

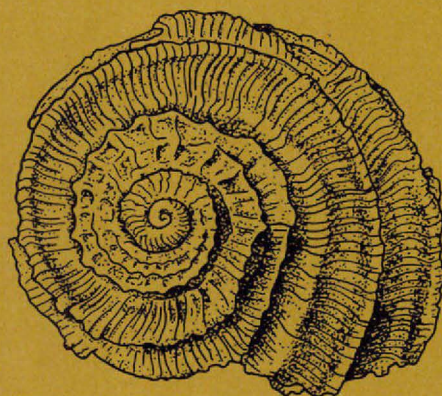


Paleocene gastropods from  
Nûgssuaq, West Greenland

*by*

*Heinz A. Kollmann and John S. Peel*

KØBENHAVN 1983





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Bulletin No. 146

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West Greenland

*by*

*Heinz A. Kollmann and John S. Peel*

1983

To the memory of Alfred Rosenkrantz (1898-1974)  
in token of his contribution to geology in Greenland

### **Abstract**

This catalogue illustrates 257 gastropod taxa from Paleocene deposits on the Nûgssuaq peninsula, West Greenland. Mesogastropods and neogastropods dominate, with 103 and 86 taxa respectively. There are 38 archaeogastropod taxa and 29 of Euthyneura, while one operculum is of unknown systematic position. Taxa are named at the generic level; no new names are introduced. Most of the fauna was collected from a single bed (Sonja Lens) within the Sonja Member of the Agatdal Formation. Faunal composition within this bed indicates a mixed assemblage with representatives from a variety of environments ranging from terrestrial (1 taxon) to shallow and deep marine, on soft and hard substrates.

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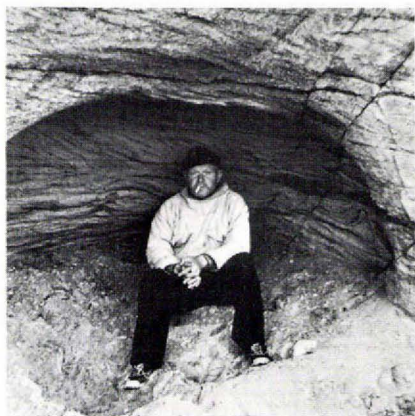
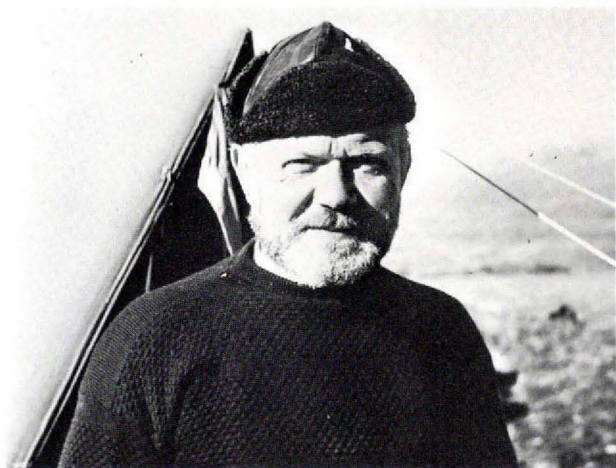
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Alfred Rosenkrantz. Photographs taken during the period 1949 – 1954 in central Nûgssuaq, West Greenland.



## INTRODUCTION

The Paleocene gastropods from the Nûgssuaq peninsula, West Greenland, illustrated in this catalogue were collected by the late Professor Alfred Rosenkrantz, Copenhagen, and co-workers in the course of 18 expeditions to West Greenland (figs 1, 2). The earliest expeditions, in 1938 and 1939, were supported by the Carlsberg Foundation, Copenhagen, and Den Kongelige Grønlandske Handel (Royal Greenland Trading Company). Sixteen expeditions in the period from 1946-1968 were under the auspices of Grønlands Geologiske Undersøgelse (GGU, the Geological Survey of Greenland); Rosenkrantz was himself prominent in the formation of this organisation. A summary of the expeditions and their results was given by Rosenkrantz (1970).

Many workers have described fossils from the outstanding collections made by the Nûgssuaq expeditions (summary in Henderson *et al.*, 1976). The gastropods were the subject of special study by Rosenkrantz, but only a fraction of the material has been published. The present catalogue is founded on the material left unpublished at his death in 1974. Its production represents the culmination of many years of work by Rosenkrantz and the technicians and artists under his direction.

## SCOPE OF THE CATALOGUE

Following collection and preparation, Rosenkrantz organised the Nûgssuaq gastropods into 'species'. These were not arranged systematically, but were given current working numbers in a series from 1 to 340. It is evident that the status of at least some of the 'species' was revised at a later date since the current number sequence is now incomplete.

All the 'species' were documented in pencil drawings by artists working under the supervision of Rosenkrantz. A number were also photographed; specimens, however, were not coated with ammonium chloride (or other) sublimate prior to photography, and the prints are not acceptable for publication. All illustrations were stored in files located together with the serially numbered collection in the Geologisk Museum, Copenhagen. Rosenkrantz arranged illustrations and accompanying notes into generic groups following Wenz (1938-44). The notes contain sparse details of localities and some references to related Paleocene species described by v. Koenen (1885), Ravn (1933) and others. With the exception of these remarks, however, only a few, incomplete systematic descriptions have been attempted. A few of the drawings were presented in Rosenkrantz (1970), but the vast majority of the many hundreds of prepared illustrations has never been published.

It is not possible to establish with certainty the names of the individual artists responsible for specific drawings. Rosenkrantz received artistic and technical support from a number of

sources during the many years in which he was engaged in his study of Nûgssuaq fossils. It would appear, however, that most of the drawings of gastropods included in the present catalogue were produced by Betty Engholm, Gunni Jørgensen and Erna Nordmann, working under the supervision of Rosenkrantz.

The present catalogue is based mainly on the serially numbered collection of 'species' organised by Rosenkrantz. Adjacent, partly curated collections have also been examined, but the remaining unprepared material has not been studied in detail. The main purpose of the catalogue, in addition to preventing the wastage of years of considerable effort and expenditure, is to provide an essentially visual record of the Paleocene gastropod fauna from Nûgssuaq and to make data on the fauna available for future scientific work.

Taxa have been determined at the generic level. Most taxa are documented with some of the drawings prepared under the supervision of Rosenkrantz; these have been selected after comparison with the original specimens. Photographs of the remaining taxa were prepared by the present authors. Remarks on systematic relationships are intended to facilitate further investigation and comparison with other faunas.

Changes in both the content and the systematic assignment of taxa from those envisaged by Rosenkrantz have been necessary. In most cases where larger numbers of specimens were available, the species concept which he used seemed too narrow. Rosenkrantz (1970, p. 438) noted more than 300 species from the Agatdal Formation alone, whereas only 254 taxa are documented here. Further study and extra material may even reduce this total slightly.

## GEOLOGICAL SETTING

A summary of the geology of Nûgssuaq by Henderson *et al.* (1976) forms the basis of the following description. Most of the western part of the peninsula is covered by Tertiary basalts. These are partly faulted against, and partly overlie, the Precambrian crystalline basement which dominates the eastern half of the peninsula. Outcrops of Lower Cretaceous to Paleocene sediments occur in the valleys Auvfarssuaq–Agatdalen, Tunorssuaq and Itivdle, and along the south and north coasts (fig. 1). Henderson *et al.* (1976) noted that the Lower Cretaceous – Paleocene sequence consists mainly of clastic, marine to non-marine sediments which were principally derived from the south. They envisaged a deltaic sequence, passing from fluvio-deltaic regimes in the south to prodelta environments in the north. A number of stratigraphic names have been applied to this sequence, but imprecise definition of these – and the effects of pronounced facies variation – hinder the formulation of an embracing stratigraphic nomenclature.

A more recent but as yet unpublished discussion of the Paleocene in West Greenland is presented by Hansen (1980). Hansen noted the widespread distribution of unconformities and discordances within the sequence and related the distribution and nature of Paleocene sediments to block faulting associated with the opening of Davis Strait.

Marine Paleocene strata on Nûgssuaq relevant to the present study are assigned to the



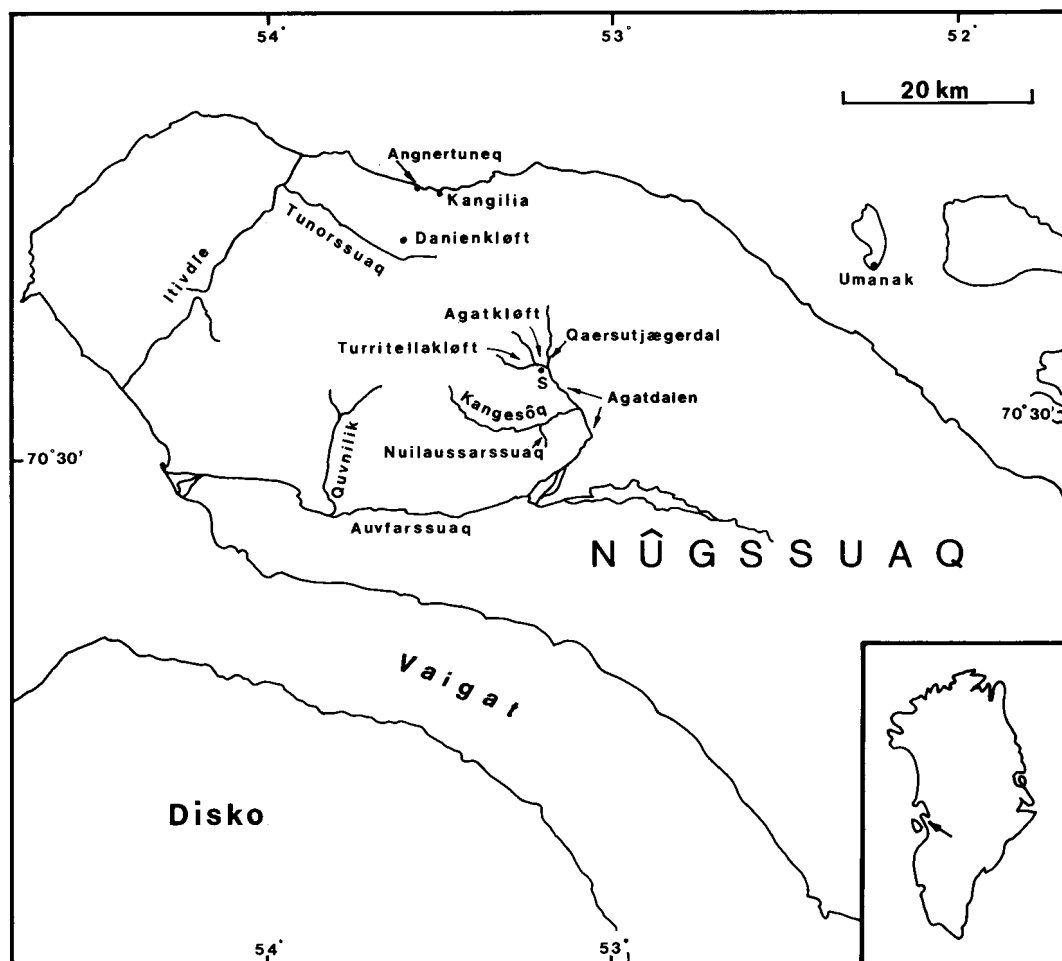


Fig. 1. Localities in Nûgssuaq, West Greenland. S marks the Sonja Member profile.

Kangilia Formation and the overlying Agatdal Formation (fig. 3). Descriptions of these formations are given by Rosenkrantz (1970), Koch (1959, 1963), Hansen (1970), Floris (1972), Henderson *et al.* (1976) and Hansen (1980); see also Croxton (1980). The formations are best known from outcrops in the Agatdalen – Kangesôq region of central Nûgssuaq, and from the north coast of Nûgssuaq, in the Angnertuneq – Kangilia area and along Tunorssuaq (fig. 1).

The Kangilia Formation, at its type locality Kangilia (fig. 1), is subdivided into 4 members (fig. 2). Henderson *et al.* (1976) noted that a basal, Conglomerate Member (50 m) rests unconformably on underlying Cretaceous sediments, but thins out completely to the west and east. The Fossil Wood Member (about 425 m) consists mainly of poorly fossiliferous black shales. The overlying *Thyasira* Member includes two fossiliferous tuffs, each 7 m thick,

**North coast of Nûgssuaq****Central Nûgssuaq****Agatdal Formation**

Abraham Member	}	? Sonja Member
Andreas Member		
Turritellakløft Member		

**Kangilia Formation**

*Propeamussium* Member  
*Thyasira* Member  
 Fossil Wood Member  
 Conglomerate Member

**Kangilia Formation**

*Propeamussium* Member  
*Thyasira* Member  
 Oyster-ammonite Conglomerate

Fig. 2. Paleocene lithostratigraphy. Nûgssuaq, West Greenland.

separated by 20 m of shales with subsidiary sandstones. Concretions in the shale are very fossiliferous. The uppermost *Propeamussium* Member consists of about 100 m of black shales with subsidiary sandstone. The sequence is overlain by 20 m of unfossiliferous sandstone, which have been referred tentatively to the Agatdal Formation, succeeded by pillow breccias and basalts.

The Kangilia Formation at its type locality is mainly of Late Danian (late Early Paleocene) or younger age (Hansen, 1980). Jürgensen & Mikkelsen (1974) recorded Late Danian coccoliths from the upper tuff in the *Thyasira* Member. Hansen in Croxton (1980) drew the Early Paleocene (Danian) – Middle Paleocene boundary near the middle of the Fossil Wood Member.

In the Agatdalen – Kangesôq region, the basal member of the Kangilia Formation, the 'Oyster-ammonite Conglomerate' (5 m), contains derived concretions yielding Cretaceous fossils in a shaly matrix, the latter with bivalves characteristic of the *Thyasira* Member. The overlying *Propeamussium* Member (75 m) consists of black shales with concretions. Henderson *et al.* (1976) noted that the formation in this region is considered to be of Early Danian (early Early Paleocene) age, but Hansen (1980) recorded Middle Paleocene dinoflagellates.

The Agatdal Formation is considered to be of Middle Paleocene age (Hansen, 1980). At the type locality, Turritellakløft (fig. 1), a basal Turritellakløft Member (fig. 2) consists of up to 50 m of black shales with sandstone lenses. The Andreas Member (25 m) is composed of coarse deltaic sandstone, while the overlying Abraham Member consists of up to 12 m of black shales and fossiliferous tuffs. The sequence is overlain by pillow breccia.

An additional member, the Sonja Member (50 m), is recognised in outcrops to the east of Turritellakløft (S in fig. 1). The member is considered to be approximately equivalent to the Turritellakløft and Andreas Members (fig. 2) and is dominated by mainly deltaic sandstones with a basal conglomerate and black shales with concretions. A sandstone lens ('Sonja Lens')



near the middle of the member has yielded an abundant and diverse marine fauna and flora, summarised by Henderson *et al.* (1976).

## NOTE ON LOCALITIES

Geological information associated with individual specimens or drawings in the serially numbered collection is usually restricted to the name of the collecting locality (fig. 1; table 1). In the case of the Sonja Lens, from which the majority of the taxa are described, the collecting horizon is unique and well located within the Sonja Member of the Agatdal Formation (fig. 2). Other localities commonly contain more than one formation or member and some uncertainty inevitably exists about the exact origin of individual specimens. In addition, a few localities are rather imprecisely located.

From discussion by Rosenkrantz (1970), it is apparent that most of the species illustrated herein from the Kangilia Formation were collected from the *Propeamussium* Member (fig. 2). With the exception of the Sonja Lens, gastropods recorded from the Agatdal Formation are apparently derived from the Turritellakløft Member of that formation.

Only the locality of collection is indicated in the systematic text, below, to avoid the propagation of interpreted, and therefore potentially incorrect, geological information, although the risk of assignment to the wrong member is not great. Localities are referred to formations in table 1, after reference to descriptions by Koch (1959, 1963), Hansen (1970), Rosenkrantz (1970) and Floris (1972).

## REMARKS ON THE FAUNA

The gastropod fauna recorded here from the Paleocene of Nûgssuaq (table 1) consists of 38 taxa of Archaeogastropoda (figs 3-40), 103 taxa of Mesogastropoda (figs 41-143), 86 taxa of Neogastropoda (figs 144-229) and 29 taxa of Euthyneura (figs 230-258); one operculum is of unknown systematic position. Only 8 of the 257 taxa are from the Kangilia Formation, and only 3 of the 8 are restricted to that formation. The Agatdal Formation contains 254 taxa, apparently exclusively from the Turritellakløft Member and Sonja Lens of the Sonja Member. Seventy per cent of the 228 taxa recorded from the so-called Sonja Lens are restricted to that unit.

There are fewer gastropods from the Kangilia Formation in the collection than listed by Rosenkrantz (1970). His determination of gastropods from the *Thyasira* Member of this formation (fig. 1) is mainly based on internal moulds which must form the subject of a future study. The fauna of the *Propeamussium* Member has mainly been quoted by Rosenkrantz from Ravn (1918). Both faunas are typical for a fine-grained, soft substrate in a moderately-

deep to deep water environment. The occurrence of *Propeamussium* in the stratigraphically higher *Propeamussium* Member suggests an increase in depth relative to the underlying *Thyasira* Member, although it is not possible to express this in absolute terms.

While the fauna from the Kangilia Formation seems to be from a single environment, the fauna of the overlying Agatdal Formation contains gastropods originating from different environments. Land snails are represented by rare, worn specimens (cf. *Grandipatula*, fig. 258). Gastropods such as *Monodonta* (fig. 25), *Clanculus* (fig. 31) and the patellids (figs 17-20) lived on rocky shores. The cerithiid *Alaba* (fig. 88) and the rissoids (figs 46-67) generally live on weeds in a shallow marine environment. A great number of forms such as the turritellids (figs 70-73), aporrhoids (figs 107-111), naticids (figs 128-136) and all the cephalaspideans (figs 239-257) lived within a soft substrate as members of the infauna or semi-infauna. The modern relatives of these forms live in moderately-deep to deep waters. There are also genera in the fauna which are restricted to deep water at the present day, such as *Pseudomalaxis* (fig. 68) and *Cerithiella* (fig. 94). A great percentage of modern turrids also live in moderately-deep to deep water, e.g. *Turris* itself (fig. 224) which occurs in depths below 60 m.

*Turris*, cypraeids (figs 122-127), *Ficus* (fig. 141, 142) and many other forms are inhabitants of warm to temperate waters (Kollmann, 1979). In addition to these, a few cold water genera occur in the Agatdal Formation, such as *Parvisipho* (figs 145-148), *Kryptos* (fig. 178) and a new trichotropin (fig. 116). These obviously lived in deeper water in West Greenland during the Paleocene, as is also the case with their modern counterparts (Nordsieck, 1968).

Available locality information concerning the Nûgssuaq gastropods is too poor to permit recognition and meaningful ecological interpretation of specific fossil associations. Most of the forms mentioned above, however, occur together within the core of the sandstone Sonja Lens which Rosenkrantz *in* Hansen (1970, p. 17) noted as only 7 m long and 0.7 m thick. It is clear that members of this fauna have not been living together in one environment. Hansen (1970, p. 21) suggested transport of the fossils by rivers; this is unlikely since the fauna, with one exception, is fully marine. A simple prodelta origin is also untenable since the strongly represented limpets suggest a rocky shore. Hansen (1970) favoured derivation of most of the fauna of the Sonja Lens from shale facies, generally the Turritellakløft Member, in which fossils are abundant in concretions but have been lost by subsequent solution from the shale itself. It is not known to what extent transported associations also occur within the shale dominated Turritellakløft Member, but 30 per cent of the approximately 100 gastropod species here recorded from that member do not occur in the Sonja Lens fauna. Rocky shore indicators, such as patellids, are also present within the Turritellakløft Member, possibly suggesting that transportation of faunas has also occurred within this member.

Reworking of fossils from the Kangilia Formation into the Agatdal Formation is considered even less likely. The molluscs from this formation are characteristic of fine-grained sediments deposited in rather deep water. The majority of the molluscs in the Agatdal Formation certainly lived in other environments. It is concluded that their present juxtaposition within this formation is less caused by a reworking of older deposits than by the transport of sediments and fossils from differing ecological settings into a deeper part of the basin.



Table 1. Distribution of Paleocene gastropods from Nûgssuaq

A, Agatkløft; An, Angnertuneq; D, Danienkløft; K, Kangilia; Ka, Kangesôq; N, Nuilaussarssuaq; Q, Quvnilik; T. Tunorssuaq.

Kangilia Formation	Agatdal Formation				Kangilia Formation	Agatdal Formation			
	Other localities	Qaersutjægerdal	Sonja Lens	Turritellakløft		Other localities	Qaersutjægerdal	Sonja Lens	Turritellakløft
Class Gastropoda					Family Patellidae				
Subclass Streptoneura					<i>Patella</i> sp. 1	A	+	+	+
Order Archaeogastropoda					<i>Patella</i> sp. 2	A		+	
Superfamily Pleurotomariacea					<i>Patella</i> sp. 3			+	+
Family Pleurotomariidae					? <i>Patella</i>		+		
? <i>Leptomaria</i>	N			+					
<i>Conotomaria</i>	Ka			+	Family Lepetidae				
Family Scissurellidae					Lepetidae, new genus?			+	
<i>Scissurella</i>			+		Superfamily Trochacea				
Superfamily Fissurellacea					Family Trochidae				
Family Fissurellidae					Subfamily Chilodontinae				
Subfamily Emarginulinae					Chilodontinae, new genus,				
<i>Emarginulina</i>			+	+	sp. 1	K	A		+
<i>Puncturella</i>			+		Chilodontinae, new genus,				
<i>Semperia</i>		+	+	+	sp. 2	K			
<i>Fissurella</i>			+		<i>Basilissa</i>			+	
Subfamily Diodorinae					Subfamily Monodontinae				
<i>Diodora</i>		+			<i>Monodonta</i>			+	
Superfamily Patellacea					<i>Osilinus</i> sp. 1			+	
Family Acmaeidae					<i>Osilinus</i> sp. 2			+	
<i>Acmaea</i> sp. 1			+		Subfamily Gibbulinae				
<i>Acmaea</i> sp. 2			+		<i>Colliculus</i>			+	
<i>Acmaea</i> sp. 3			+		Subfamily Calliostomatinae				
? <i>Acmaea</i>			+		<i>Calliostoma</i> sp. 1				+
<i>Scurria</i> sp. 1			+		<i>Calliostoma</i> sp. 2		+		
<i>Scurria</i> sp. 2			+						

Kanglia Formation	Agatdal Formation				Kanglia Formation	Agatdal Formation			
	Other localities	Qaersutjægerdal	Sonja Lens	Turritellakløft		Other localities	Qaersutjægerdal	Sonja Lens	Turritellakløft
Subfamily Trochinae					Family Littorinidae				
<i>Clanculus</i>			+		<i>Littorinopsis</i>			+	
Subfamily Solariellinae					Superfamily Rissoacea				
<i>Solariella</i>			+		Family Rissoidae				
Family Ataphridae					Subfamily Rissoinae				
<i>Ataphrus</i>			+	+	<i>Chevallieria</i>			+	
Family Turbinidae					<i>Ceratia</i> sp. 1			+	
Subfamily Homalopomatinae					<i>Ceratia</i> sp. 2			+	
<i>Homalopoma</i> sp. 1			+		<i>Ceratia</i> sp. 3			+	
<i>Homalopoma</i> sp. 2			+		<i>Taramellia</i> sp. 1			+	
Family Cyclostrematidae					<i>Taramellia</i> sp. 2			+	
Subfamily Skeneinae					<i>Arsenia</i>			+	
<i>Teinostoma</i>			+		New genus, cf. <i>Rissoina</i>			+	
<i>Leucodiscus</i>			+		? <i>Apicularia</i>			+	
Subfamily Cyclostrematinae					<i>Rissoa</i>			+	
<i>Circulus</i>				+	<i>Buvignieria</i>			+	
Superfamily Neritacea					New genus, cf. <i>Pseudotaphrus</i>			+	
Family Neritidae					<i>Microtaphrus</i> sp. 1			+	
Subfamily Neritinae					<i>Microtaphrus</i> sp. 2			+	
<i>Neritoplica</i>			+	+	<i>Microtaphrus</i> sp. 3			+	
<i>Otostoma</i>			+		<i>Microtaphrus</i> sp. 4			+	
Order Mesogastropoda					<i>Goniatoxyra</i>			+	
Superfamily Littorinacea					<i>Zebinella</i> sp. 1			+	
Family Lacunidae					<i>Zebinella</i> sp. 2			+	
<i>Dissochilus</i>			+		<i>Rissoina</i>			+	
<i>Lacuna</i>			+		<i>Cossmannia</i>			+	+
<i>Entomope</i> sp. 1			+		Rissoidae, indeterminate			+	
<i>Entomope</i> sp. 2			+		Superfamily Architectonicacea				
					Family Architectonicidae				
					<i>Pseudomalaxis</i>			+	
					<i>Nipteraxis</i>		+	+	+
					Superfamily Cerithiacea				
					Family Turritellidae				
					<i>Mesalia</i> sp. 1			+	
					<i>Mesalia</i> sp. 2		+	+	+
					<i>Turritella</i> sp. 1			+	+
					<i>Turritella</i> sp. 2	A,N	+	+	+

Kangilia Formation	Agatdal Formation				Kangilia Formation	Agatdal Formation			
	Other localities	Qaersutjægerdal	Sonja Lens	Turritellakløft		Other localities	Qaersutjægerdal	Sonja Lens	Turritellakløft
Family Mathildidae					Family Triphoridae				
<i>Clathrobaculus</i>			+		<i>Ogivia</i> sp. 1			+	
<i>Mathilda</i> sp. 1			+		<i>Ogivia</i> sp. 2			+	
<i>Mathilda</i> sp. 2			+		<i>Ogivia</i> sp. 3			+	
<i>Mathilda</i> sp. 3			+		Triphoridae, new genus			+	
<i>Mathilda</i> sp. 4			+						
<i>Mathilda</i> sp. 5			+		Superfamily Epitoniacea				
<i>Fimbriatella</i> sp. 1			+	+	Family Epitoniidae				
<i>Fimbriatella</i> sp. 2			+		<i>Hemiacirsa</i>			+	
<i>Acrocoelum</i>			+		cf. <i>Opalia</i>			+	
<i>Gegania</i> sp. 1			+	+	<i>Cerithiscala</i>			+	
<i>Gegania</i> sp. 2			+		<i>Belliscala</i>			+	
					? <i>Coniscala</i>	+		+	+
Family Procerithiidae					<i>Confusiscala</i>			+	
Subfamily Metacerithiinae									
<i>Metacerithium</i>			+		Superfamily Eulimacea				
Family Potamididae					Family Aclididae				
Subfamily Potamidinae					<i>Stilbe</i>			+	
<i>Potamidopsis</i>			+						
<i>Telescopium</i>			+		Superfamily Strombacea				
					Family Aporrhaidae				
Family Cerithiidae					<i>Drepanocheilus</i>			+	+
Subfamily Litiopinae					New genus, cf. <i>Drepanocheilus</i>			+	+
<i>Alaba</i>			+		<i>Kangilioptera ravni</i> K,T				
					<i>Arrhoges palaeocaenica</i>			+	
Subfamily Cerithiinae					Aporrhaidae, indeterminate			+	
<i>Semivertagus</i>			+						
					Family Strombidae				
Family Cerithiopsidae					aff. <i>Tibia</i>			+	+
<i>Cerithiopsis</i> sp. 1				+					
<i>Cerithiopsis</i> sp. 2			+		Superfamily Hipponicacea				
<i>Cerithiopsis</i> sp. 3			+	+	Family Hipponicidae				
New genus, cf. <i>Cerithiopsis</i>			+		<i>Hipponix</i> sp. 1	+		+	+
<i>Cerithiella</i>			+	?	<i>Hipponix</i> sp. 2			+	+
<i>Seila</i>			+		<i>Hipponix</i> sp. 3			+	

Kangilia Formation	Agatdal Formation				Kangilia Formation	Agatdal Formation			
	Other localities	Qaersutjægerdal	Sonja Lens	Turritellakløft		Other localities	Qaersutjægerdal	Sonja Lens	Turritellakløft
Superfamily Calyptraeacea					Subfamily Polinicinae				
Family Trichotropidae					<i>Polinices</i>		+	+	+
Subfamily Trichotropinae					<i>Lunatia</i> sp. 1		+		+
Trichotropinae, new genus			+		<i>Lunatia</i> sp. 2			+	+
Family Calyptraeidae					Superfamily Tonnacea				
<i>Calyptraea</i> sp. 1			+	+	Family Cymatiidae				
<i>Calyptraea</i> sp. 2			+	+	<i>Ranella</i> sp. 1			+	
<i>Sigapatella</i>			+		<i>Ranella</i> sp. 2			+	
<i>Crepidula</i> sp. 1			+		New genus, cf. <i>Plesiotriton</i>			+	
<i>Crepidula</i> sp. 2		+	+	+	Cymatiidae, indeterminate			+	
Superfamily Cypraeacea					Family Ficidae				
Family Cypraeidae					<i>Ficus</i> sp. 1			+	
Subfamily Cypraeorbinae					<i>Ficus</i> sp. 2	A	+	+	+
<i>Palaeocypraea</i>			+		<i>Fulguroficus</i>		+	+	+
? <i>Palaeocypraea</i>	A		+		Order Neogastropoda				
<i>Protocypraea</i>			+	+	Suborder Stenoglossa				
Subfamily Cypraeinae					Superfamily Buccinacea				
<i>Josseumea</i>			+		Family Pyrenidae				
Subfamily Cypraeovulinae					<i>Columbellopsis</i>			+	
<i>Zonaria</i>	A		+		Family Buccinidae				
Subfamily Sulcocypraeinae					<i>Parvisipho</i> sp. 1			+	+
<i>Eocypraea</i>			+		<i>Parvisipho</i> sp. 2			+	
Superfamily Naticacea					<i>Parvisipho</i> sp. 3			+	
Family Naticidae					<i>Parvisipho</i> sp. 3?			+	
Subfamily Globulariinae					<i>Siphonalia</i>		+		+
<i>Amaurellina</i>		+	+	+	aff. <i>Siphonalia</i>		+	+	
aff. <i>Amaurellina</i>			+	+	<i>Penion</i> sp. 1			+	
<i>Tylostoma ampullariaeformis</i>	A		+	+	<i>Penion</i> sp. 2		+	+	+
<i>Vanikoropsis skoui</i>			+		<i>Penion</i> sp. 3			+	
<i>Vanikoropsis</i> sp. 1		+			New genus, cf. <i>Penion</i> , sp. 1			+	
<i>Vanikoropsis</i> sp. 2		+			New genus, cf. <i>Penion</i> , sp. 2			+	+
					<i>Coptochetus</i>			+	
					? <i>Coptochetus</i>			+	+
					<i>Nekewis</i>			+	



Kangilia Formation	Agatdal Formation				Kangilia Formation	Agatdal Formation			
	Other localities	Qaersutjægerdal	Sonja Lens	Turritellakløft		Other localities	Qaersutjægerdal	Sonja Lens	Turritellakløft
<i>Laevibuccinum</i>			+	+	Family Muricidae				
<i>Searlesia</i> sp. 1			+		Subfamily Muricinae				
<i>Searlesia</i> sp. 2			+		New genus, cf. <i>Trophonopsis</i>		+	+	+
<i>Cominella</i>		+	+	+	<i>Muricopsis</i>			+	
<i>Pollia</i> sp. 1			+		? <i>Muricopsis</i>			+	
<i>Pollia</i> sp. 2		+	+						
cf. <i>Pollia</i>	A	+	+	+	Superfamily Volutacea				
<i>Suessonia</i>			+	+	Family Olividae				
<i>Janiopsis</i>			+		Subfamily Pseudolivinae				
Buccinidae, indeterminate			+		<i>Pseudoliva</i> sp. 1	A		+	+
Family Melongenidae					<i>Pseudoliva</i> sp. 2	A	+	+	+
<i>Sycostoma</i>		+			<i>Strepsidura</i>			+	+
Family Nassariidae					Subfamily Olivinae				
<i>Conomitra</i> sp. 1			+		<i>Ancillus</i>		+		+
<i>Conomitra</i> sp. 2			+		<i>Ancillarina</i>			+	+
<i>Conomitra</i> sp. 3			+		Family Vasidae				
<i>Conomitra</i> sp. 4		+	+		aff. <i>Tudicla</i>				+
<i>Conomitra</i> sp. 5			+		Family Harpidae				
Family Fascioliariidae					<i>Harpa</i>				+
Subfamily Fascioliariinae					Family Volutidae				
<i>Boltenella</i>		+	+	+	<i>Psephaea</i>			+	
Fascioliariinae, new genus			+		<i>Volutocorbis</i>	A	+	+	+
Subfamily Fusininae					Volutidae, indeterminate			+	
<i>Fusinus</i>	A	+	+	+	Family Cancellariidae				
<i>Kryptos</i>			+		<i>Merica</i>	A	+		
<i>Streptolathyrus</i> sp. 1			+		<i>Aneurystoma</i> sp. 1			+	
<i>Streptolathyrus</i> sp. 2			+		<i>Aneurystoma</i> sp. 2			+	
New genus, cf. <i>Streptochetus</i>			+		<i>Aneurystoma</i> sp. 3			+	
<i>Buccinofusus</i>			+		<i>Sveltella</i> sp. 1			+	
New genus, cf. <i>Levifusus</i> sp. 1				+	<i>Sveltella</i> sp. 2			+	
New genus, cf. <i>Levifusus</i> sp. 2				+	<i>Sveltella</i> sp. 3			+	
New genus, cf. <i>Haplovoluta</i>	A	+	+	+					
<i>Exilia</i>			+	+					

	Kangilia Formation	Agatdal Formation					Kangilia Formation	Agatdal Formation			
		Other localities	Qaersutjægdal	Sonja Lens	Turritellakløft			Other localities	Qaersutjægdal	Sonja Lens	Turritellakløft
<i>Cancelrana</i> sp. 1				+	+	<i>Syrnola</i>				+	
<i>Cancelrana</i> sp. 2				+		<i>Puposyrnola</i> sp. 1				+	
<i>Admete</i>				+		<i>Puposyrnola</i> sp. 2				+	
cf. <i>Bonellitia</i>				+		<i>Pyrgiscus</i>				+	
<i>Coptostoma</i>				+		<i>Creonella sonjae</i>				+	
cf. <i>Coptostoma</i>				+	+						
Suborder Toxoglossa						Order Cephalaspidea					
Superfamily Mitracea						Superfamily Acteonacea					
Family Mitridae						Family Acteonidae					
<i>Tiara</i>				+		<i>Acteon</i> sp. 1				+	
						<i>Acteon</i> sp. 2				+	
						<i>Ravniella</i> aff. <i>R. regularis</i>				+	
Superfamily Conacea						<i>Ravniella groenlandica</i>	T	+	+	+	
Family Turridae						New genus, cf. <i>Rictaxis</i> , sp. 1				+	
<i>Turricula</i>	K	+			+	New genus, cf. <i>Rictaxis</i> , sp. 2				+	
<i>Surcula</i>				+	+						
<i>Crenaturricula</i> sp. 1				+		Subfamily Cyndrobullininae					
<i>Crenaturricula</i> sp. 2		+	+	+		<i>Nonactaeonina</i>		+			+
<i>Crenaturricula</i> sp. 3				+		? <i>Douvilleia</i> sp. 1				+	
<i>Hemisurcula</i>				+	+	? <i>Douvilleia</i> sp. 2				+	
<i>Clinura</i> sp. 1		An		+	+						
<i>Clinura</i> sp. 2				+		Family Ringiculidae					
<i>Surculites</i>		D,T		+		<i>Ringiculina</i>				+	
cf. <i>Leucosyrinx</i>				+	+	<i>Gilbertina</i>				+	+
<i>Turris</i>				+	+						
<i>Hemipleurotoma</i>			+	+	+	Family Scaphandridae					
<i>Cordieria</i>					+	cf. <i>Acteocina</i>				+	+
<i>Pseudotoma</i>			+		+	<i>Cylichna</i> sp. 1		A		+	+
cf. <i>Amuletum</i>				+		<i>Cylichna</i> sp. 2					
Turridae, new genus			+		+	<i>Cylichna</i> sp. 3	K,T			+	
						<i>Ellipsoscapha</i>		A	+	+	+
Subclass Euthyneura											
Order Entomotaeniata						Family Bullidae					
Superfamily Pyramidellacea						<i>Bulla</i>					+
Family Pyramidellidae											
<i>Odostomia</i> sp. 1				+	+	Family Retusidae					
<i>Odostomia</i> sp. 2				+		<i>Retusa</i>				+	
<i>Odostomia</i> sp. 3				+							
<i>Magestomia</i>				+							

	Agatdal Formation					Agatdal Formation				
	Kangilia Formation	Other localities	Qaersutjægerdal	Sonja Lens		Turritellakløft	Kangilia Formation	Other localities	Qaersutjægerdal	Sonja Lens
Superfamily Ellobiacea Family Ellobiidae						Superfamily Zonitacea Family Zonitidae				
<i>Micrelasma</i>				+		<i>cf. Grandipatula</i>		+	+	
Order Stylommatophora Suborder Sigmurethra Infraorder Aulacopoda						Incertae sedis Operculum				+

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MMH and MGUH indicate specimens in the type collection of the Geologisk Museum, Copenhagen. Ordinary accession numbers of that institution take the form 1977.4305.

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## SYSTEMATIC PALAEOONTOLOGY

Class GASTROPODA  
Subclass STREPTONEURA  
Order ARCHAEOGASTROPODA  
Superfamily PLEUROTOMARIACEA  
Family PLEUROTOMARIIDAE

### ?*Leptomaria* Eudes-Deslong. Fig. 3

Fig. 3A,B: MGUH 15.587, internal mould of a whorl fragment from Nuilaussarsuaq,  $\times 1$ .

*Additional material.* 1977. 425, Nuilaussarsuaq (1953); 1977. 428, 1977. 429(?), Turritellakløft (1946).

*Remarks.* Only fragments of this broadly phaneromphalous form, tentatively assigned to *Leptomaria* Eudes-Deslongchamps, are available. The whorls have collabral threads, and the selenizone is at mid-whorl. The base has growth lines and collabral threads. *L. nodosereticulata* (Kaunhowen) from Maastricht seems to be related.



Fig. 3. ?*Leptomaria*,  $\times 1$

### *Conotomaria* Cox

Fig. 4

Fig. 4: MGUH 15.588, Turritellakløft,  $\times 1$ .

*Additional material.* 'Kungessaq' (Kangesôq?), 'Gaffelkløft' (locality unknown).

*Remarks.* Fragments of a form with angulated whorls and a nearly flat base with a depression close to the periphery.

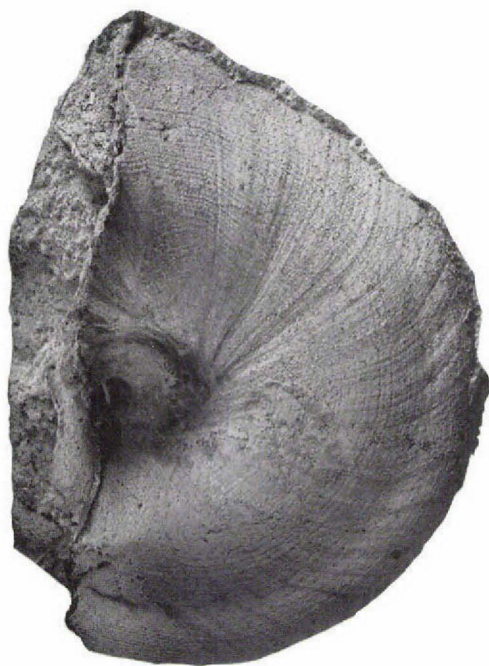


Fig. 4. *Conotomaria*,  $\times 1$

### Family SCISSURELLIDAE

### *Scissurella* d'Orbigny

Fig. 5

Fig. 5A,B: MGUH 15.589, Sonja Lens (1958),  $\times 80$ .

*Additional material.* Sonja Lens (1958), numerous specimens.



*Remarks.* The first whorls of the deuteroconch are round in outline; later whorls are flat posteriorly. Related forms include *Scissurella annulata* Ravn, from Faxø; *S. corneti* Cossmann, from the Calcaire de Mons in Belgium and *S. deshayesi* Munier-Chalmas (*fide* Cossmann & Pissarro, 1910–13) from the Bartonian of the Paris Basin.

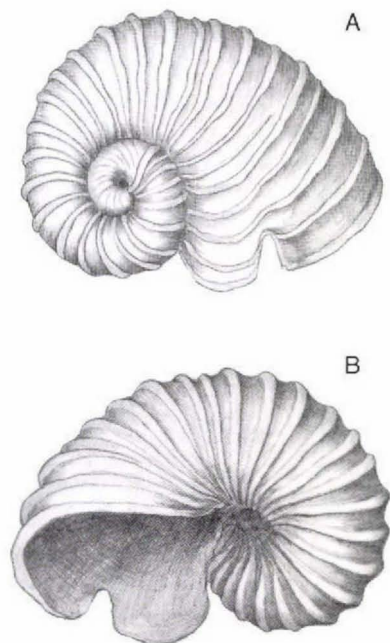


Fig. 5. *Scissurella*,  $\times 80$

Superfamily FISSURELLACEA  
Family FISSURELLIDAE  
Subfamily EMARGINULINAE

### *Emarginulina* Lamarck

Fig. 6

Fig. 6A-C: MGUH 15.590, Sonja Lens (1977),  $\times 6$ .

*Additional material.* 1977. 4037, 1977. 4038, Sonja Lens, 3 specimens; 1977. 4036, Turritellakløft (1953), 2 specimens.

*Remarks.* The selenizone is narrow and situated

between two ribs. In small specimens the slit is proportionally longer than in the figured one. A related form is *Emarginulina montensis* Cossmann from the Calcaire de Mons.

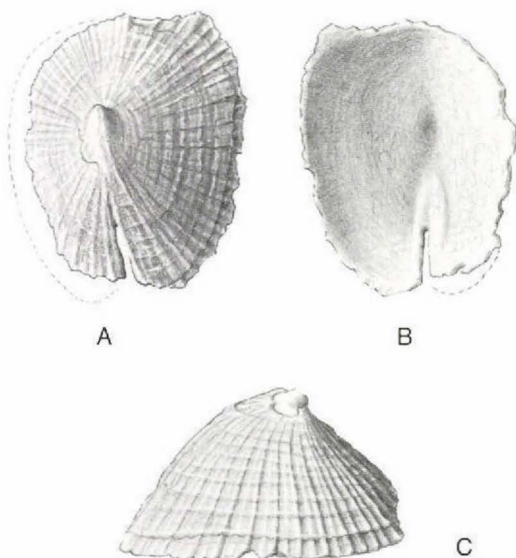


Fig. 6. *Emarginulina*,  $\times 6$

### *Puncturella* Lowe

Fig. 7

Fig. 7A,B: MGUH 15.591, Sonja Lens (1956),  $\times 12$ .

*Remarks.* There is a small oval perforation near the apex which has not been drawn.

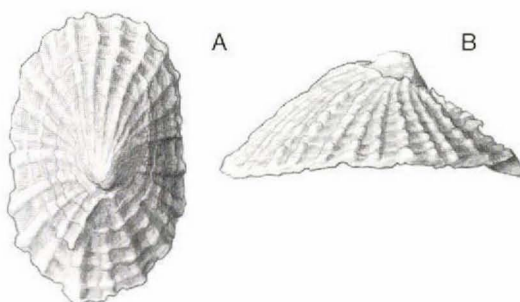


Fig. 7. *Puncturella*,  $\times 12$

*Semperia* Crosse

Fig. 8

Fig. 8A,B: MGUH 15.592, Sonja Lens (1958),  $\times 8$ .

*Additional material.* 1977. 4045, Qaersutjægørdal (1953), 1 specimen; 1977. 4046, 4033, 4042, 4032, 4043, Sonja Lens (1948, 1952, 1956, 1958), numerous specimens; 1977. 4047–4049, Turritellakløft (1946, 1949), 4 specimens.

*Remarks.* When the apical whorls are preserved, the apex extends to the posterior margin. The ridge below the slit is prominent. *Semperia plateaui* Cossmann & Pissarro from the Thanetian of the Paris Basin is a related form.

