

## AUSTRALIAN COWRIES: PART II.

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By TOM IREDALE.

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(Plates xxvii.-xxix.)

Since the publication of the first part (Vol. viii., pp. 96-135, 1935), there has been continued progress with our information regarding Cowries, from intensive collection in Australia, and from the publication of a complete resumé of the Cowries of the world gained from study of European Museum collections alone. This resumé has appeared in the Proceedings of the Malacological Society of London (Vol. xxiii., pp. 119-231, 1938-39) under the title of "Prodrome of (sic) a Monograph on Living Cypraeidae", by Drs. F. A. & M. Schilder. Obviously there must appear many discrepancies in results achieved by these very different methods of approach, and attempt at reconciliation is here undertaken.

The Drs. Schilder (husband and wife) have been working on dead Cowry shells for almost twenty years, and have examined about 60,000 specimens from 2,200 localities, about eighty (80) public and private collections being searched, while the literature, extending to some 2,500 papers, has been catalogued. Such a mass of information is now made available to all workers, and nothing but praise must be given to the authors for this excellent research. This must be emphasized as otherwise my many criticisms may be misunderstood.

The emendations now offered are mainly the result of local field experience, and are all intended to be constructive, as the basis prepared by the Schilders is a very complete foundation. My own taxonomic knowledge enables the suggestion of some alterations, but the chief purpose of this part is the recording of new facts gained in the field. For most of these I am indebted to Messrs. H. Bernhard, A. A. Cameron, C. F. & J. Laseron, and H. S. Mort for local assistance; to my colleague, Mr. G. P. Whitley, for material from that difficult locality, Shark's Bay, Western Australia; to Mr. Melbourne Ward, the initiator of the earlier paper, who has been very energetic procuring a fine collection from Western Northern Territory; and to the Rev. and Mrs. W. Chaseling, who have made large and valuable collections about Yirrkala, Eastern Arnhem Land, Gulf of Carpentaria. These last two collections fill in the only lacunae on the coast of Australia, thereby paving the way for a List of the Marine Mollusca of Australia, a desideratum hitherto impossible of accomplishment.

I am continuing these notes in the order of the previous paper, but the Schilders have utilised a somewhat different arrangement, and in the next part I may attempt adjustment as some appears necessary in both cases.

For a couple of centuries, Cowries have been the delight of amateur shell-collectors, and their varied vivid coloration has caused the nomination of very many colour-varieties. The Schilders have catalogued 165 species only which they divide into geographical races and subraces, altogether ignoring the abovementioned colour variations. They have, however, endeavoured to make use of some of colour-varietal names for these geographical races with confusing effect. From experience, it is suggested



that many of the races be regarded as species, and the subraces as subspecies, and a still better picture of the Cowry world will be prepared.

Dealing with Australian Land Shells, I pointed out that ecological forms varied with climatic conditions, and that ecomorphs might be recognised as distinct from subspecies geographically so determined. Ecomorphs can only be separated by knowledge of ecological conditions, and generally these are unknown save to the field worker. It is difficult to recognise ecomorphs under marine conditions, but the Schilders have, unfortunately, introduced a term ecotype for a recurrent individual variation, not an ecological form.

Probably the Schilders' ecotypes sometimes represent distinct species, sometimes merely individual aberrations. This seems to have been realised by the Schilders, as in their final review they indicate "superspecies" as being equivalent to some of their species, and this certainly appears to be the case.

Notes of animals of Cowries collected at Little Manly and Vacluse in the winter of 1895 are here added through the kindness of Dr. G. A. Waterhouse, who has presented the notebook kept by his mother at that time to this Museum.

#### ZOOGEOGRAPHICAL DIVISIONS.

Although Australian zoologists have determined natural geographic limits for the distribution of our fauna, the Schilders have proposed a very superficial and artificial separation, which is comparatively useless. Thus we know that the marine fauna of Queensland is divisible into two, a mainland and a coral reef series, for which the names Banksian and Solanderian are in use. We further know that marine animals with free swimming larvae extend their ranges so that Cowries have a wider range than sedentary molluscs. Hence it is obvious that the Solanderian Cowries will occur not uncommonly along the Banksian stronghold, and even extend southward into the Peronian area. Instead of accepting these facts the Schilders have created a "Queensland Region", which they humorously separate into four, North, South, East and Central, the East being Lord Howe and Norfolk Islands, the South being New South Wales, the Central being South Queensland, and the North being Mid Queensland, North Queensland being named West Melanesia. Such a negation of common correct terms is inadmissible. This misuse of divisions and names is further emphasized by the fact that the same series of species is named in each division. Quaintly enough the Schilders have used the name Dampierian Region for the North and North-west Australian series, but here again a useless separation into East, Central, West and South is given, especially as there were comparatively few records.

"These lists of faunas should replace all earlier catalogues as they critically exclude evidently incorrect indications." On account of their unwise hyperdiscrimination of areas, 115 being cited, the lists are of little more value than the earlier ones, the artificiality of the areas negating their recognition. This must be the case always when attempts are made to discuss geozoological matters without knowledge of the regions concerned.

This obsession that every Region, however homogeneous the faunula may be, must be divided into four or five, has led to the nomination of a South Australian Region, whereas we use the names Flindersian and Peronian, for the South & South East. Having eliminated the Peronian, north New South Wales is called South Queensland, and south New South Wales



is regarded as east South Australia, while Tasmania becomes south South Australia. A curious commentary is that west South Australia is really south Western Australia, but marking Esperance as the artificial division, the Cowries from deep water in the Great Australian Bight in Western Australian waters become allotted to South Australia. Such contradictory terms only confuse the issues and certainly do not advance our knowledge in any sense.

#### DAMPIERIAN COWRIES.

The Schilders have accepted the Dampierian Region indicating four divisions, East for the Gulf of Carpentaria commenting "We have provisionally united this area with N.W. Australia, as we do not know any sufficient population of Cypræidae from the Gulf of Carpentaria"; Central from Port Essington to C. Jaubert; West from Port Walcott to Exmouth Gulf; while South is from Shark's Bay to Geraldton. The Dampierian Region is an indivisible entity, the species ranging from Torres Straits to Shark's Bay, one or two straggling southward to Cape Leeuwin. There is a curious little endemism present, especially notable in the case of *Zoila decipiens*. The Schilders have listed from N.W. Australia thirty-seven species, including *onyx* which does not occur; moreover they have recognised the distinction of such species as *helvola*, *caputserpentis*, *moneta*, *subviridis*, *isabella*, etc., while rejecting others which appear to show more differences as *poraria*, *pyriformis*, etc.

This note is, however, to record a series received from Yirrkala, Eastern Arnhem Land, the western side of the Gulf of Carpentaria, the locality whence the Schilders had no information. Subspecific names are not here used as in most cases the Yirrkala species agree with the Torres Straits' forms. The species determined are *Arabica arabica*, *Leporicypraea mappa*, *Lyncina vanelli*, *Ponda carneola*, *Mystaponda vitellus*, *Talparia talpa*, *Basilitronea isabella*, *Pustularia cicercula*, *Erosaria erosa*, *Erosaria tomlini*, *Erosaria metavona*, *Paulonaria macula*, *Evenaria asellus*, *Evenaria hirundo*, *Evenaria punctata*, *Palmadusta clandestina*, *Palmadusta bizonata*, *Gratiadusta walkeri*, *Solvadusta subviridis*, *Blasicrura rhinoceros*, *Palangerosa cylindrica*, *Erronea nimiserrans*, *Erronea caurica*, with half a dozen undetermined species. It will be noted some common Cowries are missing and that this is merely due to local ecological conditions, and such might be plentiful elsewhere in the Gulf.

It may be added that the very complete Lists provided by the Schilders may be supplemented. Oliver (Trans. N.Z. Inst., Vol. xlii., 1914, p. 126, July 12, 1915) has recorded from the Kermadecs *Cypraea caputserpentis*, *carneola*, *isabella*, *erosa*, *poraria* and *flaveola* (= *tomlini*), one of the very few records overlooked by the Schilders.

The Schilders named Lord Howe Is. and Norfolk Is. as Queensland East, and listed ten common species. To these may be added *Arabica arabica*, *Lyncina vanelli*, *Cypraea tigris*, *Basilitronea isabella*, *Nuclearia nucleus*, *Erosaria poraria*, *Erosaria helvola*, *Erosaria tomlini*, *Paulonaria fimbriata*, *Paulonaria microdon*, *Evenaria asellus*, *Evenaria kieneri*, *Palmadusta clandestina* and *Erronea caurica*. For this Region the name *Phillipian* has been introduced and this is preferable, as the islands are distinctly not appanages zoologically of Queensland, but the former is definitely an outlier of New Caledonia, i.e., the Montrouzierian Region, though of course the Cowry fauna would not show any exact relationship in either direction.



## SUPERSPECIES, SPECIES, RACES and SUBRACES.

The Schilders have attempted a systematic reorganisation of the group, eliminating the very numerous colour varieties and aberrations, and separating the species into geographical races, which are commonly called subspecies. In their zeal for subdivision of every species they have utilised factors of such variable value that in many cases specimens cannot be recognised by any of their features. It is therefore useless to indicate the subspecies in many cases, and though I am prejudiced in favour of geographical subspecies I am unable to accept, at present, their discrimination in the cases of many of the common species. This is due to their lumping of many well defined minor series to form a largely distributed subspecies, the features of these minor series negating each other in the larger group, and thus minimising the recognisable value of the latter. Unfortunately the Schilders have overlooked the very important item of type designation, which is absolutely necessary in the usage of geographical races. In the first part I designated some type localities as indicated by the references and these must be accepted as long as they are in accordance with the rules which govern animal nomination. In order to clarify the position I herewith designate the type localities that concern the Australasian Cowry Fauna, and as half the total number of species recognised throughout the world occur hereabouts this is most important. Curiously when they introduced new subspecific names the Schilders omitted such designation. While they rejected all colour varieties the Schilders have attempted to use names given to such in a subspecific sense. While this is praiseworthy it is unfortunately technically impossible, and in this direction revision is necessary.

