillagoe Caves, North Queensland, but which is commonly living in that locality as are all the other species described at the same time as subfossils.

Some of the shells Marshall associated with *bipartita* Ferussac under *Thersites* will naturally associate themselves with the other members of the *dunkiensis* series.

Genus **Rhytida.**[93]

This Neozelanic generic name has been utilized for the reception in Australia of a large series of shells, none of which agree conchologically with the type, *Helix greenwoodi* Gray. Some small shells, which have been doubtfully

[89] Cox.—Proc. Zool. Soc. (Lond.), 1873, p. 148, pl. xvi, fig. 2, June: "Barney I."—Cape Sidmouth, Q.
[90] Gould.—Otia Conch, 1862, p. 243.
[91] Quoy and Gaimard.—Voy. de l'Astro., Zool., ii, p. 126, pl. x, figs. 18-21, 1832: Jervis Bay, N.S.W.
[92] Brazier.—Proc. Linn. Soc. N.S.W., iii, p. 79, pl. viii, fig. 6, Dec., 1878: Cardwell, Q'ld.
[93] Albers.—Die Heliceen, 2nd ed., 1860, p. 89.

associated, may be disposed of first; such are *Helix splendidula* Pfeiffer,[94] which has been transferred to the Neozelanic genus *Delos,* but it disagrees as much conchologically with that group. The type locality of *Helix splendidula* Pfeiffer was given as East Australia, Torres Straits, but the name was preoccupied by Gmelin, so that the new generic name, *Saladelos,* must be associated with a new specific name, *commixta,* and a definite type locality fixed, as Islands of Torres Straits. Specimens collected by Macgillivray at Lizard Island are larger, more loosely coiled, with a much wider umbilicus, and may be called *S. commixta lacertina* nov. On the other hand specimens from Ben Lomond, Port Denison, are as large as the preceding but with the earlier whorls smaller and the last whorl more produced, making the mouth much larger, while the umbilicus is smaller; this subspecies is called *S. commixta bensa* nov. The New South Wales shell has an elevated spire, large mouth, and medium umbilicus, and for it the name *S. macquariensis* Cox[95] is available.

For some time *Helix strangeoides* Cox[96] has been confused with the preceding, but it is quite different, as in addition to its more regular coiling and narrower deeper umbilicus it is sculptured with close-set spiral lines both above and below, and is therefore made the type of the new genus *Echotrida.* In South Australia the species *H. lincolniensis* Pfeiffer[97] has sometimes been assigned to *Rhytida,* but Cotton and Godfrey have placed it under *Badistes,* an impossible location. The sculpture is distinctive and the shape of the mouth and umbilical features would bring it nearer the Tasmanian Rhytidoids, so the new genus *Cupedora* is introduced for it. The Tasmanian *H. sinclairi* Pfeiffer[98] is a delicate finely sculptured shell, the base sculptured in continuation of the striæ of the upper surface, the spire flattened convex, the umbilicus open, and recalling the Endodontids rather than the present series. The new genus *Tasmaphena* is proposed, and the Tasmanian forms will later be reviewed and allotted to many species and subspecies, as obviously the present species-lumping does not show the facts. From West Australia Quoy and Gaimard described *Helix georgiana*[99] which has sometimes been placed under *Rhytida,* at others under *Flammulina,* while Tryon even made it a *Zonites*! The strongly sculptured base, narrow umbilicus, and produced outer lip differentiate it, the new generic name *Occirhenea* being here given to it.

One of the large shells classed under *Rhytida* was called *confusa* by Pfeiffer, and this name might have been characteristic of the group so much confused have been the species. Certainly the name has been confusedly used as, though it was introduced for a species from Cape Upstart, Queensland, it has been used for a New South Wales form. Cox named *Helix leichardti* from the Leichhardt Collection and afterwards regarded it as the common species at Mount Dryander, Port Denison, Queensland. Reeve had named *Helix ptychomphala* from Port Essington, but the locality was erroneous and should have been Cape Upstart, Queensland. Cox also named *Helix strangei* from Brisbane, Queensland, so there appears to be a series of names available for the species with strongly ribbed upper surface. It seems that there may be more than one genus even in the strongly sculptured forms, as sometimes rather globose and depressed species are found in adjacent localities. For the series of which *H. leichardti* Cox[100] is taken as type the new genus *Strangesta* is proposed, and the species and subspecies will

[94] Pfeiffer.—Proc. Zool. Soc. (Lond.), 1845, p. 128, Feb., 1846: East Austr. near Torres St. (Ince).
[95] Cox.—Proc. Zool. Soc. (Lond.), 1871, p. 645, pl. lii, fig. 7, May 2, 1872: Port Macquarie, N.S.W.
[96] Cox.—Cat. Austr. Land Shells, 1864, p. 20, (Mch.): Moreton Bay, Q'ld.
[97] Pfeiffer.—Proc. Zool. Soc. (Lond.), 1863, p. 527, Apl. 20, 1864: Port Lincoln, South Austr.
[98] Pfeiffer.—Zeitsch. für Malak., 1845, p. 134: Van Dieman's Land.
[99] Quoy and Gaimard.—Voy. de l'Astrol., Zool., ii, p. 129, pl. x, figs. 26-30, 1832: King George's Sound, West Aust.
[100] Cox.—Cat. Austr. Land Shells, 1864, p. 35: Australia (Leichhardt).

be fully developed later. The knowledge of local geography and topography is very necessary for this purpose, as general localities are simply meaningless, and most island forms are restricted and their range on the mainland a doubtful feature. Apparently living alongside these strongly ribbed species is a series of more flattened, more regularly coiled forms, with a fine almost obsolete ribbing, which in general appearance recall the New Caledonian group formerly called *Rhytida* but now called *Ouagapia*. The earliest known was called *Helix franklandiensis* by Forbes, from the Frankland Islands, and a somewhat similar shell from the Richmond River, New South Wales, was named *Helix ramsayi* by Cox. The genus *Murphitella* is proposed, the species *H. franklandiensis* Forbes[101] being type, and the forms *H. beddomei* Brazier and *H. jamesi* Brazier, which have been cited as synonyms, may represent subspecies or even species. Mr. W. W. Froggatt, the veteran entomologist, years ago collected a fine shell resembling the typical *franklandiensis* but with the spire more elevated, the umbilicus narrower, and a fine sculpture of impressed spiral lines. This came from the Cairns district and it was intended at the time to name the species after him so it is here named *M. froggatti* nov. Cox named *Helix namoiensis*[102] from the Upper Namoi River and the shell proves to be a smooth Rhytidoid, more elevated than the typical *Murphitella,* with a narrower umbilicus and larger mouth. For the present it may be regarded as representing a subgenus of *Murphitella,* the new name *Namoitena* being here given to it.

