

# Preangerian (Late Miocene) Mollusca from a hill near Sekurau, northern Kutai, Kalimantan Timur (East Borneo)

## C. Beets

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Molluscan fossils deriving from the western foot of a hill near Sekurau, northern Kutai, were collected by Dr M. Schmidt in 1902 in a Late Miocene succession of clayey/sandy deposits with some limestones and sandstones, overlain by Pliocene coral limestones whose fossil content has been described before. Sixty Miocene species are discussed, their combined stratigraphic ranges strongly suggesting a Preangerian age (Tf3), the fauna perhaps being a little younger than the fauna of the Gelingseh Beds from Sungai Gelingseh (to be described in a forthcoming paper) and nearer in age to Muara Kobun, recently described. The fauna would appear to have lived under sub-littoral conditions. A few new species and a new subspecies are described: *Eunaticina visenda*, *Ancilla schmidti*, *Marginella vultuosa*, *Clathrodrillia kutaiana*, *Cythara zothecula*, *Dentalium javanum tutongense*, and *Portlandia carolimartini*.

C. Beets, Backershagenlaan 18, 2243 AC Wassenaar, The Netherlands.

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## Introduction

The molluscs which form the subject of the present paper were assembled just over eighty years ago by Dr M. Schmidt who around that time was engaged upon exploration work

in Kutai on behalf of the Royal Dutch Petroleum Company, now Shell Internationale Petroleum Maatschappij (S.I.P.M.). In 1920 all the fossils collected by Schmidt in Kalimantan were incorporated in the collections of the Rijksmuseum van Geologie en Mineralogie. Dr H. Gerth (1923) subsequently undertook the examination of the Neogene corals collected by Schmidt, L. M. R. Rutten, and others in the region, but the material labelled 'Hill near Sekurau' did not contain any corals.

As was pointed out many years ago by the writer (Beets, 1950d, p. 305), there has been some confusion in the literature concerning the name of this locality, which is the true 'Hill near Sekurau' and of a Miocene age, but actually comprises a number of outcrops in line at the foot of that hill, whereas what was known in literature under this name is in fact the 'Coral limestone, hill near Sekurau', referring to an overlying reef limestone formation undoubtedly of a Pliocene age.

This then, is the first time that any fossils from the Miocene near Sekurau are described. Therefore, it is high time to amend a most misleading statement which inexplicably slipped into the writer's earlier reference to the Miocene fauna as being an assemblage of 'dwarf' mollusca (Beets, 1950d, p. 305): this qualification should be discarded.

The 'Hill near Sekurau' is an elevation about 37 m high at the western end of a range of hills (Fig. 1 and also Gerth, 1923, sketch map on p. 43, for the general setting of Sg. Sekurau), about 2 km north of Kampung Sekurau. It was described by Schmidt in a geological reconnaissance report dated 7-2-1902 (actually in part 2 dated 3-3-1902) which was put at the writer's disposal by S.I.P.M. At the western foot of the hill occur NE-SW striking, light-coloured, massive to well-bedded clays and clay shales between limestone layers, the former often with a coaly admixture and with subordinate sandstones or calcareous sandstones. At many places the sandy-clayey deposits proved to contain a molluscan fauna (some of the shells are filled with fine-grained, sandy material). The fossils discussed below were collected along a line about 250 m long and running slightly obliquely to the strike, dips being around 24° to SE.

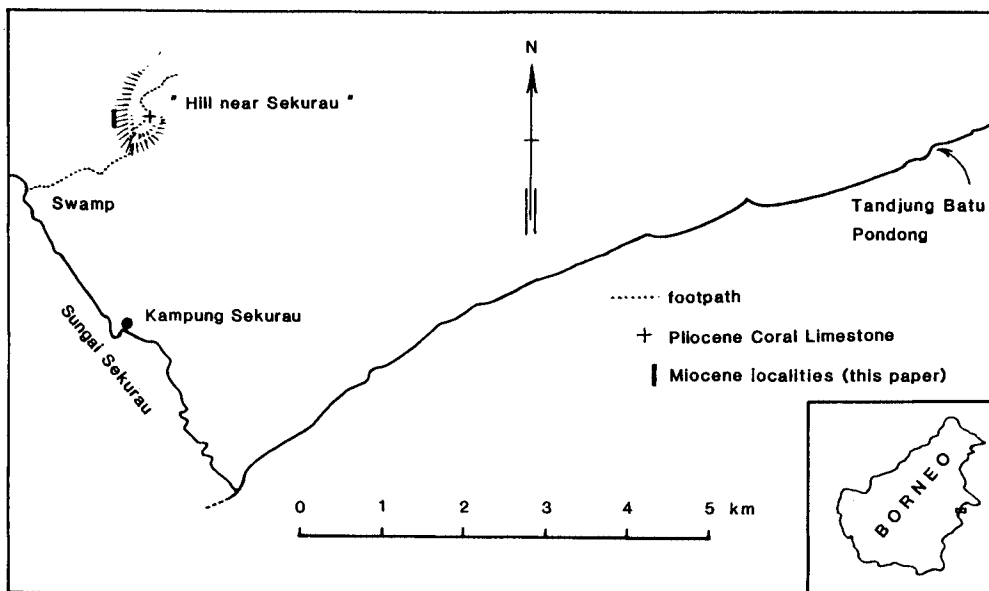


Fig. 1. Miocene and Pliocene localities near Kampung (village) Sekurau, scale 1:100 000 (inset showing approximate part of Borneo covered by the sketch map).

This succession is capped towards the top of the hill by Pliocene coral limestones up to, or even over, 10 m thick which at one place yielded fossils described by Gerth (1923, 1925), Jeannet & Martin, and the writer (Beets, 1950d, list on p. 314; see also van der Vlerk, 1925, table facing p. 31: Kembang Beds, d; and Krijnen, 1931, p. 535, loc. 175). Apparently, the Late Miocene is represented by a thickness of several tens of metres only and it remains to be seen whether or not a stratigraphical hiatus is present in the succession, which may involve part of the Upper Sangkulirang Marls and Menubar Marls as used by Leupold & van der Vlerk (1931, stratigraphic table and p. 620), and perhaps reach downward into the Gelingsseh Beds.

The splendid collection discussed below is of considerable interest. First, it is one of the more sizable and as such rather exceptional faunas derived from the Neogene of East Borneo, a valuable point of course for age determination. The assemblage is also exceptional for its containing few species which are new to science, while many faunas from the region contain much higher percentages of new species. In this case the new ones are: *Eunaticina visenda*, *Ancilla schmidti*, *Marginella vultuosa*, *Clathrodrillia kutaiana*, *Cythara zothecula*, *Dentalium javanum tutongense*, and *Portlandia carolimartini*.

A further point of interest is that, in contrast to most fossil molluscan faunas from the Bornean Neogene, the present one does not show a notable majority of gastropods over bivalves. Instead, there are almost as many bivalves as gastropods.

The fauna as a whole is most typically Indo-Western Pacific, its character being even more specifically Indonesian, with rare ties with the Philippines. Quite a number of the species have rarely been observed previously in a fossil state. Again, some are recorded here for the first time from Borneo.

### *Acknowledgements*

I should be most ungrateful and discourteous were I not to acknowledge the kindness and help I received from Dr W. Vervoort, director of the Rijksmuseum van Natuurlijke Historie, now retired, and his successor, Dr P. J. van Helsdingen, in offering all the facilities of their museum during the crucial years of completing my comparisons of fossil Mollusca with the Recent fauna.

Let me also say how grateful I am to Dr Gerda de Groot, Rijksmuseum van Geologie en Mineralogie, who has been most helpful in putting at my disposal such fossils from the museum as were required for putting the finishing touches on my comparisons of Bornean material with other Neogene Mollusca from Indonesia, started more than forty-five years ago.

Likewise, it is a pleasure to acknowledge the cheerful and efficient assistance rendered by the librarians of both museums, and the photographers of the Rijksmuseum van Natuurlijke Historie, whenever needed.

Finally, I am most grateful to Shell Internationale Petroleum Maatschappij, The Hague, for help in connection with various old fossil localities in Kalimantan.

## Conclusions

### AGE DETERMINATION

Following the usual line of approach, the percentage of living species may be considered first, in order to obtain an idea about the approximate age of the Sekurau fauna. Of course

this method has its drawbacks, its possible errors, moreover, apparently changing with the differences in composition of the faunas examined and the number of species, as well as facies conditions.

Of a total of 60 species appearing in the faunal list, 27 (28?) or 45-46.6? % are still living. Of Gastropoda exclusively (34 species), the number is 13 (14?) or 38.2-40.1? %; for Bivalvia (25 species), 14 or 56 %. Therefore, as matters stand, the Sekurau fauna might at first sight be considered Odengian in age. However, the overall percentage figure is not directly comparable with that of other faunas since there is a relatively high percentage of (long-lived) bivalves. Consequently, not much can be made of the fact that the overall percentage of living forms is quite appreciably higher than the ones obtained for such faunas as are known from the Gelingsch Beds and classical Preangerian, which yet appear to be of nearly the same age (see below).

The actual records of the species (53 considered here) show a distribution suggesting a Preangerian age:

Recent (RE)	: 27 (28?)	N.B. If Kama and Upper Gaj should turn out to be entirely Preangerian after all, the pre-Preangerian figure would be 4 lower, that of Preangerian 2 higher.
Quaternary (Q)	: 20 (22?)	
Pliocene/Quaternary (PQ)	: 15 (16?)	
Pliocene (P)	: 33 (34?)	
Late Miocene (UM)	: 12	
Preangerian (Pr)	: 42	
pre-Preangerian (pPr)	: 18	

The combined inferred time ranges of the species show the following distribution (Table 1).

Table 1. Time ranges of the Miocene molluscs from Sekurau.

	pPr	Pr	UM	P	PQ	Q	Re	
pPr	_____						Re	10
pPr	_____					Q		1
pPr	_____				PQ			1
pPr	_____			P	PQ?	Q?		1
pPr	_____		UM	P?	PQ?	Q?	Re?	1
pPr	_____	Pr						2
pPr	_____							2
		Pr						9
		Pr		P				7
		Pr					Re	10
			UM				Re	1
				P				2
				P			Re	1
						Q	Re	2
							Re	3
(a)	pPr 18	Pr 42	UM 32	P 34	PQ 24	Q 25	Re 27	(53 species)
(b)	8	32	22	24 35?	14 26?	15 27?	17 28?	(43 species)
				25?	16?	17?	18?	

(a) Number of species recorded in each zone.

(b) Excluding the ten longest ranging species.

Of 53 species taken into account the considerable number of 42 (79.2 %) occur in Preangerian deposits. Of these, 9 might even seem to be confined to that zone, were it not that 7 of them have been but rarely recorded and can in themselves hardly be

considered more or less indicative of a Preangerian age. However, *Laevicardium njalindungense* and *Cutellus dilatatus* seem to enhance the chances that we are indeed dealing with a Preangerian age. The fact that two species have so far been recorded

Table 2. Preangerian records of 42 species from Sekurau.