I therefore designate type localities as follows:—

- Lyncina vanelli* Linné. No locality = Ceylon.  
*Erosaria eburnea* Barnes. China, error = Fiji Is.  
*Cribraria gaskoini* Reeve. No locality = Hawaiian Isles.  
*Bistolida stolidi* Linné. No locality = Ceylon.  
*Paulonaria beckii* Gaskoin. No locality = Philippines.  
*Paulonaria fimbriata* Gmelin. No locality = Mauritius.  
*Evenaria contaminata* Sowerby. No locality = Amboina.  
*Evenaria hirundo* Linné. No locality = Ceylon.  
*Evenaria kieneri* Hidalgo. No locality = Madagascar.  
*Evenaria punctata* Linné. No locality = Mauritius.  
*Evenaria atomaria* Gmelin. No locality = Amboina.  
*Palmadusta humphreyi* Gray. No locality = Amboina.  
*Palmadusta lutea* Gronow. No locality = Ceylon.  
*Palmadusta ziczac* Linné. No locality = Amboina.  
*Gratiadusta pyriformis* Gray. "New Holland" = Ceylon.  
*Solvadusta subviridis* Reeve. No locality = North Queensland.  
*Blasicrura quadrimaculata* Gray. No locality = Amboina.  
*Palangerosa cylindrica* Born. No locality = Amboina.  
*Erronea caurica* Linné. No locality = Amboina.

ZOILA EPISEMA, *sp. nov.*

(Plate xxvii., figs. 3-4.)

Mr. B. C. Cotton, Conchologist, of the South Australian Museum very generously forwarded me some of the rare Cowries from their collection, and I have to thank him and the Trustees of the Museum for this opportunity of recording some very interesting facts.



In the Proc. Linn. Soc., N.S.W., Vol. iv., p. 187, pl. 15, figs. 1-2, 1889, Cox figured a very beautiful shell said to have been picked up alive at Cape Naturaliste, South-west Australia. Although noting its superficial resemblance to *thersites*, Cox concluded it was a variant of the rare North Western *venusta*. It was acquired by Sir Joseph Verco, and is now before me. It is very similar dorsally to *thersites*, but has a white base, and appears to be the Western specific representative of that South Australian species. Cox's description and figure are good when compared with *thersites* alone, and the erroneous assumption of alliance with *venusta* is rejected. I have compared it with many subadult *thersites*, but it does not agree, and cannot be regarded as an aberration. The Schilders have named the Esperance shells recorded by Verco as a broad form of *friendii* (Pl. xxvii., figs. 1-2) and thereby associated the two distinct species *friendii* and *thersites* as one species, which they very definitely are not, the present species proving that.

#### MAURITIA MAURITIANA Linné.

When I gave the history of the occurrences of this species in Australia, I overlooked a Western Australian record. Mr. J. J. Bailey had received from Rowley Shoals, North-west Australia, specimens so determined, and a couple were presented by him to this Museum, and are small stunted shells of this species. Nearly fifty years ago, Lea (Proc. Linn. Soc. N.S.W., Vol. xix., p. 708, 1895) recorded *mauritiana* from this State as having been taken alive some years previously at Long Bay, near Sydney. On account of the time doubt, this record was rejected, but Mr. A. A. Cameron wrote me that a living one had been taken on the reef of the Sondon River, northern New South Wales, and later procured the shell for this Museum. It is a beautiful dark coloured full grown shell, and thus *mauritiana* takes its place in our local faunula. Re-examination of Lea's specimen shows it to be an immature, and his record may also be now accepted, as such immature shells are not commonly met with in commerce.

By means of mathematical formulae and intensive research the Schilders have separated this and many other Cowries into races, but their diagnostic characters are of little value at present, and until series available confirm them the racial names are not worth recording. This remark appears to apply to the following common species as regards Australia: *Mauritia mauritiana*, *Arabica arabica*, *Arabica scurra*, *Leporicypraea mappa*, *Lyncina vanelli*, *Ponda carneola*, *Mystaponda vitellus*, *Cypraea tigris*, *Talparia talpa*, *Arestorides argus*, *Basilitrona isabella*, *Nuclearia nucleus*, *Ravitrona caputserpentis* and *Erosaria erosa*. It is possible that subspecies may be recognised by the characters of the animals as in the case of *carneola*, but this will be a matter of time. With regard to *L. mappa* the Schilders record the typical race from "N. Australia" and use *viridis* Kenyon, a valueless colour varietal name for a Melanesian race said to occur in N. Queensland. So far the few specimens seen from N. Queensland have differed notably, while N. Australian specimens (from Yirrkala, Northern Territory) show even more variation. As regards *Lyncina vanelli* (= *lynx* olim.) the variation is so great that all attempt at differentiation has failed. From small places colonies of similar shells are commonly received, and at first sight these appear to show geographic significance, but almost at once additional specimens negative the suggestion. Thus the Schilders have used *caledonica* based on a New Caledonian specimen for all Pacific shells, but colonies from the New Hebrides are all small, stunted, crassate shells with a very pronounced blue wash, while specimens from the Paumotus are



large, thin and pale brown, the blue wash missing. As regards the basal carina, in the former it is very pronounced and sharp, in the latter it is ill marked and unnoticeable.

#### THE GENUS ARABICA.

(Plate xxviii., figs. 1-6.)

The Schilders have given a revision of this group allowing seven species, *scurra*, *eglantina*, *grayana*, *arabica*, *histrion*, *maculifera* and *depressa* with many subspecies.

With a good intention of utilising old names they retain names that should be rejected, and in this connection rectification is necessary. The matter is too complex to discuss at present, but they have erred in using my *westralis* for an Eastern race of *arabica*, and admitting *histrion* in West Australia. My *westralis* was proposed for the West Australian shell they record as *histrion*. It is probable that the Eastern shells may include representatives of *westralis* and also of *perconfusa*, and that these may be separated by animal features.

Mr. H. Bernhard collected a large shell 71 mm. long by 43 mm. broad at South Keppel Is., Mid Queensland, and described the animal thus: "Dark blackish brown, transparent mantle edges, shell visible through it; appeared to have raised lumps like warts but no filaments. Mantle base dark blood red, top of foot same colour as top of mantle". The shell looks like a large *perconfusa* and may be the eastern form of that species. For future reference, figures of the types of *westralis* and *perconfusa* are here appended. It may be recalled that the "*perconfusa*" style is well known from New Caledonia under the name *eglantina*.

The Schilders have separated three subspecies under *scurra*, the typical one being regarded as the Mauritius form, although I have designated Amboina, while they use *indica* Gmelin for the Amboina race which they tentatively allow to reach N.W. Australia, and then utilise *retifera* Menke for an East Polynesian race. The last name has been overlooked by Sherborn as by myself when we collated the Malsburg Catalogue, and in 2nd edition of the Synopsis it appears as a nomen nudum for a var. under *arabica*. In any case it cannot be used for a East Polynesian race, and at present the few specimens show so much variation that no stable features have been determined. However, according to the Schilders' formulae, the local shell has fewer teeth, a shell from Lady Elliot Island, Queensland, sent me by Mr. H. W. Hermann, of 40 mm. length, has only 28 columellar and 33 labial teeth. To maintain interest this may be named *E. scurra antelia* subsp. nov. (Pl. xxviii., figs. 5-6), and it may be noted that a West Australian specimen is narrower and has more teeth, while one from Samarai is slightly broader with similar teeth. This species is represented by single specimens mostly, whereas its congeners occur numerously and might even be called gregarious.

#### PONDA CARNEOLA Linné.

The Schilders separate this species into four races, allowing the typical race to range from Amboina (the type locality) into North-west Australia ("and Geraldton?"), and using *propinqua* Garrett for the "Botany Bay" race, reaching there from the Central Pacific. I observed that the animal of the Queensland shell was black, and that the animal of the Tonga Tabu shell had been so described. I have come across a record by A. Adams that



the animal in the East Indies was red, with numerous opaque, oval, white spots.

As *propinqua* was named from the Paumotu and Society Islands I designate the former as the type locality, and distinguish the local form as *Ponda carneola thepalea* subsp. nov. The shell reaches a large size, 65 mm., and thereabouts, the average size recorded by the Schilders being 33-35 mm., specimens of 74 mm. being regarded as giants and made a different species. The southern shell is very similar to the typical one, but seems to have fewer teeth and comparatively being a little broader. A small adult specimen, 36 mm. long, collected by Mr. A. A. Cameron at Heron Island, Capricorn Group, differs in the animal being black, mottled with grey, slightly more black than grey, foot of a fawn colour.

[PONDA SCHILDERORUM *nom. nov.*

Gray (Zool. Journ., Vol. i., p. 147, March, 1824) described and figured (pl. vii., fig. 6, pl. vii., fig. 6), *Cypraea arenosa*, from unknown locality, the shell being in the "Mus. Sowerb." A little later, in the Conch. Illus., Sowerby gave "Pacific Ocean, Annaa", as the habitat. Although the name has been used commonly since it is invalid, as Dillwyn, the year before, had published Solander's name of *arenosa* (Index Lister Hist. Conch., p. 33, 1823). No available synonyms of Gray's species exist, so I have great pleasure in introducing the above substitute, as a mark of my respect and thanks for the wonderful mass of research the Schilders have published on this group, an unrivalled boon to all students.]

CYPRAEA TIGRIS Linné.

The colour varieties of this species have been named, irrespective of locality, and these names are valueless for geographical usage. Some of the most luridly coloured forms are due to disease, but I found a series of pallid ones showing that in some cases the paleness was also disease caused. The Schilders have recorded three races, restricting *tigris* to the East African area correctly; using *pardalis* Shaw for another race with a range of Central Malaysia to Japan, etc., but this name is invalid, being a pure substitute for *tigris* from objection to the name *tigris* for a *spotted* shell; the third race is regarded as a Central Pacific one ranging to Hawaii and Gambier Is., and occupying the Queensland coast; for this race the Schilders have selected *lyncichroa* Melvill, a varietal name introduced for a coloured phase without any locality. There is no valid reason for the usage of this name, as any one of the five prior colour-names given at the same time is equally as applicable, and technically none is available. There is too much variation seen at present to allow distinction of sub-species.

Obviously *lyncichroa* is based upon the common diseased form which can be linked up with *flavonitens* and *russonitens*, and also *zymecrasta*. A series, from the Great Barrier Reef, shows all these variations along with an excellent series of *hinnulea*-like specimens.

THE GENUS PUSTULARIA.

