THE MARINE MOLLUSCA OF THE KENDENG BEDS (EAST JAVA) GASTROPODA PART V

(Families Muricidae - Volemidae inclusive)

BY

C. O. VAN REGTEREN ALTENA,
Rijksmuseum van Natuurlijke Historie, Leiden

CONTENTS.

1. Introduction.

Part IV of this monograph was published in volume 12 of this Journal, pp. 89—120, 1942.

Since 1941 the author can devote only a small part of his time to these investigations. This fact, and the shortness of paper available for scientific publications, made him decide to alter the way of publication: the extensive lists of references to literature and the records of distribution with every species have now been omitted. As further parts of this publication will follow with rather large intervals of time, from the present part onward complete lists of references will be added to each part, instead of supplements to the bilbliography published in part I.

The author is indebted to the following persons for the permission of examining specimens in the collections belonging to their institutions, for the loan of specimens, or for other kind of assistance: Dr. CH. BAYER (Rijksmuseum van Natuurlijke Historie, Leiden), Prof. Dr. H. A. BROUWER (Geologisch Instituut, Amsterdam), Prof. Dr. B. G. ESCHER (Rijksmuseum van Geologie en Mineralogie, Leiden), Mrs. W. S. S. VAN DER FEEN—VAN BENTHEM JUTTING (Zoölogisch Museum, Amsterdam), Dr. P. KRUIZINGA (Instituut voor Mijnbouwkunde, Delft), Dr. TH. RAVEN (Mineralogisch-Geologisch Instituut, Utrecht), Dr. W. J. REES (British Museum (Natural History), London), J. R. LE B. TOMLIN (St. Leonards-on-Sea).

The figures were drawn by Mr. P. VAN 'T ZELFDE, except the numbers 1, 2, 10, and 15, which are the first products of the young artist of the Rijksmuseum van Natuurlijke Historie. The Zoölogisch Insulinde Fonds supplied part of the cost of the illustrations, and enabled the author to pay a visit to London in order to compare his material with the collections of recent mollusca in the British Museum (Natural History).

The following abbreviations have been used:

ex.: specimen(s),
fr.: fragment(s),
loc.: locality,
G. I. A.: Geologisch Instituut, Amsterdam,
R. G. L. M.: Rijksmuseum van Geologie en Mineralogie, Leiden,
R. N. H. L.: Rijksmuseum van Natuurlijke Historie, Leiden,
Z. M. A.: Zoölogisch Museum, Amsterdam.

2. Systematic survey of the mollusca of the Kendeng beds (continued).

Familia Muricidae.

182. RAPANA RAPIFORMIS (BORN, 1778).

= *Rapa volema* BOEDING, 1798, *Buccinum bulbosum* DILLWYN, 1817.

Material examined:

Poetjangan layers (volcanic facies): Sheet 110B, C 83: 2 ex.; **layer I:** Sheet 110A, M 291: 1 ex.; M 298: 1 ex. (juv.); M 299: 1 ex. (juv.); M 301: 1 ex.; C 1: 1 ex.; C 52: 1 ex.; C 60: 1 ex.; **horizon above layer I:** Sheet 110B, M 274: 1 ex.

This species has recently been dealt with by WISSEMA (1947, p. 166).

183. CHICOREUS SCABER (MARTYN, 1789).

= *Murex rubicundus* PERRY, 1811, *M. adustus* LAMARCK, 1822.

Material examined:

Poetjangan layers (volcanic facies), layer II: Sheet 110A, M 125: 1 ex.

This species has recently been dealt with by WISSEMA (1947, p. 167).

184. CHICOREUS CAPUCINUS (LAMARAK, 1822).

Material examined:

Poetjangan layers (volcanic facies), layer II: Sheet 116A, M 218: 1 ex.

This species has recently been dealt with by WISSEMA (1947, p. 168).

185. CHICOREUS SONDEIANUS (K. MARTIN, 1895).

Material examined:

Upper Kalibèng layers: Sheet 93B, M 257: 1 ex. (rather bad).

186. CHICOREUS KENDENGENSIS spec. nov.

Figures 1, 2.

Material examined:

Poetjangan layers (volcanic facies): Sheet 99B, M 9: 1 ex.; Sheet 110B, C 44: 1 ex.; **layer I:** Sheet 110A, M 90: 3 ex. (among which the holotype); Sheet 110B, M 156: 1 ex.; **horizon above layer I:** Sheet 110B, C 74: 1 ex.; **layer II:** Sheet 110A, C 54: 1 ex.; Sheet 110B, M 160: 1 ex.; M 278: 2 ex.; Sheet 116A, C 39: 1 ex.; C 40: 1 ex.

Poetjangan layers (argillaceous facies): Sheet 110B, M 264: 1 ex.

Shell fusiform. The initial whorls are missing in all my specimens;

in some of the paratypes part of the last whorl of the protoconch is preserved, it is smooth and convex. In the holotype 5½ convex, sculptured whorls are preserved; in the oldest 2½ whorl the sculpture consists of spirals running over axial ribs and their interstices; in the antepenultimate, penultimate and body whorl the spirals are numerous and somewhat finer than in the preceding whorls; here the axial sculpture consists of four

Fig. 1. *Murex kendengensis* spec. n., holotype, × 1¼ [1]).

varices bearing small spines, between every two consecutive varices a knoblike axial rib is present. Aperture oval, inner lip smooth, outer lip denticulate within, the denticles corresponding with the interstices between

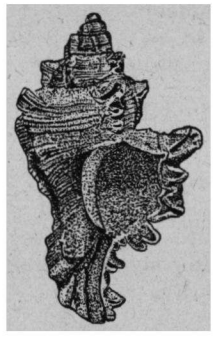

Fig. 2. *Murex kendengensis* spec. n., paratype from loc. C 74, × 1.

the spines of the last varix. Siphonal canal about as long as the height of the aperture, siphonal fasciole well developed and bearing scaly spines.

In some of the paratypes (e. g. those from the localities C 74, M 278, and M 264) the varices bear one larger spine on the shoulder angle of the penultimate and body whorl, and the group of spirals running from one spine to the corresponding one of the next varix can be followed between the varices, the middle spiral of the group being more prominent than the others.

[1]) The enlargements given with the figures are approximations. For exact measurements see the text.

Dimensions:

Alt. 46 + ?, Diam. 28, Aperture [1]) 15, Canal 15 mm. (holotype),
Alt. 38 + ?, Diam. 24, Aperture [1]) 11, Canal 13 mm. (C. 74).

I have named this new species after the Kendeng Mountains.

Ch. kendengensis spec. nov. resembles *Ch. moquinianus* (DUVAL, 1853) from the West African coast. I could compare it with recent specimens matching DUVAL's description (R. N. H. L.). My fossils belong, however, to a smaller species, of which the whorls are more convex, the suture is consequently deeper, the spiral sculpture less coarse, and the spines mostly smaller. As far as I know no recent species of *Chicoreus* with four varices occurs in the Indo-Westpacific region.

Chicoreus spec.

Material examined:

Poetjangan layers (volcanic facies): Sheet 99B, M 9: 1 ex.; Sheet 110B, C 66: 1 ex.; **layer I:** Sheet 110A, M 291: 1 fr.; C 1: 2 ex.

These specimens are too bad to allow of a more exact identification.

187. PTERYNOTUS PINNATUS (SWAINSON, 1822).

Material examined:

Poetjangan layers (volcanic facies): Sheet 110B, C 71: 1 ex.

188. MUREX TRIREMIS (PERRY, 1811).

= *Murex tenuispina* LAMARCK, 1822.

Material examined:

Upper Kalibèng layers: Sheet 93B, M 257: 2 ex.; M 260: 1 fr.
Poetjangan layers (volcanic facies): Sheet 110B, C 44: 1 ex.; C 71: 2 ex.; **layer I:** Sheet 110A, C 1: 1 ex.; C 60: 2 ex.; Sheet 110B, M 68: 1 ex.; **horizon above layer I:** Sheet 110B, M 273: 1 ex.; M 274: 3 ex.; C 74: 1 ex.; C 75: 1 ex.

There are no previous fossil records of this species, but I found two specimens from Sonde at Leiden (R. G. M. L.) s. n. *Murex verbeeki* K. MARTIN. One of these has been figured by MARTIN (1895, pl. 19 fig. 279).

Damaged and worn specimens are rather difficult to separate from the next species. The suture is more canaliculate in the recent species, and the portion of the varix between the shoulder and the suture behind it is very characteristic in *triremis*: it always bears two main spirals and is more pronounced than in *troscheli*.

189a. MUREX TROSCHELI BENTARSARIENSIS OOSTINGH, 1940.

Material examined:

Upper Kalibèng layers: Sheet 93B, M 260: 4 ex.

The reasons for considering this subspecies to belong to *Murex troscheli* LISCHKE will be dealt with in the discussion of the next subspecies. WISSEMA (1947, p. 176) was the first to record this subspecies from some localities in which *M. troscheli verbeeki* K. MARTIN also occurs. As the two forms also coexist in the Upper Kalibeng layers, it seems doubtful if they really are subspecies.

[1]) Distance between the foremost and hindmost points of meeting of the inner and outer lips.

189b. MUREX TROSCHELI VERBEEKI K. MARTIN, 1895.

Material examined:

Upper Kalibèng layers: Sheet 93B, M 252: 21 ex.; M 257: 9 ex.; M 260: 3 ex. + fr.; M 261: 12 ex. + some fr.

OOSTINGH (1940, p. 58) supposed that *M. verbeeki* might prove to be a subspecies of some recent species, perhaps of *M. troscheli* LISCHKE, 1868. I compared the whole material of the Leiden Museum with some recent shells of *M. troscheli* (R. N. H. L.) and found it difficult to find reliable characters to separate the two forms. The main reasons for this difficulty are that *M. verbeeki* is rather variable and that undamaged fossil specimens are very rare. My final conclusion is that *M. verbeeki* is to be considered a fossil subspecies of *M. troscheli*. It is distinguished from the typical subspecies by its smaller size, somewhat finer and more developed axial sculpture and shorter spines. In the specimens from the Sonde beds (= Upper Kalibeng layers) the varices are mostly less developed than in the typical *M. troscheli*, but this character is very variable.

A revision of the material labelled "*Murex verbeeki*" in the Leiden Museum led to the following result:

St. 9631, Tjikeusik, 1 ex.: *M. troscheli verbeeki*, figured by K. MARTIN (1895, pl. 19 fig. 281), here designed as lectotype. Varices well developed.

St. 9632, Padasmalang, 2 ex.: one of these certainly, the other probably *M. troscheli bentarsariensis* OOSTINGH.

St. 9633, Sonde, 3 ex.: 1 ex. belongs to *M. triremis* (PERRY), figured by K. MARTIN (1895, pl. 19 fig. 279); 1 ex. *M. troscheli verbeeki*, figured by K. MARTIN (l. c., fig. 278); 1 ex. probably *M. troscheli bentarsariensis* OOSTINGH, but the identification remains uncertain as the topwhorls are damaged. Varices less developed than in the lectotype of *verbeeki*.

St. 9634, Sonde, 5 ex.: 1 ex. belongs to *M. triremis* (PERRY), 4 ex. *M. troscheli verbeeki*. Varices less developed than in the lectotype.

St. 9637, Goenoeng Boetak, 1 ex.: bad specimen belonging to another species.

St. 9638, Tji Boerial, 1 ex.: too bad for identification.

St. 9639, Batavia, 105 m., 1 ex.: *Murex troscheli troscheli* LISCHKE?, bad specimen.

St. 17832, Ceram, Fufa layers, 1 ex.: probably *M. troscheli verbeeki*, bad specimen.

189c. MUREX TROSCHELI TROSCHELI LISCHKE, 1868.

Material examined:

Poetjangan layers (volcanic facies), layer I: Sheet 110A, M 292 or 293: 1 ex.

190. MUREX TRAPA ROEDING, 1798.

= *Murex martinianus* REEVE, 1845.

Material examined:

Poetjangan layers (volcanic facies): Sheet 110A, M 108: 2 ex.; Sheet 110B, M 161: 11 ex.; M 163: 7 ex.; M 167: 1 ex.; C 70: 1 ex.; C 71: 1 ex.; **layer I:** Sheet 105B, M 67: 1 fr.; Sheet 110A, M 88: 1 ex. (juv.); M 89: 1 ex. (juv.); M 102a: 1 ex.; Sheet 110B, M 157: 1 ex.; C 91: 1 ex.; **horizon above layer I:** Sheet 110B, M 273: 2 ex.; M 274: 1 ex.; C 74: 2 ex.; C 75: 4 ex.; **layer II:** Sheet 110A, M 304: 2 ex.; Sheet 110B, M 173: 1 ex.; M 176: 1 ex.; M 278: 2 ex.; M 281: 4 ex.; M 284: 2 ex. (juv.); C 82: 2 ex.;

Sheet 116A, M 216: 5 ex.; M 218: 2 ex.; M 221: 1 ex.; C 5: 2 ex.; C 34: 2 ex.; C 39: 2 ex.; C 40: 1 ex.; ± layer II?: Sheet 109C, M 347: 1 ex. (juv.); **layer III**: Sheet 110A, M 139: 3 ex.; M 143: 2 ex.; Sheet 116A, M 228: 1 ex.
Poetjangan layers (argillaceous facies): Sheet 110B, M 264: 13 ex.; M 267: 2 ex. + 3 fr.; M 268: 1 ex.
Kaboeh layers: Sheet 110B, M 197: 2 ex.

