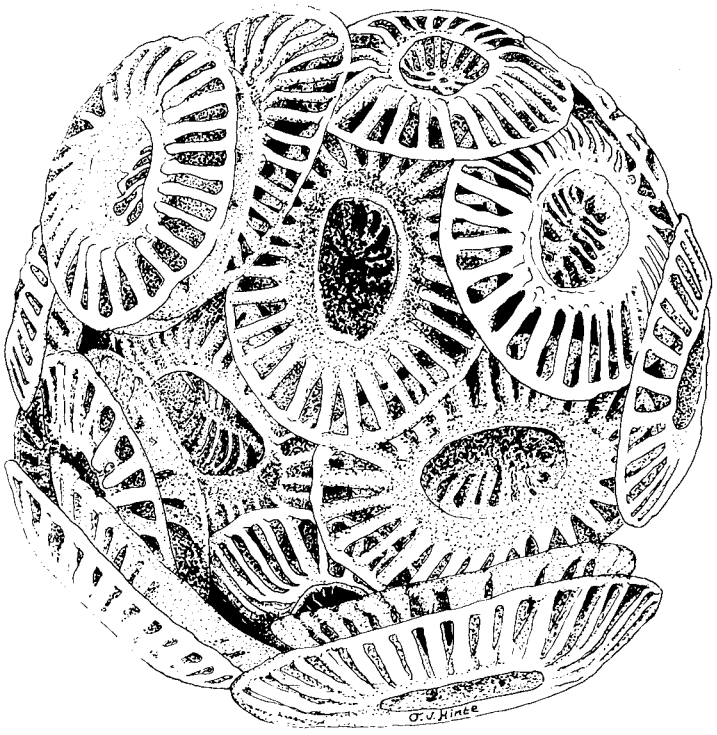
INA NEWSLETTER



INTERNATIONAL NANNOPLANKTON ASSOCIATION

VOLUME 7 NUMBER 3 1985

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volume 7 number 3 December 1985

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CONTENTS

!! NOTE !!

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- for non-members	Dfl. 25.-
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Applications for membership of the International Nannoplankton Association should be directed to the Secretary/Treasurer. Annual dues: Dfl. 35.-

* Those who pay their dues in U.S. dollars ($ 12.-) are urged to send them to John Steinmetz (Marathon Oil, Denver Res. Center, P.O. 269, Littleton, Col., U.S.A.) checks or money orders should be made out to INA; no account- or banknumber is necessary.
* Students can become a member for a reduced price (Dfl. 10.-; US $ 4); please send a confirmation of your student-status when applying for membership.

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NEXT ISSUE

Contributions for the next issue of the INA Newsletter should be received before April 1986. Please send your contributions to: The editor of the INA Newsletter, S.E. van Heck (Address : see front page).

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INFORMATION TO CONTRIBUTORS

Manuscripts should not exceed four pages. They will be reproduced in the INA Newsletter without being re-typed. Hence the authors are entirely responsible for the contents and quality of their contributions. Manuscripts of poor quality can be refused by the editor.

Format: Manuscripts should be typed on A4 (this format); a blank margin of 2.5 cm (1 inch) should border the upper, the left and the right side of each page, and the margin on the lower side should be 3.5 cm (1.5 inch). DO NOT USE DOUBLE SPACING, as this takes up too much space !

INA MEETING IN VIENNA, September 19 - 22, 1985

With 57 participants, this INA meeting was the largest held sofar, and judging by the enthusiasm expressed by the participants, it was a great success. We had a large lecture room and an equally large microscope room at our disposal at the Paleontological Institute of the University of Vienna, where Prof. Dr. Fritz Steiniger was our host. The facilities were excellent, with microscopes and plenty of coffee, tea and juices continuously available. In a relaxed and informal atmosphere discussions were lively both inside and outside the lecture room. It was good to see so many old friends, and encouraging to see so many new faces, members and non-members alike.

In three days 32 lectures and about 20 posters were presented. Eighteen speakers promised to send a manuscript for the proceedings, which will be published in the "Abhandlungen der geologischen Bundes-Anstalt, Wien". Abstracts of most of the presentations were published in the previous (special) issue of the Newsletter, and a few late ones in this issue. Subjects ranged from Triassic to Recent, dealing with morphology, systematics, evolution, stratigraphy, ecology, biogeography, magneto-stratigraphy, isotopes and silicoflagellates. Several 'ad hoc' round tables and workshops were organised outside the program to discuss more specialised topics.

On the first evening there was an informal gathering in one of the "Heurigen" (wine bars), with plenty of food and wine for all. This was an excellent opportunity to get to know each other and to renew old contacts.

After the conference proper, some 45 people joined us on an excursion which was led by Dr. Rögl (Museum of Natural History Vienna), Dr. Seifert (ÖMV, Vienna) and Miss Braunstein (University of Vienna). The excursion was well prepared, with outcrops suitably cleaned (a complete road section had been scraped clean by bulldozer). The bus was provided by ÖMV, and at the end of the day we ended up in another Heurigen, where food and wine were offered to us by our host, Prof. Dr. Steiniger. In this place I would like to thank him and the excursion leaders once again for the excellent organisation and great evening.

Of course we also discussed possibilities for future meetings. The next one, as you should all know, is in 1986 in Woods Hole. Information on that meeting can be found in vol. 7(1) of the Newsletter. The one after that shall be in Europe again, in 1987, probably in London. The Nannoplankton Working group of the British Micropalaeontological Society has already volunteered to help organise such a meeting. What happens after that has not been decided yet. It also depends on you, whether you are interested to have that many meetings, and on finding people in various countries willing to organise them.

S.v.H.

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Please send your reprints of publications on calcareous nannoplankton to:

John C. Steinmetz
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Littleton, Colorado 80160 USA

EDITORIAL

Ton Romein has left us. No, not quite as bad as it sounds, but he has left Utrecht University and moved to Jakarta, Indonesia, which is the other end of the world for us. He has started a career with Corelab Indonesia, which keeps him moving about a lot, and he will no longer be able to act as a Secretary/Treasurer for INA. For the moment therefore, we are without such a person and are looking for a replacement. Fortunately, the secretary of the stratigraphy department of Utrecht University, Mrs. Ank Pouw has promised to take care of the administration untill we have found someone who can take over. We therefore ask you to send your cheques with the dues for the coming year (Dfl 35.-) to the old address. That is, unless you pay in US dollars, in which case you are requested to send them to John Steinmetz ($ 12.-). Ton, thank you very much for all the work you have done, good luck in your new job and do keep in touch!

After the changes made in spring issue of the Newsletter, I got one or two phone calls of people who said they liked the new face of it. And as I got nothing thrown at me during the Vienna meeting I have concluded that possibly more people feel that way. Also Cees Kok got a few phone calls of English colleagues to tell him that they had recognised his UFO (nr. 2) and found it in the same interval, but sadly, nobody wrote with any comments, and no further UFO's were sent. I suppose that that is the end of this experiment, unless some of you out there feels inclined to do something about it.

We have postponed a further issue of the bibliography of silicoflagellates till the spring, because we needed the space to publish the index and bibliography of Discoasters by David Reimers, as promised in the previous issue.

The last questionnaire we had was in 1981, and we have now included a new questionnaire (on a separate sheet) because we have many new members, and because a lot of things may have changed in those few years. By completing the questionnaire you can let your colleagues know what you are working on, and it will enable you to contact people working on the same subject. So please send it back to us!

Two long awaited books have finally appeared. This summer the first volume of the "Handbook" by Marie-Pierre Aubry was distributed, but as I haven't received my copy yet, the review will have to wait till the spring. By that time Marie-Pierre expects the second and third volume to be out as well, so you can look forward to that. Then, in November, the book that became known as the "Bolli Book" (Plankton stratigraphy) has appeared. In such short time I was unable to read and digest it all, so that review too will have to wait till the spring. But I can already tell you that it looks very impressive, and is an enviable possession. It contains 19 chapters, of which one is a general introduction and one is a comparison of zonations of different groups. Then there are 7 chapters on planktonic foraminifera, two thick chapters on calcareous nannoplankton and one on silicoflagellates. The rest is on such groups as calpionellids, radiolaria, diatoms, dinoflagellates and ichthyoliths. A full review follows in the next issue.

For now, do not forget to pay your dues, and do not forget to send your reprints on calcareous nanno's to John Steinmetz and on silico's to René Almekinders (Utrecht University).

S.v.H.

NOTICE
INTERNATIONAL PALAEONTOLOGICAL ASSOCIATION

Plans are being prepared for the 5th Edition of the DIRECTORY OF PALEONTOLOGISTS OF THE WORLD to be published by the International Palaeontological Association in time for distribution at the 27th International Geological Congress, Washington, D.C., 1989. Formal notification and timings will be issued in 1986; requests for information from individual paleontologists and paleontological associations will be distributed throughout 1987 and 1988 with a deadline for receipt of data of December 1988; computerization of data will proceed through 1988 with final preparation of text and publication during 1989.

It is intended to provide the most complete listing possible of all of the active paleontologists of the world. We expect to obtain data from paleontological societies and organisations of all kinds as well as from individual paleontologists. Paleontological groups and individuals who are not members of IPA or who not regularly receive the journal or newsletter of an IPA Corporate Member, should contact the Directory editor or IPA secretariat during 1987-88 to insure inclusion in the Directory. Suggestions and advice from all interested parties are welcome.

Copies of the 4th edition of the DIRECTORY are still available from R.E. Grant (same address as Editor, below left) for US $7 (to individual members of national paleontological societies or sections) or US $10 (all others).

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INTERNATIONAL COMMISSION ON STRATIGRAPHY

Triassic - Jurassic Boundary Working Group

Calcareous Nannofossils of the Triassic - Jurassic boundary interval

I have been asked to co-ordinate any available information and to compile a report on the distribution of calcareous nannofossils across the Triassic - Jurassic boundary. It is intended that reports on a number of groups of organisms will be collected and published, probably in the context of a symposium on this boundary.

If you have information or expect to acquire some in the near future and are willing to collaborate in the project then please write to Alan Lord. Full acknowledgement of sources will be made in the report.

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July 1985

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Compiled by John C. Steinmetz

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TERT
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B131

Algirosphaera aurea (BERNARD & LECAL 1960) NORRIS 1984; p. 38; (ex Anthosphaera). A245-2

Algirosphaera bicornu (SCHLAUDER 1945) NORRIS 1984; p.38; (ex Anthosphaera). A245-2

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Calyptrolithophora pirus (KAMPTNER 1937) HALLEGRAEFF 1984; p. 244; (ex Calyptrosphaera). A240-4

Cyclolithella? neoaprica BUKRY 1985; p. 600, pl. 1, figs. 6-12; North Atlantic, Mid-Atlantic Ridge, DSDP Site 558, Lower Oligocene (Zone CP16b). A237-3

Discoaster orbis REIMERS & DAIGRE 1985; p. 309; (ex Discoaster circularis FURRAZOLA-BERMUDEZ & KREISEL). Invalid ICBN Art 32.2 [No page or plate reference]. A247-5

Discoaster tuberi FILEWICZ 1985; p. 357, pl. 1, figs. 1-9; Middle America Trench offshore Guatemala, eastern equatorial Pacific, DSDP Site 569, Middle Miocene (Zone CN4). A239-5

Rhabdosphaera xiphos (DEFLANDRE & FERT 1954) NORRIS 1984; p. 33; (ex Rhabdolithus). A245-2

Sphenolithus calyculus BUKRY 1985; pp. 600-601, pl. 1, figs. 13-19; North Atlantic, Mid-Atlantic Ridge, DSDP Site 558, Early Miocene (Subzone CN1b). A237-3

Tegumentum toolebucum SHAFIK 1984; pp. 178-179, fig. 6 M-P; Australia, Middle-Late Albian. A249-2

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Asterosphaerella VILLAIN 1975; p. 204. Type species: Asterosphaerella alveolata VILLAIN 1975. A254-1

Asterosphaerella alveolata VILLAIN 1975; p. 204; text-fig. 7, figs. 1-8; pl. 7, figs. 1-5, 8-13; pl. 8, figs. 1-12. The Netherlands, Limburg, Upper Cretaceous. A254-1

B132

Bonetocardiella neumannae VILLAIN 1975; pp. 199-200; text-fig. 1, figs. 1d, e; text-fig. 2, figs. 1-12; text-fig. 15, fig. 2; pl. 2, figs. 7-8; pl. 6, figs. 1-17. The Netherlands, Limburg, Upper Cretaceous. A254-1

Bonetocardiella vachardi VILLAIN 1977; pp. 155-156; pl. 5, figs. 1-3, 5-7. The Netherlands, Limburg, Upper Cretaceous. A254-2

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CORRECTIONS

Unintended duplicate entries of the same reference:
A141-7 = A201-4; A185-8 = A206-2; A172-1 = A206-8;
A181-6 = A204-3; A166-4 = A195-1, and SALOMON is the correct spelling of one of the authors.