This genus has been divided into three species with *mariae* and *tesselata*. The last addition is one of the most extraordinary of their actions, as no species is more distinct than this one, which has also a valid generic name, *Tesselata* Jousseaume. For *mariae* I proposed *Annepona*, giving *cicercula* as type of *Epona* H. & A. Adams, as reported by Melvill and others,



but I was unable to cite original type designation. I have a note that Weinkauff in 1881 designated *annulata* = *mariae* as type of *Epona*, and if this be verified, *Epona* must displace *Annepona*. I recorded *P. cicercula* and *P. globulus* from Queensland, the latter only from Western Australia. The Schilders have rejected *cicercula*, and in place included *Pustularia bistrinotata mediocris* (= *cicercula* Reeve, 1846), but Reeve's species came from the Is. of Annaa, and that island is selected as type locality. At the same time *P. bistrinotata sublaevis* was introduced for the East Polynesian race, and Kiener's figure of a Timor shell cited as illustrative, although Timor is included in the range of the typical *bistrinotata*.

As three species do occur in our seas these matters will be later adjusted.

#### RAVITRONA CAPUTSERPENTIS Linné.

I have been unable to distinguish races of this widely spread species, though the local form always impresses by its very dark coloration. Collections from various localities show so much variation that no stable character has been found. Yet the Schilders have separated seven races, even differentiating a West Australian form from the North-west one, and then an East Australian one as well. If these races can be confirmed later, their nomination must be reviewed as that used by the Schilders is definitely incorrect, their usage of *caputanguis* Philippi for the eastern one having no basis in fact. The name used for the North-west Australian species is also unacceptable. An animal collected at Long Reef, north of Sydney, N.S.W., by the Laserons is thus described: "Mantle greenish with a dense covering of mauve filaments with three to five branches. Foot pale ashgreen densely speckled with black towards border. Siphon pale green with white specks, fringed. Tentacles very pale heliotrope".

Mrs. Waterhouse described a Manly animal as "very dark chocolate, the mantle covered with tufts of brown", while A. Adams noted that in the East Indies the animal is a rich green-brown.

Mr. H. Bernhard found the colours intensified in a specimen he collected at Long Reef, the filaments being dark crimson and the tentacles red. The mantle was greenish overlaid with blackish dots and splashes, edge of mantle dark brown.

#### EROSARIA EROSA Linné.

(Plate xxvii., figs. 5-6.)

The Schilders have separated this species into six races and have used *purissima* Vredenburg for the Australian shell, which they diagnose "aperture dilated throughout and very wide in front . . . teeth more distant as they are less thickened. . . ." There is too much variation seen in this locality to delimit a race, as in some places the aperture is very narrow and the teeth very thickened; some shells are large, some small, with every feature inconstant. No pure white shell has ever been seen, and Vredenburg's specimen, although labelled Moreton Bay, did not come from that place. To make matters worse, the Schilders have utilized a series of varietal names given to Melvill for their so-called geographical races. Thus Melvill introduced *phagedaina* for a variety "without the vivid lateral blotches" and *chlorizans* for a dwarf form with "lateral blotches conspicuous". The Schilders have allotted these names to a Malaysian race to Japan, and to a Melanesian one, though neither agree in any sense with the diagnoses of the colour varieties alone. It may be noted that West



Australia is associated with East Australia in the range of "*purissima*", but Western shells are large and stout and may represent a distinct race. A Queensland shell selected at chance is here figured, but so far no distinctive features have been determined. A series from North-west Is., Capricorn Group, Queensland, shows a very narrow, almost linear, aperture.

EROSARIA PORARIA Linné.

(Plate xxvii., figs. 11-12.)

Mr. A. A. Cameron sent down a specimen of *poraria* for confirmation; it was exceedingly large, and upon reference all the New South Wales shells available are of the same large size. In the case of *poraria* the Schilders have divided the species into two, a Pacific and an Indian Ocean one, the latter being typical, and to the former they allotted a name, *scarabaeus* Bory. The latter is obviously unavailable, as it depends upon an unrecognisable picture, without locality. The Schilders regard the two forms as of equal size, form and appearance, the distinction being based on form, apertural characters and colour, 16:68:22:16 and 16:69:22:17. Consequently, as there are two or three separable subspecies in the Pacific, the New South Wales form is here named and described, the Cameron shell above-mentioned being taken as type. It is 25 mm. in length with 17 mm. in breadth (68%), and has 19 labial teeth and 15 columellar teeth, the base lilac, the teeth white, anteriorly the aperture widens, and each side is hollowed, altogether the aperture is comparatively wide. The edges are pitted, the right edge margined. The terminations are mauve, the back brown with numerous dull white spots, a dorsal line well marked. This may be called *Erosaria poraria theoreta* subsp. nov. New Caledonian shells appear to be smaller.

EROSARIA WILHELMINA Kenyon.

(Plate xxvii., figs. 13-14.)

The type of this species has been sent from the South Australian Museum for examination, and I find it to be a small pallid shell, which may be a pale aberration. It was well described by Mrs. Kenyon, who stated she had four others agreeing, so that this form should be kept distinct until more material is found exactly determining its status. The specimen is stout, well adult and is not albinistic in any sense, and the teeth are strong, differing appreciably from those of the eastern shells named *poraria*.

EROSARIA HELVOLA Linné.

This species has been separated into seven races by the Schilders, the typical race being given as ranging from "N. Malaysia to Cocos Is., etc.", though I had given as the restricted type locality, the Maldive Is. They use *callista* Shaw, 1909 = *agassizi* Ladd, 1934, for a race, "Polynesia to Henderson Is., Caroline Is., Torres Straits and Sydney", a somewhat confused range. Ladd gave the name *agassizi* to a Fijian subfossil, while *callista* was given by Shaw (Proc. Mal. Soc. (Lond.), Vol. viii., p. 311, August 10, 1909), to a large shell from Tahiti, measuring 29 mm. by 18 mm., with white extremities. The formula presented by the Schilders for their race named *callista* reads 19:70:18:15 as against *citrinicolor* 24:67:19:15, with the others from 19 mm. to the large South African *meridionalis* 26 mm. in length. A complication has arisen in that Mr. G. P. Whitley collected a shell at Dirk Hartog Is., Shark's Bay, W.A., which is very dark and has the fine teeth of *citrina*, but has lilac extremities, not orange. Other W.A. specimens, as already recorded, are of *citrina* coloration, but with the coarse teeth of *helvola*.



The Schilders have separated this species widely from *erosa*, but the Hawaiian *kauilani* Kenyon, cited as a synonym of this species, seems as near *erosa* as it resembles *helvola*, and I would allot it to the former in preference.

#### EROSARIA NASHI Iredale.

The Schilders have rejected *flaveola*, even as I did, but have utilised *labrolineata* Gaskoin, with range "E. Malaysia to S.W. Java, Palau and Japan", a race, *helenae* Roberts, ranging from "New Britain and Samaray to New Caledonia and Suvorov Is."; *nashi* being used for "E. Australia, Botany Bay to Fitzroy Is." However, the North Queensland shell is very distinct from the Sydney Harbour species, which ranges into South Queensland. Roberts described *Cypraea helenae* (Amer. Journ. Conch., Vol. iv., p. 250, pl. 15, figs. 7-10, February 4, 1869), from unknown locality, measuring  $11\frac{1}{4}$  mm. by 5 mm. The North Queensland shell agrees superficially, but the description of the teeth does not exactly fit "teeth small, those on the outer lip strong, those on the inner lip not so strong, but more numerous", the figure showing twelve in each instance.

I would place *helenae* as an absolute synonym of *labrolineata*, save that the latter calls for brown lines on the base and bifurcated anterior columellar teeth. Therefore *helenae* would become the specific name of the white based form, and I designate Java as the type locality in order to clarify the position.

Mr. A. R. McCulloch collected a beautiful little shell alive on St. Crispin Reef, outer Great Barrier Reef, east of Cairns, North Queensland, and I am naming this *Erosaria maccullochi* in memory of this able and enthusiastic naturalist. The shell is small, measuring 12 mm. in length by 7 mm. in breadth, and is pale greyish green above marked with distinct white spots, the dorsal line broad and well defined. The dark terminal spots are ill marked posteriorly, pale but pronounced anteriorly, with a few lateral spots of brown; base shining white. The teeth are strong and stout, the anterior columellar teeth crassly flattened, the median ones thickened, the posterior ones produced, while the labial teeth are thick and pronounced; the teeth number thirteen in each case; the fossula recedes and only the anterior tooth crosses it, columellar sulcus obsolete. (Pl. xxvii., figs. 9-10.)

This is confirmed by a series collected at Michaelmas Cay, varying from 10.5 mm. to 19 mm. in length, the teeth varying in number, irrespective of size, columellar teeth varying from thirteen in a shell 16.5 mm. long to eighteen in a shell 17.5 mm. long, the labial teeth being fifteen in each case.

Apparently this is the coral reef representative of the southern *nashi*, which differs at sight in its browner coloration, larger size, more open mouth, and less crassate columellar teeth, bolder lateral spotting and stronger anterior blotches, but little posteriorly, the dorsal spots being comparatively smaller and more distant.

A curious matter is the location by the Schilders of this series and the *helvola* group under *Ravitronea* as a subgenus of *Erosaria*, as these look like miniature *erosa*, and the Hawaiian *kauilani* puzzled me as to whether it was *erosa* or *helvola*.

The animal of *nashi* was described by Mrs. Waterhouse as "very like heath, pink and sage green and tufted all over, and the foot not very long. It is more like *C. erosa* than any other".



## EROSARIA TOMLINI Schilder, 1930.

(Plate xxvii., figs. 7-8.)

A Lemurian Cowry was named *cernica* by Sowerby, and a similar looking shell was found at New Caledonia, and the same name was used for it. Schilder separated it subspecifically with the name *tomlini*, but I am using that specifically. Specimens have been collected in New South Wales, South Queensland, Lord Howe Is., Norfolk Is. and the Kermadecs. There is little difference seen in the few shells available, but none seems to be very close to the Mauritian *cernica*.