	a	b	c	d	e	gb	g	gr	gm	j	k	l	m	n	p	pt	pr	prx	lop
<i>Turbo ruttleri</i>	—	—	—	—	—	—	—	—	—	—	k	—	—	—	—	—	—	—	—
<i>Turritella cingulifera</i>	a	—	c	—	—	—	—	—	—	—	—	—	—	n	p	—	—	—	—
<i>Turritella talarensis</i>	—	b	c	d	—	gb	—	—	—	j	—	—	—	—	—	—	—	—	lop
<i>Rhinoclavis junghuhni</i>	—	—	—	—	e	gb	—	—	—	—	—	—	—	—	—	—	—	—	—
<i>Cerithium mang-</i> <i>kalihatense</i>	—	b	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<i>Rimella javana</i>	—	b	c	—	—	gb	—	—	—	—	—	—	—	—	p	—	pr	—	—
<i>Tibia verbeeki</i>	a	—	—	—	—	gb	—	—	—	—	—	—	—	—	p	—	pr	prx	—
<i>Natica helvacea</i>	a	b	c	—	—	gb	—	—	—	—	—	—	—	—	p	—	pr	prx	lop
<i>Naticarius marochiensis</i>	—	b	—	—	—	gb	—	—	—	—	—	l	m	—	—	—	pr	prx	—
<i>Phalium bisulcatum</i>	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	prx	—
<i>Murex djarianensis</i>	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	pr	—	—
<i>Alectrion ovum</i>	—	—	—	—	—	—	—	—	—	—	—	l	—	—	p	—	pr	prx	—
<i>Alectrion siquijorensis</i>	—	—	c	—	—	gb	—	—	—	—	—	—	—	—	—	—	—	—	—
<i>Buccinofusus?</i> sp.	a	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<i>Ancilla cinnamomea</i>	—	b	c	—	—	gb	—	gr	—	—	—	l	—	—	—	—	pr	—	—
<i>Vexillum javanum</i>	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	pr	—	—
<i>Mitra menkrawitensis</i>	—	b	—	—	—	—	—	gr	—	—	—	—	—	—	—	—	—	—	—
<i>Mitra sphaerulata</i>	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	pr	—	—
<i>Marginella elegans</i>	—	—	—	—	e	gb	g	—	—	—	—	l	—	—	—	—	pr	—	lop
<i>Lophiotoma brevicaudata</i>	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	pr	—	—
<i>Conus vimineus</i>	—	—	—	—	—	gb	—	—	—	—	—	—	—	—	p	—	—	—	lop
<i>Dentalium javanum</i> <i>tutongense</i>	—	—	—	—	—	—	—	—	—	—	—	—	—	—	p	—	—	—	—
<i>Anadara antiquata</i>	—	b	—	—	—	—	—	—	—	—	k	—	—	—	p	—	pr	—	—
<i>Anadara craticulata</i>	—	—	—	—	—	—	—	—	—	—	—	—	—	—	p	—	—	—	—
<i>Anadara ferruginea</i>	—	—	—	—	—	—	—	—	—	—	—	—	—	—	p	—	—	—	—
<i>Amussium hulshofi</i>	—	—	—	—	—	—	—	—	—	—	—	—	—	—	p	—	—	—	lop
<i>Chlamys senatoria</i>	—	—	—	—	—	gb	—	—	—	—	—	—	—	—	p	—	pr	—	lop
<i>Anomia verbeeki</i>	—	—	—	—	—	—	—	—	—	—	—	—	—	—	p	—	—	—	—
<i>Placuna ephippium</i>	—	—	—	—	—	gb	—	—	—	—	—	—	—	—	—	—	—	—	—
<i>Cycladicama oblonga</i>	—	—	—	—	—	—	—	—	—	—	—	—	m	—	p	—	pr	prx	—
<i>Glans boettgeri</i>	—	—	—	—	—	gb	—	—	—	—	—	—	—	—	—	—	—	prx	—
<i>Crassatella radiata</i>	—	—	—	—	—	gb	—	—	—	—	—	—	—	—	—	—	—	—	—
<i>Laevicardium njalindungense</i>	a	b	—	—	e	—	—	—	—	—	—	—	m	—	p	pt	pr	—	lop
<i>Cutellus dilatatus</i>	a	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	pr	prx	lop
<i>Azorinus coarctatus</i>	—	—	—	—	—	—	—	—	—	—	—	—	—	—	p	—	—	—	—
<i>Circe scripta</i>	—	—	—	—	—	gb	—	—	—	—	—	—	—	—	—	—	—	—	—
<i>Dosinia boettgeri</i>	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	pr	—	—
<i>Paphia neglecta</i>	—	—	—	—	—	—	—	—	—	—	—	—	—	—	p	—	pr	prx	—
<i>Placamen isabellina</i>	a	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<i>Corbula solidula</i>	a	b	—	—	—	gb	—	—	gm	j	—	l	—	n	—	—	—	—	—
<i>Corbula taitensis</i> <i>acuticosta</i>	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	pr	—
<i>Corbula tjiguhanensis</i>	—	—	—	—	—	—	—	—	—	—	—	—	m	—	—	pt	pr	—	—

The number of species in common with: a: 8 (19 %); b: 10 (23.8 %); c: 6 (14.3 %); d: 1 (2.4 %); e: 3 (7.1 %); gb: 16 (38.1 %); g: 1 (2.4 %); gr: 2 (4.8 %); gm: 1 (2.4 %); j: 2 (4.8 %); k: 2 (4.8 %); l: 5 (11.9 %); m: 4 (9.5 %); n: 2 (4.8 %); p: 18 (42.8 %); pt: 2 (4.8 %); pr: 21 (50 %); prx: 9 (21.4 %); lop: 8 (19 %).

a — Mandul	j — Tapani Langsat
b — basal Menkrawit Beds, L.114	k — Gunung Batuta
c — Lower Menkrawit Beds	l — Gunung Madupar
d — Upper Menkrawit Beds	m — Batu Panggal
e — Muara Kobun	n — Mentawir Beds s. str.
f — Pulu Senumpah, loc. 156	p — West Borneo
gb — Gelingsih Beds s.str.	pt — Pitogo, Philippines
g — Kari Orang, Witkamp	pr — Classical Preangerian, Java (Nj, Tj, Ta, Pa)
gr — Kari Orang, loc. 141, Rutten	prx — Other Preangerian, Java
gm — Gunung Mendong, Schmidt	lop — Lower Palembang Beds, Sumatra

exclusively from Kama, two from the Pliocene, two others not older than Quaternary, and three, finally, never before as fossils, stresses the point that much more data should come to hand before species individually be considered indicative of restricted stratigraphic units.

Again, that no less than almost 80 % of the species occur in Preangerian assemblages cannot fail to impress. However, the strong showing of Pliocene may be an indication that we are dealing with a fauna from a level higher up in Tf3 than the fauna of the Gelingsih Beds, possibly one comparable to that of Muara Kobun (Beets, 1983a).

Considering, finally, the relationships with other Preangerian faunas more closely, the following picture is obtained (Table 2).

It is perhaps surprising that so few species are in common with the majority of the faunas in the same region, were it not that similar results were obtained in the case of some of those assemblages. Again, while rather better relationships appear to exist with the Gelingsih Beds (gb) and West Borneo (p), the best ties are those with the distant classical Preangerian faunas of Java (pr). This too, has been observed in the case of other faunas (Beets, 1983a-c).

#### BRIEF REMARKS ON FACIES CONDITIONS

Unfortunately, as we do not know how the collecting of the molluscs was done, or what precisely derived from one and the same locality or level of a series of localities, not much can be concluded from the preservation of the shells except generalities. A large percentage of the specimens, and there are many fragile ones, has been damaged more or less due to natural causes (and perhaps here and there also by man), while some corrosion or abrasion has taken place. Other shells are surprisingly well preserved, implying that the deposition of clayey and sandy material covered them up rapidly. Apart from the obvious signs of damage due to wave action and transport, part of the damage appears to be due to sediment compaction.

Taking all in all, one would think of a not quite near-shore environment and indeed, the rather meagre bathymetric records seem to suggest a depth between near-shore and about 40 m, while the presence of *Cycladicama oblonga* and the Aloididae suggests brackish-water influence, the sandy/clayey deposition being quite compatible with the known habitat of a number of species, both fossil and Recent.

<i>Turritella cingulifera</i>	— 5-94 m.
<i>Cerithium nodulosum</i>	— 0-36 m, shore, reefs, rocky bottom.
<i>Natica helvacea</i>	— 27-36 m.
<i>Naticarius marochiensis</i>	— 9-72 m, shores, reef flats.
<i>Phalium bisulcatum</i>	— 14.5-411 m, coral sand, sand, sand and silt, sandy mud, clay and muddy bottom.
<i>Alectrion siquijorensis</i>	— 14-56 m, muddy bottom.

<i>Ancilla cinnamomea</i>	— 18-27 m, sandy bottom.
<i>Vexillum melongena</i>	— 0-56 m.
<i>Vexillum sanguisuga</i>	— 0-36 m, reefs.
<i>Mitra sphaerulata</i>	— 0-45 m, sandy bottom.
<i>Lophiotoma brevicaudata</i>	— 25-46 m, mud, shells, coral.
<i>Maoritomella batjanensis</i>	— 397 m, mud, stones, coral.
<i>Conus vimineus</i>	— 63-148 m, sandy or muddy bottom.
<i>Anadara antiquata</i>	— 0-55 m, sandy/muddy bottom.
<i>Chlamys senatoria</i>	— 9-82 m, muddy and other substratum.
<i>Placuna ephippium</i>	— very shallow water (muddy bottom), coral reefs.
<i>Placuna quadrangula</i>	— 2-55 m, mud, gravel, shells, sand with stones.
<i>Cycladicama oblonga</i>	— 9-36 m, muddy bottom, often in brackish water.
<i>Crassatella radiata</i>	— 2-55 m, sandy bottom, mud, clay, shells, sand banks, and stony bottom.
<i>Azorinus coarctatus</i>	— shore-51 m, sand, reef.
<i>Circe scripta</i>	— 2-62 m, mud, sandy clay, sand, shells, coral reefs.
<i>Placamen isabellina</i>	— very shallow water.
<i>Corbula solidula</i>	— 2-55 m, mud, sand, clay, shell débris.

When the data on depths in the above list, which does not pretend to be complete, are plotted, the results seem to indicate a sub-littoral depth of the habitat, say 15-40 m, while two species, *Phalium bisulcatum* and *Maoritomella batjanensis*, are not confined to this range at all (of the latter, of course, extremely little is known in this respect), while *Lyria overmanae* is known from the deeper water fossil fauna of Buton, the habitat of which was probably nearer that of the *Maoritomella* than the neritic zone.

### Faunal list and stratigraphic ranges

The abbreviations listed below correspond with the stratigraphical records of the fossils discussed in the next chapter. While in that chapter full use has been made of the abbreviations or names, their application in the faunal list has been restricted to the abbreviations shown on the left.

- Re — Recent  
 Q — Quaternary  
 PQ — Pliocene/Quaternary (e.g., Togopi Formation, N.E. Borneo)  
 N — Neogene, unclassified (e.g., Tji Gugur, Java)  
 P — Pliocene (Th approximately), including, e.g., Karikal (S. India) and 'Coral Limestone, Hill near Sekurau'  
 M — Miocene, unclassified (e.g., 'Early Miocene, Tf', Eniwetok and Junghuhn's loc. K, Tjidamar, Java)  
 UM — Late Miocene, in part (largely Tg, Odengian), including Tjidjarian near Tjiodeng, Java; Palabuanratu, Java; Antjam Beds, E. Borneo (L. 963, L. 640, Leupold); Upper Dingle Formation, Panay, Philippines; Tg, Palau; Talar Beds, Pakistan (possibly starting in Tf3)

#### Preangerian:

- Pr — Preangerian s. str. (Tf3), Java:  
 Nj — Njalindung  
 Tj — Tjilanang (loc. O of Junghuhn separately indicated)  
 Ta — Tjadasngampar  
 Pa — Parungponteng (= Selatjau)  
 NT — Preangerian equivalents, including:

- Java:  
 Bo — Bodjongmanik Beds s. str.  
 Tjikao  
 Tjikarang, Loc. R, Junghuhn  
 Tjilintung/Tjiangsana  
 Purwodadi/Wirosari  
 Preangerian part of Bodas Formation  
 West Borneo: SHELL collections, unpublished  
 East Borneo:  
 Sandakan Formation, N.E. Borneo (Shuto, c.s.)  
 Sebahat Formation, N.E. Borneo (Wong)  
 Mandul (van Holst Pellekaan), unpublished  
 Menkrawit Beds (basal: L.114; Lower: L.742, L.386, L.390, L.391; Upper: L.745, L.746) (Leupold)  
 Muara Kobun (Schmidt)  
 Pulu Senumpah, loc. 156 (Rutten)  
 Gelingsseh Beds (Source area of Sg. Gelingsseh; Sg. Gelingsseh, 'layers 1 & 2'; loc. 144, loc.149, loc. 150) (Rutten), partly published  
 Kari Orang (Witkamp)  
 Kari Orang, loc. 141 (Rutten)  
 Gunung Mendong (Schmidt), unpublished  
 Sekurau (this paper)  
 Tapian Langsat (Rutten)  
 Gunung Batuta (Rutten)  
 Gunung Madupar (Rutten, Wanner), partly published  
 Batu Panggal (Schmidt)  
 Mentawir Beds s. str. (Rutten)  
 Sg. Klindjau (Witkamp)  
 Sumatra: Lower Palembang Beds  
 Philippines:  
 Lower Pitogo Formation, Luzón  
 Lower Buluan Formation, Cagayan  
 Burma: Obogan Formation
- pre-Preangerian:  
 pPr — pre-Preangerian s. l. (Tf1-2):  
 UG — Upper Gaj and equivalents, apparently Rembangian going upward into Preangerian (in part), including localities in:  
 Sri Lanka (Ceylon)  
 India: Garo Hills, Assam  
 Quilon, S. India  
 Pakistan: Sind, Katch
- K — Kama, Burma, perhaps correlating with UG (including localities along Arakan Coast)  
 R — Rembang Beds, apparently extending upward into Preangerian (in part), Java  
 Rr — Rembangian equivalents:  
 Ra — Api Api, Pasir, E. Borneo (Goldschmid), unpublished  
 Tsk — Tandjung Sepada Ketjil, Pasir, E. Borneo (Goldschmid), unpublished  
 Rm — Madura (Gsell), unpublished  
 Rl — Langkang (van Holst Pellekaan), unpublished
- W — Westprogo Beds, Java  
 Ba — Badui Beds (= W + R), Java  
 LM — Lower Miocene:  
 East Borneo: Sumatrensis Limestone, loc. U. 24  
 Sumatra: Lower Telisa Beds, approximately equivalent to Westprogo, perhaps going upward into Rembangian  
 Burma: Pyabwe and Kyaukkok  
 Iran: Lower Fars  
 Madagascar: described by Lemoine (1906)  
 East-Africa: Pemba Island, Kenya, Mozambique, described by Cox





## Descriptions

The material is kept in the Rijksmuseum van Geologie en Mineralogie, the registration numbers being preceded by the abbreviation RGM. For stratigraphical data see the explanatory notes in the previous chapter.

### *Turbo (Marmarostoma) rutteni* Beets, 1942

*Material* — RGM 315 023-315 024.

*Comments* — The first number refers to a fairly well preserved specimen, height 25 mm, maximum diameter 24 mm; the second, to three damaged shells. The former is similar to the paratype of the species, having a comparatively high spire, while the biggest incomplete specimen matches the holotype perfectly.

*References* — Beets, 1942a, p. 231, pl. 25, figs. 5-10; Beets, 1981b, pp. 18, 23, 26.