Genus **Chloritis.**

The classification of snails by one feature is always doomed to failure, and this generic name was proposed for a kind of snail with the shell bearing hairs. The original type was also possessed of a distinctive form, but the hair-bearing quality prejudiced superficial students. Then Pilsbry, realising this danger, selected as a dominating character the sculpture of the apex, but again trouble ensues. The typical *Chloritis* has a depressed spire, so Pilsbry introduced *Austrochloritis* for the Australian species, which have a conical spire. The species *Helix porteri* Cox[103] was named as type, but Gude, who investigated this "genus," used *Austro chloritis* to include all Australian species, whether they had elevated or depressed spires. Before investigating the northern forms it may be noted that the southern *Helix victoriae* Cox,[104] which has been classed in *Chloritis* and often referred to on account of its southern range, is quite unlike the typical form. In shell features it agrees with the shells of "*Badistes*" = *Meridolum* ante, but bears hairs. It has a smooth apex, and may be called *Chloritobadistes* nov. gen. to indicate its form.

Two rare species which have never been previously located may be treated first. Pfeiffer described *Helix banneri*[105] and, through autoptic unacquaintance, the species has been allotted to the *Hadra* complex, with which at first sight it shows no relationship, being thin and with a different coiling, and the presence of hair scars suggests its alliance with the "*Chloritis*" assemblage. The shell called *Chloritis coxeni* Cox is very like it in miniature, but is a true "Chloritid," having a "*Chloritis*" apex like the species of that group. *H. banneri* does not show any sculpture on the apex, and as this has been regarded as an essential feature the new generic name *Chloritisanax* is introduced for *H. banneri* Pfeiffer alone.

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[101] Forbes.—Voy. Rattlesnake, ii, app. p. 372, 379, pl. ii, fig. 7AB, Jan., 1852: Frankland I., N. Q'ld.
[102] Cox.—Mon. Aust. Land Shells, 1868, p. 29, pl. xviii, fig. 10: Namoi River, N.S.W.
[103] Cox.—Proc. Zool. Soc. (Lond.), 1866, p. 373, Sept. 5: Upper Clarence River, N.S.W.
[104] Cox.—Mon. Austr. Land Shells, 1868, p. 37, pl. xii, fig. 5: Western Port, Victoria.
[105] Pfeiffer.—Proc. Zool. Soc. (Lond.), 1862, p. 270, Apl. 20, 1863: Cape Direction, N. Q'ld.

Cox named *Helix dryanderensis,*[106] and, though no illustration has yet appeared, a good description was offered. The type proves to be a semi-uncoiled planate shell with large hair scars, and had been covered with mud, apparently by the animal itself. The mouth is free and decurved, and therefore it correlates with no *"Chloritis"* group. The new generic name *Offachloritis* is proposed for it.

Hedley described *Chloritis jacksoni,*[107] obviously not congeneric with species of *Austrochloritis* which were figured alongside. The only common conchological feature is the hair-bearing quality, and against this is the flattened shape, umbilical character, the thinness and lack of lip reflection, and therefore it is generally distinguished as *Tolgachloritis* nov. At the same time Hedley introduced *Chloritis inflecta,*[108] which was just as unlike, being small, globose, thick, with reflected lip and closed umbilicus, and this must also be generically differentiated as *Obsteugenia* nov.

The finest "Chloritid" shells in Australia are those associated with *H. coxeni* Cox, which has been already mentioned. These show the true *" Chloritis,"* apex, and have a very fine hairy surface, but are subglobose, with an elevated spire, an open almost circular mouth, a broadly reflected columella, though the outer lip is only slightly reflected, and a narrow deep umbilicus. The shell is very thin and the periphery very rounded. This genus is named *Gloreugenia* nov., the species *H. coxeni* Cox[109] being named as type.

The West Australian shell Gude called *Chloritis micromphala*[110] seems more related to the other West Australian shells, of which it might prove only a hair-bearing representative. Examination does not reveal any hairs, however, and to my surprise I found that Gude noted their absence, so that it cannot be classed as *"Chloritis"* at all, and is therefore named *Kimboraga* nov. gen.

Desert Snails.

The Horn Expedition brought back a series of small snails which were described by Tate[111] under the generic name *Hadra,* a most extraordinary location. Hedley[112] reported upon the anatomy of some of these and found two broad types of animal features, and, ignoring shell-character entirely, placed the species under the names *Xanthomelon* and *Thersites,* previously regarded as sections only of *Hadra.* Such arrangement has never been reviewed, though the conchological features demanded re-investigation. It may be observed that *Xanthomelon* was introduced for a large globose solid shell, and *Thersites* was then being used for the larger, solid, triangular species, *H. richmondiana.*

Desert species assigned to these groups were small, flattened and keeled or rounded as well as small globose forms, but never anything like the types named. Consequently the usage of such names tended to mislead students and certainly mystify them, especially as, if the same kind of shell ranged into North-west Australia, it was placed under *Rhagada, e.g., Helix fodinalis* Tate and *angasiana* Pfr. in Hedley's West Australian List.