In Leiden (R. G. M. L.) I could examine the specimens assigned to *Murex ternispina* LAMARCK by K. MARTIN (1883—'87, p. 97 (1884) partim!, cf. K. MARTIN, 1895, p. 124; 1919, pp. 85, 134; VAN DER VLERK, 1931, p. 237); I think they belong to the present species.

191. MUREX LEBACANUS K. MARTIN, 1895.

Material examined:

Poetjangan layers (volcanic facies), layer I: Sheet 110B, M 156: 1 ex.; C 89: 1 ex.

In Leiden (R. G. M. L.) I found 2 specimens from Tjiboerial[1]) and 2 others from Atjeh (K. MARTIN, 1928, pp. 10, 25) labelled "*Murex djarianensis* K. MARTIN", but belonging without any doubt to *lebacanus*. The late Dr. C. H. OOSTINGH informed me in lit. (from Bandoeng 20 III 1940) that the same mistake had been made by K. MARTIN in the identification of *M. djarianensis* from Tjidjoerei (K. MARTIN, 1926, pp. 11, 17), 2 of the 10 specimens belonging to *lebacanus*, and by himself with the shells from the pliocene of Boemiajoe (OOSTINGH, 1935, p. 64), where only one specimen of *djarianensis* was found (locality 166—167) the others all belonging to *lebacanus*. Moreover *lebacanus* occurs in the Kalibioek Series of the Bentarsari Basin, from which it also was recorded as *M. djarianensis* (cf. HETZEL, 1935, p. 28).

192. MUREX EJECTUS K. MARTIN, 1895.

Material examined:

Poetjangan layers (volcanic facies), layer II: Sheet 116A, M 216: 7 ex.; M 218: 1 ex.; M 224: 1 ex.; C 6: 1 ex.; C 34: 1 ex.; C 36: 1 ex.; C 38: 1 ex.; C 39: 1 ex.; **layer III**: Sheet 110A, M 143: 1 ex.; Sheet 110B, M 193: 1 ex.
Poetjangan layers (argillaceous facies): Sheet 116B, M 333: 3 ex. + some fr.

In Leiden (R. G. M. L.) I could examine 3 specimens identified by K. MARTIN as "*Murex djarianensis* MART." and deriving from the pliocene of Atjeh, Sumatra (K. MARTIN, 1928, pp. 10, 25). One of them proved to belong to the present species, while the two others agree with *M. lebacanus* K. MARTIN (vide supra).

193. MUREX BREVISPINA LAMARCK, 1822.

= *Murex brevispina* LAM., var. K. MARTIN, 1895.

Material examined:

Poetjangan layers (volcanic facies): Sheet 99B, M 9: 1 ex.

[1]) The protoconch of one of these specimens has been figured by K. MARTIN, 1921, pl. 59, fig. 49.

194. MUREX spec.

Material examined:

Poetjangan layers (volcanic facies), layer I: Sheet 110A, M 298: 5 ex.; **layer II:** Sheet 110A, M 125: 1 ex.

These specimens are rather damaged; they seem, however, to belong to one and the same species. They agree in many respects with *M. rectirostris* G. B. SOWERBY II, 1841, with the types of which I could compare them in London, but the varices are not so thick in my fossils, and they bear a smaller spine. Moreover the inner lip is wrinkled in the only fossil specimen in which it is well preserved. Better material is required for a certain identification of this species.

Murex spec.

Material examined:

Upper Kalibèng layers: Sheet 93B, M 251: 1 ex.; M 255: 1 ex.
Poetjangan layers (volcanic facies), layer I: Sheet 110A, M 86: 1 ex.; M 302: 1 fr.

Fragments and bad specimens.

195. MURICOPSIS BANTAMENSIS (K. MARTIN, 1899).

Material examined:

Upper Kalibèng layers: Sheet 93B, M 260: 1 ex.

A beautiful specimen; the scaly lines of growth are more pronounced than in MARTIN's types (R. G. M. L.), which is probably due to the better preservation of my specimen. WISSEMA (1947, p. 178) recently dealt with this species.

196. ASPELLA (FAVARTIA) SYKESI (PRESTON, 1904).

Material examined:

Poetjangan layers (volcanic facies): Sheet 99B, M 9: 1 ex.

Dr. W. J. REES was so kind as to compare my specimen with the type of the species in the British Museum, with which it appeared to agree.

197. DRUPA UNDATA (GMELIN, 1790).

Material examined:

Upper Kalibèng layers: Sheet 93B, M 260: 1 ex.

198. DRUPA SCHROEDERI WISSEMA, 1947.

Figures 3a, b.

Material examined:

Poetjangan layers (volcanic facies), layer III: Sheet 110A, M 139: 1 ex.

This specimen is somewhat more worn than the holotype of the species, with which I could compare it (R. G. M. L.). It agrees with the holotype in all essential details.

199. DRUPA CONCATENATA (LAMARCK, 1822).

Material examined:

Poetjangan layers (volcanic facies), layer II: Sheet 116A, C 5: 1 ex.

This species has recently been dealt with by WISSEMA (1947, p. 180).

Judging after the description and figures "*Ocinebra* spec. ind." of NARDINI (1934, p. 205, pl. 15 figs. 14a, b) may be the present species. I saw a recent East Indian specimen which also showed some small teeth on the columellar lip near the canal.

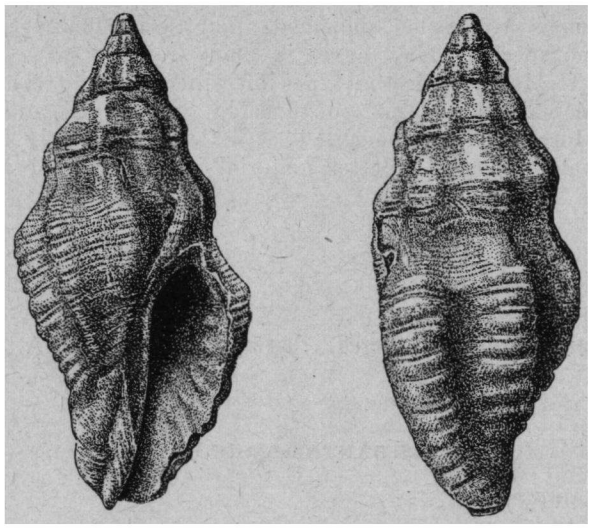

Fig. 3a, b. *Drupa schroederi* Wissema, from loc. M 139, × 3.

200. **MANCINELLA ALOUINA** (ROEDING, 1798).

= *Purpura mancinella* auctorum nec (LINNAEUS, 1767) (cf. HEDLEY, 1908, p. 457), *P. gemmulata* LAMARCK, 1822.

Material examined

Poetjangan layers (volcanic facies), layer II: Sheet 110A, M 126: 1 ex.

In my opinion the specimen from Sonde mentioned and figured by K. MARTIN (1899, p. 134, pl. 21 figs. 309, 309a) is a subscalarid of this species. The spiral groove encircling the siphonal fasciole, to which MARTIN calls special attention, occurs sometimes in recent specimens too (Z. M. A.). The species has been recently dealt with by WISSEMA (1947, p. 183).

201. **MANCINELLA ECHINATA** (BLAINVILLE, 1832).

Material examined:

Poetjangan layers (volcanic facies), layer II: Sheet 110A, M 126: 1 ex.

202. **CYMIA IMPERIALIS** (BLAINVILLE, 1832?; REEVE, 1846).

Material examined:

Poetjangan layers (volcanic facies), below layer I: Sheet 105B, M 68: 1 ex.; **layer I**: Sheet 110A, M. 94a: 1 ex.; **layer II**: Sheet 110B, M 175: 1 ex.
Poetjangan layers (argillaceous facies): Sheet 110A, M 113: 1 ex.; Sheet 116B, M 333: 2 ex.

203. **CYMIA CARINIFERA** (LAMARCK, 1822).

= *Melongena* (*Pugilina*) *proteiformis* COSSMANN, 1903.

Material examined:

Poetjangan layers (volcanic facies), layer II: Sheet 110B, M 267: 4 ex.
Poetjangan layers (argillaceous facies): Sheet 110A, M 304: 1 ex.

I cannot agree with VREDENBURG (1925, 1, p. 228; cf. K. MARTIN, 1931, p. 2) who places this species in the synonymy of "*Cymia sacellum* (CHEMNITZ)".

204. CYMIA RUGOSA (BORN, 1778).

Material examined:

Poetjangan layers (volcanic facies): Sheet 110B, C 83: 1 ex.

My only specimen is damaged, but there is a good series of what is evidently the same form from the mud-volcano Kalang Anjar near Soerabaja in the collection of the Geological Institute at Amsterdam. In these shells the sculpture, both in spiral and in axial direction, is very well preserved; they agree strikingly with the shell figured by KING & PING (1931, p. 274, figs. 9, 9). In the specimen from the Coral bed of Awa figured by YOKOYAMA (1924, p. 16, pl. 1 fig. 10) the number of spirals in the body whorl is less than in the typical species.

205. CYMIA COSTATA (BLAINVILLE, 1832).

Material examined:

Poetjangan layers (volcanic facies): Sheet 110A, M 120: 1 ex.; Sheet 110B, C 71: 1 ex. (juv.); **layer II**: Sheet 116A, M 216: 1 ex.
Kaboeh layers: Sheet 110B, C 28: 2 ex.

Cymia costata also occurs in the pliocene of Mount Gombel, Residence of Samarang, Java (cf. v. R. ALTENA, 1948, p. 12).

Moreover I found a specimen of this species in the Leiden Museum in a sample of *Cymia carinifera* (LAM.) from Tjidjoerei (Cheribon, Java).

Cymia spec.

Material examined:

Poetjangan layers (volcanic facies), layer I: Sheet 110A, M 89: 1 ex.; M 94a: 2 ex.; Sheet 110B, C 76: 1 ex.

I am unable to identify these shells; partly because they are too young or too much damaged.

206. UROSALPINX CONTRACTA (REEVE, 1846).

Material examined:

Poetjangan layers (volcanic facies): Sheet 110B, C 44: 1 ex.; **layer I**: Sheet 110B, M 153: 1 ex.; C 77: 4 ex.; **layer II**: Sheet 110A, M 127: 1 ex.; Sheet 110B, M 160: 3 ex.; M 176: 1 ex.; ± **layer II?**: Sheet 109C, M 346: 1 ex.

I could compare my specimens with the type and two paratypes in the British Museum. My specimens are smaller and slenderer than the types, the aperture is slightly narrower, and the shoulder angle less pronounced in the body whorl.

Dimensions of REEVE's types:	Alt. 30,	Diam. 15½ mm	(holotype)
	Alt. 29½,	Diam. 14½ mm	
	Alt. 25,	Diam. 13 mm	
Dimensions of some of my specimens:	Alt. 31,	Diam. 16 mm	(C 77)
	Alt. 25,	Diam. 12 mm	(M 160)
	Alt. 23½,	Diam. 11½ mm	(M 160)
	Alt. 22,	Diam. 11 mm	(M 346)

My specimens agree very well with those figured by STURANY (1904, pp. 219, 238, pl. 6 figs. 1a, b) and YOKOYAMA (1924, p. 15, pl. 1 fig. 2). In the collection of the Geological Institution at Amsterdam there is a series of this species from the mud-volcano Kalang Anjar near Soerabaja, and one specimen from young miocene deposits at Tji Livat (Priangan, Java).

There is no unanimity as to the generic position of this species; it has been assigned to the genera *Buccinum* LINNÉ (REEVE, 1846), *Pollia* SOWERBY (LISCHKE, 1871), *Murex* LINNÉ (TRYON, 1880), *Urosalpinx* STIMPSON (MELVILL & ABERCROMBIE, 1893), *Tritonidea* SWAINSON (PILSBRY, 1895), *Ocenebra* GRAY (MELVILL & STANDEN, 1898), *Trophon* MONTFORT (HEDLEY, 1910), *Xymene* IREDALE (HEDLEY, 1918), *Ergalatax* IREDALE (HIRASE, 1936), and *Lataxiena* JOUSSEAUME (NOMURA & ZINBÔ, 1936). The species has been assigned to the genus *Urosalpinx* here, as SMITH (1906, p. 39) states that the radula agrees with that of *Urosalpinx*. Conchologically it seems very near the species assigned here to *Ocinebrina* JOUSSEAUME. According to SMITH (l. c.) *Ricinula heptagonalis* REEVE is an earlier synonym for this species, but the material I examined does not agree with REEVE's original figure (1846, pl. 3, fig. 17).