A190-9: add strat., Atlantic.C. to the Codes.
A208-1: replace Formatoion with Formation.
A212-2: replace 9 app. with 1 app.
A216-4: replace Creatia with Croatia.
A221-5: replace Antartic with Antarctic.
A227-7: replace strat.syst. with strat.syst.
A231-3: complete title is: Numerical ages of Cenozoic magneto- and bio-stratigraphic zones, South Atlantic.

+ +

Species names in alphabetical order.

alveolata, Asterosphaerella (C)
aurea, Algirosphaera
bicornu, Algirosphaera
calyculus, Sphenolithus
lithostratos, Anacanthoica
meteora, Algirosphaera
neoaprica, Cyclolithella?
neumannae, Bonetocardiella (C)
orbis, Discoaster *
pirus, Calyptrolithophora
quadricornu, Algirosphaera
robusta, Algirosphaera
toolebucum, Tegumentum
tuberi, Discoaster
vachardi, Bonetocardiella (C)
xiphos, Rhabdosphaera

New genus names.

Asterosphaerella (C)

* = Invalid.
(C) = Calcisphere.

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Reprints, comments, and corrections are always welcome. Please send them to: John C. Steinmetz, Denver Research Center, Marathon Oil Company, P.O. Box 269, Littleton, Colorado 80160 USA.

INDEX AND BIBLIOGRAPHY OF THE GENUS DISCOASTER

DAVID D. REIMERS

The following index and bibliography of the genus Discoaster is taken from the index and bibliographies of nannoplankton as previously published by Loeblich & Tappan, and the International Nannoplankton Association. The present index includes all entries made under the genus Discoaster in these previous indexes and are written as stated in these works.

The alphabetical index by species names includes the following information:

(1) Species name,

(2) Original reference author and data,

(3) Listed stratigraphic range if given in the original reference,

(4) Later synonomy references.

The bibliography listing gives the following information:

(1) Original references,

(2) A list of Discoaster species named in each reference,

(3) The volume number of the previous bibliography where each reference was originally listed,

(4) The volume number of the previous bibliography where any synonomy was listed.

This present index is meant to serve only as an up-to-date completion of all the listings under the genus name Discoaster as found in the previous bibliographies. Both the present index and the bibliography are computer generated and thus no accent marks or italics for latin names and works are included. The author hopes no inconvenience is cause by this omission. The author also welcomes any additions or corrections to this index.

DISCOASTER SPECIES LIST

AS TAKEN FROM; "INDEX AND BIBLIOGRAPHY OF CALCAREOUS NANNOPLANKTON", PARTS I - VII, BY LOEBLICH & TAPPAN AND "INTERNATIONAL NANNOPLANKTON ASSOCIATION NEWSLETTERS", NOS. 1-1 THRU 6-2.

SPECIES NAME	ORIGINAL REFER. (SYNONOMY REFERENCE)	STRATIGRAPHIC RANGE (X = INVALID NAME)
-A-		
ACEROSUS	DANG DIC NGA & SHUMENKO, 1975	EOCENE
ADAMANTEUS	BRAMLETTE & WILCOXON, 1967A	OLIG.-MIOCENE
	(REFER. TO MARTINI, 1965)	
	(SEE TROCHODISCOASTER ADAMANTEUS)	
AECUS	BRONNIMAN & STRADNER, 1960	L. EOCENE
AEOCENICUS	SHAMRAI & LAZAREVA, 1956	M. EOCENE
	(FIDE NOEL, 1960 FIG. 1(2) = D. SAIPANENSIS, FIG.1(3)= D. LODOENSIS)	
ALTUS	MULLER, 1974	L. PLIOCENE
	(SEE EU-DISCOASTER ALTUS)	
ANCONITANUS	CATI & BORSETTI, 1972 (NOM. NOV. PRO D. STRADNERI, CATI & BORSETTI, 1970 NON MARTINI, 1961)	
ANDAMANENSIS	SINGH & VIMAL, 1976	L. MIOCENE - E. PLIOCENE
ANOMALUS	DANG DIC NGA & SHUMENKO, 1975	EOCENE
ARANEUS	BUKRY, 1971A	U. PALEOCENE
ARCHIPELAGOENSIS	SINGH & VIMAL, 1976	L. MIOCENE - E. PLIOCENE
ARGUTUS	HAY IN HAY ET AL., 1967	MIOCENE
ASTER	BRAMLETTE & RIEDEL, 1954	OLIGOCENE
ASTER VAR. CASTATUS	GORGULEVSKAYA, 1967 (AS ASTOR) X	
ASTERISCUS	FURRAZOLA & ITURRALDE, 1972, IN FURRAZOLA-BERMUDEZI,G & KREISEL, K.	L. EOCENE
ASYMMETRICUS	GARTNER, 1969	PLIOCENE
	(SEE EUDISCOASTER ASYMMETRICUS)	
	(SEE EU-DISCOASTER ASYMMETRICUS)	
ATHANASIUI	FILIPESCU & HANGANU, 1960	MIOCENE
? ATLANTICUS	WILCOXON, 1972	BARREMIAN (CRET.)
AULAKOS	GARTNER IN HAY ET AL., 1967 X	
AULAKOS	GARTNER, 1967	MIOCENE
	(SEE CLAVODISCOASTER AULAKOS)	
AUSONIUS	DEFLANDRE, 1959 (NOT FIG.)	MIOCENE
-B-		
BARBADIENSIS	TAN SIN HOK, 1927	TERTIARY
	(TYPE OF HELICODISCOASTER)	
	(SEE HELIO-DISCOASTER)	
BARBADIENSIS VAR. BEBALINI	TAN SIN HOK, 1927	TERTIARY
	(SEE - D. BEBALAINI , HELIO. BARBADIENSIS VAR. BEBALAINI)	
BEBALINI (TAN SIN HOK)	BRONNIMANN & RIGASSI, 1963	
BELLUS	BUKRY & PERCIVAL, 1971	L. M. MIOCENE
	(SEE EU-DISCOASTER BELLUS)	
BERGGRENII	BUKRY, 1971A	U. MIOCENE
	(SEE EU-DISCOASTER BERGGRENII)	
BIFAX	BUKRY, 1971B	M. EOCENE
	(SEE HELIO-DISCOASTER BIFAX)	

BIFIDUS NOEL, 1960 U. CRET.,EOC.,OLIG.,MIOC.
BINODOSUS MARTINI, 1958 EOCENE
(SEE AGALMATOASTER & GEMMIODISCOASTER BINODOSUS)
(SEE HELIO-DISCOASTER BINODOSUS)
BINODOSUS SSP. BINDOSUS MARTINI, 1958 EOCENE
BINODOSUS SSP.HIRUNDINUS MARTINI, 1958 U. EOCENE
(FIDE NOEL, 1960 = D. TANI NODIFER)
BLACKSTOCKAE BUKRY, 1973 U. MIOCENE
BOLLII MARTINI & BRAMLETTE, 1963 MIOCENE
(SEE EUDISCOASTER BOLLI)
(SEE EU-DISCOASTER BOLLI)
BORROI FURRAZOLA & KREISEL, 1972 L. EOCENE
BOULANGERI LEZAUD, 1968 M. EOCENE
BRAARUDII BUKRY, 1971A M. MIOCENE - U. PLIOCENE
BRAMLETTEI MARTINI, 1958 U. EOCENE
(FIDE MARTINI, 1971 = TROCHOASTER SIMPLEX)
(SEE TROCHASTRITES BRAMLETTEI)
BRAMLETTEI (BUKRY & PERCIVAL 1971)X ROMEIN,1979 (EX DISCOASTEROIDES)
(NON MARTINI, 1958) (SEE D. DRIEVERI)
BRONNIMANNI STRADNER, 1961 M. EOCENE
(SEE AGALMATOASTER BRONNIMANNI)
BROUWERI TAN SIN HOK, 1927 TERTIARY
(FIDE GARDET, 1955 = ACTINISCUS STELLA; FIDE BRAMLETTE &
RIEDEL, 1954 = D. MOLENGRAAFFII)
(SEE EUDISCOASTER BROUWERI)
(SEE EU-DISCOASTER BROUWERI)
BROUWERI CALCARIS (GARTNER) HAY, 1970 X (EX D. CALCARIS)
BROUWERI SUBSP. BIPARTITUS HAQ & BERGGREN, 1978 MIOCENE
BROUWERI SUBSP. PICENTINUS CATI & BORSETTI, 1970 MIOCENE
BROUWERI SUBSP. RECURVUS CATI & BORSETTI, 1970 MIOCENE
BROUWERI SUBSP. RUTELLUS GARTNER, 1967 MIOCENE
BROUWERI TAMALIS (KAMPTNER) HAY, 1970 X
(EX D. TAMALIS)
BROUWERI TRIDENUS (KAMPTNER) HAY, 1970 X
(EX D. TRIDENUS)
BROUWERI TRIRADIATUS (TAN SIN HOK) HAY, 1970 X
(EX D. TRIRADIATUS)
BROUWERI VAR. α TAN SIN HOK, 1927 TERTIARY
(FIDE NOEL, 1960 = D. CLAVATUS)
BROUWERI VAR. ALPHA COLOM, 1952 X
BROUWERI VAR. ALPHA DEFLANDRE, 1959 X
BROUWERI VAR. β TAN SIN HOK,1927 TERTIARY
(FIDE NOEL, 1960 = D. BIFIDUS)
BROUWERI VAR. BETA COLOM, 1952 X
BROUWERI VAR. BETA DEFLANDRE, 1959 X
BROUWERI VAR. δ TAN SIN HOK, 1927 TERTIARY
(FIDE NOEL, 1960 = D. BIFIDUS)
BROUWERI VAR. DELTA COLOM, 1952 X
BROUWERI VAR DELTA DEFLANDRE, 1959 X
BROUWERI VAR. ϵ KLUMP, 1953 EOCENE
(FIDE NOEL, 1960 = D. DISTINCTUS)
BROUWERI VAR. γ TAN SIN HOK,1927 TERTIARY
(FIDE NOEL, 1960 = D. CHALLENGERI
BROUWERI VAR. GAMMA COLOM, 1952 X
BROUWERI VAR. GAMMA DEFLANDRE, 1959 X

-C-

CALCARIS GARTNER IN HAY ET AL., 1967 X

CALCARIS GARTNER, 1967 MIOCENE

(SEE CLAVODISCOASTER CALCARIS)

(SEE D. BROUWERI CALCARIS)

(SEE EU-DISCOASTER CALCARIS)

CALCULOSUS BUKRY, 1971A OLIGOCENE-MIOCENE

CHALLENGERI BRAMLETTE & RIEDEL,1954 MIOCENE, L. TERTIARY

(FIDE NOEL, 1960 INCLUDES D. MOLENGRAAFFII VAR. GAMMA)

(SEE CLAVODISCOASTER CHALLENGERI)

CHALLENGERI SUBSP. MEDITERRANEUS CATI & BORSETTI, 1970 MIOCENE

CHALLENGERI SUBSP. NELLENSIS SINGH & VIMAL, 1976 L.MIOCENE-L.PLIOCENE

CHAMBRAYENSIS HOJJATZADEH, 1978 M. MIOCENE

CIRCULARIS HOFFMAN, 1970 U. EOCENE

CIRCULARIS FURRAZOLA & KREISEL, 1972 X L. EOCENE

(THIS SYNONOMY IS CORRECTED BY REIMERS & DAIGRE, IN PRESS)

CLAVATUS NOEL, 1960 MIOCENE, PLIOCENE

CLAVIGER KAMPTNER IN BACHMAYER, 1964 TERTIARY

COLLETI (PAREJAS) BERSIER, 1939 OLIGOCENE

(SEE HELIO-DISCOASTER COLLETI)

COLLETI VAR. γ BERSIER, 1939 OLIGOCENE

(FIDE NOEL, 1960 = D. DEFLANDREI)

COLLETI VAR. γ F. DISCULA, GARDET, 1955 X

(FIDE NOEL, 1960 = D. DEFLANDREI)

COLLETI VAR. GAMMA, DEFLANDRE, 1959 X

COLLETI VAR. GAMMA F.DISCULA, DEFLANDRE, 1959 X

CONTORTUS STRADNER,1958 MIOCENE

(SEE MARTHASTERITES CONTORTUS)

CORNIGER SHASHAMRAI & LAZAREVA, 1956 U. EOCENE

(FIDE NOEL, 1960 = D. PENTARADIATUS)

(SEE RECTERADIATUS CORNIGER)

CRASSUS MARTINI, 1958 U. EOCENE

(FIDE NOEL, 1960 = D. STELLA)

(FIDE MARTINI, 1971C = SP. DUBIA; POSS.= D. SUBLODOENSIS)

CRASSUS GORGULEVSKAYA,1967 X

(NON D. CRASSUS MARTINI, 1958)

CRUCIATUS (PAREJAS) GARDET, 1955

CRUCIATUS VAR. σ GARDET, 1955 U. MIOCENE

CRUCIATUS VAR DELTA DEFLANDRE, 1959 X

CRUCIFORMIS MARTINI, 1958 U. EOCENE

(FIDE NOEL, 1960 = D. ROTUNDUS, BUT LATTER IS JR.)