Schilder named *Erosaria cernica tomlini* in the Proc. Mal. Soc. (Lond.), Vol. xix., p. 51, March 13, 1930, from Lifu, New Caledonia, as a slender dwarf race with a maximum length of 23 mm., the type being 12.4 only. Later the Schilders gave the formula of the subspecies as 17:64:21:18, writing "smaller than *cernica*", whose formula was given as 22:69:20:17, but the above-mentioned shells are all larger, one from Kurnell, Botany Bay, reaching 27.5 mm. in length by 18 mm. in breadth with eighteen columellar teeth and twenty labial teeth; one from Lord Howe Is. 28 mm., Norfolk Is. 30 mm., and Kermadec Group 31 mm. A specimen from the Ilot Amédée, Noumea, New Caledonia, measures 28 mm., thus confirming the alliance of the series, while one from Bampton Reef is only 15 mm., though a crassate adult shell. Upon re-examining this series it seems best to give a name to this larger shell, citing the figured Newcastle specimen as type, calling the subspecies *E. tomlini prodiga* nov.

## EROSARIA PERCOMIS Iredale.

The Schilders questionably relegate this to the synonymy of *nashi*, commenting "The description and the figure of *percomis* are not sufficient to decide, whether it is a dilated *nashi*, or an Australian race of *cernica* allied to *tomlini*". It is neither for although it is dilated as typical *cernica*, it differs in lacking lateral spotting, and is quite unlike the local *tomlini*. The teeth on the inner lip are much more clearly cut, more regular, and not thickened anteriorly, columellar sulcus slight, with a couple of denticles only, no teeth crossing the sulcus nor appearing on the fossula. The mouth is notably narrower than that of *nashi* and the teeth are finer.

## EROSARIA METAVONA Iredale.

(Plate xxvii., figs. 15-16.)

Although I had correctly rejected *miliaris* Gmelin, the Schilders persist in its usage, this time for a Japanese shell, and then utilise *differeus* Schilder for a "Central Malaysia to Java, North Australia, etc.", race, and give *diversa* Kenyon as the name for the East Australian form ranging into North-east Australia. Mrs. Kenyon proposed her varietal name *diversa* for a shell supposed to have come from Shark's Bay, and it is not even certain that the name refers to this species. The only shell so far seen from Shark's Bay, Western Australia, is like *metavona*, but more pinched anteriorly and more elevated; it is dead, so that the exact coloration is unknown. It does not otherwise agree with Mrs. Kenyon's description.

Mr. Melbourne Ward collected *metavona* alive at Southport, South Queensland, and noted the animal recalled that of *erosa*, but unfortunately did not make a painting.

Specimens from the Northern Territory are similar to those from Torres Straits.



## EROSARIA EBURNEA Barnes.

When I compiled my List I had seen no Australian specimens, although the species, an unmistakeable one, had been recorded from Moreton Bay. Comparatively recently, Mr. A. A. Cameron picked up a handsome subadult shell at the mouth of the Clarence River, New South Wales, which he presented to this Museum. A little later he saw one in the collection of Mr. E. Hermann, which had been picked up on the beach at Ballina, a little further north still in New South Wales, which he persuaded Mr. Hermann to present to this Museum also. These appear to be broader than the New Caledonian shells, being 33 mm. by 22 mm., and 39 mm. by 25 mm. respectively. Fijian shells range from 37 to 41 mm. in length, and 23 to 25 mm. in breadth, while the New Caledonian shells grow much larger, measuring 45 mm. by 27 mm., 48 mm. by 28 mm., and 52 mm. by 30 mm., and thus represent a larger race, which may be called *E. e. mara* subsp. nov. Some Solomon Islands shells differ in shape, being more oval, recalling a refined *erosa* than the elegant pyriform *eburnea*, but they undoubtedly belong here. A few from the New Hebrides are smaller and stouter and may belong to another race.

Undoubtedly the species is quite distinct from *metavona*, although it belongs to the same small group. It is unfortunate that the Schilders should have used this group to illustrate specific and subspecific distribution (p. 225, fig. 9), as already their data must be revised.

## THE GENUS MONETARIA.

(Plate xxvii., figs. 19-28.)

The Schilders have published an exhaustive account of the Money Cowries allowing four species, many subspecies, and a series of ecotypes. They even separate the *annulus* group as a subgenus classing *obvelata* thereunder, while their second species of *Monetaria* s.str., is *icterina* Lamarck. While their results are excellent they do not show the variation and distribution of these animals in life. Thus the type locality of *moneta* is the Maldive Isles, and the typical form is a small shell with nodules above and below posteriorly. Rochebrune separated sixteen species, but unfortunately used the shells as counters, and thus gave a confused distribution while recording many false localities. In Australia there appears to be four species, "*moneta*", "*mercatorium*", "*icterina*", and *annulus*. The Schilders admitted three races of *moneta*, two Indian Ocean and one Pacific one. This is not at all true of the Pacific Ocean shells, as there is more than one species living therein.

The small nodulose species varies with subspecies of its own, while the large "*mercatorium*" may also be divided, and the small "*icterina*" occurs alongside. The only name available is *barthelemyi*, based on a New Caledonian aberration, and the name should be restricted to the New Caledonian race. In the field there can be no doubt that these are not due to any ecological condition, as they are found associated together, and are easily distinguished. Mr. Ted Dranga gave me specimens he had collected at I. Tutuila, American Samoa, and these prove very interesting as the *annulus* form shows a raised torus and thus becomes near *obvelata*. It may be called *Monetaria annulus dranga* subsp. nov. (Pl. xxvii., figs. 27-28), as it is a very important form. The species *obvelata* was reported by the American Exploring Expedition from Samoa, but this was rejected, as all shells from Samoa have been regarded merely as *annulus*. The aperture recalls that of



*obvelata* and the teeth are variable, but resemble those of *obvelata*. A medium sized shell measures 20 mm. in length by 15 mm. in breadth, and 10 mm. in height; it has eight columellar teeth and eleven labial teeth, and the torus is well raised but not enveloping the "*annulus*" area, as in *obvelata*. A smaller shell shows more envelopment, and a larger one less. Specimens from Luma, and Ta'u with a note "most common at Ofu, an island ten or twelve miles west of Ta'u, in the Samoan group", sent by Mr. Wray Harris, show the *obvelata* tendency, but it is not so noticeable at first sight, while the teeth are similarly few in number but more produced, and confirm the distinction from typical *annulus*.

The distinction between the "*mercatorium*" series and the "*moneta*" group is well seen in the Samoan specimens given me by Mr. Ted Dranga, and those sent by Mr. Wray Harris. Mr. Ted Dranga's shells from Tutuila are small, with four prominent dorsal nodules, the base strongly nodulose, the aperture open, the yellowish green coloration showing a faint transverse band only. The length of the shell is 22 mm., the breadth 16 mm., and the height 11.5 mm., the teeth on the columellar side being ten, the anterior six short, the posterior elongated, three of them producing strong conical tubercles; the labial teeth are also ten in number, but only two or three anteriorly are short, most of the posterior ones again producing strong nodules. The dorsal nodules differ in appearance from those of typical *moneta*, so that this Samoan shell may be called *M. monetoides* sp. nov. (Pl. xxvii., figs. 25-26). On the other hand the shells from Luma and Ta'u from Mr. Wray Harris are larger, broader, with the dorsal nodulation missing, while the broad base is smooth. The shell measures 29 mm. in length and 23 mm. in breadth with a height of 16 mm. The dorsal surface is pale creamy white with a central paler area surrounded by a yellow "*annulus*" line. The four dorsal nodules of the "*moneta*" form are faintly indicated only, while basally the aperture is very narrow, the columellar teeth, twelve in number, short, none produced, the labial teeth thirteen, slightly produced, but none nodulose. This is a very distinct form through showing the *annulus* markings and is here named *Monetaria harrisi* sp. nov. (Pl. xxvii., figs. 19-20), to signify its many differences. A Rarotonga shell, collected by Mr. A. A. Cameron, belongs to this species.

Mr. G. P. Whitley collected a series at Rarotonga, some large and broad belonging to *harrisi*, others small and narrow, and apparently referable to a smaller species. The shell is much narrower, pale greenish above without markings, the juveniles showing the three narrow cross bands associated with the *moneta* form. The dorsal nodulation is obsolete and the aperture is not so narrowed as in the larger species, the teeth coarser and the labial ones produced a little but not nodulate. These appear to agree with the common Queensland form in general, and suggest the *icterina* style rather than *moneta* typical. Michaelmas Cay shells are here described as *M. isomeres* sp. nov. (Pl. xxvii., figs. 21-22). A medium shell measures 25 mm. in length and 19 mm. in breadth, the dorsal surface pale green with signs of the narrow banding; the dorsal nodulation is never pronounced, although always indicated. The aperture is narrow but anteriorly a little broadened; the teeth are short, the base smooth, columellar teeth number twelve, the labial thirteen. Shells from the Capricorn Group, South Queensland, are larger and deeper coloured, the teeth in some cases being produced and even slightly noded, while shells from Murray Is., Torres Straits, are even deeper coloured and sometimes a little broader, but with the base smooth; these may be selected shells. Most of the shells collected in Queensland



appear referable to this species, and West Australian shells differ only slightly in that the anterior termination of the aperture offers a slightly greater declivity. They do not seem to be closely related to *moneta*, nor its eastern representative *monetoides*. Ellice Is. shells are similar to Samoan *monetoides*.

#### CRIBRARIA CRIBRARIA Linné.

(Plate xxvii., figs. 17-18.)

The Schilders allow four races, two Indian Ocean, one West Australian, and one other for the Pacific Ocean. For the lastnamed they use *melwardi*, which I proposed for a very distinct shell. Many specimens of *melwardi* are now before me, and its relationship with *cribraria* is admitted, but it is still a distinct species. In Queensland typically marked "*cribraria*" occur, while in New Caledonia the species grows to a large size, and shows a curious aberration, double spotting, advancing to multimarking almost obliterating the spots, and showing a dark brown netted appearance. Such cannot be correctly associated with the shining stout white *melwardi*, and therefore another name must be introduced.

As many large specimens occur in New Caledonia, a large one is selected for nomination as *Cribraria cribraria zadela* subsp. nov., a specimen from Hamilton Is., Whitsunday Group, Queensland, being selected as type. It measures 23 mm. by 13 mm., a norm of *melwardi*, being 21 mm. by 14 mm., it has the normal *cribraria* colouring, the dorsal line well marked, anteriorly more narrowed and posteriorly more produced. The mouth is more open, with the teeth coarser, thirteen columellar teeth and fourteen labial teeth, the columellar sulcus less defined, and the labial teeth more produced.