207. OCINEBRINA VANDERVLERKI spec. nov.

Figure 4.

Material examined:

Poetjangan layers (volcanic facies), layer II: Sheet 110A, M 125: 1 ex. (holotype).

Description: Shell fusiform, whorls 7½. Protoconch conoid, consisting

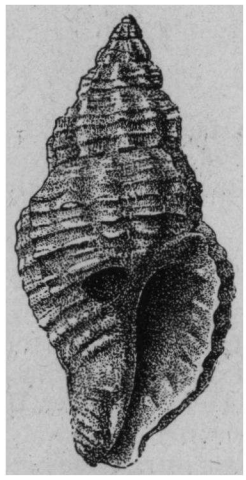

Fig. 4. *Ocinebrina vandervlerki* spec. n., holotype, × 3½.

of 2 smooth whorls. Further whorls convex, sculptured both in axial and in spiral direction. At first only 2 spirals occur, of which the hindmost indicates the rather distinct shoulder, then the number of spirals gradually increases, firstly on the area behind the shoulder, then also before it; the penultimate whorl possesses 6 spirals. Here and there secondary spirals are visible in the interstices. The axial ribs number ± 11 on each whorl. Between the axial ribs, and on their sides turned to the mouth, rather distinct lines

of growth occur, giving a scaly appearance to the spirals, especially on the body whorl. Body whorl narrowing in front into a short canal. The axial ribs do not continue on the dorsal side of the canal: here spirals only occur. For the rest the sculpture of the body whorl agrees with that of the spire. Aperture oval, its height about half the altitude of the shell.

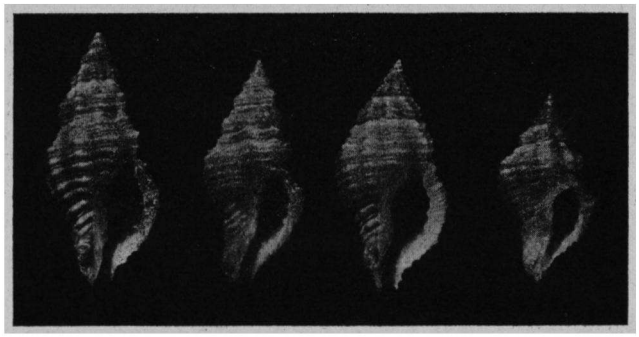

Fig. 5a–d. *Murex serotina* A. Adams, syntypes, × 2. Fig. 5a represents the lectotype [photographs by courtesy of the British Museum (Natural History)].

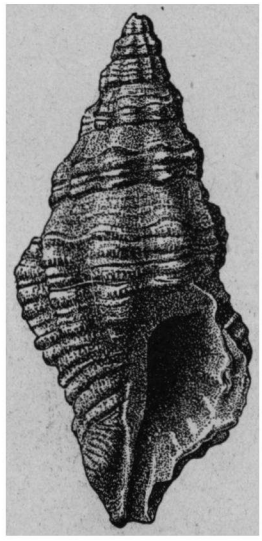

Fig. 6. *Ocinebrina serotina* (A. Adams), from station 303 of the Siboga Expedition (Z. M. A.), × 4.

Inner lip smooth, with a parietal tooth; outer lip with 6 teeth inside, of which the posterior is indistinct. Canal short, open.

Alt. 17, Diam. 8½ mm.

I have named this new species after Professor Dr. I. M. VAN DER VLERK.

Ocinebrina vandervlerki spec. nov. is related to a recent species dredged by the Siboga at her stations 164 and 303, and identified by SCHEPMAN (1911, p. 350) as *Ocinebra serotina* (A. ADAMS). As HEDLEY (1913, p. 326) remarked, there are 4 syntypes of *Murex serotina* A. ADAMS, 1851, in the British Museum. I had an opportunity to examine these specimens in October 1947, and photographs of them are reproduced here (fig. 5a—d). I doubt whether

the four shells belong to one and the same species. Two of them are slender, they measure: alt. 16, diam. 7½, and alt. 14½, diam. 7 mm respectively. The largest of these two (fig. 5a) is here designed as the lectotype of A. ADAMS' species, the second (fig. 5b) seems to belong to the same species as do the shells dredged by the Siboga (fig. 6). HEDLEY (1913, pl. 19 fig. 78) figured the third syntype (fig. 5c) which belongs to a less slender species with differently shaped spiral whorls separated by a canaliculate suture. Its measurements are: alt. 14½, diam. 7½ mm. The fourth syntype (fig. 5d) has again a different habitus and may be a young specimen of a larger species belonging to another genus. It measures: alt. 12, diam. 7 mm.

Ocinebrina vandervlerki spec. nov. differs from *O. serotina* by its less slender habitus and the greater number of axial ribs, which I found to be 6½—9 in the body whorl of the recent species.

208. OCINEBRINA CEREUS (E. A. SMITH, 1884).

Figures 7, 8a, b.

Material examined:

Poetjangan layers (volcanic facies): Sheet 105B, M 63: 1 ex.; Sheet 110B, C 44: ? 1 ex.; **layer II:** Sheet 110A, M 125: 4 ex.

My specimens agree with the type of this species, an empty shell from

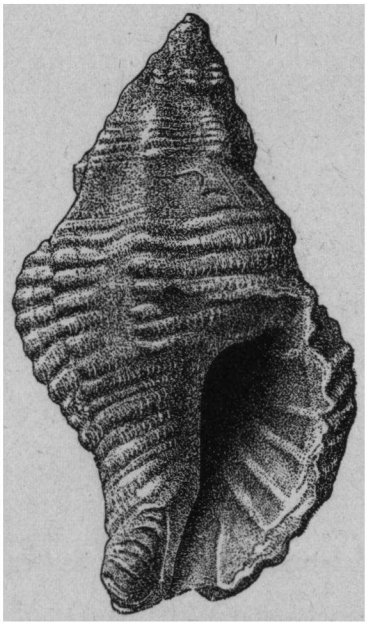

Fig. 7. *Ocinebrina cereus* (E. A. Smith), from loc. M 125, × 5.

7 fathoms depth at Port Curtis, which I examined in the British Museum. The outer lip of the type is damaged, as appears from SMITH's original figure. Therefore a specimen from locality M 63 has been figured here in which the aperture is undamaged. The outer lip bears 6 elongate denticles inside. The species is apparently closely related to *O. contempta* (A. ADAMS, 1854), of which I failed to find a figure. A specimen from the quaternary of Kajoe Ragi, Celebes (R. G. M. L., cf. SCHEPMAN, 1907, p. 179) has therefore been

figured here (fig. 9). In London I examined the type of A. ADAMS's species, which is slenderer than *O. cereus*, while the shoulder angle of the whorls is more pronounced and the sculpture less coarse, especially behind the shoulder

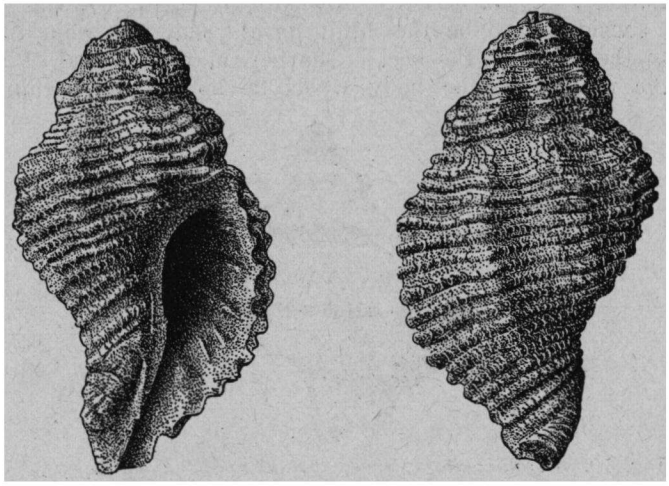

Fig. 8a, b. *Ocinebrina cereus* (E. A. Smith), from loc. M 63, × 4.

angle. In both species the columella may show 1—3 obsolete plicae. I shall not be astonished if future investigations will eventually show that *cereus* (SMITH) is a synonym of *contempta* (A. ADAMS).

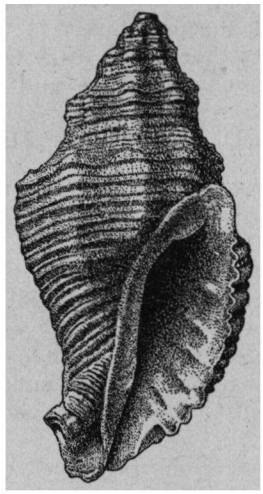

Fig. 9. *Ocinebrina contempta* (A. Adams), from the pleistocene of Kajoe Ragi, Celebes (R. G. M. L.), × 3½.

Familia Magilidae.

209. **CORALLIOPHILA (MIPUS) TOMLINI** spec. nov.

Figure 10.

Material examined:

Poetjangan layers (volcanic facies): Sheet 110B, C 71: 1 ex. (holotype); **horizon above layer I:** Sheet 110B, M 273: 1 ex.

Two damaged specimens belong to a form related to, but evidently different from, *C. gyrata* (HINDS, 1844). From the holotype the topmost whorls and the greater part of the body whorl is missing. It resembles SOWERBY's figure of "*Latiaxis pagoda* JONAS" (SOWERBY, 1882, pl. 424 figs. 2, 3) which is generally considered to be the adult *gyrata*, but the whorls are broader in relation to their height, the keel is sharper, and the spiral sculpture much finer. In the middle of the body whorl 26 spirals run behind the keel;

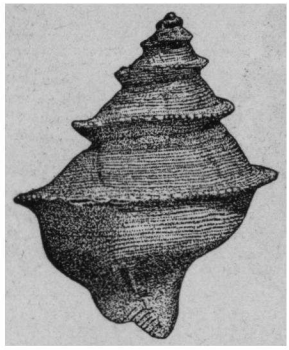

Fig. 10. *Coralliophila* (*Mipus*) *tomlini* spec. n., holotype, × 1.

in the middle of the penultimate whorl I count 17 spirals behind, and 6 in front of the keel.

Alt. 44 + ?, diam. 35 + ? mm.

In London (B. M.) I could examine the type of *C. gyrata*, which shows a coarser sculpture and a broader keel. As long as nothing is known about the variability of the recent species, it is very difficult to judge about the taxonomic value of this new form. A difference in habitus seems to be correlated with a difference in sculpture and therefore I classed it as a species.

This new species has been named after Mr. J. R. LE B. TOMLIN.

210. LATIAXIS DEBURGHIAE (REEVE, 1857).

Material examined:

Poetjangan layers (volcanic facies), layer I: Sheet 110B, M 157: 1 ex.; C 77: 1 ex.; **horizon above layer I:** Sheet 110B, M 274: 1 ex.; **layer II:** Sheet 116A, C 6: 1 ex.; C 40: 1 ex.

My specimens reach larger dimensions than those dredged by the Siboga (largest specimen from Station 204: Alt. 30 mm, Z. M. A.). My largest shell, from locality C 40, has a height of 44 m. HIRASE (1936, p. 80) gives a height of 39 mm. for this species.

There is also a specimen from the mud-volcano Kalang Anjar in the collection of the Geological Institution at Amsterdam.

In Delft I could examine *Latiaxis* aff. *deburghiae* REEVE of Miss KOPERBERG (1931, p. 115); this is a different form; the shell is slenderer than that of *deburghiae*, and the umbilicus is very narrow.

Familia Pyrenidae.

211. PYRENE (PYRENE) SPLENDIDULA (SOWERBY, 1844).

Material examined:

Poetjangan layers (argillaceous facies): Sheet 110B, M 333: 1 ex.

A damaged specimen which, however, agrees very well with the supposed types of this species in the British Museum.

212. PYRENE (PYRENE) PHILIPPINARUM (REEVE, 1843).

Material examined:

Upper Kàlibèng layers: Sheet 93B, M 257: 1 ex.; M 258: 8 ex.; M 260: 3 ex. **Poetjangan layers (volcanic facies):** Sheet 110B, C 83: 1 ex.; **layer I:** Sheet 110A, M 82a: 1 ex.; **layer II:** Sheet 11A, M 124: 1 ex.