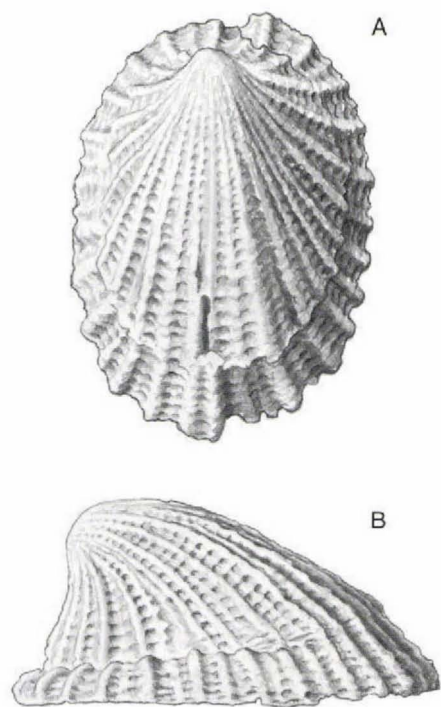
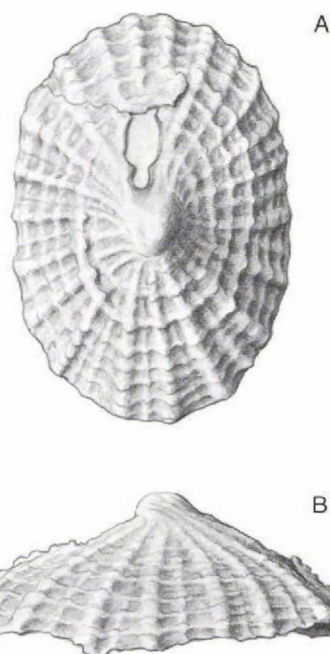
Fig. 8. *Semperia*,  $\times 7$ *Fissurella* Bruguière

Fig. 9

Fig. 9A,B: MGUH 15.593, Sonja Lens (1956),  $\times 12$ .

*Additional material.* 1977. 409, Sonja Lens (1953, 1956, 1958), numerous specimens.

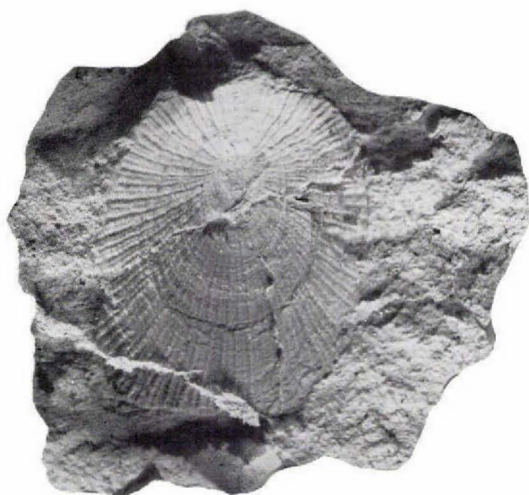
*Remarks.* The keyhole-shaped perforation lies in front of the apex, indicating that the form is a juvenile.

Fig. 9. *Fissurella*,  $\times 12$ 

## Subfamily DIODORINAE

*Diodora* Gray

Fig. 10

Fig. 10: MGUH 15.594, Qaersutjægørdal (1951),  $\times 2$ .Fig. 10. *Diodora*,  $\times 2$

*Remarks.* Only one external mould is available.

Superfamily PATELLACEA

Family ACMAEIDAE

*Acmaea* Eschscholtz, species 1 Fig. 11

Fig. 11A,B: MGUH 15.595, Sonja Lens (1956),  $\times 16$ .

*Additional material.* 1977. 4024, Sonja Lens (1956), 1 specimen.

*Remarks.* The apex is long, blunt and smooth; in the unfigured shell the radial threads are crossed by growth lines.

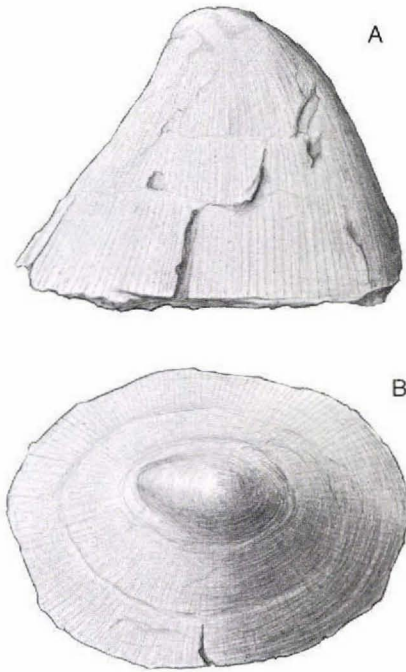


Fig. 11. *Acmaea* sp. 1,  $\times 24$

*Acmaea* Eschscholtz, species 2 Fig. 12

Fig. 12A,B: MGUH 15.596, Sonja Lens (1953),  $\times 7$ .

*Remarks.* The protoconch points toward the anterior and a broad marginal zone is developed at

the aperture. In spite of the unusual shape this form belongs to the Acmaeidae. It is distinguished from species 1 by its more rounded rectangular margin.

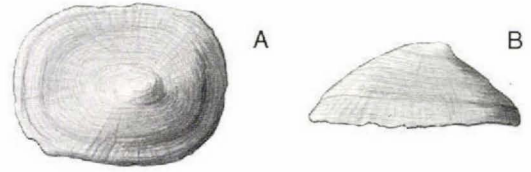


Fig. 12. *Acmaea* sp. 2,  $\times 7$

*Acmaea* Eschscholtz, species 3 Fig. 13

Fig. 13A,B: MGUH 15.597, Sonja Lens (1954),  $\times 12$ .

*Additional material.* 1977. 4011, Sonja Lens (1953, 1954), 7 specimens.

*Remarks.* The shells have a broad elliptical aperture.

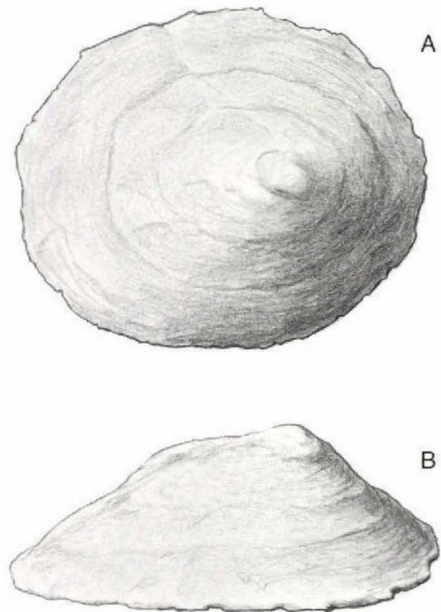


Fig. 13. *Acmaea* sp. 3,  $\times 12$



*?Acmaea* Eschscholtz

Fig. 14

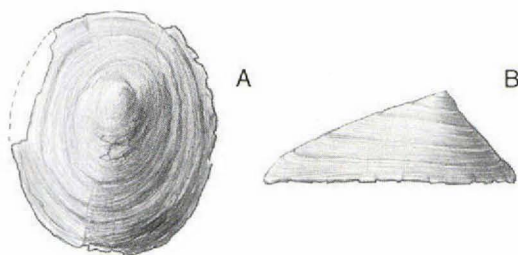
Fig. 14A,B: MGUH 15.598, Sonja Lens (1954),  $\times 6$ .*Additional material.* 1977. 984, Sonja Lens (1954, 1956), numerous specimens.*Remarks.* The assignment to *Acmaea* is not secure, since the aperture is slightly curved.Fig. 14. *?Acmaea*,  $\times 6$ *Scurria* Gray, species 1

Fig. 15

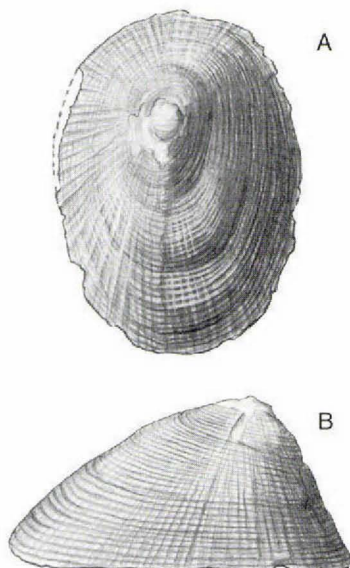
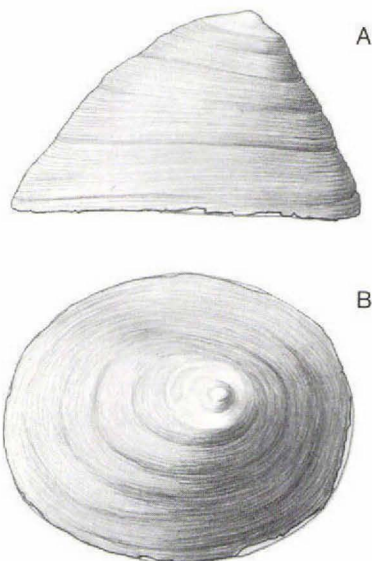
Fig. 15A,B: MGUH 15.599, Sonja Lens (1956),  $\times 7$ .*Additional material.* 1977. 4003, 4035, 4015, Sonja Lens (1952, 1956, 1958), 14 specimens.Fig. 15. *Scurria* sp. 1,  $\times 7$ *Remarks.* The apex is flat and porcellaneous. The ornamentation in the upper part of the deuteroconch consists solely of collabral ribs. However, in the lower two thirds, radial ribs form crenulations with the collabral ribs.*Scurria* Gray, species 2

Fig. 16

Fig. 16A,B: MGUH 15.600, Sonja Lens (1956),  $\times 6$ .*Additional material.* 1977. 4010, 4030, 4031, Sonja Lens (1953, 1954, 1956), 8 specimens.*Remarks.* The sculpture consists only of collabral lines, in contrast to *Scurria*, species 1, where radial ribs are also present.Fig. 16. *Scurria* sp. 2,  $\times 6$ 

## Family PATELLIDAE

*Remarks.* A definite distinction between the Acmaeidae and Patellidae is only possible after the examination of soft part anatomy. A conchological distinction can be made by using the muscle scar, which is joined by a thin line anteriorly in

the Acmaeidae. However, when this feature is not visible, all forms with an elongated large protoconch have been referred tentatively to *Acmaea*.

### *Patella* Linné, species 1 Fig. 17

Fig. 17A–C: MGUH 15.601, Sonja Lens (1953),  $\times 3$ .

*Additional material.* 1977. 3988, Agatkløft (1953), 1 specimen; 1977. 4002 (?), Sonja Lens (1952), 1 specimen; 1977. 4019, Qaersutjægerdal (1953), 1 specimen; 1977. 4001 (?), Turritel-lakløft (1953), 1 specimen.

*Remarks.* The figure does not show the weak radial striations between the prominent ribs, or the growth lines.

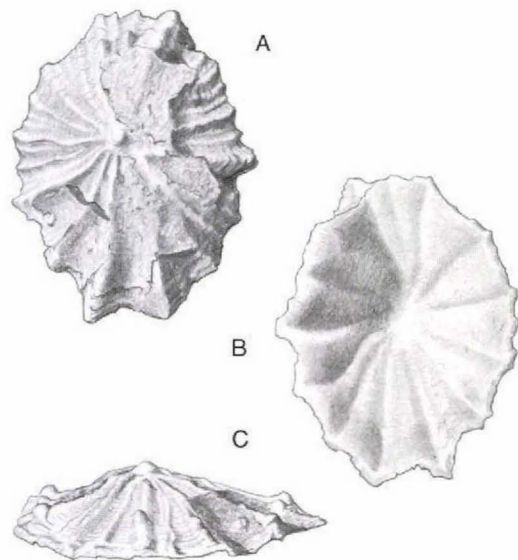


Fig. 17. *Patella* sp. 1,  $\times 3$

### *Patella* Linné, species 2 Fig. 18

Fig. 18A,B: MGUH 15.602, Sonja Lens (1956),  $\times 2$ .

*Additional material.* 1977. 3083, 4014 (part), Sonja Lens (1948, 1953, 1956, 1958), 16 specimens; 1977. 3980, Agatkløft, large section (1952), 1 specimen; 1977. 3998 (?), Sonja Lens (1953), 1 specimen.

*Remarks.* This species has finer radial ribs than *Patella* species 1, and a completely round aperture.



Fig. 18. *Patella* sp. 2,  $\times 2$

### *Patella* Linné, species 3 Fig. 19

Fig. 19A,B: MGUH 15.603, Sonja Lens 1956,  $\times 1.5$ .

Fig. 19C,D: MGUH 15.604, Sonja Lens,  $\times 2$ .

*Additional material.* 1977. 3987, 3996, 4014, 4016, 4027–4029, Sonja Lens (1952, 1954, 1956, 1958), numerous specimens; 1977. 3989, Turritelakløft (1949), 1 fragment.

*Remarks.* The shells have a broad elliptical outline, as in *Patella* species 2. However, the protoconch is larger and the radial ribs are less prominent.

### ? *Patella* Linné Fig. 20

Fig. 20: MGUH 15.605, Qaersutjægerdal (1952),  $\times 3$ .

*Remarks.* This is the shell of a patelliform gastropod with a central apex and low, pliciform radial sculpture.

## Family LEPETIDAE

### *Lepetidae*, new genus? Fig. 21

Fig. 21A,B: MGUH 15.606, Sonja Lens (1956),  $\times 12$ .

*Additional material.* 1977. 4024, Sonja Lens (1953, 1956), 2 specimens.



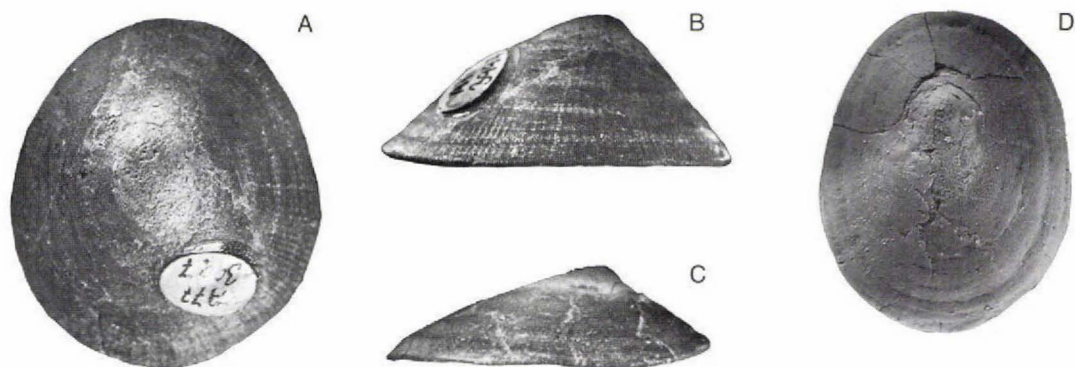


Fig. 19. *Patella* sp. 3, A,B,  $\times 1.5$ , C,D,  $\times 2$

*Remarks.* From the position of the muscle scar, which is preserved in the figured specimen, it can be deduced that the apex is pointed towards the front of the shell. A generic assignment of the high shell is not possible. *Patella subglabra* Ravn from the Paleocene of Copenhagen is closely related.

Superfamily TROCHACEA  
Family TROCHIDAE  
Subfamily CHILODONTINAE

### Chilodontinae, new genus, species 1

Fig. 22

Fig. 22: MGUH 15.607, Turritellakløft, large section (1953),  $\times 3$ .

*Additional material.* 1977. 1042, 1043, Kangilia, 2 specimens; 1977. 1044 (?), Agatkloft, large section, 1 fragment.

*Remarks.* The sculpture consists of strongly prosocline axial folds which are crossed by spiral threads. The outer lip is thickened and nearly in the same plane as the columella, which bears one strong tooth on the middle. The form differs from other members of the Chilodontinae by its sculpture and the presence of the single tooth.



Fig. 20. ?*Patella*,  $\times 3$

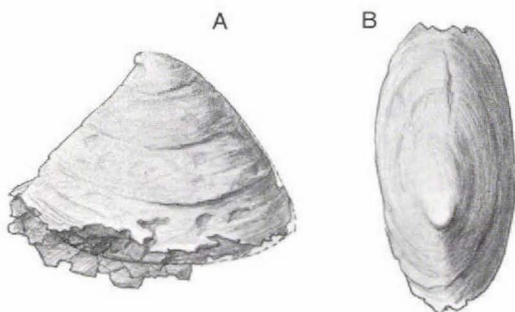


Fig. 21. *Lepetidae*, new genus?,  $\times 12$

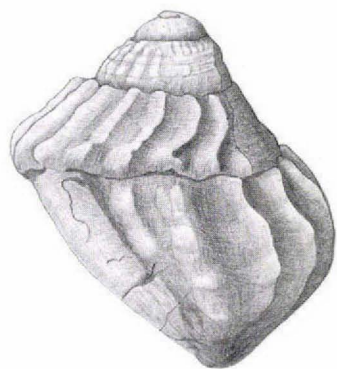


Fig. 22. Chilodontinae, new genus, sp. 1,  $\times 3$

Chilodontinae, new genus,  
species 2

Fig. 23

Fig. 23A,B: MGUH 15.608, Kangilia (1947),  $\times 3$ .

*Additional material.* 1977. 1042, Kangilia (1946), 1 specimen.

*Remarks.* This species differs from species 1 by virtue of the more convex whorls, the rounded periphery and the strongly convex base. The incomplete aperture precludes further comparison.

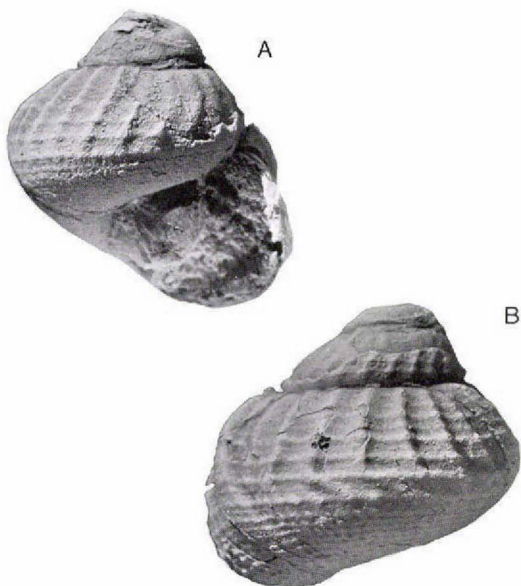


Fig. 23. Chilodontinae, new genus, sp. 2,  $\times 3$

Subfamily MARGARITINAE

*Basilissa* Watson

Fig. 24

Fig. 24A–C: MGUH 15.609, Sonja Lens (1958),  $\times 18$ .

*Additional material.* 1977. 1236, Sonja Lens (1958) 2 specimens.

*Remarks.* The whorls of the figured specimen are somewhat eroded. In the accompanying material, 1 specimen shows prosocline growth lines which form nodes at the sutures. *Delphinula helicina* Briart & Cornet from the Calcaire de Mons is closely related.

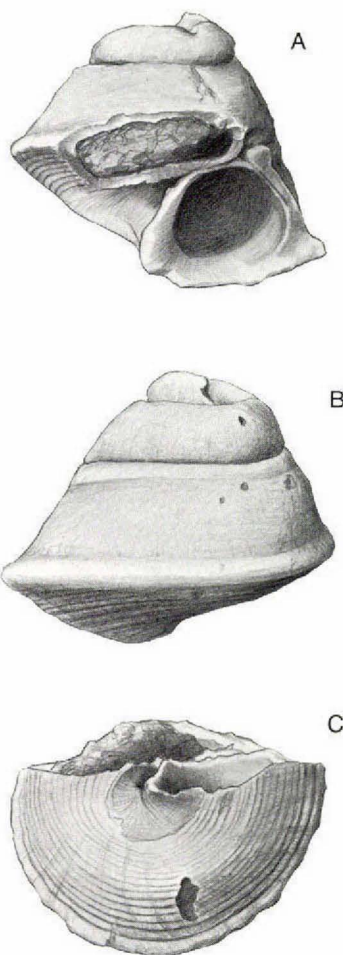
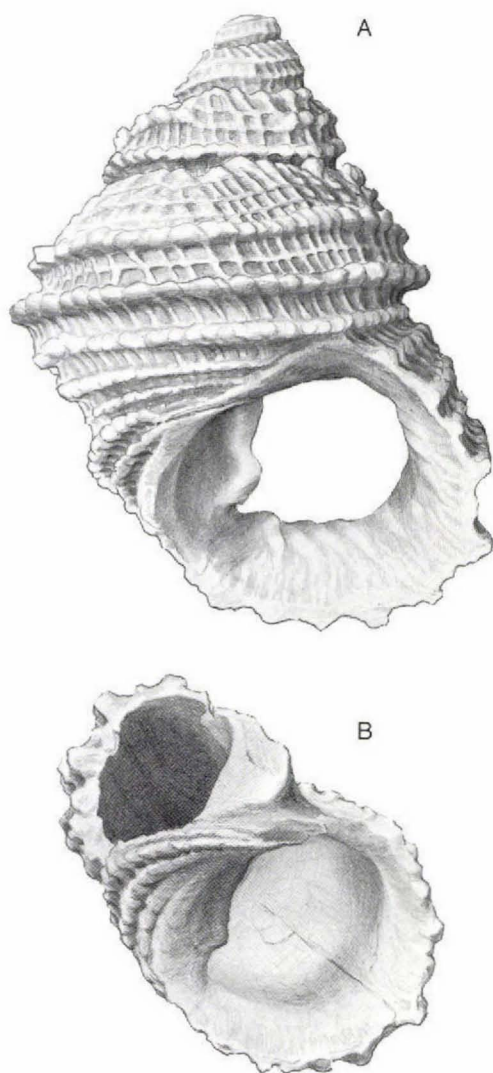


Fig. 24. *Basilissa*,  $\times 18$

Fig. 25. *Monodonta*,  $\times 9$ 

## Subfamily MONODONTINAE

*Monodonta* Lamarck

Fig. 25

Fig. 25A: MGUH 15.610, Sonja Lens (1958),  $\times 9$ .Fig. 25B: MGUH 15.611, Sonja Lens (1956),  $\times 9$ .

*Additional material.* 1977. 1075, Sonja Lens (1953, 1956), numerous examples.

*Remarks.* The sculpture is rather unusual for a *Monodonta*, but the shell and apertural shape

agree well with modern examples of this genus. Despite the sculpture, the form may not be assigned to the Chilodontinae because of its strongly prosocline outer lip. In the present form the columellar lip is expanded completely over the umbilicus only in large specimens. The columella is bidentate. *Monodonta* (*Danilia*) *faxensis* Ravn from Denmark is closely related.

*Osilinus* Philippi, species 1

Fig. 26

Fig. 26: MGUH 15.612, Sonja Lens (1953),  $\times 6$ .

*Additional material.* 1977. 1007, Sonja Lens (1952, 1954, 1956), 3 specimens; 1977. 1274, Sonja Lens (1958), 1 specimen.

*Remarks.* The whorls are densely covered by spiral threads. *Osilinus carinatus* Ravn is a closely related form which differs from the present species by its second angulation on the upper part of the last whorl and its spiral threads.

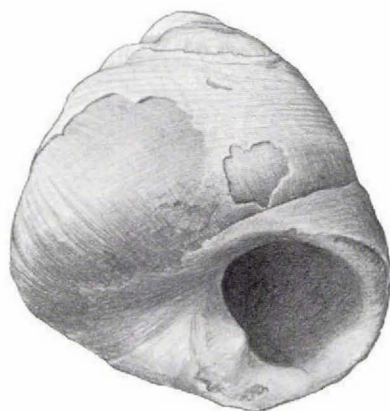
Fig. 26. *Osilinus* sp. 1,  $\times 6$ *Osilinus* Philippi, species 2

Fig. 27

Fig. 27A,B: MGUH 15.613, Sonja Lens (1953),  $\times 16$ .

*Additional material.* 1977. 992, Sonja Lens (1953), numerous specimens.

*Remarks.* In large specimens, the last whorl is



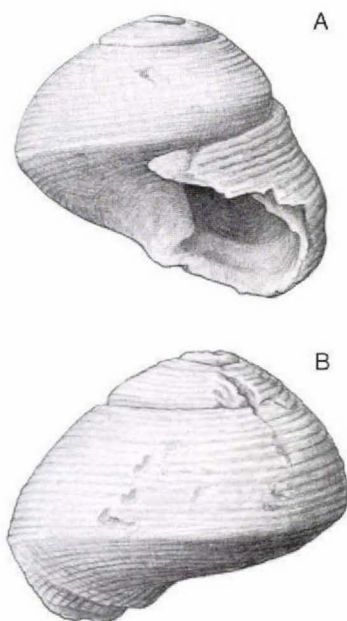


Fig. 27. *Osilinus* sp. 2,  $\times 16$

rounded with a slightly curved base and a narrow umbilicus. The whorls in species 2 are covered with spiral threads whereas they are smooth in

species 1. The second carination in the upper part of the whorls known from *Osilinus carinatus* Ravn is not present.

#### Subfamily GIBBULINAE

### *Colliculus* Monterosato Fig. 28

Fig. 28A,B: MGUH 15.614, Sonja Lens (1956),  $\times 12$ .

*Additional material.* 1977. 1212, Sonja Lens (1953), 3 specimens.

*Remarks.* The columellar tooth is strong, but not drop-like as it might appear from the slight damage to the lower part of the aperture, in the figured specimen.

#### Subfamily CALLIOSTOMATINAE

### *Calliostoma* Swainson, species 1 Fig. 29

Fig. 29A–C: MGUH 15.615, Turritelakløft, large section (1961),  $\times 3$ .

### *Calliostoma* Swainson, species 2 Fig. 30

Fig. 30A,B: MGUH 15.616, Sonja Lens (1956),  $\times 7$ .

*Additional material.* 1977. 1132, 1234, Sonja Lens (1953, 1956), 2 fragments.

*Remarks.* The nodes at the suture are less numerous and more pointed than on the drawing. A row of nodes lower on the whorl profile is only visible on the last whorl, the nodes lie on the steeper inclined upper part of the whorls and not on the concave lower part of the whorl, as the figure might suggest. The row of nodes on the base is only developed on the final half of the last whorl, immediately prior to the aperture. The nodes at the sutures and at the keel are more prominent than in *Calliostoma* species 1.

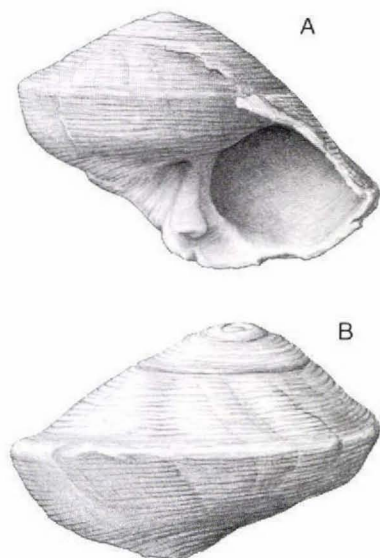


Fig. 28. *Colliculus*,  $\times 12$

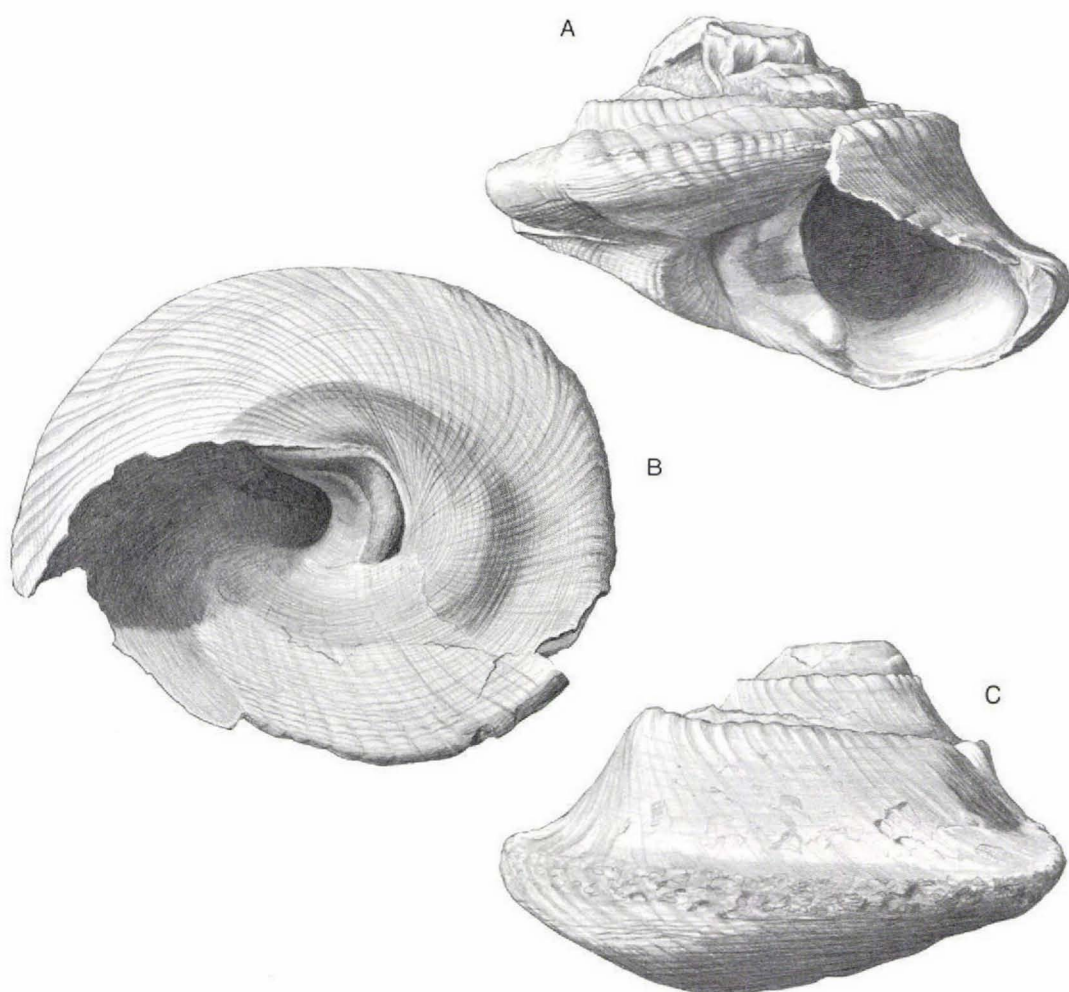


Fig. 29. *Calliostoma* sp. 1,  $\times 3$

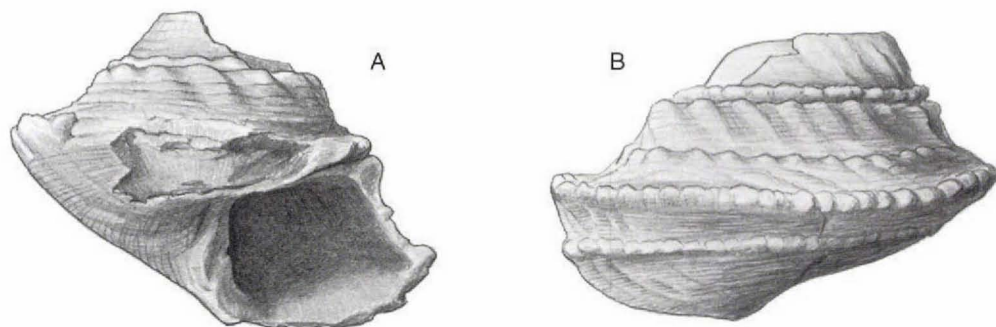


Fig. 30. *Calliostoma* sp. 2,  $\times 7$



## Subfamily TROCHINAE

*Clanculus* Montfort

Fig. 31

Fig. 31A: MGUH 15.617, Sonja Lens (1956),  $\times 6$ .Fig. 31B,C: MGUH 15.618, Sonja Lens (1953),  $\times 12$ .Fig. 31D: MGUH 15.619, Sonja Lens (1956),  $\times 3$ .

*Additional material.* 1977. 988, 989, Sonja Lens (1952, 1953, 1956, 1958), numerous specimens.

*Remarks.* *Solariella tricincta* (Deshayes) from the Bartonian of the Paris Basin and *S. tricostata* (Conrad, after Palmer, 1937) from the Claibornian of the southern United States are related forms. In both species the base is not as strongly convex as in the West Greenland examples.

## Subfamily SOLARIELLINAE

*Solariella* Wood

Fig. 32

Fig. 32A–C: MGUH 15.620, Sonja Lens (1958),  $\times 6$ .

*Additional material.* 1977. 1276, Sonja Lens (1958), 1 small specimen.

## Family ATAPHRIDAE

*Ataphrus* Gabb

Fig. 33

Fig. 33A,B: MGUH 15.621, Sonja Lens (1953),  $\times 9$ .

*Additional material.* 1977. 860, 861, Sonja Lens (1951, 1952, 1953, 1954, 1956), numerous specimens; 1977, 862, Turritel-lakløft, 1 fragment.

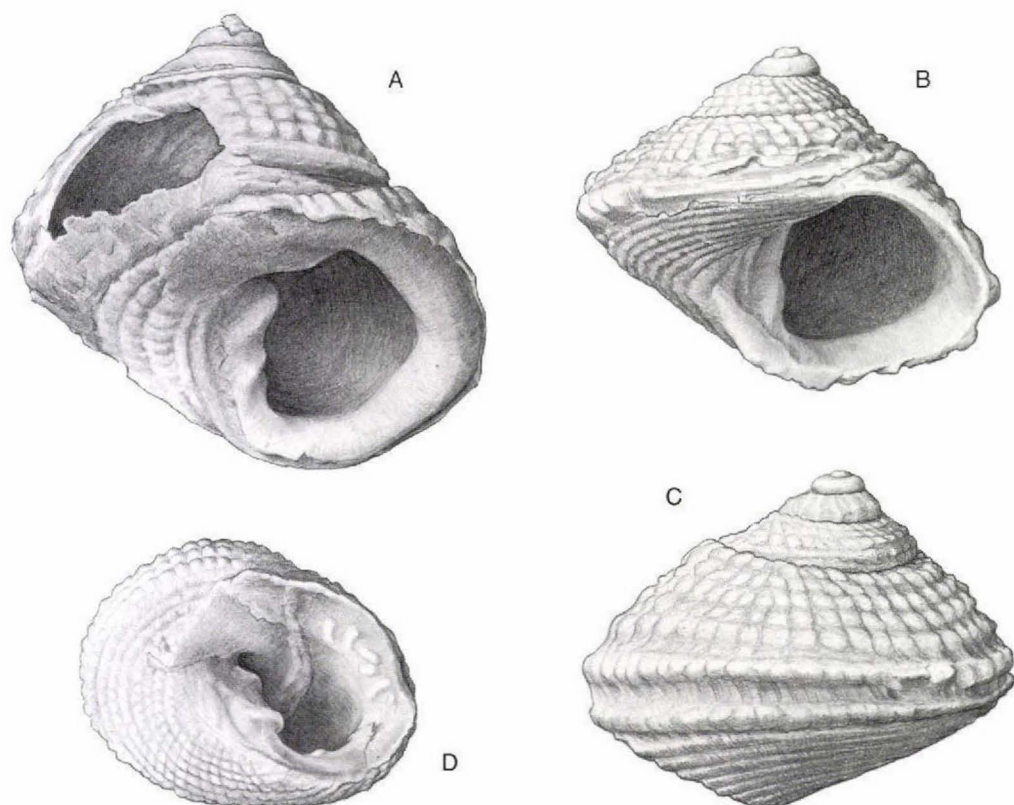
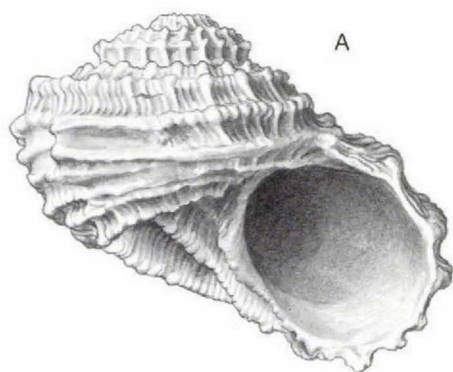


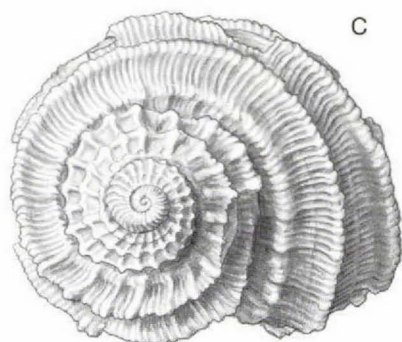
Fig. 31. *Clanculus* A,  $\times 6$ ; B,C,  $\times 12$ ; D,  $\times 3$



A



B



C

Fig. 32. *Solariella*,  $\times 6$

*Remarks.* This form is inflated at the end of the columella, and the furrow below extends into the base. Both these features, and the anomphalous low spired shell are characteristic for *Ataphrus*. *Collonia (Cirsochilus) carpatica* Krach from the Babica Clays of the Middle Carpathians is related.

Family TURBINIDAE  
Subfamily HOMALOPOMATINAE

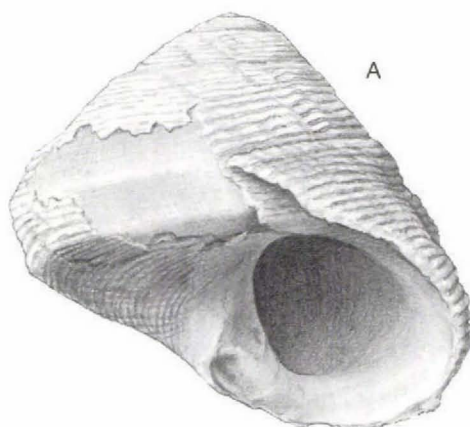
*Homalopoma* Carpentier,  
species 1

Fig. 34

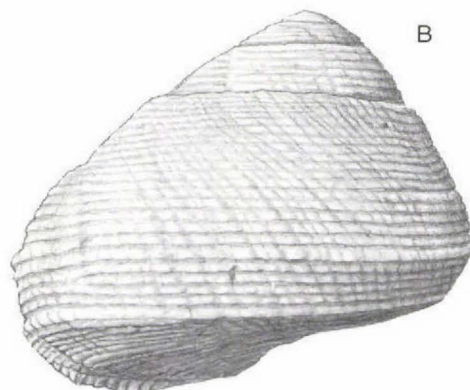
Fig. 34: MGHU 15.622, Sonja Lens (1958),  $\times 7$ .

*Additional material.* 1977. 1323, Sonja Lens (1952, 1953, 1956, 1958), numerous examples.

*Remarks.* The first whorls are flat on top and bear spiral striae. The shells are broadly umbilicate. On the last whorl, which has a completely rounded periphery, the spiral striae vanish and the umbilicus is nearly closed. The columellar lip is slightly thickened. *Homalopoma montensis* Briart & Cornet from the Calcaire de Mons, which Andersen (1975) also recorded from Northwest Germany, is closely related.



A



B

Fig. 33. *Ataphrus*,  $\times 9$



Fig. 34. *Homalopoma* sp. 1,  $\times 7$

*Homalopoma* Carpentier,  
species 2

Fig. 35A,B: MGUH 15.623, Sonja Lens (1953),  $\times 30$ .

Additional material. 1977. 1129, Sonja Lens (1953), 5 specimens.

Fig. 35

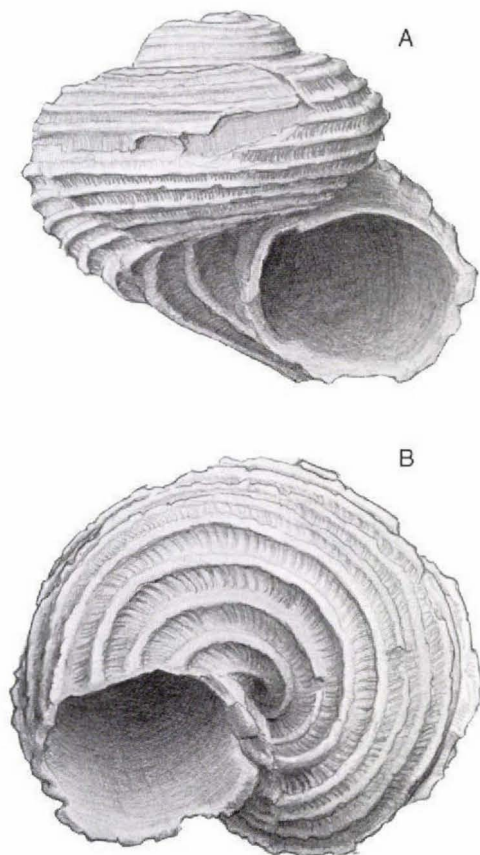


Fig. 35. *Homalopoma* sp. 2,  $\times 30$

*Remarks.* The upper surface of the whorls is flattened. In the figured specimen the aperture is incomplete. One of the accompanying specimens shows the expansion of the columellar lip which is characteristic for the genus.

Family CYCLOSTREMATIDAE  
Subfamily SKENEINAE

*Teinostoma* Adams & Adams Fig. 36

Fig. 36A–C: MGUH 15.624, Sonja Lens (1956),  $\times 10$ .

Additional material. 1977. 981, Sonja Lens (1951, 1953, 1954, 1956), numerous specimens.

*Remarks.* Related forms are *Teinostoma glaberrima* Ravn from the Faxe Limestone, *T. briarti* Cossmann from the Calcaire de Mons and *Rotelorbis nincki* Cossmann (?) of Krach (1963) from the Babica Clays.

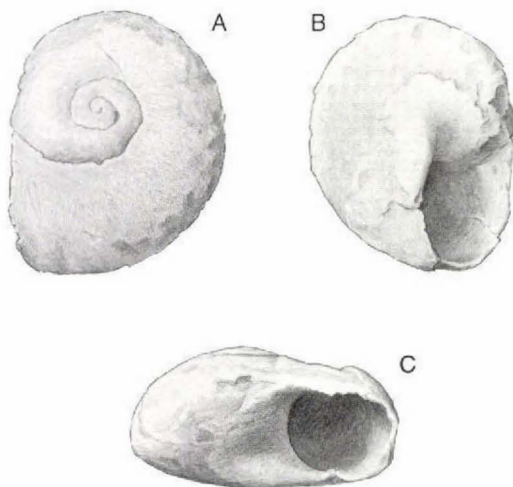


Fig. 36. *Teinostoma*,  $\times 10$

*Leucodiscus* Cossmann Fig. 37

Fig. 37: MGUH 15.625, Sonja Lens (1953),  $\times 20$ .

Additional material: 1977. 1324, Sonja Lens (1953, 1956, 1958), numerous specimens.





Fig. 37. *Leucodiscus*,  $\times 20$

#### Subfamily CYCLOSTREMATINAE

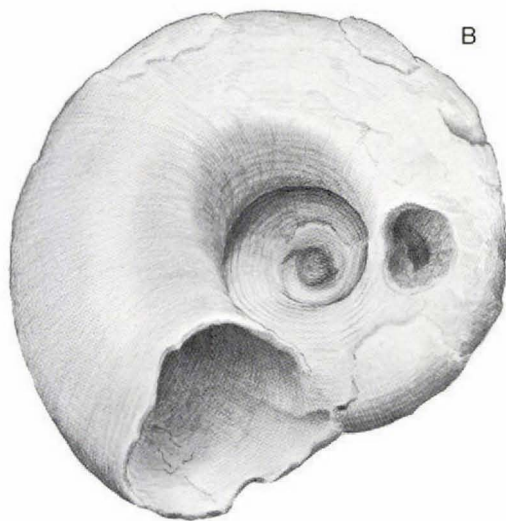
#### *Circulus* Jeffreys

Fig. 38

Fig. 38A–C: MGUH 15.626, *Turritellakløft*, large profile (1949),  $\times 15$ .

*Additional material.* *Turritellakløft* (1949), 2 specimens.

*Remarks.* This form differs from most other species of the genus by its lack of a peripheral keel. Related forms where the keel is more or less prominent are *Circulus densilineata* (Ravn), *C. similis* (Deshayes *vide* Cossmann & Pissarro, 1910–1913) and *C. simplex* Briart & Cornet from the Calcaire de Mons and from the Hueckelhoven Formation of Northwest Germany (Anderson, 1975).



#### Superfamily NERITACEA

#### Family NERITIDAE

#### Subfamily NERITINAE

#### *Neritoplica* Oppenheim

Fig. 39

Fig. 39A,B: MGUH 15.627, *Turritellakløft*, large profile (1948),  $\times 3$ .

Fig. 39C: MGUH 15.628, Sonja Lens (1956),  $\times 12$ .

Fig. 39D: MGUH 15.629, Sonja Lens (1958),  $\times 6$ .

*Additional material.* 1977. 607, 608, Sonja Lens (1958), 3 specimens; 1977. 1113, 1114, Sonja Lens (1952, 1953, 1956), numerous; 1977. 1253, 1247, 1258, Sonja Lens (1953, 1956, 1958), 8 specimens.