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[106] Cox.—Proc. Zool. Soc. (Lond.), 1872, p. 19, June: Mt. Dryander, Port Denison, Q'ld.
[107] Hedley.—Proc. Linn. Soc. N.S.W., xxxvii, p. 256, pl. v., figs. 13-16, Dec. 13, 1912: Near Cairns, N. Q'ld.
[108] Hedley.—Proc. Linn. Soc. N.S.W., xxxvii, p. 256, pl. iv, figs. 9-11, pl. v, fig. 12, Dec. 13, 1912: Tinaroo, N. Q'ld.
[109] Cox.—Proc. Zool. Soc. (Lond.), 1871, p. 54, pl. iii, fig. 12, June 12: Whitsunday I., N. Q'ld.
[110] Gude.—Proc. Mal. Soc. (Lond.), vii, p. 231, pl. xxi, fig. 6, Apl. 3: Barrier Range, N.W. Austr.
[111] Tate.—Trans. Roy. Soc. South Austr., xviii, pp. 192-3, Nov., 1894.
[112] Hedley.—Rep. Horn Sci. Exped., Zool., ii, pp. 220-226, Feb., 1896.

Tate, who was a great conchologist, remarked upon the discrepancies, while using Hedley's classing, in the Horn Report, and his observations are good. Why desert influence should modify shells in many different directions, so that they conchologically resemble wet country types but have no relation, is a problem for the future student. How this variation can be carried out without affecting the inhabitant may then be studied. One of our great malacologists would allow shell convergence in some groups, but deny it in others, the circumstances being identical, so there may be another puzzle. In view of such perplexing conditions it seems best to group these Desert Snails conchologically until much more is known of animal characters. Thus *Angasella* was introduced years ago for one of these Desert Snails, and the group, though the name to be used is *Pleuroxia,* can be recognised. Then Pilsbry added *Glyptorhagada* for the beautiful shell called *Helix silveri* by Angas and that group can also be used. Hedley at one time refused acceptance of these, determining all the species as either *Thersites* or *Xanthomelon,* and thus he introduced *Xanthomelon asperrimum,*[113] an exquisite, flattened, strongly keeled, heavily sculptured shell with a narrow open umbilicus. This may be placed alongside *silveri,* but a new subgeneric name *Eximiorhagada* is needed. On the other hand a species recalling *silveri* has been described from Kangaroo Island as *Helix bordaensis* by Angas.[114] The mouth is open in all the specimens seen, and there is a notable anteperipheral ditch which separates it, and a new subgeneric name *Halmatorhagada* is introduced for this species, *tomsetti* Tate being placed with it. Another strongly keeled shell was named *Thersites hillieri* by Smith,[115] but it does not show the grained sculpture of *Eximiorhagada* and has a broad umbilicus indicating that the keeling is due to convergence only. A new generic name *Divellomelon* is proposed for this species.

The most curious allotment to *Hadra* was *wattii* Tate,[116] a small, flattened subdiscoidal, many-whorled, minutely but openly umbilicated shell. In no feature does it conchologically resemble the types of *Hadra, Xanthomelon* or *Thersites* auct., so it is made the type of the new genus *Vidumelon.* Another extraordinary shell is that named *Hadra granditu̇berculata* by Tate;[117] the tuberculation is somewhat peculiar but more distinctive is the complete aperture, almost free, and the elevated spire with rounded whorls and deep sutures. Though assigned to *Xanthomelon* by Hedley its relations to the rest of the Centralian shells are somewhat obscure; the new generic name *Granulomelon* is therefore introduced for it.

A very curious matter which needs consideration is the occurrence throughout Central Australia of species conchologically resembling North Queensland coastal shells. While the preceding species do not resemble *Xanthomelon,* there is a series of globose shells which conchologically do recall that form, and for these I have already proposed *Sinumelon.* Again Hedley described *Thersites basedowi,*[118] which recalls the *Trachiopsis* series, but which is nothing like any shell of the *"Thersites"* association. Three forms resemble each other in general conchological features but one has the apex granulated while another bears hairs; the hair-bearing one has the apex smooth so that it is difficult to assess the value of the differences in terms used in connection with other groups. Therefore the generic name *Semotrachia* is proposed for *T. basedowi* Hedley, and the subgeneric name

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[113] Hedley.—Trans. Roy. Soc. South Austr., xxix, p. 164, fig. on text, 1905: Mann Range, Central Aus.
[114] Angas.—Proc. Zool. Soc. (Lond.), 1880, p. 419, pl. xl, fig. 3, Oct. 1: Kangaroo I., South Austr.
[115] Smith.—Proc. Mal. Soc. (Lond.), ix, p. 26, fig., Mch. 31, 1910: South Central Austr.
[116] Tate.—Trans. Roy. Soc. South Austr., xviii, p. 192, Nov., 1894: Central Australia.
[117] Tate.—Trans. Roy. Soc. South Austr., xviii, p. 193, Nov., 1894: Central Australia.
[118] Hedley.—Trans. Roy. Soc. South Austr., xxix, p. 161, pl. xxx, figs. 1-3, 1905: Musgrave Ranges, Central Austr.

Catellotrachia for the smaller shell *Hadra winneckeana* Tate[119] with the granulose apex, and the subgeneric name *Spernachloritis* for *Hadra setigera* Tate,[120] the species showing hairs and having a smooth apex.

Since the above was written Cotton and Godfrey[121] have proposed *Notobadistes,* naming *Helix bitaeniata* Cox as type. That species is undoubtedly congeneric with my prior *Sinumelon* (type *H. nullaborica* Tate, which they include in their group), and the specific name is *flindersi* A. Adams and Angas, published five years earlier than Cox's name. They still allow *angasiana* Pfeiffer, but that name was preoccupied, so that I rename it *Sinumelon godfreyi,* as a mark of appreciation of the work of Mr. F. K. Godfrey in connection with South Australian shells.

Cotton and Godfrey place under *Badistes* the species *patruelis* A. Adams and Angas while under *Notobadistes* they place *loriolianus* Crosse, *rufofasciatus* Brazier and *subloriolianus* Pilsbry. The last two were regarded as synonymous by Hedley and these three or four form a very distinct group which is here given the new generic name *Meracomelon, rufofasciata* Brazier[122] being selected as type.