The specimens from Sonde referred to by K. MARTIN (1895, p. 118, pl. 18 figs. 263, 263a, 264, 264a, 265, 266) as *Columbella bandongensis* perfectly agree with the recent *P. philippinarum*; even what is left of the colour shows the same characteristic pattern as the recent species. The fossil specimens are sometimes larger (29 mm) than the recent shells I could examine (21 mm). It may be that the form from Waled (= Menenteng ravine) (K. MARTIN, l. c., fig. 267), which I also examined in Leiden, represents a variety of this species, but the original *C. bandongensis* [K. MARTIN, 1879—'80, p. 30, pl. 6 fig. 7 (1879)] is certainly at least subspecifically distinct. I saw no typical *P. philippinarum* among the specimens from several upper miocene localities in the residence of Priangan, Java (R. G. M. L.).

213. MITRELLA (MITRELLA) PALABUANENSIS ACOLYTHA[1]) subsp. nov.

Figure 11.

Material examined:

Poetjangan layers (volcanic facies), horizon above layer I: Sheet 110B, M 274: 1 ex. (holotype); **layer II:** Sheet 110B, M 176: 1 ex.
Poetjangan layers (argillaceous facies): Sheet 110B, C 78: 1 ex.

These specimens differ from the type of *M. palabuanensis* (K. MARTIN,

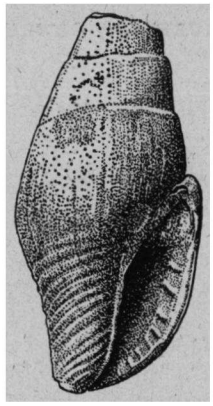

Fig. 11. *Mitrella* (*Mitrella*) *palabuanensis acolytha* subspec. n., holotype, × 3.

1895) (R. G. M. L.) in two respects: they have 8—9 sharp teeth (instead of 5—6 obsolete ones) inside the outer lip, and the thickened labrum is antecurrent, while it is retrocurrent in MARTIN's type. For the rest my shells agree in every respect with the typical *palabuanensis*. In Leiden I could moreover examine a specimen from the pliocene of Atjeh assigned to "*Colum-*

[1]) From ἀκόλουθος, following closely, as this seems a younger subspecies.

bella palabuanensis" by K. MARTIN (1928, pp. 8, 25); this shell also belongs to the present subspecies.

214. MITRELLA (MITRELLA) TEGALENSIS (OOSTINGH, 1935).

Material examined:

Poetjangan layers (volcanic facies): Sheet 110A, M 135a: 1 ex.; **below layer I:** Sheet 105B, M 68: 1 ex. (juv.).

My specimens differ from the description by OOSTINGH in having only 3—4 teeth inside the outer lip, but I found the same feature in one of OOSTINGH's paratypes (R. G. M. L.).

215. MITRELLA (COLUMBELLOPSIS) MOLENGRAAFFI (TESCH, 1915).

Material examined:

Upper Kalibèng layers: Sheet 105B, M 47: 3 ex.

This species can easily be recognised by the spiral groove which accompanies the suture and which is more pronounced than the other spirals. Although it is not mentioned in the original description, it is clearly visible in the type figured by TESCH (1915, p. 62, pl. 81 figs. 138a, b), which I could examine in Delft. My largest specimen has an altitude of 13 mm.

216. MITRELLA (COLUMBELLOPSIS) CONSPERSA (GASKOIN, 1851).

Material examined:

Poetjangan layers (volcanic facies), layer II: Sheet 110B, M 278: 1 ex. (damaged).

217. MITRELLA (MACRURELLA) GRACILLIMA (K. MARTIN, 1895).

Material examined:

Upper Kalibèng layers: Sheet 93B, M 252: 2 ex.; M 257: 4 ex.; M 260: 12 ex.; M 261: 3 ex.

My largest specimen of this species (from M 261) has an altitude of 37 mm.

218. MITRELLA spec.

Material examined:

Poetjangan layers (volcanic facies), layer I: Sheet 110A, M 295: 1 ex.

This specimen is damaged, but it certainly does not belong to one of the previously mentioned species.

219. MITRELLA spec.

Material examined:

Poetjangan layers (argillaceous facies): Sheet 110A, M 289: 1 ex.

I failed to identify this specimen, which at any rate does not belong to one of the species dealt with above. The top is missing and moreover the specimen seems to be not quite adult. Therefore I do not think it advisable to base a new species on it.

220. ANACHIS (COSTOANACHIS) YABEI (NOMURA, 1935).

Material examined:

Upper Kalibèng layers: Sheet 105B, M 47: 7 ex.; M 49: 5 ex.

My shells are larger than those described by NOMURA, and they show some little tubercles on the inner lip, which correspond with spirals on the base of the body whorl; for the rest they agree in every respect with the original description and figure. The dimensions of two of my specimens are:

Alt. 10½ mm., Diam. 4½ mm. (from M 47),
Alt. 9½ mm., Diam. 4 mm. (from M 49).

221. PSEUDANACHIS DUCLOSIANA (G. B. SOWERBY I, 1844).

Material examined:

Poetjangan layers (volcanic facies), layer II: Sheet 110B, C 2: 1 ex.; Sheet 116A, M 216: 1 ex.

Familia Buccinidae.

222. PSEUDONEPTUNEA PARADOXICA CRASSICOSTATA (K. MARTIN, 1926).

Material examined:

Poetjangan layers (argillaceous facies): Sheet 110A, M 289: 1 ex.

223. PSEUDONEPTUNEA INFLATA (OOSTINGH, 1941).

Figure 12.

Material examined:

Poetjangan layers (volcanic facies), layer II: Sheet 116A, C 33: 1 ex.

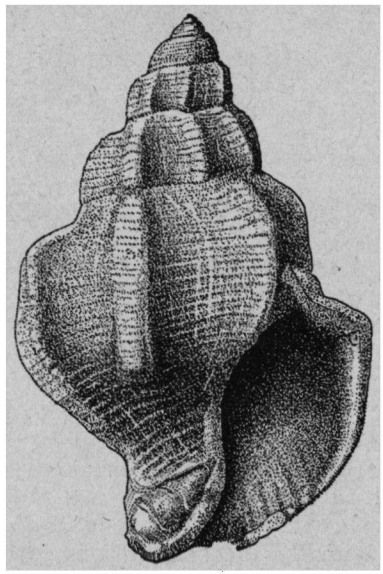

Fig. 12. *Pseudoneptunea inflata* (Oostingh), from loc. C 33, × 1½.

Poetjangan layers (argillaceous facies): Sheet 116B, M 333: 3 fr. belonging to at least 2 specimens.

This species can easily be recognised. I saw two specimens of it from

Mount Gombel, Samarang, Java (R. G. M. L.), which have been mentioned by K. MARTIN (1918, p. 165) as "*Siphonalia* (s. str.) spec. nov." (cf. v. R. ALTENA, 1948, p. 12). The apex is insufficiently preserved in my specimens just as in those described by OOSTINGH (1941, p. 63, figs. 3a, b).

224. PSEUDONEPTUNEA PRAEVARICOSA spec. nov.

Figures 13, 14.

Material examined:

Poetjangan layers (volcanic facies): Sheet 11B, C 70: 1 ex.; Sheet 115C, M 329: 1 ex.; **horizon above layer I:** Sheet 110B, C 75: 1 ex.; **layer II:**

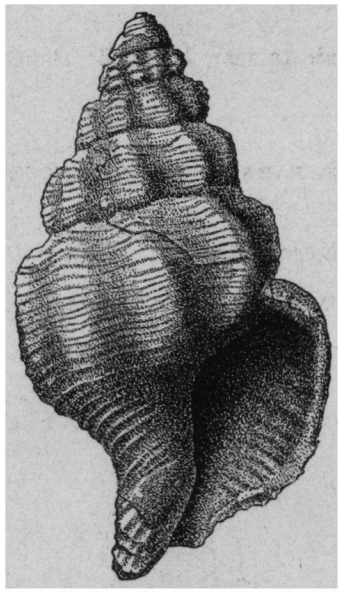

Fig. 13. *Pseudoneptunea praevaricosa* spec. nov., holotype, × 2.

Sheet 116A, M 216: 1 ex.; ± **layer II?:** Sheet 109C, M 346: 1 ex.; **layer III:** Sheet 110A, M 142: 1 ex.

Poetjangan layers (argillaceous facies): Sheet 110A, C 45: 3 ex.; C 46: 1 ex.; Sheet 110B, M 264: 1 ex.; C 78: 1 ex.; C 85: 1 ex.; Sheet 115C, M 328: 3 ex. + 1 fr.; Sheet 116A, M 321: 1 fr.

Description: Shell ovoido-conical; whorls about 7½, convex, with a narrow sutural ramp and a rounded shoulder, whorls separated by a distinct, non-canaliculate suture. The protoconch is more or less damaged and worn in all my specimens, it consists probably of nearly 2, smooth whorls. In the third whorl three rather strong spirals originate, which become undulate in the fourth whorl by running over axial ribs. In some of my paratypes (e. g., fig. 14) the axial ribs are more pronounced and narrower in the fourth whorl and consequently the sculpture is reticulate there. From the fourth whorl onward the spirals gradually grow in number, I count 15 of them on the antepenultimate and 17 on the penultimate whorl. Except those which have newly arisen they are of equal strength, flat, and narrower (mostly much narrower) than the interstices. The axial ribs number about 9 in each whorl in the holotype, 9—11 in the paratypes. In the fourth whorl

they are broader than the interstices, in the fifth about as broad as these, and in the younger whorls the interstices gradually become wider than the axial ribs. Body whorl narrowed in front into a short neck, which bears a distinct siphonal fasciole. On the base and the neck the spirals are stronger and the interstices wider. The axial ribs evanesce on the base, towards the mouth they become more and more obsolete; in some of my paratypes (e. g., from M 264) they vanish earlier, i. e., at the end of the penultimate whorl. Aperture oval, with an obtuse angle corresponding with the shoulder of the body whorl, continuing into a short, reflected siphonal canal in front. Inner lip sigmoid, smooth but for an obsolete parietal tooth near the junction with the outer lip. The outer lip is thickened by an axial rib in the holotype,

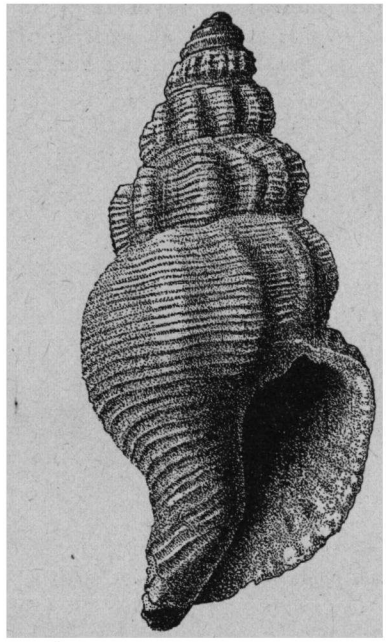

Fig. 14. *Pseudoneptunea praevaricosa* spec. n., from loc. C 45, × 3.

simple in the paratypes. Edge of the outer lip bearing some short teeth in front, which correspond with the wider interstices of the spirals on the base. There are 12 short folds inside the outer lip.

Alt. 38 mm., Diam. 21 mm. (holotype, being the largest specimen).
Alt. 37 mm., Diam. 21 mm. (broadest specimen, from M 264).
Alt. 35 mm., Diam. 18 mm. } (slender form from C 45, the second
Alt. 27 mm., Diam. 13 mm. } specimen is figured).

Ps. praevaricosa spec. nov. is closely related to *Ps. varicosa* (ANTON, 1839), of which I could compare several recent specimens (Z. M. A., G. I. A., R. N. H. L.). The differences between the two forms seem, however, constant, as I saw no transitional specimens. Although the relation Alt.: Diam. varies a good deal, as is obvious from the measurements given above and from the figures, *Ps. praevaricosa* is always slenderer than its recent congener; moreover it has a finer spiral sculpture, and the axial ribs are less pronounced and slightly more numerous.

In Leiden (R. G. M. L.) there is a specimen of this new species from

Mount Gombel near Tjandi, Samarang, Java, which has been mentioned by K. MARTIN (1912, p. 165) as "*Siphonalia* (*Pseudoneptunea*) spec. nov.". The Geological Institution at Amsterdam possesses two specimens from Sangiran, Solo, Java, of which the larger is the holotype, and one from the mud-volcano Kalang Anjar, Soerabaja, Java.

225. BUCCINARIA (OOTOMELLA) JAVANENSIS spec. nov.

Figure 15.

Material examined:

Poetjangan layers (volcanic facies), ± layer II?: Sheet 109C, M 346: 1 ex.