*Remarks.* In large specimens, the columellar lip bears three or four teeth. A single strong plication may be observed in all specimens. The presence of this plication is consistent with assignment to *Neritoplica*, since it extends into the in-

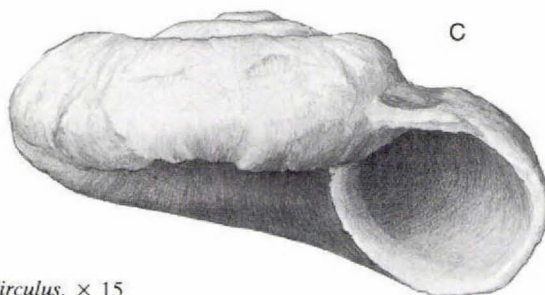
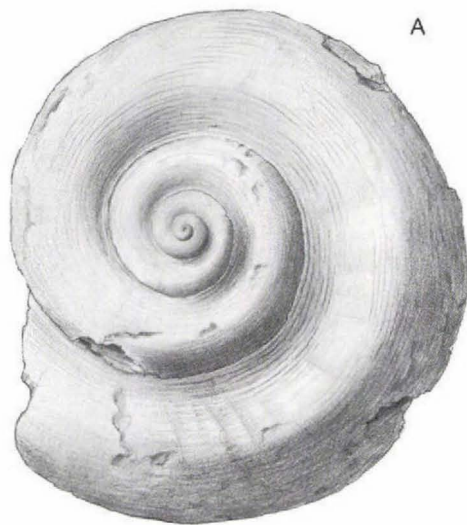


Fig. 38. *Circulus*,  $\times 15$

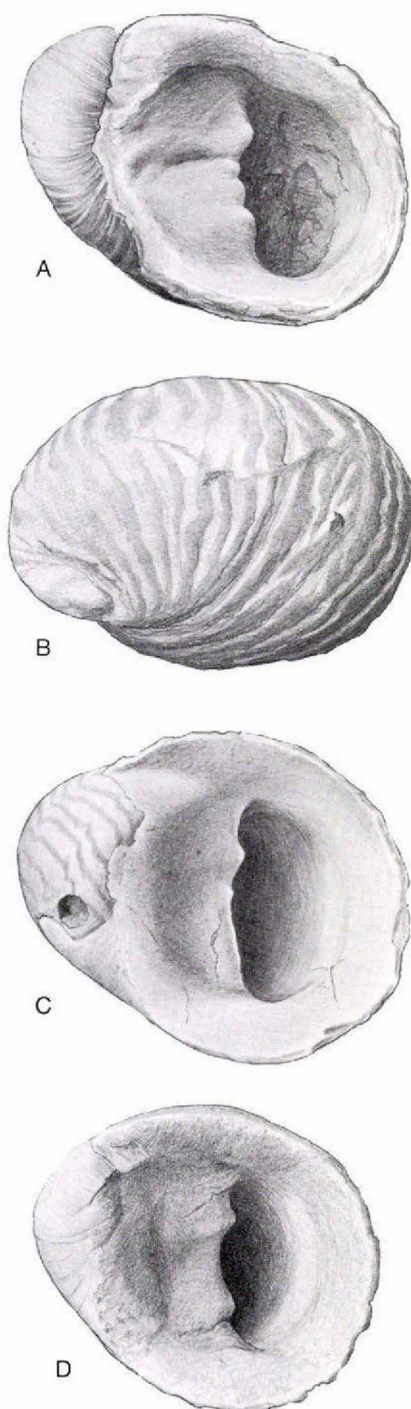


Fig. 39. *Neritoplica* A,B,  $\times 3$ ; C,  $\times 12$ , D  $\times 6$

terior of the shell. The number of columellar teeth increases with growth.

### *Otostoma* d'Archiac

Fig. 40

Fig. 40A,B: MGUH 15.630, Sonja Lens (1956),  $\times 14$ .

*Additional material.* 1977. 741, Sonja Lens (1953, 1954, 1956), numerous.

*Remarks.* Smaller shells are smooth outside. In larger ones the wrinkles are developed as shown in the figure. The tooth on the outer lip in the apertural view is exaggerated and does not occur in other specimens. *Otostoma* cf. *O. bicoronata* (Glibert) from the Calcaire de Mons is closely

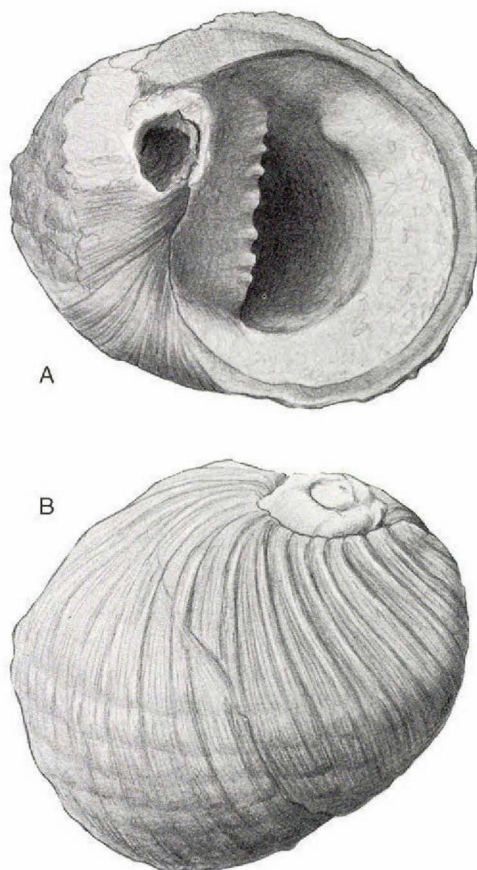


Fig. 40. *Otostoma*,  $\times 14$

related, but has a concave ramp on the upper part of the whorl.

Order MESOGASTROPODA  
Superfamily LITTORINACEA  
Family LACUNIDAE

*Dissochilus* Cossmann

Fig. 41

Fig. 41: MGUH 15.631, Sonja Lens (1952),  $\times 15$ .

*Additional material.* 1977. 1068, Sonja Lens (1954).

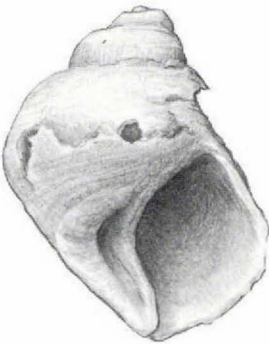


Fig. 41. *Dissochilus*,  $\times 15$

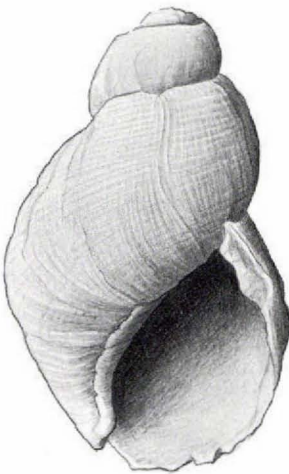


Fig. 42. *Lacuna*,  $\times 6$

*Remarks.* Related forms are *Dissochilus lineatus* (Briart & Cornet), *D. selandicus* (Ravn), *D. heterogonus* Deshayes and *D. conicus* Cossmann.

*Lacuna* Turton

Fig. 42

Fig. 42: MGUH 15.632, Sonja Lens (1958),  $\times 6$ .

*Additional material.* 1977. 1185, Sonja Lens (1958), 1 specimen.

*Remarks.* In an unfigured specimen, the aperture is complete and shows the narrow umbilicus, bordered on one side by the separated columellar lip and on the other side by an angulation.

*Entomope* Cossmann,  
species 1

Fig. 43

Fig. 43A,B: MGUH 15.633, Sonja Lens (1953),  $\times 14$ .

*Additional material.* 1977. 1080, 1166, Sonja Lens (1953), 5 specimens.

*Remarks.* This form differs from the species described from the Paris Basin, namely *E. pezanti* (Cossmann) from the Cuisian of Parnes, *E. nana* (Briart & Cornet) and *E. montensis* (Glibert) from the Calcaire de Mons, by the slight angulation on the last whorl.

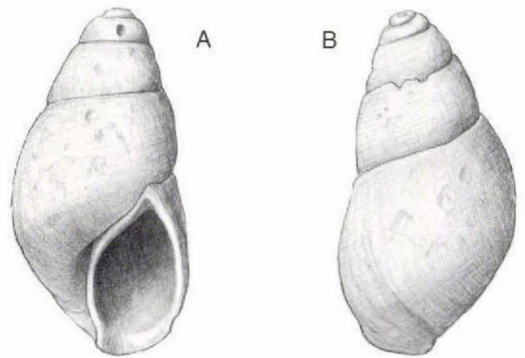


Fig. 43. *Entomope* sp. 1,  $\times 14$



*Entomope* Cossmann,  
species 2

Fig. 44

Fig. 44A: MGUH 15.634, Sonja Lens (1952),  $\times 14$ .

Fig. 44B: MGUH 15.635, Sonja Lens (1952),  $\times 14$ .

*Additional material.* 1977. 1132, Sonja Lens (1953, 1954), numerous specimens.

*Remarks.* The columellar and the parietal lip are not attached as the figure might suggest. *Entomope* species 2 differs from species 1 in its lack of spiral threads and by possessing a broader aperture, with a more concave columellar lip.

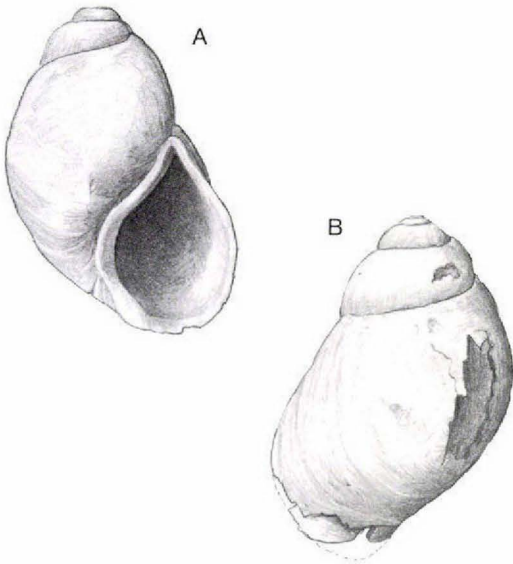


Fig. 44. *Entomope* sp. 2,  $\times 14$

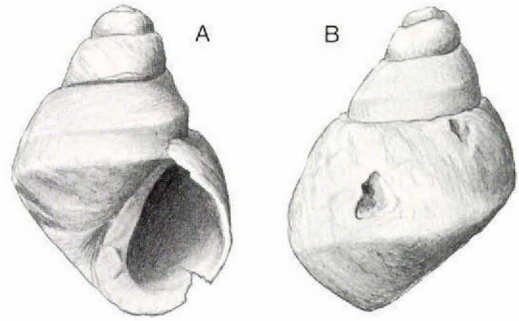


Fig. 45. *Littorinopsis*,  $\times 14$

Superfamily RISSOACEA  
Family RISSOIDAE  
Subfamily RISSOINAE

*Chevallieria* Cossmann

Fig. 46

Fig. 46: MGUH 15.637, Sonja Lens (1958),  $\times 30$ .

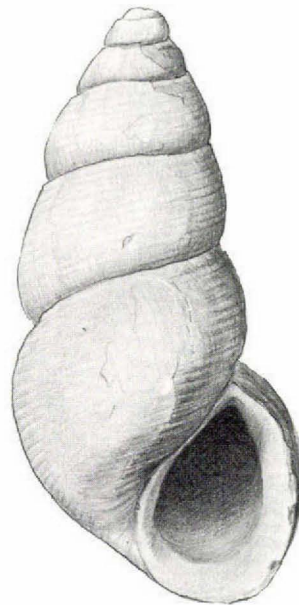


Fig. 46. *Chevallieria*,  $\times 30$

Family LITTORINIDAE

*Littorinopsis* Moerch

Fig. 45

Fig. 45A,B: MGUH 15.636, Sonja Lens (1958),  $\times 14$ .

*Additional material.* 1977. 805, Sonja Lens (1958), 1 specimen.

*Remarks.* The shell is very small for this genus. *Littorinopsis deshaysi* (Cossmann) from the Bartonian of Valmondois does not have the strong carination in the upper portion of the whorl present in the West Greenland examples.

*Ceratia* Adams & Adams,  
species 1

Fig. 47

Fig. 47: MGUH 15.638, Sonja Lens (1953),  $\times 15$ .

*Additional material.* 1977. 1174, 1187, Sonja Lens (1953), 2 specimens.

*Remarks.* The outer lip of the aperture of the figured specimen is partly broken. The figure has not been drawn with the original apertural plane facing the viewer, but with it turned slightly to the left. The aperture was originally continuous, with the inner lip slightly expanded and concave.



Fig. 47. *Ceratia* sp. 1,  $\times 15$

*Ceratia* Adams & Adams,  
species 2

Fig. 48

Fig. 48A: MGUH 15.639, Sonja Lens (1953),  $\times 15$ .

Fig. 48B: MGUH 15.640, Sonja Lens (1953),  $\times 15$ .

*Additional material.* 1977. 1190, 1191, 1198, Sonja Lens (1951, 1952, 1953), numerous specimens.

*Remarks.* The sculpture consists of fine grooves. The whorls are not as high as in *Ceratia* species 1.

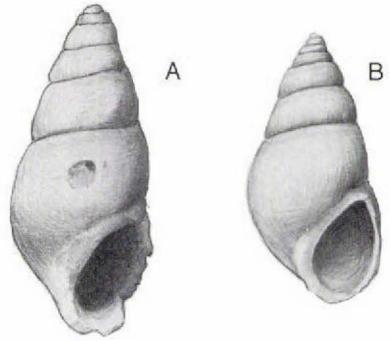


Fig. 48. *Ceratia* sp. 2,  $\times 15$

*Additional material.* 1977. 1187, 1977. 1130, Sonja Lens (1953), numerous specimens.

*Remarks.* The spires are not finished in the drawings and there are no spiral threads as might be suggested. This form has higher whorls than *Ceratia* species 2, but it should not be excluded that it is just an extreme form of it.

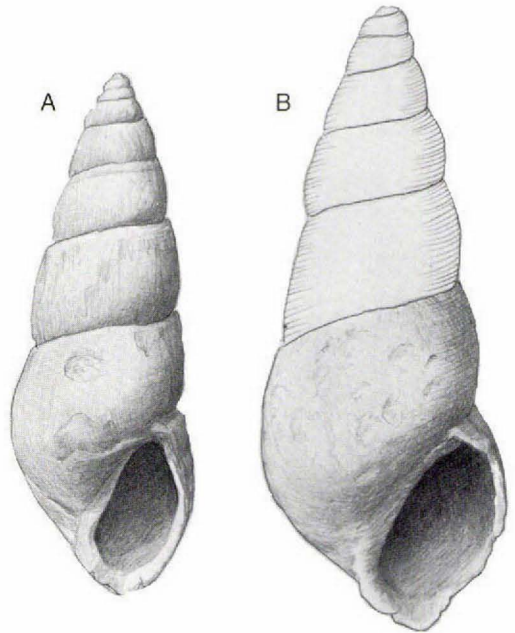


Fig. 49. *Ceratia* sp. 3,  $\times 15$

*Ceratia* Adams & Adams,  
species 3

Fig. 49

Fig. 49A: MGUH 15.641, Sonja Lens (1953),  $\times 15$ .

Fig. 49B: MGUH 15.642, Sonja Lens (1953),  $\times 15$ .

*Taramellia* Seguenza, species 1 Fig. 50

Fig. 50A,B: MGUH 15.643, Sonja Lens (1953),  $\times 16$ .

*Additional material.* 1977. 1194, Sonja Lens (1953), 2 specimens.

*Remarks.* One of the unfigured specimens shows the duplication of the outer lip which is characteristic for the genus.

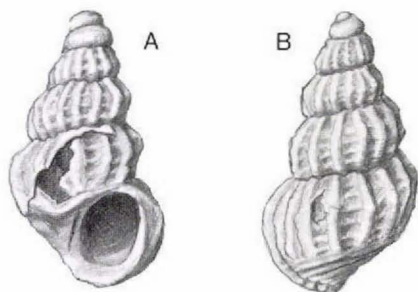


Fig. 50. *Taramellia* sp. 1,  $\times 16$

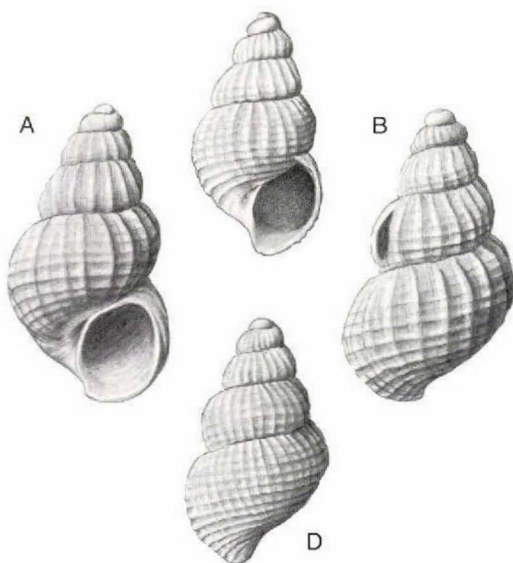


Fig. 52. *Arsenia*,  $\times 14$

*Additional material.* 1977. 1198, 1127, Sonja Lens (1953, 1954, 1958), 9 specimens.

*Taramellia* Seguenza, species 2 Fig. 51

Fig. 51A,B: MGUH 15.644, Sonja Lens (1953),  $\times 16$ .

*Remarks.* The ornament of the whorls is the same as in *Taramellia* species 1, but the base has a few strong spiral ribs.

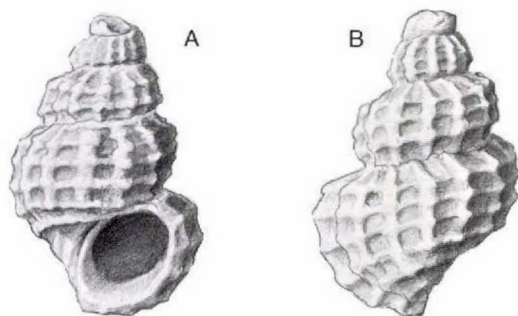


Fig. 51. *Taramellia* sp. 2,  $\times 16$

New genus,  
cf. *Rissoina* d'Orbigny

Fig. 53

Fig. 53A,B: MGUH 15.647, Sonja Lens (1953),  $\times 15$ .

Fig. 53C: MGUH 15.648, Sonja Lens (1953),  $\times 15$ .

*Additional material.* 1977. 1159, Sonja Lens (1952, 1953, 1954), 13 specimens.

*Remarks.* This form should be assigned to a new genus which is close to *Rissoina* because of the oval aperture with its hardly excavated base, and its sculpture. It differs from *Rissoina* by the strong radial ribs on the base.

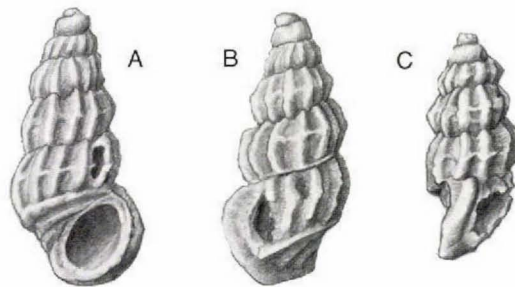


Fig. 53. New genus, cf. *Rissoina*,  $\times 15$

*Arsenia* Monterosato

Fig. 52

Fig. 52A,B: MGUH 15.645, Sonja Lens (1953),  $\times 14$ .

Fig. 52C,D: MGUH 15.646, Sonja Lens (1953),  $\times 14$ .



# ? *Apicularia* Monterosato Fig. 54

Fig. 54A,B: MGUH 15.649, Sonja Lens (1954),  $\times 15$ .

*Additional material.* 1977. 847, Sonja Lens (1953), 1 specimen.

*Remarks.* The genus is not determinable with certainty since the apertures of both specimens are not complete.

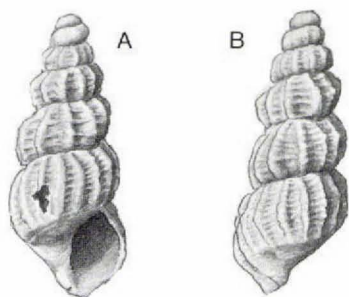


Fig. 54. ?*Apicularia*,  $\times 15$

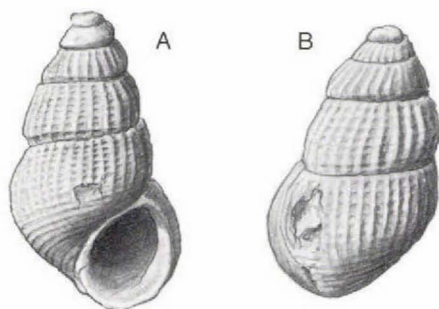


Fig. 55. *Rissoa*,  $\times 15$

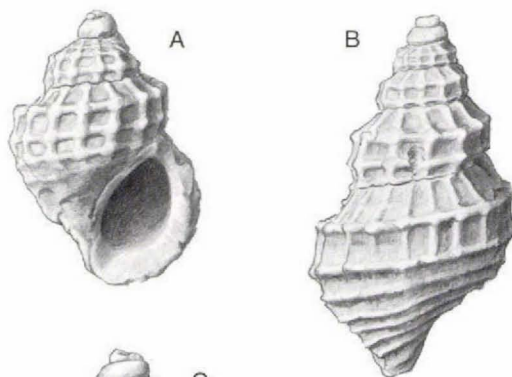
*Remarks.* The aperture of this form agrees well with that of *Pseudotaphrus* which is angular between the columella and the basal lip, and in the upper part. The sculpture differs by the presence of spiral ribs, and axial ribs in early ontogenetic stages.

# *Rissoa* Desmarest Fig. 55

Fig. 55A,B: MGUH 15.650, Sonja Lens (1953),  $\times 15$ .

*Additional material.* 1977. 1141, Sonja Lens (1953, 1954), 10 specimens.

*Remarks.* The shells resemble the genus *Alvania* Risso very closely in sculpture and form, but do not have denticles on the outer lip.



# *Buvignieria* Cossmann Fig. 56

Fig. 56A,D: MGUH 15.651, Sonja Lens (1953),  $\times 12$ .

Fig. 56B: MGUH 15.652, Sonja Lens (1953),  $\times 12$ .

Fig. 56C: MGUH 15.653, Sonja Lens (1953),  $\times 12$ .

*Additional material.* 1977. 1204, Sonja Lens (1952, 1953, 1954, 1956), numerous specimens.

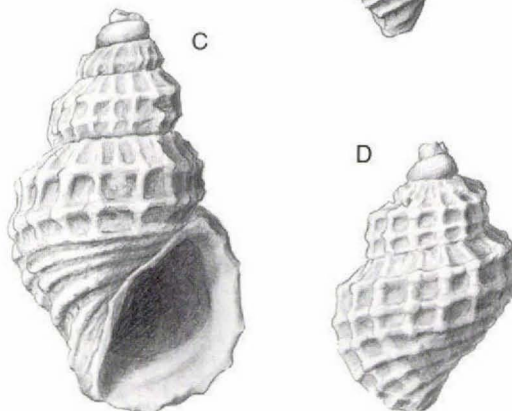


Fig. 56. *Buvignieria*,  $\times 12$

# New genus, cf. *Pseudotaphrus* Fig. 57 Cossmann

Fig. 57A,B: MGUH 15.654, Sonja Lens (1953),  $\times 15$ .

*Additional material.* 1977. 1077, 1136, Sonja Lens (1953), numerous.

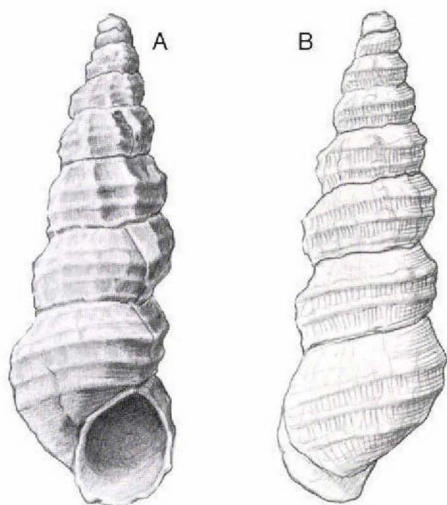


Fig. 57. New genus, cf. *Pseudotaphrus*,  $\times 15$

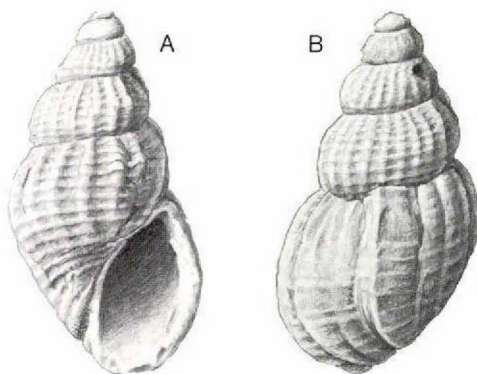


Fig. 58. *Microtaphrus* sp. 1,  $\times 12$

*Microtaphrus* Cossmann,  
species 1

Fig. 58

Fig. 58A,B: MGUH 15.655, Sonja Lens (1953),  $\times 12$ .

*Additional material.* 1977. 1196, Sonja Lens (1948, 1953), numerous.

*Microtaphrus* Cossmann,  
species 2

Fig. 59

Fig. 59A,B: MGUH 15.656, Sonja Lens (1953),  $\times 12$ .

*Additional material.* 1977. 999, Sonja Lens (1951, 1952, 1953, 1954), numerous specimens.

*Remarks.* The aperture is higher and the spiral ribs on the base are stronger than in *Microtaphrus* species 1.

*Microtaphrus* Cossmann,  
species 3

Fig. 60

Fig. 60A,B: MGUH 15.657, Sonja Lens (1956),  $\times 12$ .

*Additional material.* 1977. 1182, Sonja Lens (1952, 1953, 1954, 1956), 11 specimens.

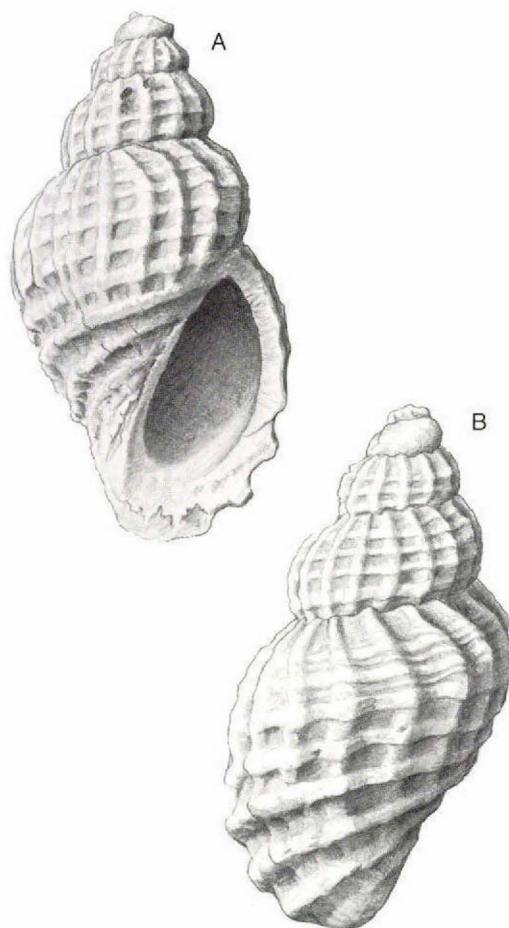


Fig. 59. *Microtaphrus* sp. 2,  $\times 12$

*Remarks.* In the figures, the axial sculpture is over-emphasised. In fact only growth lines are visible between the dominating spiral ribs. In *Microtaphrus* species 1 and 2 the axial sculpture is relatively stronger.

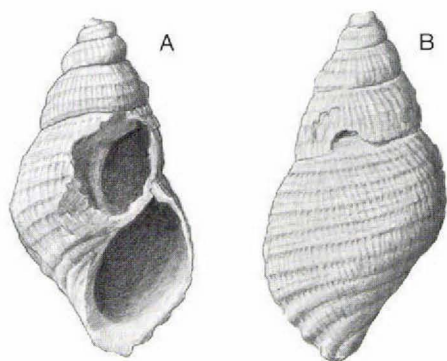


Fig. 60. *Microtaphrus* sp. 3,  $\times 12$

*Microtaphrus* Cossmann,  
species 4

Fig. 61

Fig. 61A,B: MGUH 15.658, Sonja Lens (1953),  $\times 12$ .

*Additional material.* 1977. 1120, 1140, 1157, Sonja Lens (1953), 6 specimens.

*Remarks.* There are more spiral threads than in *Microtaphrus* species 3 and these are crossed by growth lines.

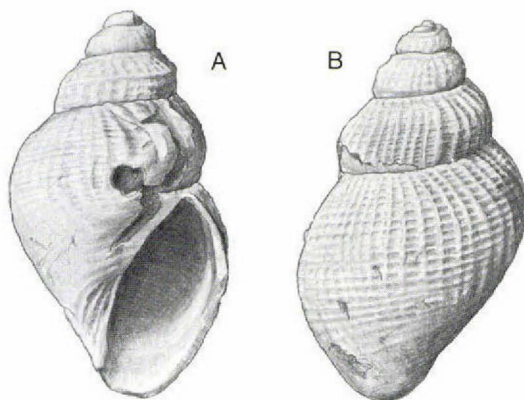


Fig. 61. *Microtaphrus* sp. 4,  $\times 12$

*Goniatogyra* Cossmann

Fig. 62

Fig. 62A,B: MGUH 15.659, Sonja Lens (1954),  $\times 15$ .

*Additional material.* 1977. 869, Sonja Lens (1954), 1 specimen.

*Remarks.* Not visible in the figure is a small siphonal fasciole which forms a keel around the umbilicus. The only other known species of this genus is *Goniatogyra tenuis* (Briart & Cornet) from the Calcaire de Mons.

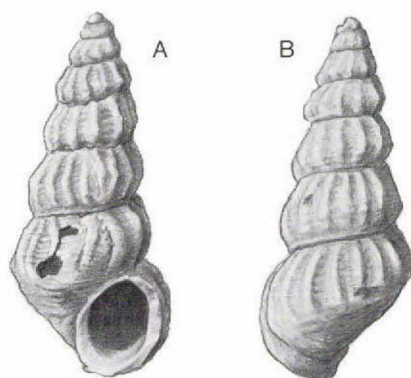


Fig. 62. *Goniatogyra*,  $\times 15$

*Zebinella* Moersch, species 1

Fig. 63

Fig. 63A: MGUH 15.660, Sonja Lens (1953),  $\times 13$ .

Fig. 63B: MGUH 15.661, Sonja Lens (1953),  $\times 13$ .

*Additional material.* 1977. 998, Sonja Lens (1952, 1953, 1954), numerous specimens.

*Remarks.* There are no teeth inside the outer lip but a cellular shell layer is developed between the thickened part and the innermost shell layers. The sculpture resembles that of *Mirarissoina* Woodring but, in this genus, the columella is uniformly concave.

*Zebinella* Moersch, species 2

Fig. 64

Fig. 64A,B: MGUH 15.662, Sonja Lens (1951),  $\times 13$ .

*Additional material.* 1977. 859, Sonja Lens (1951, 1952, 1953, 1954, 1956), numerous specimens.



*Rissoina* d'Orbigny

Fig. 65

Fig. 65A,B: MGUH 15.663, Sonja Lens (1953),  $\times 15$ .

Additional material. 1977. 993, Sonja Lens (1953), 1 example.

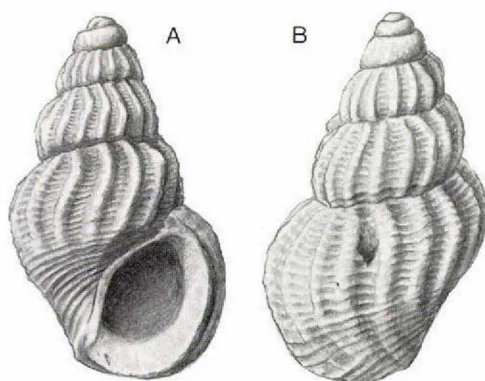
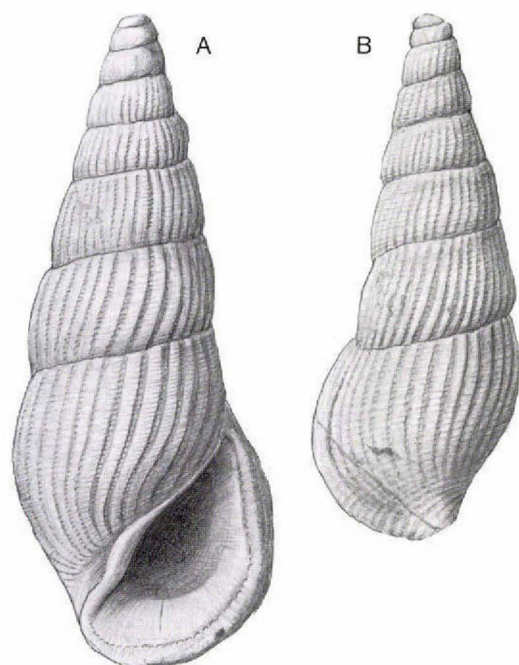
Fig. 65. *Rissoina*,  $\times 15$ *Cossmannia* Newton

Fig. 66

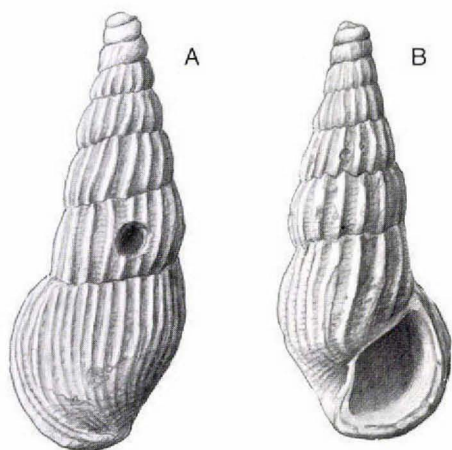
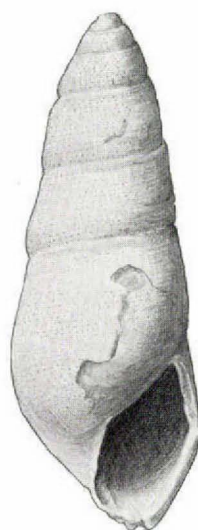
Fig. 66: MGUH 15.664, Sonja Lens (1953),  $\times 15$ .

Additional material. 1977. 856, Turritellakløft (1946), 1 specimen; 1977. 857, Sonja Lens (1952, 1953), numerous.

Fig. 63. *Zebinella* sp. 1,  $\times 13$ 

*Remarks.* The opisthocline axial ribs are further apart than in *Zebinella* species 1, with the exception of the last half of the last whorl where they are more concentrated.

*Remarks.* The figure does not adequately show the weak spiral grooves which are punctate. *Bayanica danica* (Ravn) is completely smooth.

Fig. 64. *Zebinella* sp. 2,  $\times 13$ Fig. 66. *Cossmannia*,  $\times 15$

## Rissoidae, indeterminate

Fig. 67

Fig. 67: MGUH 15.665, Sonja Lens (1953),  $\times 12$ .Fig. 67. Rissoidae, indeterminate,  $\times 12$ 

Superfamily ARCHITECTONICEA  
Family ARCHITECTONICIDAE

*Pseudomalaxis* Fischer

Fig. 68

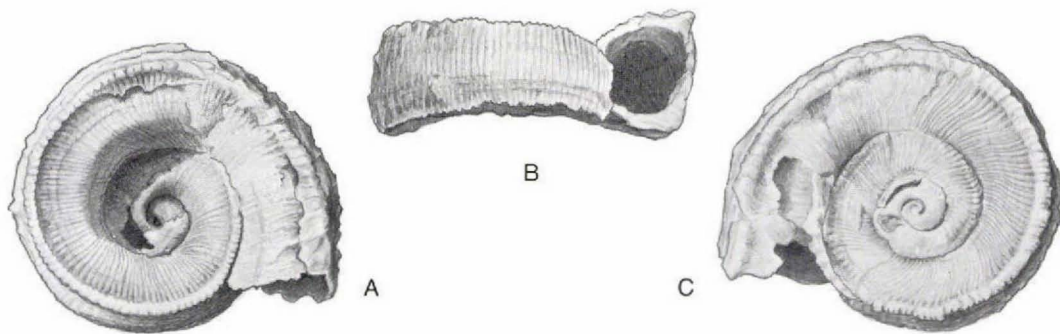
Fig. 68A–C: MGUH 15.666, Sonja Lens (1952),  $\times 14$ .*Additional material.* 1977. 1144, Sonja Lens (1952), fragments.*Remarks.* *Pseudomalaxis groenwalli* (Ravn) is a related form.Fig. 68. *Pseudomalaxis*,  $\times 14$ *Nipteraxis* Cossmann

Fig. 69

Fig. 69A–C: MGUH 15.667, Turritellakløft (1957),  $\times 4$ .*Additional material.* 1977. 764, 769, Qaersutjægerdal (1953, 1958), 2 specimens; 1977. 765, 771, Sonja Lens (1951, 1952, 1953, 1954, 1956, 1958), numerous specimens; 1977. 770, Turritellakløft (1958), 2 specimens.*Remarks.* *Nipteraxis kroisbachensis* (Traub), described under the generic name *Solariella*, is closely related.

Superfamily CERITHIACEA  
Family TURRITELLIDAE

*Mesalia* Gray, species 1

Fig. 70

Fig. 70A: MGUH 15.668, Sonja Lens (1958),  $\times 18$ .Fig. 70B: MGUH 15.669, Sonja Lens (1956),  $\times 6$ .*Remarks.* The sculpture on each whorl of the smaller specimen consists of two large ribs below and three small ribs above. In the larger specimens these are replaced by a large number of weaker ribs.*Mesalia* Gray, species 2

Fig. 71

Fig. 71: MGUH 15.670, Sonja Lens (1958),  $\times 12$ .*Additional material.* 1977. 1285, 462, Sonja Lens (1953, 1958), numerous specimens; 1977. 461, Qaersutjægerdal, 1 specimen from a concretion layer below tuffitic shales; 1977. 464–466, Turritellakløft, 4 specimens.*Remarks.* This form differs from *Mesalia* species 1 by its ornamentation of five equally spaced spiral ribs.



Fig. 69. *Nipteraxis*,  $\times 4$

### *Turritella* Lamarck, species 1 Fig. 72

Fig. 72A: MGUH 15.671, Sonja Lens (1958),  $\times 12$ .

Fig. 72B: MGUH 15.672, Sonja Lens (1958),  $\times 12$ .

*Additional material.* 1977. 472, 1040, Sonja Lens (1953, 1958), numerous specimens; 1077. 463, 1039, Turritellakløft, 2 specimens.

*Remarks.* The sculpture of the earlier whorls consists of a prominent rib in the lower part with zero to two weaker ribs above. In larger whorls

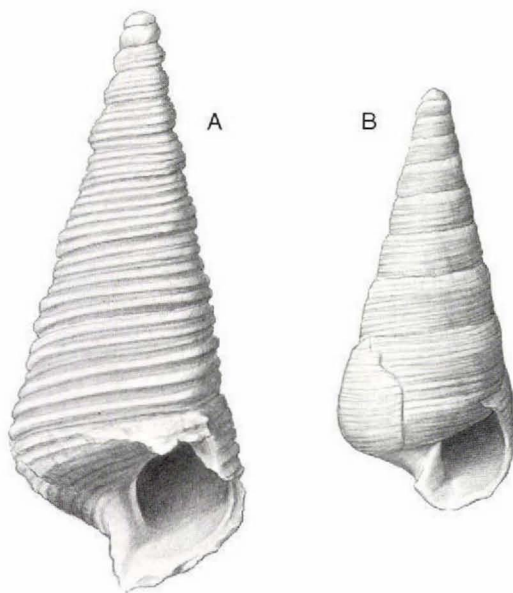


Fig. 70. *Mesalia* sp. 1, A,  $\times 18$ ; B,  $\times 6$

three ribs are always developed. The assignment to *Turritella* is only based on shell sculpture, since no definite growth lines could be found. *Turritella*



Fig. 71. *Mesalia* sp. 2,  $\times 12$



*nysti* Briart & Cornet described from the Calcaire de Mons and by Anderson (1975) from North-west Germany is closely related.

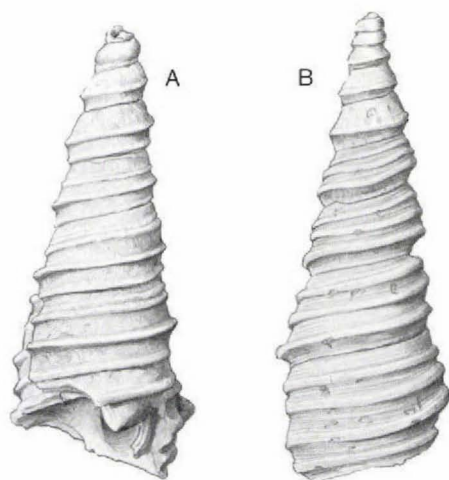


Fig. 72. *Turritella* sp. 1,  $\times 12$

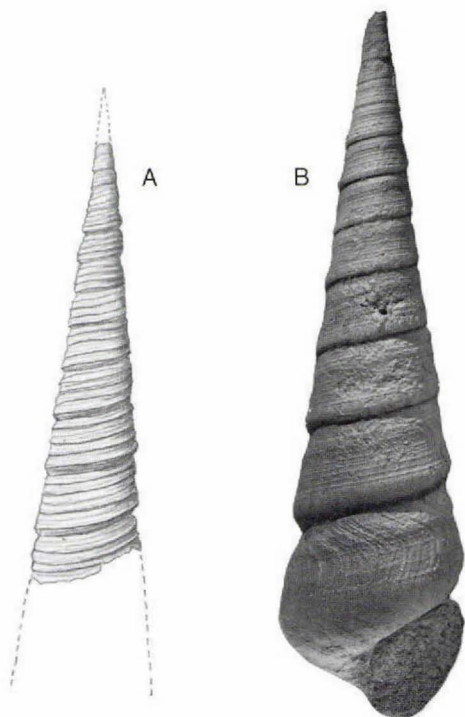


Fig. 73. *Turritella* sp. 2, A,  $\times 4$ , B,  $\times 1$

## *Turritella* Lamarck, species 2 Fig. 73

Fig. 73A: MGUH 15.673, Sonja Lens (1956),  $\times 4$ .

Fig. 73B: MGUH 15.674, Qaersutjægerdal (1952),  $\times 1$ .

**Additional material.** 1977. 514, 518, 522, 520, 471, 473, 1281, Sonja Lens (1951, 1952, 1953, 1956), numerous examples; 1977. 460, 464, 466, 483, 484, 486, 488, 489, 493, 498, 500, 503, 509–512, 515–517, 519, Turritellakløft (1939, 1946, 1948, 1949, 1951, 1954), numerous specimens; 1977. 461, 469, 470, 479, 480, 487, 494, 499, 501, 507, 529, Qaersutjægerdal (1951, 1952, 1953), numerous specimens; 1977. 502, Agatkløft, large section (1948), 5 specimens; 1977. 504, Nuilaussarsuaq (1953), 1 specimen.

**Remarks.** Shells show considerable ontogenetic variation. The primary sculpture of small whorls consists of three noded ribs in the lower three quarters of the whorl and a weaker one below the suture. During shell growth threads are developed between these ribs in increasing numbers, and increase in size to become ribs on later whorls. The lowermost portion of the whorls becomes more and more prominent and inflated during growth, becoming rather angular towards the base. *Turritella montensis* Briart & Cornet is closely related.

## Family MATHILDIDAE

## *Clathrobaculus* Cossmann Fig. 74

Fig. 74: MGUH 15.675, Sonja Lens (1952),  $\times 8$ .

**Remarks.** *Clathrobaculus morgani* (de Boury fide Cossmann & Pissarro, 1910–1913) from the Paris Basin has the same sculpture, but more convex whorls than the Greenland specimen.



Fig. 74. *Clathrobaculus*,  $\times 8$

*Mathilda* Semper, species 1 Fig. 75

Fig. 75A: MGUH 15.676, Sonja Lens (1953),  $\times 7$ .

Fig. 75B,C: MGUH 15.677, Sonja Lens (1956),  $\times 14$ .

*Additional material.* 1977. 1133, 1209, Sonja Lens (1953, 1956, 1958), 8 specimens.

*Remarks.* Originally Rosenkrantz separated two forms, one with flat, the other one with acute spiral ribs. The distinction is not maintained since there are transitions between the two groups. *Mathilda obtusa* v. Koenen is closely related.

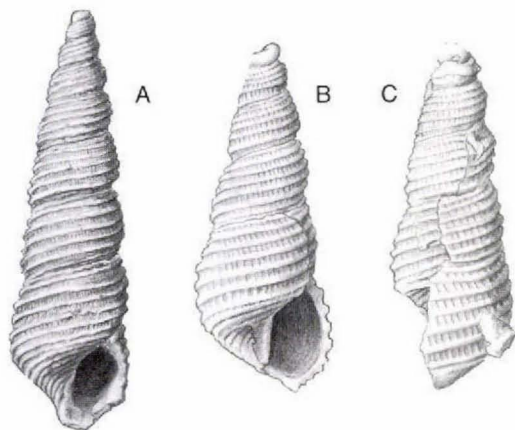


Fig. 75. *Mathilda* sp. 1, A,  $\times 7$ ; B,C,  $\times 14$

*Mathilda* Semper, species 2 Fig. 76

Fig. 76: MGUH 15.678, Sonja Lens (1956),  $\times 12$ .