The species *H. bednalli* Brazier[123] has even been classed as a form of *jervisensis,* though geographically it is divorced through the intervention of *H. victoriae* Cox. The former does not show any hair-scars or it might be placed with the latter. The correct name appears to be *sutilosa* Deshayes,[124] and to keep the form under notice it may be located in *Meridolum* with the new subgeneric name *Exilibadistes.*

Genus **Rhagada.**[125]

This generic name was proposed for the West Australian *Helix reinga* Gray[126] which is now identified with *torulus* Ferussac.[127] Many Westralian shells group around this, and *Rhagada* has been used loosely, but subgenera may be differentiated. Thus *H. sykesi* Smith[128] is elevated, many-whorled, with fairly open mouth, the columella bearing a prominent tooth and appressed, practically closing the umbilicus: the name *Amplirhagada* is here introduced with *sykesi* as type. *H. plectilis* Benson[129] is very rudely sculptured, the shell more globose, the mouth larger and open, and, while the columella is reflected, it is not appressed to the body-whorl; it may be cited as type of *Plectorhagada,* a new subgeneric name. Another subgeneric name, *Globorhagada,* is proposed for *prudhoensis* Smith,[130] which is large and globose, with open circular mouth, the columella thickened, much reflected and appressed but not closing the umbilicus, a thick glaze joining the inner and outer lips.

So-called Endodonts.

Two or three different families are confused under the general family name Endodontidae in Australia. Hedley's last conchological essay[131] dealt with some species when he introduced *Gyrocochlea* and *Rhophodon,* but also introduced the

[119] Tate.—Trans. Roy. Soc. South Austr., xviii, p. 194, Nov., 1894: Centralia.
[120] Tate.—Trans. Roy. Soc. South Austr., xviii, p. 194, Nov., 1894: Centralia.
[121] Cotton and Godfrey.—South Aust. Naturalist, xiii, Aug., 1932, pp. 169-170.
[122] Brazier.—Proc. Linn. Soc. N.S.W., i, p. 17, May, 1875: Yardea, 360 miles N. of Adelaide, S.A.
[123] Brazier.—Proc. Zool. Soc. (Lond.), 1871, p. 641, May 2, 1872: Near Adelaide, S.A.
[124] Deshayes.—Hist. Nat. Moll. Terr. (Ferussac), i, p. 203, *ante* 1850, pl. 17A, figs. 8-19: Ile St. Pierre. S.A.
[125] Albers.—Die Heliceen, 2nd ed., 1860, p. 108.
[126] Gray in Pfeiffer.—Symb. Helic., iii, 1846, 73: New Zealand, error—West Austr.
[127] Ferussac.—Hist. Nat. Moll. Terr., Tabl. Lim., 1821, 34, pl. xxvii, figs. 3-4: New Holland (Peron).
[128] Smith.—Proc. Mal. Soc. (Lond.), i, p. 92, pl. 7. fig. 8, June, 1894: Parry I., N.W.A.
[129] Benson.—Ann. Mag. Nat. Hist. (2), xi, p. 29, Jan. 1853: Sharks Bay, West Aust.
[130] Smith.—Proc. Mal. Soc. (Lond.), i, p. 91, pl. 7, fig. 9, June, 1894: Prudhoe I., N.W.A.
[131] Hedley.—Austr. Zool., iii, pp. 215-221, May 9, 1924.

generic Neozelanic name *Suteria* for a new species *seticostata*. Instead of the last named the new generic name *Setomedea* is introduced, the species *seticostata*[132] being taken as type. Many years ago Suter reported that the Tasmanian snailfauna appeared to be very closely related to that of New Zealand, judging from examination of the radular characters. His conclusions have not been accepted by Australian malacologists on account of the discrepant shell characters. Mollendorff and others have noted that two or three families must be separated, yet the species have here been regarded as congeneric. As a beginning, a few easily recognizable groups may be named as the following groupings will prove necessary. *Helix jungermanniae* Petterd[133] was allotted to *Flammulina* by Suter, and the last location by May was in *Laoma,* another Neozelanic group more familiar to Suter than to May; the generic name *Pasmaditta* is here introduced. Another shell located by May in *Laoma* was the curious sinistral *H. weldii* Ten, Woods,[134] which lacks the mouth armament of the Neozelanic type, and is here made the type of the genus *Miselaoma.* Another species regarded by May as *Flammulina* was the *Helix fordei* Brazier,[135] which Suter had referred to *Thalassohelix*; the Tasmanian shell is made the type of the genus *Mulathena.*

Pedicamista is proposed for *H. caesus* Cox,[136] which was also placed by May in *Laoma,* though Suter had assigned it to *Phrixgnathus,* from the type of which it differs as much as from the typical *Laoma.* A remarkable little shell is the *Helix minima* Cox,[137] with a wide open umbilicus very unlike that of *Laoma,* under which genus it has been placed. The generic name *Laomavix* is proposed, and, as Cox's specific name is invalid, the species will be known as *Laomavix collisi* Brazier.[138]

The unarmed species of Endodontidae were classed as *Charopa,* the Neozelanic *coma* Gray being the type, and Suter regarded *Helix antialba* Beddome[139] as there referable, but it disagrees conchologically and is representative of an Australian series, so that it may be regarded as type of the new genus *Geminoropa. H. albanensis* Cox[140] has more the appearance of a Charopid form, but Suter classed it under *Gerontia,* a generic name later displaced by the earlier *Flammulina,* which is now regarded as of family distinction. The generic name *Pernagera* is therefore introduced for *albanensis.*

Brazier's *Helix dispar*[141] is so different superficially, especially in showing a basal tooth, that it must be separated as *Dentherona;* at present it stands alone. A very easily recognizable group is that about *H. sericatula* Pfeiffer[142] with its almost obsolete umbilicus and its fine sculpture, so that *Elsothera* is here introduced; *inusta* Cox and *funerea* Cox appear congeneric. The Tasmanian *Helix savesi* Petterd[143] was regarded as *Phacussa* by Suter, but relegated to *Flammulina* by May, with which genus it cannot be associated, so that *Stenacapha* is here added for it.