#### CRIBRARIA CUMINGII and GASKOINII.

According to the Schilders, *cumingii* is restricted to East Polynesia, while *gaskoinii* is an Hawaiian species. Consequently neither will occur in Queensland, and the species so recorded must be redetermined. The Schilders have introduced *catholicorum* for a Melanesian representative, but this has not yet been recognised.

#### STAPHYLAEA STAPHYLAEA Linné.

(Plate xxvii., figs. 23-24.)

The Schilders have separated *staphylaea* into four races, allowing *descripta* as the name for the East Australian race, admitting it may be larger than the Pacific race which they call *consobrina* Garrett. It will be found later that many races occur in these localities, especially as the Schilders range typical *staphylaea* from the Andamans to Japan and then include New Caledonia, but specimens from the lastnamed locality are very like some Queensland shells.

#### Genus BISTOLIDA.

1920. *Bistolida* Cossmann, Revue Critique Paléozool., 24th Year, p. 83, Oct.  
23. New name for *Stolida* Jousseaume, 1884, not *Stolida* Lesson, 1831.

When I proposed *Derstolida* I overlooked this correction by Cossmann, as the Schilders had not recorded it either. It of course dispossesses *Derstolida*, and is also older than *Blasicrura*, which the Schilders had associated with it. Under the subgenus *Derstolida* the Schilders arranged



the *hirundo-kieneri* series, which does not seem accurate judging from animal characters.

BISTOLIDA FLUCTUANS Iredale.

(Plate xxviii., figs. 7, 8, 9, 10.)

This name was proposed to replace *stolida*, which does not occur in Australian waters as yet. I write "as yet" because the Schilders appear to assume that the *stolida* picturesque markings are absent as they had not been recorded. However, it is possible that *deceptor* may be a distinct species, and that the normally coloured *stolida* like shells a third. How the Schilders transfer names is seen in this case as *brevidentata* was described from "Borneo", and they have allotted it to Australia, using *stolida* for the Borneo species. The small *fluctuans* shells appear very distinct from the *deceptor* shells, but the peculiarly coloured *stolida*-like shells provide a puzzle. These occur as far south as Caloundra, beautifully coloured shells at Keppel Bay, while the *crossei* state from Palm Islands appears to have been similarly coloured.

The Schilders place under *brevidentata*, as well as *fluctuans* and *deceptor*, *moniontha*, a varietal name only, and certainly not from Australia, and *irvineanae* from South-west Australia. The lastnamed is not known exactly and cannot be here located yet. A figure of *deceptor* is given (Pl. xxviii., figs. 7-8), and of the "*crossei*" specimen from Palm Islands (Pl. xxviii., figs. 9-10).

TALOSTOLIDA TERES Gmelin.

(Plate xxviii., figs. 15-16.)

I recognised both *teres* and *subteres* from Australia, but the Schilders have restricted the latter to South-east Polynesia. There are two species here, as Mr. H. W. Hermann collected them together at Lady Elliot Island, South Queensland.

For the local form of *teres*, the Schilders use Links' *subfasciata*, a name given to a specimen in the Mus. Feldmann, from unknown locality. As the shell was illustrated in 1769, it is obvious that the shell must have come from Mauritius, as it shows a broad shell. Local shells are notably narrower, and the lateral spots fewer, the columellar and labial teeth both numbering twenty-one in a shell measuring 30 mm. long by 16 mm. broad. It may be called *T. teres pentella* subsp. nov., the type being a Lady Elliot Is. specimen (Pl. xxviii., figs. 15-16).

Mrs. Waterhouse has described the animal of a Port Jackson specimen as "the animal did not come out of the shell and was very little extended, but the foot was a rather pale orange colour with the mantle a little deeper".

The smaller Lady Elliot species is named *T. subteres hermanni* subsp. nov. (Pl. xxviii., figs. 13-14), as it measures 19 mm. long by 10 mm. broad and has also 21 columellar and labial teeth. It agrees in coloration with Sowerby's figure (*subteres*), but is broader, and according to the Schilders that shell has "extremely fine teeth".

PAULONARIA MACULA Angas.

(Plate xxviii., figs. 11-12.)

The Schilders have transferred *macula*, *fimbriata*, etc., from *Paulonaria* to the subgenus *Melicerona*, which they place under *Palmadusta*, for some



unknown reason rejecting *Evenaria*. Their location under *Melicerona* is not at all natural, and it would be better to separate the *minoridens* series as *Opponaria* gen. nov., and propose *Cupinota* gen. nov., with *macula* as type.

The shell listed, with doubt, as *fimbriata* appears to be *minoridens* Melvill, and the cylindrical small size, the more open mouth, especially anteriorly, the prominent columellar teeth and almost obsolete posterior teeth on the inner lip, the very short labial teeth all distinguish the group from the *macula* series. The columellar features easily separate both from *Melicerona*, the juveniles of which are characteristic.

The name *minoridens* was brought in as a substitute for *microdon* of authorities not of Gray, but Melvill did not name any type locality. The Schilders also failed to select a locality, but figured a shell from Lifu, whence also Melvill had specimens, so I designate Lifu as the type locality of *minoridens* Melvill (Journ. Conch., Vol. 10, p. 119, Oct. 1, 1901).

The genus *Opponaria* includes *fimbriata* Gmelin, *microdon* Gray, *ser-rulifera* Schilders, *waikikiensis* Schilder, and *minoridens* Melvill as listed by the Schilders under *Melicerona*.

The Schilders have divided *microdon* into three races, restricting the typical form to "S. Malaysia to Andaman Is. and Philippines", although it had been described from the Pacific Ocean. As it was also in the Mus. Stutchbury, I designate Fiji as the type locality, and name the Philippine Is. form figured by Reeve, *microdon katha* subsp. nov.

To come back to the *macula* series, the Schilders have arranged these under *gracilis*, allowing *macula* subspecific rank with range "E. Australia to Botany Bay and Shark's Bay", with a comment, "Later investigations will possibly prove the N.W. Australian shells to be distinct". Specimens, from Yirrkala, Northern Territory, are very like local ones, but the Shark's Bay shells are smaller and paler, and may be named *C. macula hilda* nov. (Pl. xxviii., figs. 11-12). The Schilders wrote, "Ecological varieties . . . in *macula* there is a smaller variety (*irescens*), which is more ovate with the terminal spots still more reduced than in large pyriform shells". This is rather a variable species on the East Coast and the small shells are not ecological varieties, while *irescens* is not a valid name.

I recorded a large pyriform specimen as *cholmondeleyi* as that was named from Australia, but the Schilders, apparently from examination of the type, now record the name as a synonym of *notata*, indicating that the locality given was incorrect. Until more specimens are received the local specimen is laid on one side.

The local specimens of *minoridens* are separated subspecifically as *O. m. blandita* nov. (type from Port Jackson) (Pl. xxviii., figs. 17-18) as they differ in their larger size, less projecting posterior extremities, less pronounced inner columellar ledge and also their greater proportional breadth.

#### CUPINOTA HAMMONDAE sp. nov.

(Plate xxviii., figs. 19-22.)

Mr. A. A. Cameron sent me down an immature shell which I could not determine, and then later secured another one from the same collector, Mrs. Hammond, a beautiful little adult shell, collected at the Clarence River, northern New South Wales.

In all generic details the adult agrees with *macula*, but is coloured in a different style.



It measures 18 mm. in length by 11 mm. in breadth and 8 mm. in height. The dorsal surface is creamy white densely, evenly freckled with pale yellowish brown, a median brown band indistinctly indicated. The extremities are tinged with pinkish lilac, an umbilical brown spot, the sides with a few dark brown dots, massed in the middle on the left side and scattered on the right side. The base is also creamy, the lateral dotting extending on the base on the left side. The aperture is of median width, the short labial teeth numbering sixteen, the columellar teeth fifteen, the anterior four or five stout and crossing the slight columellar sulcus, the remainder shorter and becoming obsolete posteriorly.

The juvenile is a cream shell with the outer lip just inturned and shows dorsally six narrow lines of squarish dots. An adult specimen was collected at Woolgoolga, N.S.W., years ago by Mr. C. F. Laseron and was unnamed, as it had suffered a slight fracture and this suggested that it might be an aberration.

A specimen from Yirrkala, Northern Territory, belongs to this species.

#### EVENARIA ASELLUS Linné.

(Plate xxviii., figs. 25-26.)

The type locality of this well known species is "Amboina" as the name is taken from Rumph, at the reference given by Linné. Unfortunately the Schilders have neglected this fact, and used *asellus* for the Mauritius race, *vespacea* Melvill, given to a colour variation, for the Amboina subspecies, *bitaeniata* Geret, based on a freak colour only, for the Queensland form, and *latefasciata* proposed for the southern New South Wales race. This lastnamed is very distinct, being large with very dark broad bands, and attracts attention at first sight. It is, however, difficult to separate North Queensland shells from Northern Territory shells, and the latter must be very close to the typical race. Geret's name was given to a colour abnormality only with two bands instead of three, and should be dismissed as such. A Northern Territory specimen is figured showing the narrow dark bands as in Rumph's illustration. The northern shells differ in the prolongation of the posterior columellar teeth half way across the base, the southern *latefasciata* lacking this feature.

#### EVENARIA HIRUNDO Linné.

(Plate xxviii., figs. 29-31.)

The determination of this species has varied during the ages, but now it is accepted that Petiver's illustration refers to the species Sowerby distinguished as *neglecta*, and that Sowerby's *hirundo* be named *kieneri*. The Schilders have utilised this view, and admitted two other species, *owenii* and *ursellus*, defining subspecies in all the species. It is unfortunate that their names are not acceptable, but the truth is that the basis of the name *ursellus* is a *kieneri* form, and apparently will displace the later one, Schilders *ursellus* then taking the name of *coffea*.