*Remarks.* This differs from *Mathilda* species 1 in having a flat and nearly smooth base. *M. bimorpha* Briart & Cornet from the Calcaire de Mons is closely related.

*Mathilda* Semper, species 3 Fig. 77

Fig. 77: MGUH 15.679, Sonja Lens (1953),  $\times 12$ .

*Additional material.* 1977. 1126, Sonja Lens (1953, 1954, 1956), 10 specimens.

*Remarks.* This species differs from *Mathilda* species 2 on account of its two prominent ribs, with a smaller one above. In addition, its flat base is bordered by a further rib.



Fig. 76. *Mathilda* sp. 2,  $\times 12$

*Mathilda* Semper, species 4 Fig. 78

Fig. 78: MGUH 15.680, Sonja Lens (1956),  $\times 12$ .

*Remarks.* The single specimen placed here has a high base, as in *Mathilda* species 1, but this is ornamented with stronger spiral ribs. The spiral ribs in the lower part are considerably more prominent than in the higher portion.

*Mathilda* Semper, species 5 Fig. 79

Fig. 79A,B: MGUH 15.681, Sonja Lens (1954),  $\times 12$ .

*Remarks.* Although the base is flatter, it cannot be excluded that *Mathilda* species 5 is just a large specimen of *Mathilda* species 4.



Fig. 77. *Mathilda* sp. 3,  $\times 12$





Fig. 78. *Mathilda* sp. 4,  $\times 12$

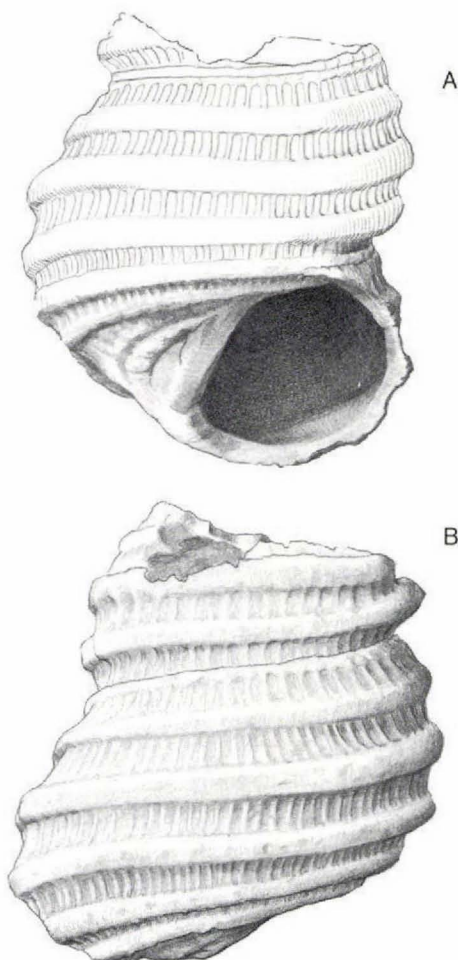


Fig. 79. *Mathilda*, sp. 5,  $\times 12$

### *Fimbriatella* Sacco, species 1 Fig. 80

Fig. 80A: MGUH 15.682, Turritellakløft, large section (1949),  $\times 8$ .

Fig. 80B,C: MGUH 15.683, Sonja Lens (1956),  $\times 16$ .

*Remarks.* *Fimbriatella carinata* Ravn is closely related.

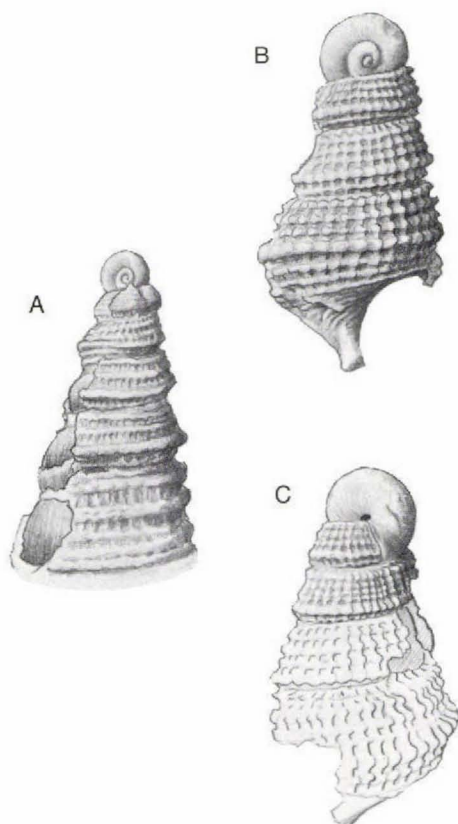


Fig. 80. *Fimbriatella* sp. 1, A,  $\times 8$ ; B,C  $\times 16$

### *Fimbriatella* Sacco, species 2 Fig. 81

Fig. 81A,B: MGUH 15.684, Sonja Lens (1953),  $\times 15$ .

*Additional material.* 1977. 1213, Sonja Lens (1952, 1953, 1956), 7 specimens.

*Remarks.* *Fimbriatella* species 2 has two strong ribs on the lower part of the whorls instead of the one present in *Fimbriatella* species 1.

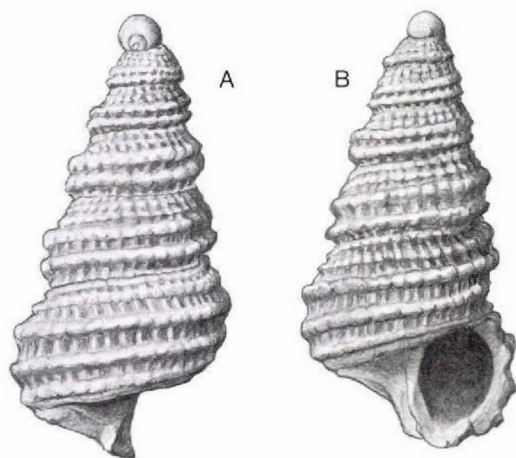


Fig. 81. *Fimbriatella* sp. 2,  $\times 15$

### *Acrocoelum* Cossmann

Fig. 82

Fig. 82A: MGUH 15.685, Sonja Lens (1953),  $\times 8$ .

Fig. 82B: MGUH 15.686, Sonja Lens (1956),  $\times 16$ .

*Additional material.* 1977. 1139, Sonja Lens (1953), numerous.

*Remarks.* *Mathilda bimorpha* Makarenko *non* Briart & Cornet is related.

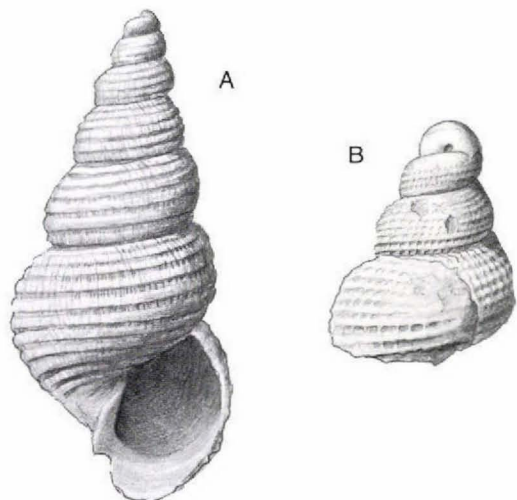


Fig. 82. *Acrocoelum*, A,  $\times 8$ ; B,  $\times 16$

### *Gegania* Jeffreys, species 1

Fig. 83

Fig. 83A: MGUH 15.687, Sonja Lens (1956),  $\times 3$ .

Fig. 83B: MGUH 15.688, Sonja Lens (1956),  $\times 12$ .

*Additional material.* 1977. 602, Sonja Lens (1956), 1 specimen; 1977. 601, Turrnellakløft, large section, 1 specimen.

*Remarks.* *Gegania cyclostomoides* (Deshayes) from the Lutetian and Cuisian of Parnes is related to the Greenland species.

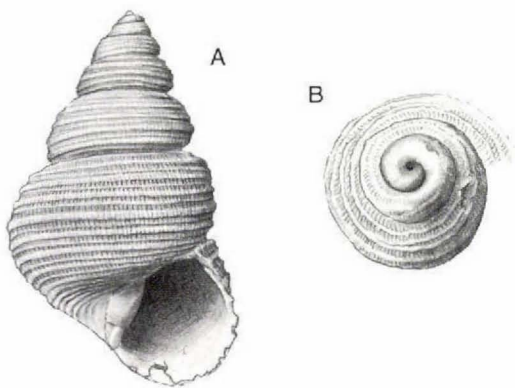


Fig. 83. *Gegania* sp. 1, A,  $\times 3$ ; B,  $\times 12$

### *Gegania* Jeffreys, species 2

Fig. 84

Fig. 84A,B: MGUH 15.689, Sonja Lens (1958),  $\times 7$ .

*Remarks.* *Gegania* species 2 differs from species 1 only in terms of its less elevated spire and therefore could be just a variety of the same species.

Family PROCERITHIIDAE

Subfamily METACERITHIINAE

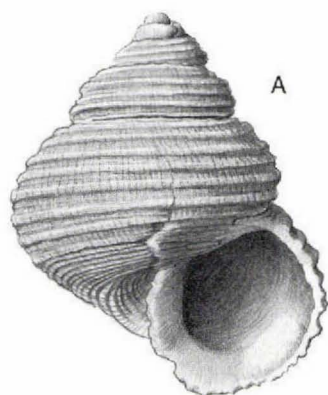
### *Metacerithium* Cossmann

Fig. 85

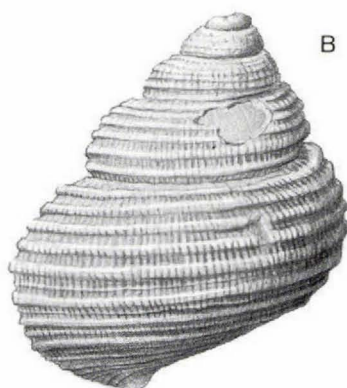
Fig. 85: MGUH 15.690, Sonja Lens (1953),  $\times 7$ .

*Additional material.* 1977. 1176, Sonja Lens (1953), 1 specimen.

*Remarks.* *Metacerithium hauniense* (v. Koenen) from the Paleocene of Copenhagen is closely related.



A



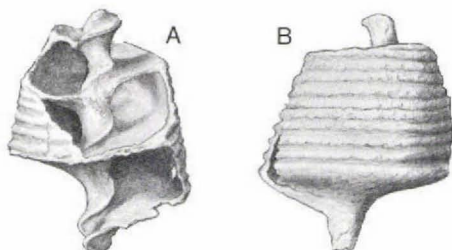
B

Fig. 84. *Gegania* sp. 2,  $\times 7$ Fig. 85. *Metacerithium*,  $\times 7$ 

Family POTAMIDIDAE  
Subfamily POTAMIDINAE

### *Potamidopsis* Munier-Chalmas Fig. 86

Fig. 86A,B: MGUH 15.691, Sonja Lens (1958),  $\times 4$ .

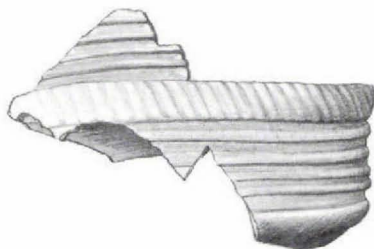
Fig. 86. *Potamidopsis*,  $\times 4$ 

### *Telescopium* Montfort Fig. 87

Fig. 87: MGUH 15.692, Sonja Lens (1958),  $\times 1.5$ .

*Additional material.* 1977. 423, Sonja Lens (1958), fragment.

*Remarks.* Only two fragments of this species are in the collection. These show the same sculpture as *Campanile*. However, in this latter genus the growth lines are strongly opisthocline, while they are opisthocyrt in the upper part of the whorls of the present material. In *Cerithiopsis* the channel is not accompanied by a plication, and the sculpture is dominated by axial ribs.

Fig. 87. *Telescopium*,  $\times 1.5$

Family CERITHIIDAE  
Subfamily LITIOPINAE

*Alaba* Adams & Adams Fig. 88

Fig. 88A: MGUH 15.693, Sonja Lens (1953),  $\times 15$ .

Fig. 88B: MGUH 15.694, Sonja Lens (1953),  $\times 15$ .

Fig. 88C: MGUH 15.694, Sonja Lens (1953),  $\times 15$ .

*Additional material.* 1977. 1149, 1150, Sonja Lens (1953, 1956, 1958), numerous specimens.

*Remarks.* The protoconch is flat, which is typical for the genus.

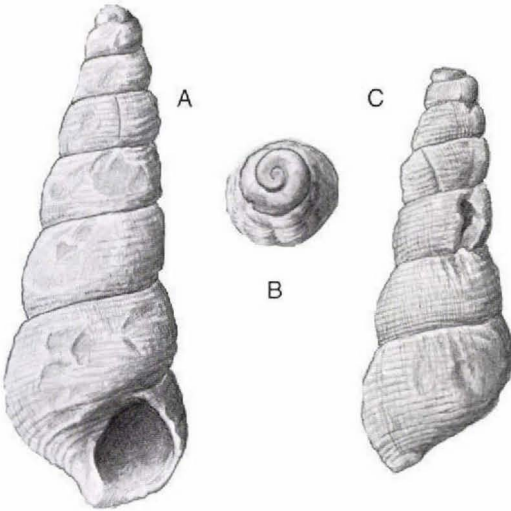


Fig. 88. *Alaba*,  $\times 15$

Subfamily CERITHIINAE

*Semivertagus* Cossmann Fig. 89

Fig. 89: MGUH 15.696, Sonja Lens (1958),  $\times 4$ .

*Additional material.* 1977. 1277, Sonja Lens (1956), 2 specimens.

*Remarks.* *Semivertagus abnormis* (Briart & Cornet) and *S. urania* (d'Orbigny) from the Calcaire de Mons and *S. unisulcatus* (Lamarck) from the Lutetian of Montainville in the Paris Basin are closely related, as are *Rhinoclavis unisulcatus* Krach and *R. queteleti* Krach from the Babica Clay.



Fig. 89. *Semivertagus*,  $\times 4$

Family CERITHIOPSIDAE

*Cerithiopsis* Forbes & Hanley, species 1 Fig. 90

Fig. 90: MGUH 15.697, Turritellakløft (1949),  $\times 10$ .

*Additional material.* 1 external mould.

*Remarks.* In contrast to the other forms figured here this one has no evenly convex whorls. Rather, the whorl profile is increasing in convexity from the upper suture towards the strong rib which lies on the lower part of the whorl.

*Cerithiopsis* Forbes & Hanley, species 2 Fig. 91

Fig. 91: MGUH 15.698, Sonja Lens (1953),  $\times 15$ .

*Additional material.* 1977. 1178, Sonja Lens (1953), 6 specimens.

*Remarks.* The shells are nearly cylindrical, with slightly convex whorls.



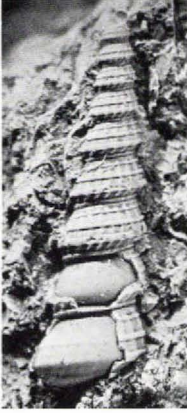


Fig. 90. *Cerithiopsis* sp. 1,  $\times 10$

*Cerithiopsis* Forbes & Hanley,  
species 3

Fig. 92

Fig. 92: MGUH 15.699, Sonja Lens (1952),  $\times 10$ .

*Additional material.* 1977. 994, 995, 1177, Sonja Lens (1951, 1952, 1953), 6 specimens; 1977. 996, Turrittelakløft (1949), 3 specimens.

*Remarks.* *Cerithiopsis* species 3 differs from species 2 on account of its convex spire and the closer axial ribs on the whorls.

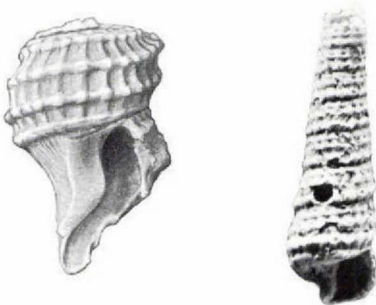


Fig. 91. *Cerithiopsis* sp. 2,  $\times 15$  (left)

Fig. 92. *Cerithiopsis* sp. 3,  $\times 10$  (right)

New genus, cf. *Cerithiopsis*

Fig. 93

Fig. 93A,B: MGUH 15.700, Sonja Lens (1956),  $\times 7$ .

Fig. 93C: MGUH 15.701, Sonja Lens (1953),  $\times 7$ .

*Additional material.* 1977. 801–804, 1134, 1135, Sonja Lens (1948, 1953, 1954, 1956, 1958), many specimens.

*Remarks.* The shells are very close to *Cerithiopsis* but differ in their somewhat higher columella and the strong spiral ribs on the rounded base. *Cerithiopsidella* Bartsch has a similar sculpture but differs in possessing an angulation towards the base on the last whorl. The Greenland species is

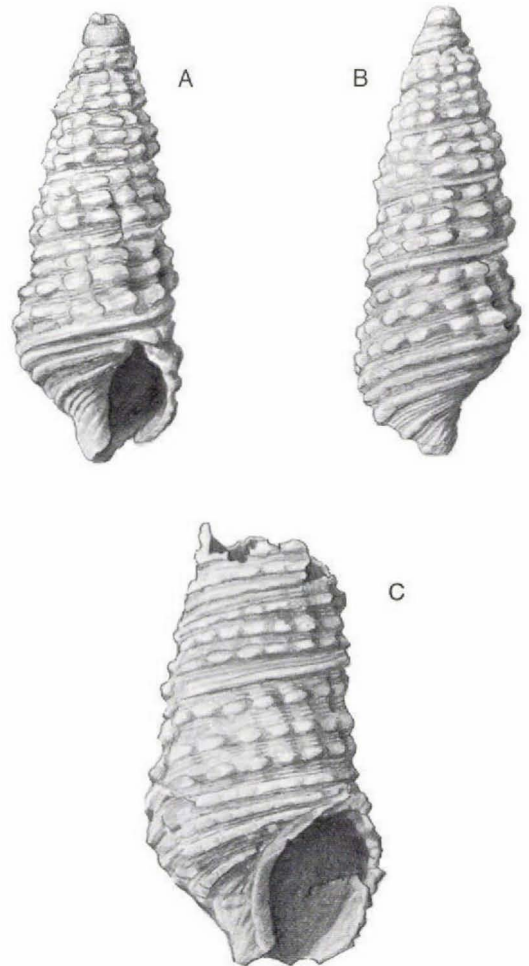


Fig. 93. New genus, cf. *Cerithiopsis*,  $\times 7$



very close to "*Cerithiopsis*" *francisi* (Briart & Cornet) which is not a true *Cerithiopsis*, as pointed out by Glibert (1973). *Bittium palaeocaenicum* Anderson is also closely related. The shape and sculpture of the base of the Greenland species compare well with *Bittium*. The basal part of the aperture, however, is excavated, and the new genus is consequently more closely related to *Cerithiopsis*.

### *Cerithiella* Verrill

Fig. 94

Fig. 94A: MGUH 15.703, Sonja Lens (1953),  $\times 16$ .

Fig. 94B,C: MGUH 15.702, Sonja Lens (1956),  $\times 4$ .

*Additional material.* 1977. 681, Sonja Lens (1948, 1951, 1952, 1953, 1954, 1956), numerous; ? 1977. 682, Turretellakløft.

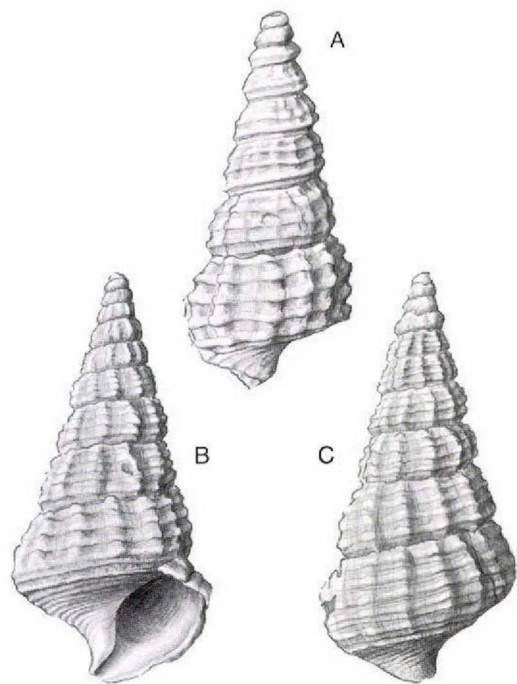


Fig. 94. *Cerithiella*, A,  $\times 16$ ; B,C,  $\times 4$

### *Seila* Adams

Fig. 95

Fig. 95: MGUH 15.704, Sonja Lens (1956),  $\times 14$ .

*Additional material.* 1977. 1125, Sonja Lens (1953, 1956), 6 specimens.

*Remarks.* Related forms are *Seila tenuifila* (Briart & Cornet) and *S. ravni* Glibert, both from the Calcaire de Mons; and *S. trifaria* (Deshayes), *S. trilirata* (Deshayes), and *S. mundula* (Deshayes) from the Lutetian and Cuisian of the Paris Basin.



Fig. 95. *Seila*,  $\times 14$

### Family TRIPHORIDAE

#### *Ogivia* Harris & Burrows, species 1

Fig. 96

Fig. 96A,B: MGUH 15.705, Sonja Lens (1952),  $\times 14$ .

*Remarks.* *Ogivia crassigranulata* (Ravn) is a related species.

#### *Ogivia* Harris & Burrows, species 2

Fig. 97

Fig. 97A,B: MGUH 15.706, Sonja Lens (1953),  $\times 14$ .

Fig. 97C: MGUH 15.707, Sonja Lens (1952),  $\times 14$ .

Fig. 97D: MGUH 15.708, Sonja Lens (1952),  $\times 14$ .

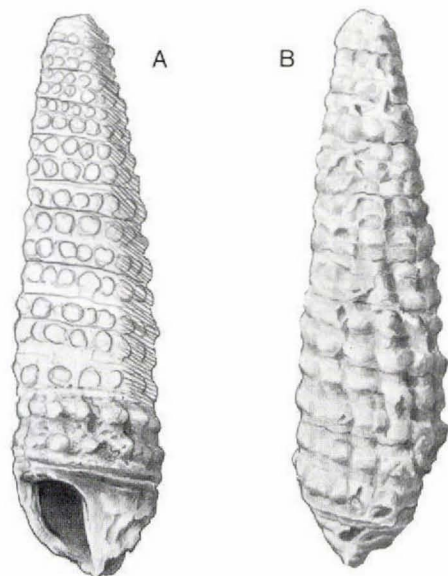


Fig. 96. *Ogivia* sp. 1,  $\times 14$

*Additional material.* 1977. 1116, Sonja Lens (1952, 1953, 1958), 3 specimens.

*Remarks.* *Ogivia* species 2 differs from species 1 by its third spiral row of nodes. In both species, the columellar lip is not attached to the columella. *O. montensis* (Glibert) is closely related.

*Ogivia* Harris & Burrows,  
species 3

Fig. 98

Fig. 98: MGUH 15.709, Sonja Lens (1952),  $\times 14$ .

*Additional material.* 1977. 1005, Sonja Lens (1953), 4 specimens.

*Remarks.* This is possibly referable to *Ogivia* species 2. However, the aperture is not complete, which causes the channel to appear longer and less inclined.

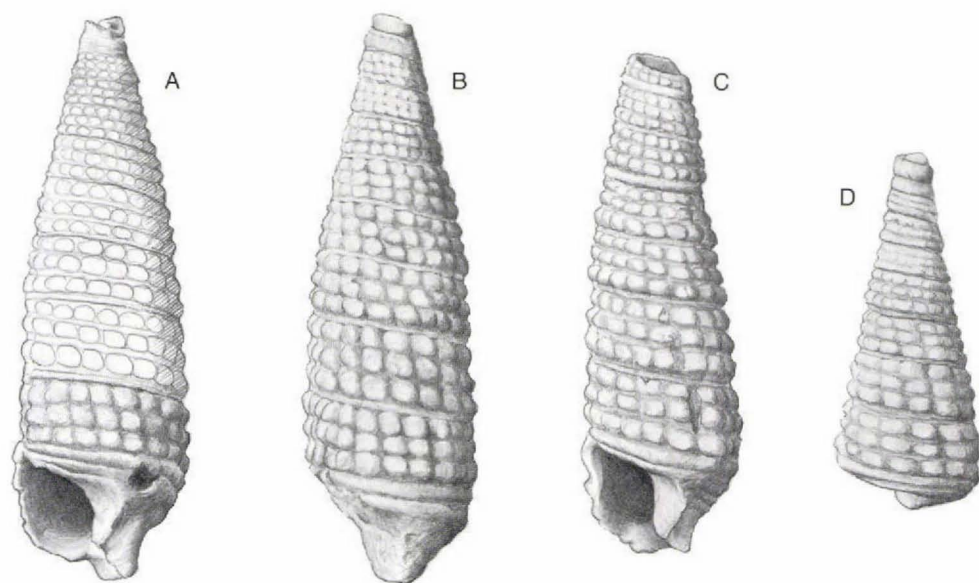


Fig. 97. *Ogivia* sp. 2,  $\times 14$

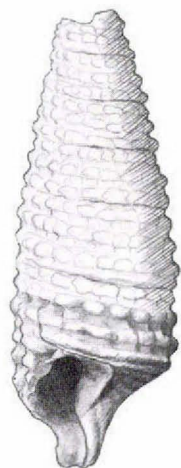


Fig. 98. *Ogivia* sp. 3,  $\times 14$

*Remarks.* This form has a broad open channel which is slightly turned backwards and to the left. The same aperture occurs in "*Triphora (Ogivia)*" *faxensis* Ravn which should be assigned to the same genus.

Superfamily EPITONIACEA

Family EPITONIIDAE

### *Hemiacirsa* Boury

Fig. 100

Fig. 100: MGUH 15.711, Sonja Lens (1956),  $\times 7$ .

*Additional material.* 1977. 1070, 1072, 1073, Sonja Lens (1953, 1954, 1956), 11 specimens.

*Remarks.* The axial ribs become weaker on the last whorl of large specimens.



Fig. 100. *Hemiacirsa*,  $\times 7$

### Triphoridae, new genus

Fig. 99

Fig. 99A,B: MGUH 15.710, Sonja Lens (1953),  $\times 14$ .

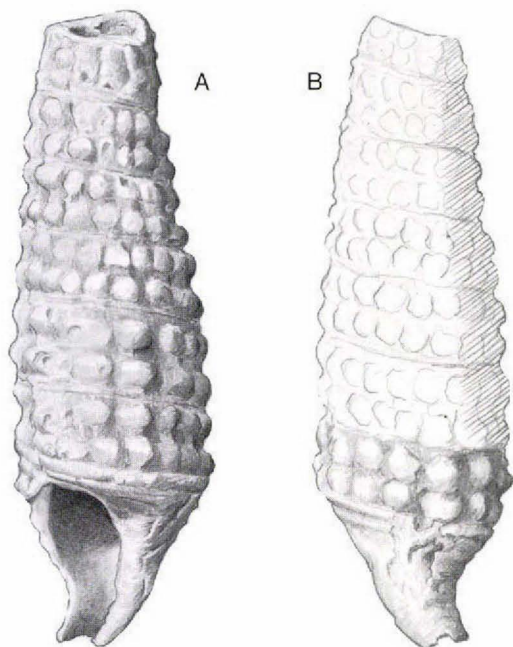


Fig. 99. Triphoridae, new genus,  $\times 14$

### cf. *Opalia* Adams & Adams

Fig. 101

Fig. 101: MGUH 15.712, Sonja Lens (1956),  $\times 14$ .

*Additional material.* 1977. 1119, Sonja Lens (1953, 1956), 15 specimens.

*Remarks.* The figure does not show the spiral rows of faint grooves between the axial ribs. This morphologic feature is characteristic of *Opalia* and several related genera. The figured form differs from *Opalia* in terms of its massive basal plate which is ornamented by longitudinal striae

and by growth lines. *Acrilla bruennichi* Ravn from the Paleocene of Copenhagen and *Opalia wateleti* Briart & Cornet, which has also been described from the Lower Paleocene of the Ukraine by Makarenko (1976), are related.

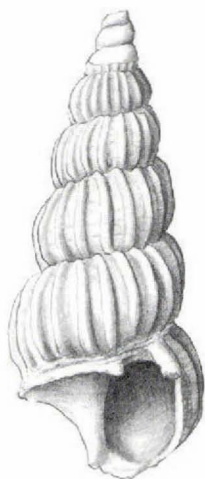


Fig. 101. cf. *Opalia*,  $\times 14$

### *Cerithiscala* Boury

Fig. 102

Fig. 102A,B: MGUH 15.713, Sonja Lens (1956),  $\times 14$ .

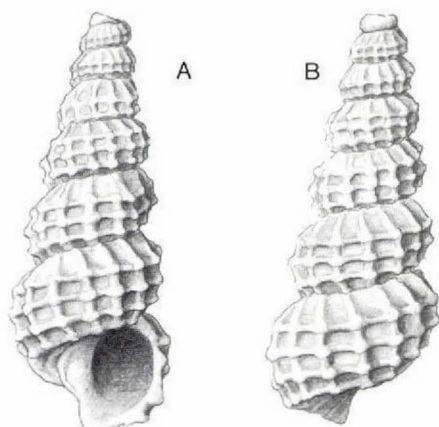


Fig. 102. *Cerithiscala*,  $\times 14$

*Additional material.* 1977. 1218, Sonja Lens (1956), 2 specimens.

### *Belliscala* Stephenson

Fig. 103

Fig. 103: MGUH 15.714, Sonja Lens (1956),  $\times 7$ .

*Remarks.* An exact determination of the genus is not possible, as the aperture and the basal disc are not preserved.



Fig. 103. *Belliscala*,  $\times 7$

### ? *Coniscala* Boury

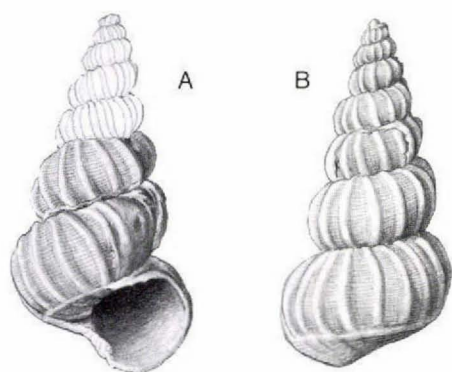
Fig. 104

Fig. 104A,B: MGUH 15.715, Sonja Lens (1953),  $\times 2$ .

*Additional material.* 1977. 342, Sonja Lens (1953), 4 specimens; 1977. 343, 345, 346, Qaersutjægørdal, large section, 4 fragments; 1977. 347, 348, Turritellakløft, large section, 4 fragments.

*Remarks.* The aperture is not preserved in any of the specimens. The sculpture is that of a *Coniscala*. In small specimens the axial ribs are sometimes very thin in the upper part of the whorls. *C. tournoueri* (Briart & Cornet) is related.



Fig. 104. ?*Coniscala*,  $\times 2$ 

*Remarks.* As in recent *Stilbe*, which lives in deeper waters in the Atlantic, the aperture is angular between the columella and the outer lip. In our form the columella is slightly twisted.

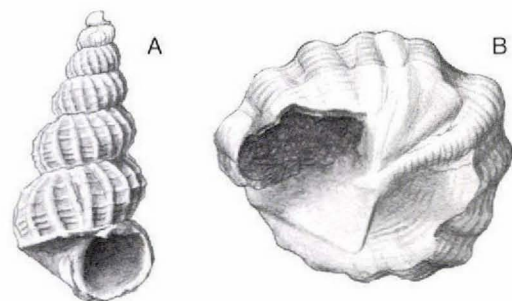
### *Confusiscala* Boury

Fig. 105

Fig. 105A: MGUH 15.716, Sonja Lens (1956),  $\times 6.5$ .

Fig. 105B: MGUH 15.717, Sonja Lens (1956),  $\times 6.5$ .

*Additional material.* 1977. 1223, Sonja Lens (1956), 1 specimen.

Fig. 105. *Confusiscala*,  $\times 6.5$ 

Superfamily EULIMACEA  
Family ACLIDIDAE

### *Stilbe* Jeffreys

Fig. 106

Fig. 106: MGUH 15.718, Sonja Lens (1953),  $\times 14$ .

*Additional material.* 1977. 1198, Sonja Lens, 1 fragment.

Fig. 106. *Stilbe*,  $\times 14$ 

Superfamily STROMBACEA  
Family APORRHAIIDAE

### *Drepanocheilus* Meek

Fig. 107

Fig. 107: MGUH 15.719, Sonja Lens (1956),  $\times 8$ .

*Additional material.* 1977. 776–780, 783, Sonja Lens (1952, 1953, 1954, 1956, 1958), many specimens; 1977. 779, 781, 782, 784, Turrillakløft, large section, 6 specimens.

*Remarks.* *Drepanocheilus granocarinatus* Traub is related.

### New genus, cf. *Drepanocheilus* Meek

Fig. 108

Fig. 108A,B: MGUH 15.720, Turrillakløft, large section (1948),  $\times 4$ .

*Additional material.* 1977. 1244, 1245, 1248, Sonja Lens (1956, 1958), 11 specimens; 1977. 1246, 1247, 1249, 1250, 1252, 1259, Turrillakløft, large section (1956, 1949, 1953), 16 specimens.



Fig. 107. *Drepanocheilus*,  $\times 8$

*Remarks.* The outer lip has a deep sinus on its lower edge. The wing is bent, although this is not evident from the figure. A wing of this kind has

not been described before in aporrhoids of the *Drepanocheilus* type; these usually have axial ribs on all the whorls except for the last one which has 2 angulations. The Greenland specimens should therefore be referred to a new genus.

### *Kangilioptera ravni* Rosenkrantz

Fig. 109

1970. *Anchura* (*Kangilioptera*) *ravni* Rosenkrantz, p. 431, fig. 9/1 and 2.

Fig. 109. MMH 10.797, the original of Rosenkrantz (1970, fig. 9/1), here designated as the lectotype, Kangilia (1952),  $\times 1$ .

*Additional material.* MMH 10.798, paralectotype, Tunorssuaq; 1977. 1488, Kangilia, 1939, 1 specimen.

*Remarks.* *Kangilioptera ravni* Rosenkrantz is the type species of the genus, although it was not described adequately by Rosenkrantz (1970). This genus has nothing in common with *Anchura* except for the bilobation of the wing on the outer lip. "*Arrhoges*" *granocarinatus* Traub seems to be closely related.

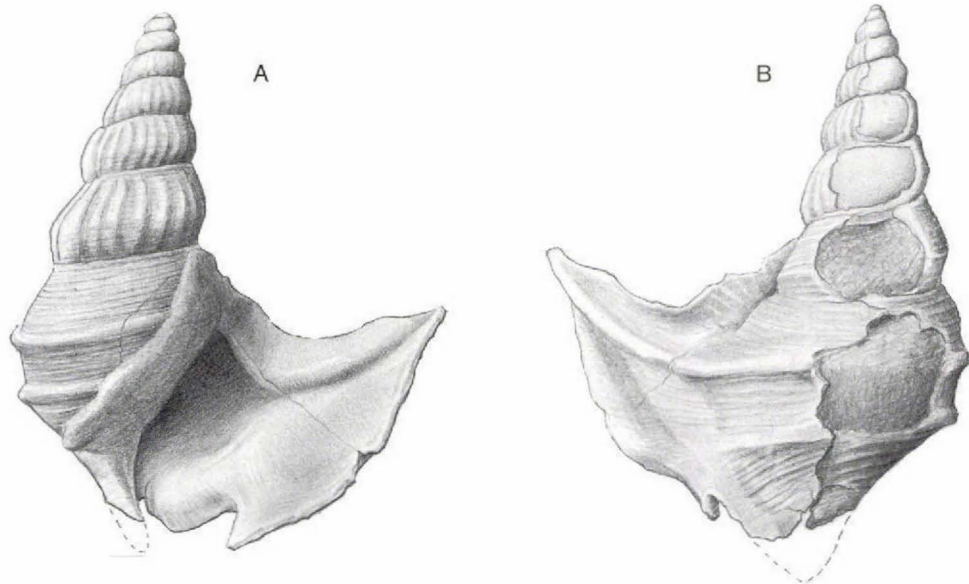


Fig. 108. New genus, cf. *Drepanocheilus*,  $\times 4$

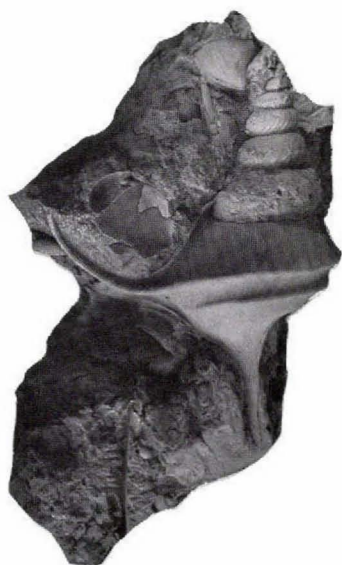


Fig. 109. *Kangilioptera ravni*,  $\times 1$

*Arrhoges palaeocaenica* Rosenkrantz  
Fig. 110

1970. *Arrhoges* (*Latiala*) *palaeocaenica* Rosenkrantz, p. 439, fig. 14/ 1a, 1b.

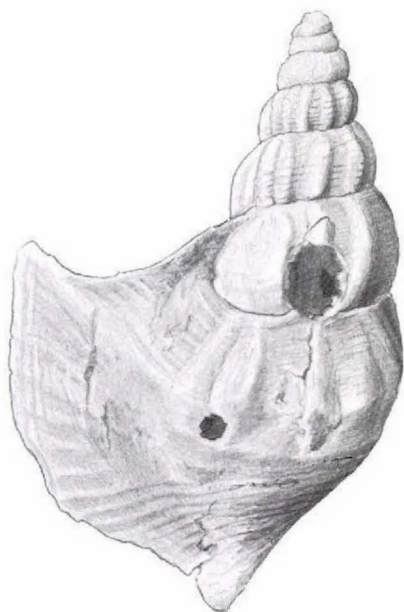


Fig. 110. *Arrhoges palaeocaenica*,  $\times 8$

Fig. 110: MMH 10.808, Sonja Lens (1953),  $\times 8$ .

*Additional material.* 1977. 785, 786, Sonja Lens (1953, 1954, 1956, 1958), 10 specimens.

*Remarks.* This species does not fall into the genus *Latiala* Sohl since a sinus is not present in the lower edge of the wing of the outer lip. A very small sinus is present in the broad outer edge.

Aporrhaidae, indeterminate Fig. 111

Fig. 111: MGUH 15.721, Sonja Lens (1956),  $\times 7$ .

*Additional material.* 1977. 1272, Sonja Lens (1952), 2 specimens.

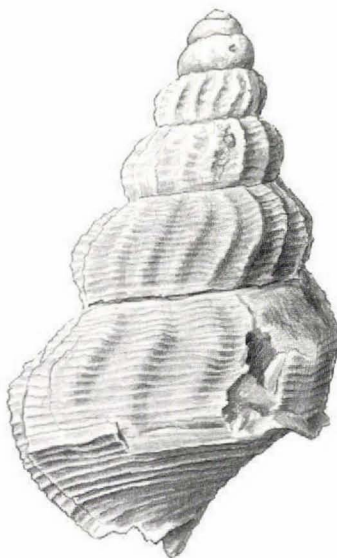


Fig. 111. Aporrhaidae, indeterminate,  $\times 7$

Family STROMBIDAE

aff. *Tibia* Roeding Fig. 112

Fig. 112: MGUH 15.722, Turritellakløft, large section (1953),  $\times 6$ .

*Additional material.* 1977. 1225, 1226, Sonja Lens (1951, 1953), 2 fragments.

*Remarks.* As we have only fragments of this gastropod, a closer determination is not possible. The form resembles *Tibia* since the narrow aperture ends in a narrow channel. In addition, the whorls are smooth, except for opisthocline growth lines.

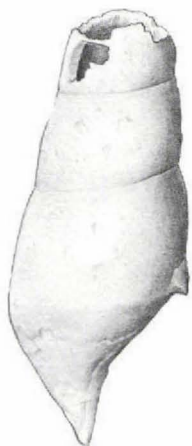


Fig. 112. aff. *Tibia*,  $\times 6$

Superfamily HIPPONICACEA  
Family HIPPONICIDAE

*Hipponix* Defrance,  
species 1

Fig. 113

Fig. 113A,B: MGUH 15.723, Sonja Lens (1956),  $\times 14$ .

*Additional material.* 1977. 4047, 4048, 4049, Turritellakløft (1946, 1949), 5 specimens. 1977. 4032, 4033, 4042, 4043, 4046, Sonja Lens (1948, 1951, 1953, 1956, 1958), many specimens; 1077. 4045, Qaersutjægerdal 1953, 1 specimen.

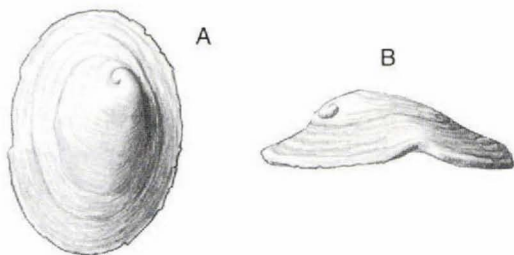


Fig. 113. *Hipponix* sp. 1,  $\times 14$

*Hipponix* Defrance,  
species 2

Fig. 114

Fig. 114: MGUH 15.724, Sonja Lens (1956),  $\times 14$ .

*Additional material.* 1977. 3990, 3992, 3993, 3994, 4000, Sonja Lens (1948, 1951, 1952, 1953, 1954, 1956), numerous; 1977. 3991, 3995, Turritellakløft, large section, 2 specimens.

*Remarks.* *Hipponix* species 2 differs from species 1 by its larger protoconch. *H. inevolutus* (Briart & Cornet) and *H. imbricata* (Briart & Cornet), which have been synonymised by Glibert (1973), have the same sculpture. The former has a protoconch similar to species 2, while this is not preserved in *H. imbricata*.



Fig. 114. *Hipponix* sp. 2,  $\times 14$

*Hipponix* Defrance,  
species 3

Fig. 115

Fig. 115A,C: MGUH 15.725, Sonja Lens (1956),  $\times 4$ .

Fig. 115B: MGUH 15.726, Sonja Lens (1953),  $\times 4$ .

*Additional material.* 1977. 3999, 4004, 4008, Sonja Lens (1952, 1953, 1956, 1958), 23 specimens.

*Remarks.* The shells are much more elevated than *Hipponix* species 1 and 2 and the apex extends far over the margin. In addition, the sculpture differs on account of its imbricating growth lines with the axial riblets between.



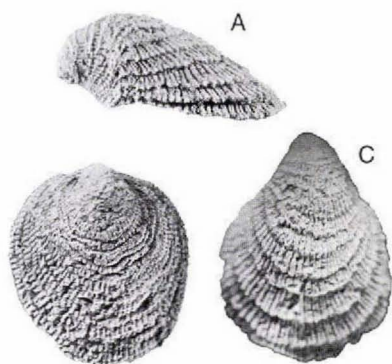


Fig. 115. *Hipponix* sp. 3, A,C,  $\times 4$ , B,  $\times 4$

Superfamily CALYPTRAEACEA

Family TRICHOTROPIDAE

Subfamily TRICHOTROPINAE

Trichotropinae, new genus Fig. 116

Fig. 116A,B: MGUH 15.727, Sonja Lens (1954),  $\times 7$ .

Additional material. 1977. 1111, 1112, Sonja Lens (1953, 1954, 1956, 1958), numerous specimens.

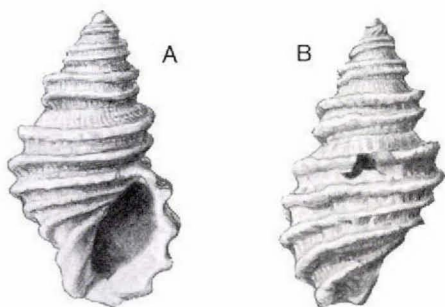


Fig. 116. Trichotropinae, new genus,  $\times 7$

**Remarks.** The shells do not have an inclined outer lip and differ therefore from all Trichotropinae with a comparable sculpture. *Opposius* Iredale is the most similar, but this does not have the truncated columella and channel seen in the Greenland species.

Family CALYPTRAEIDAE

*Calyptraea* Lamarck,  
species 1

Fig. 117

Fig. 117A: MGUH 15.728, Sonja Lens (1951),  $\times 7.5$ .

Fig. 117B,C: MGUH 15.729, Turrnellakloft, large section (1956),  $\times 1.5$ .

Additional material. 1977. 445, Sonja Lens (1956), 1 specimen; 1977. 451, Turrnellakloft, loose (1939), 2 specimens.

**Remarks.** The sculpture is only preserved in one of the figured specimens and consists of undulating growth lines. High shells with a high early deutoconch have been placed together in this species. *Calyptraea montensis* Cossmann, in which Glibert (1973) united *C. trochiformis* and *C. suessoniensis* Briart & Cornet, is closely related or identical. The edge of the internal lamella is broadly curved and does not have the deep sinus of modern *Calyptraea*. This may be also observed in the species figured by Cossmann & Pissarro (1910–13) from the Paris Basin.