*Range* — Preangerian: NT (Gunung Batuta).

### *Turritella cingulifera* Sowerby, 1825

*Material* — RGM 315 025.

*Comments* — Five fairly small specimens are available. I am strongly inclined to accept Shuto's opinion favouring *T. filiola* Yokoyama, 1928 as a subspecies of *T. cingulifera* rather than a full synonym (Shuto, 1969, p. 59), but may revert to the subject after a revision of the Indonesian material accessible to me (it is, incidentally, the typical form that occurs in the Rembang Beds and other Indonesian deposits rather than *T. filiola*). The species is also present in some undescribed collections in the RGM from New Guinea (Neogene), East Borneo (Mandul) and West Borneo.

*References* — Smith, 1910, p. 330; Smith, 1911, p. 376; Altena, 1938, p. 304; Beets, 1941, p. 191; Wissema, 1947, p. 34; Beets, 1950b, p. 279; Beets, 1950e, p. 330; Nuttall, 1965, p. 168; Beets, 1981a, pp. 4, 5.

*Range* — Early Miocene to Recent: R - NT (Mandul; Lower Menkrawit Beds, L.742; Mentawir Beds s.str.; West Borneo) - P - N - PQ (Togopi) - Q - Re.

### *Turritella talarensis* Eames, 1950

*Material* — RGM 315 026.

*Comment* — A damaged specimen, belonging to the forma typica is present.

*References* — Chapman, 1925, p. 84 (*T. subulata* Martin); Beets, 1941, pp. 28 (syn.), 168, 188, 190, 192, 194, 196, 199, 200, pl. 9, figs. 346-347 (*T. subulata* Martin, 1884 & forma

sedanensis); Westerveld, 1941, p. 1137 (*T. subulata*); Eames, 1950a, p. 87 (*T. talarensis* nom. nov.); Dey, 1962, pp. 8, 13, 59 (*T. subulata*); Beets, 1981b, pp. 16, 23, 24.

*Range* — Early Miocene to Pliocene, Quaternary? (presumed lapse): Ba - W - R - Rr (Rm) - UG (Quilon) - NT (basal, Lower and Upper Menkrawit Beds: L.114, L.386/391 and L.745; Gelingseh Beds: Source area of Sg. Gelingseh; Sg. Gelingseh, 'layer 1' and loc. 144/149; Tapian Langsat; Lower Palembang Beds) - UM (Antjam Beds: L.963; Talar Beds) P-?Q.

*Rhinoclavis (Rhinoclavis) junghuhni* (Wanner & Hahn, 1935)

*Material* — RGM 315 027.

*Comments* — Four more or less damaged specimens are available. Though not complete, the protoconch invariably missing, the specimens are well preserved as to ornament. There is some variation in the secondary ornament of the teleoconch: between the abapical main spiral and the suture usually three secondary spirals are developed, the middle one stronger than the others. Between the adapical and middle spiral three, instead of two, secondary spirals may be present, sometimes even four. Between the middle and abapical spiral there are usually three secondary spirals, but this number may increase to five by the insertion of two fine threads. The interior of the varices bears three spiral plications, the two adapical ones prominent and far apart, the abapical lira close to both the middle plication and the siphonal canal and weaker than the other plications.

*Reference* — Beets, 1983a, pp. 3, 14, 16.

*Range* — Early Miocene to Preangerian: R - NT (Muara Kobun; Gelingseh Beds: Source area of Sg. Gelingseh).

*Cerithium mangkalihatense* Beets, 1941

*Material* — RGM 315 028.

*Comment* — A single fine specimen is present, 6 mm long, its protoconch missing. It compares closely with the holotype.

*Reference* — Beets, 1941, pp. 4, 47, 168, pl. 9, fig. 356.

*Range* — Preangerian: NT (basal Menkrawit Beds: L.114).

*Cerithium (Cerithium) nodulosum* Bruguière, 1792

*Material* — RGM 315 029.

*Comments* — A damaged specimen is present, 36 mm high, its maximum diameter 18 mm. There is no previous record of the species as a fossil from the Indonesian archipelago.

The Sekurau specimen agrees very well with Recent specimens in the Rijksmuseum van Natuurlijke Historie, particularly with the slenderer specimens in which the spiral ornament between the adapical sutural band and the rounded shoulder angulation is less pronounced than is usually the case. *C. erythraeonense* Lamarck, 1822, also known as a fossil from the Red Sea area (Barron, 1907, pp. 104, 105; Abrard, 1942, p. 59, pl. 6, fig. 21) is often, I believe rightly, considered as conspecific, although it may stand apart slightly as a somewhat smaller subspecies with finer sculpture.

*References* — Pratt & Smith, 1913, pp. 312, 324, pl. 1, fig. 10; Dickerson, 1922, p. 229, pl. 15, fig. 10; MacNeil, in Foster, 1965, p. 80 (*Contumax nobulosus* (!)).

*Range* — Quaternary to Recent: Q - Re.

*Rimella (Dientomochilus) javana* (Martin, 1879)

*Material* — RGM 315 030.

*Comments* — There are six more or less damaged specimens and two fragments, in ornament comparing with a relatively large specimen from Tji Kaputi (RGM 10 301) and with others from Tjiangsana/Tjimerang (RGM 10 298), Java. The slightly angular whorls agree best with specimens from Tjitalahab, Java (RGM 10 293). The forma typica of *R. javana* apparently is restricted to the Neogene. The specimen figured by Smith (e.g., 1913, pp. 254, 262, pl. 4, fig. 4) from the Quaternary of Mindanao may well represent *R. cancellata* (Lamarck, 1816).

*References* — Beets, 1941, pp. 64 (syn.), 169, 188, 190, 192, 196; Nuttall, 1961, pp. 88, 92; Nuttall, 1965, pp. 166, 170, 186, 191 (var.).

*Range* — Early Miocene to Quaternary?: K - Nj - Tj (& loc.O, Junghuhn) - NT (basal and Lower Menkrawit Beds: L.114 and L.386; Gelingseh Beds: Sg. Gelingseh, 'layer 2'; West Borneo) - UM (Palabuanratu; Talar Beds: var.) - N - PQ (Togopi: var.) - Q?

*Tibia (Tibia) cf. T. verbeeki* (Martin, 1899)

*Material* — RGM 315 031.

*Comments* — Two spire fragments are available, which compare closely with typical representatives of the species. On the other hand, the material recorded by Haanstra & Spiker (1932b, p. 1313) from the Pliocene of Benkulen appears to belong to *T. fusus* (Linné, 1758). Shuto (1969, p. 71), quite rightly I believe suspects *T. verbeeki* of being a synonym of *T. fusus* as the material of one appears to fall within the range of variation of the other. I am however leaving the question open until entirely convincing material comes to hand.

*References* — Van der Vlerk, 1931, pp. 246, 291; Haanstra & Spiker, 1932a, pp. 1096, 1100; Oostingh, 1934, p. 19; Pannekoek, 1936, p. 7; Durham, 1940, p. 161; Beets, 1941, pp. 192, 196, 198 (all: *Rostellaria verbeeki*).

*Range* — Early to Late Miocene (to Recent?): R - Rr (Rm, Rl) - Nj - Ta - Pa - Bo - NT (Mandul; Gelingsch Beds: Sg. Gelingsch, 'layer 1'; West Borneo) - UM (Tjiodeng).

Note: if actually *T. fusus*, its range would include: NT (Kari Orang, Witkamp) - UM (Dingle Formation) - M - P - PQ - Q? - Re.

*Strombus* spec. indet.

*Material* — RGM 315 032.

*Comments* — All that is preserved of the Sekurau specimen is a half of the body whorl which is reminiscent of *S. triangulatus* Martin, 1879 (van der Vlerk, 1931, p. 247), determination, however, being impossible. It is not mentioned in the faunal list.

*Eunaticina (Eunaticina) visenda* spec. nov.

Pl. 1, figs. 1-4.

*Holotype* — RGM 315 033: Pl. 1, figs. 1-4.

*Paratype* — RGM 315 034.

*Type-locality* — Hill near Sekurau, North Kutai, Kalimantan.

*Type-horizon* — Not specified, presumably some level high up in the Gelingsch Beds.

*Name* — Latin: worthy to be seen.

*Range* — No previous records.

*Description* — The height of the holotype is 11.2 mm, its maximum diameter 10.9 mm. The spire is moderately high, with 4 whorls in the type and 3½ in the paratype. The nucleus, tending to be slightly submerged, is not well preserved. The post-apical whorls are separated by canaliculate sutures, these being defined by an angular to rounded shoulder rising above the adapical suture and bearing a rather prominent spiral which is however replaced in the paratype by a couple of delicate lirae. On the body whorl, the spiral recedes from the adapical suture and is in the holotype accompanied by two other spirals on its abapical side, the adapical one of these additional spirals being stronger than the other.

Whorls slightly convex, with conspicuous growth lines and delicate spiral striations which seem to develop in the beginning of the penultimate whorl. On the last whorl the striations develop rapidly into spiral bands of varying width, being broadest in the adapical quarter of this whorl. Around the umbilicus, the bands are narrower, hence more prominent like the most adapical spirals. The interior of the narrow and deep umbilicus is smooth but for the presence of growth lines. Parietal lip moderately callous, its abapical part with a tongue-shaped lobe set off by a shallow sinus of the detached umbilical part of the inner lip. The latter is reflected over an almost imperceptible funicle and is separated from the abapical portion of the shell by another shallow sinus. Aperture ovoid, with a shallow adapical channel.

The species is unlike any of the figured species compared.

*Natica helvacea* Lamarck, 1822

*Material* — RGM 315 035.

*Comment* — Ten rather well preserved specimens of different sizes are present.

*References* — Altena, 1941, p. 70 (syn.); Beets, 1941, pp. 74, 169, 175, 188, 190, 194, 196, 201; Wissema, 1947, p. 133.

*Range* — Early Miocene to Recent: Rr (Rm) - UG (Garo Hills) - Nj - Tj - NT (Mandul; basal and Lower Menkrawit Beds: L.114 and L.386/391; Gelingseh Beds: loc. 150; West Borneo; Tjilintung/Tjiangsana; Lower Palembang Beds) - UM (Tjiodeng; Palabuanratu; Talar Beds) - M - P - N - PQ (Togopi) - Q - Re.

*Naticarius marochiensis* (Gmelin, 1790)

*Material* — RGM 315 036.

*Comments* — There are three small specimens which are similar to other small fossils assigned to the species. It remains indeed to be seen whether in all cases one is dealing with this or other 'species' sometimes considered conspecific (MacNeil, 1960, p. 55, pl. 15, figs. 21-22).

*References* — Altena, 1941, p. 79 (syn.); Beets, 1941, pp. 75, 169, 175, 190, 192, 196, 201; Abrard, 1942, pp. 57, 94, pl. 6, fig. 16; Altena & Beets, 1945, pp. 39, 60; Abrard, 1946, pp. 53, 97, 104, 109; Beets, 1947, p. 201 (all: *Natica marochiensis*); Wissema, 1947, p. 136 (*Naticarius marochiensis*); Beets, 1950b, pp. 269, 277 (*Natica marochiensis*); Nuttall, 1965, p. 171 (*Natica marochiensis*); MacNeil, in Foster, 1965, p. 72 (*Naticarius marochiensis*); Shuto, 1969, pp. 15, 23, 25, 77, pl. 6, figs. 1-4, 6-9.

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## Plate 1

Figs. 1-4. *Eunaticina visenda* spec. nov. (figs. 3-4 slightly more enlarged). Holotype, RGM 315 033, height 11.2 mm, maximum diameter 10.9 mm. Locality: Hill near Sekurau.

Figs. 5-7. *Ancilla schmidti* spec. nov. Holotype, RGM 315 042, height 13.9 mm. Locality: Hill near Sekurau.

Fig. 8. *Ancilla schmidti* spec. nov. Paratype, RGM 315 043, height 13+ mm. Locality: Hill near Sekurau.

Fig. 9. *Microdrillia* spec. indet. RGM 315 062, height 5.9 mm. Locality: Hill near Sekurau.

Figs. 10-13. *Marginella vultuosa* spec. nov. Holotype, RGM 315 055, height 3 mm. Locality: Hill near Sekurau.