(SEE AGALMATOASTER CRUCIFORMIS)

CUBENSIS FURRAZOLA-BERMUDEZ & ITURRALDE-VINENT, 1967 OLIG.

CURRENS STRADNER, 1959A PALEOCENE

(FIDE BRAMLETTE & SULLIVAN, 1961 = D. LODOENSIS)

-D-

DECAPETALUS (PAREJAS) GARDET, 1955

DECORATUS DANG DIC NGA & SHUMENKO, 1975 EOCENE

DECORUS (BUKRY, 1971) BUKRY, 1973 (EX D. VARIABILIS)

(SEE EU-DISCOASTER DECORUS)

DEFLANDREI BRAMLETTE & RIEDEL, 1954 U. EOCENE - MIOCENE

(FIDE NOEL, 1960 INCLUDED IN SYNONYMY; D. COLLETI VAR. Y F. DISCULA; D. NONARADIATUS VAR. Y;D. HILLI VAR.Y; D. HEPTARADIATUS VA. Y.)

(SEE CLAVODISCOASTER DEFLANDREI)

(SEE EU-DISCOASTER DEFLANDREI)

DELICATUS BRAMLETTE & SULLIVAN, 1961 PALEOCENE - L. EOCENE
(SEE RADIODISCOASTER DELICATUS)
DIASTYPUS BRAMLETTE & SULLIVAN, 1961 EOCENE
(SEE HELIODISCOASTER DIASTYPUS SUBSP. DIASTYPUS)
(SEE HELIO-DISCOASTER DIATYPUS)
DILATUS HAY IN HAY ET AL., 1967 MIOCENE
DISTINCTUS MARTINI, 1958 U. EOCENE
(FIDE NOEL, 1960 INCLUDES D. BROUWERI VAR.E;
D. PENTARADIATUS VAR. E; D. HEPTARADIATUS VAR. E)
(SEE AGALMATOASTER DISTINCTUS)
(SEE EU-DISCOASTER DISTINCTUS)
DIVARICATUS HAY IN HAY ET AL., 1967 MIOCENE
DIVERSUS MARTINI, 1960 M. OLIG.
DRIEVERI ROMEIN, 1980 (NOMEN NOVUM PRO D. BRAMLETTEI
(BUKRY & PERCIVAL,1971)ROMEIN 1979, NON MARTINI,1959)
(SEE D. BRAMLETTEI AND DISCOASTEROIDES BRAMLETTEI)
DRUGGI BRAMLETTE & WILCOXON, 1967B
(NOM. SUBST. PRO D. EXTENSUS BRAMLETTE & WILCOXON, 1967
NON HAY, 1967)
(SEE CLAVODISCOASTER DRUGGII)
(SEE EU-DISCOASTER DRUGGI)
DURUSRADIATUS SHAMRAI & LAZAEEVA, 1956 U. EOCENE
(FIDE NOEL, 1960 = D. STELLA)

-E-

EHRENBERGI TAN SIN HOK, 1927B TERTIARY
(SEE HELIOCODISCOASTER)
ELEGANS BRAMLETTE & SULLIVAN, 1961 L.-M. EOCENE
(FIDE STRADNER, 1961 = D. STRADNERI, WHICH IS A JR. SYNONYM)
(SEE HELIODISCOASTER BARBADIENSIS SUBSP. ELEGANS)
(SEE HELIO-DISCOASTER ELEGANS)
EXILIS MARTINI & BRAMLETTE, 1961 MIOCENE
(SEE EUDISCOASTER EXILIS)
(SEE EU-DISCOASTER EXILIS)
EXTENSUS HAY IN HAY ET AL., 1967 MIOCENE
EXTENSUS BRAMLETTE & WILCOXON, 1967A X
(HOMONYM OF D. EXTENSUS HAY, 1967; SEE D. DRUGGI)

-F-

FALCATUS BRAMLETTE & SULLIVAN,1961 PALEO.-L. EOCENE
(FIDE HAY ET AL., 1967 = D. NOBILIS)
(SEE CURVIDISCOASTER NOBILIS SUBSP. FALCATUS)
FLOREUS BYSTRICKA, 1964 EOCENE
FLORIDUS SHAMRAI & LAZAREVA, 1956
(SEE HELICODISCOASTER FLORIDUS)
FLORIDUS GORKA, 1957 X U CRET.
(NON D. FLORIDUS, SHAMRAI & LAZAREVA)
(SEE BISCUTUM CONSTANS & B. FLORIDUM)
(FIDE SHUMENKO, 1971C = DISCORHABDUS TESTUDINARIUM)
FLORIDUS VAR. PETALIFORMIS GORGULEVSKAYA, 1965 X
FORMOSUS MARTINI & WORSLEY, 1971 MIOCENE
(?) FURCATUS DEFLANDRE IN DEFLANDRE & FERT, 1954 CRET.
(TYPE SPECIES OF MARTHASTERITES)
FURUS KAMPTNER, 1967 LATE TERTIARY

-G-

GEMMEUS STRADNER, 1959A PALEOCENE
(SEE RADIODISCOASTER GEMMEUS)
(SEE HELIO-DISCOASTER GEMMEUS)
GEMMIFER STRADNER, 1961 M. EOCENE
(SEE AGALMATOASTER GEMMIFER)
GEOMETRICUS BRONNIMANN & STRADNER, 1960 L. EOCENE
GERMANICUS MARTINI, 1958 U. EOCENE
(FIDE NOEL, 1960 = D. TANI NODIFER; FIDE BRAMLETTE &
SULLIVAN, 1961 INCLUDES D. PLEBIUS)
(SEE GEMMIODISCOASTER GERMANICUS)
GLADIATUS NISHIDA, 1969 MIOCENE
GOZOENSIS HOJJATZADEH, 1978 M. MIOCENE
GRAVITERMINATUS VAROL, 1984 M. MIOCENE
GRILLII RADE, 1977 PLIOCENE

-H-

HAMATUS MARTINI & BRAMLETTE, 1963 MIOCENE
(SEE EU-DISCOASTER HAMATUS)
(SEE EUDISCOASTER HAMATUS; CLAVODISCOASTER HAMATUS)
?HAYI BUKRY, 1969 U. CRET.
(SEE BUKRYASTER HAYI)
HELIANTHUS BRAMLETTE & SULLIVAN, 1961 PALEOCENE - L. EOCENE
(FIDE MARTINI, 1971 = D. SPLENDIDUS)
(SEE RADIODISCOASTER GEMMEUS SUBSP. HELIANTHUS)
HEPTARADIATUS KLUMPP, 1953 EOCENE
(SEE EUDISCOASTER HEPTARADIATUS)
HEPTARADIATUS VAR. γ KLUMPP, 1953 EOCENE
(FIDE NOEL, 1960 = D. DEFLANDREI)
HEPTARADIATUS VAR. ε KLUMPP, 1953 EOCENE
(FIDE NOEL, 1960 = D. DISTINCTUS)
HILLI TAN SIN HOK, 1927 TERTIARY
(REFER. TO JUKES-BROWNE & HARRISON, 1892)
(SEE EUDISCOASTER HILLI)
HILLI VAR. β BERSIER, 1939 OLIGOCENE
(FIDE NOEL, 1960 = D. BIFIDUS)
HILLI VAR. BETA DEFLANDRE, 1959 X
HILLI VAR. γ KLUMPP, 1953 EOCENE
(FIDE NOEL, 1960 = D. DEFLANDREI)
HOHNENSIS MARTINI, 1958 U. EOCENE
(SEE TROCHASTRITES HOHNENSIS)

-I-

ICARUS STRADNER, 1973 U. MIOCENE
ILVENSIS (PAREJAS) GARDET, 1955 U. MIOCENE
INCOMPTUS HAY IN HAY ET AL., 1967 EOCENE
INDICA SINGH & VIMAL, 1976 L.MIOCENE-E.PLIOCENE
INFLATUS DANG DIC NGA & SHUMENKO, 1975 EOCENE
INTERCALARIS BUKRY, 1971B U. MIOCENE- U. PLIOCENE
IRREGULARIS FILIPESCU & HANGANU, 1960 MIOCENE
ISTANBULENSIS SADEK & OZER, 1981 EOCENE

-J-

JAPONICUS NISHIDA, 1969 U.-M. MIOCENE

-K-

KIEVENSIS DANG DIC NGA & SHUMENKO, 1975 EOCENE

KUEPPERI STRADNER, 1959B PALEOCENE
(TYPE SPECIES OF DISCOASTEROIDES)
(SEE HELIODISCOASTER KUEPPERI , PRINS 1970)
(SEE HELIO-DISCOASTER KUEPPERI)
KUGLERI MARTINI & BRAMLETTE, 1963 MIOCENE
(SEE ?CLAVDISCOASTER KUGLERI)
(SEE EU-DISCOASTER KUGLERI)

-L-

LAUTUS HAY IN HAY ET AL., 1967 MIOCENE
LENTICULARIS BRAMLETTE & SULLIVAN, 1961 PALEOC.-L. EOCENE
(SEE RADIODISCOASTER LENTICULARIS)
(SEE HELIO-DISCOASTER LENTICULARIS)
LEVINII HAY IN HAY ET AL., 1967 EOCENE
LIDZII HAY IN HAY ET AL., 1967 OLIGOCENE
LIMBATUS BRAMLETTE & SULLIVAN, 1961 PALEOC.-L. EOCENE
(SEE CURVIDISCOASTER LIMBATUS)
LODOENSIS BRAMLETTE & RIEDEL, 1954 L.-M. EOCENE
(SEE CUNEATUS LODOENSIS)
(SEE CURVIDISCOASTER LODOENSIS & RADIODISCOASTER LODOENSIS)
(SEE HELIO-DISCOASTER LODOENSIS)
LOEBLICHII BUKRY, 1971B U. MIOCENE
(SEE EU-DISCOASTER LOEBLICHII)
LUBLINAENSIS BYSTRICKA, 1966 M. EOCENE

-M-

MAHMOUDII PERCH-NIELSEN, 1981 U. PALEOCENE
MARTINII STRADNER, 1959B L. EOCENE
(SEE TURBODISCOASTER MARTINII)
MEDIOSUS BRAMLETTE & SULLIVAN, 1961 U. PALEOCENE-L. EOCENE
(SEE GEMMIODISCOASTER MEDIOSUS)
(SEE HELIO-DISCOASTER MEDIOSUS)
MEGASTYPUS (BRAMLETTE & SULLIVAN, 1961)
PERCH-NIELSEN, 1984
(SEE DISCOASTEROIDES)
(SEE DISCOASTEROIDES)
MELITENSIS HOJJATZADEH, 1978 M. MIOCENE
MEMBRANAEFORMAE SHAMRAI & LAZAREVA, 1956 U. EOCENE
MENDOMOBENSIS WISE, 1973 U. MIOCENE
(SEE EU-DISCOASTER MENDOMOBENSIS)
MINIMUS SULLIVAN, 1964 L. EOCENE
MINUTUS HOJJATZADEH, 1978 M. MIOCENE
MIRUS DEFLANDRE IN GRASSE, 1952 X (NO DESCRIPT.)
MIRUS DEFLANDRE IN DEFLANDRE & FERT, 1954 EOCENE
(SEE AGALMATOASTER MIRUS)
(SEE HELIO-DISCOASTER MIRUS)
MOHLERI BUKRY & PERCIVAL, 1971 U. PALEOCENE
(SEE HELIO-DISCOASTER MOHLERI)
MOLARIS SHAMRAI & LAZAREVA, 1956 M. EOCENE
MOLENGRAAFFI TAN SIN HOK, 1927 TERTIARY
(REFER. TO MURRAY & RENARD, 1891)
(FIDE BRAMLETTE & RIEDEL, 1954 = D. BROUWERI)
(TYPE SPECIES OF HEMIDISCOASTER)
MOLENGRAAFFI VAR. ✓ TAN SIN HOK, 1927 TERTIARY
MOLENGRAAFFI VAR. DELTA DEFLANDRE, 1959 X
MOLENGRAAFFI VAR. GAMMA DEFLANDRE, 1959 X

(FIDE NOEL, 1960 = D. CHALLENGERI)
MONSTRATUS MARTINI, 1961 EOCENE
(SEE AGALMATOASTER MONSTRATUS)
MOOREI BUKRY, 1971A M. MIOCENE
(SEE EU-DISCOASTER MOOREI)
MRAZECI FILIPESCU & HANGANU, 1960 MIOCENE
MULTINUCLEATUS FILIPESCU & HANGANU, 1960 MIOCENE
MULTIRADIATUS BRAMLETTE & RIEDEL, 1954 PALEOCENE
(SEE DISCOASTEROIDES MULTIRADIATUS)
(SEE HELIO-DISCOASTER MULTIRADIATUS)
MULTIRADIATUS SUBSP. PEDUNCULATUS BYSTRICKA, 1966 U. EOCENE
MULTIRADIATUS SUBSP. ROBUSTUS BYSTRICKA, 1966 L. EOCENE
MUNITUS STRADNER, 1961 M. EOCENE
(SEE AGALMATOASTER MUNITUS)
MURRAYI BLACK & BARNES, 1961 RECENT ?
(FIDE MCINTYRE & BE, 1967 = MICROCOCCOLITHS OF
UMBELLOSPHAERA IRREGULARIS & TENUIS)
MUSICUS STRADNER, 1959A MIOCENE
(SEE EU-DISCOASTER MUSICUS)