Shell small, elongated ovoid; whorls at least 7. In the unique type the topmost part of the spire is missing, and the surface of the oldest whorls

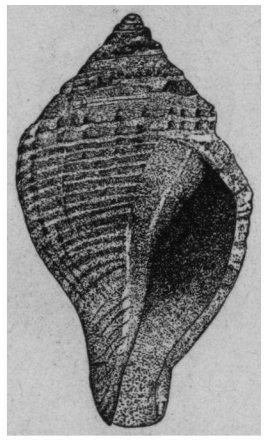

Fig. 15. *Buccinaria* (*Ootomella*) *javanensis* spec. n., holotype, × 3.

is worn. The younger whorls of the spire clearly show the spiral groove characteristic of *Ootomella*. Sculpture consisting of fine spirals crossed by numerous knoblike axial ribs, which are present only in front of the spiral groove. In the penultimate whorl I count 4 spirals, of which the hindmost runs in the spiral groove. Body whorl occupying $^5/_6$ of the total height of the shell, with a pronounced shoulder angle in front of the spiral groove, spirally sculptured over the whole surface, the knoblike axial ribs evanescent in front of the shoulder angle. Aperture high and probably rather narrow, outer lip damaged, inner lip smooth.

Alt. 18, Diam. (reconstructed) 10½ mm.

I have named this new species after the island of Java.

Buccinaria javanensis spec. nov. somewhat resembles *B. martini* (KOPERBERG, 1931) forma a 1 (KOPERBERG, 1931, p. 51, pl. 1 fig. 14b), but the spiral groove runs closely along the hindmost suture, the axial sculpture occurs in front of instead of behind this groove, the body whorl is less convex and spirally sculptured over the whole surface.

BEETS (1944) recently drew attention to the close relation of *Ootomella* BARTSCH, 1933, to *Buccinaria* KITTL, 1887.

226. NASSARIA TAMBACANA (K. MARTIN, 1884).

Figures 16a, b.

Material examined:

Upper Kalibèng layers: Sheet 93B, M 252: 46 ex.; M 257: 4 ex.; M 260: 4 ex.; M 261: 3 ex.
Poetjangan layers (volcanic facies): Sheet 99B, M 9: 1 ex.; Sheet 110A, C 63: 1 ex.; Sheet 110B, C 44: 1 ex.; C 71: 4 ex.; Sheet 116B, M 335: 1 ex.; **layer I:** Sheet 105B, M 67: 1 ex.; Sheet 110 A, M 88: 4 ex.; M 89:

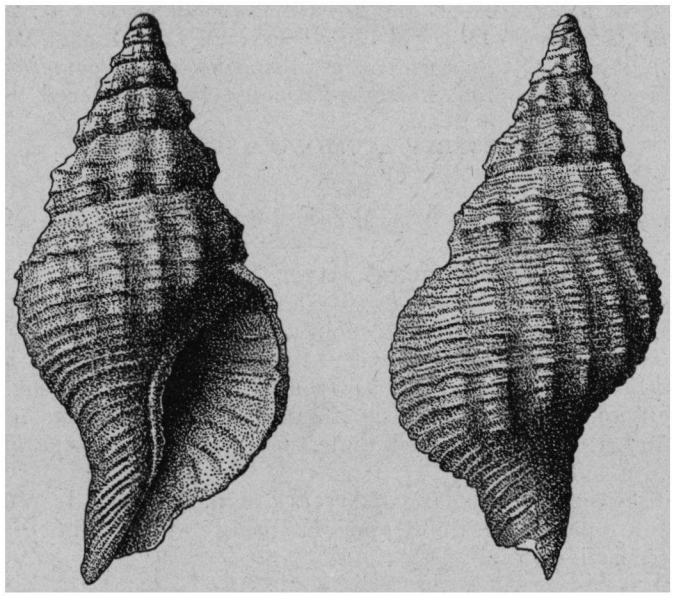

Fig. 16a, b. *Nassaria tambacana* (K. Martin), from loc. M 112, × 3½.

4 ex.; M 292 + 293: 1 ex.; M 299: ? 1 ex.; C 60: 3 ex.; Sheet 110B, M 153: 3 ex.; M 156: 4 ex.; C 89: 5 ex.; **horizon above layer I:** Sheet 110B, M 273: 1 ex.; M 274: 2 ex.; C 74: 4 ex.; C 75: 4 ex.; **layer II:** Sheet 110A, M 125: 5 ex.; M 311: ? 1 ex.; C 54: 2 ex.; Sheet 116A, M 216: 9 ex.; C 4: 2 ex.; C 5: 1 ex.; C 39: 5 ex.; C 115: 1 ex.; ± **layer II:** Sheet 109C, M 347: 3 ex.
Poetjangan layers (argillaceous facies): Sheet 110A, M 112: 1 ex.; C 45: 4 ex.; C 46: 1 ex. + ? 1 fr.; Sheet 110B, M 149: 1 ex.; M 263: 2 ex.; C 80: 1 ex.

In the Upper Kalibèng layers I found only the typical form of this species. The material from the Poetjangan layers shows, however, a greater variability. There a variety occurs, connected with the type by all sorts of transitional forms, in which especially the axial, but also the spiral sculpture is less pronounced than in the type, while the varix bordering the outer lip is not so well developed. This variety strikingly resembles *N. atjehensis* OOSTINGH (vide infra); it can be distinguished from that species by the shape of the protoconch and by the aperture being narrower in relation to the height. The altitude of the shells which I consider to be adult, because they possess an outer lip with a distinct varix, varies from 24 to 32 mm. in the Upper Kalibèng layers, and from 16 to 33 mm. in the Poetjangan layers.

The peculiar protoconch distinguishes this species from all other species of *Nassaria*. The Siboga dredged an evidently recent, not adult shell with the same type of protoconch in Station 100 (SCHEPMAN, 1911, p. 311). It differs from the young *tambacana* by its sculpture.

227. NASSARIA ATJEHENSIS OOSTINGH, 1939.

Material examined:

Poetjangan layers (volcanic facies), layer I: Sheet 105B, M 67: 1 ex.; Sheet 110A, M 90: 1 ex.; M 94b: 1 ex.; M 98: 14 ex.; M 100: 6 ex.; M 101: 13 ex.; M 292 + 293: 5 ex.; M 295: 1 ex.; M 297: 7 ex.; M 298: 78 ex.; M 299: 4 ex.; M 301: 23 ex.; C 1: 20 ex.; C 52: 10 ex.; C 55: 2 ex.; C 60: 37 ex.; **layer II:** Sheet 110A, M 126: 1 ex.; M 127: 1 ex.; M 311: 1 ex.

OOSTINGH described this form as a subspecies of *N. acuminata* (REEVE) (vide infra); in my opinion, however, it must be considered as a distinct species.

228. NASSARIA ACUMINATA (REEVE, 1844).

Material examined:

Upper Kalibèng layers: Sheet 93B, M 251: 2 ex.; M 255: 1 ex.; M 257: 4 ex.; M 258: 1 ex.; M 260: 1 ex.

Poetjangan layers (volcanic facies), layer II: Sheet 116A, M 217: 1 ex.; **layer III:** Sheet 116A, M 288: 1 ex.

OOSTINGH (1939, p. 112) already pointed out that the recent *N. acuminata* is variable and that therefore it is very difficult to separate the nearly allied *N. gendinganensis* (K. MARTIN, 1899) from it. After comparison of a series of recent shells of *acuminata* with my fossil material, which matches MARTIN's type (R. G. M. L.), I am convinced that it is impossible to separate the fossil form even as a subspecies.

The shells from the Poetjangan layers are slightly smaller and slenderer than the adult ones from the Upper Kalibèng layers. The dimensions of some of my specimens are:

Alt. 32½ Diam. 20 (from locality M 257),
Alt. 33½ (+ ? 1) Diam. 21 (from locality M 258),
Alt. 24 Diam. 14 (from locality M 255),
Alt. 28 Diam. 15½ (from locality M 228),
Alt. 30 Diam. 16 (from locality M 217).

229. NASSARIA AMBOYNENSIS WATSON, 1881.

Material examined:

Poetjangan layers (volcanic facies): Sheet 99B, M 9: 1 ex.; Sheet 110B, C 71: 1 ex.; **layer I:** Sheet 110A, M 95: 1 ex.; M 101: 1 ex.; **horizon above layer I:** Sheet 110B, M 273: 5 ex.; M 274: 14 ex.; C 74: 3 ex.; C 75: 10 ex.; **layer II:** Sheet 110A, M 126: 1 ex.; M 304: 2 ex.

Poetjangan layers (argillaceous facies): Sheet 110A, M 289: 2 ex.; Sheet 116B, M 333: 1 ex.

I could compare my specimens with the type of this species in the British Museum. Some of my specimens agree exactly with WATSON's type. In others the axial sculpture is less developed, the suture less canaliculate, and the varices are partly or altogether missing in the whorls of the spire. In some of my shells the siphonal canal is shorter than in WATSON's type. The dimensions of two of my specimens are:

Alt. 30 (+ ? 1), Diam. 17 (from locality M 9),
Alt. 37 (+ ? 2), Diam. 22 (from locality M 273).

230. NASSARIA cf. NODICOSTATA (A. ADAMS, 1853).

Figures 17a, b.

Material examined:

Poetjangan layers (volcanic facies), layer I: Sheet 110A, C 60: 1 ex.; Sheet 110B, C 77: 18 ex.; ± **layer I:** Sheet 110B, M 269: 1 ex.; **layer II:** Sheet 110B, M 278: 4 ex.; M 281: 2 ex. (bad).
Poetjangan layers (argillaceous facies): Sheet 116B, M 333: 1 ex.

Unfortunately the type of this species is not to be found in the British Museum. The original description is very scanty and SOWERBY's (1859,

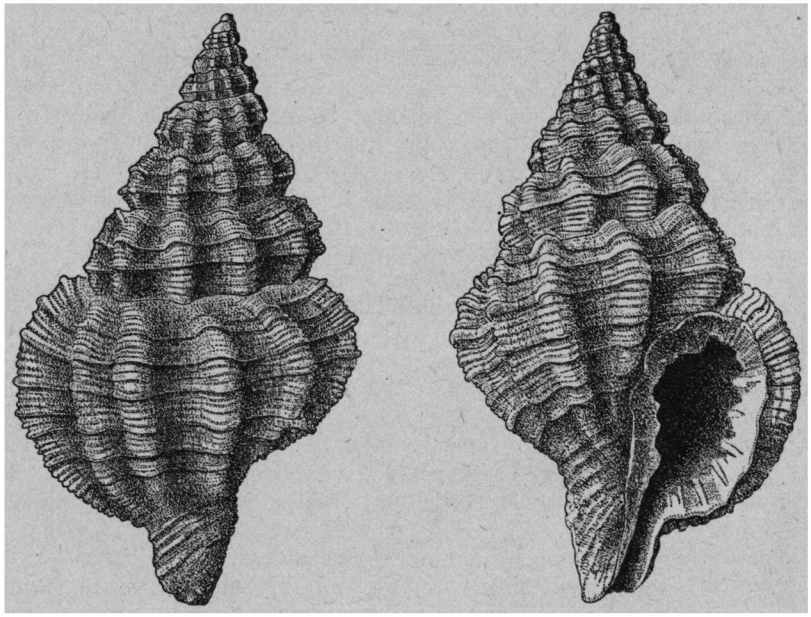

Fig. 17a, b. *Nassaria* cf. *nodicostata* (A. Adams), from loc. C 77, × 3.

pl. 220 fig. 13) figure in the Thesaurus Conchyliorum only represents the dorsal side. As far as I can judge from this figure my fossils agree with A. ADAMS's species, but the most characteristic feature of my shells seems to be the rather narrow oval mouth. Each whorl bears 10 axial ribs in my specimens except in the specimen from locality M 269, where I count 12 of them. The dimensions of some of my specimens are:

Alt. 26, , Diam. 15 (from locality C 77),
Alt. 27 (+ ? 1), Diam. 16 (largest specimen from the same locality),
Alt. 24½, Diam. 13.

231. NASSARIA SUTURALIS TJEMOROENSIS (K. MARTIN, 1899).

Material examined:

Poetjangan layers (volcanic facies): Sheet 110B, M 167: 1 ex.; C 44: 1 ex.; **layer I:** Sheet 110A, M 89: 14 ex.; **layer II:** Sheet 110B, M 176: 3 ex.; M 278: 6 ex.; ? M 278: 1 ex.; Sheet: 116A, C 6: 1 ex.; ± **layer II?:** Sheet 109C, M 346: 1 ex.

Poetjangan layers (argillaceous facies): Sheet 110A, C 45: 1 ex.; C 46: 12 ex.; C 107: 1 ex.; Sheet 110B, M 264: 5 ex.; M 267: 4 ex.; Sheet 115C, M 328: 1 ex.

My specimens agree with the types of K. MARTIN's "*Hindsia tjemoroënsis*" (K. MARTIN, 1899, p. 221, pl. 23 fig. 335, 1906, p. 316) as far as these derive from Kali Tjemoro, Solo, Java (R. G. M. L.). As MARTIN named his species after the River Tjemoro, it seems the best practice to choose the lectotype among the specimens from that locality. Therefore the shell figured on his plate 23 figure 335 is here designed as lectotype.