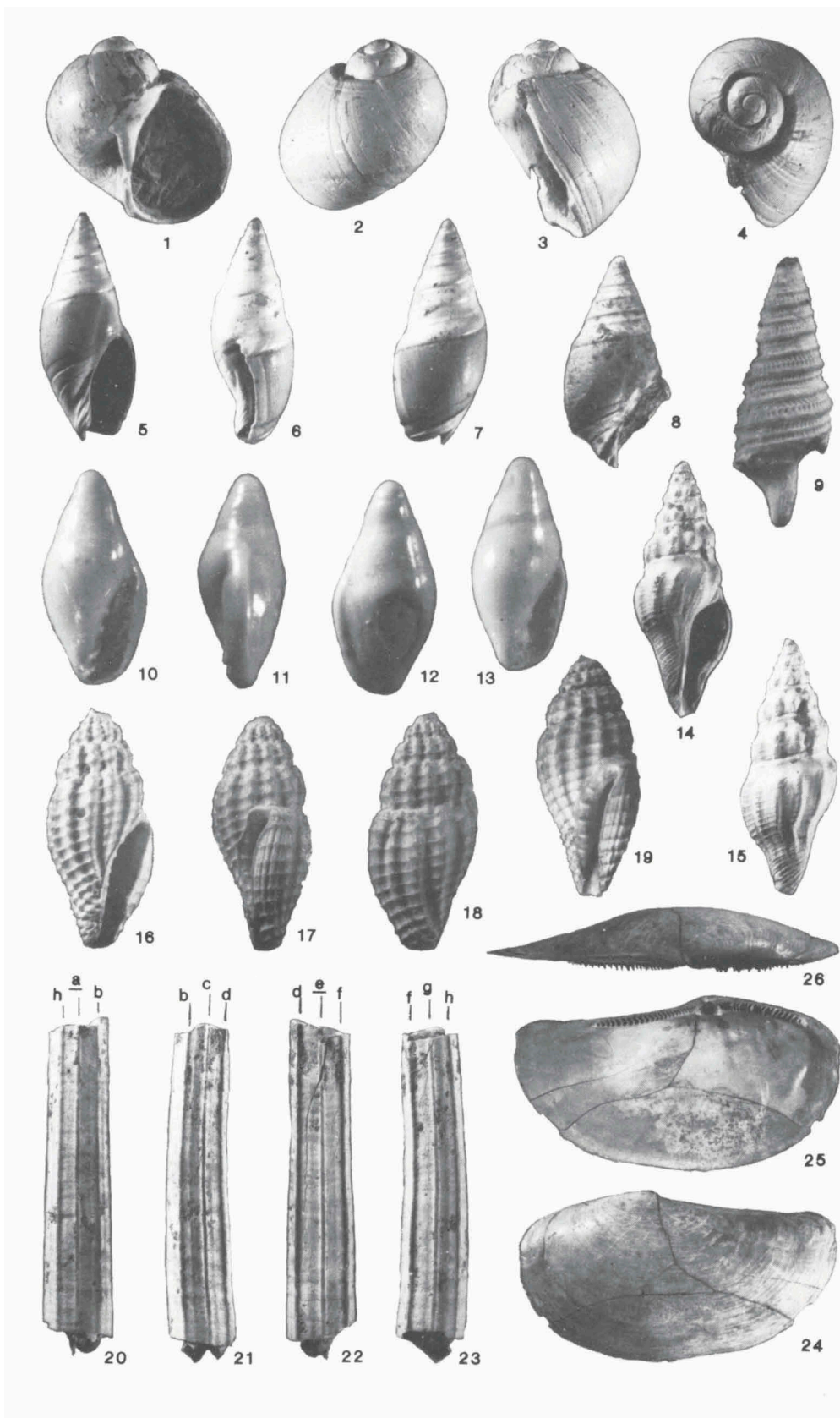
Figs. 14-15. *Clathrodrillia kutaiana* spec. nov. Holotype, RGM 315 058, height 15.7 mm. Locality: Hill near Sekurau.

Figs. 16-19. *Cythara zothecula* spec. nov. Holotype, RGM 315 063, height 7+ mm. Locality: Hill near Sekurau.

Figs. 20-23. *Dentalium javanum tutongense* subspec. nov. Holotype, RGM 315 069, length 23.5+ mm. Locality: Seria Well 16, d. 1350-1360 m, West Borneo (N.B. figures taken anti-clockwise around the shell).

Figs. 24-26. *Portlandia carolimartini* spec. nov. Holotype, left valve, RGM 315 073, length 42.4 mm, height 22.7 mm, inflation 7 mm. Locality: Hill near Sekurau.

Plate 1



*Range* — Early Miocene to Recent: LM (Sumatrensis Limestone: loc. U.24) - W - R - Nj - Tj - Ta - NT (basal Menkrawit Beds: L.114; Gelingseh Beds: Sg. Gelingseh, 'layer 2'; Gunung Madupar, Wanner; Batu Panggal; Tjilintung/Tjiangsana) - UM (Fidji) - P - N (Tji Gugur) - PQ (Togopi) - Q - Re.

*Phalium (Semicassis) bisulcatum* (Schubert & Wagner, 1829)

*Material* — RGM 315 037.

*Comments* — One damaged specimen and an outer lip of a second shell are available, both characteristic. The specimens represent a form with only faintly shouldered whorls. The greater part of the last whorl of the incomplete shell is nearly smooth but there is more pronounced spiral ornament — growth striae and spirals — near the adapical suture and the siphonal canal. The other specimen bears faint spirals over its larger part, though they are weakest in the middle. The material appears to be closest to the syntypes from Port Blair, Andaman Islands, but is also quite similar to some of the specimens from Nias identified by Wissema. A part of his material is, however, inseparable from *P. pila* (Reeve, 1848). Nuttall (1965) favoured uniting *P. pila* and *P. bisulcatum*, and Abbott (1968, p. 126, pls 106-115) went even further in lumping a variety of forms which are indeed most difficult, if at all, to distinguish from one another.

*References* — Wissema, 1947, p. 140 (*Semicassis bisulcata*); Nuttall, 1965, p. 171 (*P. bisulcata*).

*Range* — Preangerian to Recent: NT (Tjikao) - P - PQ (Togopi) - Re.

*Murex (Murex) djarianensis* Martin, 1895

*Material* — RGM 315 038.

*Comments* — Four damaged specimens and a fragment are present, comparing well with the typical form of the species. Partial revision of the material referred to *M. djarianensis* by various authors has been carried out by Oostingh (1938-1940, prt 10, pp. 59-60, footnotes 217, 221) and Altena, 1950, p. 210.

*References* — Martin, 1891-1922, p. 124, pl. 19, figs. 282-283, 284 (var.); Martin, 1911, pp. 12, 20, 41, 46 (pars); Martin, 1921-1922, pp. 464, 492, pl. 2, fig. 49.

*Range* — Preangerian to Pliocene: Nj - Tj - UM (Palabuanratu) - P.

*Alectrion (Zeuxis) ovum* (Martin, 1879)

*Material* — RGM 315 039.

*Comments* — Eight well preserved specimens are available which compare well with the smaller of the Javanese shells from the Njalindung Beds and Junghuhn's loc. O. Mukerjee (1939, p. 60, pl. 3, figs. 8-9) figured a specimen which belongs to some other species. He also included in its synonymy Cossmann's *N. ovum* from Karikal (Cossmann, 1903, p. 138,



pl. 4, fig. 25) which seems to be another species and was earlier renamed as *N. francoindicus* (Martin, 1919).

*References* — Feuilletau de Bruyn, 1921, p. 47 (*Nassa ovum*); Meer Mohr, 1923, p. 210 (*Nassa ovum*); Oostingh, 1935b, pp. 74, 216 (*Nassarius ovum*).

*Range* — Preangerian to Pliocene, Neogene: Nj - Tj (loc. O, Junghuhn) - NT (Gunung Madupar, Rutten & Wanner; West Borneo; Tjilintung/Tjiangsana) - UM (Palabuanratu) - P - N.

*Alectrion (Zeuxis) siquijorensis* (Adams, 1852)

*Material* — RGM 315 040.

*Comments* — One damaged specimen is available, which, though lacking most of its spire, matches Recent specimens likewise bearing comparatively fairly strong and hence, less numerous ribs. The same applies to specimens from the Kendeng Beds in the RGM-collection identified by van Regteren Altena and shells from the Gelingsch Beds (loc. 149). In all the specimens mentioned the inner lip is not conspicuously expanded.

I agree with Oostingh that the fossils recorded as *Nassa kueneni* Koperberg, 1931, from Timor, and as *N. verbeeki* Martin, 1895, and *N. caelatus* Adams, 1851 from Taiwan, actually belong to *A. siquijorensis* and so may part of the fossils recorded as *N. verbeeki* from the Philippine Islands (Smith, 1913, p. 262, pl. 4, fig. 8 exclusively). Several other records of *Nassa siquijorensis* want revision: Brazier, in Etheridge, 1889, p. 174; Martin, 1890, pp. 276, 279 (var.); Jack & Etheridge, 1892, p. 695 (*N. liquijorensis* (!)); Boettger, 1908, p. 669; Chapman, 1918, p. 10; Chapman, 1925, p. 86; Fischer, 1927, pp. 5, 9, 15, 17, 18, 20, 33,75; de Bruyne, 1941, p. 29; Valk, 1945. p. 29.

*References* — Smith, 1913, pp. 254, 262, pl. 4, fig. 3 (*Nassa siquijorensis*); Oostingh, 1938-1940, prt 9, p. 179, pl. 16, fig. 281 (*Nassarius siquijorensis*); Beets, 1941, p. 191 (*N. verbeeki*) (cf. Beets, 1950e, p. 334).

*Range* — Preangerian to Recent: NT (Lower Menkrawit Beds: L.742; Gelingsch Beds: loc. 149) - P - N - PQ - Q - Re.

*Buccinofusus?* spec. indet.

*Material* — RGM 315 041.

*Comment* — One fragment of a spire might represent *B. ilocanus* (Smith, 1913) from the Philippines (Smith, 1913, p. 257, pl. 3, fig. 8: *Turbinella ilocana*).

*Range* — Preangerian: NT (Mandul).

*Ancilla (Baryspira) schmidti* spec. nov.  
Pl. 1, figs. 5-8.

*Holotype* — RGM 315 042: Pl. 1, figs. 5-7.

*Paratypes* — RGM 315 043: Pl. 1, fig. 8; RGM 315 044 (2 specimens).

*Type-locality* — Hill near Sekurau, north Kutai, Kalimantan.

*Type-horizon* — Not specified, presumably some level high up in the Gelingseh Beds.

*Name* — The species is named after Dr M. Schmidt.

*Range* — No previous records.

*Description* — The largest specimen is 15.4 mm high. There appear to be almost two smooth apical whorls including the flat nucleus. The protoconch is delimited by an incised axial line, not well preserved, and at any rate by the appearance of a ridge-like spiral along the abapical suture of the whorls of the teleoconch. Both the spiral and suture remain well developed in all whorls. Along the adapical suture runs a broad and smooth callous spiral band which is on its abapical side sharply defined by a deep groove, much more conspicuous than the suture. About halfway between the latter spiral and the finer abapical sutural spiral lies a second conspicuous spiral band whose abapical delimitation is not so sharp as that of the adapical spiral. Between the three main spirals occur flattish to slightly concave zones. In places where the glaze is thin, it is seen that the adapical band actually consists of three lirae close together, and the narrower, yet more prominent middle spiral band, of two lirae. In the holotype, the latter may be accompanied on its adapical side by a faint lira running in the abapical part of the flat zone between the spiral bands.

The adapical spiral band is continuous over the last whorl, still sharply delimited by a groove. On its abapical side about half of this whorl bears no glaze, the only visible ornament being growth lines and, on its abapical part, two conspicuous sulci. The posterior sulcus corresponds with a denticle on the edge of the outer lip. The basal part of the last whorl is covered by a glaze and bears a smooth spiral limiting its posterior part and another on a sharp fold corresponding with the siphonal notch. On this anterior portion of the shell more lirae are faintly indicated.

Aperture rather wide, inner lip well defined, with a callosity corresponding with the suture, its parietal part with a number of faint spiral lirae. Columellar lip standing out from the base of this whorl so as to mark a shallow pseudumbilical cavity. The columella bears five folds.

*A. gerthi* Oostingh (1935b, p.106, text-fig. 10) is fairly similar in general outline, its ornament however being quite different from that of *A. schmidtii*.

*A. tornata* Cossmann (1903a, p. 116, pl.3, figs. 22-23) shows affinities too. However, it has a shorter spire and the posterior portion of its last whorl is more obese, its anterior part more pointed than in *A. schmidtii*. Furthermore, its ornament is different and so are the profiles of its whorls.

#### *Ancilla (Sparella) cinnamomea* (Lamarck, 1810)

*Material* — RGM 315 045.

*Comments* — There are two specimens which compare very closely with Recent specimens in the Rijksmuseum van Natuurlijke Historie and also with a number of fossils from Indonesia.

*References* — Newton, in Barron, 1907, p. 104; Oostingh, 1935b, pp. 105, 217 (syn.); Montanaro-Gallitelli, 1939, p. 225; Beets, 1941, pp. 105 (syn.), 170, 175, 177, 190, 192, 194, 197; Abrard, 1942, pp. 82, 96, pl. 8, fig. 20; Eames, 1950b, p. 244.

*Range* — Early Miocene to Recent: Rr (Rm) - Nj - Tj (& loc. O, Junghuhn) - NT (basal and Lower Menkrawit Beds: L.114 and L.386/391; Gelingseh Beds: Sg. Gelingseh, 'layer 1'; loc.150; Kari Orang, loc. 141; Gunung Madupar, Rutten & Wanner) - M - P - Q - Re.

*Vexillum (Costellaria) javanum* (Martin, 1879)

*Material* — RGM 315 046.

*Comments* — A rather well preserved specimen is available, its spire damaged. It compares well with bigger specimens from the Tjilang Beds in the RGM. The relationships between this species and *V. gembacanum* (Martin, 1883) want clarification.

*References* — Martin, 1879-1880, p. 27 (pars), pl. 6, fig. 3 exclusively (*Mitra javana*) (fig. 2 and part of the variety described represent *V. gembacanum*); Martin, 1883-1887, p. 91, pl. 5, fig. 91 (*Mitra javana*); Martin, 1891-1922, p. 80 (*Turricula javana*); Martin, 1911, pp. 35, 41, 44, 45; Martin, 1919, pp. 80, 128; Martin, 1928a, p. 113; non: Tesch, 1915, p. 48, pl. 8, fig. 104 (see Shuto, 1969, p. 164).