As a bad refuge for some Endodontid forms whose apical sculpture was very notable, being lirate concentrically, Cox and Hedley selected the Neozelanic genus

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[132] Hedley.—Austr. Zool., iii, p. 221, pl. xxxii, figs. 41-44, May 9, 1924: Dorrigo, N.S.W.
[133] Petterd.—Mon. Land Shells Tasm., p. 17, Apl., 1879: Launceston, Tasmania.
[134] Tenison-Woods.—Proc. Roy. Soc. Tasm., 1876, p. 160, Feb. 27, 1877: Stanley, N. Tasm.
[135] Brazier.—Proc. Zool. Soc. (Lond.), 1870, p. 662, May, 1871: Mt. Wellington, Tasm.
[136] Cox-Legrand.—Coll. Mon. Land Shells, Tasm., 1st ed., p. 3, June, 1871: Recherche Bay, S. Tasm.
[137] Cox.—Mon. Aust. Land Shells, p. 10, pl. xii, fig. 8, 1868: Mt. Wellington, Tasm.
[138] Brazier.—Proc. Roy. Soc. Tasm., 1876, p. 168, Feb. 27, 1877.
[139] Beddome-Petterd.—Mon. Land Shells Tasm., p. 41, Apl., 1879: Gads Hill, N. Tasm.
[140] Cox.—Proc. Zool. Soc. (Lond.), 1867, p. 723, Apl. 3, 1868: Pt. Albany, West. Austr.
[141] Brazier.—Proc. Zool. Soc. (Lond.), 1870, p. 661, May, 1871: Mt. Wellington, Tasm.
[142] Pfeiffer.—Proc. Zool. Soc. (Lond.), 1849, p. 127, 1850: Port Jackson, N.S.W.
[143] Petterd.—Mon. Land Shells Tasm., p. 12, Apl. 1879: Table Cape, N. Tasm.

Allodiscus. Gabriel has followed, so that revision is demanded, and *Helix otwayensis* Petterd[144] is made the type of the genus *Oreomava*, the Tasmanian species, *alpina* Johnston[145] being renamed *Oreomava johnstoni*, the name *alpina* being preoccupied. A very dissimilar shell is *Flammulina meraca* Cox and Hedley,[146] and this is named *Pillomena*; a second species may be *Helix subdepressa* Brazier,[147] but, as that name is preoccupied, it will be known as *Pillomena dandenongensis* Petterd, a recognised synonym. A somewhat "Charopid" appearance is shown by the North Queensland *Helix spaldingi* Brazier,[148] but Hedley placed it under *Flammulina*, with which it conchologically disagrees in every detail. The generic name *Torresiropa* is introduced for it, and the new name *Torresiropa mella* is proposed for the species named var. *carinata* Brazier,[149] which name is invalid.

Another curious shell was named *Helix* (*Thalassia*) *gayndahensis* by Brazier,[150] and Hedley classed it under *Flammulina*, suggesting that it might be added to *Hedleyoconcha* as a second species. It does not recall the last-named group, and it is very surely not a *Flammulina* conchologically, and the fact that Brazier placed it in *Thalassia* indicates its distinction. Its texture is different from any of the above, and the quaint keeling and rounded base make it generically separable as *Delinitesta* gen. nov.

The Tasmanian *diemenensis* Cox[151] recalls the Rhytidoid series and little resembles true *Flammulina*, under which it was placed by May, so that the new generic name *Thryasona* is introduced for it.

Pfeiffer described a small shell as *Helix lizardensis*[152] and it appears to have been sadly neglected. Pilsbry, probably from its rarity, allowed it an undefined place in his family Endodontidae, but it has no resemblance to any Australian "Endodont" in the vaguest sense of that term. It suggests rather the Trochomorphas of the Pacific and is here made the type of a new genus *Theskelomensor*. The shell is small, lenticular, sharply keeled, many-whorled narrowly, but deeply umbilicated. The apical whorls are smooth, while a very distinctive antiperipheral groove is present, guarded by a ridge parallel to the keel. Odhner has introduced a *Flammulina cumulus*[153] from Bellender Ker Mountain (4,000 ft.) placing it in the family Endodontidae, and then has used the genus in connection with zoogeographical suggestions. As the species is certainly not conchologically referable to the genus *Flammulina*, the new genus *Oreokera* is proposed for it. It appears to belong to the family Endodontidae in the widest sense, but, of course, *Flammulina* itself does not belong to that association. It is somewhat unfortunate that the New Guinea species mentioned as belonging to *Flammulina, abdita* Hedley,[154] is also not referable to that genus nor even to the same family.

Genus **Planispira.**

No typical species occurs in Australia but some species have been referred here, though Pilsbry[155] wisely introduced *Trachiopsis* for the *tuckeri* series. The larger form known as *delessertiana* appears to need separation, as from Chillagoe

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[144] Petterd.—Mon. Land Shells Tasm., p. 39, Apl., 1879: Cape Otway, Victoria.
[145] Johnston-Petterd.—Mon. Land Shells Tasm., p. 39, Apl., 1879: Surrey Hills, N. Tasm.
[146] Cox and Hedley.—Mem. Nat. Mus. Melb., No. 4, Feb. 1912, p. 13, p. 12, pl. iv, figs. 19-21: Dandenong Range, Vic.
[147] Brazier.—Proc. Zool. Soc. (Lond.), 1871, p. 641, May 2, 1872: Snowy River, Vic.
[148] Brazier.—Proc. Linn. Soc. N.S.W., i, p. 103, 1876: Cape York, N. Q'ld.
[149] Brazier.—Proc. Linn. Soc. N.S.W., i., p. 103, 1876: Thursday I., Torres St.
[150] Brazier.—Proc. Lenn. Soc. N.S.W., i, p. 2, May, 1875: Gayndah, S. Q'ld.
[151] Cox.—Mon. Aust. Land Shells, p. 20, pl. 7, fig. 6, 1868.
[152] Pfeiffer.—Proc. Zool. Soc. (Lond.), 1862, p. 269, Apl. 10, 1863: Lizard I., N. Austr.
[153] Odhner.—Kungl. Svensk. Vetenskap. Handl., Bd. 52, No. 16, p. 84, pl. 3, figs. 89-91, Sept. 19, 1917: Bellendenker Mt., Q'ld.
[154] Hedley.—Rec. Austr. Mus., iii, p. 47, Aug. 5, 1897: Brit. New Guinea.
[155] Pilsbry.—Man. Conch. (2), viii, p. 284, 1892.