-N-
NEOHAMATUS BUKRY & BRAMLETTE, 1969 U. MIOCENE
(SEE EUDISCOASTER & CLAVODISCOASTER NEOHAMATUS)
(SEE EU-DISCOASTER NEOHAMATUS)
NEORECTUS BUKRY, 1971B MIOCENE
(SEE EU-DISCOASTER NEORECTUS)
NEPHADOS HAY IN HAT ET AL., 1967 MIOCENE
NIVALIS MANIVIT, 1961 L. EOCENE
NOBILIS MARTINI, 1960 X
NOBILIS MARTINI, 1961 PALEOCENE
(SEE RADIODISCOASTER NOBILIS)
(SEE HELIO-DISCOASTER NOBILIS)
NODIFER (BRAMLETTE & RIEDEL,1954) BUKRY, 1973 (EX D. TANI)
(SEE HELIO-DISCOASTER NODIFER)
?NOELAE BUKRY, 1969 U. CRET.
(SEE BUKRYASTER NOELAE)
NONARADIATUS KLUMPP, 1953 EOCENE
(SEE EU-DISCOASTER NONRADIATUS)
NONARADIATUS VAR. Y KLUMPP, 1953 EOCENE
(FIDE NOEL, 1960 = D. DEFLANDREI)
NOTOENSIS NISHIDA, 1969 U. MIOCENE

-O-
OBSCURUS MARTINI, 1958 EOCENE
(SEE LITHOSTROMATION OBSCURUM & L. VASTUM, ESP. MARTINI,1962)
(SEE MARTHASTERITES OBSCURUM & IMPERIASTER OBSCURUS)
OBTUSUS GARTNER, 1967 MIOCENE
OCTORADIATUS (SUJKOWSKI) GARDET, 1955 (EX ASTEROLITHES)
OKADAI BUKRY, 1981 PALEOCENE
OLTENIAE FILIPESCU & HANGANU, 1960 MIOCENE
ORNATUS STRADNER, 1958 MIOCENE
(FIDE NOEL, 1960 = D. STELLA)
(SEE HELIO-DISCOASTER ORNATUS)

-P-
PACIFICUS HAQ, 1969 EOCENE

(SEE HELIO-DISCOASTER PACIFICUS)
PANSUS (BUKRY & PERCIVAL,1971) BUKRY, 1973
(EX D. VARIABILIS SUBSP. PANSUS)
(SEE EU-DISCOASTER PANSUS)
PENTARADIATUS TAN SIN HOK, 1927 (AS VAR.) TERTIARY
(SEE EUDISCOASTER PENTARADIATUS)
(SEE EU-DISCOASTER PENTARADIATUS)
PENTARADIATUS VAR. ε KLUMPP, 1953 EOCENE
(FIDE NOLE, 1960 = D. DISTINCTUS)
PENTARADIATUS VAR. COMMUNIS FILIPESCU & HANGANU, 1960 MIOCENE
PENTARADIATUS VAR. FLOSCULOIDES FILIPESCU & HANGANU,1960 MIOCENE
PERCLARUS HAY IN HAY ET AL., 1967 MIOCENE
PERFORATUS STRADNER, 1959A MIOCENE
PERPLEXUS BRAMLETTE & RIEDEL, 1954 MIOCENE
PERPOLITUS MARTINI, 1961 PALEOCENE
(SEE DISCOASTEROIDES MULTIRADIATUS SUBSP. PERPOLITUS)
(SEE HELIO-DISCOASTER PERPOLITUS)
PETALIFORMIS MOSHKOVITZ & EHRLICH, 1980 M. MIOCENE
PHYLLODUS HAY IN HAY ET AL., 1967 MIOCENE
PLANCTONICUS LECAL, 1952 RECENT ?
(SEE DISCOASTEROMONAS CALCIFERUS VAR. PLANCTONICUS)
PLEBEIUS MARTINI, 1958 U. EOCENE
(FIDE NOEL, 1960 = D. BROUWERI & D. HEPTARADIATUS;
(FIDE BRAMLETTE & SULLIVAN, 1961 = D. GERMANICUS)
PREPENTARADIATUS BUKRY & PERCIVAL, 1971 L.-M. MIOCENE
(SEE EU-DISCOASTER PREPENTARADIATUS)
PRISMATICA HOJJATZADEH, 1978 M. MIOCENE
PSEUDOVARIABILIS MARTINI & WORSLEY, 1971 MIOCENE
(SEE EU-DISCOASTER PSEUDOVARIABILIS)
PUGNOSA HOJJATZADEH, 1978 M. MIOCENE
PYSZKIENSIS (SUJKOWSKI) GARDET, 1955 (EX ASTEROLITHES)

-Q-

QUADRAMUS BUKRY, 1973 L. PLIOCENE
QUINARIUS (EHRENBERG) BERSIER, 1939 (EX ACTINISCUS)
QUINARIUS VAR. α BERSIER, 1939 OLIGOCENE
(FIDE NOEL, 1960 = D. TUMESCENS)
QUINARIUS VAR. ALPHA DEFLANDRE, 1959 X
QUINARIUS VAR. δ BERSIER, 1939 OLIGOCENE
(FIDE NOEL, 1960 = D. BIFIDUS)
QUINARIUS VAR. DELTA DEFLANDRE, 1959 X
QUINARIUS F. DISCULA GARDET, 1955 MIOCENE
QUINARIUS VAR. γ GARDET, 1955 NEOGENE
QUINARIUS VAR. GAMMA DEFLANDRE, 1959 X
QUINQUERAMUS GARTNER, 1969 L. MIOCENE- L. PLIOCENE
(SEE EUDISCOASTER QUINQUERAMUS)
(SEE EU-DISCOASTER QUINQUERAMUS)
QUINTATUS BUKRY & BRAMLETTE, 1969 U. MIOCENE- L. PLIOCENE
(FIDE BUKRY & BRAMLETTE, 1969 = SUBJ. JR. SYNONYM
OF D. QUINQUERAMUS)

-R-

RAOI SINGH & VIMAL, 1976 L. MIOCENE- L. PLIOCENE
RHOMBOIDA HOJJATZADEH, 1978 M. MIOCENE
ROBUSTUS HAQ, 1969 EOCENE
ROTANS STRADNER, 1959A PALEOCENE

(FIDE BRAMLETTE & SULLIVAN, 1961 = D. TRIBRACHIATUS)
(SEE MARTHASTERITES ROTANS)
ROTUNDUSNOEL, 1960 CRET. - PLIOCENE
(FIDE NOEL, 1960 = D. ASTER, D. CRUCIFORMIS, & D. HILLI)
ROTUNDUS VAR. ELEGANS MANIVIT, 1961 L. EOCENE
RUFUS ROTH, 1970 OLIGOCENE
RUGOSUS HOJJATZADEH, 1978 M. MIOCENE

-S-
SABBAE FILIPESCU & HANGANU, 1960 MIOCENE
SAIPANENSIS BRAMLETTE & RIEDEL, 1954 U. EOCENE
(SEE HELIODISCOASTER SAIPANENSIS)
(SEE HELIO-DISCOASTER SAIPANSIS)
SALISBURGENSIS STRADNER IN BRONNIMANN & STRADNER, 1960 X
SALISBURGENSIS STRADNER, 1961 PALEOCENE
(SEE HELIODISCOASTER DIASTYPUS SUBSP. SALISBURGENSIS)
SANMIGUELENSIS BUKRY, 1981 M. MIOCENE
SAUNDERSII HAY IN HAY ET AL., 1967 OLIGOCENE
SEPTEMRADIATUS (KLUMPP) MARTINI, 1958 (EX AGALMATOASTER)
SIGNUS BUKRY, 1971A M. MIOCENE
(SEE EU-DISCOASTER SIGNUS)
SLATIORENSIS FILIPESCU & HANGANU, 1960 MIOCENE
SOLIDUS NOEL, 1960 PALEOCENE-MIOCENE
(NOEL CITED SYN. = D. TRIBRACHIATUS VAR. SOLIDUS; ERR. CIT.
D. TRIBRACHIATUS SUBCENT. ROBUSTUS ; & D. TRIRADIATUS)
SPLENDIDUS MARTINI, 1960 M. OLIGOCENE
(SEE HELIO-DISCOASTER SPLENDIDUS)
STAUROPHORUS GARDET, 1955 MIOCENE-PLIOCENE
(SEE MICULA STAUROPHORA, NANNOTETRASTER STAUROPHORUS &
TROCHOASTER STAUROPHORUS)
STELLA (EHRENBERG) BERSIER, 1939
STELLA VAR. α GARDET, 1955 NEOGENE
(FIDE NOEL, 1960 = D. TUMESCENS)
STELLA VAR. ALPHA DEFLANDRE, 1959 X
STELLA VAR. β GARDET, 1955 NEOGENE
(FIDE NOEL, 1960 = D. BIFIDUS)
STELLA VAR. BETA DEFLANDRE, 1959 X
STELLA VAR. DECORUS MANIVIT, 1961 EOCENE
STELLA VAR. σ GARDET, 1955 NEOGENE
STELLA VAR. DELTA DEFLANDRE, 1959 X
STELLA F. DISCULA GARDET, 1955 MIOCENE
STELLA VAR. γ GARDET, 1955 NEOGENE
STELLA VAR. γ F. DISCULA GARDET, 1955 X MIOCENE
STELLA VAR. GAMMA DEFLANDRE, 1959 X
STELLA VAR. GAMMA F. DISCULA DEFLANDRE, 1959 X
STELLULUS GARTNER IN HAY ET AL., 1967 X
STELLULUS GARTNER, 1967 MIOCENE
STRADNERI NOEL, 1960 M. EOCENE
STRADNERI MARTINI, 1961 X (NON D. STRADNERI NOEL) L. EOCENE
(FIDE STRADNER IN STRADNER & PAPP, 1961 = D. ELEGANS)
STRADNERI CATI & BORSETTI, 1970 MIOCENE
(= D. STRADNERI, NOEL ??)
(SEE D. ANCONITANUS , CATI & BORSETTI, 1972)
STRICTUS STRADNER, 1961 M. EOCENE
SUBBARBADIENSIS HAQ, 1971 OLIGOCENE
SUBDEFLANDREI FURRAZOLA-BERMUDEZ & ITURRALDE VINENT, 1967 U. OLIGOCENE

SUBLODOENSIS	BRAMLETTE & SULLIVAN, 1961		M. EOCENE
	(SEE RADIODISCOASTER & CLAVODISCOASTER SUBLODOENSIS)		
	(SEE HELIO-DISCOASTER SUBLODOENSIS)		
SUBSURCULUS	GARTNER IN HAY ET AL., 1967	X	
SUBSURCULUS	GARTNER, 1967		MIOCENE
	(SEE EU-DISCOASTER SUBSURCULUS)		
SURCULUS	MARTINI & BRAMLETTE, 1963		MIOCENE - PLIOCENE
	(SEE CLAVODISCOASTER SURCULUS)		
	(SEE EU-DISCOASTER SURCULUS)		
-T-			
TAMALIS	KAMPTNER, 1967		LATE TERTIARY
	(SEE D. BROUWERI TAMALIS)		
	(SEE EU-DISCOASTER TAMALIS)		
TAMALIS SUBSP. ORNATUS	BRAMLETTE & WILCOXON, 1967A		OLIGOCENE
TANI	BRAMLETTE & RIEDEL, 1954		U. EOCENE
	(SEE TURBODISCOASTER TANI & T. TANI TANI)		
	(SEE DISCOASTER NODIFER , BUKRY 1973)		
	(SEE HELIO-DISCOASTER TANI)		
TANI SUBSP. NODIFER	BRAMLETTE & RIEDEL, 1954		U. EOCENE
	(FIDE NOEL, 1960 INCL. D. GERMANICUS & D. BINODOSUS HIRUNDINUS) (SEE GEMMIODISCOASTER NODIFER)		
TANI SUBSP. ORNATUS	BRAMLETTE & WILCOXON, 1967		OLIGOCENE
	(SEE TURBODISCOASTER TANII ORNATUS)		
TAROSUS	KAMPTNER, 1967		LATE TERTIARY
TINGUARENSIS	FURRAZOLA-BERMUDEZ & ITURRALDE-VINENT, 1967		U.OLIG.
	(SEE CLAVODISCOASTER TINGUARENSIS)		
TLIOUANETENSIS	GARDET, 1955		MIOCENE
TOKERAE	VAROL, 1984		M. MIOCENE
TORALUS	ELLIS, LOHMAN, & WRAY, 1972		U.MIOCENE-L.PLIOCENE
TORTONIENSIS	GARDET, 1955		MIOCENE - PLIOCENE
TRIANGULARIS	BYSTRICKA, 1966		EOCENE
TRIBRACHIATUS	BRAMLETTE & RIEDEL, 1954		L. EOCENE
	(TYPE SPECIES OF TRIBRACHIATUS ; SEE MARTHASTERITES)		
TRIBRACHIATUS SUBCENT. ROBUSTUS	STRADNER, 1959B		PALEOCENE
	(SEE MARTHASTERITES ROBUSTUS & M. TRIBRACHIATUS SUBCENT. ROBUSTUS)		
TRIDENUS	KAMPTNER, 1967		LATE TERTIARY
	(SEE D. BROUWERI TRIDENUS)		
TRIFURCATUS	NISHIDA, 1969		M. MIOCENE
TRINIDADENSIS	HAY IN HAY ET AL., 1967		MIOCENE
TRINUS	STRADNER, 1961		M. EOCENE
TRIRADIATUS	TAN SIN HOK, 1927		TERTIARY
	(SEE HEMIDISCOASTER TRIRADIATUS)		
	(SEE D. BROUWERI TRIRADIATUS)		
TRIRADIATUS VAR. α	TAN SIN HOK, 1927		TERTIARY
TRIRADIATUS VAR. β	TAN SIN HOK, 1927		TERTIARY
TRIRADIATUS VAR. BETA	DEFLANDRE, 1959	X	
TRISTELLIFER	BUKRY, 1976		L. PLIOCENE
	(SEE EU-DISCOASTER TRISTELLIFER)		
TUMESCENS	NOEL, 1960		OLIGOCNE - MIOCENE
TURKIENSIS	SADEK & OZER, 1981		EOCENE
-U-			
UNCINATUS	BRONNIMANN & STRADNER, 1960		L. EOCENE
UNGUINCUS	SHAMRAI & LAZAREVA, 1956		U. EOCENE