*Range* — Preangerian, Neogene: Tj (& loc.O, Junghuhn) - N.

*Vexillum (Costellaria) melongena* (Lamarck, 1811)

*Material* — RGM 315 047.

*Comments* — A single well preserved specimen is present. Its last whorl is a little shorter than is usually the case, but it compares very well with Recent shells from Indonesia (Coll. Mulder) in the Rijksmuseum van Natuurlijke Historie. W. D. Smith figured a juvenile shell which cannot possibly represent *V. jonkeri* (Martin, 1884), but evidently is a *V. melongena* (Smith, 1913, pp. 253, 259, pl. 4, fig. 18) (see Smith, 1910, p. 330).

*References* — Schepman, 1907, p. 167; Schepman, 1911, p. 280 (*Turricula melongena*).

*Range* — Quaternary to Recent: Q - Re.

*Vexillum (Costellaria) sanguisuga* (Linné, 1758)

*Material* — RGM 315 048.

*Comments* — A single fine shell is available which compares closely with the fossils recorded from Java and Timor. In size and ornament, it agrees best with a specimen from Tjidamar. Its ornament is very similar also to that of a fossil from Fatu Lulih, Timor, in the RGM. The shell figured by Tesch is stouter than the Bornean specimen.

*References* — Martin, 1883-1887, pp. 91, 307, 360 (*Mitra sanguisuga*); Schepman, 1911, p. 281 (*Turricula sanguisuga*); Tesch, 1915, p. 51, pl. 8, fig. 110 (*T. sanguisuga*).

*Range* — Miocene, Pliocene to Recent: M (Tjidamar) - P - Re.

*Vexillum (Costellaria) thangaense* (Vredenburg, 1923)

*Material* — RGM 315 049.

*Comments* — One specimen is present. The species shows affinities to *V. gembacanum* (Martin, 1884). The abapical end of the Sekurau shell is somewhat damaged and so is its spire. However, it agrees so closely with the figures of the type specimen that its identification is considered quite safe. The basal part of the last whorl of both the type and the Bornean specimen is faintly concave which reminds of the specimen of *V. gembacanum* from Tjiangsana (RGM 8934). However, *V. thangaense* and *V. gembacanum* are probably not conspecific.

*Reference* — Vredenburg, 1923a, p. 275, pl. 16, fig. 2 (*Turricula thangaensis*).

*Range* — Early Miocene: K.

*Mitra (Tiara) menkrawitensis* Beets, 1941

*Material* — RGM 315 050.

*Comments* — A single shell is present, agreeing very well with the type. The interior of the outer lip is crenulated corresponding to the spirals on its exterior.

A specimen referred to as *M. aff. M. menkrawitensis* and figured by MacNeil (1960, p. 94, pl. 4, fig. 30) is much bigger, its whorls are rounded in profile, there are more spirals and an adapical secondary lira is present. It might actually belong to *M. vandervlerki* Beets (1941, p. 117, pl. 6, figs. 241-244) although the type material is much smaller than MacNeil's specimen. I may add that at present, I am not confident any more that *M. vandervlerki* and *M. menkrawitensis* really are different species, additional material being necessary to settle the point.

*References* — Beets, 1941, pp. 5, 116, 170, 194, pl. 6, figs. 239-240; Beets, 1983c, pp. 53, 59, 61.

*Range* — Preangerian: NT (basal Menkrawit Beds: L.114; Kari Orang, loc.141, Rutten).

*Mitra (Mitra) sphaerulata* Martyn, 1784

*Material* — RGM 315 051.

*Comments* — A single juvenile specimen is available, with comparatively little secondary ornament. It seems to agree best with the specimen figured by Yokoyama.

*References* — Schepman, 1911, p.272; Martin, 1928a, pp. 111, 121; Yokoyama, 1928a, pp. 5, 15, 36, pl. 2, fig. 4; Nomura, 1935, pp. 61, 137; Oostingh, 1938-1940, pt 7, p. 44, pl. 11, fig. 194; non: Martin, 1891-1922, p. 75, pl. 11, figs. 168, 168a-b, and Martin, 1928b, pp. 10, 26: *M. tjikeusikensis* Oostingh (Oostingh, 1938-1940, pt 7, p. 43).

*Range* — Preangerian to Recent: Nj - P - Re.

*Lyria (Harpella) cf. L. overmanae* Beets, 1942

*Material* — RGM 315 052.

*Comments* — There is a single damaged specimen. It agrees so closely with the type that the identification may well be correct. However, the last whorl is missing and even part of the spire so that one hesitates to identify the remaining portion without proper reservations.

The species was described from the so-called Oligocene of Buton, subsequently referred to 'Neogene' (Beets, 1953).

*Reference* — Beets, 1942b, pp. 294, 325, pl. 29, figs. 86-88.

*Range* — Neogene: N.

*Cymbiola?* spec. indet

*Material* — RGM 315 053.

*Comments* — Since only part of the columella and an adjoining portion of the base of a single shell is available, it is hard to say with which genus and species one is dealing. It may represent a large representative of *C. (Aulica) martini* Cox (1948, p. 49, pl. 5, fig. 2). It is not mentioned in the faunal list.

*Marginella (Cryptospira) aff. M. elegans* (Gmelin, 1788)

*Material* — RGM 315 054.

*Comments* — Eight more or less damaged, yet on the whole rather well preserved specimens are available.

*References* — Beets, 1983a, pp. 6, 14, 16; Beets, 1983b, pp. 33, 38, 39.

*Range* — Early Miocene to Preangerian: R - Rr (Rm, Rl) - Tj (& loc.O, Junghuhn) - NT (Muara Kobun; Gelingsih Beds: Sg. Gelingsih, 'layer 1'; loc.144, 150; Kari Orang, Witkamp; Gunung Madupar, Wanner; Lower Palembang Beds).

*Marginella (Eratoidea) vultuosa* spec. nov.

Pl. 1, figs. 10-13.

*Holotype* — RGM 315 055: Pl.1, figs. 10-13.

*Type-locality* — Hill near Sekurau, North Kutai, Kalimantan.

*Type-horizon* — Not specified, presumably some level high up in the Gelingsih Beds.

*Name* — Latin: full of airs.

*Range* — No previous records.

*Description* — The holotype is a minute specimen, merely 3 mm high, with a slender spire. The protoconch consists of 1½ smooth glossy whorl delimited by a conspicuous growth

line. There are  $2\frac{3}{4}$  whorls in the teleoconch, slightly convex, smooth and glossy, with a very shallow groove near the adapical suture which is somewhat obscured by a thin coating of glaze, the groove finally inconspicuous as a vaguely defined flexure marking the adapical boundary of a flat, somewhat depressed band of the whorls.

The last whorl comparatively large and stout. Aperture widening towards the abapical end but tapering towards the apex, with a well defined adapical channel. No siphonal canal is set off from the aperture, and neither is a notch developed at all. The outer lip heavily thickened, its inner margin bearing three denticles, the middle one faintly double (fig. 13). Adaxial wall without callus, the columella bearing four folds, i.e., two shorter adapical ones and two longer and more oblique abapical ones, the latter close together.

*M. ringicula* Sowerby, 1900 (Beets, 1941, p. 124, pl. 7, figs. 264-266) is bigger, if not always, and has a stouter spire, while its outer lip bears more denticles. *M. vultuosa* is not unlike *M. bojadorensis* Thiele (1925, p. 159, pl. 21, fig. 27) but its outline is clearly different. Another related species, *M. alchymista* Melvill & Standen, 1903 (Beets, 1950c, p. 296) is bigger and has different outlines too.

*Marginella?* spec. indet.

*Material* — RGM 315 056.

*Comments* — A couple of specimens is present, perhaps belonging to *Hyalina*, not very well preserved, small and somewhat reminiscent of both *M. deningeri* Fischer (1927, p. 83, pl. 3, fig. 58) from Ceram, and *M. tambacana* Martin, 1885 (Martin, 1883-1887, p. 95, pl. 5, fig. 96); also, *Hyalina berauensis* (Beets) (1941, p. 123, pl. 6, figs. 248-250) from the Menkrawit Beds. The species is not mentioned in the faunal list.

*Turricula (Turricula) javana tegalensis* (Martin, 1895)

*Material* — RGM 315 057.

*Comment* — A single specimen is present which, though somewhat damaged, agrees closely with a specimen from Tjidjurej, Java, in the RGM.

*References* — Oostingh, 1938-1940, prt 1, p. 25; perhaps also Yokoyama, 1928a, pp. 4, 33, pl. 1, fig. 12 (*Surcula javana*) and Rin, 1935, pp. 23-24 (*Pleurotoma javana*).

*Range* — Pliocene, Neogene: P - N.

*Clathrodrillia kutaiana* spec. nov.

Pl. 1, figs. 14-15.

*Holotype* — RGM 315 058: Pl. 1, figs. 14-15.

*Paratypes* — RGM 315 059 (7 specimens).

*Type-locality* — Hill near Sekurau, North Kutai, Kalimantan.

*Type-horizon* — Not specified, presumably some level high up in the Gelingsch Beds.

*Name* — The name is derived from the Kutai region.

*Range* — No previous records.

*Description* — Eight slender shells are available, up to 16.5 mm long. Shape somewhat variable, the protoconch either missing or damaged beyond certain recognition of possibly three smooth (?) whorls. The ornament of the whorls of the teleoconch consists of sigmoidal ribs and spiral lirae. Sutures slightly undulating. Sutural ramp flat to concave (in the adult part) and comparatively smooth but for the presence of the weak adapical ends of the ribs. A strong spiral runs a little away from the adapical suture; spiral lirae on the sutural ramp faint, as implied above.

Whorls convex abapically, with inflated ribs slightly pointed at the periphery of the whorls. Spiral ornament consisting of moderately conspicuous lirae overriding the ribs and being slightly inflated over their crests. Secondary spirals are developed between the primary ones, usually one in each interspace. Growth lines fairly well developed.

On the last whorl the ribs die out in the constricted part of the neck bordering the siphonal fasciole. Spiral ornament as on the earlier whorls but two or three primary spirals in the continuation of the suture more prominent than the other lirae nearby, and the spirals being closest and strongest on the siphonal fasciole. Aperture moderately wide, long, constricted into a long siphonal canal well set off from the aperture. Outer lip with a deeply rounded anal notch corresponding with the concave sutural ramp. Siphonal notch shallow, the fasciole only slightly inflated. Columella straight, the inner lip well defined, particularly the columellar lip. Parietal lip thin, with a well developed, smooth and rounded parietal ridge.

The new species belongs to a group of interrelated forms and apparently shows the closest affinities to *C. suturalis* (Gray, 1838), *C. losariensis* (Martin, 1895) and *C. neglecta* (Martin, 1884), which however never approach *C. kutaiana* sufficiently in shape and ornament to be confounded with it. *Drillia indica* Vredenburg (1921c, p.107, pl. 13, fig. 2) is similar too, but *C. kutaiana* has pointed ribs and consequently quite conspicuously shouldered whorls instead of rounded ones.

*Clathrodrillia* spec. indet.

*Material* — RGM 315 060.

*Comment* — There are two damaged specimens which show affinities to both *C. suturalis* (Gray, 1838), especially a Javanese fossil from Bajah, Java, in the RGM, and *C. aesopus* (Schepman, 1913) which was recorded as a fossil by Fischer (1927, p. 95, pl. 3, fig. 75). The species is not mentioned in the faunal list.

*Lophiotoma brevicaudata* (Reeve, 1843)

*Material* — RGM 315 061.

*Comment* — One well preserved specimen is available, slender and juvenile, which is more similar to *Pleurotoma* spec. 3 from Tjikaputih, Java, referred to *L. brevicaudata* by the writer, than to the specimen from the Pliocene Coral Limestone near Sekurau.

*References* — Schepman, 1907, p. 158; Beets, 1950d, pp. 310, 314, 315.

*Range* — Preangerian to Recent: Tj - P - Q - Re.

*Microdrillia* spec. indet.  
Pl. 1, fig. 9.

*Material* — RGM 315 062.

*Comment* — A small damaged specimen is available which may yet be identified when better material comes to hand. It is not mentioned in the faunal list.

*Cythara (Cythara) zothecula* spec. nov.  
Pl. 1, figs. 16-19.

*Holotype* — RGM 315 063.

*Type-locality* — Hill near Sekurau, North Kutai, Kalimantan.

*Type-horizon* — Not specified, presumably some level high up in the Gelingsch Beds.

*Name* — Latin: a small private cabinet.

*Range* — No previous records.

*Description* — The holotype, 7 mm high, is rather stout, the spire comparatively short, the protoconch missing. Teleoconch with 4½ or more whorls, moderately constricted, ornamented with conspicuous axial riblets overridden by three spiral lirae which are inflated (bead-like) on the ribs, the hindmost less conspicuous than the others. In the abapical suture a fourth lira becomes visible. The riblets number thirteen per whorl and are slightly sigmoidal on the last whorl. A fine thread is added between the adapical primary spiral and the suture, and another very delicate one between the middle and abapical primary lirae, but only on the body whorl. Growth lines extremely delicate.

Last whorl bearing some ten additional spiral lirae. Aperture long and narrow, anal notch deep, the outer lip with a strong varix bearing axial riblets and conspicuous growth lines; on part of its interior, eight ridge-like denticles, six of which are well developed while the most abapical couple are weak. The edge of the outer lip sharp. Inner lip lamellate, well delimited, bearing six plications lying at regular intervals (Pl. 1, fig. 19), and three very small denticles close to the terminal plications: two on the parietal lip and one near the most abapical plication.