When comparing the fossils with the material of *Nassaria suturalis* A. ADAMS, 1853, in the British Museum, and the specimens of that species dredged by the Siboga (Z. M. A.) it appeared that the characters given by MARTIN to distinguish *tjemoroënsis* are insufficient. The twisting of the siphonal canal proves to be variable, and the typical sculpture of the whorls of the spire in *tjemoroënsis* to which MARTIN calls special attention, also occurs in some specimens dredged by the Siboga. Nevertheless the shells from Kali Tjemoro as well as those in my collection differ from the recent *suturalis* by their smaller number of axial ribs (8—9 in the body whorl), which are narrow, clearly cut, and separated by wide interspaces. Therefore *tjemoroënsis* can be maintained as a subspecies of *suturalis*. I doubt, however, if the specimens from Tjikeusik can be separated from the recent form.

232. PHOS ROSEATUS HINDS, 1844.

Material examined:

Upper Kalibèng layers: Sheet 93B, M 252: 3 ex.; M 255: 10 ex.; M 257: 10 ex.; M 258: 1 ex.; M 260: 3 ex.
Poetjangan layers (volcanic facies), layer I: Sheet 110A, M 89: 2 ex.; M 100: 2 ex.; M 295: 5 ex. (bad); C 1: 1 ex. (bad); C 60: 5 ex.; **horizon above layer I:** Sheet 110B, M 274: 1 ex. (bad); **± layer II?:** Sheet 109C, M 347: 3 ex. + fr. (top).

My material of this species shows two varieties. In the first between the primary spirals, secondary spirals of one and the same type are running, in the second secondary and tertiary spirals are found between the primary ones. Most of my specimens belong to the first variety, only one specimen from locality M 257 and the shell from locality M 89 represent the second. Specimens of the first variety proved on the contrary rare in the recent species. I found only two of them, in the British Museum, deriving from Cargados Carajos and Muscat. MARTIN [1883—'87, p. 127, pl. 7 fig. 129 (1884)] figured a specimen of the first variety from Sonde as "*Phos Woodwardianus* MART.". It differs, however, from the typical *Ph. woodwardianus* K. MARTIN, 1884, by its slenderer habitus and by possessing not so strong a spiral sculpture.

233. PHOS TEXTUS (GMELIN, 1790).

Material examined:

Poetjangan layers (volcanic facies), layer I: Sheet 110A, M 82a: 1 ex.
This is a large specimen: Alt. 27, Diam. 13.

234. PHOS DEKONINGI (KOPERBERG, 1931).

Figure 18.

Material examined:

Poetjangan layers (argillaceous facies): Sheet 115D, M 337: 2 ex.

I could compare my specimens with Miss KOPERBERG's (1931, p. 44, pl. 1 fig. 8) type in Delft. The larger of my specimens is rather worn; its sculpture is in complete agreement with that of the type. In my second specimen, which is not adult, the scultpure is very well preserved and the

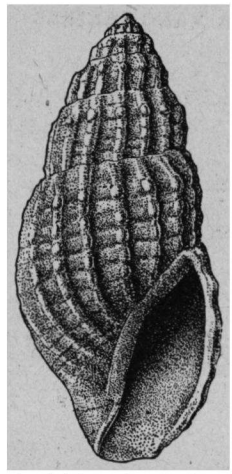

Fig. 18. *Phos dekoningi* Koperberg, from loc. M 337, × 5½.

aperture is undamaged, therefore this shell has been figured here. It appears that the complete aperture does not resemble that of *Bela* so much as the aperture of the type, in which the outer lip is damaged. In my opinion TESCH was right in classifying this species in the genus *Phos*.

235. PHOS MINUTUS MINUTUS SCHEPMAN, 1911.

Material examined:

Upper Kalibèng layer: Sheet 93B, M 251: 1 ex.

My specimen differs from the type figured by SCHEPMAN (1911, p. 306, pl. 19 fig. 9) by the closer set axial sculpture on the body whorl. I presume this to be an individual aberration, as the axial ribs on the whorls of the spire are placed in the same way as in SCHEPMAN's type. The dimensions of my specimen are: Alt. 11½, Diam. 5 mm, so it is not slenderer than the typical species, as is the case with *Ph. minutus pliocenicus* KOPERBERG (1931, p. 99).

236. ENGINA SINENSIS MELVILL, 1895.

Material examined:

Poetjangan layers (volcanic facies), layer I: Sheet 110A, M 295: 1 ex.

I could examine MELVILL's type, which has recently been refigured by YEN (1942, p. 229, pl. 23 fig. 159), in the British Museum. My shell is slightly larger: Alt. $13^1/_2$, Diam. $6^1/_2$ mm, $8^1/_2$ whorls, and the spirals are narrower. Consequently the interstices are wider and contain 3—4 secondary spirals against 1—2 in the type.

237. BABYLONIA CANALICULATA (SCHUMACHER, 1817).

Material examined:

Poetjangan layers (volcanic facies): Sheet 110B, C 71: 1 ex.; **layer I:** Sheet 110A, M 81: 1 ex.; M 82a: 1 ex.; M 296: 1 ex.; **layer II:** Sheet 110A, M 122:

6 ex.; M 123: 1 ex.; M 124: 1 ex.; M 125: 3 ex.; M 126: 2 ex.; C 54: 5 ex.; Sheet 110B, M 168: 1 ex.; M 177: 1 ex.; Sheet 116A, M 222: 1 ex.; C 39: 1 ex.; ± **layer II?**: Sheet 109C, M 346: 2 ex.; **layer III**: Sheet 110A, M 140: 1 ex.; M 142: 1 ex.

238. BABYLONIA PANGKAENSIS (K. MARTIN, 1895).

Material examined:

Poetjangan layers (volcanic facies): Sheet 99B, M 9: 1 ex.; **layer I**: Sheet 105B, M 67: 2 ex.; M 87: 1 ex.; Sheet 110A, M 83: 1 ex.; M 86: 4 ex. (bad); M 88: 1 ex.; M 89: 17 ex.
Poetjangan layers (argillaceous facies): Sheet 110A, C 45: 1 ex.

239. BABYLONIA GRACILIS (K. MARTIN, 1895).

Material examined:

Poetjangan layers (volcanic facies), layer I: Sheet 105B, M 66: 1 ex.; **horizon above layer I**: Sheet 110B, M 273: 1 ex.; **layer II**: Sheet 110A, M 304: 1 ex.; Sheet 110B, M 173: 1 ex.; Sheet 116A, C 5: 1 ex.

Babylonia spec.

Material examined:

Poetjangan layers (volcanic facies): Sheet 99B, M 16: 2 ex.; **layer I**: Sheet 110A, M 89: 3 ex.

These specimens are too young or too bad for a more exact identification.

240. BUCCINULUM OOSTINGHI spec. nov.

Figures 19.

Material examined:

Poetjangan layers (volcanic facies), layer I: Sheet 105B, M 67: 2 ex.; Sheet 110A, M 291: 1 ex.; C 56: 1 ex.; Sheet 110B, C 77: 6 ex.
Poetjangan layers (argillaceous facies): Sheet 110A, M 289: 1 ex.; Sheet 110B, C 78: 1 ex. (holotype).

Description: Shell fusiform, in the holotype, in which the top is missing, about 7½ whorl are left. From reconstruction with the aid of a young paratype from locality C 77 it appears that the whorls number 10—11 in the adult shell. This same paratype shows a conoidal protoconch consisting of 1½ smooth whorls. Whorls convex, with a rounded shoulder just before the middle. Sculpture: broad knoblike axial ribs, which evanesce towards the posterior suture, are crossed by fine, sharp spirals. In the penultimate whorl I count 11 axial ribs and ± 17 spirals; the latter are of nearly equal strength. In young paratypes the axial ribs of the older whorls appear to run regularly from one suture to the other without forming knobs. This type of axial ribs gradually changes into the other in the younger whorls. Minute crowded lines of growth crossing the spirals and their interstices cover the entire surface of all the whorls. In the body whorl the axial ribs have vanished on the long neck; here the spiral sculpture alone continues, the interstices between the spirals becoming slightly broader towards the anterior end of the neck. In one of my paratypes (from locality C 56) the axial sculpture is less developed in the body whorl, in another (from locality M 291) it has practically vanished there. Siphonal fasciole well developed, nearly smooth; with a lens lines of growth are visible on it. Umbilicus

closed. Aperture oval. Outer lip with a broad but not very thick varix at the outside, and with a sharp edge bearing minute teeth at the end of the interstices between the spirals. The outer lip is damaged in my adult types, but from the course of the lines of growth it appears that it must have a convex profile in front of the shoulder. In front view the outer lip has two rounded angles; the posterior corresponds with the shoulder of the body whorl, the anterior is far less conspicuous. Inside the outer lip fine spiral folds can be followed over a distance of about ¼ of the body whorl.

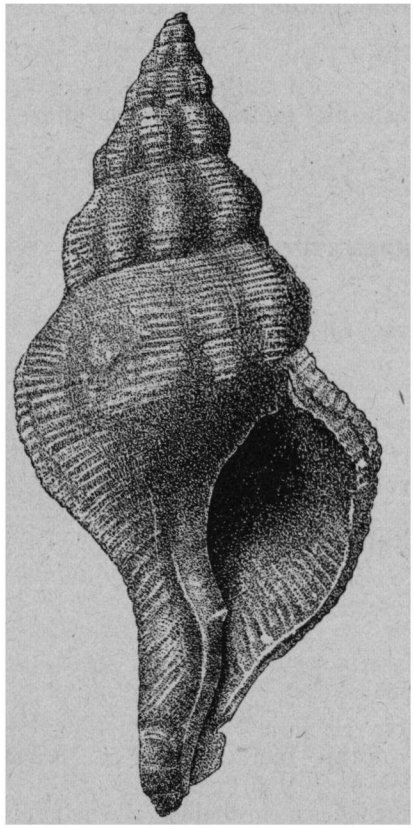

Fig. 19. *Buccinulum oostinghi* spec. nov., holotype, × 1½.

Peristome discontinuous. Inner lip rather concave, smooth, but for a tooth near the junction with the outer lip — a groove occurs between this tooth and the outer lip — and the tooth characteristic of this genus near the beginning of the canal. Siphonal canal long, nearly straight.

Dimensions: Alt. 72 (+ ? 1), Diam. 32½ (holotype),
Alt. 72 (+ ? 1), Diam. 32 (from locality C 56),
Alt. 41, Diam. 18 (from locality C 77).

I have named this new species after the late Dr. C. H. OOSTINGH.

Buccinulum oostinghi spec. nov. is related to *B. orangense* BEETS (1942, p. 225, pl. 24 figs. 10—13) from the upper miocene of East Borneo. *B. orangense* is, however, a much smaller species, as, judging from the figure,

the holotype is adult. Moreover it has a comparatively shorter and slightly wider siphonal canal.

There is a remarkable resemblance of my types with VREDENBURG's figure of *Siphonalia* (*Kelletia*) *kelletiiformis* VREDENBURG (1923, p. 66, pl. 2 figs. 11a, b) the only differences being the sharper shoulder angle and the less pronounced spirals in *S. kelletiiformis*. VREDENBURG's "description" is not very elaborate, and after inspection of the figure I wonder of his type cannot be a (perhaps immature) *Buccinulum*.

241. PISANIA (PRODOTIA) WANNERI (J. FISCHER, 1927).

Material examined:

Upper Kalibèng layers: Sheet 93B, M 257: 3 ex.
Poetjangan layers (volcanic facies), horizon above layer I: Sheet 110B, M 274: 1 ex.

In a recent paper I discussed the generic position of this species (v. R. ALTENA, 1948, p. 11).

242. ANTEMETULA BOETTGERI (K. MARTIN, 1899).

Material examined:

Upper Kalibèng layers: Sheet 93B, M 257: 2 ex.

243. ANTEMETULA spec. A.

Material examined:

Upper Kalibèng layers: Sheet 93B, M 257: 2 ex.
Poetjangan layers (volcanic facies), layer I: Sheet 110A, M 101: 1 ex.; M 301: 3 ex.

These specimens belong to a probably new species which will be fully dealt with before long in a separate publication on the genus *Antemetula* in the Indo-Westpacific area [1]).

Antemetula spec.

Material examined:

Upper Kalibèng layers: Sheet 93B, M 260: 1 ex.
Poetjangan layers (volcanic facies), layer I: Sheet 110A, M 100: 2 ex.; M 291: 1 ex.; M 298: 1 ex.; M 301: 2 ex.

These are bad specimens, probably all belonging to the two species recorded above.

244. CANTHARUS (CANTHARUS) FUMOSUS (DILLWYN, 1817).

Figure 20.