The three species occurring in East Australia may be recognised by the features indicated by the Schilders, viz., *hirundo* is a plump medium sized (for the group) shell, the dorsal surface being bluish grey with a couple of small white markings towards each end and with the columellar teeth crossing the base; *ursellus* (= *kieneri* Schilders) is cylindrical, with the white markings more extensive leaving curiously shaped coloured markings, and the teeth of the inner lip only cross the base posteriorly, the anterior



teeth being short; *coffea* (= *ursellus* Schilders) is smaller, more pyriform, anteriorly a little narrowed and posteriorly the ends produced, the dorsal area showing coloured blotches not unlike those of the preceding species, but all the teeth of the inner lip are produced across the base.

The Schilders have introduced a new subspecies of "*kieneri*", viz., *schneideri* for the form with a range "Melanesia to Geelvink Bay, Mapia Is., and E. Australia to Sydney". The type locality must be New Britain, as on p. 121, the Schilders stated they dedicated the race to P. Joseph Schneider, who collected Cowries in that locality. A topotype shows differences from New South Wales specimens so the latter are differentiated as *E. ursellus marcia* subsp. nov. (Pl. xxviii., figs. 23-24). In this form only three or four of the columellar teeth, the most posterior, are produced across the base, the type measuring 15 mm. in length by 9 mm. in breadth, being a shell collected, with many others, by Mr. A. A. Cameron at the Clarence River beaches, northern New South Wales.

All the eastern shells so far seen from many localities are small, so that *kieneri* may be retained for the large East African form almost an inch long, and the difference in the teeth may allow it specific value. It shows the same number of teeth in a shell almost twice the size, and there are other minor differences as indicated by the Schilders. From the description and locality it is obvious that Schilders' *depriesteri* is the typical *ursellus* of Gmelin, based on Rumph t. 39, fig. O, the markings agreeing, when it is remembered that the figure is reversed.

As a subspecies of "*ursellus*" = *coffea*, the Schilders introduced *amoeba* from "Melanesia from Eitapé and Port Moresby to New Caledonia" as being more pyriform and more inflated, with the lateral spots rather obsolete; its central labial teeth do not attain the lateral callus, which is crossed by the posterior teeth only.

A series from Michaelmas Cay belongs to this species, but the shells do not exactly agree. According to the Schilders' formula there should be 15-16 columellar teeth and 20 labial teeth in a 10 mm. specimen, but the Queensland shells have 12-13 columellar and 15 labial teeth in a 12 mm. shell. The type locality of *amoeba* is here designated as Eitapé, and the Michaelmas Cay subspecies named *E. coffea endela* subsp. nov. (Pl. xxviii., figs. 36-37).

For the Melanesian expression of *hirundo* the Schilders have used *rouxi* Ancey for which there is no illustration cited. For the North Australian shell with an apparent range from Shark's Bay, Western Australia, Northern Territory, Queensland, and northern New South Wales, I propose *E. hirundo cameroni* subsp. nov. (Pl. xxviii., figs. 29-31), but it may be a distinct species. Many dead shells are available from Yirrkala, Northern Territory, and living ones from Lindeman Is. and dead ones from the Clarence River, New South Wales, collected by Mr. A. A. Cameron. The general features have been given above and the colour markings are here shown, the type, the living shell measuring 19 mm. in length by 11 mm. in breadth, columellar teeth sixteen, labial teeth eighteen in number from Lindeman Is., Queensland.

Mr. A. A. Cameron has also given me a specimen collected at Northwest Island, measuring 21.5 mm. in length by 15 mm. in breadth. It is dead, but shows more lateral spotting than the preceding, and apparently represents a different form, which may be called *E. peropima* sp. nov. (Pl. xxviii., figs. 38-39).



Dautzenberg has named Weinkauff's figure of a similar broad shell from Borneo, var. *abbreviata* (Journ. de Conch., Vol. 50, p. 311, 1902).

EVENARIA PUNCTATA Linné.

(Plate xxviii., figs. 32-35.)

I allowed two species in Queensland, *punctata* and *atomaria*, but the Schilders have lumped these into one, with four races, restricting *punctata* to the Eastern Indian Ocean, using *atomaria* for a Western Indian Ocean race, introducing *iredalei* for a South Melanesian race, citing the Lindeman Island figure, and adding *trizonata* Sowerby for an East Polynesian race. The lastnamed is certainly a distinct species, even from the Schilders' own remarks. While *iredalei* may be used for the shell I recorded as *atomaria*, the Michaelmas Cay shell I regarded as *punctata* is undoubtedly different, having many small spots dorsally, the posterior end not incrassate umbilicad, the teeth coarser and colourless, though more produced on the base. This may now be named *Evenaria persticta* sp. nov. (Pl. xxviii., figs. 34-35).

Although *punctata* appeared on the New South Wales List, this proves to have been due to an erroneous location of "Bird Is." Hedley associated this locality with an island near Port Stephens, whereas the Bird Island in the Coral Sea was intended by Brazier as corrected in the Australian Museum, where the specimen is preserved. However, we can still retain it, as *iredalei*, as Mr. J. C. Wiburd collected a lovely specimen alive at Brunswick Heads, Northern New South Wales (Pl. xxviii., figs. 32-33), and Mr. A. A. Cameron sent a dead one collected by Mrs. Alf. Fisher at the Clarence River, N.S.W.

EVENARIA CARULA sp. nov.

(Plate xxviii., figs. 27-28.)

Amongst a large number of small Cowries collected at Yirrkala, Eastern Arnhem Land, Gulf of Carpentaria, by the Rev. and Mrs. Wilbur Chaseling was a small shell recalling the *punctata-atomaria* series. Shell small, elegantly pyriform, measuring 10 mm. in length and 6.5 mm. in breadth. Coloration white, sparsely spotted with brown, a brown spot on the umbilicus and one on each side of the anterior extremity. In the *punctata-atomaria* shells such spots are small and insignificant, but in this shell they are notable while lateral spots are small. The base is white, the mouth narrow, the columellar teeth sixteen, half crossing the anterior columellar sulcus, but none extending on to the base and there are no yellow lines; the labial teeth number fifteen, short, yellow streaked. The anterior terminal ridge projects strongly. A dead specimen occurs among the Michaelmas Cay, Queensland, material. Comparison with specimens show *iredalei* to be a larger shell, more cylindrical with the posterior extremities calloused, umbilical dot and anterior dots almost negligible, while the yellow streaks on the base, both sides of the aperture are striking.

The mouth of *persticta* is more open, the columellar sulcus recessive, no yellow lines basally and the posterior columellar teeth are produced, the labial teeth numbering sixteen, the columellar fifteen, the shell measuring 16 mm. in length by 9.5 mm. in breadth.

PALMADUSTA CLANDESTINA Linné.

(Plate xxix., figs. 5-8.)

The type locality is Ceylon, and the Schilders have admitted four



subspecies, only one in the Pacific Ocean from Botany Bay to Rarotonga. For this complex they have utilised *candida* Pease, given to a Central Pacific aberration.

However, there appear to be recognisable subspecies in this area, as the series from the Great Barrier Reef are all smaller, and stouter than the mainland ones, while the name *candida* is applicable to neither.

A series from Michaelmas Cay, North Queensland, is composed of small solid pyriform shells, anterior end somewhat cramped, 14 mm. long, 9 mm. broad and 7.5 mm. high. The dorsal surface is shining white with three pale fulvous zones of equal width with narrow white intervals; the sides white, unspotted, thickly glazed. In the clean dead shells available the characteristic lining appears missing, and if it has ever been present it must have been very faint. The photograph shows it up. The mouth is narrow, fairly even, the ends a little produced, the columellar teeth, fourteen, extend half way across base and also internally, the columellar sulcus slight, a little recessive, the anterior teeth continuous across it, the posterior teeth not reaching across the fossula, while the labial teeth, sixteen, are produced about half way across the left side, although I was at first inclined to associate these with *artuffeli*, I am naming them *P. clandestina whitleyi* subsp. nov. (Pl. xxix., fig. 6).

Southern shells are larger, less solid, less pyriform, anteriorly broader, clouded but zoning indistinct, and zigzag lines notable and persistent even in dead shells; the teeth are less pronounced, coarser and, though the shells measure 19 and 20 mm. long, the number of teeth is the same, columellar teeth fourteen, labial teeth sixteen, as in the smaller shells. These may be named *P. clandestina extrema* subsp. nov. (Pl. xxix., figs. 7-8), the type coming from Shellharbour, New South Wales. As a feature of the African form of *clandestina* the Schilders have noted that the extremities are dorsally orange. No such coloration has yet been seen in Eastern Australia, but a specimen from Yirrkala, Northern Territory, is thus coloured and is also narrower than usual (Pl. xxix., fig. 5). More material is awaited to determine the significance of this difference.

After I had differentiated *Evenaria* for the *asellus* group, I added *Palmadusta* for the *clandestina* series, and the animal characters appear to justify this separation, though the shells are alike generally. The Schilders have suppressed *Evenaria* and used *Palmadusta*, which is technically incorrect. At present I am still allowing both genera, and if combination became necessary *Evenaria* must be used. Instead of combination I suggest there will be more subdivision as in the case of the *hirundo* series, and probably also the *humphreyi* group.

A figure of *P. saulae nugata* is here given (Pl. xxix., figs. 9-10), a still larger specimen having recently been collected at Hayman Is., Whitsunday Group, Queensland, by Mr. H. W. Hermann.

#### PALMADUSTA HUMPHREYII Gray.

(Plate xxix., fig. 11.)

Mr. A. A. Cameron wrote: "On Saturday, September 2, 1939, I found a live specimen at Iluka, Clarence River, N.S.W. The mantle was not quite scarlet, spotted with small brown dots, the same colour as that of the shell. The mantle is also covered with small brown filaments, some of which are thicker than others, the very fine ones being white; although the white filaments are distributed throughout the mantle the white is not very



noticeable due to the fineness of the filaments. The tentacles are the same colour as the mantle, the siphon very short. Another impression was that of a very bright *macula* with small brown dots on the mantle".

At Long Reef, north of Manly, N.S.W., Mr. Mel. Ward found a very young specimen, the mantle, covering the shell, being deep orange red thickly spotted with brown. The top of the foot was a little paler and thinly speckled with brown dots. The sole of the foot was also orange red, as were also the siphon and tentacles.

Many years ago Mrs. Waterhouse wrote "has a bright light red foot, the mantle a darker bright red with tiny white tufts and tiny speckles of black".