I am not aware of the existence of any closely related species.

*Cythara* spec. indet.

*Material* — RGM 315 064.

*Comment* — Two small and slender shells are present, showing affinities to a species described as *Turricula minima* Vredenburg (1923a, p. 275, pl. 16, fig. 7). The species is not mentioned in the faunal list.

*Maoritomella batjanensis* (Schepman, 1913)

*Material* — RGM 315 065

*Comments* — There are three specimens, agreeing perfectly with the type. The latter is 7½ mm high, as is the smallest and best preserved fossil, the other fossil specimens being



up to 9.3 mm high. This is an interesting find, the type having been dredged from a depth of 397 m, near Batjan, Halmahera.

*References* — Schepman, 1913, p. 415, pl. 27, fig. 1 (*Drillia batjanensis*); Shuto, 1970, p. 169, pl. 11, figs. 5-7.

*Range* — Recent: Re.

*Conus vimineus* Reeve, 1849

*Material* — RGM 315 066.

*Comments* — A single specimen is available, agreeing very well with other Indonesian fossil and Recent specimens compared.

Vredenburg (1921a, p. 284) perhaps wrongly included a wider variety of forms than other malacologists, lumping *C. subvimineus* Cossmann, 1900, *C. palabuanensis* Martin, 1895, part of *C. protofurvus* Noetling, 1901, and *C. vimineus*. Until the original material from the Sitsayan, Kama, Mekran, and Karikal formations has been revised, I refrain from using the records queried above for the age determination of Sekurau.

*C. kikaiensis* Pilsbry, 1904, as recorded by Yokoyama (1928a, p. 29, pl. 1, fig. 7), which is, incidentally, very similar to *C. subvimineus* Cossmann (itself but a variety of *C. vimineus* according to Eames, 1950b, p. 245; 1950c, p. 151), would seem to be no more removed from *C. vimineus* than as a subspecies. However, according to Nomura (1935, p. 109), Yokoyama's material should be considered conspecific with *C. aculeiformis* Reeve, 1844, while another synonym would be Martin's *C. vimineus*. As far as the last mentioned material is concerned, I venture to disagree with Nomura's view.

*References* — Martin, 1891-1922, p. 16, pl. 2, figs. 23-25; Boettger, 1908, p. 674; Smith, 1910, p. 329; Martin-Icke, 1911, p. 46; Schepman, 1913, p. 393; Chapman, 1918, pp. 10, 12; Martin, 1919, pp. 72, 141; Chapman, 1925, p. 86; Martin, 1928b, pp. 13, 27; van Es, 1931, pp. 57, 94; van der Vlerk, 1932, p. 110; Oostingh, 1938-1940, prt 1, p. 22; Oostingh, 1941, pp. 23, 26, pl. 2, fig. 31.

*Range* — Preangerian to Recent: NT (Gelingsch Beds: loc. 149; West Borneo; Lower Palembang Beds) - M ('Upper Miocene', Papua) - P - N - Re.

*Strioterebrum (Strioterebrum) iravadicum* (Vredenburg, 1921)

*Material* — RGM 315 067.

*Comments* — Two specimens are present, comparing so closely with *S. iravadicum* that they are identified with this species without any hesitation.

*S. bomasensis* (Martin, 1916), a variable species (Oostingh, 1938-1940, prt 2, p. 54), seems rather closely related but the specimens assigned to *S. iravadicum* all have a greater number of riblets.

*Reference* — Vredenburg, 1921b, pp. 346, 358, pl. 10, fig. 24 (*Terebra iravadica*).

*Range* — Early Miocene: K.

*Dentalium (Dentalium) javanum tutongense* subsp. nov.  
Pl. 1, figs. 20-23.

*Holotype* — RGM 315 069: Pl. 1, figs. 20-23.

*Paratypes* — RGM 315 068 (one specimen; Sekurau), RGM 315 070 (one specimen: Seria Well 16, depth 1350-1360m), and RGM 315 071 (four specimens and a fragment: Tutong Coast, loc. 6, West Borneo).

*Type-locality* — Seria Well 16, depth 1350-1360 m, Brunai, West Borneo.

*Type-horizon* — Miri Formation.

*Name* — The name is derived from the Tutong Coast, West Borneo.

*Range* — Preangerian: NT (West Borneo).

*Description* — The specimens show close affinities to *D. javanum* Sowerby, 1860 (Boissevain, 1906, p. 18, pl. 1, fig. 6, pl. 4, fig. 7) and the same arrangement of the longitudinal ribs. However, the fossils are invariably distinguished from the Recent material by having a thick-walled shell. In addition, *D. javanum* is on the whole much more curved, its ribs may be very much higher and they are comparatively stronger anyway, as well as more rounded, while there is no secondary ornament in their interspaces. In the subspecies *tutongense*, on the other hand, secondary ornament may be either absent or it consists of threads, one in each interspace of the ribs and not always situated in the middle. In addition, longitudinal striae may be visible with the hand lens, particularly on the specimen from Sekurau. Growth lines delicate.

The arrangement of the ribs is shown by the photographs: one rib on the dorsal side (a: fig. 20), flanked by comparatively distant ribs on either side (h and b: figs. 20-21, 23). Subsequently, another rib occurs on either side after a smaller interval (c and g: figs. 21, 23), and again, another rib after a larger interval (d and f: figs. 21-23) on either side of the ventral rib (e: fig. 22), from which they are separated by smaller intervals than the ones before.

*Dentalium* spec. indet.

*Material* — RGM 315 072.

*Comments* — Eight smooth specimens and a fragment are present which show affinities to the living *D. acutissimum* Watson, 1879, as was ascertained by a comparison with the Siboga Expedition material identified by Miss Boissevain (1906, p. 45). The species is not mentioned in the faunal list.

*Portlandia (Portlandia) carolimartini* spec. nov.  
Pl. 1, figs. 24-26.

*Holotype* — RGM 315 073: Pl. 1, figs. 24-26, left valve.

*Type-locality* — Hill near Sekurau, North Kutai, Kalimantan.

*Type-horizon* — Not specified, presumably some level high up in the Gelingseh Beds.

*Name* — The species is named after Dr Karl Martin.

*Range* — No previous records.

*Description* — The holotype is a rather big left valve 42.4 mm long, 22.7 mm high, its inflation being 7 mm. Its shape is sub-elliptical, somewhat rostrate, the beak well in front

of the middle of the shell, which is thin, polished. Escutcheon lanceolate, concave, bordered by a fairly sharp escutcheon ridge. The latter is accompanied on its ventral side by a rather deep, asymmetrical sulcus hitting the postero-dorsal margin above, and in front of the rostrum. Lunule well defined by a ridge which is accompanied on its ventral side by a very shallow, ill-defined sulcus. Commarginal striae well developed yet rather delicate.

The anterior margin of the valve has a shallow sinus, correspondingly shown in the course of the growth lines. A similar sinus occurs on the ventral side of the posterior rostrum. Faint anterior and posterior sulci of the valve correspond with these sinuses.

A remarkable ornament — which I do not know from related species — is present on the anterior part of the valve, between the anterior margin, antero-dorsal margin and beak, viz., dense, very delicately incised and distinctly wavy striations of equal strength, visible with the hand lens only. These striations run approximately parallel with the ventral half of the anterior margin but cut obliquely and uninterruptedly across the growth lines, particularly near the dorsal end of the anterior margin. The remainder of the valve surface bearing exceedingly faint radial striations between the growth lines, crossing only the most delicate of these.

Resilium pit triangular, fairly large and wide. Resilifer extending well below the teeth. The two rows of teeth diverge at a very obtuse angle. Posterior row narrow, gradually tapering, the size of its 28 teeth gradually diminishing towards the beak, more rapidly so posteriorly. Anterior row of 23 teeth shorter and wider than posterior row. Interior surface of the valve glossy, adductor scars faintly, and only partly defined, most of the pallial line invisible, sinus seemingly fairly widely rounded.

*P. japonica* (Adams & Reeve, 1850) (Reeve, 1843-1878, 18, Mon. *Yoldia*, pl. 2, fig. 8; pl. 4, fig. 20) is quite similar, yet different in rostral, dorsal and anterior outlines. *P. lischkei* Smith (1885, p. 242, pl. 20, figs. 4, 4a-b) shows less affinities although its rostrum is like that of the new species. *P. nicobarica* (Bruguière, 1789) has well developed commarginal ornament and different outlines. Another species which is reminiscent of *P. caroli-martini* is *P. watasei* (Kanehara, 1937) (Kanehara, 1937, p. 158, pl. 15, figs. 5-9) but it too is differently shaped.

#### *Striarca thielei* Schenck & Reinhart, 1938

*Material* — RGM 315 074.

*Comments* — A single left valve is available. The type material was dredged off West Sumatra (Thiele, in Thiele & Jaekel, 1931, p. 175, pl. 6, fig. 9: *Arca aequilateralis* Thiele, non Briart & Cornet, 1870). The fossil is not very well preserved and this might account for the absence of the very delicate crenulations on its inner margin as described from the type material, since the margin of the fossil is slightly worn. The posterior portion of the fossil is damaged but it compares very well with the descriptions and figures given by Thiele and Schenck & Reinhart, particularly with fig. 4 (left valve) and figs. 1-2 (right valve) given by the latter authors. The height of the fossil is 9.8 mm, its diameter 3 mm. Its hinge bears 29 or 30 teeth. The total number of riblets is not easily ascertained but seems to be about 68. The area is exactly as in Schenck & Reinhart's fig. 12, and the anterior muscle impression as in their fig. 2.

It seems likely that the Indian Ocean region will prove to yield yet other fossils representing *Striarca*. For instance, *Arca bataviana* (non) Martin var. *carinata* Noetling as figured by Mukerjee (1939, p. 25, pl. 1, figs. 12-13). The Assamese specimen is much bigger than Noetling's Burmese type (Noetling, 1901, p. 148, pl. 7, fig. 8) while both do not seem

to represent *A. bataviana* at all, not even as a variety. While Noetling's type is shaped quite differently from *S. thielei*, especially anteriorly, and its beak placed nearer the front of the shell, Mukerjee's figure shows a specimen comparing so closely to *S. thielei* that revision seems indicated. Another species showing affinities to *S. thielei* is *Arca mekranica* Vredenburg, 1928 (Vredenburg, 1925-1928, prt. 2, p. 417, pl. 33, fig. 9). However, the former's ventral margin is flattened.

*Reference* — Schenck & Reinhart, 1938, p. 306, pl., figs. 1-4, 7, 12.

*Range* — Recent: Re.

*Anadara (Anadara) antiquata* (Linné, 1758)

*Material* — RGM 315 075.

*Comments* — This well known and widespread species is represented by a characteristic, though damaged, right valve.

Dall et al. (1938, p.17, pl. 2, figs. 1-2, 5-6, text-fig. 5) described a new species, *Arca vetula*, which would include *A. hankeyana* Reeve, 1844 as described by Ostergaard (1928, pp. 8, 16, 24, 25, pl. 1, fig. e). I fail to see any appreciable differences between the species quoted and the fossil and Recent specimens known as *A. antiquata*.

*References* — Barron & Hume, 1902, pp. 127, 142, 144; Hedley, in Mawson, 1905, pp. 414, 477; Icke & Martin, 1907, p. 247, pl. 17, fig. 34 (*Arca kannegieteri*); Oostingh, 1935b, pp. 132 (syn.), 218; Weir, 1938, p. 67; Montanaro-Gallitelli, 1939, pp. 254, 255; Beets, 1941, pp. 153 (syn.), 171, 175, 177, 180, 188, 194; de Bruyne, 1941, p. 31; Abrard, 1942, pp. 21, 90, pl. 2, figs. 13-14 (incl. *A. scapha*); Abrard, 1946, pp. 30, 99, 100, 101, 103, 107; Beets, 1948, p. 9; Beets, 1950d, pp. 310, 314, 315; Nuttall, 1965, pp. 161, 176; MacNeil, in Foster, 1965, pp. 62, 81 (*A. scapha*); Beets, 1981b, pp. 22, 23, 26.

*Range* — Early Miocene to Recent: LM (Iran) - Rr (Rl) - Nj - Tj - NT (basal Menkrawit Beds: L.114; Gunung Batuta; West Borneo) - UM (Iran) - P - N (e.g., Tji Gugur) - PQ - (Togopi) - Q - Re.

*Anadara (Anadara) craticulata* (Nyst, 1848)

*Material* — RGM 315 076.

*Comment* — Several mostly well preserved valves are available.