Material examined:

Poetjangan layers (volcanic facies): Sheet 99B, M 9: 1 ex.; M 24: 1 ex.; Sheet 110A, C 63: 1 ex.; Sheet 110B, M 167: 3 ex.; **layer I**: Sheet 110B, C 77: 2 ex.; **layer II**: Sheet 110A, M 126: 2 ex.; Sheet 110B, M 160: 1 ex.
Poetjangan layers (argillaceous facies): Sheet 110A, M 289: 1 ex.; Sheet 116B, M 333: 2 ex.

This species is very variable. Part of my material belongs to a variety in which the whorls are more convex than in the typical form, and the axial

[1]) See: Bijdr. Dierk., vol. 28, 1949.

ribs are cut off at the hindmost suture, which consequently is pseudo-canaliculate. I saw similar recent specimens and transitions between the two forms. My specimens from the localities M 24, C 77, M 289, and M 333 belong to this variety, one of those from C 77 has been figured here.

245. CANTHARUS (CANTHARUS) ERYTHROSTOMA (REEVE, 1846).

Material examined:

Poetjangan layers (volcanic facies), layer II: Sheet 110B, C 89: 1 ex.; **layer II:** Sheet 110A, M 126: 1 ex.; Sheet 116A, M 216: 1 ex.; C 34: ? 1 ex.; C 39: 1 ex.

My specimens agree with recent shells of this species (Z. M. A., R. N. H. L.). It is very difficult (if possible!) to separate this species

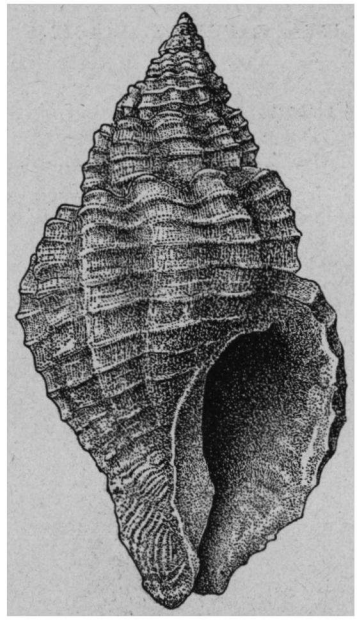

Fig. 20. *Cantharus (Cantharus) fumosus* (Dillwyn), from loc. C 77, × 3.

from *C. bucklandi* (ARCHIAC, 1850), which according to OOSTINGH (1939, p. 118) is a synonym of *C. ventriosa* (K. MARTIN, 1883). The specimens in the Leiden Museum labelled by MARTIN generally are slenderer than the shells figured by OOSTINGH, only MARTIN's holotype has the same habitus as OOSTINGH's Bantam and Atjeh specimens.

The specimen from locality C 34 has been referred to with doubt as it is a subscalarid in which the axial sculpture on the body whorl is less pronounced.

246. TOMLINIA SANGIRANENSIS (K. MARTIN, 1906).

Material examined:

Poetjangan layers (volcanic facies): Sheet 110B, C 72: 2 ex.; C 83: 19 ex.; Sheet 116A, C 119: 3 ex.; C 120: 3 ex.; **horizon above layer I:** Sheet 110B, M 273: 1 ex.; M 274: 5 ex.; C 74: 5 ex.; C 75: 1 ex.; **layer II:** Sheet 110A, M 304: 3 ex.; Sheet 110B, C 82: 6 ex.; Sheet 116A, C 5: 1 ex.; C 6: 6 ex.;

C 30: 1 ex.; C 31: 1 ex.; C 33: 1 ex.; C 34: 4 ex.; C 38: 2 ex.; C 40: 2 ex.; **layer II?**: Sheet 110B, M 283 + 284: 36 ex.; **layer III**: Sheet 116A, C 133: 2 ex.; C 136: 6 ex.; C 137: 2 ex.

Poetjangan layers (argillaceous facies): Sheet 110A, M 289: 1 ex.; Sheet 110B, M 266: 21 ex.; Sheet 116B, M 333: 24 ex.

A close comparison of this species and the following revealed that they are certainly congeneric. The sculpture of the top whorls as well as that of the front part of the body whorl is very much the same in the two species. A young specimen of the present species has been figured by MARTIN (1928, pl. 14 fig. 6). It differs from those of the next species by its far greater plumpness only. The adult specimens are at once distinguished by the shape of the body whorl and by the outer lip bearing a varix and being denticulate within in *sangiranensis*.

247. TOMLINIA RAPULUM GRACILIS subsp. nov.

Material examined:

Poetjangan layers (argillaceous facies): Sheet 110B, M 266: 1 ex.; Sheet 116B, M 333: 2 ex.

This new subspecies differs from *Tomlinia rapulum* (REEVE, 1846) by its slenderer habitus and by its regularly convex whorls without shoulder.

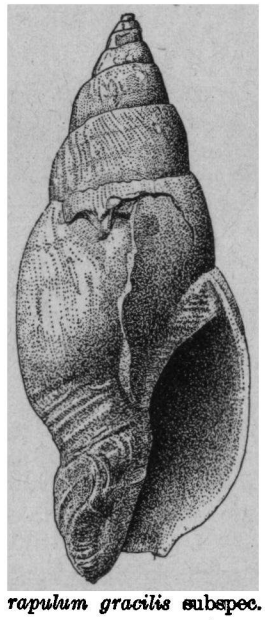

Fig. 21. *Tomlinia rapulum gracilis* subspec. n., holotype, × 2.

The spire is higher in this subspecies than in the type figured by REEVE, but this height is variable in the recent species as may appear from the dimensions of some recent specimens (Z. M. A.):

Alt. 43, Diam. 18; Alt. 34, Diam. 16.

There is a fine series of the new subspecies in the collection of the Geological Institute at Amsterdam deriving from pliocene or younger beds at the mud-volcano Kalang Anjar near Soerabaja (Java). The holotype has been selected from this series; its dimensions are:

Alt. 39, Diam. 16.

In the subspecies as well as in the typical species the sculpture of the older whorls is very characteristic: faint spirals are crossed by distinct axial ribs, which both evanesce towards the younger whorls. In a young specimen from Kalang Anjar this sculpture is well preserved, therefore it is figured

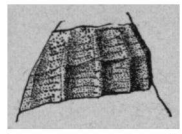

Fig. 22. *Tomlinia rapulum gracilis* subspec. n., from Kalang Anjar (G. I. A.), sculpture of spiral whorl, much enlarged.

here. In one of the specimens from locality M 333 a shoulder as in the typical *rapulum* is present in the penultimate whorl. This specimen is intermediate between the subspecies and the typical species.

Familia Volemidae.

250. **VOLEMA MYRISTICA** (RÖDING, 1798).

= *Pyrula galeodes* LAMARCK, 1822.

Material examined:

Upper Kalibèng layers: Sheet 93B, M 257: 1 ex.; M 258: 1 ex. (juv.).
Poetjangan layers (volcanic facies): Sheet 105B, M 64: 1 ex. (juv.).

248a. **PUGILINA (PUGILINA) PUGILINA MADJALENGKENSIS** (K. MARTIN, 1895).

Material examined:

Poetjangan layers (volcanic facies): Sheet 110A, M 120: 1 ex.; Sheet 110B, C 71: 1 ex.; **layer II:** Sheet 110A, C 54: 2 ex.; Sheet 110B, M 175: 2 ex.; Sheet 116A, M 217: 1 ex.; M 220: 1 ex.; M 221: 1 ex.; M 222: 1 ex.; M 223: 2 ex.; M 224: 1 ex.; M 225: 1 ex.; M 226: 2 ex.; M 227: 1 ex.; C 5: 2 ex.; C 6: 3 ex.; C 30: 1 ex.; C 33: 2 ex.; C 38: 1 ex.; ± **layer II:** Sheet 110B, M 283: 1 ex.; **layer III:** Sheet 110B, C 27b: 1 ex.

These specimens agree with the shells from Tjidjoerei assigned to this subspecies by K. MARTIN (1926, pp. 13, 17, 21, pl. 1 fig. 5) (R. G. M. L.). The differences from the variable type species are but slight and can only be verified in adult and complete or nearly complete specimens. Therefore the bulk of young and damaged specimens of my material has been referred to as "*P. pugilina* (BORN) subsp. ?", though they are likely to belong to this subspecies too. In Amsterdam (Z. M. A.) I found a sample of recent *P. pugilina* from Merauke, New Guinea, which cannot be separated from *madjalengkensis*. These specimens, which were mentioned by SCHEPMAN (1919, p. 188); probably are recent beach shells. Their colour varies between flesh-colour and chestnut; the shells are very heavy, and knobs occur in the last whorl only. The largest of the half-grown specimens in which knobs have not yet developed has a length of 64 mm. So the subspecies has no absolute stratigraphical value, but importance may be attached to the fact that it seems to substitute fully the typical species in the Poetjangan layers and in other quaternary and neogene sediments.

248. **PUGILINA (PUGILINA) PUGILINA** (BORN, 1778) subsp.?

Material examined:

Poetjangan layers (volcanic facies): Sheet 99B, M 3: 1 ex.; M 9: 2 ex.;

Sheet 105B, M 54: 1 ex.; Sheet 110A, M 120: 1 ex.; Sheet 110B, C 73: 1 ex.; C 83: 1 ex.; **below layer I**: Sheet 105B, M 68: 2 ex.; **layer I**: Sheet 110A, M 293: 1 ex.; **horizon above layer I**: Sheet 110B, C 75: 1 ex. (juv.); **layer II**: Sheet 110A, M 278: 1 ex.; C 54: 3 ex. (juv.); Sheet 110B, M 166: 1 ex. (juv.); M 168: 2 ex.; M 172: 1 ex. (juv.) + 1 fr.; M 175: 2 fr.; M 176: 1 ex.; M 177: 1 ex.; C 7: 1 ex. (juv.); C 29: 1 ex. (top); Sheet 116A, M 216: 6 ex. + some fr.; M 218: 1 ex.; M 221: 2 ex.; M 222: 3 ex.; M 223: 2 ex.; M 224: 1 ex.; M 225: 1 ex.; M 226: 1 ex.; M 227: 2 ex. + 2 fr.; C 38: 1 ex.; C 40: 1 ex.; C 113: 1 ex.; ± **layer II**: Sheet 110B, M 283: 1 fr.; **layer III**: Sheet 110A, M 141: 1 ex.; Sheet 110B, M 185: 1 ex.; Sheet 116A, C 133: 1 ex.; C 136: 1 ex.

Poetjangan layers (argillaceous facies): Sheet 110B, M 266: 6 ex.; M 267: 1 ex. (juv.); Sheet 116A, M 321: 1 ex.; Sheet 116B, M 333: 1 ex.

Kaboeh layers: Sheet 110B, M 200b: 1 ex.; C 28: 3 ex.

As has already been stated above, these specimens are likely also to belong to the subspecies *madjalengkensis* (K. MARTIN), but they are either too young or too much damaged to enable us to verify their subspecific characters.

K. MARTIN has recorded the typical *pugilina* (BORN) from Tjidamar, Grissee [K. MARTIN, 1883—'87, p. 99 (1884)], and Mount Gombel (K. MARTIN, 1912, p. 164). I could examine his specimens (R. G. M. L.), and in my opinion the shell from Tjidamar must belong to another species of this genus, whereas the specimens from Mount Gombel, which are immature, can equally well belong to the subspecies *madjalengkensis* (K. MARTIN). The identification of the Grissee shells seems to be right.

Pugilina (*Pugilina*) spec.

Material examined:

Poetjangan layers (volcanic facies): Sheet 99B, M 15: 1 ex.; Sheet 105B, M 56: 1 fr.; M 60: 1 ex. (juv.); M 64: 1 fr.; Sheet 116A, M 209: 1 fr.; **layer I**: Sheet 110A, M 84: 2 fr.; **layer II**: Sheet 110A, M 122: 3 fr.; M 304: 3 fr.; Sheet 110B, M 278: 1 fr.; C 82: 1 ex.; Sheet 116A, M 222: 1 ex.; **layer III**: Sheet 110B, M 183: 1 fr.; M 185: 1 fr.; Sheet 116A, C 13: 1 ex.

Poetjangan layers (argillaceous facies): Sheet 110B, M 266: 1 fr.; Sheet 116B, M 333: 2 fr.

Kaboeh layers: Sheet 110B, M 200b: 1 fr.

249. PUGILINA (HEMIFUSUS) TIMORENSIS (K. MARTIN, 1884).

Material examined:

Poetjangan layers (volcanic facies): Sheet 99B, M 9: 2 ex.; **layer II**: Sheet 110B, M 281: 1 ex.

The largest specimen (from locality M 281) is rather slender, and the canal is relatively longer than in MARTIN's holotype, but I think it is still distinct enough from the closely related recent *P. blosvillei* (DESHAYES, 1832).