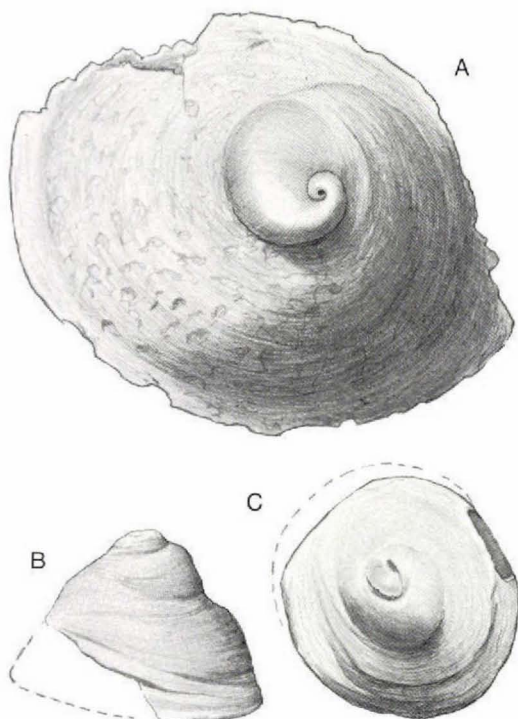


Fig. 117. *Calyptraea* sp. 1, A,  $\times 7.5$ ; B, C,  $\times 1.5$

*Calyptraea* Lamarck,  
species 2

Fig. 118

Fig. 118A: MGUH 15.730, Sonja Lens (1958),  $\times 4$ .Fig. 118B: MGUH 15.731, Sonja Lens (1953),  $\times 4$ .

*Additional material.* 1977. 1264, 452, 453, 4014, 445, Sonja Lens (1954, 1956, 1958), 13 specimens; 1977. 448, 450, 1266, 1267, Turrnellakløft (1946, 1948), 6 specimens.

*Remarks.* In contrast to *Calyptraea* species 1, the shells in species 2 are regularly flat. The growth lines on the surface are undulating and form hollow spine-like projections.

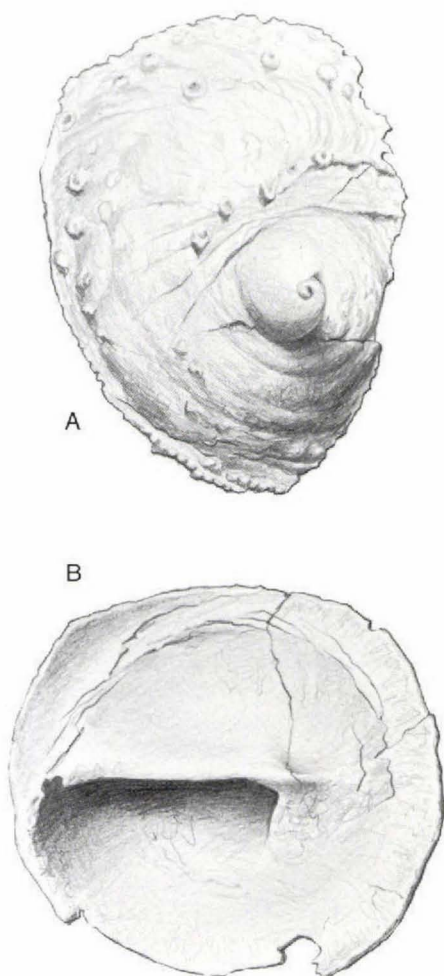
Fig. 118. *Calyptraea* sp. 2,  $\times 4$ *Sigapatella* Lesson

Fig. 119

Fig. 119A,B: MGUH 15.732, Sonja Lens (1956),  $\times 7$ .

*Remarks.* The lamella is slightly concave and thin. The spiral sculpture is not as dominant as suggested by the figure.

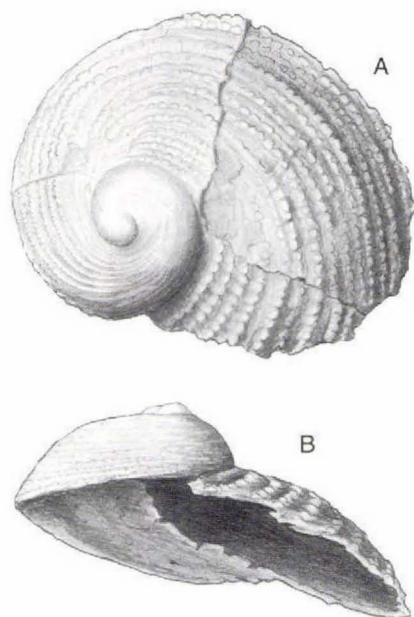
Fig. 119. *Sigapatella*,  $\times 7$ *Crepidula* Lamarck,  
species 1

Fig. 120

Fig. 120A,B: MGUH 15.733, Sonja Lens (1958),  $\times 7$ .

*Remarks.* The figure shows the remains of the broken lamella.

*Crepidula* Lamarck,  
species 2

Fig. 121

Fig. 121A,B: MGUH 15.734, Sonja Lens (1956),  $\times 3$ .

*Additional material.* 1977. 435, 441, 442, 445, 446, Sonja Lens (1951, 1952, 1953, 1954, 1956, 1958), many specimens; 1977. 437, Turrnellakløft, large section (1953), 1 specimen; 1977. 433, 438, 440, 443, 444, 454, Qaersutjægerdal (1951, 1952, 1953, 1957), 14 specimens.

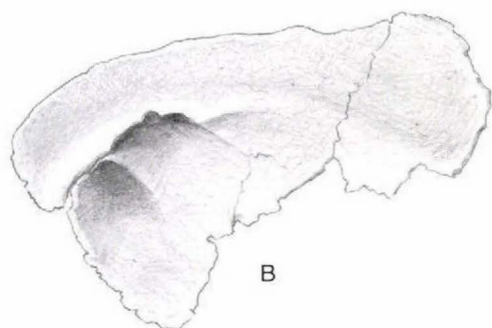
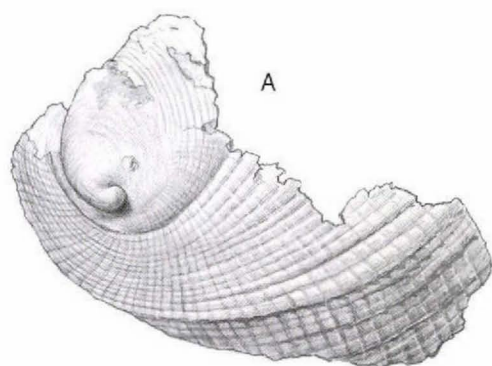


Fig. 120. *Crepidula* sp. 1,  $\times 7$

*Remarks.* The lamella is strongly assymetrical, with the deepest sinuate point close to the apex. This may be a generic character. *Crepidula*, species 1 has a much smaller protoconch, forming only half of a whorl.

Superfamily CYPRAEACEA  
Family CYPRAEIDAE  
Subfamily CYPRAEORBINAE

### *Palaeocypraea* Schilder Fig. 122

Fig. 122A,B: MGUH 15.735, Sonja Lens (1958),  $\times 6$ .

Fig. 122C: MGUH 15.736, Sonja Lens (1958),  $\times 12$ .

*Additional material.* 1977. 1291, Sonja Lens (1958), 1 specimen.

### ? *Palaeocypraea* Schilder Fig. 123

Fig. 123A–C: MGUH 15.737, Sonja Lens (1956),  $\times 5$ .

*Additional material.* 1977. 143, Sonja Lens (1956), 1 fragment; 1977. 144, Agatkløft, large section (1948), 1 large fragment.

*Remarks.* The elevation of the spire is visible in this slightly deformed shell.

### *Protocypraea* Schilder Fig. 124

Fig. 124A–C: MGUH 15.738, Sonja Lens (1958),  $\times 3$ .

*Additional material.* 1977. 139, 1401, Sonja Lens (1948, 1958), 3 specimens; 1977. 141, Turrillakløft, large section (1948), 1 fragment.



Fig. 121. *Crepidula* sp. 2,  $\times 3$



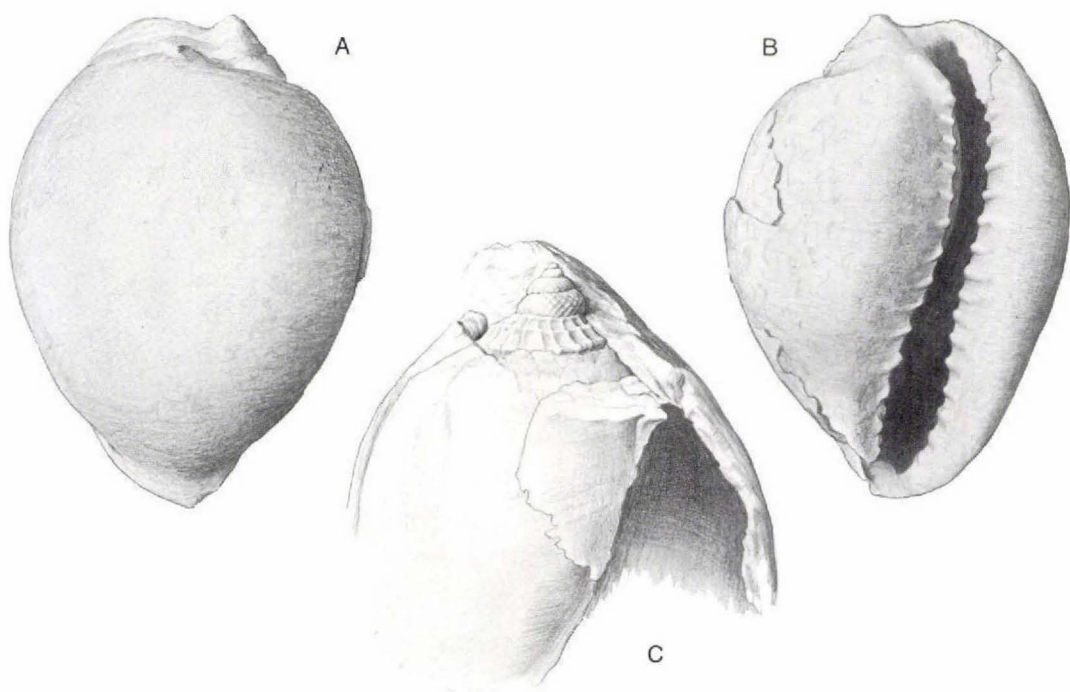


Fig. 122. *Palaeocypraea*, A,B,  $\times 6$ ; C,  $\times 12$

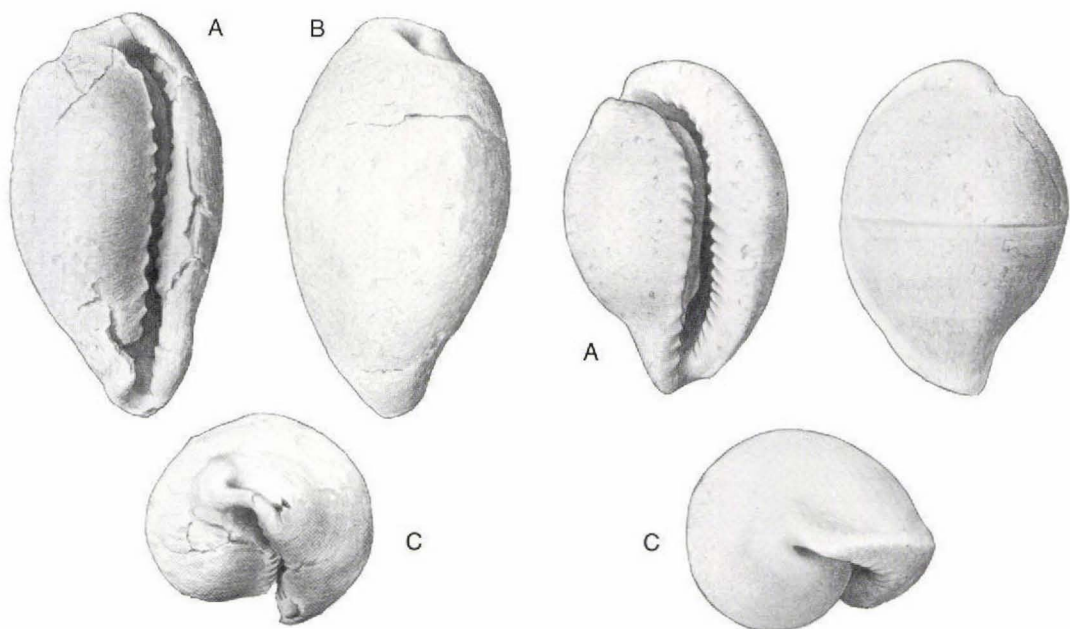


Fig. 123. ?*Palaeocypraea*,  $\times 5$

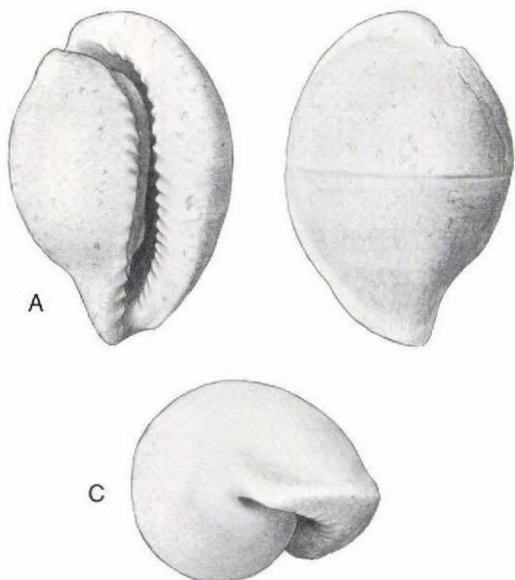


Fig. 124. *Protocypraea*,  $\times 3$



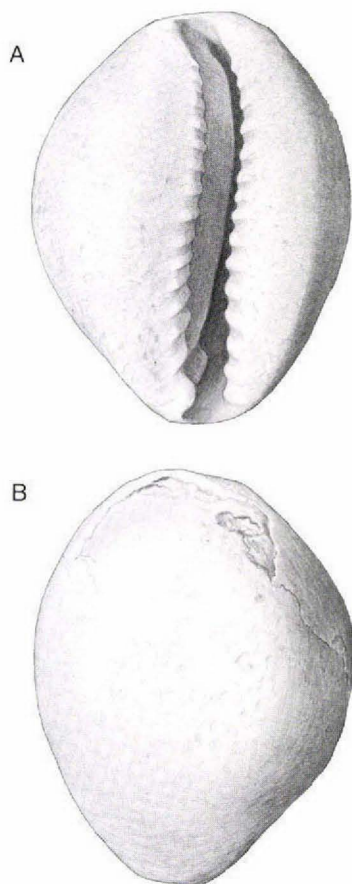


Fig. 125. *Josseumea*,  $\times 10$

Subfamily CYPRAEINAE

*Josseumea* Sacco

Fig. 125

Fig. 125A,B: MGUH 15.739, Sonja Lens (1958),  $\times 10$ .

*Additional material.* 1977. 1300, Sonja Lens (1958).

Subfamily CYPRAEOVULINAE

*Zonaria* Josseume

Fig. 126

Fig. 126: MGUH 15.740, Sonja Lens (1958),  $\times 6$ .

*Additional material.* 1977. 1230, Agatkløft, large section (1948), 1 fragment.

*Remarks.* Schilder's (1927) "Endzahn" which has some importance for the systematics of the Cypraeidae is separated from the other denticles and begins close to the anterior end of the aperture.

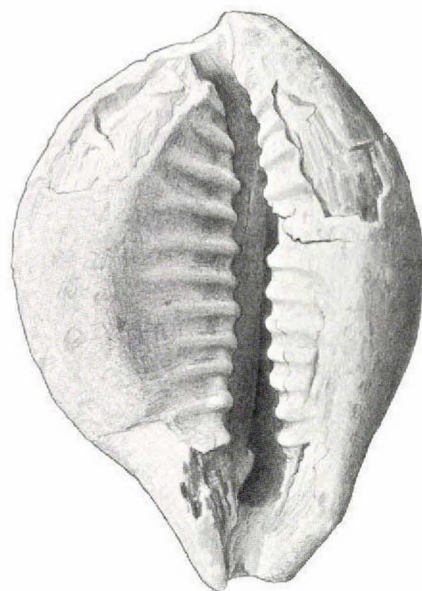


Fig. 126. *Zonaria*,  $\times 6$

Subfamily SULCOCYPRAEINAE

*Eocypraea* Schilder

Fig. 127

Fig. 127A-C: MGUH 15.741, Sonja Lens (1956),  $\times 3$ .

*Additional material.* 1977. 1219, Sonja Lens (1958).

Superfamily NATICEA

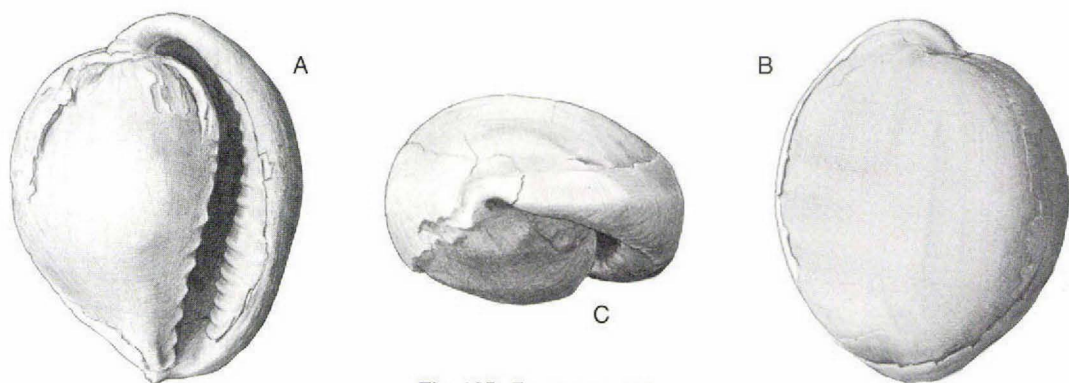
Family NATICIDAE

Subfamily GLOBULARIINAE

*Amaurellina* P. Fischer

Fig. 128

Fig. 128: MGUH 15.742, Qaersutjægerdal, concretion layer below tuffitic shales (1954),  $\times 2$ .

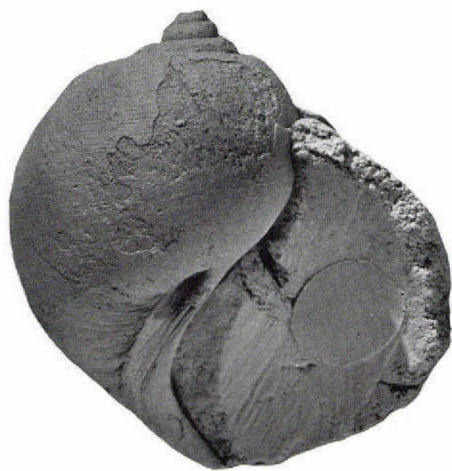
Fig. 127. *Eocypraea*,  $\times 3$ 

*Additional material.* 1977. 311, 316, Sonja Lens (1952, 1953), 5 specimens; 1977. 313, 315, 320, 321, 322, 324, 325, 326, 327, 328, 329, Qaersutjægerdal (1951, 1952, 1953, 1954, 1956, 1958), 26 specimens; 1977. 314, 317, 318, 330, 331, 332, Turrnellakløft, large section (1946, 1948, 1953), 14 specimens.

*Remarks.* Some of the specimens have indistinct spiral threads.

*Additional material.* 1977. 923–926, Turrnellakløft (1946, 1948, 1949), numerous specimens; 1977. 927, Sonja Lens (1948), 5 fragments.

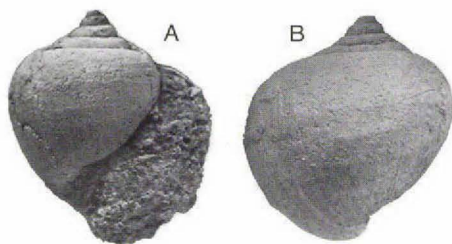
*Remarks.* The specimens are imperfectly preserved but the high, slightly concave columellar lip, together with the rounded whorls and the aperture, are characteristic for *Amaurellina*.

Fig. 128. *Amaurellina*,  $\times 2$ 

aff. *Amaurellina* Fischer

Fig. 129

Fig. 129A,B: MGUH 15.743, Turrnellakløft (1946),  $\times 2$ .

Fig. 129. aff. *Amaurellina*,  $\times 2$ 

### *Tylostoma ampullariaeformis* Ravn Fig. 130

1970. *Tylostoma* sp. n. aff. *ampullariaeforme* Ravn; Rosenkrantz, p. 440, text fig. 15/ 2–5.

Fig. 130: MMH 10.810, Turrnellakløft (= Rosenkrantz, 1970, fig. 15/4),  $\times 1$ .

*Additional material.* The other specimens figured by Rosenkrantz (1970): MMH 10.809, Turrnellakløft (fig. 15/2); MMH 10.811, Turrnellakløft (fig. 15/5); MMH 10.812, Sonja Lens (fig. 15/3). 1977. 618–620, 623, 626–629, Turrnellakløft (1946, 1949, 1953, 1961, 1968), 17 specimens; 1977. 621, Agatkjøft (1948), 1 specimen; 1977. 634–637, 1240, Sonja Lens (1951, 1953, 1956, 1958), numerous.

*Remarks.* Rosenkrantz (1970) mentioned spiral cords in this form which were only traceable on the last whorl of a very large specimen (1977. 620). He suggested that this morphologic feature, and the location of the varices, which are not exactly above each other on consecutive whorls, permitted the separation of the nordic forms into a new genus or subgenus. However, we do not concur with this opinion.

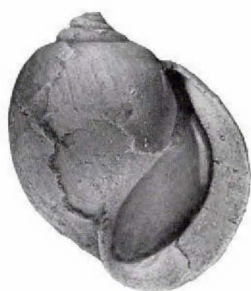


Fig. 130. *Tylostoma ampullariaeformis*,  $\times 1$

### *Vanikoropsis skoui* Rosenkrantz

Fig. 131

1970. *Vanikoropsis skoui* Rosenkrantz, p. 438, text fig. 13/1a,b.

Fig. 131A,B: MMH 10.807, Sonja Lens (= Rosenkrantz, 1970, fig. 13/1a,b),  $\times 3$ .

Fig. 131C,D: MGUH 15.744, Sonja Lens (1958),  $\times 12$ .

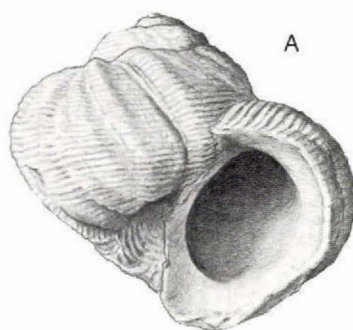
*Additional material.* 1977. 1308, Sonja Lens (1958), 1 specimen.

### *Vanikoropsis* Meek, species 1

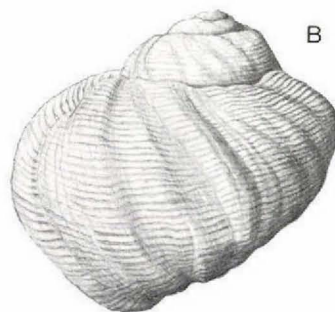
Fig. 132

Fig. 132A,B: MGUH 15.745, Qaersutjægerdal (1953),  $\times 3$ .

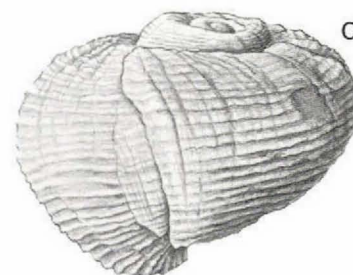
*Remarks.* The single specimen has stronger and less numerous spiral ribs than *Vanikoropsis skoui* Rosenkrantz, but it is possibly just a variation of this species.



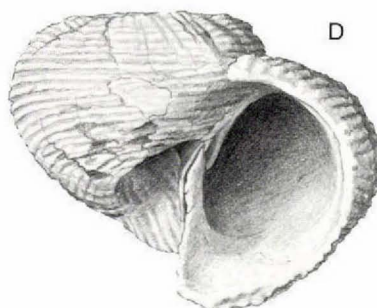
A



B



C



D

Fig. 131. *Vanikoropsis skoui*, A,B,  $\times 3$ ; C,D,  $\times 12$



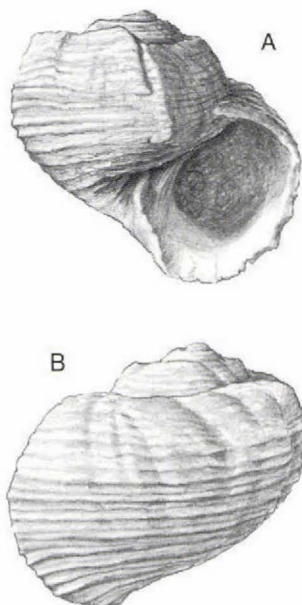


Fig. 132. *Vanikoropsis* sp. 1,  $\times 3$

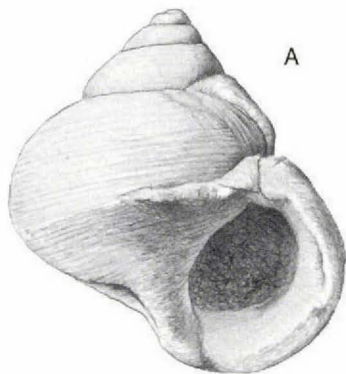
*Vanikoropsis* Meek,  
species 2

Fig. 133

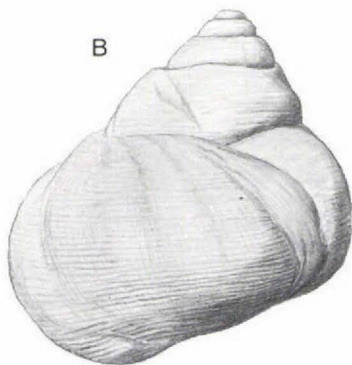
Fig. 133A,B: MGUH 15.746, Qaersutjægerdal (1958),  $\times 3$ .

*Additional material.* 1977. 1296, Qaersutjægerdal.

*Remarks.* The form differs from the others by its delicate spiral threads which cover the whole shell densely. *Littorina* sp. ind. of Krach (1963) from the Babica Clay in Poland seems to be related.



A



B

Fig. 133. *Vanikoropsis* sp. 2,  $\times 3$

Subfamily POLINICINAE

*Polinices* Montfort

Fig. 134

Fig. 134: MGUH 15.747, Turritellakløft (1948),  $\times 1.5$ .

*Additional material.* 1977. 112, 113, 115–120, Turritellakløft (1946, 1948, 1949, 1951), 19 specimens; 1977. 124, Sonja Lens (1951), numerous specimens; 1977. 110, 114, 121, 122, 123, 125, Qaersutjægerdal (1953, 1954, 1956, 1958), 34 specimens.

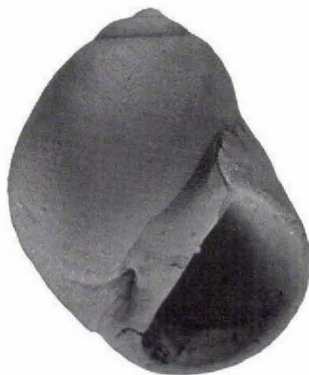


Fig. 134. *Polinices*,  $\times 1.5$

*Lunatia* Gray, species 1

Fig. 135

Fig. 135A,B: MGUH 15.748, Qaersutjægerdal (1954),  $\times 1.5$ .

*Additional material.* 1977. 645, 647–656, 1977. 938–978, 1977. 982–987, Turritellakløft and Qaersutjægerdal, numerous specimens; ? 1977. 928, Turritellakløft, 1 specimen.

*Remarks.* The ratio total height to breadth varies considerably. *Lunatia briarti* (v. Koenen) is closely related.



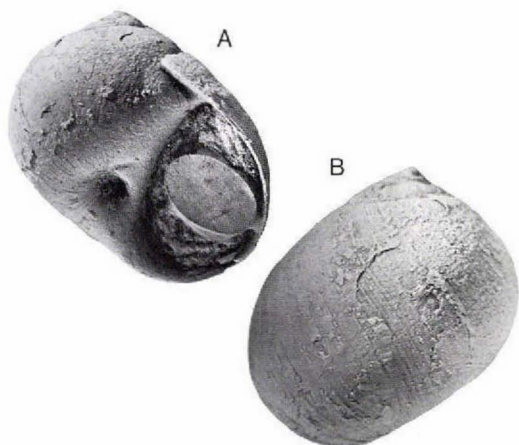


Fig. 135. *Lunatia* sp. 1, A,B,  $\times 1.5$

*Lunatia* Gray, species 2 Fig. 136

Fig. 136: MGUH 15.749, Sonja Lens (1958),  $\times 6$ .

*Remarks.* The whorls are more convex than in *Lunatia* species 1 and the spire is higher. Under the accession numbers 1977. 929 to 1977. 937 there is a large number of shells of a *Lunatia* which should probably be separated from *Lunatia*

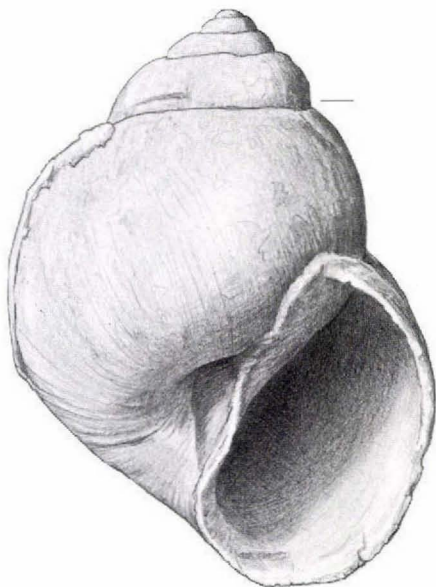


Fig. 136. *Lunatia* sp. 2,  $\times 6$

species 2. These belong to a form that is still broader, with the spire constantly occupying one whorl more and a flat protoconch. All the specimens are from Turritellakløft.

Superfamily TONNACEA

Family CYMATIIDAE

*Ranella* Lamarck, species 1 Fig. 137

Fig. 137A,B: MGUH 15.750, Sonja Lens (1956),  $\times 3$ .

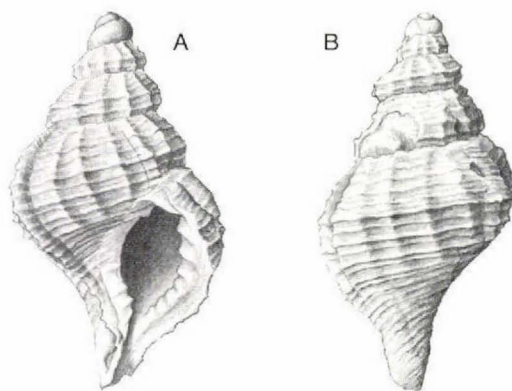


Fig. 137. *Ranella* sp. 1,  $\times 3$

*Ranella* Lamarck, species 2 Fig. 138

Fig. 138A,B: MGUH 15.751, Sonja Lens (1953),  $\times 3$ .

*Remarks.* This form has been separated from *Ranella* sp. 1 because of its more angular whorls and its lower number of denticles on the columella. More specimens are required before it can be ascertained if transitions occur between the two forms.

New genus, cf. *Plesiotriton* Fischer

Fig. 139

Fig. 139A,B: MGUH 15.752, Sonja Lens (1958),  $\times 3$ .

*Additional material.* 1977. 1286, Sonja Lens (1956), 1 questionable fragment.

*Remarks.* The new genus differs from the otherwise closely related *Plesiotriton* by having 2 columellar plaits instead of three.



Fig. 138. *Ranella* sp. 2,  $\times 3$



Cymatiidae, indeterminate Fig. 140

Fig. 140: MGUH 15.753, Sonja Lens (1958),  $\times 3$ .

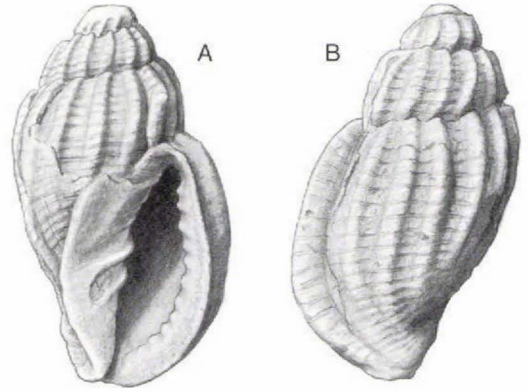


Fig. 139. New genus, cf. *Plesiotriton*,  $\times 3$

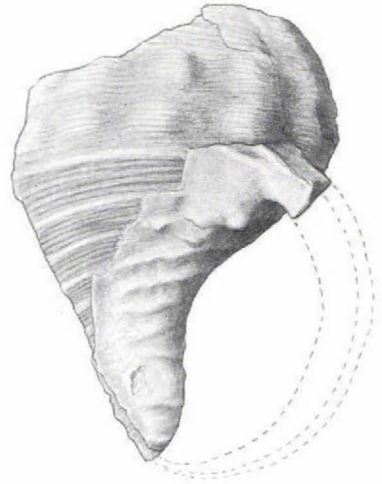


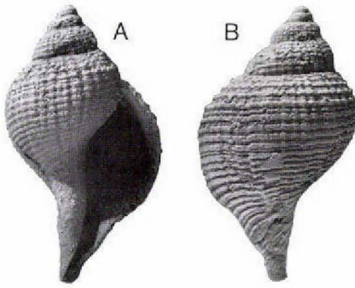
Fig. 140. Cymatiidae, indeterminate,  $\times 3$

#### Family FICIDAE

#### *Ficus* Roeding, species 1 Fig. 141

Fig. 141A,B: MGUH 15.754, Sonja Lens (1953),  $\times 2$ .

*Additional material.* 1977. 364, Sonja Lens (1948, 1951, 1952, 1953, 1954, 1956, 1958), numerous specimens.

Fig. 141. *Ficus* sp. 1,  $\times 2$ 

*Additional material.* 1977. 356, 352, Sonja Lens (1954, 1958), 2 specimens; 1977. 349, 350, 354, 355, 358, 359, Turritlekløft (1948, 1953), 9 specimens; 1977. 353, Agatkløft, large section (1948), 1 specimen; 1955. 357, Qaersutjægørdal (1953), 1 specimen.

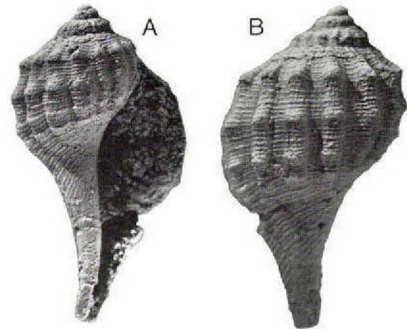
*Remarks.* The shell is broader than in *Ficus* species 1 with a more twisted columella and a lower spire.

### *Fulguroficus* Sacco

Fig. 143

Fig. 143A,B: MGUH 15.756, Sonja Lens (1948),  $\times 2$ .

*Additional material.* 1977. 384, 387, 409, Sonja Lens (1948, 1952, 1953, 1954, 1956, 1958), numerous specimens; 1977. 360, 385, 386, 392–408, 410–415, 417, 418, 420, 421, Turritlekløft, large section, numerous specimens; 1977. 393, 416, Qaersutjægørdal, 2 specimens.

Fig. 143. *Fulguroficus*,  $\times 2$ 

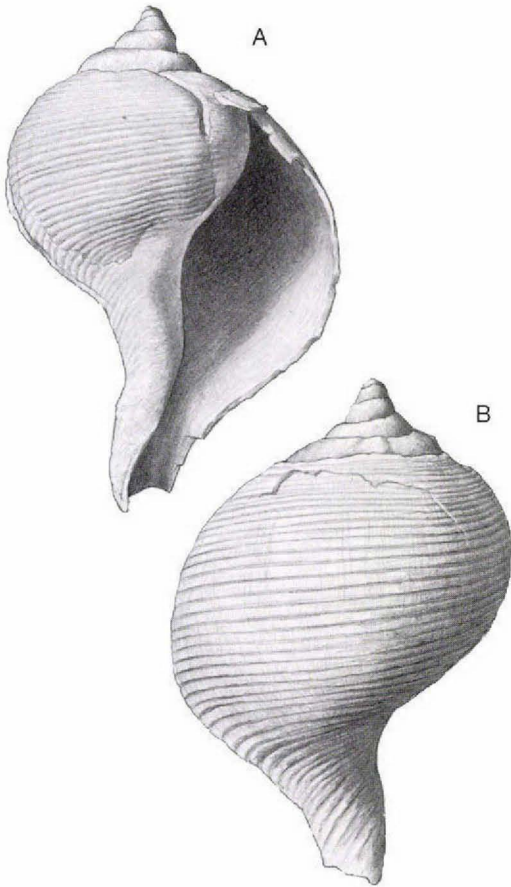
*Remarks.* The sculpture consists of four spiral ribs which form nodes of varying prominence at the intersections with the axial folds. Less prominent spiral ribs may be developed between the main ones. The whole shell is covered by undulating spiral threads.

Order NEOGASTROPODA  
Suborder STENOGLLOSSA  
Superfamily BUCCINACEA  
Family PYRENIDAE

### *Ficus* Roeding, species 2

Fig. 142

Fig. 142A,B: MGUH 15.755, Sonja Lens (1958),  $\times 3$ .

Fig. 142. *Ficus* sp. 2,  $\times 3$



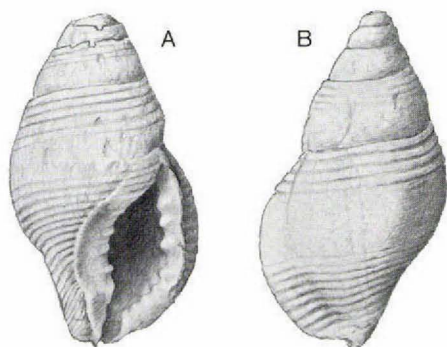
*Columbelopsis* Bucquoy,  
Dautzenberg & Dollfuss

Fig. 144

Fig. 144A: MGUH 15.757, Sonja Lens (1953),  $\times 7$ .Fig. 144B: MGUH 15.758, Sonja Lens (1953),  $\times 7$ .

*Additional material.* 1977. 835, 836, Sonja Lens (1952, 1953, 1954, 1956, 1958), numerous specimens.

*Remarks.* *Columbelopsis mississippiensis* (Meyer & Aldrich) from the Claiborn Formation of the USA is closely related (see also Palmer, 1937).

Fig. 144. *Columbelopsis*,  $\times 7$ 

Family BUCCINIDAE

*Parvisipho* Cossmann,  
species 1

Fig. 145

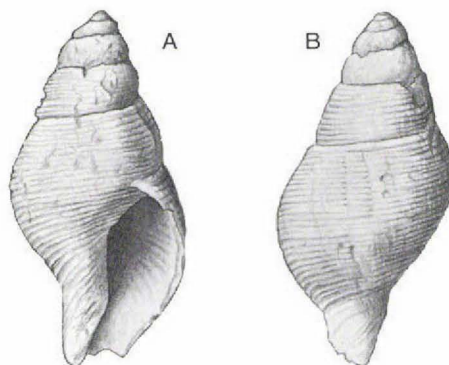
Fig. 145A,B: MGUH 15.759, Sonja Lens (1956),  $\times 8$ .

*Additional material.* 1977. 848, 849, Sonja Lens (1948, 1951, 1953), numerous specimens; 1977. 850–853, 855, Turritella-kløft, large section (1946, 1948, 1957), 15 specimens.

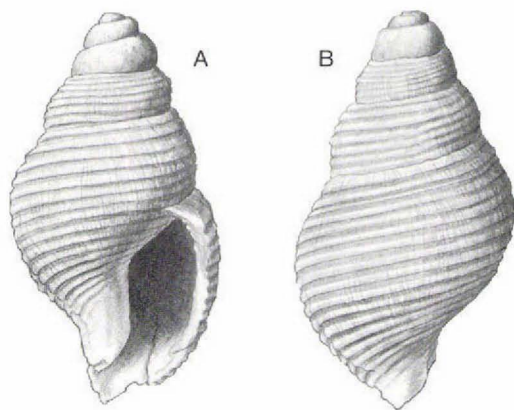
*Remarks.* *Parvisipho subglaber* (Ravn) and *P. preyi*, described by Traub (1980), are closely related.

*Parvisipho* Cossmann,  
species 2

Fig. 146

Fig. 146A,B: MGUH 15.760, Sonja Lens (1958),  $\times 12$ .Fig. 145. *Parvisipho* sp. 1,  $\times 8$ 

*Remarks.* *Parvisipho* species 2 has fewer and stronger spiral ribs than species 1. The channel is not complete in the only specimen but seems to be more bent to the left.

Fig. 146. *Parvisipho* sp. 2,  $\times 12$ 

*Parvisipho* Cossmann,  
species 3

Fig. 147

Fig. 147A,B: MGUH 15.761, Sonja Lens (1956),  $\times 16$ .

*Remarks.* This is the nucleus together with the first whorls, possibly of *Parvisipho* species 1 or 2.



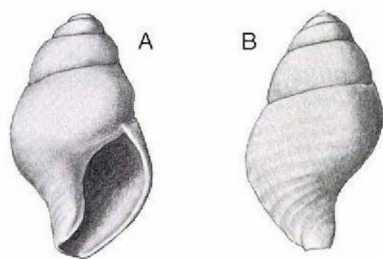


Fig. 147. *Parvisipho* sp. 3,  $\times 16$

*Parvisipho* Cossmann,  
species 3 ?

Fig. 148

Fig. 148A,B: MGUH 15.762, Sonja Lens (1953),  $\times 3$ .

*Additional material.* 1977. 1079, Sonja Lens (1953), 1 specimen.

*Remarks.* As in *Parvisipho* species 3 this form has spiral ribs but its shells are much larger and have flat axial folds. However, they probably belong to the same species.

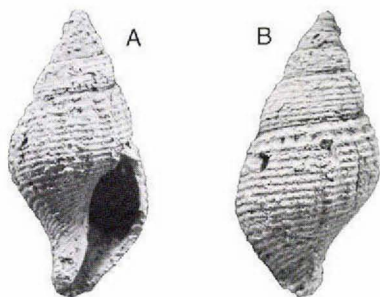


Fig. 148. *Parvisipho* sp. 3?  $\times 3$

*Siphonalia* Adams

Fig. 149

Fig. 149A,B: MGUH 15.763, Qaersutjægerdal, large section (1953),  $\times 2$ .

*Additional material.* 1977. 1045, 1048, Turritellakløft (1946), 3 specimens.

aff. *Siphonalia* Adams

Fig. 150

Fig. 150A,B: MGUH 15.764, Qaersutjægerdal, large section (1953),  $\times 4$ .

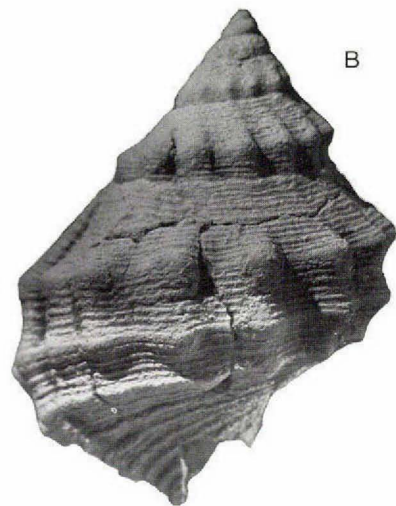
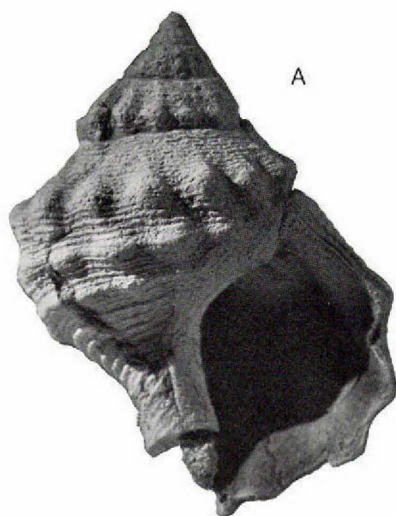


fig. 149. *Siphonalia*,  $\times 2$

*Additional material.* 1977. 1050, Sonja Lens (1958), 1 specimen.

*Remarks.* The assignment of the two specimens is tentative as the lower part of the aperture is not preserved.