*References* — *A. craticulata* (Nyst, 1848): Cox, 1930, p. 150; Cox, 1939, pp. 2, 8; Mukerjee, 1939, pp. 3, 26, pl. 1, figs. 7, 15; Dey, 1962, pp. 7, 16, 39. *Arca burnesi* d'Archiac, 1854: d'Archiac & Haime, 1853-1854, p. 264, pl. 22, figs. 5, 5a-d; Martin, 1883-1887, p. 245 (pars), pl. 12, fig. 250 (excluding a left valve from the well Batavia 3 (d. 81 m) which belongs to *A. biformis* Martin, 1885), pp. 308, 309, 313 (pars); Martin, 1890, p. 280; Noetling, 1901, p. 131, pl. 5, figs. 6-10; (non) Icke & Martin, 1907, p. 246 (this is *A. biformis*); Boettger, 1908, p. 668; Pascoe, 1908, p. 140 (?); Dalton, 1908, pp. 609, 623; Tipper, 1911, p. 202; Pascoe, 1912, p. 61 (?); Stuart, 1912, p. 246; Martin, 1919, pp. 60,

124; Tesch, 1920, p. 97, pl. 20, fig. 258; Clegg, 1938, pp. 263, 276; Mukerjee, 1939, p. 2; Shuto, 1971, pp. 3, 20, pl. 2, figs. 7, 8, 14, text-fig. 4. *A. nodosa* (non) Martin, 1879: Smith, 1910, p. 329; Smith, 1911, p. 376; Smith, 1913, pp. 254, 278, pl. 9, fig. 2; Pratt & Smith, 1913, p. 327(?); Dickerson, 1922, p. 212(?). *A. clathrata* (non) Reeve, 1844: Hedley, in Mawson, 1905, pp. 442, 477; Chapman, 1918, pp. 9, 12; Chapman, 1925, p. 85; Chapman, 1928, pp. 9, 12; Vredenburg, 1928, p. 411; Martin, 1931, p. 3 (var. *burnesi*); Abrard & de la Rue, 1939, p. 821; Abrard, 1942, pp. 22, 90, pl. 2, fig. 16.

*Range* — Early Miocene to Recent: LM (Pyabwe; Kyaukkok) - K - UG (Quilon; Garo Hills) - NT (West Borneo) - UM (Talar Beds) - M - P - Q - Re.

*Anadara ferruginea* (Reeve, 1844)

*Material* — RGM 315 077 – 315 078.

*Comments* — Quite a number of well preserved valves is available, comparing well with recent specimens from Indonesia and with Neogene fossils from New Guinea in undescribed collections made by Wichmann (localities 630, 631, 632), in the Instituut voor Aardwetenschappen, Utrecht.

*A. dautzenbergi* (Lamy, 1907) is a related species but the representatives of *A. ferruginea* never have the same outlines, nor are they ever as flat as *A. dautzenbergi*. In addition, the hinge of *A. dautzenbergi* is considerably narrower, its costae run much more obliquely in a posterior direction and are more pronouncedly subdivided. The differences were checked by means of the Siboga Expedition material identified by Prashad (1932, p. 39), in the Zoologisch Museum, Amsterdam. *A. consociata* Smith (1885, p. 266, pl. 17, fig. 7) is in my opinion more closely related to *A. dautzenbergi* than to *A. ferruginea*. *A. nodosa* (non) Martin, 1879 var. *batanensis* Smith (1906, pp. 630, 631, pl. 3, fig. 6) seems to be closely related to, if not identical with *A. ferruginea*.

*References* — Martin, 1891-1922, p. 366, pl. 52, fig. 85; Martin, 1919, pp. 60, 134; Tesch, 1920, p. 93, pl. 20, fig. 251; Dickerson, 1921, pp. 6, 7, 8, 11; Smith, 1922, p. 32; Dickerson, 1922, pp. 203, 213, 217, 226, pl. 6, fig. 3; Cossmann, 1924, p. 93, pl. 4, figs. 19-22; van Es, 1931, p. 95; van der Vlerk, 1932, p. 112; Eames, 1950b, p. 249; Nuttall, in Wolfenden & Haile, 1963, p. 51; Shuto, 1971, pp. 3, 18, pl. 2, figs. 10, 13, 15-16, text-fig. 4.

*Range* — Preangerian to Recent: NT (West Borneo) - P - N - PQ - Q - Re.

*Anadara spec. indet.*

*Material* — RGM 315 079.

*Comment* — A poorly preserved left valve is present. It is not mentioned in the faunal list.

*Amussium hulshofi* (Martin, 1909)

*Material* — RGM 315 080.

*Comments* — A few fragments are available, agreeing well with a series of specimens from

Preangerian deposits of West Borneo. One of the specimens from Sedan, Java, identified by Pannekoek (see refs.) actually represents *Pecten singkirensis* (Martin, 1909) as mentioned before (Beets, 1950e, p. 338).

*References* — *Pecten hulshofi*: Martin, 1891-1922, p. 349, pl. 49, figs. 46-49; Martin, 1912, p. 156; Cox, 1924, pp. 54, 60 (?); van der Vlerk, 1932, p. 112. *Amussium hulshofi*: van Es, 1931, pp. 58, 95, 116; Haanstra & Spiker, 1932a, p. 1097; Haanstra & Spiker, 1932b, p. 1314; Pannekoek, 1936, pp. 8, 13, 63 (pars: see comments above); Nuttall, 1965, pp. 177, 185, 186, 192; Oostingh, 1938, p. 511.

*Range* — Early Miocene to Pliocene, Pliocene/Quaternary: Ba - R - NT (West Borneo; Lower Palembang Beds) - P - N - PQ (Togopi).

*Chlamys senatoria* (Gmelin, 1790)

*Material* — RGM 315 081.

*Comment* — A fragmentary valve which belongs to the variety described by Martin.

*References* — *Pecten senatorius*: Smith, 1910, p. 329; Martin, 1912, pp. 150, 156, 157; Pratt & Smith, 1913, pp. 312, 325, 326, 330, pl. 2, fig. 1; Martin, 1931, p. 2; Oostingh, 1935b, pp. 151 (syn.), 211, 218, 226; Pannekoek, 1936, pp. 8, 12, 63; Oostingh, 1941, pp. 23, 26, 27; Altena & Beets, 1945, pp. 54, 61, 66. *Chlamys senatoria*: Cox, 1927, pp. 45, 75, pl. 7, figs. 1-3, pl. 15, fig. 3, pl. 17, fig. 10; Douglas, 1928, p. 2, pl. 8, figs. 3-5; Cox, 1929, p. 191; Cox, 1930, pp. 103, 104, 108, 114, 115, 122, 152, pl. 13, fig. 21; Cox, 1931, pp. 2, 6, 7; Wanner & Hahn, 1935, pp. 233, 239, 267; Cox, 1936, pp. 9, 10, 11, 54, pl. 5, fig. 18, pl. 6, fig. 9; Weir, 1938, pp. 65, 66, 67; Mukerjee, 1939, pp. 3, 31, pl. 1, fig. 2, pl. 2, figs. 9-10; Montanaro-Gallitelli, 1939, pp. 254, 255; Cox, 1939, pp. 2, 3, 12, 19, pl. 1, fig. 14; Abrard, 1942, pp. 15, 16, 90, 98, pl. 1, figs. 19-20; Stockley, 1942, p. 235; Eames, 1950b, pp. 240, 241, 249; Eames, 1950c, p. 145; Azzarolli, 1958, pp. 12, 18, 19, 20, 43, 111, pl. 31, figs. 8-11; Nuttall, 1961, pp. 89, 90; Nuttall, 1965, pp. 161, 177.

*Range* — Oligocene?, Early Miocene to Recent: O (Padaung) - LM (Lower Telisa, Sumatra; Iran; Pemba Island; Kenya) - W - R - Rr (Rm, Rl) - UG (Sind; Sri Lanka) - Nj - Tj - NT (Gelingseh Beds: loc. 144; West Borneo; basal & Lower Palembang Beds) - M - P - N (e.g., Tji Gugur; Middle & Upper Fars, Iran) - PQ (e.g., Togopi) - Q - Re.

*Anomia* (*Anomia*) cf. *A. verbeeki* Martin, 1881

*Material* — RGM 315 082.

*Comment* — A single damaged valve is available which may well belong to *A. verbeeki*.

*References* — Martin, 1881, p. 94, pl. 5, figs. 4-6; Tesch, 1913, p. 159; Fischer, 1927, pp. 10, 13, 14, 16, 115; van der Vlerk, 1931, p. 266; Haanstra & Spiker, 1932b, p. 1314.

*Range* — Preangerian to Pliocene, Neogene: NT (West Borneo) - P - N.

*Placuna (Placuna) ehippium* (Philipsson, 1788)

*Material* — RGM 315 083.

*Comments* — A damaged specimen is available comparing very well with saddle-shaped Recent shells and even showing traces of the original colour.

*References* — Blanford, 1862, p. 193; Martin, 1883-1887, pp. 308, 313, 376 (*P. sella*); Oostingh, 1935b, pp. 160 (syn.), 218 (*Placenta ehippium*); Altena & Beets, 1945, pp. 55, 61 (*Placenta ehippium*); Nuttall, 1965, pp. 161, 178.

*Range* — Preangerian to Recent: NT (Gelingseh Beds: loc. 149) - UM (Tjiodeng) - P - N (Tji Gugur) - PQ (Togopi) - Q - Re.

*Placuna (Placuna) quadrangula* (Philipsson, 1788)

*Material* — RGM 315 084.

*Comments* — There are two specimens which agree perfectly with Recent shells in the Rijksmuseum van Natuurlijke Historie, showing even the delicate ornament. This would seem to be the first fossil record of the species.

*Reference* — Lyngé, 1909, p. 108 (*Placuna papyracea*).

*Range* — Recent: Re.

*Ostrea* spec. indet.

*Material* — RGM 315 085.

*Comments* — A few juvenile valves are present showing affinities to *O. cucullata* (Born, 1780). Not mentioned in the faunal list.

'*Lucina*' spec. indet.

*Material* — RGM 315 089.

*Comment* — A single fragmentary valve is present which is not mentioned in the faunal list.

*Cycladicama (Cycladicama) oblonga* (Hanley, 1856)

*Material* — RGM 315 088.

*Comments* — A number of mostly well preserved valves is available which agree on the whole well with other representatives of the species, both fossil and Recent.

*References* — Newton, 1905, p. 510 (*Diplodonta*); Oostingh, 1935b, pp. 171, 219 (syn.) (*Joannisiella*); Beets, 1950b, pp. 272, 277.

*Range* — Preangerian to Recent: Nj - Tj - NT (Batu Panggal; West Borneo; Tjikao) - P - Q - Re.

*Glans (Centrocardita?) boettgeri* (Martin, 1879)

*Material* — RGM 315 086.

*Comments* — Two fragments and one damaged valve are available. The material agrees best with specimens from the Gelingseh Beds. Two of the specimens from Sekurau are bigger than the type material. This rarely observed species has been recorded from the Philippines by Smith (1910, p. 329, pl. 4, fig. 10; 1913, pp. 254, 279, pl. 9, fig. 3), but his material actually appears to represent *Cardita ovalis* Reeve, 1843, a species recorded from Tji Gugur by Altena & Beets (1945, p. 55).

*References* — *Cardita boettgeri*: Martin, 1879-1880, p. 111, pl. 17, figs. 10, 10a-b; Martin, 1919, pp. 62, 131; van Es, 1931, pp. 116, 119.

*Range* — Preangerian, Miocene: NT (Gelingseh Beds: loc. 149, 150; Luzon) - M (Tjidamar).

*Crassatella radiata* Sowerby, 1825

*Material* — RGM 315 087.

*Comments* — A single left valve is present which, although damaged, compares so closely with other representatives of the species, both Recent and fossil, that its identification is considered safe. I agree with Eames that Cossmann's *C. dimorphorugata*, 1924, is probably but an abnormal variant of *C. radiata*.

*References* — Oostingh, 1935b, pp. 165, 166 (text-fig. 20), 218; Beets, 1947, p. 203; Beets, 1950a, pp. 250, 259; Beets, 1950d, pp. 312, 314, 315; Eames, 1950b, p. 250 ('*Crassinella*'); Eames, 1950c, p. 147; Nuttall, 1961, pp. 89, 90, 92; Nuttall, 1965, pp. 161, 178.

*Range* — Early Miocene to Recent: R - K (Arakan Coast) - NT (Gelingseh Beds: loc. 149) - P - PQ (Togopi) - Q - Re.

*Laevicardium (Fulvia?) njalindungense* (Martin, 1922)

*Material* — RGM 315 090.

*Comments* — A juvenile specimen is present which agrees very well with the smaller shells of a large series of late Miocene age from localities in East and West Borneo. It may be recorded here that a *Cardium* sp. (RGM 5486) from the Njalindung Beds also belongs to *L. njalindungense*. Martin presumably left it unidentified since it differs somewhat from the type material and at the time no intermediate specimens were available, as they are now.



*References* — Beets, 1941, pp. 162, 171, 186, 200, pl. 8, fig. 313 (*Cardium*); Beets, 1950b, pp. 272, 277, 279; Beets, 1950e, p. 338; Kotaka & Noda, 1977, p. 137, pl. 23, figs. 18-26 (*Vasticardium njalindungense*); Beets, 1983a, pp. 10, 14, 15, 16.

*Range* — Preangerian: Nj - NT (Mandul; basal Menkrawit Beds: L.114; Muara Kobun; Batu Panggal; West Borneo; Lower Palembang Beds; Pitogo Formation).

*Cultellus (Cultellus) dilatatus* Martin, 1879

*Material* — RGM 315 091.

*Comments* — A single left valve is available and, although damaged, it is perfectly safely identifiable. This *Macrosolen*-like species is usually considered to be a reliable index fossil for Preangerian. It may be added that Jenkins's description of a *Cultellus?* applies obviously to *C. dilatatus* (see: Jenkins, 1864, p. 62).