district Mr. W. D. Campbell sent many specimens of apparently new species representing each series, and these were very distinct. Thus the true *Trachiopsis* was represented by a larger keeled shell, lacking the fine sculpture and with continuous mouth, while the *delessertiana* series was replaced by a still larger almost globose species. In West Australia the species *froggatti* Ancey[156] and *monogramma* Ancey resemble the keeled *Trachiopsis*-like shell, but the mouth is distinctly not continuous, so that the generic name *Westraltrachia* is here proposed, the species *froggatti* being selected as type. The correct name for *delessertiana* appears to be *torresiana* Hombron and Jacquinot, and the larger form may be specifically separable, in which case its name would be *leucolena* Crosse,[157] a later name being *endeavourensis* Brazier.[158] The generic name *Torresitrachia* is here proposed, the large form *endeavourensis* being the type.

Smith[159] described two small shells from Baudin Island, North-west Australia, placing them under *Gonostoma*. Transferred to the *Trachiopsis* section of *Planispira* by Pilsbry, they cannot remain there, as neither agree with the *tuckeri* form. The first species, *baudinensis*, has strong sculpture, and a peculiar aperture, and is made the type of the new genus *Gonobaudinia*, while the second *H. collingii*, though the apertural features are somewhat similar to those of the preceding, is covered with "*Chloritis*" hairs and is certainly not congeneric, so may be called *Setobaudinia;* perhaps both are more nearly related to extralimital groups.

At the end of his Monograph published in 1868 Cox added two new species *Helix wesselensis* and *H. creedi*, from the north-eastern extremity of Arnhem Land. These are very interesting as they prove to be quite unlike known East Australian forms. *H. creedi* is here made the type of the new genus *Arnemelassa*, which may be related to *Rhagada* sensu lato, and perhaps *H. forrestiana* Angas may be an ally. This Hedley put under *Albersia*, a genus which it does not much resemble. The other species, *H. wesselensis*, agrees generally with the type of *Cristigibba* Tapparone-Canefri, and may be placed here as indicating the source of these Northern Territory shells, but a new subgenus *Australgibba* is introduced too. Under *Planispira* Hedley placed the interesting shell Cox named *Helix leucocheilus*,[160] describing from near Cairns, North Queensland a variety *pusilla*, the type locality of *leucocheilus* being the Clarence River, N.S. Wales. Pilsbry located it under *Hadra*, proposing a variety *lismorensis*, while this variety had been described by Cox and Brazier as *bellingerensis* independently. The shell suggests *Chloritis* in some respects, but the keel is foreign to that group, and, while the apertural features suggest *Trachiopsis*, the curious thickening of the mouth is unmatched in either. The new generic name *Ventopelita* is proposed, *leucocheilus* Cox being named as type, but Cox's first name *mariae*[161] must be revived as it is not preoccupied.

Genus **Sitala.**

A series of Australian shells has been referred to *Sitala*, and this association has been questioned by malacologists such as Mollendorff. Odhner has given some anatomical details which confirm the relationship with *Sitala*, but also subgeneric segregation. For these Australian species the name *Turrisitala* is

[156] Ancey.—Proc. Linn. Soc. N.S.W., xxii, p. 774, pl. 36, fig. 2, June 4, 1898: Oscar Range, N.W.A.
[157] Crosse.—Journ. de Conch., xv, p. 447, Oct. 1, 1867: "Fiji" error—North Austr.
[158] Brazier.—Proc. Zool. Soc. (Lond.), 1871, p. 640, May 2, 1872: Endeavour R., N. Q'ld.
[159] Smith.—The Conchologist, ii, pp. 97-98, Mch. 25, 1983: Baudin I., N.W. Austr.
[160] Cox.—Mon. Aust. Land Shells, p. 54, pl. viii, figs. 7-7AB, 1868.
[161] Cox.—Proc. Zool. Soc. (Lond.), 1864, p. 594, May 2, 1865: Clarence River, N.S.W.

therefore introduced, the somewhat elevated *Helix turriculata* Cox[162] being named as type, but as Cox's name is preoccupied the species must be called *Turrisitala normalis.*

Genus **Microcystis.**

The non-recognition of this genus in Australia was long ago urged, and Smith placed the West Australian shell in *Lamprocystis. Thalassia* had been proposed for *Helix subrugata* Pfeiffer, but as it was invalid Gude introduced *Nitor.*[163] This group is well defined by texture and the glassy forms must be anatomically examined for accurate classification. A good guide is their habitat, and when this is associated with apparently slight characters these demand recognition. Thus Hedley described *Microcystis inscensa,*[164] writing, "This species is distinguished from Australian co-generic forms by being more globose." He then added that the collector had found it "climbing the trunks of trees," whereas generally *"Microcystis"* lives under fallen leaves on the ground." The generic name *Dendronitor* is here proposed for the species *M. inscensa* Hedley, which differs in size, elevation, texture, and umbilical features from the type of *Nitor.*

The West Australian shell Smith named *Lamprocystis lissa*[165] has been transferred to *Microcystis* by Hedley, but it is not much like *Nitor,* the East Australian representative, and therefore may be called *Westracystis* until its anatomy is studied.

Odhner has given some anatomical details of some Queensland *"Microcystis,"* including *marmorata* Cox (the correct name being *circumcincta* Cox), which has many more teeth in the radular rows than *rustica* Cox (the authority should be Pfeiffer) also allows *Thalassia* (*i.e. Nitor*) for *pudibunda* Cox. Odhner[166] then introduced *Macrochlamys,* an Indian genus, into the Australian fauna for a new species *M. suturalis,* giving both anatomical and shell characters of the species. In view of this good description it is better to propose the new generic name *Malandena* for the Australian species rather than allow the vague term *Macrochlamys,* which Godwin-Austen has much restricted in usage in connection with Indian molluscs.