-V-

VARIABILIS	MARTINI & BRAMLETTE, 1963	MIOCENE- PLIOCENE
	(SEE CLAVODISCOASTER VARIABILIS)	
	(SEE DISCOASTER DECORUS & D. PANSUS)	
	(SEE EU-DISCOASTER VARIABILIS)	
VARIABILIS SUBSP. DECORUS	BUKRY, 1971A	L.-M. PLIOCENE
VARIABILIS SUBSP. PANSUS	BUKRY & PERCIVAL,1971	U. MIOCENE-L.PLIOCENE
VARIABILIS SUBSP. SASTRII	SINGH & VIMAL, 1976	L. MIOCENE-E.PLIOCENE

-W-

WEMMELENSIS	ACHUTHAN & STRADNER, 1969	EOCENE
	(RADIODISCOASTER WEMMELENSIS)	
	(SEE HELIO-DISCOASTER WEMMELENSIS)	
WOODRINGI	BRAMLETTE & RIEDEL, 1954	OLIGOCENE

-Z-

ZAMMITMAEMPELI	HOJJATZADEH, 1978	M. MIOCENE

DISCOASTER INDEX
BIBLIOGRAPHY

REFERENCES

DISCOASTER SPECIES DESCRIBED IN CITED REFERENCE
(* = SEE SYNONOMIES IN INDEX AND BIBLIOG.,OR INA NEWSLETTER) (ALSO IN DISCOASTER SPECIES LIST)
(X = INVALID NAME, SEE INDEX OR INA NEWSLETTER)

NUMBERS AFTER REFERENCES INDICATE THE INDEX AND VOLUME NUMBER WHERE THE REFERENCE AND ALL LISTED SPECIES ARE CITED.
NUMBERS AFTER SPECIES NAMES INDICATE THE INDEX AND VOLUME NUMBER WHERE THE SPECIES IS LATER PLACED IN SYNONOMY.
- ROMAN NUMERIALS INDICATE THE SERIES NUMBER OF THE "INDEX AND BIBLIOGRAPHY OF CALCAREOUS NANNOPLANKTON" BY LOEBLICH AND TAPPAN.
- ARABIC NUMERIALS INDICATE THE VOLUME AND NUMBER OF THE "INTERNATIONAL NANNOPLANKTON ASSOCIATION NEWSLETTER".

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1. ACHUTHAN, M.V., AND STRADNER,H., 1969. CALCAREOUS NANNOPLANKTON FROM THE WEMMELIAN STRATOTYPE. IN;BRONNIMANN, P. AND RENZ, H.H. PROCEEDINGS FIRST INTERNATIONAL CONFERENCE ON PLANKTONIC MICROFOSSILS, GENEVA, E.J. BRILL, LEIDEN, V.1, PP.1-13, PLS. 1-5, FIGS.1,2. (V,VII)

WEMMELENSIS

2. BERSIER, A., 1939. DISCOASTERIDEES ET COCCOLITHOPHORIDEES DES MARNES OLIGOCENES VAUDOISES. BULL. SOC. VAUD. SC. NAT., V.60, PP. 229-248, 42 FIGS. (I)

COLLETI *
COLLETI VAR. γ *
HILLI VAR. β *
QUINARIUS *
QUINARIUS VAR. α *
QUINARIUS VAR. δ *
STELLA *

3. BLACK, M., & BARNES, B., 1961. COCCOLITHS AND DISCOASTERS FROM THE FLOOR OF THE SOUTH ATLANTIC OCEAN. J. ROY. MICR. SOC. (LONDON), SER. 3,V. 80, PP. 137-147 , PLS. 19-26. (I,III)

MURRAYI

4. BRAMLETTE, M.N., & RIEDEL, W.R.,1954. STRATIGRAPHIC VALUE OF

DISCOASTERS AND SOME OTHER MICROFOSSILS RELATED TO RECENT COCCOLITHOPHORES. J. PALEONT., V. 28, PP.385-403, PLS. 38 & 39, 3 TEXT FIGS. (I)

ASTER	
CHALLENGERI	(VII)
DEFLANDREI	(VII)
LODOENSIS	(VII)
MULTIRADIATUS	(VII)
PERPLEXUS	
SAIPANENSIS	(VII)
TANI	(VII)
TANI SUBSP. NODIFER	(VII)
TRIBRACHIATUS *	
WOODRINGI	

5. BRAMLETTE, M.N., & SULLIVAN, F.R., 1961. COCCOLITHOPHORIDS AND RELATED NANNOPLANKTON OF THE EARLY TERTIARY IN CALIFORNIA. MICROPALEONTOLOGY, V. 7, PP. 129-188, 14 PLS., I FIG. (I,VII)

DELICATUS	
DIASTYPUS	
ELEGANS	(III)
FALCATUS	
HELIANTHUS	
LENTICULARIS	
LIMBATUS	
MEDIOSUS	
SUBLODOENSIS	

6. BRAMLETTE, M.N., & WILCOXON, J.A.,1967A. MIDDLE TERTIARY CALCAREOUS NANNOPLANKTON OF THE CIPERO SECTION, TRINIDAD, W.I. TULANE STUD. GEOL., V. 5, PP. 93-131, 10 PLS.

ADAMANTEUS	(III,VII)
EXTENSUS *	(III)
TAMALIS SUBSP. ORNATUS	(VII)
TANI SUBSP. ORNATUS	(III)

7. BRAMLETTE, M.N., & WILCOXON, J.A.,1967B. DISCOASTER DRUGGI NOM. NOV. PRO DISCOASTER EXTENSUS BRAMLETTE & WILCOXON, 1967, NON HAY, 1967. TULANE STUD. GEOL., V. 5, P. 220. (III,VII)

DRUGGI

8. BRONNIMANN, P., & RIGASSI, D.,1963. CONTRIBUTION TO THE GEOLOGY AND PALEONTOLOGY OF THE AREA OF THE CITY OF LA HABANA, CUBA AND ITS SURROUNDINGS: ECLOG. GEOL. HELVET. V.56, PP.193-480, 26 PLS., 75 TEXT FIGS. (I)

BEBALINI (TAN SIN HOK) *

9. BRONNIMANN, P., & STRADNER,H., 1960. DIE FORAMINIFEREN UND DISCOASTERIDENZONEN VON KUBA UND IHRE INTERKONTINENTALE KORRELATION. ERDOEL-Z., V. 76, PP.364-369, 44 FIGS.,2 SCHEMATA. (I)

AECUS
GEOMETRICUS
SALISBURGENSIS (BY STRADNER - INVALID)
UNCINATUS

10. BUKRY, DAVID, 1969. UPPER CRETACEOUS COCCOLITHS FROM TEXAS AND EUROPE. UNIV. KANSAS PALEONT. CONTR., ART. 51 (PROTISTA 2), 79 P., 50 PLS., 1 FIG. (IV,VII)

HAYI ? *
? NOELAE *

11. BUKRY, DAVID, 1971A. DISCOASTER EVOLUTIONARY TRENDS. MICROPALEONTOLOGY, V. 17, PP. 43-52, PLS. 1-3. (VII)

ARANEUS
BERGGRENII
BRAARUDII
CALCULOSUS
MOOREI
SIGNUS
VARIABILIS SUBSP. DECORUS

12. BUKRY, DAVID, 1971B. CENOZOIC CALCAREOUS NANNOFOSSILS FROM THE PACIFIC OCEAN. SAN DIEGO SOC. NAT. HIST., TRANS., V. 16, PP. 303-327, PLS. 1-7. (VII)

BIFAX
INTERCALARIS
LOEBLICHII
NEORECTUS

13. BUKRY, DAVID, 1973A. COCCOLITH STRATIGRAPHY, EASTERN EQUATORIAL PACIFIC, LEG 16, DEEP SEA DRILLING PROJECT. IN; VAN ANDEL, T.H., HEATH, G.R., ET AL., INTIAL REPORTS DSDP, V. 16, PP. 653-711, 5 PLS., 4 FIGS. (3/2)

DECORUS *
NODIFER *
PANUS *

14. BUKRY, DAVID, 1973B. PHYTOPLANKTON STRATIGRAPHY, DEEP SEA DRILLING PROJECT LEG 20, WESTERN PACIFIC OCEAN. IN; HEEZEN, B.C., MCGREGOR, I.D., ET AL., INTIAL REPORTS DSDP , V. 20, PP. 307-317, 2 PLS., I FIG. (4/1)

BLACKSTOCKAE
QUADRAMUS

15. BUKRY, DAVID, 1976. COCCOLITH STRATIGRAPHY OF MANIHIKI PLATEAU, CENTRAL PACIFIC, DEEP SEA DRILLING PROJECT, SITE 317. IN SCHLANGER, S.O., JACKSON, E.D., ET AL., INTIAL REPORTS DSDP, V. 33, PP. 493-501, 1 PL., 5 FIGS. (2/1)

TRISTELLIFER

16. BUKRY, DAVID, 1981. PACIFIC COAST COCCOLITH STRATIGRAPHY BETWEEN POINT CONCEPTION AND CABO ORIENTES, DEEP SEA DRILLING PROJECT LEG 63. IN YEATS, R.S., HAQ, B.S., ET AL., INTIAL REPORTS DSDP, V.63, PP. 445-471, 6 PLS., 14 FIGS. (4/1)

OKADAI
SANMIGUELENSIS

17. BUKRY, DAVID, & BRAMLETTE, M.N., 1969. SOME NEW AND STRATIGRAPHICALLY USEFUL CALCAREOUS NANNOFOSSILS OF THE CENOZOIC. TULANE STUD. GEOL. PALEONTOL., V.7, PP. 131-142, 3 PLS. (V)

NEOHAMATUS
QUINTATUS * (VII)

18. BUKRY, DAVID, & PERCIVAL, S.F. JR., 1971. NEW TERTIARY CALCAREOUS NANNOFOSSILS. TULANE STUD. GEOL. PALEONTOL., V. 8, PP. 123-146, 7 PLS. (VII)

BELLUS
MOHLERI
PREPENTARADIATUS
VARIABILIS SUBSP. PANSUS
BRAMLETTEI (AS DISCOASTEROIDES - SEE DISCOASTER DRIEVERI) *

19. BYSTRICKA, HEDVIGA, 1964. LES COCCOLITHOPHORIDES (FLAGELLES) DE L'EOCENE SUPERIEUR DE LA SLOVAQUIE. GEOL. SBORN.(SLOV. AKAD. VIED, BRATISLAVA). VOL. 15, PP. 203-225, PLS. 5-8. (I)

FLOREUS

20. BYSTRICKA, HEDVIGA, 1966. NOUVELLES ESPECES DU GENRE DISCOASTER DU PALEOGENE DES KARPATES OCCIDENTALES. GEOL. SBOR. (SLOV. AKAD. VIED, BRATISLAVA), V. 17, PP. 237-240, 10 FIGS. (II)

LUBLINAENSIS
MULTIRADIATUS SUBSP. PEDUNCULATUS
MULTIRADIATUS SUBSP. ROBUSTUS
TRIANGULARIS

21. CATI, F. & BORSETTI, A.M., 1970. I DISCOASTERIDI DEL MIOCENE DELLE MARCHE. GIOR. GEOL., SER.2, V.36 (1968), PP. 617-632, PLS. 73-82, 2 FIGS. (VI)

BROUWERI SUBSP. PICENTINUS
BROUWERI SUBSP. RECURVUS
CHALLENGERI SUBSP. MEDITERRANEUS
STRADNERI *

22. CATI, F. & BORSETTI, A.M., 1972. NUOVO NOMO PER UN DISCOASTERIDE DEL MIOCENE DELLE MARCHE. GIORN. GEOL., SER. 2, V. 38, P.373.