*References* — Martin, 1879-1880, p. 90, pl. 15, fig. 3; Martin, 1911, p. 43; Martin, 1919, pp. 66, 126, 128; Martin, 1921-1922, pp. 492, 493; Martin, 1928a, p. 117; Oostingh, 1934, p. 19; Oostingh, 1938, p. 511; Durham, 1940, p. 161; Westerveld, 1941, p. 113 (footnote 21).

*Range* — Preangerian: Nj - Tj - Bo - NT (Mandul; Lower Palembang Beds).

*Cultellus?* spec. indet.

*Material* — RGM 315 092.

*Comments* — A mould with part of the shell attached to it is available. The specimen shows commarginal folds. It compares very well with the earlier portion of a big Pliocene specimen from Gunung Gombel, Java (RGM 6841) which was left unidentified by Martin.

*Range* — Pliocene: P.

*Tellina* spec. indet.

*Material* — RGM 315 093.

*Comments* — Two damaged valves are available. The species is not mentioned in the faunal list.

*Tellina (Arcopagia?)* spec. indet.

*Material* — RGM 315 094.

*Comment* — Two fragile valves are available which appear to be related to *Arcopagia cygnus* (Hanley, 1844). The material is not mentioned in the faunal lists.

'Gari' spec. indet.

*Material* — RGM 315 095.

*Comment* — A single damaged shell is available which is not mentioned in the faunal list.

*Azorinus (Azorinus) coarctatus* (Gmelin, 1791)

*Material* — RGM 315 096.

*Comments* — A mould and a single valve are present, comparing very well with Recent specimens in the Rijksmuseum van Natuurlijke Historie and with fossil specimens from Ceram in the RGM identified by Fischer.

*References* — Smith, 1910, p. 330 (*Tagelus coarctatus* (!)); Smith, 1911 p. 376 (*Tagalus(!) abbreviatus*); Koert & Tornau, 1910, p. 9 (*Solecurtus abbreviatus*); Smith, 1913, pp. 254, 270, pl. 7, fig. 1 (*Azor coarctatus*); Yokoyama, 1920, p. 111, pl. 7, figs. 12-13 (*S. abbreviatus*); Cossmann, 1924, p. 143, pl. 8, figs. 8-9 (*S. abbreviatus*); Fischer, 1927, pp. 10, 13, 14, 20, 21, 22, 131 (*S. coarctatus*); Yokoyama, 1928b, pp. 116, 124, pl. 19, fig. 12 (*S. abbreviatus*); van der Vlerk, 1931, p. 282 (*S. coarctatus*); Nomura, 1932, p. 90 (*Psammosolen abbreviatus*); Prashad, 1932, p. 311 (*S. coarctatus*); Nomura, 1933, pp. 7, 104, 108 (*P. abbreviatus*); Nomura & Zinbô, 1936, p. 248 (*S. abbreviatus*); Suzuki & Ichimura, 1936, pp. 711, 712, 715, pl. 39, figs. 10-18 (*Zozia abbreviata, var.*); Abrard, 1942, pp. 46, 92, pl. 5, fig. 13 (*S. coarctatus*); Abrard, 1946, pp. 46, 97, 103, 108, pl. 4, fig. 5 (*S. coarctatus*); Eames, 1950b, p. 249 (*Azorinus abbreviatus*); Nuttall, 1961, p. 180 (*Z. coarctatus*); Dey, 1962, pp. 7, 15, 27 (*A. abbreviatus*); Shuto, 1971, pp. 4, 51, pl. 6, figs. 17-18, text-fig. 11 (*A. abbreviatus*).

*Range* — Early Miocene to Recent: UG (Quilon) - NT (West Borneo) - P - PQ (Togopi) - Q - Re.

*Circe (Circe) scripta* (Linné, 1758)

*Material* — RGM 315 097.

*Comments* — A few damaged valves and fragments are present. I know *C. scripta* also from undescribed collections in the Instituut voor Aardwetenschappen, Utrecht ('Young Neogene' of New Guinea and Ceram), and from Neogene deposits of the Bird's Head, New Guinea, in the RGM.

*References* — *Circe scripta*: Issel, 1869, p. 251; Koert & Tornau, 1910, p. 9; Yokoyama, 1927, p. 400; Yokoyama, 1928b, pp. 116, 127, pl. 20, fig. 2; Cox, 1929, p. 175; Oostingh, 1935b, pp. 180 (syn.), 219; Nomura, 1937, p. 72; de Bruyne, 1941, p. 31; Cox, 1948, p. 66, pl. 6, fig. 8; Nuttall, 1965, p. 179. *Gafrarium scriptum*: Rin, 1935, p. 19; Beets, 1941, pp. 195, 197; Beets, 1950a, pp. 251, 257, 259.

*Range* — Preangerian to Recent: NT (Gelingsch Beds: loc. 149) - P - N - PQ (e.g., Togopi) - Q - Re.

*Dosinia (Dosinia) boettgeri* Martin, 1879

*Material* — RGM 315 098.

*Comments* — Three valves are available which agree very well with some of the Javanese fossils, particularly from Pasir Kuta, Tjilang Beds (RGM 6559). The species was occasionally misinterpreted. Thus, Smith (1910, p. 239; 1913, p. 273, pl. 8, fig. 2) figured material which undoubtedly represents a different species. Finds recorded by Boettger (1908, p. 671: Quaternary) and von Kutassy (1934, pp. 307, 311) want checking. Meer Mohr (1922, p. 101, pl. on p. 100, fig. 2, top left) figured material which may represent a species closely related to *D. plana* (Reeve, 1850) rather than *D. boettgeri*; however, specimens recorded by this author in 1923 are included in *D. boettgeri* by Oostingh (loc. Tjiporang).

*Reference* — Oostingh, 1935b, pp. 182 (syn.), 211, 219.

*Range* — Preangerian to Pliocene: Tj - M (Tjidamar) - P - N (Luzon).

*Paphia (Paratapes) neglecta* (Martin, 1919)

*Material* — RGM 315 099 - 315 102.

*Comments* — A fair number of specimens is available, some complete, others damaged. The species was considered a reliable index fossil for Preangerian. However, recently doubt has been cast as to its stratigraphical value: Cox (see Shuto, 1971, p. 59) quoted it from Mio-Pliocene, on grounds unknown to me, and Shuto, from 'Miocene and Lower Pliocene of Indonesian region', while reporting its presence in the Ulian and Cabatuan formations in Panay (Pliocene).

Shuto considered *P. neglecta* as a subspecies of the Recent *P. undulata* (Born, 1778), a species which Martin already considered worth a close comparison. The difference in ornament which Martin stressed to separate the two, was not mentioned by Shuto who instead emphasized the difference in colour pattern, yet preferred considering them to be conspecific. Taking the differences together, however, causes the present writer to consider *P. neglecta* a species on its own.

*References* — Martin, 1919, pp. 65, 115, 126, 128, pl. 1, fig. 8; Martin, 1921-1922, pp. 491, 493; Martin, 1928a, p. 117 (all: *Tapes neglecta*); Oostingh, 1934, p. 19; Oostingh, 1938, p. 511.

*Range* — Preangerian to Pliocene: Nj - Tj - Bo - NT (West Borneo) - P.

*Placamen isabellina* (Philippi, 1849)

*Material* — RGM 315 103.

*Comments* — Some well preserved valves are present. Considering the systematic position assigned by various authors to *P. isabellina* (= *P. chlorotica* (Philippi, 1849)), *P. tiara* (Dillwyn, 1817) (= *P. foliacea* (Philippi, 1848), = *P. karikalensis* (Cossmann, 1924)) and

*P. calophylla* (Philippi, 1836), additional comparisons are sorely needed. For the time being, I am satisfied that my specimens agree with, for instance, Martin's material of *Venus chlorotica* from Tjidjerei (RGM 6695) and the specimens figured as *Chione isabellina* by Oostingh, whose synonymy I follow here. In the Java collection of the RGM, *P. isabellina* is also present, invariably called *Venus chlorotica*, from the following localities:

Tjilanang Beds: loc. O, Junghuhn: the specimen figured by Martin (1879, p. 98, pl. 16, fig. 9) is perhaps unidentifiable, but two other specimens are clearly *P. isabellina* (RGM 6615); Tji Burial: RGM 6691, 47 275; Pasir Kuta: RGM 6692.

Pliocene: Gunung Gombel: RGM 6688, 47 152.

Quaternary: Banjar Anjar: RGM 6616.

Other specimens in the collection could as well be *P. tiara* (RGM 6693-6694, from the Njalindung Beds) and the specimen from the Well Batavia, *P. calophylla*.

I feel doubtful about the alleged synonymy of *P. isabellina* and *P. calophylla*, Shuto's figs. 14-16, moreover, evidently representing *P. tiara*: Shuto, 1971, p. 60, pl. 8, figs. 8-19.

Cox (1948) figured a specimen from the Dent Peninsula which indeed seems to be *P. isabellina*. Nuttall (1965) went a step further, lumping *P. tiara*, *P. isabellina* and *P. chlorotica*.

*References* — Dickerson, 1921, pp. 5, 6, 7 (*Chione chlorotica*); Oostingh, 1935b, pp. 185, 219, pl. 15, figs. 138-140; Saurin, 1936, p. 235 (*Venus isabellina*); Cox, 1948, p. 64, pl. 6, fig. 11 (*Venus isabellina*); Nuttall, 1961, pp. 89, 92, table 16 (*Venus isabellina* (?)); Nuttall, 1965, p. 180 (*Chione tiara* (?)).

*Range* — Preangerian to Recent: Tj (& loc. O, Junghuhn) - NT (Mandul, West Borneo) - P - PQ (Togopi?) - Q - Re.

#### *Corbula* cf. *C. erythrodon* Lamarck, 1818

*Material* — RGM 315 104.

*Comment* — Seven isolated valves are available, agreeing with thin-shelled Recent shells and fossils from Gunung Gombel, Java (RGM-collection).

*References* — Beets, 1950d, pp. 313 (syn., excl. Beets, 1941), 315 (*Aloidis erythrodon*); Hayasaka, 1961, table 4 facing p. 24, p. 63, pl. 6, fig. 2 (*Solidicorbula erythrodon*).

*Range* — Late Miocene to Recent: UM (Japan) - P - Q - Re.

#### *Corbula solidula* Hinds, 1843

*Material* — RGM 315 105.

*Comment* — Two isolated valves and a complete specimen are available of this tiny species.

*References* — Lynge, 1909, p. 174, pl. 5, figs. 31-34, 42-44; Nomura, 1933, pp. 7, 106, 108, pl. 3, figs. 10-11 (*C. taiwanensis*); Nomura & Zinbô, 1936, pp. 231, 248 (*C. taiwanensis*); Beets, 1950b, p. 279; Beets, 1950e, p. 339; Beets, 1981a, pp. 4, 6; Beets, 1981b, pp. 18, 23, 24.

*Range* — Early Miocene to Recent: Rr (R1) - NT (Mandul; basal Menkrawit Beds: L.114; Gelingseh Beds: source area of Sg. Gelingseh; Sg. Gelingseh, 'layer 2'; Gunung Mendong; Tapian Langsat; Gunung Madupar, Rutten & Wanner; Mentawir Beds s. str.) - P - N - Re.

*Corbula taitensis acuticosta* Martin, 1885

*Material* — RGM 315 106.

*Comment* — Two well preserved valves are available, slightly flatter and comparatively longer than the typical material, and the ribs slightly more distant. One of the valves shows a faint radial depression reminiscent of the living *C. taitensis taitensis* Lamarck, 1818 (Prashad, 1932, p. 308).

Newton (1900, p. 557: *C. taheitensis* (!)) and Cox (1931, pp. 6, 8) recorded *C. taitensis taitensis* from Quaternary and 'Pliopleistocene' deposits of the Red Sea area, which also yielded *C. acutangula* Issel, 1869, probably conspecific with *C. taitensis* as was pointed out by Abrard (1942, pp. 48, 99, pl. 5, fig. 23), although approaching the subspecies *acuticosta* more closely than the Recent one.

*References* — Martin, 1883-1887, pp. 197, 360, pl. 10, fig. 200; Martin, 1919, pp. 66, 128; Martin, 1928a, pp. 111, 117; Vredenburg, 1928, p. 461; Martin, 1931, p. 3; van der Vlerk, 1931, p. 283; Beets, 1947, p. 203 (*Aloidis taitensis acuticosta*).

*Range* — Preangerian to Pliocene, Neogene: Nj - Tj - M (Tjidamar) - P - N.

*Corbula tjiguhanensis* Martin, 1922

*Material* — RGM 315 107.

*Comment* — Six valves agreeing very well with the type material.

*References* — Oostingh, 1935b, pp. 205 (syn.), 211, 219; Beets, 1950b, pp. 273, 277; Beets, 1950c, p. 301; Kotaka & Noda, 1977, p. 146, pl. 25, fig. 12 (?).

*Range* — Preangerian to Pliocene, Neogene: Nj - NT (Batu Panggal; Pitogo?) - UM (Tjidjarian near Tjiodeng; Tjiodeng) - P - N.

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## Errata Scripta Geologica 74

- p. 5: 2nd line from the top: for enhance read enhance.
- p. 23: 3rd line from the bottom: for writter read writer.
- p. 32: range of *Glans boettgeri*: loc. Luzon to be deleted.
- p. 35: range of *Dosinia boettgeri*: N (Luzon) to be deleted.
- p. 69: 3rd line from the top to be deleted and replaced by: and the shell is flatter. Among the numerous Recent shells compared the author never