Genus **Diplommatina.**

The species classed under *Diplommatina* were monographed by Kobelt, who, however, was unfamiliar with the Australian species, and consequently located them without serious consideration. Thus, the peculiar form named *D. gowllandi* by Brazier[167] was placed under *Pseudopalaina,* with the type of which it disagrees in many features. It is here named *Eclogarinia.* Hedley suggested that the species he named *D. egregia*[168] might go under *Arinia,* and Kobelt so placed it, though it is very unlike the type of that group. The name *Famarinia* is here proposed for it.

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[162] Cox.—Mon. Aust. Land Shells, p. 8, pl. viii, fig. 11, 1868: Port Curtis, Q'ld.
[163] Gude.—Proc. Mal. Soc. (Lond.), ix, p. 270, Mch. 30, 1911.
[164] Hedley.—Proc. Linn. Soc. N.S.W., xxxvii, p. 262, pl. vii, figs. 39-40; pl. viii, fig. 41, Dec, 13, 1912: Coolabunia, Q'ld.
[165] Smith.—Proc. Mal. Soc. (Lond.), i, p. 86, pl. vii, figs. 22-23, Jan., 1894: North West Austr.
[166] Odhner.—Kungl. Svensk. Vetenskap. Handl., Bd. 52, No. 16, p. 81, pl. 3, figs. 86-88, Sept. 19, 1917: Bellendenker Mt., Q'ld.
[167] Brazier.—Proc. Zool. Soc. (Lond.), 1874, p. 670, pl. 83, figs. 19-21, Apl. 1, 1875: Fitzroy I., N. Q'ld.
[168] Hedley and Musson.—Proc. Linn. Soc. N.S.W. (2), vi, p. 561, text fig. 8, May 23, 1891: Calliungal, Q'ld.

Genus **Georissa.**

Brazier named *Georissa multilirata,*[169] and through the erroneous location Odhner[170] did not recognise the species, and therefore renamed it *Omphalotropis minuta.* It, however, seems more like the former than the latter, and as it is conchologically neither, the new name *Omphalorissa* is introduced for it.

Genus **Ditropis.**

Australian Cyclophorids are few and rare, so that when they were found they were allotted to extra limital groups without careful criticism. The species *C. macleayi* Brazier[171] was referred to *Ditropis,* and Hedley suggested *Ditropopsis,* but remarked that the operculum differed. As that is an essential feature, the new name *Ditropisena* is here proposed. In the same manner Cox reported that the opercular characters of *Callia splendens* Dohrn[172] were not those of *Callia,* now *Callianella,* so that a new name *Suavocallia* is introduced for our species.

The new names are listed herewith for easy reference:—

Fastosarion subgen. nov.: type *Vitrina superba* Cox.
Vercularion subgen. nov.: type *Helicarion bullacea* Odhner.
Luinarion subgen, nov.: type *Helicarion thomsoni* Ancey.
Hedleyella falconeri jacksoniana subsp. nov.
Hedleyella falconeri imitator subsp. nov.
Pygmipanda gen. nov.: type *Bulimus atomatus* Gray.
Brazieresta gen. nov.: type *Bulimus larreyi* Brazier.
Pandofella gen. nov.: type *Panda whitei* Hedley.
Victaphanta subgen. nov.: type *Nanina atramentaria* Shuttleworth.
Melavitrina gen. nov.: type *Vitrina milligani* Pfeiffer.
Prolesophanta gen. nov.: type *Helix dyeri* Petterd.
Tasmanembryon subgen. nov.: type *Bulimus tasmanicus* Pfeiffer.
Hartogembryon subgen. nov.: type *Bulimus onslowi* Cox.
Larapintembryon subgen. nov.: type *Liparus spenceri* Tate.
Satagembryon subgen. nov.: type *Buliminus gratwicki* Cox.
Papuexul subgen. nov.: type, *Helix bidwilli* Pfeiffer (em).
Noctepuna subgen. nov.: type *Helix poiretiana* Reeve.
Posorites gen. nov.: type *Helix fucata* Pfeiffer.
Rachispeculum gen. nov.: type *Bulimus bidwilli* Cox.
Amimopina gen. nov.: type *Bulimus beddomei* Brazier.
Hadra webbi incallida subsp. nov.
Annakelea gen. nov.: type *Helix richmondiana* Reeve.
Bentosites gen. nov.: type *Helix macleayi* Cox.
Bentosites macleayi wardiana subsp. nov.
Bentosites gavisa nom. nov. for *Helix gratiosa* Cox.
Bentosites birchi sp. nov.
Bentosites blomfieldi sidneyi subsp. nov.
Bentosites blomfieldi latior subsp. nov.
Varohadra gen. nov.: type *Helix oconnellensis* Cox.
Varohadra oconnellensis jacksoni subsp. nov.
Varohadra oconnellensis caroli subsp. nov.

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[169] Brazier.—Proc. Zool. Soc. (Lond.), 1874, p. 670, pl. 83, figs. 8-10, Apl. 1, 1875: Fitzroy I., N. Q'ld
[170] Odhner.—Kungl. Svensk. Vetenskap. Handl., Bd. 52, No. 16, p. 99, pl. 3, figs, 113-114, Sept. 19, 1917: Chillagoe Caves, Q'ld.
[171] Brazier.—Proc. Linn. Soc. N.S.W., ii, 122, July, 1877.
[172] Dohrn.—Proc. Zool. Soc. (Lond.), 1862, p. 183, Sept.: Lizard I., N. Q'ld.