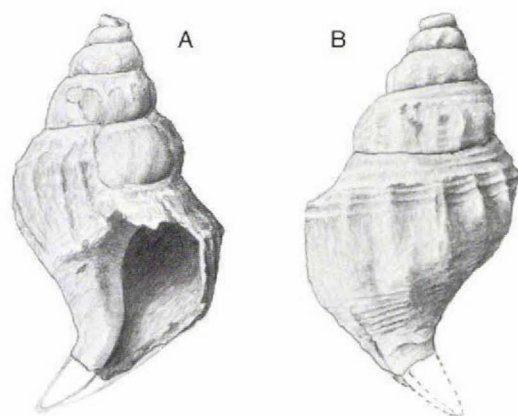


Fig. 150. aff. *Siphonalia*,  $\times 4$

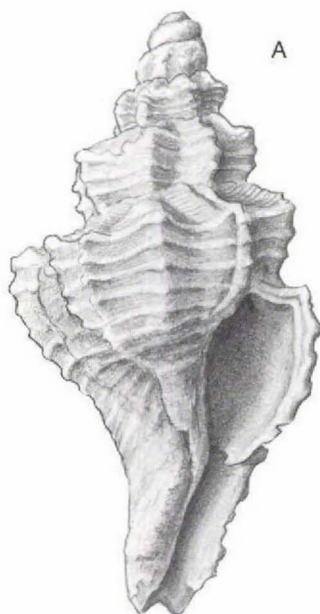
*Penion* Fischer, species 1

Fig. 151

Fig. 151A,B: MGUH 15.765, Sonja Lens (1956),  $\times 10$ .

*Additional material.* 1977. 1217, Sonja Lens (1956, 1958), 2 specimens.

*Remarks.* The spines on the keel of the whorls in *Penion* species 3 are not as prominent as in species 1.



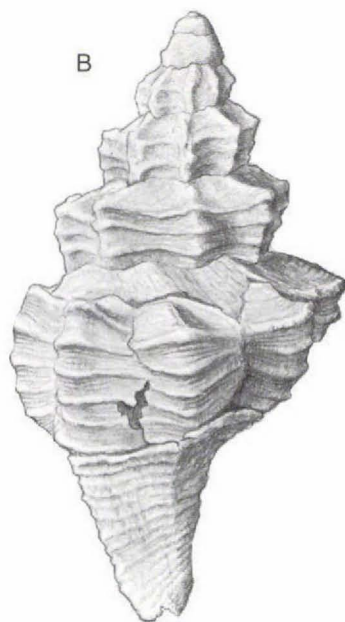
*Penion* Fischer, species 2

Fig. 152

Fig. 152A,B: MGUH 15.766, Sonja Lens (1953),  $\times 3$ .

*Additional material.* 1977. 701, Sonja Lens (1958), 1 specimen; 1977. 700, 710, 712–15, 718, Qaersutjægerdal, numerous examples; 1977. 702–709, 711, 716, 717, 719, Turritellakløft, large section, 20 specimens.

*Remarks.* The prominence of the axial ribs varies, but generally they are more elevated than drawn in the figure. The ribs are more frequent than in *Penion* species 1 and do not end posteriorly in spines, as in this form. In addition, the sutural ramp is not bordered by a strong keel, as in *Penion* species 1.



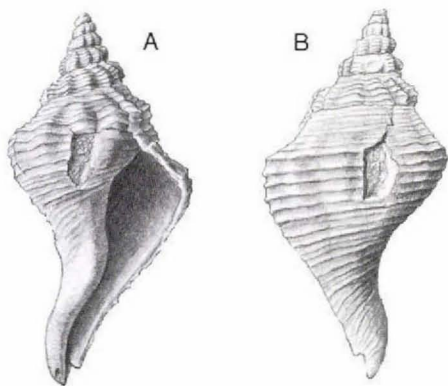
*Penion* Fischer, species 3

Fig. 153

Fig. 153A,B: MGUH 15.767, Sonja Lens (1958),  $\times 9$ .

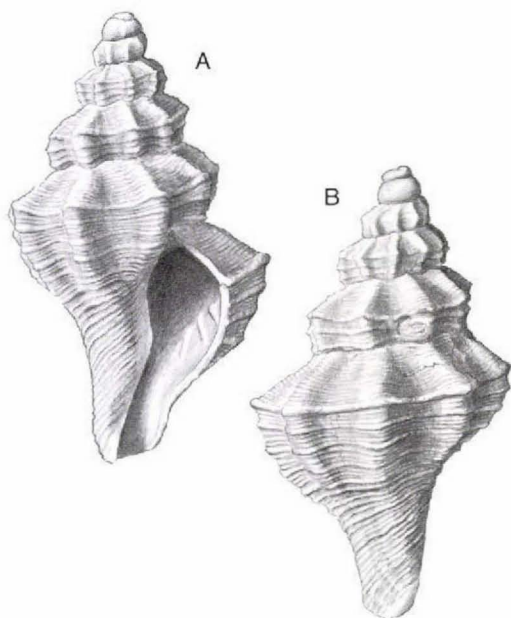
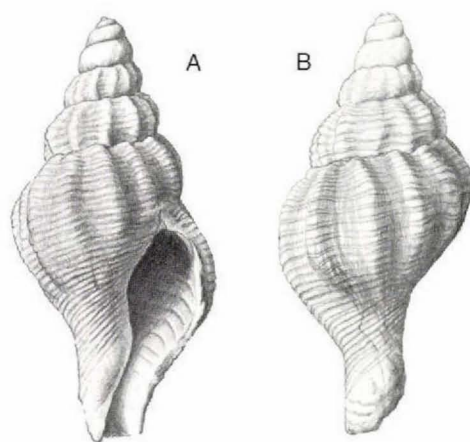
*Additional material.* 1977. 1294, Sonja Lens (1958), 1 specimen.

Fig. 151. *Penion* sp. 1,  $\times 10$

Fig. 152. *Penion* sp. 2,  $\times 3$ 

feature. Palmer (1937) has assigned a number of Claibornian species to the genus *Verconella* Iredale which, after Wenz (1938–44), is a homonym of *Penion* Fischer. These species agree in their shape and aperture with the one figured here. In contrast to *P. dilatatus* Quoy & Gaimard, the type species of *Penion*, these forms do not have angular whorls and the siphonal process is well separated from the posterior part of the last whorls. Glibert (1973) has assigned "*Fusus Edmondi*" Briart & Cornet and "*F. subnudus*" Briart & Cornet to the same group.

Since this group is clearly distinguishable, it should be separated from *Penion* and perhaps be divided in different genera according to the protoconch sculpture.

Fig. 153. *Penion* sp. 3,  $\times 9$ Fig. 154. New genus, cf. *Penion* sp. 1,  $\times 6$ 

#### New genus, cf. *Penion* Fischer, species 1

Fig. 154

Fig. 154A,B: MGUH 15.768, Sonja Lens (1958),  $\times 6$ .

*Additional material.* 1977. 1038, Sonja Lens (1952, 1953, 1954), numerous specimens.

*Remarks.* The length of the channel is variable but no distinct groups could be separated on this

#### New genus, cf. *Penion* Fischer, species 2

Fig. 155

Fig. 155: MGUH 15.769, Sonja Lens (1952),  $\times 10$ .

*Additional material.* 1977. 1009, Turritellakløft (1953), 1 specimen; 1977. 1010, Sonja Lens (1952), 3 specimens.

*Remarks.* The whorls are higher and less inflated than in species 1. There are no folds on the outer lip.





Fig. 155. New genus, cf. *Penion* sp. 2,  $\times 10$

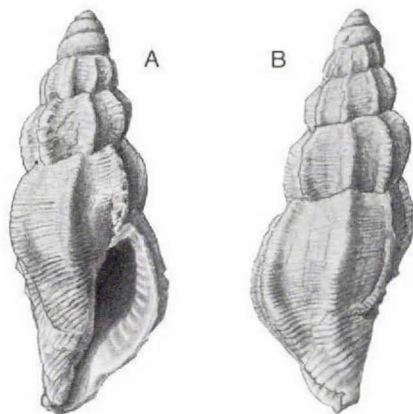


Fig. 156. *Coptochetus*,  $\times 7$

### *Coptochetus* Cossmann Fig. 156

Fig. 156A,B: MGUH 15.770, Sonja Lens (1953),  $\times 7$ .

*Additional material.* 1977. 767, 773, Sonja Lens (1953, 1954, 1956, 1958), 6 specimens.

*Remarks.* In the figured specimen the apertural plane has been rotated slightly so that the aperture seems smaller than it actually is. The channel is broadly open.

quoted Wrigley (1927) who pointed out that a similar sinus of the growth lines is not characteristic for the turrids alone but may even occur in the fusids. The genus is assigned here to the buccinids because of the form of its channel, which is not straight but bent to the left.

### ? *Coptochetus* Cossmann Fig. 157

Fig. 157A,B: MGUH 15.771, Sonja Lens (1958),  $\times 7$ .

*Additional material.* 1977. 790, Turritellakløft (1948), 1 specimen.

*Remarks.* The aperture is not complete and precise determination is, therefore, not possible.

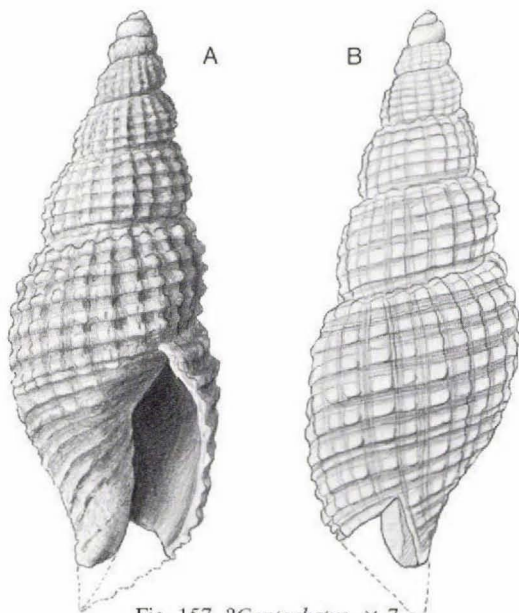


Fig. 157. ?*Coptochetus*,  $\times 7$

### *Nekewis* Stewart Fig. 158

Fig. 158A,B: MGUH 15.772, Sonja Lens (1958),  $\times 3$ .

*Remarks.* *Nekewis* has a broad shallow sinus on the sutural ramp. Powell (1966) therefore expressed doubts as to whether or not this genus should be included within the Turridae. He



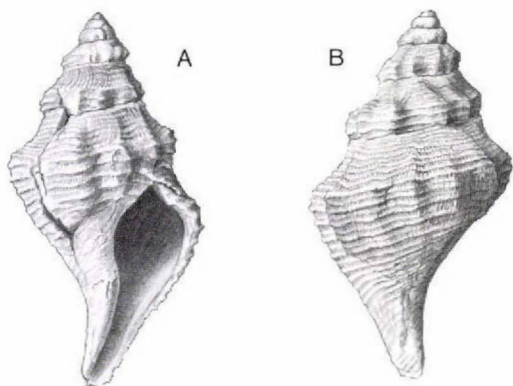


Fig. 158. *Nekewis*,  $\times 3$

### *Laevibuccinum* Conrad Fig. 159

Fig. 159A,B: MGUH 15.773, Sonja Lens (1956),  $\times 1.5$ .

*Additional material.* 1977. 333, 336, Sonja Lens (1956, 1958), 3 specimens; 1977. 334, 335, 336 (in part), Turrnellakløft, large section, 4 specimens.

*Remarks.* *Laevibuccinum* generally has spiral grooves, at least in the upper part of the whorls, but the specimens from Greenland are smooth. While the forms from Sonja Lens are small, those from Turrnellakløft have an estimated total height of 8 cm. In only one of these could wrinkles be found on the outer lip; in other examples the outer lip is smooth.

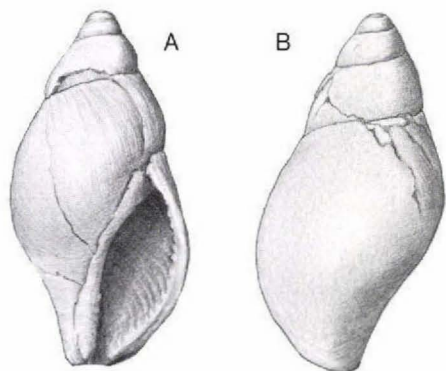


Fig. 159. *Laevibuccinum*,  $\times 1.5$

### *Searlesia* Harmer, species 1 Fig. 160

Fig. 160A,B: MGUH 15.774, Sonja Lens (1952),  $\times 9$ .

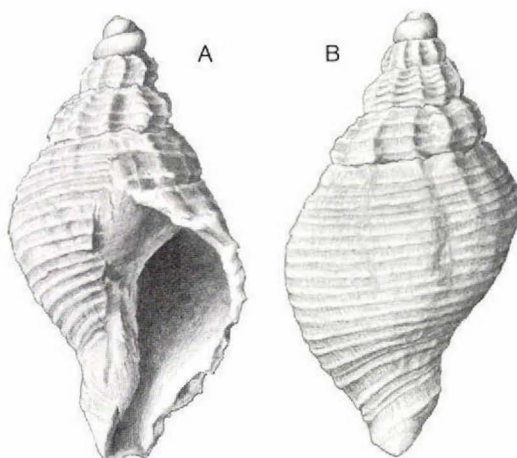


Fig. 160. *Searlesia* sp. 1,  $\times 9$

### *Searlesia* Harmer, species 2 Fig. 161

Fig. 161A,B: MGUH 15.775, Sonja Lens (1948),  $\times 3$ .

*Additional material.* 1977. 815, Sonja Lens (1953), numerous specimens.

*Remarks.* The whorls are higher than in species 1. In a single large specimen, the axial ribs become weaker on the last whorl.

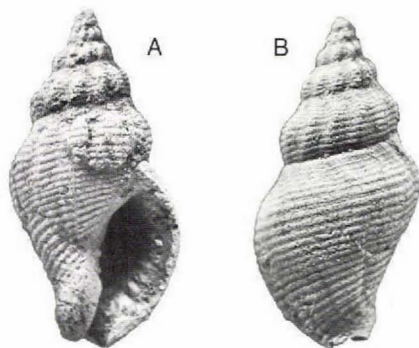


Fig. 161. *Searlesia* sp. 2,  $\times 3$

*Cominella* Gray

Fig. 162

Fig. 162A,B: MGUH 15.776, Sonja Lens (1956),  $\times 3$ .

*Additional material.* 1977. 819, 821, Sonja Lens (1948, 1951, 1952, 1953, 1956), numerous specimens; 1977. 817, 818, 822, Turritellakløft (1948, 1949), 3 specimens; 1977. 823, Qaersutjægerdal (1961), 1 specimen.

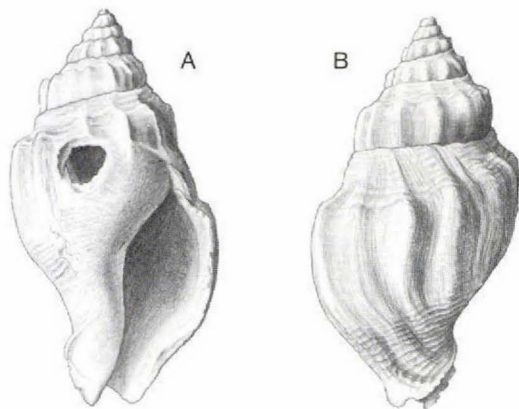
Fig. 162. *Cominella*,  $\times 3$ *Pollia* Sowerby, species 1

Fig. 163

Fig. 163A,B: MGUH 15.777, Sonja Lens (1956),  $\times 6$ .

*Additional material.* 1977. 1085, 1086, 1123, 1134, Sonja Lens (1951, 1953, 1956, 1958), 36 specimens.

*Remarks.* Only two columellar plaits occur in small specimens, but with further shell growth the number is increased to four.

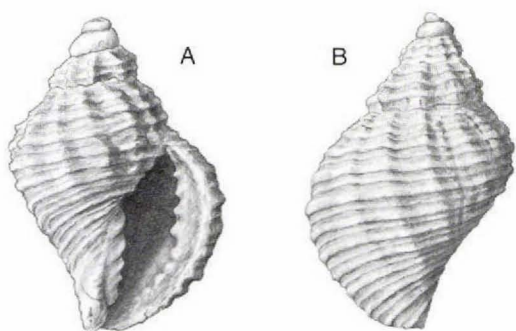
Fig. 163. *Pollia* sp. 1,  $\times 6$ *Pollia* Sowerby, species 2

Fig. 164

Fig. 164A,B: MGUH 15.778, Sonja Lens (1952),  $\times 4$ .

*Additional material.* 1977. 1061, Sonja Lens (1953, 1954), 5 specimens; 1977. 1062, Qaersutjægerdal (1953), 1 specimen.

*Remarks.* The form differs from *Pollia* species 1 by its less prominent spiral ornamentation and the three weak columellar plaits.

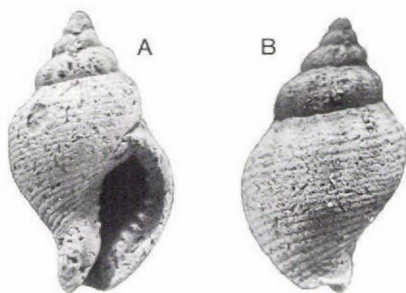
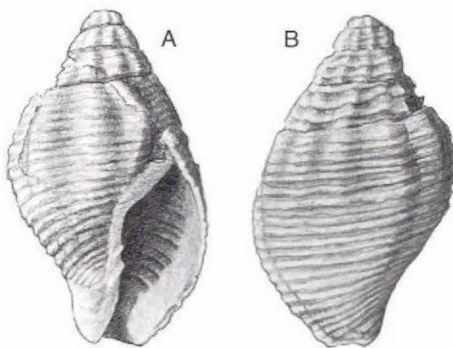
Fig. 164. *Pollia* sp. 2,  $\times 4$ cf. *Pollia* Sowerby

Fig. 165

Fig. 165A,B: MGUH 15.779, Sonja Lens (1956),  $\times 4$ .

*Additional material.* 1977. 725, 733, 736, 1032, Sonja Lens (1952, 1953, 1956, 1958), many specimens; 1977. 731, 732, 735, Agatkløft, loose, 3 specimens; 1977. 726, 728, 732, 734, 737, 738, Turritellakløft, large section, 6 specimens; 1977. 727, 729, 730, 739, Qaersutjægerdal, 5 specimens.

*Remarks.* This form has spiral ribs and two columellar plaits, instead of the three or four present in *Pollia*. Axial folds disappear prior to the start of the final whorl.

Fig. 165. cf. *Pollia*,  $\times 4$

*Suessonia* Cossmann

Fig. 166

Fig. 166A,B: MGUH 15.780, Sonja Lens (1952),  $\times 12$ .

*Additional material.* 1977. 870–872, 876, 877, 1087, Sonja Lens (1952, 1953, 1956), numerous specimens; 1977. 874–876, Turrillakløft, large section, 7 specimens.

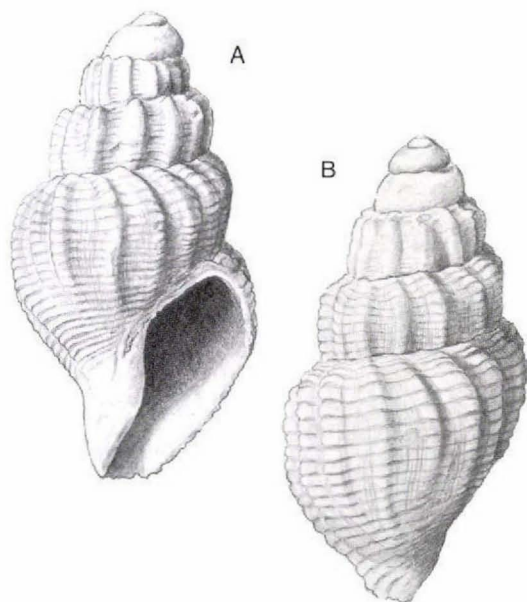
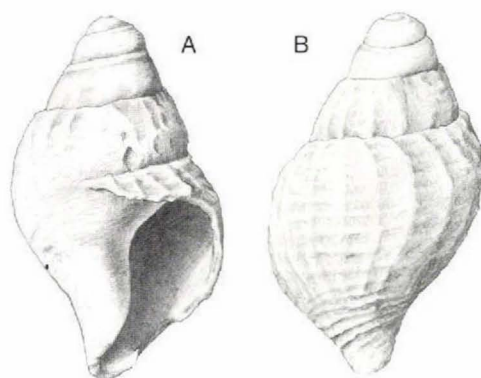
Fig. 166. *Suessonia*,  $\times 12$ *Janiopsis* Rovereto

Fig. 167

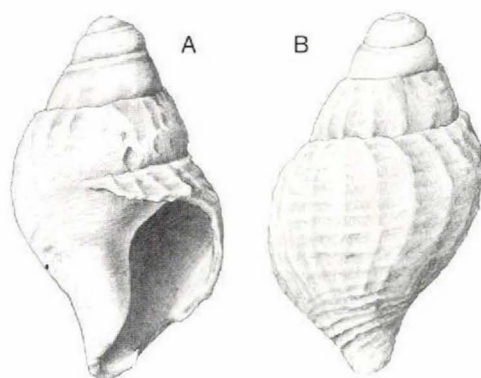
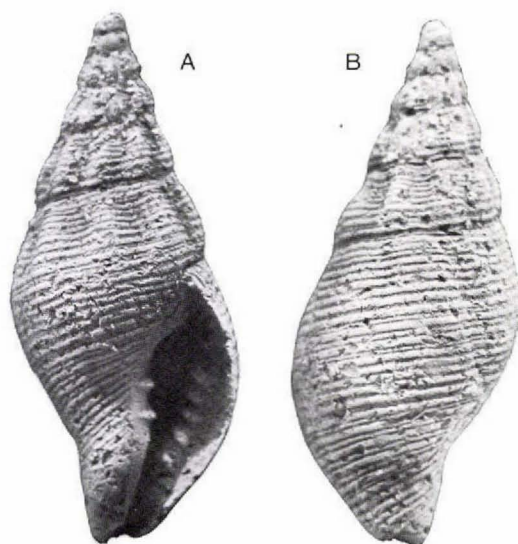
Fig. 167A,B: MGUH 15.781, Sonja Lens (1953),  $\times 6$ .

*Additional material.* 1977. 815, 830, 837, 838, Sonja Lens (1948, 1952, 1953), 13 specimens.



## Buccinidae, indeterminate

Fig. 168

Fig. 168A,B: MGUH 15.782, Sonja Lens (1953),  $\times 12$ .Fig. 168. Buccinidae, indeterminate,  $\times 12$ Fig. 167. *Janiopsis*,  $\times 6$ 

## Family MELONGENIDAE

*Sycostoma* Cox

Fig. 169

Fig. 169A,B: MGUH 15.783, Quaersutjærgedal, large section (1954),  $\times 2$ .

*Additional material.* 1977. 688–697, Quaersutjærgedal (1952, 1953, 1956, 1958), many specimens.

*Remarks.* *Sycostoma distans*, described by Traub (1981) under the generic name *Cominella*, is closely related. A number of species of *Sycostoma* are known from the Lutetian and Bartonian of the Paris Basin. They agree well with the Greenland examples in the shape of the shell but are mostly smooth, except for a few spiral grooves. The four species described by Palmer (1937) from the Claibornian of the southern United States are similarly not as densely covered with longitudinal grooves as the form Greenland.



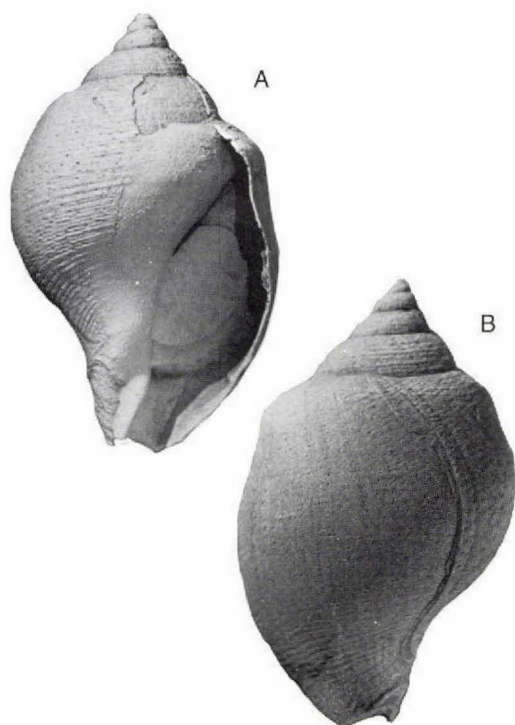


Fig. 169. *Sycostoma*,  $\times 2$

#### Family NASSARIIDAE

#### *Conomitra* Conrad, species 1 Fig. 170

Fig. 170A,B: MGUH 15.784, Sonja Lens (1956),  $\times 3$ .

*Additional material.* 1977. 1055, Sonja Lens (1948, 1952, 1953), 13 specimens.

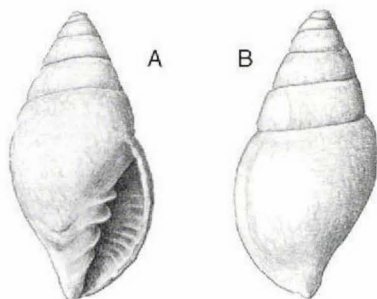


Fig. 170. *Conomitra* sp. 1,  $\times 3$

*Remarks.* *Conomitra* sp. (Ravn, 1933), *Turricula* (*Fusimitra*) *glabra* Ravn, and *T. (F.) faxensis* Ravn from Faxe are closely related. *Conomitra montense* Glibert, *C. hordeola* (Deshayes) and *C. prisca* (Deshayes) are similar species from the Paris Basin.

#### *Conomitra* Conrad, species 2 Fig. 171

Fig. 171A,B: MGUH 15.785, Sonja Lens (1953),  $\times 6$ .

*Additional material.* 1977. 1205, Sonja Lens (1953), 2 specimens.

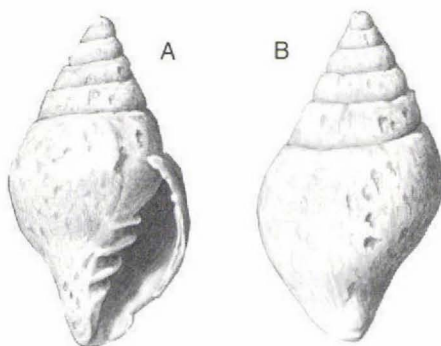


Fig. 171. *Conomitra* sp. 2,  $\times 6$

*Remarks.* The last whorl is more inflated than in *Conomitra* species 1 and the other whorls are lower. However, *C. species 2* is possibly just a variety of this species.

#### *Conomitra* Conrad, species 3 Fig. 172

Fig. 172A,B: MGUH 15.786, Sonja Lens (1953),  $\times 4$ .

*Additional material.* 1977. 990, 991, Sonja Lens (1952, 1953, 1954), 3 specimens.

*Remarks.* The form differs from *Conomitra* species 1 and 2 by its broad and flat folds on the whorls and the faint spiral threads.



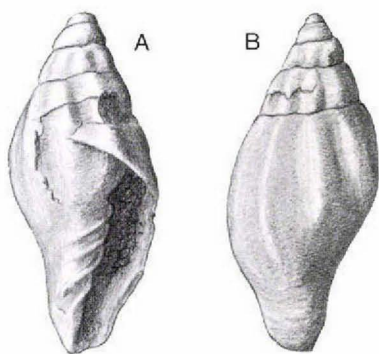


Fig. 172. *Conomitra* sp. 3,  $\times 4$

### *Conomitra* Conrad, species 4 Fig. 173

Fig. 173A,B: MGUH 15.787, Sonja Lens (1956),  $\times 3$ .

Fig. 173C: MGUH 15.788, Sonja Lens (1956),  $\times 3$ .

*Additional material.* 1977. 833, Sonja Lens (1951, 1953, 1956), numerous specimens; 1977. 834, Qaersutjægerdal, 1 specimen.

*Remarks.* *Conomitra* species 4 and 5 have three columellar plaits instead of the four present in the preceding forms. Cernohorsky (1970) has noted that the number of plaits in *Conomitra* varies between three and five. *Conomitra subcostata* described by Traub (1979) is closely related.

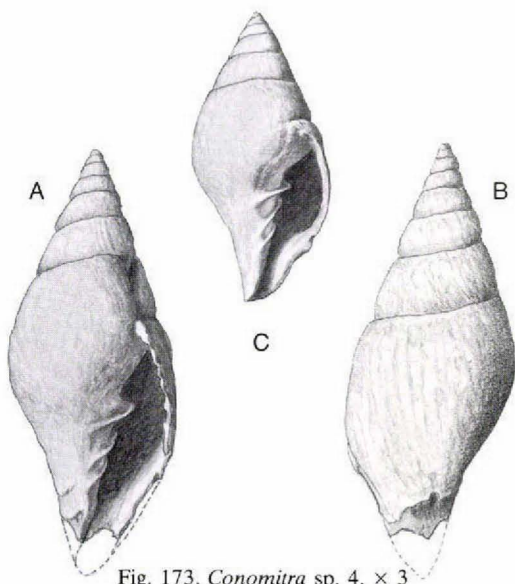


Fig. 173. *Conomitra* sp. 4,  $\times 3$

### *Conomitra* species 5

Fig. 174

Fig. 174A: MGUH 15.789, Sonja Lens (1953),  $\times 4$ .

Fig. 174B: MGUH 15.790, Sonja Lens (1956),  $\times 4$ .

*Additional material.* 1977. 979, 1206, Sonja Lens (1953, 1956), 14 specimens.

*Remarks.* The shells have the same shape as species 1, but the axial folds are not so strongly developed.

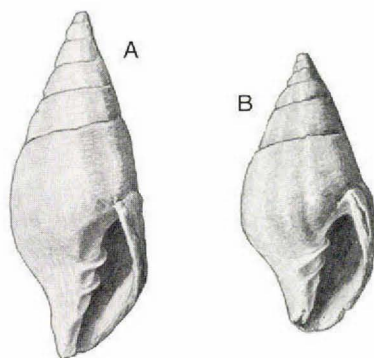


Fig. 174. *Conomitra* sp. 5,  $\times 4$

### Family FASCIOLARIIDAE

#### Subfamily FASCIOLARIINAE

### *Boltenella* Wade

Fig. 175

Fig. 175A,B: MGUH 15.791, Sonja Lens (1953),  $\times 2$ .

Fig. 175C: MGUH 15.792, Turritellakløft, large section (1948),  $\times 2$ .

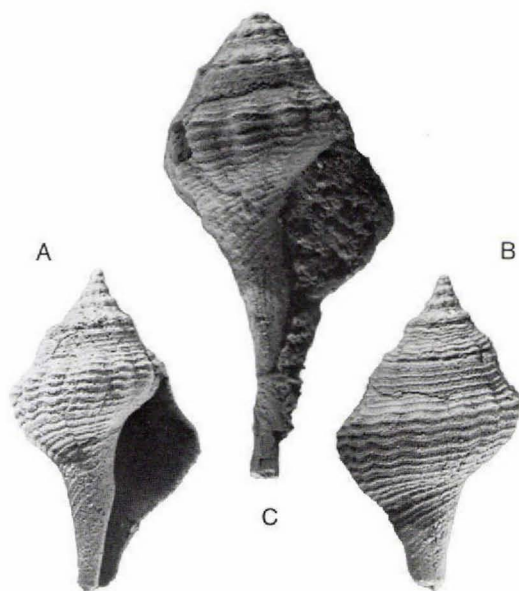
*Additional material.* 1977. 245–247, 258, 259, 276, 280, 283–288, 291, 292, 296, 298, 300–303, Turritellakløft, numerous examples; 1977. 261, 293, 304, Qaersutjægerdal, 6 specimens; 1977. 278, 281, 282, 295, 299, Sonja Lens (1948, 1951, 1953), 4 specimens; 1977. 1096, 1097, Sonja Lens, numerous specimens.

### Fasciolarinae, new genus

Fig. 176

Fig. 176A,B: MGUH 15.793, Sonja Lens (1956),  $\times 3$ .

*Additional material.* 1977. 881, 882, 1088, Sonja Lens (1956), 13 specimens.

Fig. 175. *Boltinella*,  $\times 2$ 

**Remarks.** The narrow channel and the straight columella with one plait characterise this form as a fascioliariid. The outer lip curves backwards down from the suture. The species differs from *Latirus* Montfort by its rather stout whorls and the folds inside the outer lip. *Clavilithes* Swainson has a longer channel. "*Charonia*" *krachi* Makarenko is related.

#### Subfamily FUSININAE

### *Fusinus* Rafinesque Fig. 177

Fig. 177A: MGUH 15.794, Sonja Lens (1958),  $\times 2$ .

Fig. 177B: MGUH 15.795, Turritellakløft, large section (1948),  $\times 2$ .

**Additional material.** 1977. 594, Sonja Lens (1958), 1 fragment; 1977. 585, 586, 590, Agatkløft, fragments; 1977. 584, 592, 593, Turritellakløft, large section, 3 fragments; 1977. 589, Qaersutjægerdal, 1 fragment.

**Remarks.** A total height of about 15 cm can be deduced from the fragments available. The deuteroconch is in agreement with that of

*Fusinus*. According to Wenz (1938–44), the protoconch should have only one and a half whorls, with axial ribs being present after the first whorl.

Fig. 176. Fascioliariinae, new genus,  $\times 3$ 

### *Kryptos* Dautzenberg & Fischer Fig. 178

Fig. 178A,B: MGUH 15.796, Sonja Lens (1953),  $\times 4$ .

**Additional material.** 1977. 1001–1003, Sonja Lens (1952, 1953, 1954, 1956, 1958), numerous specimens.

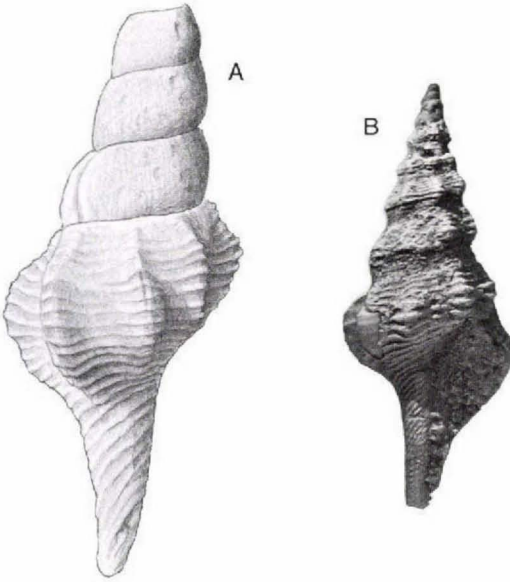


Fig. 177. *Fusinus*, A  $\times 12$ ; B,  $\times 2$

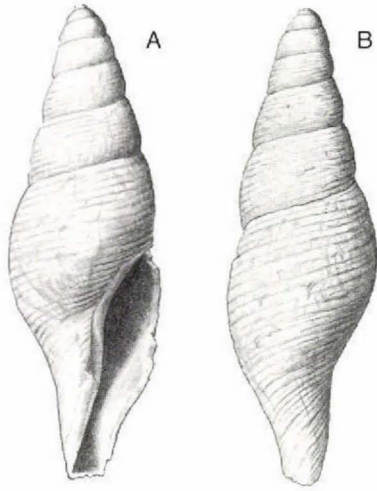


Fig. 179. *Streptolathyrus* sp. 1,  $\times 6$

*Streptolathyrus* Cossmann,  
species 1

Fig. 179A,B: MGUH 15.797, Sonja Lens (1958),  $\times 6$ .

Fig. 179

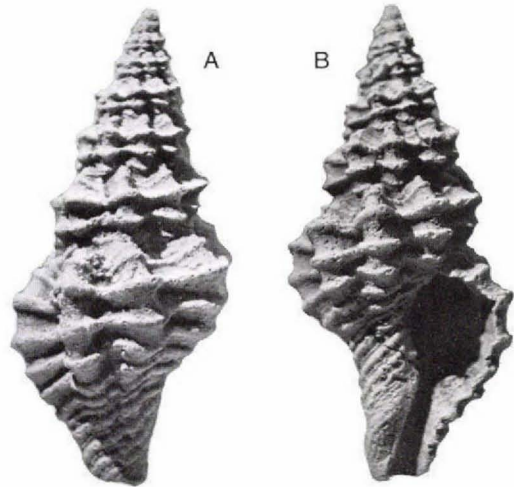


Fig. 178. *Kryptos*,  $\times 4$

*Streptolathyrus* Cossmann,  
species 2

Fig. 180

Fig. 180A,B: MGUH 15.798, Sonja Lens (1958),  $\times 6$ .

*Additional material.* 1977. 1317, Sonja Lens (1958), 1 fragment.

*Remarks.* The whorls are lower and more numerous than in *Streptolathyrus* species 1. However, in view of the scarcity of material, it is not certain if two different species are represented.

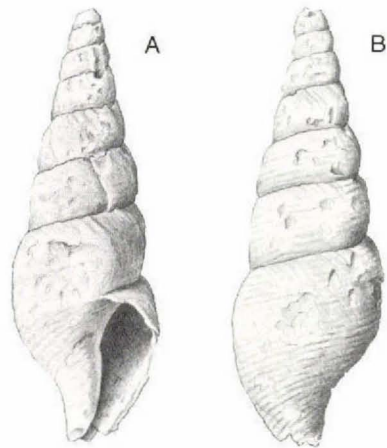


Fig. 180. *Streptolathyrus* sp. 2,  $\times 6$



New genus, cf. *Streptochetus*  
Cossmann

Fig. 181

Fig. 181A: MGUH 15.799, Sonja Lens (1953),  $\times 4$ .

Fig. 181B: MGUH 15.800, Sonja Lens (1953),  $\times 6$ .

*Additional material.* 1977. 1064, 1065, Sonja Lens (1953), numerous specimens.

*Remarks.* The form is distinguished from *Streptochetus* by its more regular axial ribs and the lack of folds or dentition on the interior of the outer lip.

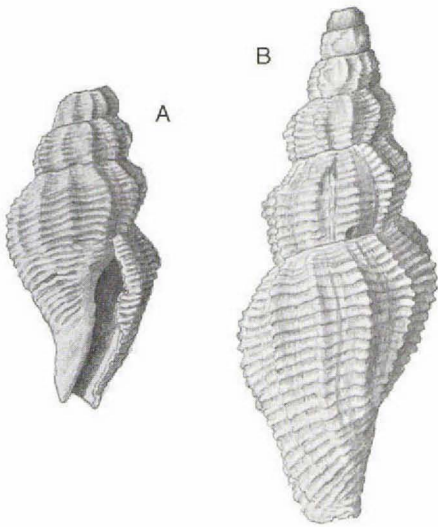


Fig. 181. New genus, cf. *Streptochetus*, A,  $\times 4$ ; B,  $\times 6$

*Buccinofusus* Conrad

Fig. 182

Fig. 182A,B: MGUH 15.801, Sonja Lens (1958),  $\times 6$ .

*Additional material.* 1977. 829, 1066, Sonja Lens (1953, 1956, 1958), 3 specimens.

*Remarks.* The grooves on the interior of the outer lip were only observed in small specimens.

New genus, cf. *Levifusus* Conrad,  
species 1

Fig. 183

Fig. 183: MGUH 15.802, Turrillaklöst, south side (1939),  $\times 2$ .

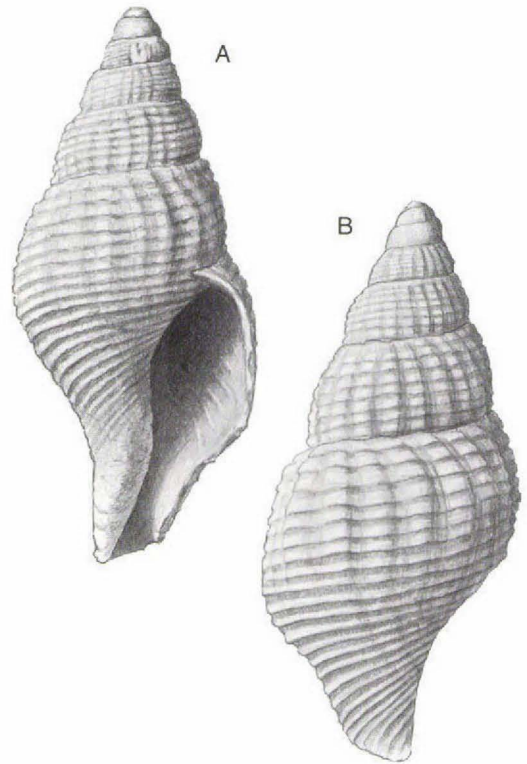


Fig. 182. *Buccinofusus*,  $\times 6$

*Additional material.* 1977. 297, Turrillaklöst, large section, 1 specimen; 1977. 308, Turrillaklöst, south side (1939), 1 specimen.

*Remarks.* The type species of *Levifusus*, *L. trabeatus* (Conrad), has a large last whorl with a broad sutural ramp and a carina in the lower part. This carina may be weak or even absent in other species assigned to *Levifusus* by Palmer (1937) which all have a bent columella and siphonal channel. The forms described here agree with *Levifusus* in terms of the broad but shallow sinuosity of the growth lines on the ramp. Their last whorls are not as inflated, do not have a carina in the lower part and the siphonal channel is straight. Although closely related, the present species are separated from *Levifusus* as a new genus, together with *Pleurotoma pagoda* Heilprin from the Claibornian and *L. amplus* (Briart & Cornet *sensu* Glibert, 1973).





Fig. 183. New genus, cf. *Levifusus* sp. 1,  $\times 2$



Fig. 184. New genus, cf. *Levifusus* sp. 2,  $\times 2$

New genus, cf. *Levifusus* Conrad,  
species 2 Fig. 184

Fig. 184: MGUH 15.803, Turrítellaklœft, large section (1946),  $\times 2$ .

*Remarks.* The base is more convex than in species 1 and the axial ribs are more prominent.

New genus, cf. *Haplovoluta* Wade  
Fig. 185

Fig. 185A,B: MGUH 15.804, Sonja Lens (1956),  $\times 1$ .

Fig. 185C: MGUH 15.805, Sonja Lens (1958),  $\times 4$ .

*Additional material.* 1977. 234–236, 238, 243, 244, 247–250, 254, 258, 260, 263, Turrítellaklœft, numerous specimens; 1977. 278, 284, 289, Sonja Lens (1953, 1958), numerous specimens; 1977. 237, 255, Agatklœft, 4 specimens; 1977. 262, 264, 266, 268, 285, 304 (part), Qaersutjægerdal, 14 specimens.

*Remarks.* The relationship between this and the preceding genus is about the same as that between *Haplovoluta* and *Hercorhyncus*, both described from the Upper Cretaceous of the North American Gulf coast. These are distinguished from each other primarily by the more dominant axial sculpture of the former, which also has axial sculpture on the basal sulcus. These differences are also apparent in the new genera from Greenland. The American forms are mainly different in possessing an angulation above the beginning of the basal sulcus.

*Exilia* Conrad Fig. 186

Fig. 186A,B: MGUH 15.806, Sonja Lens (1958),  $\times 3$ .

*Additional material.* 1977. 811, Turrítellaklœft (1946), 1 specimen.

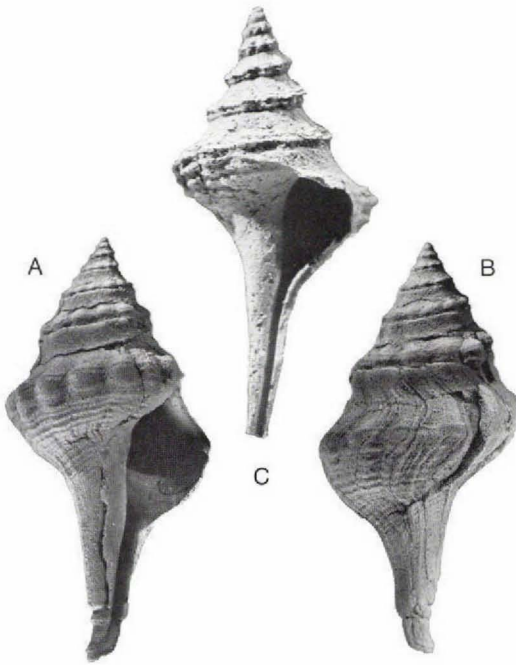


Fig. 185. New genus, cf. *Haplovoluta*, A,B,  $\times 1$ , C,  $\times 4$

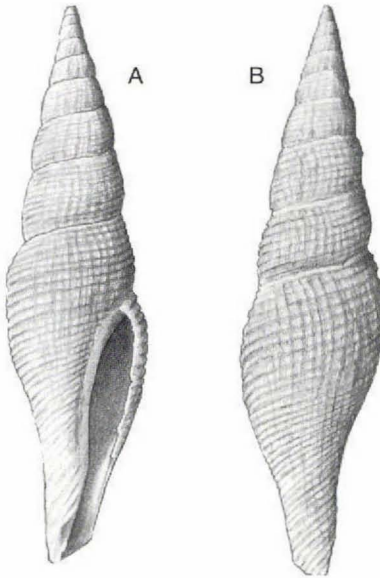


Fig. 186. *Exilia*,  $\times 3$

*Remarks.* Powell (1966) has expressed doubts as to whether or not *Exilia* Conrad actually belongs to the Turridae, to which it has usually been referred since Stewart (1927) pointed out a faint siphonal notch. In fact, this notch is not existent, the growth lines being only slightly sinuous in contrast to the situation in the turrids where they curve strongly backwards. *Exilia* is therefore assigned to the Fusinae.