Mr. Cameron also sent a very beautiful juvenile shell which proved that this was very distinct from the North Western *bizonata* (Pl. xxix., fig. 12) as it was faintly banded with white but very densely speckled with brown (Pl. xxix., fig. 11).

PALMADUSTA ZICZAC Linné.

(Plate xxix., fig. 13.)

As no locality was given for this species, and as the Schilders have used the name for a race from S. E. Malaysia to Japan, I have designated Amboina. The Schilders have separated four races, and have utilised *vittata* Deshayes, for a form ranging from Melanesia to New South Wales. The name *vittata* is based on an illustration without locality, and our shells do not even agree with the figure. As locality of *vittata*, I designate Amboina, and thus relegate it to the synonymy from which it should not have been resurrected. The Schilders state that the Melanesian race differs from the Malaysian in coloration and slightly in form; specimens available are not sufficient to confirm the diagnostic features given, but a Clarence River shell is figured and named *P. ziczac signata* subsp. nov.

GRATIADUSTA PYRIFORMIS Gray.

This species was described without locality, and I accepted Sowerby's record of Ceylon, but the Schilders have questioned that locality, giving a range of "S.E. Malaysia and N.W. Australia to Queensland and Mergui Arch." without any subspecies, and synonymising *smithi* Sowerby and *kaiseri* Kenyon. The lastnamed, of which the type is before me is a very distinct species, while *smithi* appears also valid, and there is another easily separable form. Too many specimens are not available, but I have a suspicion that the curious *Ipserronea problematica* may be the juvenile of one of the species. The Schilders referred this to *Erronea* with which it obviously has no relationship, the juveniles of *Erronea* being very common and well known.

A shell from N.W. Australia, regarded as *smithi* is shaped like *macula* with similar lateral spotting, a black umbilical spot and a dorsal blotch. The underside shows a mouth, something after the style of *pyriformis*, the four columellar anterior teeth white, ten posterior fine and brown.

GRATIADUSTA KAISERI Kenyon.

(Plate xxix., figs. 16-17.)

The type of this species is preserved in the South Australian Museum,



and is now before me on loan. It was well described by Mrs. Kenyon, and should never have been synonymised. It differs at sight in lacking the banding always associated with *pyriformis*, only the reddish anterior columellar teeth recalling that species, but the fossula recedes more anteriorly, and the teeth are shorter, the columellar sulcus being slight. The aperture a little narrowed anteriorly.

Dead shells collected in Queensland at Seaforth, north of Mackay, and at Townsville, are larger and plumper, but have the same elegant shape, and very similar apertural characters, and apparently represent this species on the East Coast. They occur alongside large *pyriformis*, and seem very distinct, not micromorphs of that species.

#### GRATIADUSTA CONTINENS Iredale.

(Plate xxix., figs. 14-15.)

I described this as a subspecies of *walkeri*, and consequently the Schilders have used it as the East Australian representative, allotting *walkeri* typical to N. Lemuria, and naming *bregeriana* as a third subspecies. Recent collections have proved the validity of *continens*, and the occurrence of a form of *walkeri* living alongside, which has a black animal. Therefore we have two species in Queensland "*walkeri*", and *continens* with another species *bregeriana* in New Caledonia. The lastnamed is nearer *continens* in dorsal coloration than *walkeri* s.l., but can never be confused, the base coloration and white speckling being diagnostic. An adult specimen of *continens* collected at Peel Island, Moreton Bay, Queensland, has only a few lateral spots, dorsally a little clouded, but otherwise in close agreement with the type of *continens* measuring 33 mm. by 20 mm. The mouth is still open, the columella receding and only two anterior teeth crossing, no sulcus being present. The four anterior columellar teeth are strong and distant, the remainder being closely set, fine and long, but produced neither internally nor externally, the fine teeth number twenty, while the short stout labial teeth are about the same number.

The Schilders regard the Philippine Island shell as a subspecies of *walkeri*, and the local *walkeri* differs from that in coloration, and in teeth formation, but belongs to that specific form.

The "*walkeri*" shells collected in Queensland differ from *continens* in being small, more narrowed, and less pyriform. The dorsal surface lacks the dense spotting, speckling only occurring on the side near the margin where there are half a dozen brown spots. The general coloration above tends to shades of lilac with narrow whitish banding, one above the middle with a series of squarish brown blotches, the other below with a similar series on each side, the upper one only show a series above. The base is a rich fulvous, the teeth with purple interstices; the columellar teeth have three anterior larger and separated, and seventeen closer, long, and the most posterior produced; the labial teeth short, sixteen in number. The columella recedes as in the preceding species.

For the present this is named as a subspecies of *G. walkeri*, *merista* subsp. nov., the type measuring 23 mm. by 13 mm., collected at Hayman Is., Whitsunday Group, Queensland (Pl. xxix., fig. 20-21).

#### GRATIADUSTA XANTHODON Sowerby.

This beautiful shell has a very restricted range in East Australia only



on the mainland as yet; in some localities being almost common. The animal is a very beautiful one and has been described by Mr. H. Bernhard from specimens collected at Emu Park, Keppel Bay, Queensland, as follows: "Siphon and mantle brownish green, base of mantle pinkish, the branched filaments being bright red. Foot greenish white with brown dots. Edge of mantle black with white dots along it. Tentacles and siphon red, the latter fringed with white. Viewed from above the animal has a greenish hue".

SOLVADUSTA VATICINA Iredale.

(Plate xxix., figs. 18-19.)

I used this name for the Lindeman Is. animal, and allotted *subviridis* to the North and West Australian species. The Schilders have restricted *vaticina* to northern New South Wales, *subviridis* to North Queensland, and introduced *dorsalis* for the West Australian form (Pl. xxix., figs. 18-19).

Mr. G. P. Whitley recently collected a specimen at Broome, North-west Australia, crawling on the surface of a rock between tide marks on a hot day. Upon handling it the animal crawled actively over his hand, and he describes it as follows: "Mantle mottled rusty brown or cream with dark grey linear markings and warty processes. (These warty processes may be collapsed filaments.) Foot extended beyond shell, dull white, densely mottled with dark grey on top of extended portion. Anterior edge of foot showing linear markings, muzzle bright orange red, siphon brown, with paler fimbriate edge, tentacles orange yellow, darker towards base. Sole of foot dull white".

This is quite unlike the animal of *vaticina* (Austr. Zool., Vol. viii., pl. viii., fig. 9), but approaches fig. 8, which was tentatively allotted to *Erronea chrysostoma*. Apparently that figure must now be transferred to *subviridis*, and *vaticina* widely separated, although the shells are very easily confused. Juvenile shells of *vaticina* also recall those of the very different *pyriformis*.

MELICERONA MELVILLI Hidalgo.

(Plate xxix., figs. 22-26.)

When using Hidalgo's name I noted that our form was more elongate than Hidalgo's cited figure from "Amboina", and also recorded the occurrence at the Capricorns of pathological varieties of the New Caledonian style.

New Caledonia is famed for the curious aberrations of Cowries there found showing a strong tendency to rostration and melanism. These are due to some disease which attacks all the species and is almost restricted to the locality. Thus Dautzenberg has recorded (Journ. de Conch., Vol. 54, pp. 263-266, pl. ix., 1906) as being affected, *neglecta*, *caurica*, *stolida*, *mappa*, *eglantina*, *moneta*, *annulus*, *vitellus*, *lynx*, *errones*, *asellus*, *clandestina*, *punctata*, *cribraria*, *erosa*, *staphylaea*, *poraria*, *scurra*, *carneola*, *mauritiana*, *arabica* and commented "*tabescens elaiodes* Melvill is due to disease".

I have given this list as I find *melvilli* is not included, yet this is strongly attacked at the Capricorns, many specimens having been collected by Mr. A. A. Cameron showing melanism, humpbacked, and elongated aberrations. The same enthusiast has sent a large series from the Clarence River, New South Wales, which is composed of larger broader shells with a tendency to dark coloration, but not the melanistic diseased appearance, and no



rostrations occur. Southern shells are normal, and the animal of a specimen collected at Long Reef, near Manly, N.S.W., by C. F. & J. Laseron is described. "Mantle thin translucent brownish flesh, without filaments, towards the foot same colour as that, pinkish minutely spotted with brown, edge white with a darker line inside; anteriorly the foot has a wavy edge. The siphon is pale brown, fringed, the tentacles brownish red".

Reverting to the disease-stricken Cowries of the Capricorn Group, Mr. Cameron collected specimens of *erosa*, *vanelli*, etc., attacked in places, and *nimiserrans* and *caurica* showing darkened dorsal areas. But the most curious case is that of a fine *tigris* showing a broad white longitudinal band suggesting that the mantle supplying colour had failed to reach this area. Later Mr. Cameron collected shells of *vitellus* and *arabica*, alive, showing a similar broad longitudinal area, but in these instances the surface was eroded away, a feature not before seen in living Cowries.

For the form ranging through Amboina from the Andaman Is. to Japan, the Schilders have introduced *pauciguttata*, citing Hirase's Japanese figures as illustrative, so I designate Japan as the type locality. This will leave *melvilli* free for the Amboina form with restricted geographical limits, and I propose *M. melvilli velesia* subsp. nov. for the southern race, a Clarence River shell being selected as type measuring 21.5 mm. by 12.5 mm. (Pl. xxix., figs. 22-23). These average about 20 mm., the largest being 26 mm. by 15 mm., the columellar teeth being about 12 and the labial about 14 in number. The Capricorn Group shells are generally narrower through disease as here figured (Pl. xxix., figs. 24, 25, 26).

#### BLASICRURA QUADRIMACULATA Gray.

As this species was introduced from unknown locality and the Schilders have admitted three subspecies, restricting the typical one to "Central Malaysia, Luzon, etc.", I designate "Amboina" as the type locality.

The Schilders then proposed *garretti* for the race, ranging from Fiji to the Solomon Is. and Astrolabe Bay, and for this race I select Fiji as the type locality. The third subspecies was named *thielei*, the distribution being "Broome to Queensland (Lindeman Is.)" with the illustration of the Lindeman Is. shell given in the Austr. Zool., Vol. viii., pl. ix., fig. 6, being cited as exemplifying the race. I therefore designate this specimen as the type of *B. q. thielei*.

#### PALANGEROSA CYLINDRICA Born.

(Plate xxix., figs. 29-30.)