Figuladra subgen. nov.: type *H. curtisiana* Pfeiffer.
Varohadra curtisiana exedra subsp. nov.
Varohadra bernhardi sp. nov.
Varohadra incei mattea subsp. nov.
Varohadra volgiola nom. nov. for *Helix andersoni* Cox.
Varohadra volgiola fortasse subsp. nov.
Varohadra probleema sp. nov.
Gnarosophia gen. nov.: type *Helix bellendenkerensis* Brazier.
Gnarosophia palmensis austrina nom. nov. for *H. meridionalis* Brazier.
Gnarosophia mitifica nom. nov. for *H. incei* var. *multifasciata* Cox.
Temporena subgen. nov.: type *Helix whartoni* Cox.
Pallidelix gen. nov.: type *Helix greenhilli* Cox.
Micardista gen. nov.: type *Helix barneyi* Cox.
Meridolum gen. nov.: type *Helix jervisensis* Quoy and Gaimard.
Spurlingia gen. nov.: type *Helix nicomede* Brazier.
Saladelos gen. nov.: type *Helix splendidula* Pfeiffer.
Saladelos commixta nom. nov. for *Helix splendidula* Pfeiffer.
Saladelos commixta lacertina subsp. nov.
Saladelos commixta bensa subsp. nov.
Echotrida gen. nov.: type *Helix strangeoides* Cox.
Cupedora gen. nov.: type *Helix lincolniensis* Pfeiffer.
Tasmaphena gen. nov.: type *Helix sinclairi* Pfeiffer.
Occirhenea gen. nov.: type *Helix georgiana* Quoy and Gaimard.
Strangesta gen. nov.: type *Helix leichardti* Cox.
Murphitella gen. nov.: type *Helix franklandiensis* Forbes.
Murphitella froggatti sp. nov.
Namoitena subgen. nov.: type *Helix namoiensis* Cox.
Chloritobadistes gen. nov.: type *Helix victoriae* Cox.
Chloritisanax gen. nov.: type *Helix banneri* Pfeiffer.
Offachloritis gen. nov.: type *Helix dryanderensis* Cox.
Tolgachloritis gen. nov.: type *Chloritis jacksoni* Hedley.
Obsteugenia gen. nov.: type *Chloritis inflecta* Hedley.
Gloreugenia gen. nov.: type *Helix coxeni* Cox.
Kimboraga gen. nov.: type *Chloritis micromphala* Gude.
Eximiorhagada subgen. nov.: type *Xanthomelon asperrimum* Hedley.
Halmatorhagada subgen nov.: type *Helix bordaensis* Angas.
Divellomelon gen. nov.: type *Thersites hillieri* Smith.
Vidumelon gen. nov.: type *Hadra wattii* Tate.
Granulomelon gen. nov.: type *Hadra grandituberculata* Tate.
Semotrachia gen. nov.: type *Thersites basedowi* Hedley.
Catellotrachia subgen nov.: type *Hadra winneckeana* Tate.
Spernachloritis subgen. nov.: type *Hadra setigera* Tate.
Sinumelon godfreyi nom. nov for *Helix angasiana* Pfeiffer.
Meracomelon gen. nov.: type *Helix rufofasciata* Brazier.
Exilibadistes subgen. nov.: type *Helix bednalli* Brazier = *sutilosa* Deshayes.
Amplirhagada subgen, nov.: type *Helix sykesi* Smith.
Plectorhagada subgen. nov.: type *Helix plectilis* Benson.
Globorhagada subgen. nov.: type *Helix prudhoensis* Smith.
Setomedea gen. nov.: type *Suteria seticostata* Hedley.
Pasmaditta gen. nov.: type *Helix jungermanniae* Petterd.
Miselaoma gen. nov.: type *Helix weldii* Tenison-Woods.

Mulathena gen. nov.: type *Helix fordei* Brazier.
Pedicamista gen. nov.: type *Helix caesus* Cox.
Laomavix gen. nov.: type *Helix minima* Cox = *collisi* Brazier.
Geminoropa gen. nov.: type *Helix antialba* Beddome.
Pernagera gen. nov.: type *Helix albanensis* Cox.
Dentherona gen. nov.: type *Helix dispar* Brazier.
Elsothera gen. nov.: type *Helix sericatula* Pfeiffer.
Stenacapha gen. nov.: type *Helix savesi* Petterd.
Oreomava gen. nov.: type *Helix otwayensis* Petterd.
Oreomava johnstoni nom. nov. for *H. otwayensis* var. *alpina* Johnston.
Pillomena gen. nov.: type *Flammulina meraca* Cox and Hedley.
Torresiropa gen. nov.: type *Helix spaldingi* Brazier.
Torresiropa mella nom. nov. for *H. spaldingi* var. *carinata* Brazier.
Delinitesta gen. nov.: type *Helix gayndahensis* Brazier.
Thryasona gen. nov.: type *Helix diemenensis* Cox.
Theskelomensor gen. nov.: type *Helix lizardensis* Pfeiffer.
Westraltrachia gen. nov.: type *Trachia froggatti* Ancey.
Oreokera gen. nov.: type *Flammulina cumulus* Odhner.
Torresitrachia gen. nov.: type *Helix endeavourensis* Brazier.
Gonobaudinia gen. nov.: type *Helix baudinensis* Smith.
Setobaudinia gen. nov.: type *Helix collingii* Smith.
Ventopelita gen. nov.: type *Helix leucocheilus* Cox = *mariae* Cox.
Arnemelassa gen. nov.: type *Helix creedi* Cox.
Australgibba sub. gen. nov.: type *Helix wesselensis* Cox.
Turrisitala gen. nov.: type *Helix turriculata* Cox.
Turrisitala normalis nom. nov. for *Helix turriculata* Cox.
Dendronitor gen. nov.: type *Microcystis inscensa* Hedley.
Westracystis gen. nov.: type *Lamprocystis lissa* Smith.
Malandena gen. nov.: type *Macrochlamys suturalis* Odhner.
Eclogarinia gen. nov.: type *Diplommatina gowllandi* Brazier.
Famarinia gen. nov.: type *Diplommatina egregia* Hedley.
Omphalorissa gen. nov.: type *Georissa multilirata* Brazier.
Ditropisena gen. nov.: type *Cyclophorus macleayi* Brazier.
Suavocallia gen. nov.: type *Callia splendens* Dohrn.