*Fusus crassistriata* v. Koenen, which was assigned to *Exilia* by Ravn (1939) is a closely related species. It has also been described from the Lower Paleocene of the Ukraine by Makarenko (1976).

Family MURICIDAE  
Subfamily MURICINAE

New genus, cf. *Trophonopsis* Bucquoy,  
Dautzenberg & Dollfuss Fig. 187

Fig. 187A,B: MGUH 15.807, Sonja Lens (1958),  $\times 6$ .

*Additional material.* 1977. 743, 744, Sonja Lens (1952, 1953, 1954, 1956, 1958), numerous specimens; 1977. 745, Qaersutjægerdal (1958), 1 specimen; 1977. 746, Turritellakløft (1946), 1 specimen.

*Remarks.* *Pagodula* Monterosato and *Austrotrophon* Dall, subgenera of *Trophonopsis* with sharp axial ribs (Wenz, 1938–44), both differ from the specimen figured here by their longer channel. Specimens from Turritellakløft and Qaersutjægerdal are more coarsely ribbed than the ones from Sonja Lens. *Hexaplex* (*Murexul*) *hannonicus* (Briart & Cornet) of Glibert (1973) and *Murex nanus* Ravn should be assigned to the same genus.

*Muricopsis* Bucquoy, Dautzenberg  
& Dollfuss Fig. 188

Fig. 188A,B: MGUH 15.808, Sonja Lens (1956),  $\times 9$ .

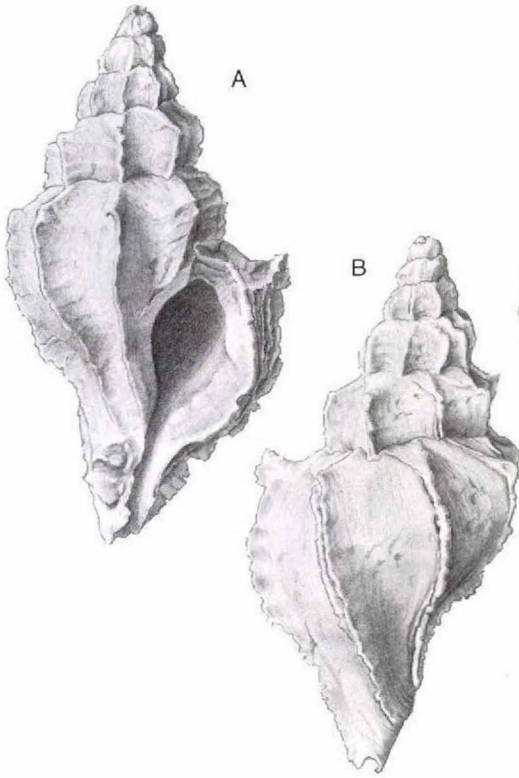


Fig. 187. New genus, cf. *Trophonopsis*,  $\times 6$

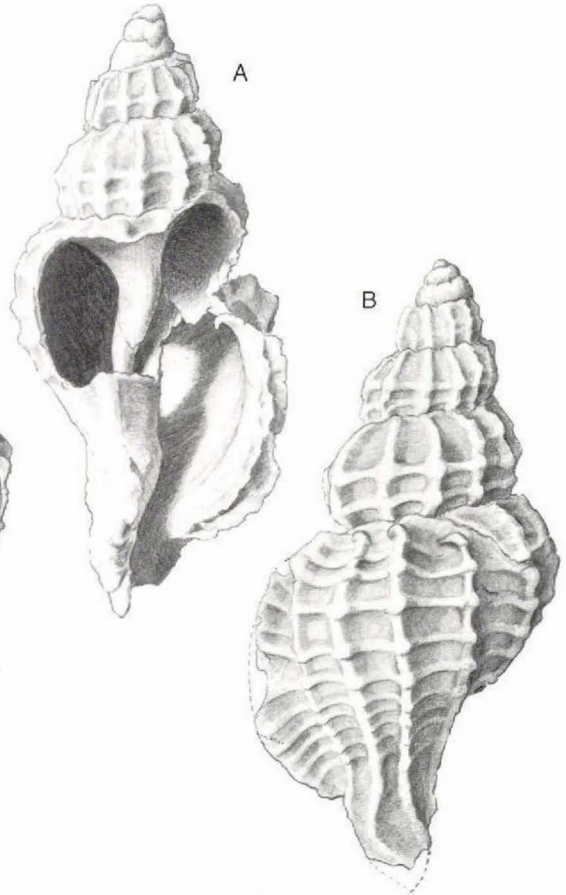


Fig. 188. *Muricopsis*,  $\times 9$

? *Muricopsis* Bucquoy, Dautzenberg  
& Dollfuss Fig. 189

Fig. 189: MGUH 15.809, Sonja Lens (1951),  $\times 8$ .

*Additional material.* 1977. 1993, Sonja Lens (1953), 3 specimens.

*Remarks.* These specimens, which are all incomplete, show strongly angulated whorls. The axial and spiral ribs form nodes together.

Superfamily Volutacea  
Family Olividae  
Subfamily Pseudolivinae

*Pseudoliva* Swainson,  
species 1

Fig. 190

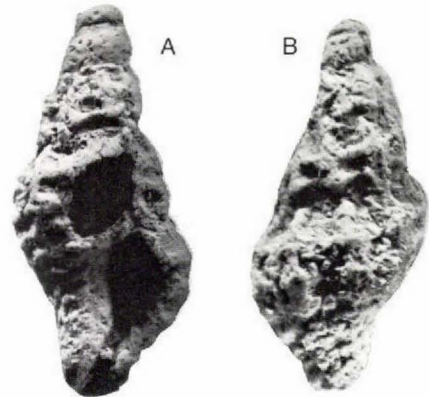


Fig. 189. ?*Muricopsis*,  $\times 8$



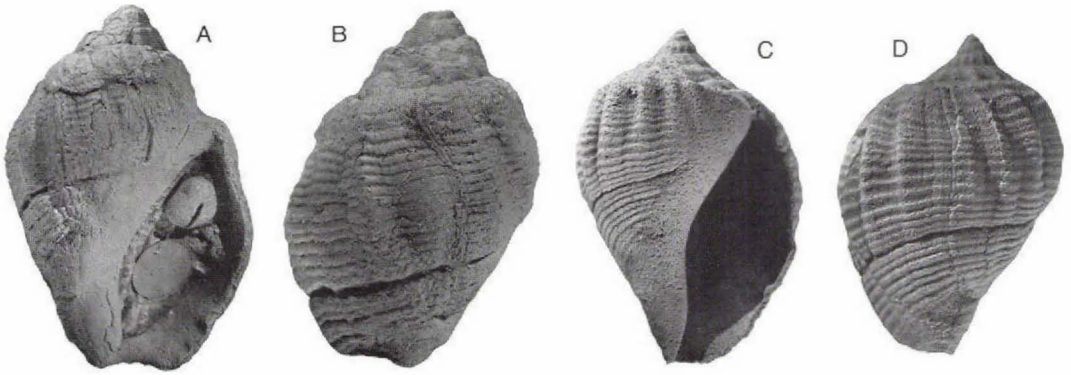


Fig. 190. *Pseudoliva* sp. 1, A,B,  $\times 1$ ; C,D,  $\times 2$

Fig. 190A,B: MGUH 15.810, Sonja Lens (1956),  $\times 1$ .

Fig. 190C,D: MGUH 15.811, Sonja Lens (1952),  $\times 2$ .

*Additional material.* 1977. 153, Sonja Lens, numerous specimens; 1977. 168–170, 172, 173, 176–179, 183, Turritellakløft, 16 specimens; 1977. 182, Agatkløft, 1 specimen.

*Remarks.* The axial sculpture gets weaker towards the aperture.

### *Pseudoliva* Swainson, species 2

Fig. 191

Fig. 191: MGUH 15.812, Sonja Lens (1956),  $\times 6$ .

*Additional material.* 1977. 145–148, 150, 152, 154–159, 161, 163, 164, 165, 167, 174, 175, Turritellakløft, numerous speci-

mens; 1977. 153, Sonja Lens, numerous specimens; 1977. 149, 151, Qaersutjægerdal, 3 specimens; 1977. 162 Agatkløft, 2 specimens.

*Remarks.* In common with a number of other species from the Calcaire de Mons described by Briart & Cornet (1870–87) and Glibert (1973), namely *Pseudoliva robusta* Briart & Cornet, *P. briarti* Vincent, *P. chavani* Glibert, *P. curvicos-tata* Briart & Cornet, *P. elisae* Briart & Cornet and *P. tenuicostata* Briart & Cornet, the Greenland specimens have coarse axial ribs. In most of these species spiral ribs are developed at least below the spiral groove. The shells are anom-phalous in common with *Buccinorbis* Conrad from North America, but have a large siphonal fasciole.

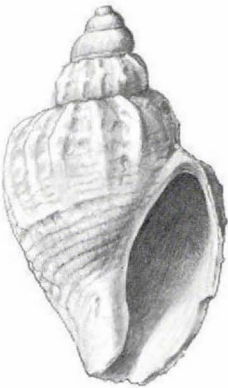


Fig. 191. *Pseudoliva* sp. 2,  $\times 6$

### *Strepsidura* Swainson

Fig. 192

Fig. 192A,B: MGUH 15.813, Turritellakløft (1946),  $\times 3$ .

*Additional material.* 1977. 432, Sonja Lens (1953), 1 fragment.

### Subfamily OLIVINAE

### *Ancillus* Montfort

Fig. 193

Fig. 193A,B: MGUH 15.814, Turritellakløft (1948),  $\times 4$ .



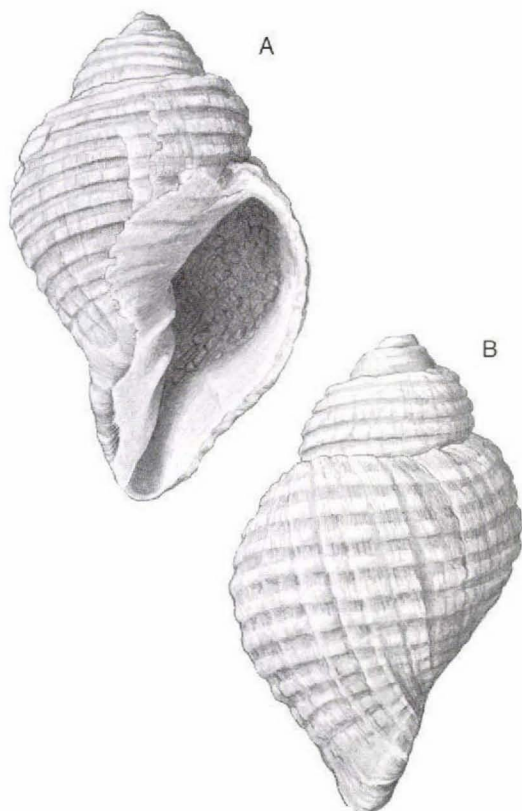


Fig. 192. *Strepsidura*,  $\times 3$

*Additional material.* 1977. 129, 131, 132, Turritellakløft, 5 specimens; 1977. 133, Qaersutjægerdal, 1 specimen.

*Remarks.* The spire is rather obtuse for a species of *Ancillus*, but other shell characters are in agreement with the generic description. "*Ancillus buccinoides* Lamarck" of Briart & Cornet (1870–87) from the Calcaire de Mons and *Ancilla flexuosa* (v. Koenen) from the Paleocene of Copenhagen and from Northwest Germany (Anderson, 1975) are closely related.

#### *Ancillarina* Bellardi

Fig. 194

Fig. 194A,B: MGUH 15.815, Sonja Lens (1956),  $\times 6$ .  
Fig. 194C,D: MGUH 15.816, Sonja Lens (1958),  $\times 4$ .

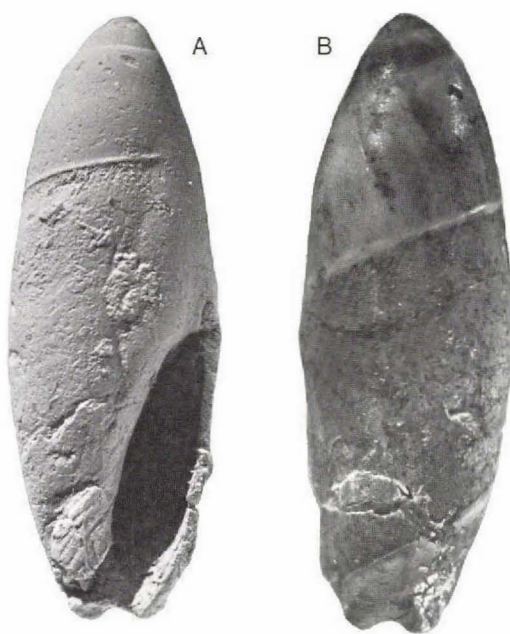


Fig. 193. *Ancillus*,  $\times 4$

*Additional material.* 1977. 1089, 1091, 1092, Sonja Lens (1953, 1956, 1958), 4 specimens; 1977. 1090, Turritellakløft, large section, 2 specimens.

#### Family VASIDAE

##### aff. *Tudicla* Roeding

Fig. 195

Fig. 195: MGUH 15.817, Turritellakløft (1946),  $\times 1.5$ .

*Remarks.* This small fragment of a gastropod has two keels on the whorl profile. The columella is bent at the beginning of the siphonal channel.

#### Family HARPIDAE

##### *Harpa* Walch

Fig. 196

Fig. 196A: MGUH 15.818, Turritellakløft, large section (1946),  $\times 6$ .

Fig. 196B: MGUH 15.819, Turritellakløft, large section (1946),  $\times 6$ .

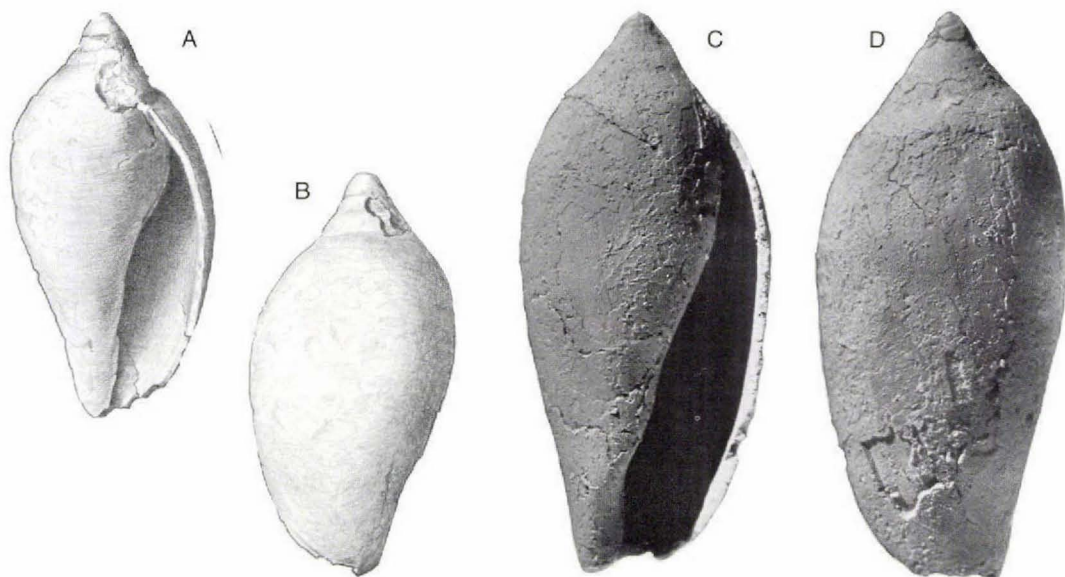


Fig. 194. *Ancillarina*, A,B,  $\times 6$ ; C,D,  $\times 4$

# Family VOLUTIDAE

## *Psephaea* Crosse

Fig. 197

Fig. 197: MGUH 15.820, Sonja Lens (1958),  $\times 6$ .

*Additional material.* 1977. 1303, Sonja Lens (1961), 2 specimens.

*Remarks.* Two columellar plications are visible in the aperture. In *Psephaea* two additional plications occur in the interior of the whorls, but these cannot be seen in complete apertures. In the Claibornian of the southern United States Palmer (1937) has assigned a group of less highly spired but otherwise similar shells with the same sculpture to *Athleta*.



Fig. 195. aff. *Tudicla*,  $\times 1.5$

## *Volutocorbis* Dall

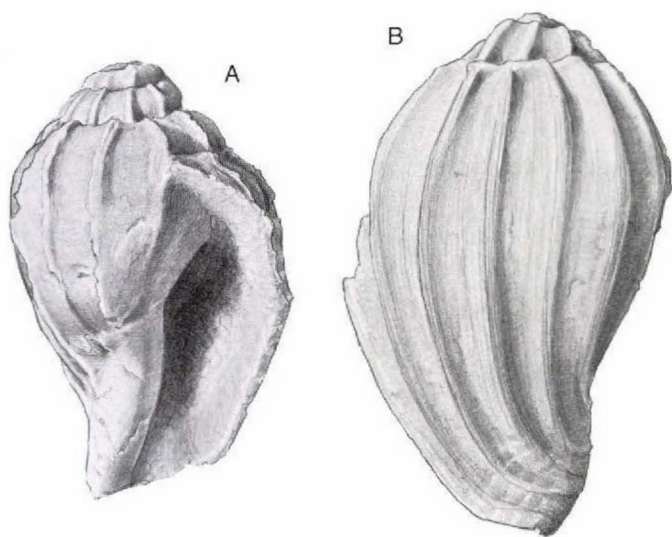
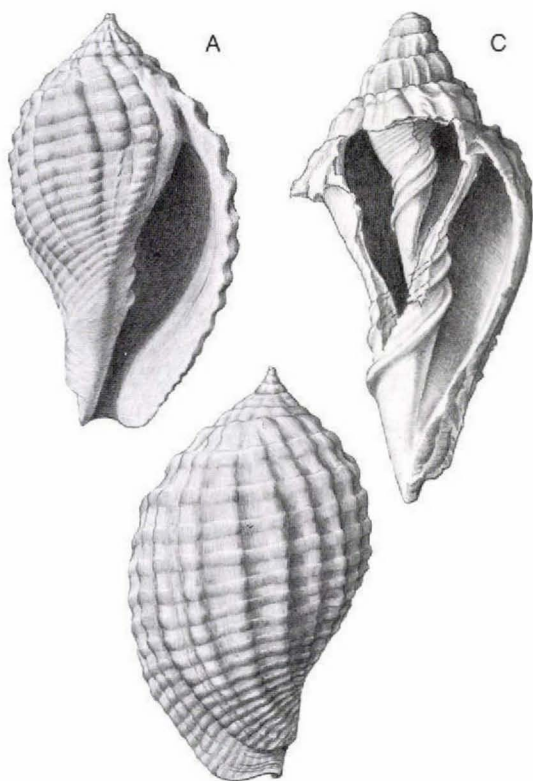
Fig. 198

Fig. 198A,B: MGUH 15.821, Sonja Lens (1956),  $\times 6$ .

Fig. 198C: MGUH 15.822, Sonja Lens (1958),  $\times 6$ .

*Additional material.* 1977. 195, 210, 211, 213, 217, 230, 231, Sonja Lens, 26 specimens; 1977. 184, 199, 221, 233, Qaersut-jægerdal, 6 specimens; 1977. 185, 192, 200–203, 205–209, 212, 214–216, 218, 219, 222–227, 229, Turrillakløft, large section, numerous specimens; 1977. 220, 228, Agatkløft, 3 specimens.

*Remarks.* *Voluta nodifera* v. Koenen from Denmark and *Volutilithes limopsis* (Conrad) from the Midway Formation of North America belong to the same genus and are closely related.

Fig. 196. *Harpa*,  $\times 6$ Fig. 197. *Psephaea*,  $\times 6$ Fig. 198. *Volutocorbis*,  $\times 6$ 

### Volutidae, indeterminate Fig. 199

Fig. 199A,B: MGUH 15.823, Sonja Lens (1956),  $\times 12$ .

### Family CANCELLARIIDAE

### *Merica* Adams & Adams Fig. 200

Fig. 200A: MGUH 15.824, Qaersutjægerdal (1958),  $\times 3$ .

Fig. 200B: MGUH 15.825, Agatkloft, east side (1948),  $\times 3$ .

### *Aneurystoma* Cossmann, species 1 Fig. 201

Fig. 201: MGUH 15.826, Sonja Lens (1953),  $\times 3$ .

*Additional material.* 1977. 1180, Sonja Lens (1956, 1958), 2 specimens.

*Remarks.* The whorls have a small sutural ramp which does not come out well in the figures. *Aneurystoma* species 1, 2 and 3 can be separated easily from each other although they are morphologically very similar. *Cancellaria propinqua* Kounhowen from Maastricht is closely related.



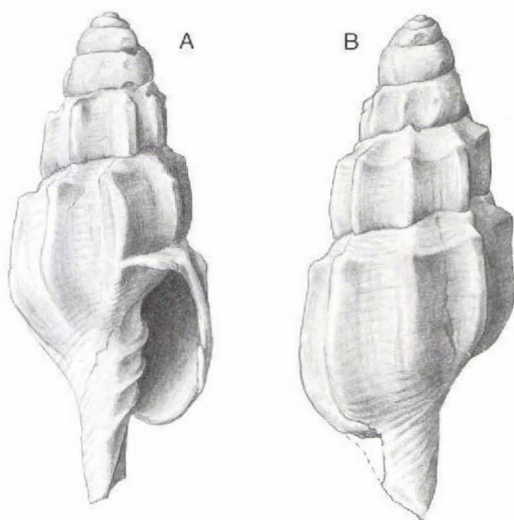


Fig. 199. Volutidae, indeterminate,  $\times 12$

*Aneurystoma* Cossmann,  
species 2

Fig. 202

Fig. 202A,B: MGUH 15.827, Sonja Lens (1953),  $\times 6$ .

*Additional material.* 1977. 812, Sonja Lens (1956, 1958), 31 specimens.

*Remarks.* The ramp is broader in this species than in species 1 and the grooves are very narrow. *Cancellaria conoidea* v. Koenen, which Ravn (1939) assigned to *Admete* Krøyer, is closely related. Makarenko (1976) has assigned the same species to *Unitas* Harris & Palmer.

*Aneurystoma* Cossmann,  
species 3

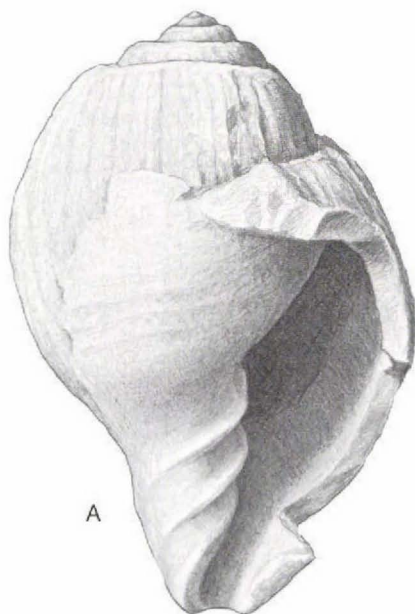
Fig. 203

Fig. 203A,B: MGUH 15.828, Sonja Lens (1953),  $\times 8$ .

Fig. 203C: MGUH 15.829, Sonja Lens (1953),  $\times 8$ .

*Additional material.* 1977. 841, 1200, 1201, 1238 (partly), Sonja Lens (1953, 1956, 1958), numerous specimens.

*Remarks.* *Aneurystoma* species 3 differs from species 1 in terms of its stronger, broader ramp. Species 3 is distinguished from species 2 on ac-



A



B

Fig. 200. *Merica*,  $\times 3$

count of its broader grooves on the whorls and the more prominent growth lines. *Aneurystoma* species 3 is also closely related to *Cancellaria conoidea* v. Koenen.



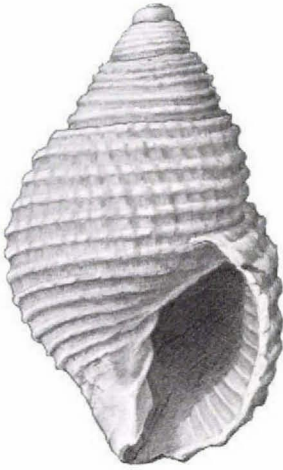


Fig. 201. *Aneurystoma* sp. 1,  $\times 3$

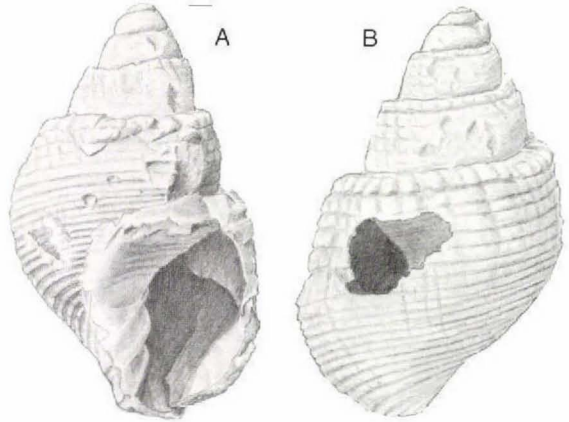


Fig. 202. *Aneurystoma* sp. 2,  $\times 6$

*Sveltella* Cossmann, species 1 Fig. 204

Fig. 204A,B: MGUH 15.830, Sonja Lens (1956),  $\times 6$ .

*Additional material.* 1977. 1231, Sonja Lens (1958), 1 specimen.

*Remarks.* This species is narrowly umbilicate. *Sveltia multistriata* Ravn, and perhaps also *Cancellaria curta* v. Koenen from which only a fragment is described, belong to the same genus.

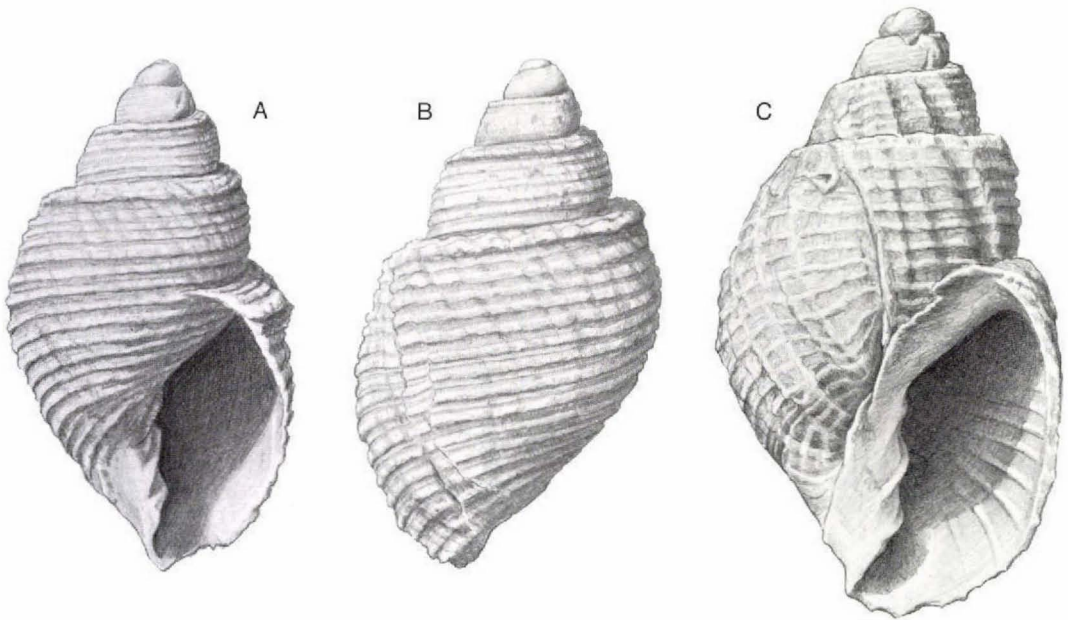


Fig. 203. *Aneurystoma* sp. 3, A,B,  $\times 8$ ; C,  $\times 8$

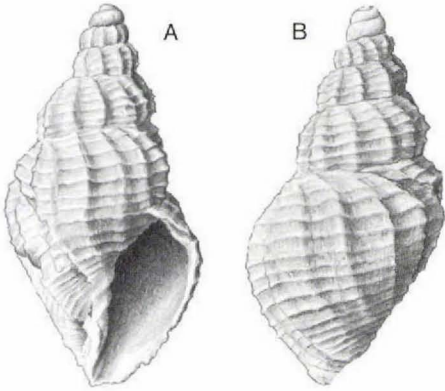


Fig. 204. *Sveltella* sp. 1,  $\times 6$

*Sveltella* Cossmann, species 2 Fig. 205

Fig. 205: MGUH 15.831, Sonja Lens (1956),  $\times 12$ .

*Additional material.* 1977. 1238, Sonja Lens (1956, 1958), 2 specimens.

*Remarks.* The axial ribs are thinner than in *Sveltella* species 1, and rather strong varices occur between them. The second feature is especially characteristic of *S. multistriata* Ravn from the Paleocene of Copenhagen which seems closely related to this form.



Fig. 205. *Sveltella* sp. 2,  $\times 12$

*Sveltella* Cossmann, species 3 Fig. 206

Fig. 206A,B: MGUH 15.832, Sonja Lens (1958),  $\times 12$ .

*Additional material.* 1977. 1313, Sonja Lens (1958), 4 specimens.

*Remarks.* This form is more slender and has higher whorls than *Sveltella* species 1 and 2. In addition, the axial ribs are flatter and broader.

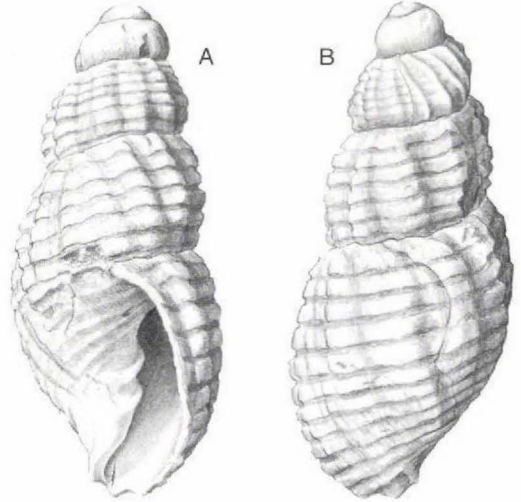


Fig. 206. *Sveltella* sp. 3,  $\times 12$

*Cancelrana* Palmer, species 1 Fig. 207

Fig. 207A,B: MGUH 15.833, Sonja Lens (1953),  $\times 12$ .

*Additional material.* 1977. 842–845, Sonja Lens (1948, 1952, 1956, 1958), numerous specimens; 1977. 846, Turritellakløft, large section, 1 specimen.

*Remarks.* Related species are *Cancelrana finexa* (Harris), which is the type species of the genus from the Claibornian and *C. angulifera* v. Koenen from Copenhagen.

*Cancelrana* Palmer, species 2 Fig. 208

Fig. 208A,B: MGUH 15.834, Sonja Lens (1953),  $\times 12$ .

*Additional material.* 1977. 1202, Sonja Lens (1953, 1958), 3 specimens.

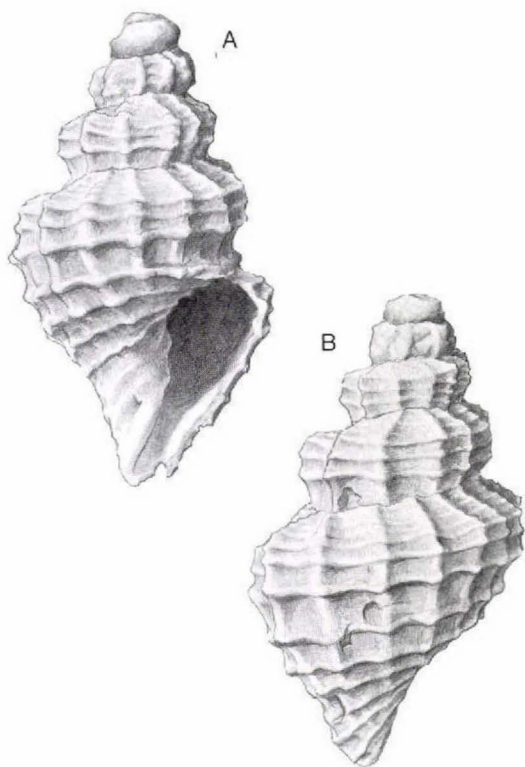


Fig. 207. *Cancellrana* sp. 1,  $\times 12$

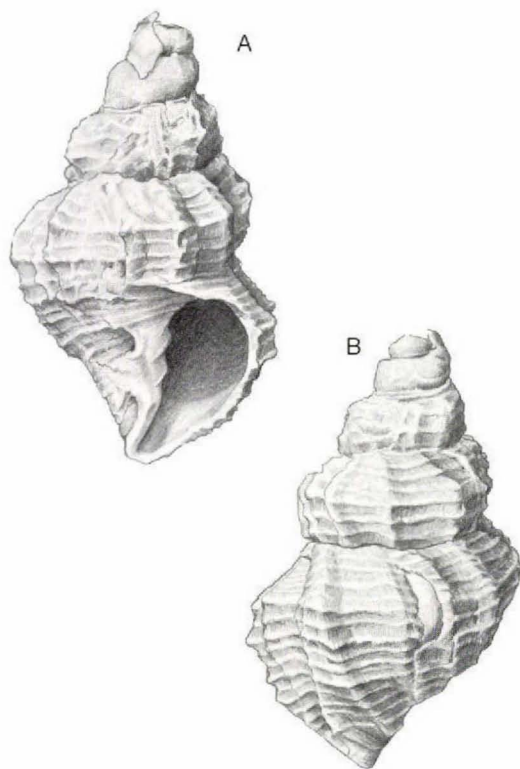


Fig. 208. *Cancellrana* sp. 2,  $\times 12$

*Remarks.* The aperture is not as high as in *Cancellrana* species 1 and the umbilicus is wider. The ramp bears more spiral threads. However, as in *C.* species 1, related species include *C. finexa* and *C. angulifera*.

### *Admete* Krøyer

Fig. 209

Fig. 209: MGUH 15.835, Sonja Lens (1953),  $\times 3$ .

*Additional material.* 1977. 1006, Sonja Lens (1956), 1 specimen.

*Remarks.* Only two plaits are visible on the columella, although a third may originate from the upper termination of the channel in the interior of the shell. The twisted columella is characteristic for *Admete*.

### cf. *Bonellitia* Josseume

Fig. 210

Fig. 210A,B: MGUH 15.836, Sonja Lens (1956),  $\times 6$ .

*Additional material.* 1977. 1183, 1184, Sonja Lens (1953, 1954, 1956, 1958), 22 specimens.

*Remarks.* The axial sculpture in these shells consists only of varices and not of thin ribs as has been described by Cossmann (1889) and Wenz (1938–44). However, after consideration of the other morphologic features, the form is assigned tentatively to *Bonellitia*.

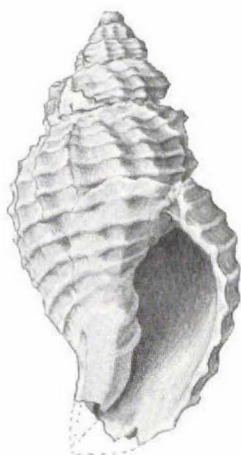
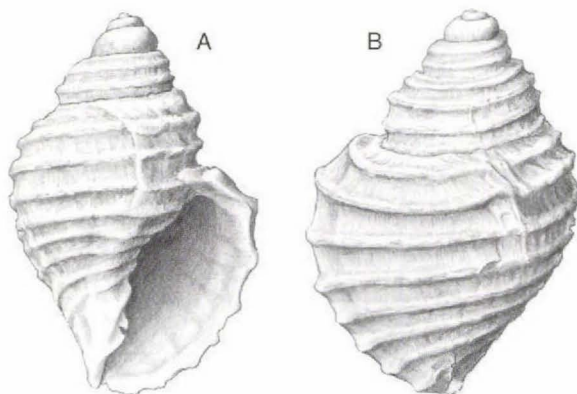
### *Coptostoma* Cossmann

Fig. 211

Fig. 211A,B: MGUH 15.837, Sonja Lens (1948),  $\times 6$ .

*Additional material.* 1977. 828, Sonja Lens (1956, 1958), 8 specimens.

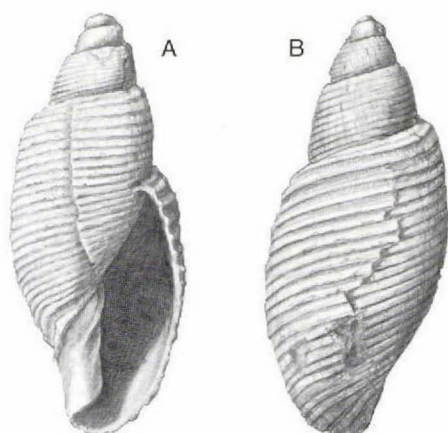
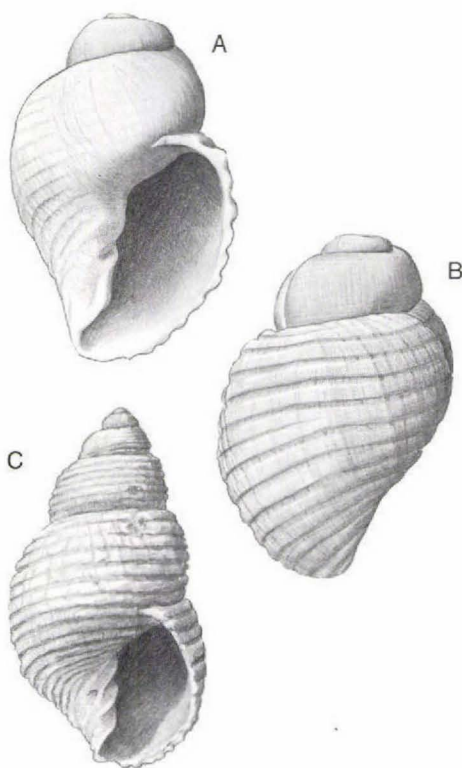


Fig. 209. *Admete*,  $\times 3$ Fig. 210. cf. *Bonellitia*,  $\times 6$ cf. *Coptostoma* Cossmann Fig. 212Fig. 212A,B: MGUH 15.838, Sonja Lens (1958),  $\times 24$ .Fig. 212C: MGUH 15.839, Sonja Lens (1953),  $\times 6$ .

*Additional material.* 1977. 806, 807, 813, 1054, 1164, 1181, Sonja Lens (1952, 1953, 1956, 1958), numerous specimens; 1977. 808, Turritellakløft, large section (1946), 1 specimen.

*Remarks.* This form differs from *Coptostoma* in terms of its low and convex last whorl, although the columella, with three plaits, is similar. There is some variation in the number and separation of the spiral grooves, and in the inflation of the

whorls, but it is not possible to distinguish the six different species which Rosenkrantz (in ms) had suggested.

Fig. 211. *Coptostoma*,  $\times 6$ Fig. 212. cf. *Coptostoma*, A,B,  $\times 24$ ; C,  $\times 6$



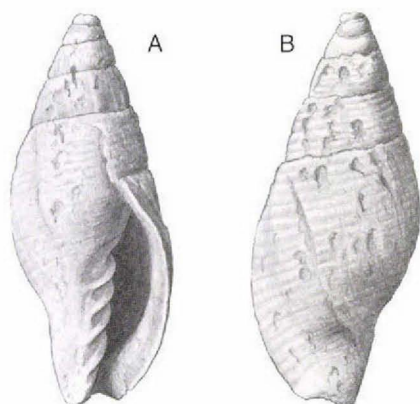


Fig. 213. *Tiara*,  $\times 6$

Suborder TOXOGLOSSA  
Superfamily MITRACEA  
Family MITRIDAE

*Tiara* Swainson

Fig. 213

Fig. 213A,B: MGUH 15.840, Sonja Lens (1956),  $\times 6$ .

Superfamily CONACEA  
Family TURRIDAE

*Turricula* Schumacher

Fig. 214

Fig. 214A,B: MGUH 15.844, Qaersutjægerdal (1952),  $\times 2$ .

Fig. 214C: MGUH 15.842, Kangilia (1949),  $\times 2$ .

*Additional material.* 1977. 722, Turritellakløft, 1 specimen; 1977. 723, Qaersutjægerdal, 2 specimens; 1977. 724, Kangilia, 2 specimens.

*Remarks.* *Turricula steinbacherae* Traub is closely related (Traub, 1979).

*Surcula* Adams & Adams

Fig. 215

Fig. 215A,B: MGUH 15.843, Sonja Lens (1958),  $\times 4$ .

*Additional material.* 1977. 1304, Turritellakløft, large section, 2 specimens.

*Remarks.* Growth lines, not visible in the figure, indicate a deep anal sinus on the ramp.

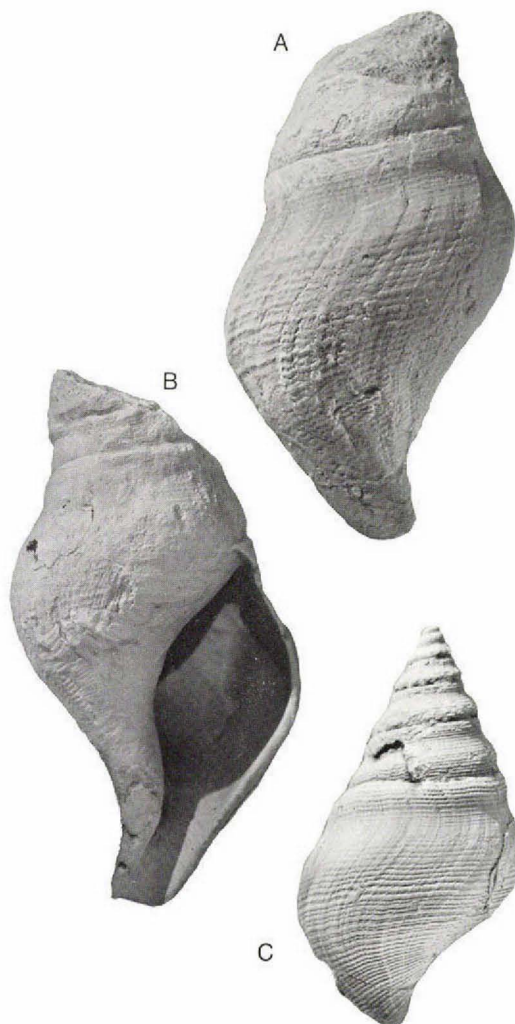


Fig. 214. *Turricula*,  $\times 2$

*Crenaturricula* Vokes,  
species 1

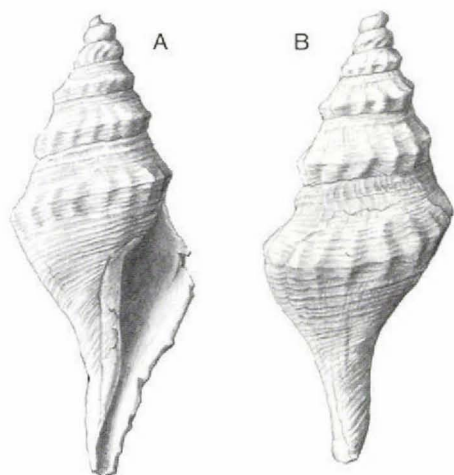
Fig. 216

Fig. 216: MGUH 15.844, Sonja Lens (1958),  $\times 3$ .

*Crenaturricula* Vokes,  
species 2

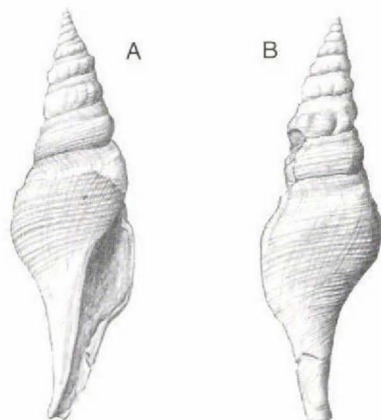
Fig. 217

Fig. 217A,B: MGUH 15.845, Turritellakløft, large section (1953),  $\times 1.5$ .

Fig. 215. *Surcula*,  $\times 4$ Fig. 216. *Crenaturricula* sp. 1,  $\times 3$ 

*Additional material.* 1977. 531, 532, 542, 544–546, 548, 550–554, 556, 557, 560–562, 905, 906, 1318, 1335, Turritelakløft, large section (1939, 1946, 1948, 1953, 1956), numerous specimens; 1977. 558, 1319, Sonja Lens (1953, 1958), 6 specimens; 1977. 543, 549, 599, Qaersutjægerdal (1946, 1953, 1958), 9 specimens.

*Remarks.* The whorls are higher and the last one is more convex than in *Crenaturricula* species 1. This species also lacks sculpture other than nodes on the angulation, while *C.* species 2 is covered by spiral threads. The growth lines indicate a medium deep sinus on the ramp, with the deepest point closer to the angulation than to the suture. *Pleurotoma torelli* v. Koenen and *Pleurotoma hauniensis* v. Koenen are related forms.