(4/2)

ANCONITANUS

23. COLOM, G., 1952. AQUITANIAN-BURDIGALIAN DIATOM DEPOSITS OF THE NORTH BETIC STRAIGHT, SPAIN. JOUR. PALEONTOLOGY, V. 26, PP. 867-885, 4 FIGS. (IV)

BROUWERI VAR. ALPHA X
BROUWERI VAR. BETA X
BROUWERI VAR. DELTA X
BROUWERI VAR. GAMMA X

24. DANG DIC NGA & SHUMENKO, S.I., 1975. NOV'IE VID'I IZVESTKOVOGO NANOPLANKTONA IZ EOCENA UKRAIN'I (NEW SPECIES OF CALCAREOUS NANNOPLANKTON FROM THE EOCENE OF THE UKRAINE). AKAD. NAUK. SSSR. PALEONT. ZURN., MOSKWA, PP. 22-26, 1 PL., 1 FIG. (2/2)

ACEROSUS
ANOMALUS
DECORATUS
INFLATUS
KIEVENSIS

25. DEFLANDRE, G., 1952. CLASSE DES COCCOLITHOPHORIDES (COCCOLITHOPHORIDAE LOHMANN, 1902); IN; GRASSE, P.P., TRAITE DE ZOOLOGIE. ANATOMIE, SYSTEMATIQUE, BIOLOGIE. TOME 1, FASC. 1; PHYLOGENIE. PROTOZOAIRES: GENERALITES. FLAGELLES. PP. 439-470, FIGS. 339-364. (I)

MIRUS X

26. DEFLANDRE, G., & FERT C., 1954. OBSERVATIONS SUR LES COCCOLITHOPHORIDES ACTUELS ET FOSSILES EN MICROSCOPIE ORDINAIRE ET ELECTRONIQUE. ANN. PALEONT., V. 40, PP. 115-176, 15 PLS., 127 TEXT FIGS. (I)

FURCATUS ? *
MIRUS (VII)

27. DEFLANDRE, G., 1959. SUR LES NANNOFOSSILES CALCAIRES ET LEUR SYSTEMATIQUE. REV. MICROPALEONT., V. 2, PP. 127-152, 4 PLS. (I)

AUSONIUS
BROUWERI VAR. ALPHA X
BROUWERI VAR. BETA X
BROUWERI VAR. DELTA X
BROUWERI VAR, GAMMA X
COLLETI VAR. GAMMA X
COLLETI VAR. GAMMA F. DISCULA X
CRUCIATUS VAR. DELTA X
HILLI VAR. BETA X
MOLENGRAAFFI VAR. DELTA X
MOLENGRAAFFI VAR. GAMMA X
QUINARIUS VAR. ALPHA X
QUINARIUS VAR. DELTA X
QUINARIUS VAR. GAMMA X

STELLA VAR. ALPHA X
STELLA VAR. BETA X
STELLA VAR. DELTA X
STELLA VAR. GAMMA X
STELLA VAR. GAMMA F. DISCULA X
TRIRADIATUS VAR. BETA X

28. ELLIS, C.H., LOHMAN, W.H. & WRAY, J.L., 1972. UPPER CENOZOIC CALCAREOUS NANNOFOSSILS FROM THE GULF OF MEXICO (DEEP SEA DRILLING PROJECT, LEG 1, SITE 3). QUART. COLORADO SCH. MINES, V.67, NO. 3, PP. 1-103, 18 PLS., 4 FIGS. (6/1)

TORALUS

29. FILIPESCU, MILTIADE, & HNAGANU, ELISABETA, 1960. SUR LES DISCOASTERIDES DU TERTIAIRE DU N-O DE L'OLTENIE. REV. GEOL. GEOGR., ACAD. REP. POP. ROUM., V.4, PP. 217-232, 3 PLS. (II)

ATHANASIUI
IRREGULARIS
MRAZECI
MULTINUCLEATUS
OLTENIAE
PENTARADIATUS VAR. COMMUNIS
PENTARADIATUS VAR. FLOSCULOIDES
SABBAE
SLATIORENSIS

30. FURRAZOLA-BERMUDEZ, G., & ITURRALDE-VINENT, M., 1967. ESTUDIO MICROPALEONTOLOGICO DEL OLIGOCENO SUPERIOR DE CUBA, EN EL POZO PIJUAN NO. 47. REV. TECHNOLOGICA (LA HABANA, CUBA), V. 5, PP. 3-11, 2 PLS., 4 TEXT FIGS. (II)

CUBENSIS
SUBDEFLANDREI * (VII)
TINQUARENSIS * (VII)

31. FURRAZOLA-BERMUDEZ & ITURRALDE-ITURRALDE-VINENT, M., 1972. IN; FURRAZOLA-BERMUDEZ, G. & KREISEL, K., 1972. (SEE BELOW) (4/2)

ASTERISCUS

32. FURRAZOLA-BERMUDEZ, G. & KREISEL, K., 1972. DISCOASTERIDOS Y BRAARUDOSFERIDOS DE LA FORMACION UNIVERSIDAD (EOCENO INFERIOR) DE CUBA. MINIST. MINERIA, COMBUST., METALURG., PUBL. ESPEC. NO. 6, 51 PP., 4 PLS., 6 FIGS. (4/2)

BORROI
CIRCULARIS X

33. GARDET, MONIQUE, 1955. CONTRIBUTION A ETUDE LES COCCOLITHES DES TERRAINS NEOGENES DE L'ALGERIE. PUBL. SERV. CARTE GEOL. ALGERIE. SER. 2, BULL. 5, PP. 477-550, 11 PLS., 1 TEXT FIG. (I)

COLLETI VAR. γ F. DISCULA *
CRUCIATUS *
CRUCIATUS VAR. δ
DECAPETALUS *
ILVENSIS *
OCTORADIATUS *
PYSZKIENSIS *
QUINARIUS F. DISCULA
QUINARIUS VAR. γ
STAUROPHORUS *
STELLA VAR. α *
STELLA VAR. β *
STELLA VAR. δ
STELLA F. DISCULA
STELLA VAR. γ
STELLA VAR. γ F. DISCULA X
TLIOUANETENSIS
TORTONIENSIS

34. GARTNER, STEFAN, JR., 1967. CALCAREOUS NANNOFOSSILS FROM NEOGENE OF TRINIDAD, JAMAICA, AND GULF OF MEXICO. UNIV. KANSAS PALEONT. CONTR., PAPER 29, 7 P.; 10 PLS.
(III)

AULAKOS (VII)
BROUWERI SUBSP. RUTELLUS
CALCARIS
OBTUSUS (VII)
STELLULUS
SUBSURCULUS

35. GARTNER, STEFAN, JR., 1969. CORRELATION OF NEOGENE PLANKTONIC FORAMINIFERA AND CALCAREOUS NANNOFOSSIL ZONES. TRANS. GULF COAST ASSOC. GEOL. SOC., V.19, PP. 585-599, 2 PLS., 7 FIG.
(V)

ASYMMETRICUS (VII)
QUINQUERAMUS (VII)

36. GORGULEVSKAYA, E.I., 1965. PALEOGENOVYE KOKKOLITOFORIDY YUGOVOSTOCHNYKH ERGENEY I IZMENENIE IZ VIDOVOGO SOSTAVA PO RAZREZU (PALOEGENE COCCOLITHOPHORIDS OF SOUTHEASTERN ERGENCY AND THE CHANGE IN ASPECT OF THE ASSEMBLAGE THROUGHOUT THE SECTION). AKAD. NAUK SSSR, SIBIRSK. OTDEL. INST. GEOL. GEOFIZ. TEZISY DOKLADOV K PERVOMU VSESOYUZNOMU PALEOALGOLOGICHESKOMU SOVESHEHANIYU, PP. 98-100 (NOVOSIBIRSK).
(II)

FLORIDUS VAR. PETALIFORMIS X

37. GORGULEVSKAYA, E.I., 1967. PALEOGENOVYE KOKKOLITOFORIDY YUGO-VOSTOCHNYKH ERGENEY (PALEOGENE COCCOLITHOPHORIDS OF THE SOUTHWESTERN YERGEN REGION). ISKOPAEMYE VODOROSLI SSSR, AKAD. NAUK. SSSR, SIBIRSKOE OTDEL., INST. GEOL. GEOFIZ., PP. 90-93, PLS. 14,15. (III)

ASTER VAR. CASTATUS X
CRASSUS * X

38. GORKA, HANNA, 1957. COCCOLITHOPHORIDAE Z GORNEGO MASTRYCHTU POLSKI SRODKOWJ (LES COCCOLITHOPHORIDES DU MAESTRICHTIEN SUPERIEUR DE POLOGNE). ACTA PALAEONT. POLON. VOL.2, PP. 235-284, 5 PLS. (I,III,VII)

FLORIDUS X

39. HAQ, U.Z. BILAL UL, 1969. THE STRUCTURE OF EOCENE COCCOLITHS AND DISCOASTERS FROM A TERTIARY DEEPSEA CORE IN THE CENTRAL PACIFIC. STOCKHOLM CONTR. GEOL., V.21, PP. 1-19, 5 PLS., 4 FIGS. (V)

PACIFICUS
ROBUSTUS

40. HAQ, U.Z. BILAL UL, 1971. PALEOGENE CALCAREOUS NANNOFLORA PART III: OLIGOCENE OF SYRIA. STOCKHOLM CONTRIB. GEOL., V. 25, PP. 99-127, 25 PLS., 1 FIG. (VII)

SUBBARBADIENSIS

41. HAQ, U.Z. BILAL UL, & BERGGREN, W.A., 1978. LATE NEOGENE CALCAREOUS PLANKTON BIOCHRONOLOGY OF THE RIO GRANDE RISE (SOUTH ATLANTIC OCEAN). J. PLAEONT., V. 52, NO.6, PP. 1167-1194, 5 PLS., 16 FIGS. (1/2)

BROUWERI SUBSP. BIPARTITUS

42. HAY, W.W., MOHLER, H.P, ROTH, P.H., SCHMIDT, R.R., & BOUDREAUX, J.E., 1967. CALCAREOUS NANNOPLANKTON OF THE CENOZOIC OF THE GULF COAST AND CARIBBEAN-ANTILLEAN AREA, & TRANSOCEANIC CORRELATION. TRANS. GULF COAST. ASSOC. GEOL. SOC., V.17, PP. 428-480, PLS. 1-13. (III)

ARGUTUS (BY HAY)
AULAKOS (BY GARTNER) X
CALCARIS (BY GARTNER) X
DILATUS (BY HAY)
DIVARICATUS (BY HAY)
EXTENSUS (BY HAY)
INCOMPTUS (BY HAY)
LAUTUS (BY HAY)
LEVINII (BY HAY)
LIDZII (BY HAY)
NEPHADOS (BY HAY)
PERCLARUS (BY HAY)
PHYLLODUS (BY HAY)
SAUNDERSII (BY HAY)
STELLULUS (BY GARTNER) X
SUBSURCULUS (BY GARTNER) X
TRINIDADENSIS (BY HAY)

43. HAY, W.W., 1970. CALCAREOUS NANNOFOSSILS FROM CORES RECOVERED ON LEG 4. IN; BADER, R.G. ET AL, INTIAL REPORTS OF THE DSDP, V.4, PP. 455-501. (VI)

BROUWERI CALCARIS * X
BROUWERI TAMALIS * X
BROUWERI TRIDENUS * X
BROUWERI TRIRADIATUS * X

44. HOFFMAN, N., 1970. ELEKTRONENMIKROSKOPISCHE UNTERSUCHUNGEN AN DISCOASTERIDEN AUS DEM OBER-EOZAN DER BOHRUNG SALZWEDEL 202/64 (ALTMARK). HALL. JB. MITTELDT. ERDG., V. 10 (1968), PP.7-26, PLS. 1-3. (VI)

CIRCULARIS

45. HOJJATZADEH, M., 1978. DISCOASTERS OF THE BLUE CLAY (MIDDLE MIOCENE) OF MALTA AND GOZO. GEOL. MAG., V.115, NO.1, PP.1 -19, 3 PLS., 7 FIGS. (1/1)

CHAMBRAYENSIS
GOZOENSIS
MELITENSIS
MINUTUS
PRISMATICA
PUGNOSA
RHOMBOIDA
RUGOSUS
ZAMMITMAEMPELI

46. KAMPTNER, E., 1964. IN; BACHMAYER, FRIEDRICH, 1964. UNTERSUCHUNG EINER KLUFFTULLUNG IM STEINBRUCH STAATZ (KAUTENDORF), NORDLICHES NIEDEROSTERREICH. ANN. NATURH. MUS. WIEN, V. 67, PP. 181-187, 2 PLS., 4 FIGS. (II)