251. PUGILINA (HEMIFUSUS) TERNATANA (GMELIN, 1791).

Material examined:

Poetjangan layers (volcanic facies): Sheet 116A, M 212: 2 ex.; C 120: 1 ex.; **layer II**: Sheet 110A, M 126: 1 ex.; M 304: 1 ex.; C 54: 1 ex.; Sheet 110B, M 173: 1 fr. (top); M 278: 1 ex.; C 82: 1 ex.; Sheet 116A, M 216: 1 ex.;

M 217: 1 ex.; M 218: 1 ex.; C 33: 1 ex.; ± layer II?: Sheet 109C, M 347: 1 ex.; layer III: Sheet 116A, M 228: 1 ex.
Poetjangan layers (argillaceous facies): Sheet 110B, M 264: 1 ex.
Kaboeh layers: Sheet 110B, M 197: 1 ex.

251. PUGILINA (HEMIFUSUS) spec.

Material examined:

Poetjangan layers (argillaceous facies): Sheet 116B, M 333: 1 ex.

This is probably a new species, but my specimen is too incomplete for description.

252. PUGILINA (HEMIFUSUS) COLOSSEA (LAMARCK, 1822).

Figure 23.

Material examined:

Poetjangan layers (volcanic facies): Sheet 110B, C 71: 1 ex.

My only specimen is damaged and moreover much worn, but there are two shells from Sangiran in the collection of the Geological Institution at

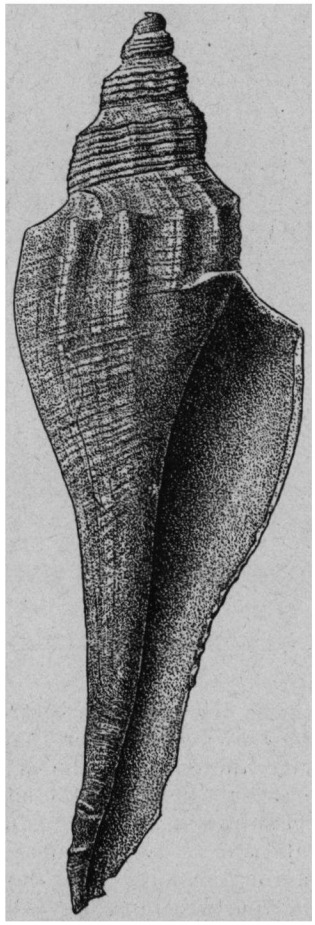

Fig. 23. *Pugilina* (*Hemifusus*) *colossea* (Lamarck), from Sangiran (G. I. A.), × 1.

Amsterdam, which evidently belong to the same species. One of these two has been figured here. None of these fossil shells is adult. They belong to the very slender form of *colossea* in which the axial sculpture is prominent. They are very near the specimen figured by REEVE (1847, pl. 5 fig. 19) and I could compare them with a similar recent shell (Z. M. A.).

253. PUGILINA (HEMIFUSUS) ELEGANTISSIMA spec. nov.

Figure 24.

Material examined:

Poetjangan layers (argillaceous facies): Sheet 110B, M 264: 1 ex. (holotype).

Description: Shell fusiform, very slender, imperforate. The top is missing, 6½ convex whorls are left. Sculpture consisting of axial ribs crossed

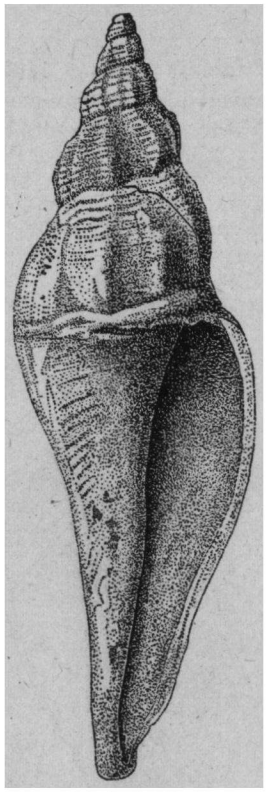

Fig. 24. *Pugilina* (*Hemifusus*) *elegantissima* spec. n., holotype, × 1½.

by spirals. In the oldest whorls the spirals are stronger than the axial ribs, but gradually the latter are growing stronger than the former. In the last two whorls a slight concavity along the hindmost suture is present; in this concave ramp the axial ribs are obsolete and the spirals remain strong. There are 12 axial ribs and about 11 spirals in the antepenultimate whorl. In the body whorl some 4 distinct spirals run along the suture; in the middle part the spirals are obsolete, whereas on the long neck they are distinct again. The outer lip is broken off; the aperture must have been of a rather long and narrow oval shape, gradually passing into the siphonal canal, of which the

terminal part is also missing. Inner lip nearly straight: slightly concave behind, slightly convex in front.

Alt. 68 + ?, Diam. 22 + ?.

Though this new species is undoubtedly related to the previous species, it can be readily distinguished from it by its slenderer habitus and different sculpture. This single shell may be an immature specimen of a larger species. As to the habitus *P. elegantissima* spec. nov. has a remarkable resemblance to the species of the subgenus *Psephaea* CROSSE of the genus *Fulgoraria* SCHUMACHER.

Pugilina (*Hemifusus*) spec.

Material examined:

Poetjangan layers (volcanic facies), layer II: Sheet 110B, M 172: 1 fr.; Sheet 116A, M 221: 1 fr.

Poetjangan layers (argillaceous facies): Sheet 116B, M 333: 1 ex.

3. References.

ALTENA, C. O. VAN REGTEREN, 1948. Notes on caenozoic and recent Mollusca from the Dutch East Indies, 6—7 (Stenoglossa). Basteria, vol. 12, pp. 10—12.

BEETS, C., 1942. Mollusken aus dem Tertiär des ostindischen Archipels. Leidsche Geol. Meded., vol. 13, pp. 218—254, pl. 24—26.

——, 1944. Ueber Ootomella und Buccinaria. Basteria, vol. 9, pp. 32—37, figs.

FISCHER, J., 1927. Beitrag zur Kenntnis der Pliozänfauna der Molukken-inseln Seran und Obi. Palaeont. Timor, part 15, 179 pp., 6 pls.

HEDLEY, C., 1908. Studies on Australian Mollusca, part X. Proc. Linn. Soc. N. S. Wales, vol. 33, pp. 456—489, pls. 7—10bis.

——, 1913. Idem, part XI. Ibidem, vol. 38, pp. 258—339, pls. 16—19.

HETZEL, W. H., 1935. Toelichting bij blad 54 (Madjenang). Geologische kaart van Java. Batavia, 53 pp., 6 photos, 10 figs.

HIRASE, S., 1936. A collection of Japanese shells with illustrations in natural colours. 5th edition. Tokyo, 14 + 2 + 216 pp., frontispiece + 129 pls.

KING, S. G. & PING, C., 1931. The molluscan shells of Hongkong, part 2. Hongkong Naturalist, vol. 2, pp. 265—286, 20 figs.

KOPERBERG, E. J., 1931. Jungtertiäre und quartäre Mollusken von Timor. Jaarb. Mijnw. Ned. O.-Indië, 1930, Verh., part 1, 165 pp., 3 pls.

MARTIN, K., 1879—'80. Die Tertiärschichten auf Java nach den Entdeckungen von Fr. Junghuhn. Leiden, XII + 164 + VI + 51 + 6 pp., 28 pls., map.

——, 1883—'87. Palaeontologische Ergebnisse von Tiefbohrungen auf Java, nebst allgemeineren Studien über das Tertiär von Java, Timor und einiger anderer Inseln. Samml. Geol. Reichsmus. Leiden, (1) vol. 3, 380 pp., 15 pls.

——, 1895. Die Fossilien von Java auf Grund einer Sammlung von Dr. R. D. M. Verbeek bearbeitet. Mollusken, Heft 1—4. Ibidem, (2) vol. 1, part 2—5, pp. 1—132, pls. 1—20.

——, 1899. Idem. Mollusken, Heft 5—7. Ibidem, part 6—8, pp. 133—221, pls. 21—33.

——, 1906. Idem. Mollusken, Heft 9. Ibidem, part 10, pp. 281—232, pls. 42—44.

——, 1912. Vorläufiger Bericht über geologische Forschungen auf Java. Zweiter Teil. Ibidem, (1) vol. 9, pp. 108—200, pl. 9.

——, 1919. Unsere palaeozoologische Kenntnis von Java. Leiden, XI + 158 pp., 4 pls.

——, 1921. Die Mollusken der Njalindungschichten. Ibidem, (2) vol. 1, section 2, part 3, pp. 446—470, pls. 58—59.

——, 1926. Plioceene versteeningen van Cheribon in Java. Wetensch. Meded. Mijnb. Ned.-Indië, vol. 4, pp. 1—24, pl. 1.

——, 1928. Eine Nachlese zu den neogenen Mollusken von Java. Leidsche Geol. Meded., vol. 3, pp. 105—129, pl. 14.

——, 1928. Mollusken aus dem Neogen von Atjeh in Sumatra. Wetensch. Meded. Mijnb. Ned.-Indië, vol. 10, pp. 1—36, 1 pl.

——, 1931. Wann löste sich das Gebiet des indischen Archipels von der Tethys? Leidsche Geol. Meded., vol. 4, pp. 1—8.

NARDINI, S., 1934. Molluschi delle spiagge emerse del Mar Rosso e dell'Oceano Indiano. Paleontogr. Italica, vol. 34, pp. 171—267, 1 fig., pls. 14—18.

OOSTINGH, C. H., 1935. Die Mollusken des Pliozäns von Boemiajoe (Java). Wetensch. Meded. Mijnb. Ned.-Indië, vol. 26, VIII + 247 pp., map, 17 pls.

——, 1939. Die Mollusken des Pliocäns von Süd-Bantam in Java, VIII. Ingenieur Ned.-Indië, vol. 6, pp. IV 103—IV 120, pls. 13, 14.

——, 1940. Idem, 3. Abschnitt (Gastropoda III). Ibidem, vol. 7, pp. IV 45—IV 60, pls. 17—19.

——, 1941. Three new species of gastropods from the pliocene of Semarang (Central Java). Ibid., vol. 8, pp. IV 63—IV 64, figs. 1—3.

REEVE, L., 1846. Monograph of the genus Ricinula. Conchologia Iconica, vol. 3. 5 pls. + text & index.

——, 1847. Monograph of the genus Fusus. Ibidem, vol. 4. 21 pls. + text & index.

SCHEPMAN, M. M., 1907. Mollusken aus posttertiären Schichten von Celebes. Samml. Geol. Reichsmus. Leiden, (1) vol. 8, pp. 153—203, pls. 10—13.

——, 1911. The Prosobranchia of the Siboga Expedition, part 4, Rachiglossa. Siboga Exp., part 58. Monogr XLIX[2], pp. 247—363, pls. 18—24.

——, 1919. On a collection of land- and freshwater and a few marine Mollusca chiefly collected by Dr. H. A. Lorentz from New Guinea, the Aru Islands, Timor and Borneo. Nova Guinea, vol. 13 Zool., pp. 155—196, pls. 4—8.

SMITH, E. A., 1906. On South African Mollusca. Ann. Natal Museum, vol. 1, pp. 19—71, pls. 7, 8.

SOWERBY, G. B., 1859. Monograph of the genus Nassaria, Link. Thesaurus Conchyliorum, vol. 3, pp. 85—88, pl. 220.

——, 1882. Monograph of the genus Latiaxis. Ibidem, vol. 5, pp. 1—5, pl. 424.

STURANY, R., 1904. Gastropoden des Rothen Meeres. (Exped. "Pola"). Denkschr. K. Akad. Wissensch. Wien, math.-naturw. Classe, vol. 74, pp. 209—283, pls. 1—7.

YEN, T. C., 1942. A review of Chinese gastropods in the British Museum. Proc. Mal. Soc., vol. 24, pp. 170—289, pls. 11—28.

YOKOYAMA, M., 1924. Mollusca from the coral bed of Awa. Journ. Coll. Sci. Imp. Univ. Tokyo, vol. 45, art. 1, 62 + III pp., 5 pls.

VLERK, I. M. VAN DER, 1931. Caenozoic Amphineura, Gastropoda, Lamellibranchiata, Scaphopoda. Leidsche Geol. Meded., vol. 5, pp. 206—296.

VREDENBURG, E., 1923. Indian Tertiary Gastropoda, No. 5. Fusidae, Turbinellidae, Chrysodomidae, Strepturidae, Buccinidae, Nassidae, Columbellidae, with short diagnoses of new species. Rec. Geol. Survey India, vol. 55, pp. 52—77, pls. 1—5.

——, 1925. Descriptions of Mollusca from the post-eocene tertiary formation of North Western India, I. Mem. Geol. Survey India, vol. 50, part 1, XII + 350 + XIV pp., 13 pls.

WESSEMA, G. G., 1947. Young tertiary and quaternary Gastropoda from the island of Nias (Malay archipelago). Thesis, Leiden, 212 pp., 7 tbls, 6 pls, map.