Fig. 217. *Crenaturricula* sp. 2,  $\times 1.5$ 

### *Crenaturricula* Vokes, species 3

Fig. 218

Fig. 218A,B: MGUH 15.846, Sonja Lens (1958),  $\times 6$ .

*Additional material.* 1977. 1319 (part), 1333, Sonja Lens (1956, 1958), 4 specimens.

*Remarks.* *Crenaturricula* species 3 has fewer nodes on the whorl carination than species 1 and 2, and the profile is more concave above the carination.

### *Hemisurcula* Casey

Fig. 219

Fig. 219A,B: MGUH 15.847, Sonja Lens (1956),  $\times 3$ .

*Additional material.* 1977. 916, Turritelakløft (1948), 1 specimen.

*Remarks.* *Pleurotoma inconspicua* v. Koenen is related.

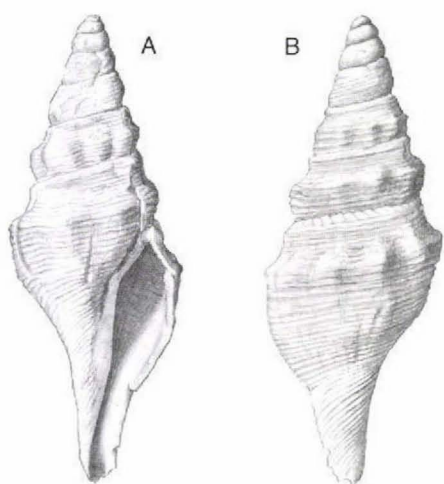


Fig. 218. *Crenaturricula* sp. 3,  $\times 6$

*Clinura* Bellardi, species 1 Fig. 220

Fig. 220A,B: MGUH 15.848, Sonja Lens (1956),  $\times 6$ .

Fig. 220C,D: MGUH 15.849, Turritellakløft, large section (1948),  $\times 2$ .

*Additional material.* 1977. 597, Angnertuneq (1939), 1 specimen; 1977. 578, 580, 582, 583, Turritellakløft (1946, 1948, 1949), 7 specimens; 1977. 581, Sonja Lens (1953), 3 specimens.

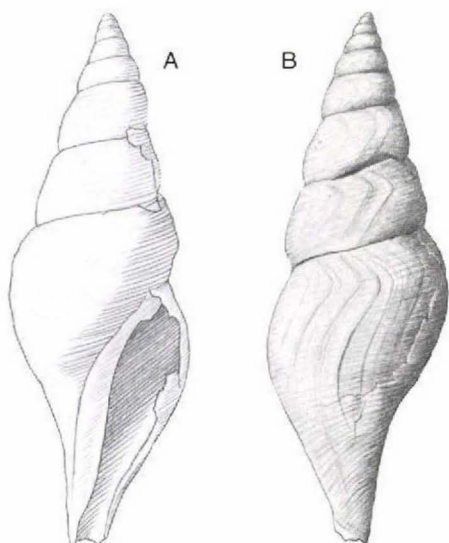


Fig. 219. *Hemisurcula*,  $\times 3$

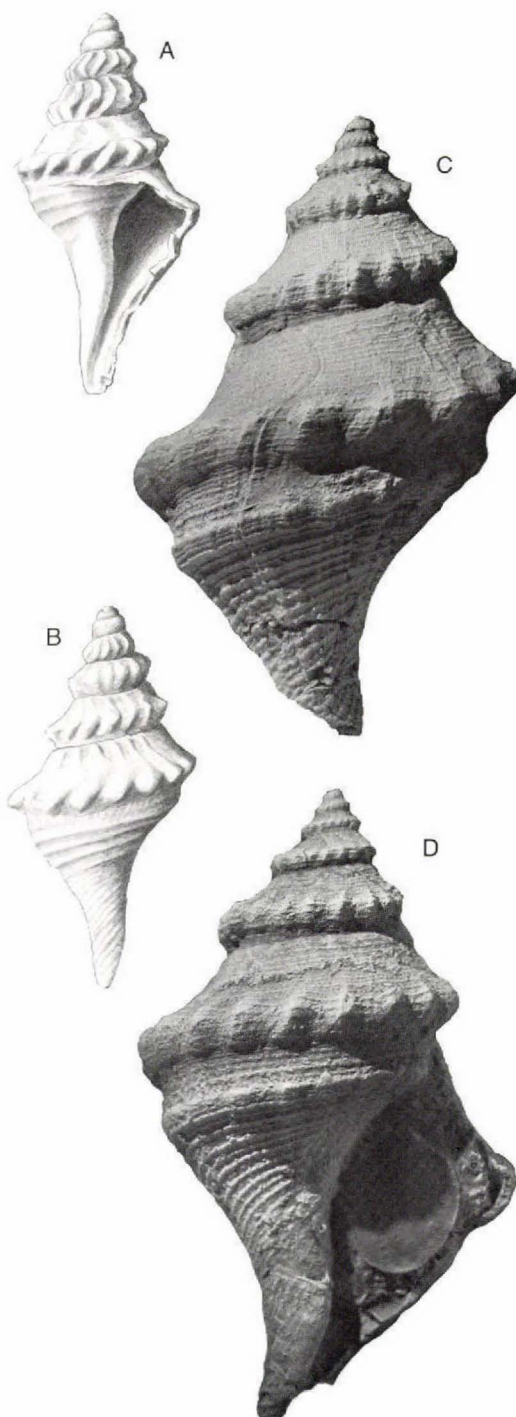


Fig. 220. *Clinura* sp. 1, A,B  $\times 6$ ; C,D,  $\times 2$

*Remarks.* The drawing of the specimen from Sonja Lens (Fig. 220A,B) does not adequately show the angulation below the noded keel which is present as in the other specimen. The related species, *Pleurotoma brevior* v. Koenen, sometimes has a third angulation.

### *Clinura* Bellardi, species 2      Fig. 221

Fig. 221: MGUH 15.850, Sonja Lens (1952),  $\times 6$ .

*Remarks.* This form is very similar to *Clinura* species 1 but has a lower base with only longitudinal threads. *Surcula* (*Cochlespira*) *bøggildi* Ravn is related.

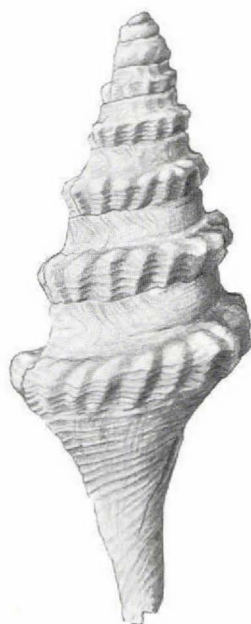


Fig. 221. *Clinura* sp. 2,  $\times 6$

### *Surculites* Conrad      Fig. 222

Fig. 222: MGUH 15.851, Tunorssuaq, Danienkloft (1957),  $\times 3$ .

*Additional material.* 1977. 1097, 1298, 1953, Sonja Lens (1952, 1953, 1956), 5 specimens.

*Remarks.* The genus *Surculites* resembles *Clinura* but has a more slender shell and is less ornamented. Ravn (1939) figured two shells from the Paleocene of Copenhagen under the name *Surcula* (*Cochlespira*) *bøggildi*. The more slender one, which he figured on plate 4, fig. 14, is closely related to the species discussed here. *Surculites bilineatus* is also closely related (Traub, 1980).

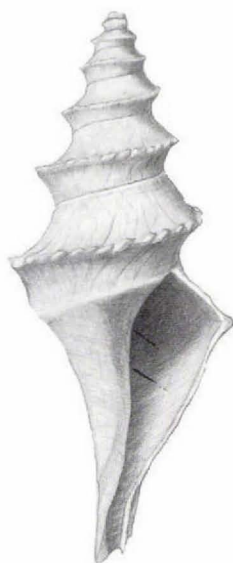


Fig. 222. *Surculites*,  $\times 3$

### cf. *Leucosyrinx* Dall      Fig. 223

Fig. 223A,B: MGUH 15.852, Sonja Lens (1952),  $\times 8$ .

Fig. 223C,D: MGUH 15.853, Sonja Lens (1958),  $\times 2$ .

*Additional material.* 1977. 894, 897–904, 907, 908, Turritelakløft (1948, 1949, 1953, 1957), 21 specimens; 1977. 913, 1122, Sonja Lens (1952–1954, 1956), 9 specimens.

*Remarks.* The shells agree well with *Leucosyrinx* in terms of their long, terminally slightly backwards bent siphonal channel, but the sinus is normally closer to the keel. Small specimens show a distinct row of nodes below the suture, but these become flattened in larger examples.



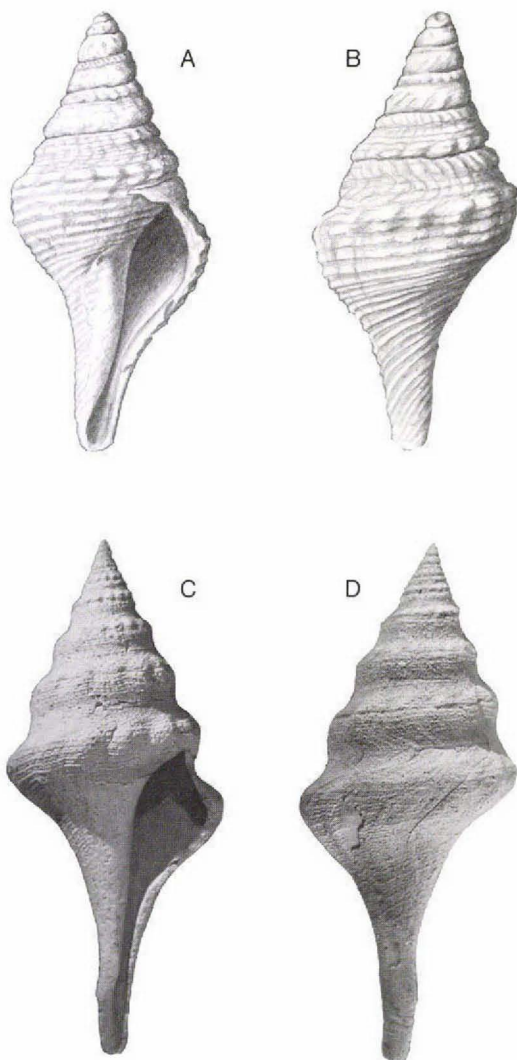


Fig. 223. cf. *Leucosyrinx*, A,B,  $\times 8$ ; C,D,  $\times 2$

### *Turris* Roeding

Fig. 224

Fig. 224: MGUH 15.854, Turrnellakløft, large section (1961),  $\times 6$ .

*Additional material.* 1977. 866, Turrnellakløft (1946), 4 specimens; 1977. 867, Sonja Lens (1958), 5 specimens.

*Remarks.* *Pleurotoma* (*Hemipleurotoma*) *gryi* Ravn, which is probably the same as *P. cf. P. reticulosa sensu v. Koenen*, is closely related.

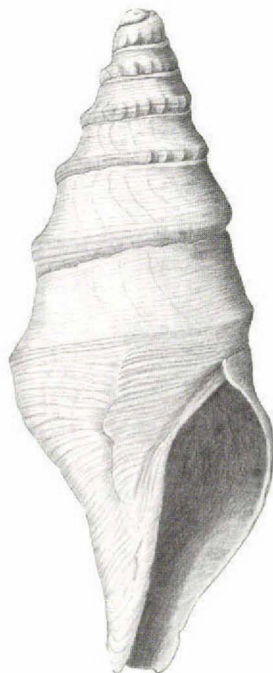


Fig. 224. *Turris*,  $\times 6$

### *Hemipleurotoma* Cossmann Fig. 225

Fig. 225A,B: MGUH 15.855, Sonja Lens (1958),  $\times 3$ .

*Additional material.* 1977. 564, 1256, Sonja Lens (1951, 1952, 1953, 1956, 1958), numerous examples; 1977. 566–574, 576, 905, 910, Turrnellakløft (1946, 1948, 1953), 21 specimens; 1977. 575, Qaersutjægerdal (1953), 2 specimens.

*Remarks.* The shape of the anal sinus and the growth lines are shown by the axial ribs. *Pleurotoma seelandica v. Koenen* is closely related.

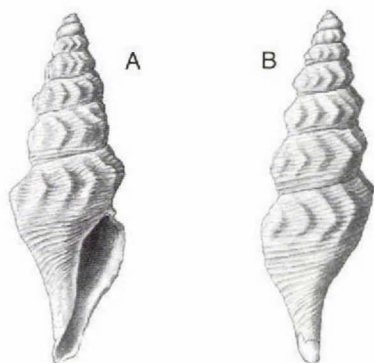
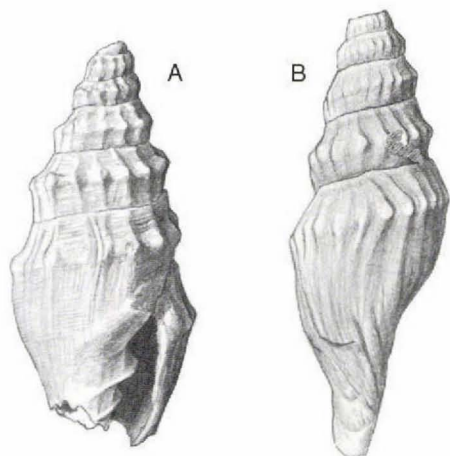
### *Cordieria* Rouault

Fig. 226

Fig. 226A: MGUH 15.856, Turrnellakløft, large section (1948),  $\times 4$ .

Fig. 226B: MGUH 15.857, Turrnellakløft, large section (1946),  $\times 4$ .

*Additional material.* 1977. 556, 1328, 1330–1332, Turrnellakløft (1946, 1948, 1953, 1956), 5 specimens.

Fig. 225. *Hemipleurotoma*, × 3Fig. 227. *Pseudotoma*, × 2Fig. 226. *Cordieria*, × 4

*Remarks.* This form comes very close to *Amuletum* Stephenson which is hitherto only known from the Cretaceous of the American Gulf coast. It differs only in terms of its shorter siphonal channel. The subsutural collar is more pronounced in some specimens than in the figured one.

### *Pseudotoma* Bellardi

Fig. 227

Fig. 227: MGUH 15.858, Turritellakløft, large section (1946), × 2.

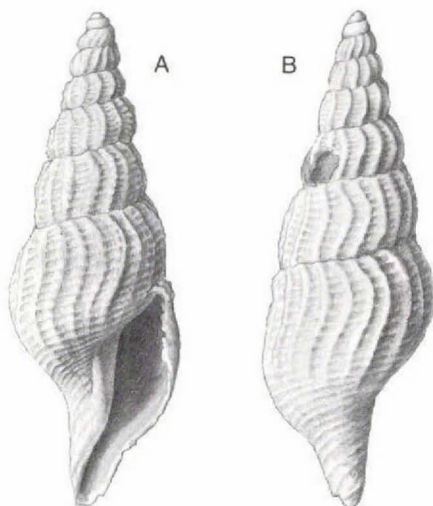
*Additional material.* 1977. 883, 887, 888, 890, Turritellakløft (1946, 1948, 1958), 7 specimens; 1977. 889, Qaersutjægerdal (1953) 1 specimen.

### cf. *Amuletum* Stephenson

Fig. 228

Fig. 228A,B: MGUH 15.859, Sonja Lens (1956), × 6.

*Additional material.* 1977. 810, 1301, Sonja Lens (1953, 1956, 1958), 10 specimens.

Fig. 228. cf. *Amuletum*, × 6

## Turridae, new genus

Fig. 229

Fig. 229A: MGUH 15.860, Turritellakløft, large section (1949),  $\times 2$ .

Fig. 229B: MGUH 15.861, Turritellakløft, large section (1949),  $\times 8$ .

*Additional material.* 1977. 555, Turritellakløft, large section (1948), 1 specimen; 1977. 563, Qaersutjægerdal (1954), 1 specimen.

*Remarks.* This form is characterised by depression of the upper whorl surface and a strongly bent channel. It comes closest to *Amuletum* Stephenson but has not so strong axial folds, while the channel is more strongly bent.

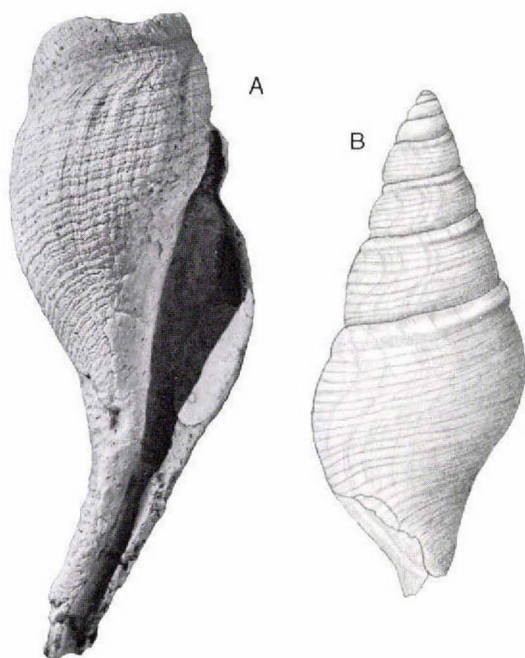


Fig. 229. Turridae, new genus, A,  $\times 2$ ; B,  $\times 8$

*Odostomia* Fleming,  
species 1

Fig. 230

Fig. 230A: MGUH 15.862, Sonja Lens (1953),  $\times 12$ .

Fig. 230B: MGUH 15.863, Sonja Lens (1953),  $\times 12$ .

*Additional material.* 1977. 795, 1021, 1124, 1175, Sonja Lens (1953), numerous examples; 1977. 796, Turritellakløft, large section (1948), 1 specimen.

*Remarks.* The whorls bear very fine spiral threads. The columellar lip is high and slightly concave; the plait is small in the aperture but becomes more prominent in the interior of the shell. The expansion of the columellar lip over the umbilicus varies, in some specimens a small gap is left open.

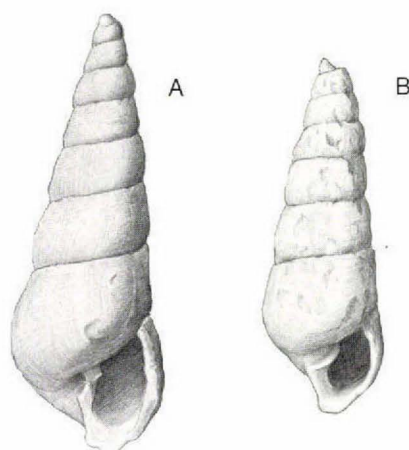


Fig. 230. *Odostomia* sp. 1,  $\times 12$

*Odostomia* Fleming,  
species 2

Fig. 231

Fig. 231A: MGUH 15.864, Sonja Lens (1953),  $\times 12$ .

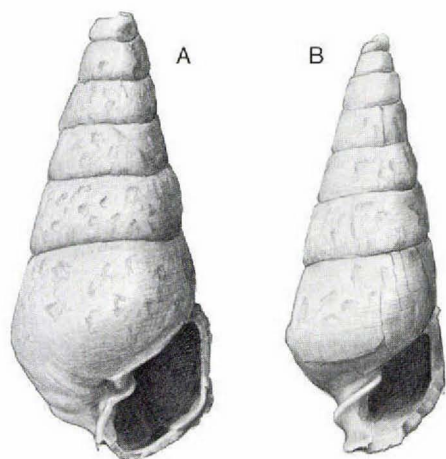
Fig. 231B: MGUH 15.865, Sonja Lens (1953),  $\times 12$ .

*Additional material.* 1977. 1188, Sonja Lens (1953), numerous specimens.

*Remarks.* *Odostomia* species 2 differs from species 1 in terms of its broader shell and the slight angulation on the last whorl. This last character may be observed also in *O. obtusum*

Subclass EUTHYNEURA  
Order ENTOMOTAENIATA  
Superfamily PYRAMIDELLACEA  
Family PYRAMIDELLIDAE

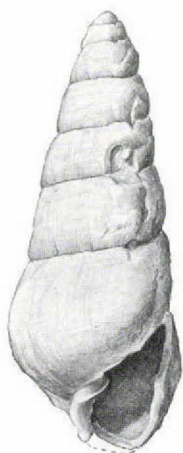


Fig. 231. *Odostomia* sp. 2,  $\times 12$ 

and *O. undiferum* v. Koenen, but they both have fewer whorls. Other related forms are *O. briarti* Cossmann and *Turbonilla conjugens* Briart & Cornet.

### *Odostomia* Fleming, species 3

Fig. 232

Fig. 232: MGUH 15.866, Sonja Lens (1953),  $\times 12$ .Fig. 232. *Odostomia* sp. 3,  $\times 12$ 

*Remarks.* This is known only from one specimen which has an edge on the last whorl as in *Odostomia* species 2. However, the whorls are slightly more convex.

### *Magestomia* Monterosato Fig. 233

Fig. 233: MGUH 15.867, Sonja Lens (1953),  $\times 12$ .

*Additional material.* 1977. 1060, Sonja Lens (1948, 1953), numerous examples.

*Remarks.* This form is assigned to *Megastomia* on account of the grooves on the outer lip.

Fig. 233. *Magestomia*,  $\times 12$ 

### *Syrnola* Adams Fig. 234

Fig. 234: MGUH 15.868, Sonja Lens (1953),  $\times 12$ .

*Additional material.* 1977. 720, 1172, 1173, ?1198, Sonja Lens (1951, 1952, 1953), 6 specimens;

*Remarks.* *Turbonilla extensa* Briart & Cornet which was assigned to *Tiberia* (*Orinella*) by Glibert (1973) is a related form.

### *Puposyrnola* Cossmann, species 1 Fig. 235

Fig. 235: MGUH 15.869, Sonja Lens (1956),  $\times 20$ .





Fig. 234. *Syrnola*,  $\times 12$

Fig. 236: MGUH 15.870, Sonja Lens (1958),  $\times 20$ .

*Remarks.* The axis of the protoconch is at right angles to the axis of the teleconch. The whorls of *Puposyrnola* species 1 are slightly convex and not concave as in species 2.

### *Pyrgiscus* Philippi

Fig. 237

Fig. 237A: MGUH 15.871, Sonja Lens (1956),  $\times 12$ .

Fig. 237B: MGUH 15.872, Sonja Lens (1954),  $\times 12$ .

*Additional material.* ?1977. 1160, Sonja Lens (1953), 1 fragment.

*Remarks.* *Puposyrnola rutoti* Glibert is related, but the columellar lip seems to be less broadly extended in the Greenland example.

### *Puposyrnola* Cossmann, species 2

Fig. 236

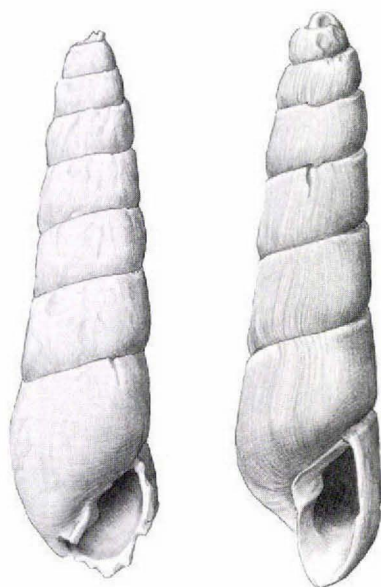


Fig. 235 (left). *Puposyrnola* sp. 1,  $\times 20$

Fig. 236 (right). *Puposyrnola* sp. 2,  $\times 20$

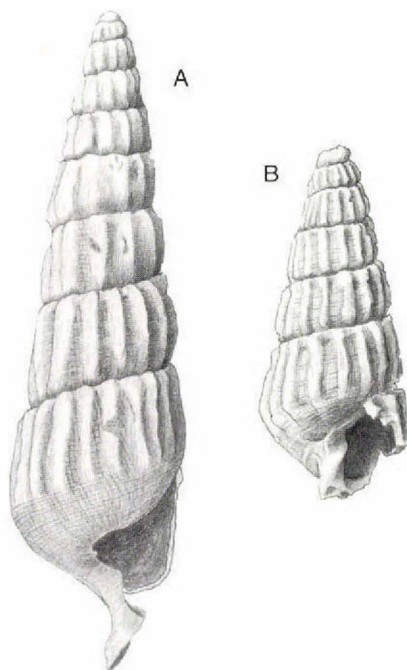


Fig. 237. *Pyrgiscus*,  $\times 12$

### *Creonella sonjae* Rosenkrantz Fig. 238

1970. *Creonella sonjae* Rosenkrantz, p. 437, fig. 12/2,3.

Holotype: MMH 10.806, Sonja Lens (1956).

Paratype: MMH 10.805, Sonja Lens (1953).

Fig. 238A: MGUH 15.873, Sonja Lens (1951),  $\times 12$ .

Fig. 238B: MGUH 15.874, Sonja Lens (1953),  $\times 12$ .

*Additional material.* 1977. 1170, Sonja Lens (1951, 1953, 1956, 1958), numerous examples.

*Remarks.* Rosenkrantz (1970) has mentioned already the close relations between *Creonella sonjae* and *C. triplicata* Wade from the Ripley Formation of the Gulf coast of the United States.

#### Order CEPHALASPIDEA

#### Superfamily ACTEONACEA

#### Family ACTEONIDAE

#### *Acteon* Montfort, species 1 Fig. 239

Fig. 239: MGUH 15.875, Sonja Lens (1953),  $\times 7$ .

*Additional material.* 1977. 1052, Sonja Lens (1953, 1956, 1958), 17 specimens.

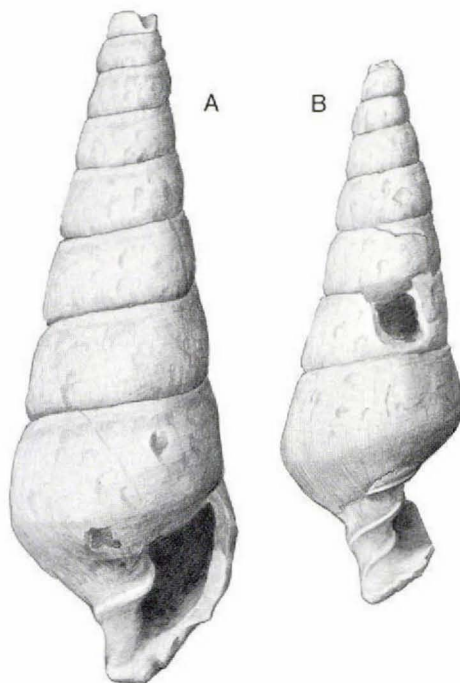


Fig. 238. *Creonella sonjae*,  $\times 12$



Fig. 239. *Acteon* sp. 1,  $\times 7$

#### *Acteon* Montfort, species 2 Fig. 240

Fig. 240A: MGUH 15.876, Sonja Lens (1953),  $\times 14$ .

Fig. 240B: MGUH 15.877, Sonja Lens (1953),  $\times 7$ .

*Additional material.* 1977. 1163, 1168, Sonja Lens (1953, 1956), 21 specimens.

*Remarks.* The spiral grooves are not as numerous as in *Acteon* species 1.

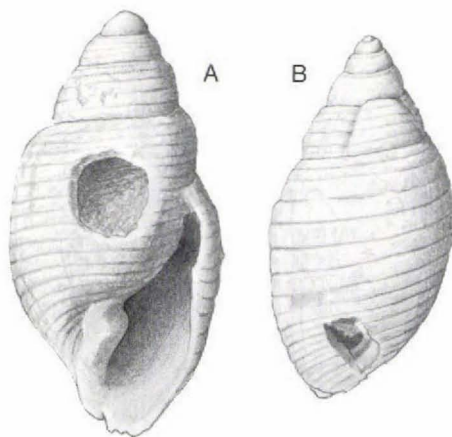


Fig. 240. *Acteon* sp. 2, A,  $\times 14$ ; B,  $\times 7$

#### *Ravniella* aff. *R. regularis* (v. Koenen) Fig. 241

1970. *Tornatellaea* (*Ravniella*) aff. *regularis* (v. Koenen); Rosenkrantz, p. 431, text fig. 10/3.

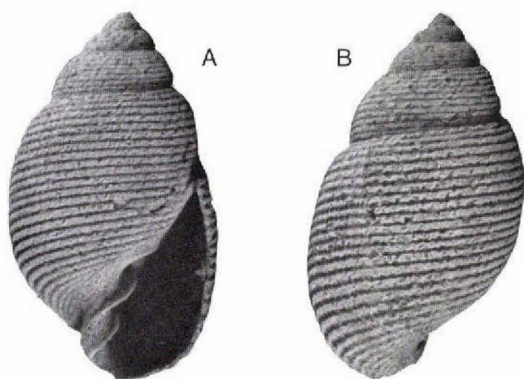


Fig. 241. *Ravniella* aff. *R. regularis*,  $\times 4$

Fig. 241: MMH 10.801, Sonja Lens (1958),  $\times 4$ .

**Remarks.** Rosenkrantz (1970) proposed *Cinulia* (*Avellana*) *danica* Ravn as type species of *Ravniella* n. subgen. It has very convex whorls and the spiral grooves are more distantly spaced than in *R. regularis* (v. Koenen).

### *Ravniella groenlandica* Rosenkrantz Fig. 242

1970. *Tornatellaea* (*Ravniella*) *groenlandica* Rosenkrantz, p. 431, fig. 10/2.

Fig. 242: MMH 10.800, the holotype, Tunorssuaq,  $\times 4$ .



Fig. 242. *Ravniella groenlandica*,  $\times 4$

**Additional material.** 1977. 668, 669, 672–676, Turritellakløft (1946, 1948, 1953, 1956), 28 specimens; 1977. 670, 671, 678–680, Qaersutjægerdal (1953, 1958), 16 specimens; 1977. 1165, Sonja Lens (1953), 3 fragments.

**Remarks.** Rosenkrantz (1970) did not give a diagnosis or description of this new species. Certainly, *Ravniella regularis* (v. Koenen) and *R. cf. R. regularis* (v. Koenen) *sensu* Rosenkrantz are very closely related. They probably fall within the range of variation of one species since the variability within acteonid species is rather high.

### New genus cf. *Rictaxis* Dall, species 1 Fig. 243

Fig. 243: MGUH 15.878, Sonja Lens (1956),  $\times 12$ .

**Remarks.** As distinct from *Acteon*, the plait in this species is high on the columella but not at its upper end. The same condition is typical for *Rictaxis*, but this is normally not as broad. The shells are high spired with the whorls increasing rapidly in size.

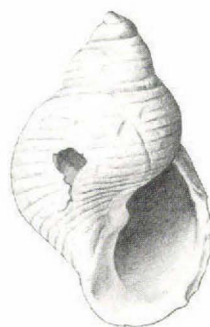


Fig. 243. New genus, cf. *Rictaxis* sp. 1,  $\times 12$

### New genus cf. *Rictaxis* Dall, species 2 Fig. 244

Fig. 244: MGUH 15.879, Sonja Lens (1958), A,  $\times 18$ ; B,  $\times 24$ .

**Additional material.** 1977. 1138, Sonja Lens (1953, 1956), 2 specimens.

*Remarks.* The whorls are higher and less inflated than in species 1.

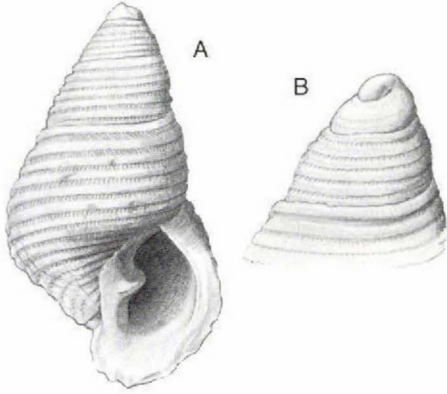


Fig. 244. New genus, cf. *Rictaxis* sp. 2,  $\times 18$

#### Subfamily CYLINDROBULLININAE

### *Nonactaeonina* Stephenson Fig. 245

Fig. 245: MGUH 15.880, Qaersutjægerdal (1958),  $\times 2$ .

*Additional material.* 1977. 1056, 1058, 1373, Qaersutjægerdal (1953, 1954, 1956), 4 specimens; 1977. 1057, Turretillakløft, large section (1946), 1 example.

*Remarks.* *Nonactaeonina* is hitherto only known from the Upper Cretaceous of the Gulf coast of the United States.



Fig. 245. *Nonactaeonina*,  $\times 2$

### ?*Douvilleia* Fischer, species 1 Fig. 246

Fig. 246: MGUH 15.881, Sonja Lens (1953),  $\times 12$ .

*Remarks.* This specimen is tentatively assigned to *Douvilleia* because of its high aperture and the twisted columella.



Fig. 246. ?*Douvilleia* sp. 1,  $\times 12$

### ?*Douvilleia* Fischer, species 2 Fig. 247

Fig. 247: MGUH 15.882, Sonja Lens (1956),  $\times 2$ .

*Remarks.* The specimen is incomplete but represents a much larger individual than that referred to ?*Douvilleia* species 1. The columellar lip is flat but no plait is recognisable, a condition typical of larger forms according to Zilch (1959–60). Both forms may belong to the same species.

#### Family RINGICULIDAE

### *Ringiculina* Monterosato Fig. 248

Fig. 248: MGUH 15.883, Sonja Lens (1953),  $\times 12$ .

*Additional material.* 1977. 684–686, 1142, Sonja Lens (1951, 1952, 1953, 1954, 1956, 1958), numerous examples.



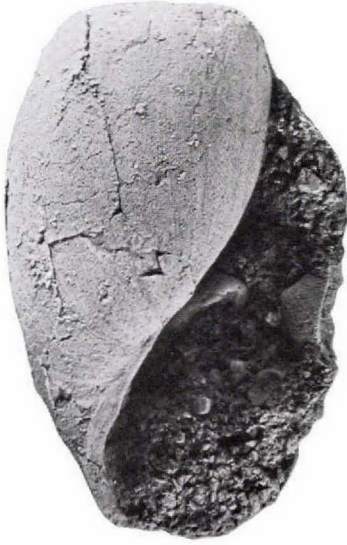


Fig. 247. ?*Douvilleia* sp. 2,  $\times 2$

*Remarks.* Related forms are *Ringiculina pinguis* Glibert and probably *R. erratica* Roedel, as figured by Ravn (1939).

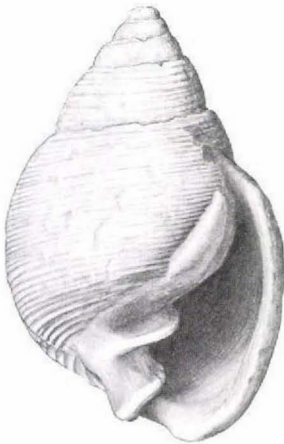


Fig. 248. *Ringiculina*,  $\times 12$

### *Gilbertina* Morlet

Fig. 249

Fig. 249A,B: MGUH 15.884, Sonja Lens (1953),  $\times 6$ .

*Additional material.* 1976. 116, 117, 121, 1607, 1609–1613, Sonja Lens (1948, 1951, 1953, 1954), 11 specimens; 1976. 118–120, 122, 123, 156, 182, 1603–1606, Turrillakløft (1946, 1948, 1953, 1956), numerous examples.

*Remarks.* *Cinulia ultima* v. Koenen is related.

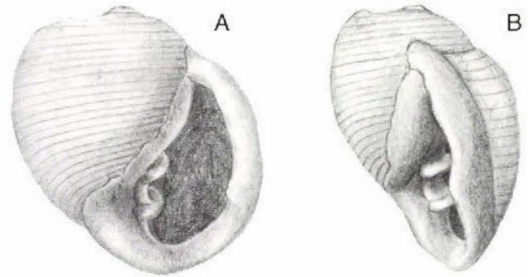


Fig. 249. *Gilbertina*,  $\times 6$

### Family SCAPHANDRIDAE

cf. *Acteocina* Gray

Fig. 250

Fig. 250: MGUH 15.885, Sonja Lens (1956),  $\times 10$ .

*Additional material.* 1977. 135, 136, Sonja Lens (1956, 1958), 12 specimens; 1977. 137, Turrillakløft (1946), 3 specimens.



Fig. 250. cf. *Acteocina*,  $\times 10$

*Remarks.* The shell form and the rather high columellar lip forming an angle with the base are suggestive of *Acteocina*. However, there is no columellar plait. The last whorl has a faint sculpture of widely spaced growth lines and grooves.

### *Cylichna* Loven, species 1 Fig. 251

Fig. 251: MGUH 15.886, Sonja Lens (1951),  $\times 8$ .

*Additional material.* 1977. 660–662, Sonja Lens (1948, 1951, 1952), numerous specimens; 1977. 663, Agatkløft, loose (1951), 14 specimens; 1977. 659, 663, 665, Turrnellakløft, large section (1946, 1949, 1956), 4 specimens.

*Remarks.* The columellar plait is extremely weak or absent. *Cylichna discifera* v. Koenen is a related form.



Fig. 251. *Cylichna* sp. 1,  $\times 8$

### *Cylichna* Loven, species 2 Fig. 252

Fig. 252A,B: MGUH 15.887, Kangilia (1939),  $\times 1.5$ .

*Additional material.* 1977. 1865, Kangilia (1939), 1; 1977. 1856, 1857, Tunorssuaq (1952, 1957), 3 specimens.

*Remarks.* This species is more cylindrical than *Cylichna* species 1. The ratio of total height to breadth is 3:2 in large specimens and closer to 2.5:1 in small ones, in contrast to 2:1 in species 1. Species 1 also has fewer axial grooves and an aperture which is less extended upwards beyond the shell axis. *Cylichna gliberti* Anderson is closely related.

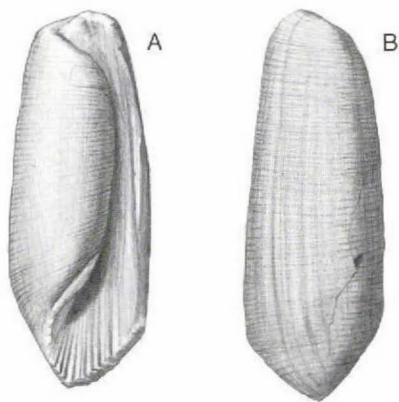


Fig. 252. *Cylichna* sp. 2,  $\times 1.5$

### *Cylichna* Loven, species 3 Fig. 253

Fig. 253A,B: MGUH 15.888, Sonja Lens (1958),  $\times 12$ .

*Remarks.* This form has a more inflated shell than species 1 and 2.

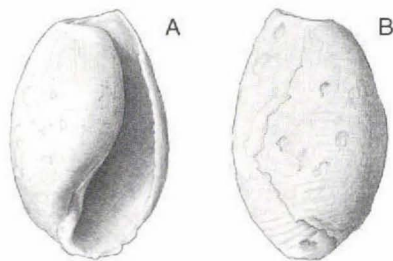


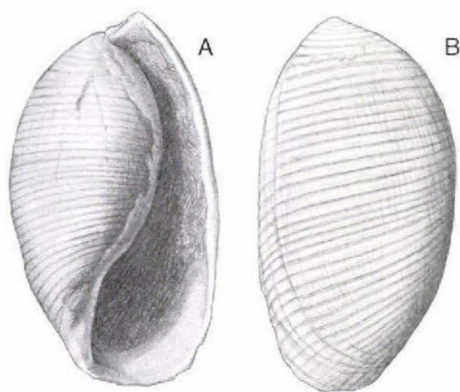
Fig. 253. *Cylichna* sp. 3,  $\times 12$

### *Ellipsoscapha* Stephenson Fig. 254

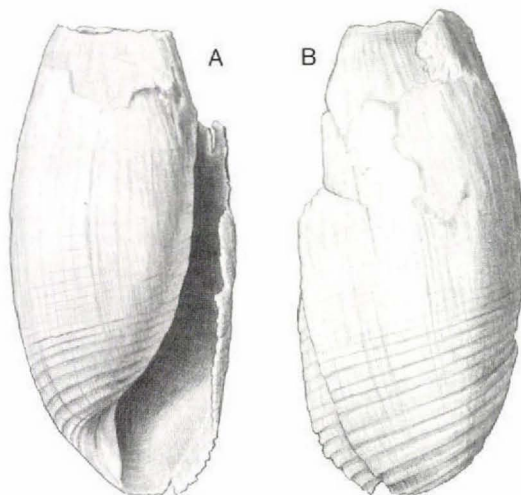
Fig. 254A,B: MGUH 15.889, Turrnellakløft, large section (1961),  $\times 3$ .

*Additional material.* 1977. 757, 1858 (partly), 2383, Sonja Lens (1953, 1958), 7 specimens; 1977. 748–754, 756, 759, 2384?, Turrnellakløft (1946, 1948, 1953, 1956), 27 specimens; 1977. 755, Qaersutjægerdal, large section (1953), 1 specimen; 1977. 758, Agatkløft, loose (1951), 1 specimen.

*Remarks.* The first whorls are completely covered. The columella is thin and a little concave, forming a distinct angle with the base.

Fig. 254. *Ellipsoscapa*, × 3

*Remarks.* *Cylichna rugosa* Ravn, described from Angnertuneq, is closely related or identical. *Tornatina plicatella* v. Koenen is a related form.

Fig. 256. *Retusa*, × 6

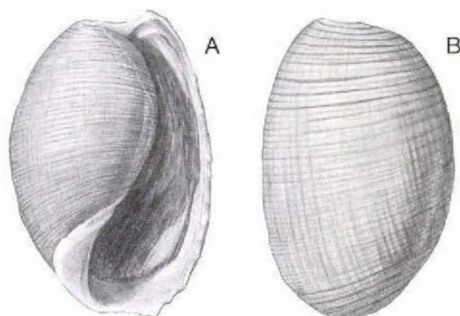
## Family BULLIDAE

### *Bulla* Linnaeus

Fig. 255

Fig. 255A,B: MGUH 15.890, Kangilia (1939), × 3.

*Additional material.* 1977. 2376, 2416, 2423, Kangilia, 3 specimens; 1977. 2377, Turrillaklœft, 1 specimen; 1977. 1855, 1864, 2415, Quvnilik (1953, 1956), 4 specimens; 1977. 2387, Angnertuneq (1949), 1 specimen; 1977. 2391, 2419, Tunorssuaq, numerous examples.

Fig. 255. *Bulla*, × 3

## Superfamily ELLOBIACEA Family ELLOBIIDAE

### *Micrelasma* Harris & Burrows Fig. 257

Fig. 257A,B: MGUH 15.892, Sonja Lens (1958), × 3.

*Remarks.* The form is closely related to *Micrelasma lemoinei* (Cossmann) from the Paleocene of Cuise which is the only species hitherto known, according to Zilch (1959–60).

## Order STYLOMMATOPHORA Suborder SIGMURETHRA Infraorder AULACOPODA Superfamily ZONITACEA Family ZONITIDAE

### cf. *Grandipatula* Cossmann Fig. 258

Fig. 258A–C: MGUH 15.893, Sonja Lens (1956), × 3.

*Additional material.* 1977. 1109, Sonja Lens (1956), 1 specimen; 1977. 1107, 1108, Qaersutjærdal (1958, 1961), 2 specimens.

## Family RETUSIDAE

### *Retusa* Brown

Fig. 256

Fig. 256A,B: MGUH 15.891, Sonja Lens (1953), × 6.

*Additional material.* 1977. 801, 802, Sonja Lens (1956, 1958), 10 examples.



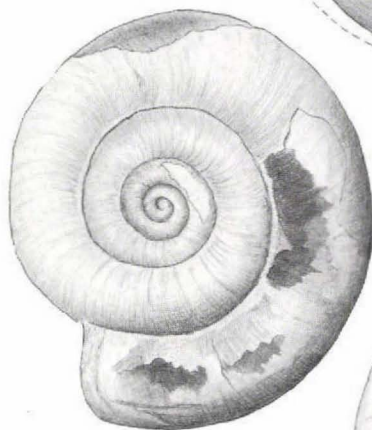


A

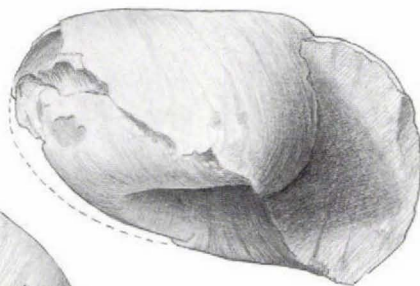


B

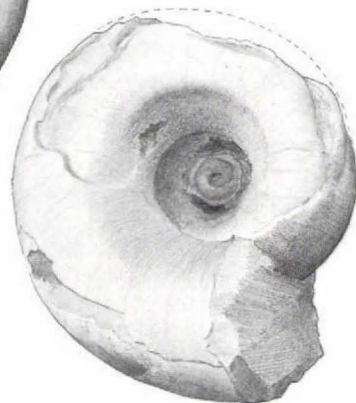
Fig. 257. *Micrelasma*,  $\times 3$



B



A



C

Fig. 258. cf. *Grandipatula*,  $\times 3$

Operculum, incertae sedis

Fig. 259

Fig. 259: MGUH 15.894, Sonja Lens (1958),  $\times 30$ .

Additional material. 1977. 1275, Sonja Lens (1958).



Fig. 259. Operculum, incertae sedis,  $\times 30$



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