CLAVIGER

47. KAMPTNER, E., 1967. KALKFLAGELLATEN-SKELETTRESTE AUS TIEF-SEESCHLAMM DES SUDATLANTISCHEN OZEANS. ANN. NATURHIST. MUS. WIEN, V. 71, PP. 117-198, 24 PLS., 30 TEXT FIGS. (III)

FURUS
TAMALIS * (VI)
TAROSUS
TRIDENUS * (VI)

48. KLUMPP, BARBARA, 1953. BEITRAG ZUR KENNTNIS DER MIKROFOSSILIEN DES MITTLEREN UND OBEREN EOZAN. PALAEONTOGRAPHICA, V. 103A, PP. 377-406, PLS. 16-20, 5 TEXT FIGS. (I)

BROUWERI VAR. ϵ * X
HEPTARADIATUS
HEPTARADIATUS VAR. γ *
HEPTARADIATUS VAR. ϵ *
HILLI VAR. γ *
NONARADIATUS
NONARADIATUS VAR. γ *
PENTARADIATUS VAR. ϵ *

49. LECAL, JULIETTE, 1952. SUR UNE PROTISTE PELAGIQUE REATTACHABLE

AUX DISCOASTERIDES. ARCH. ZOOL. EXPER. ET GEN. 89 (NOTES ET REVUE), PP. 51-55, 2 FIGS. (I)

PLANCTONICUS

50. LEZAUD, LUCIEN, 1968. ESPECIES NOUVELLES DE NANNOFOSSILES CALCAIRES (COCCOLITHOPHORIDES) D'AQUITAINE SUD-OUEST. REV. MICROPALEONTOLOGIE, V.11, PP. 22-28, 2 PLS. (IV)

BOULANGERI

51. MANIVITT, HELENE, 1961. CONTRIBUTION A L'ETUDE DES COCCOLITHES DE L'EOCENE. PUBL. SERV. CARTE GEOL. ALGERIE, SER. 2, BULL. 25, PP. 331-382, 10 PLS. (I)

NIVALIS
ROTUNDUS VAR. ELEGANS
STELLA VAR. DECORUS

52. MARTINI, E., 1958. DISCOASTERIDEN UND VERWANDTE FORMEN IM NW-DEUTSCHEN EOZAN (COCCOLITHOPHORIDA). 1. TAXIONOMISCHE UNTERSUCHUNGEN. SECKENB. LETH., V. 39, PP. 353-388, 6 PLS. (I)

BINODOSUS	(VII)
BINODOSUS SUBSP. BINODOSUS	
BINODOSUS SUBSP. HIRUNDINUS *	
BRAMLETTEI *	(VII)
CRASSUS *	(VII)
CRUCIFORMIS *	(VII)
DISTINCTUS *	(VII)
GERMANICUS *	(VII)
HOHNENSIS *	
OBSCURUS *	(IV, VI)
PLEBEIUS *	
SEPTEMRADIATUS	

53. MARTINI, E., 1960A. BRAARUDOSPHAERIDEN, DISCOASTERIDEN UND VERWANDTE FORMEN AUS DEM RUPELTON DES MAINZER BECKENS. NOTIZBL. HESS. LANDESAMT. BODENFORSCH. WIESBADEN, V. 88, PP. 65-87, PLS. 8-11. (I)

DIVERSUS
SPLENDIDUS

54. MARTINI, E., 1960B. NANNOPLANKTON IN DER GEOLOGIE . UMSCHAU WISS. U. TECH. 1960, PP. 394-397, 14 FIGS. (I)

NOBILIS X

55. MARTINI, E., 1961. NANNOPLANKTON AUS DEM TERTIAR UND DER OBERSTEN KREIDE VON SW-FRANKREICH. SENCKENB. LETH. V. 42, PP. 1-32, 5 PLS., 3 TEXT FIGS. (I)

MONSTRATUS (VII)
NOBILIS (VII)
PERFOLITUS (VII)
STRADNERI * X

56. MARTINI, E., & BRAMLETTE, M.N., 1963. CALCAREOUS NANNOPLANKTON FROM THE EXPERIMENTAL MOHOLE DRILLING. J. PALEONT., V. 37, PP. 845-856, PLS. 102-105, 2 TEXT FIGS. (I,VII)

BOLLI
EXILIS
HAMATUS
KUGLERI
SURCULUS
VARIABILIS

57. MARTINI, E., & WORSLEY, T.,1971. TERTIARY CALCAREOUS NANNOPLANKTON FROM THE WESTERN EQUATORIAL PACIFIC. IN; E.L. WINTERER ET AL., INTIAL REPORTS OF THE DSDP, V. 7, PT.2, PP. 1471-1507, 3 PLS., 3 FIGS. (VII)

FORMOSUS
PSEUDOVARIABILIS

58. MOSHKOVITZ, S. & EHRLICH, A, 1980. DISTRIBUTION OF THE CALCAREOUS NANNOFOSSILS IN THE NEOGENE SEQUENCE OF THE JAFFA-1 BOREHOLE, CENTRAL COASTAL PLAIN, ISRAEL. REPORT P.D./1/80, 25 P., 7 PLS., 1 FIG. (3/1)

PETALIFORMIS

59. MULLER, C., 1974. CALCAREOUS NANNOPLANKTON, LEG 25 (WESTERN INDIAN OCEAN). IN; SIMPSON, E.S.W., SCHLICH, R., ET AL., INIT. REPORTS DSDP, V. 25, PP. 579-633, 19 PLS., 1 FIG. (3/1)

ALTUS

60. NISHIDA, S., 1969. NANNOFOSSILS FROM JAPAN I. MIOCENE DISCOASTERS FROM NOTO. TRANS. PROC. PALAEONTOL. SOC. JAPAN., V. 75, PP.136-152, PLS. 15-17, 3 FIGS. (V)

GLADIATUS
JAPONICUS
NOTOENSIS
TRIFURCATUS

61. NOEL, DENISE, 1960. REVISION DU GENRE DISCOASTER TAN SIN HOK, 1927. BULL. SOC. HIST. NAT. AFR. NORD., V. 51, PP. 201-229, 3 PLS. (I)

BIFIDUS
CLAVATUS
ROTUNDUS
SOLIDUS
STRADNERI
TUMESCENS

(NOTE: NOEL HAS PLACED MANY DISCOASTER SPECIES IN SYNONOMY IN THIS REFERENCE)

62. PERCH-NIELSEN, K., 1981. NEW MAASTRICHTIAN AND PALEOCENE CALCAREOUS NANNOFOSSILS FROM AFRICA, DENMARK, THE U.S.A., AND THE ATLANTIC, AND SOME PALEOCENE LINEAGES. ECLOGAE GEOL. HELV., V. 74, NO. 3, PP. 831-863, 7 PLS., 2 FIGS. (4/1)

MAHMOUDII

63. PERCH-NIELSEN, K., 1984. VALIDATION OF NEW COMBINATIONS. INTERNAT. NANNO. ASSOC. NEWSLETTER, V.6(1), PP.42-46 (6/1)

MEGASTYPUS *

64. RADE, J., 1977. TERTIARY BIOSTRATIGRAPHIC ZONATION BASED ON CALCAREOUS NANNOPLANKTON IN EASTERN AUSTRALIAN NEARSHORE BASINS. MICROPAL., V. 23(3), PP. 270-296, 3 PLS., 3 FIGS. (1/2)

GRILLII

65. ROMEIN, A.J.T., 1979. LINEAGES IN EARLY PALEOGENE CALCAREOUS NANNOPLANKTON. UTRECHT MICROPAL. BULL., V. 22, 231 P., 10 PLS., 77 FIGS. (2/1)

BRAMLETTEI X

66. ROMEIN, A.J.T., 1980. DISCOASTER DRIEVERI, NOMEN NOVUM PRO DISCOASTER BRAMLETTEI (BUKRY & PERCIVAL, 1971) ROMEIN 1979 NON MARTINI 1958. INTERNAT. NANNO. ASSOC. NEWSLETTER, V. 2(1), P. 35. (2/2)

DRIEVERI (EX BRAMLETTEI, NON MARTINI) *

67. ROTH, P.H., 1970. OLIGOCENE CALCAREOUS NANNOPLANKTON BIOSTRATIGRAPHY. ECOLOG. GEOL. HELV., V. 63, P. 799-881, 14 PLS., 17 FIGS. (VI)

RUFUS

68. SADEK, A. & OZER, O., 1981. TWO NEW DISCOASTERS FROM TURKEY. REV. ESP. MICROPAL., V. 13(1), PP. 43-45, 1 PL., 2 FIGS. (3/2)

ISTANBULENSIS
TURKIENSIS

69. SHAMRAI, I.A., & LAZAREVA, E.P., 1956. PALEOGENOVYE COCCOLITHOPHORIDAE I IKH STRATIGRAFICHESKOE ZNACHENIE (PALEOGENE COCCOLITHOPHORIDAE AND THEIR STRATIGRAPHIC SIGNIFICANCE) DOKL. AKAD. NAUK. SSSR, V. 108, PP. 711-714, 1 FIG. (I)

AEOCENICUS *
CORNIGER *
DURUSRADIATUS
FLORIDUS

MEMBRANAEFORMAE
MOLARIS
UNGUINCUS

70. SINGH P. & VIMAL, K.P., 1976. LATE MIOCENE- EARLY PLIOCENE DISCOASTER FROM NEILL ISLAND, SOUTH ANDAMAN. GEOL. SOC. INDIA, V. 17(1), PP. 37-44, 4 PLS., 1 FIG. (1/1)

ANDAMANENSIS
ARCHIPELAGOENSIS
CHALLENGERI SUBSP. NELLENSIS
INDICA
RAOI
VARIABILIS SUBSP. SASTRII

71. STRADNER, H. 1958. DIE FOSSILIEN DISCOASTERIDEN OSTERREICHS. 1. TEIL. DIE IN DEN BOHRKERNEN DER TIEFBOHRUNG KORNEUBURG 1 ENHALTENEN DISCOASTERIDEN. ERDOEL-Z., V. 74, PP. 178-188, 38 FIGS. (I)

CONTORTUS
ORNATUS

72. STRADNER, H., 1959A. FIRST REPORT ON THE DISCOASTERS OF AUSTRIA AND THEIR STRATIGRAPHIC USE. PROC. FIFTH WORLD PETROL. CONGR. (NEW YORK, 1959), V.1, PP. 1081-1095, 30 FIGS. (I)

CURRENS
GEMMEUS * (VII)
MUSICUS
PERFORATUS
ROTANS *

73. STRADNER, H., 1959B. DIE FOSSILEN DISCOASTERIDEN OSTERREICHS. II. TEIL. ERDOEL-Z., V. 75, PP. 472-488, 77 FIGS. (I)

KUEPPERI
MARTINII * (VII)
TRIBRACHIATUS SUBCENT. ROBUSTUS *

74. STRADNER, H., 1961. VORKOMMEN VON NANNOFOSSILIEN IM MESOZOIKUM UND ALTTERTIAR. TEIL. ERDOEL-Z., V. 77, PP. 77-88, 99 FIGS. (I)

BRONNIMANNI (VII)
GEMMIFER (VII)
MUNITUS (VII)
SALISBURGENSIS (VII)
STRICTUS
TRINUS

75. STRADNER, H., 1973. CATALOGUE OF CALCAREOUS NANNOPLANKTON FROM SEDIMENTS OF NEOGENE AGE IN THE EASTERN NORTH ATLANTIC AND MEDITERRANEAN SEA. IN; RYAN, W.B.F., HSU, K.J. ET AL., INIT. REP. DSDP, V.13, PT.2, PP. 1137-1199, 51 PLS. (4/1)

ICARUS

76. SULLIVAN, F.R., 1964. LOWER TERTIARY NANNOPLANKTON FROM THE CALIFORNIA COAST RANGES. I. PALEOCENE. UNIV. CALIF. PUBL. GEOL. SC., V.44, PP. 163-227, 12 PLS., 2 TEXT FIGS. (I)

MINIMUS

77. TAN SIN HOK, 1927. DISCOASTERIDAE INCERTAE SEDIS. PROC. SECT. SC. K. AKAD. WET. AMSTERDAM, V.30, PP. 411-419, 14 FIGS. (I)

BARBADIENSIS
BARBADIENSIS VAR. BEBALINI
BROUWERI *
BROUWERI VAR. α *
BROUWERI VAR. β *
BROUWERI VAR. δ *
BROUWERI VAR. γ *
EHRENBERGI
HILLI
MOLENGRAAFFI *
MOLENGRAAFFI VAR. δ *
PENTARADIATUS (AS VAR.)
TRIRADIATUS
TRIRADIATUS VAR. α
TRIRADIATUS VAR. β

78. THEODORIDIS, S.A., 1983. ON THE LEGITIMACY OF THE GENERIC NAME DISCOASTER TAN, 1927 EX TAN, 1931. INTERNAT. NANNO. ASSOC. NEWSLETTER, V.5(1), PP.15-21. (5/1)

(NOTE; IN THIS REFER. MANY SPECIES PREVIOUSLY ASSIGNED TO THE GENUS DISCOASTER ARE PLACED UNDER THE GENERA EU-DISCOASTER AND HELIO-DISCOASTER PLEASE SEE THIS REFERENCE FOR LISTING)

79. VAROL, O., 1984. NEW NEOGENE CALCAREOUS NANNOFOSSIL TAXA FROM MALTA AND SOUTHERN TURKEY. N. JB. GEOL. PALAONT. MH., V. 6, PP. 375-384, 3 FIGS. (6/2)

GRAVITERMINATUS
TOKERAE

80. WILCOXON, J.A., 1972. UPPER JURASSIC - LOWER CRETACEOUS CALCAREOUS NANNOPLANKTON FROM THE WESTERN NORTH ATLANTIC BASIN. IN; HOLLISTER, C.D., EWING, J.L., ET AL., INIT. REP. DSDP, V. 11, PP. 427-457, 12 PLS. (4/2)

ATLANTICUS ?