The Schilders have allowed two races, *sowerbyana* from North-west Australia, and *cylindrica* typical from "S.E. Malaysia to Jap, Japan, New Caledonia and Gilbert Is., Tahiti?" They suggest that the Pacific form may be distinct. Our West Australian shells do not agree with Sowerby's figures, 269-270, which moreover are localized as "Indian Ocean, Ceylon, Philippines" and the teeth "labii brevioribus (*cylindrica*) columellae brevissimis". I designate Ceylon as the type locality of *sowerbyana*. It may be pointed out that when Schilder introduced *sowerbyana*, citing only Sowerby's figures he gave as localities "S.E. Asien (Loy.-Bro.-Chi.)". As noted previously, West Australian shells are only very slightly different from typical "*cylindrica*", while East Australian ones appear to be very regularly cylindrical. The Schilders observe "they seem to be smaller, thinner, with the



aperture wider, the labial teeth more distant, and the columellar ones more numerous”.

This may be named *P. cylindrica lenella* subsp. nov. (Pl. xxix., figs. 29-30), the shells from Michaelmas Cay being small, as stated, the labial teeth numbering fifteen, stout and produced, the columellar nineteen, also produced, but thin, the shell measuring 23 mm. by 11 mm.; larger dead shells from the Capricorns reach 34 mm. in length. The Western shell measures 36 mm. by 19 mm., is ovate, the teeth less pronounced, and the same number, and this may be named *P. cylindrica sista* subsp. nov. (Pl. xxix., figs. 35-36). However, as cylindrical shells occur also in the North and North-west, this may be specifically distinct.

ERRONEA NIMISERRANS Iredale.

(Plate xxix., figs. 27-28.)

Unfortunately the Schilders have continued the misuse of *errones* for this species, and then classing all the Australian forms as one sub-species have used *cori* Brazier, given to a West Australian shell, which may or may not be an aberration of this group. I suggested in my previous account that there was much variation, and this is not yet correctly interpreted. However, there are two series occurring in Queensland, a larger and a smaller, and these appear to represent different species.

Mr. Melbourne Ward figured the animal of a Lindeman Island shell and this was named as above. However, the larger shells have a different animal and apparently also different juveniles. Mr. Mort tells me that the “*errones*” seen at Caloundra, Queensland, was branched as described by Quoy and Gaimard for *olivacea*. This was confirmed by Mr. H. Bernhard, who examined living animals at Emu Park, Keppel Bay, Queensland. “A large dark coloured shell, 38 mm. in length by 20 mm., showed a white body with black dots massed in some numbers giving a blackish appearance. Scattered over the mantle are many fine branched filaments of a very light yellow colour. Tentacles and mouth red. Siphon same colour as mantle with fine black hairs on edge. The foot white dotted with black more lightly than the mantle giving a grey mottled effect. Paler shells appear to have less black on mantle showing a lighter coloured animal”.

More recently the Lasersons collected a specimen at Long Reef, near Manly, N.S.W., and this was described thus: “Foot marbled grey and black with white specks. The mantle blackish grey with white specks and numerous fine bunches of bright yellow filaments”. It will be noted that all these differ from Mr. Mel. Ward’s specimen, and the accuracy of that description is confirmed by an account by A. Adams in the Voyage of the Samarang, which I previously overlooked. As to the shells a further study of available specimens has shown that a series collected at Michaelmas Cay, North Queensland, was composed of very small shells, about 18 mm. in length, a similar series had been secured at the Hope Islands, another series from Low Isles, about 22 mm. in length, while Capricorn Island shells were a little larger but still small, about 25 mm.

Beautiful large shells have been secured at Lord Howe Island, but Mr. A. A. Cameron has sent down a series showing variation, including large and small shells, showing a tendency to broadening. West Australian shells are generally broader, some comparatively very broad shells being found with a breadth of 65%. Probably some of these have been mistaken for *ovum* and *chrysostoma*, but there is no reddish coloration on the teeth,



while this is never missing on the Eastern specimens of *chrysostoma*. Along with these broad shells here occurs cylindrical shells to which *coxi* may apply, but this has not been proved.

It will be useful to designate these large shells as *E. magerrones* sp. nov., the Keppel Bay shell being the type (Pl. xxix., figs. 31-32), and regard the West Australian shell as a broader subspecies, *E. magerrones proba*, subsp. nov. (Pl. xxix., figs. 33-34).

#### ERRONEA CAURICA Linné.

(Plate xxix., figs. 1-4.)

The Schilders have separated no fewer than seven races of this species, allowing *longior* from North Australia, while they use *obscura* Rossiter for the Pacific form. However, *obscura* Rossiter given to a colour aberration from New Caledonia is invalid as there is a prior *obscura* Gaskoin. The Pacific "*obscura*" Schilders is very similar to *longior*, but the coarser and more produced teeth seem to separate it, while it does not grow quite so long. It may be renamed *E. caurica thema* subsp. nov. (Pl. xxix., fig. 12), the type being the New Caledonian "*obscura*" shell figured. The West Australian shells are notably broader, though otherwise showing the general features of Australian *caurica*, viz., length, lack of marginal thickening, short coarse teeth, and may be called *E. caurica blaesae* subsp. nov. (Pl. xxix., figs. 3-4).

#### OVATIPSA CHINENSIS Gmelin.

The Schilders have recognised the distinction of *Ovatipsa*, but have placed it as a subgenus of *Cribraria*, a location that appears very unsuitable. The nearest form seems to be *Erronea caurica*, especially as *coloba* is admitted as a second species of *Ovatipsa*, and there is on record a long discussion as to whether *coloba* was a variety of *caurica* or *chinensis*. The typical *chinensis* is allowed by the Schilders to range from Japan to N.W. Australia, and New Caledonia, assigning *variolaria* Lam. to Mauritius, etc., though I had designated Amboina as the type locality, and then they have introduced a new subspecies, *sydneyensis*, for the shell I recorded as *chinensis*, suggesting that it may have spread from another geographical centre. Obviously the only centre would be New Caledonia, and through the enthusiasm of Mr. A. A. Cameron I have received a fine specimen collected by Mrs. Alf. Fisher at the Clarence River. It agrees fairly closely with New Caledonian specimens, though it shows the fewer coarse teeth of the Sydney shell. A shell with a label "Torres Straits" agrees in teeth characters, but the back shows no lacunae, thus recalling the Mauritius *variolaria*.

#### EXPLANATION OF PLATE XXVII.

- Figs. 1, 2. *Zoila friendii vercoi* Schilder. Type.  
 „ 3, 4. *Zoila episema* Iredale.  
 „ 5, 6. *Erosaria erosa* Linné.  
 „ 7, 8. *Erosaria tomlini prodiga* Iredale.  
 „ 9, 10. *Erosaria maccullochi* Iredale.  
 „ 11, 12. *Erosaria poraria theoreta* Iredale.  
 „ 13, 14. *Erosaria wilhelmina* Kenyon. Type.  
 „ 15, 16. *Erosaria metavona* Iredale.  
 „ 17, 18. *Cribraria cribraria zadela* Iredale.



- „ 19, 20. *Monetaria harrisi* Iredale.
- „ 21, 22. *Monetaria isomeres* Iredale.
- „ 23, 24. *Staphylaea staphylaea descripta* Iredale.
- „ 25, 26. *Monetaria monetoides* Iredale.
- „ 27, 28. *Monetaria annulus dranga* Iredale.

EXPLANATION OF PLATE XXVIII.

- Figs. 1, 2. *Arabica perconfusa* Iredale.
- „ 3, 4. *Arabica westralis* Iredale.
- „ 5, 6. *Arabica scurra antelia* Iredale.
- „ 7, 8. *Bistolida fluctuans deceptor* Iredale.
- „ 9, 10. *Bistolida crosseii* aberration.
- „ 11, 12. *Cupinota macula hilda* Iredale (enlarged).
- „ 13, 14. *Talostolida subteres hermanni* Iredale (enlarged).
- „ 15, 16. *Talostolida teres pentella* Iredale.
- „ 17, 18. *Opponaria minoridens blandita* Iredale.
- „ 19, 20. *Cupinota hammondae* Iredale.
- „ 21, 22. *Cupinota hammondae* juvenile (enlarged).
- „ 23, 24. *Evenaria ursellus marcia* Iredale.
- „ 25. *Evenaria asellus* Linné.
- „ 26. *Evenaria asellus latefasciata* Schilder.
- „ 27, 28. *Evenaria carula* Iredale.
- „ 29, 30. *Evenaria hirundo cameroni* Iredale (living shell).
- „ 31. *Evenaria hirundo cameroni* (dead shell).
- „ 32, 33. *Evenaria iredalei* Sch.-Schilder.
- „ 34, 35. *Evenaria persticta* Iredale.
- „ 36, 37. *Evenaria coffea endela* Iredale.
- „ 38, 39. *Evenaria peropima* Iredale.

EXPLANATION OF PLATE XXIX.

- Figs. 1, 2. *Erronea caurica thema* Iredale.
- „ 3, 4. *Erronea caurica blaesa* Iredale.
- „ 5. *Palmadusta clandestina* Linné.
- „ 6. *Palmadusta clandestina whitleyi* Iredale.
- „ 7, 8. *Palmadusta clandestina extrema* Iredale.
- „ 9, 10. *Palmadusta saulae nugata* Iredale.
- „ 11. *Palmadusta humphreyii* Gray. Juvenile.
- „ 12. *Palmadusta bizonata* Iredale.
- „ 13. *Palmadusta ziczac signata* Iredale.
- „ 14, 15. *Gratiadusta continens* Iredale.
- „ 16, 17. *Gratiadusta kaiseri* Kenyon. Type.
- „ 18, 19. *Solvadusta subviridis dorsalis* Sch.-Schilder.
- „ 20, 21. *Gratiadusta walkeri merista* Iredale.
- „ 22, 23. *Melicerona melvilli velesia* Iredale.
- „ 24, 25, 26. *Melicerona melvilli*. Diseased specimens.
- „ 27, 28. *Erronea nimiserrans* Iredale.
- „ 29, 30. *Palangerosa cylindrica lenella* Iredale.
- „ 31, 32. *Erronea magerrones* Iredale.
- „ 33, 34. *Erronea magerrones proba* Iredale.
- „ 35, 36. *Palangerosa cylindrica sista* Iredale.





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