81. WISE, S.W., 1973. CALCAREOUS NANNOFOSSILS FROM CORES RECOVERED DURING LEG 18, DSDP; BIOSTRATIGRAPHY AND OBSERVATIONS ON DIAGENESIS. IN; KULM, L.D., HUENE, R.VON, ET AL., INIT. REP. DSDP, V. 18, PP. 569-615, 10 PLS., 2 FIGS. (4/1)

MENDOMOBENSIS

Discoaster orbis nom. nov. pro *Discoaster circularis* FURRAZOLA-BERMUDEZ and KREISEL, 1972, non HOFFMANN, 1970.

by David D. Reimers and Denise O. Daigre

Discoaster circularis FURRAZOLA-BERMUDEZ and KREISEL, 1972, p.31, fig.6, is a later homonym of *Discoaster circularis* HOFFMANN, 1970, p.16, pl.3, figs.1-3. *Discoaster orbis* is here proposed as a replacement name for *D. circularis* FURRAZOLA-BERMUDEZ and KREISEL.

References

FURRAZOLA-BERMUDEZ,G. & KREISEL,K., 1972. Discoastéridos y Braarudosféridos de la formación Universidad Eoceno Inferior de Cuba. -Ministerio de Minería, Combustibles y Metalurgia, Publicación Especial no.6, pp.1-51, pls.1-4, 6 text-figs.

HOFFMANN,N., 1970. Elektronenmikroskopische Untersuchungen an Discoasteriden aus dem Ober-Eozän der Bohrung Salzwedel 202/64 (Altmark). -Hallesches Jahrbuch für Mitteldeutsche Erdgeschichte, vol.10 (1968), pp.7-26, pls.1-3.

(Note: This corrects a previous publication of the same title where reference to page and plate numbers were omitted.)

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Additional abstracts of the INA Meeting in Vienna:

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SEASONAL CYCLICITY IN CALCAREOUS NANNOFOSSIL FLORAS FROM LATE PLIOCENE LAMINITES FROM CRETE

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The calcareous nannofossil assemblages from Late Pliocene laminites (diatomites) from Prassas, Crete, have been investigated. The laminae were isolated and inventarised on nannoflora in a semi-quantitative manner.

The floras are dominated by *Helicosphaera sellii* and *Reticulofenestra minuta*, of which the frequency patterns show strong fluctuations. Three cycles could be recognized, each consisting of three laminae. Each cycle is considered to be representing one year. Outside counts of *Braarudosphaera bigelowii* elements showed considerable fluctuations in frequency; peak frequencies are interpreted as caused by the "wet season" of the year (Bukry, 1974). Superimposed on the yearly cycle of *B. bigelowii*, a longer term cycle was found.

A tentative correlation with a sapropel interval in core 8-2 of DSDP site 378, made by Bianchi et al. supports annual sedimentation of three laminae in the Prassa section.

The cyclical pattern we found supports the theory in which stratification of watermasses in the Pliocene Mediterranean is caused by run-off (a.o. Gudjonsson & v.d. Zwaan, 1985).

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STABLE ISOTOPES OF QUATERNARY NANNOFOSSILS

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Scipps Institution of Oceanography, University of California, San Diego, La Jolla, CA 92093, USA (present address of first author: Geologisches Institut, ETH-Zentrum, CH-8092 Zürich, Switzerland).

Pleistocene oxygen isotopic stratigraphies established on calcareous nannofossils (i.e. <38 um carbonate fractions) in deep-sea cores from various locations show regional variability. In the North Atlantic oxygen isotope stratigraphies of nannofossils are very similar to those of planktonic foraminifera, in the Caribbean they show considerably higher glacial-interglacial amplitudes, and in the Pacific they show decreased glacial-interglacial amplitudes as well as downcore trends towards more positive values. The carbon isotopic stratigraphies of nannofossils are dominated by an interval of significantly more positive isotope ratios in isotope stages 9 through 13. Results from our studies so far indicate, that the observed trends and differences are caused by a combination of vital and preservational effects.

Vital isotope effects of various nannofossil taxa have been identified in the various subfractions of the <38 um-fractions, which were obtained by repeated decanting. The coarsest subfractions are dominated by juvenile foraminifera and foraminifera fragments and by thoracosphaerids. The finest subfractions are composed of *E. huxleyi*, small gephyrocapsids and *Florisphaera profunda*. Oxygen isotope ratios of the resulting 11 <38 um-

subfractions are near estimated surface water equilibrium values and not as much offset as would be expected from disequilibrium precipitation of cultured coccolithophores. The carbon isotopic ratios of the subfractions are most frequently outside the expected range for equilibrium precipitation, suggesting incorporation of variable proportions of isotopically light, metabolic carbon dioxide. We suspect that this metabolic effect is temperature dependent, because in each sample analysed we found a linear correlation between the oxygen and carbon isotopic ratios of the subfractions.

A comparison of the bathymetric trends observed in the accumulation rates and isotopic ratios of the dominant foraminifera species, of foraminifera fragments, and of the nannofossil fractions suggests, that differential foraminifera fragmentation, feeding into the <38 um-fractions, is responsible for most of the stable isotopic depth trends observed in the nannofossil fractions. Similar preservational effects seem to be responsible for the observed downcore trends, which appear to document a Pleistocene dissolution cycle in the Pacific of about 500ka wavelength.

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OXYGEN AND CARBON ISOTOPIC FLUCTUATIONS IN CYCLIC MID-CRETACEOUS NANNOFOSSIL CARBONATES: DOMINANCE OF DIAGENETIC EFFECTS.

Hans R. Thierstein (Scripps Institution of Oceanography, University of California, San Diego, La Jolla, CA 92093, USA; present address: Geologisches Institut, ETH-Zentrum, CH-8092 Zürich, Switzerland) and

Peter H. Roth (Geology and Geophysics Department, The University of Utah, Salt Lake City, Utah 84112, USA).

Detailed studies of abundance and preservation of nannofossils, $CaCO_3$ and organic carbon contents, and stable isotopic ratios of <38 um fractions in numerous, closely sampled cyclic mid-Cretaceous intervals from Atlantic and Pacific Oceans reveal the following:

1. Calcareous nannofossil preservation is closely related to carbonate contents. Nannofossil preservation is optimal in samples of 40-60 % $CaCO_3$, dissolution is strong at lower and recrystallization is dominant at higher $CaCO_3$ contents.

2. Stable isotope ratios of the <38 um carbonate fractions are highly correlated with nannofossil preservation and $CaCO_3$ contents within cyclic intervals. Progressive recrystallization with increasing carbonate contents leads to depletion of ^{18}O by up to 2% because of carbonate precipitation from isotopically light pore waters at possibly elevated temperatures and to a depletion of ^{13}C by up to 1% , caused by decomposition of organic matter through microbial oxidation and/or sulfate reduction. Progressive dissolution has little effect on oxygen isotopes, but leads to enrichment of ^{13}C by up to 4% probably caused by methanogenesis and precipitation of authigenic carbonate.

3. Stable isotope fluctuations are conspicuously absent in intervals with cyclic laminated and bioturbated beds, where $CaCO_3$ contents and nannofossil preservation do not vary significantly.

The dominance of diagenetic effects severely restricts paleotemperature and paleofertility interpretations of oxygen and carbon isotope ratios in mid-Cretaceous biogenous deep-sea carbonates.

A PROPOSED LOWER CRETACEOUS NANNOFOSSIL ZONATION SCHEME
FOR THE MORAY FIRTH AREA OF THE NORTH SEA.

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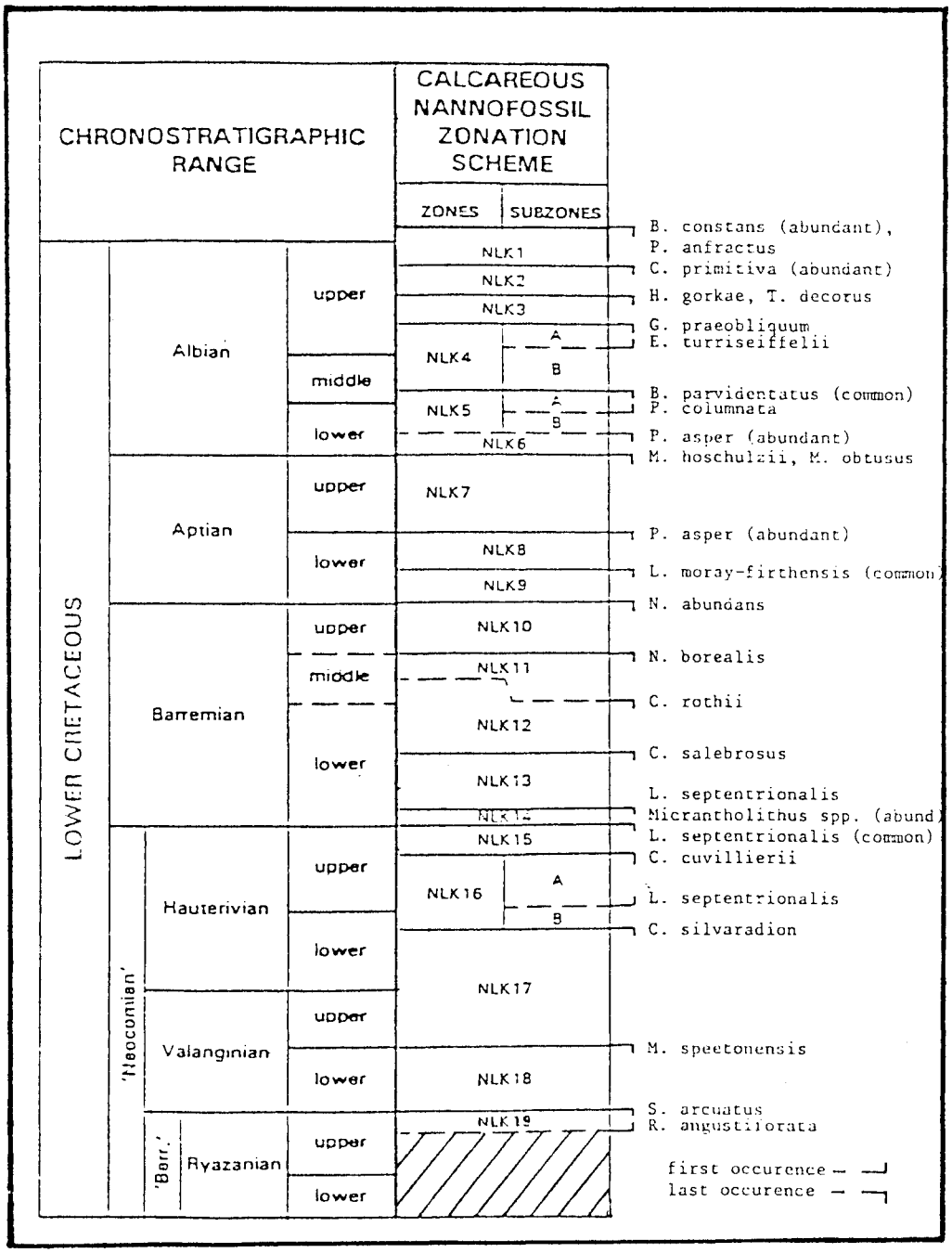
A Lower Cretaceous calcareous nannofossil zonation scheme for the Moray Firth Area of the North Sea is proposed, based on the examination of several well sections together with reference to unpublished work from onshore exposures. The zonal subdivisions are based upon the extinction, evolution, association and abundance of taxa. The application of the zonation scheme enables the recognition of minor hiatuses within the Lower Cretaceous section. Special attention has also been given to the early stages in the evolution of the genera Eprolithus and Gartnerago.



LATE CRETACEOUS CALCAREOUS NANNOFOSSIL BIOSTRATIGRAPHY OF THE SOUTHERN NORWEGIAN AND DANISH NORTH SEA AREA

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The purpose of this paper is to focus attention on Late Cretaceous calcareous nannofossils from the Southern Norwegian and Danish North Sea Area, with particular emphasis being placed on erecting a zonation scheme. In order to accomplish this the author has studied numerous Late Cretaceous well sections using core, sidewall core and in particular ditch cuttings samples. 19 zones and 9 subzones have been recognised for the area spanning the Maastrichtian to Cenomanian interval, and a comparison with the existing zonation schemes of Sissingh (1977, 1978) Perch-Nielsen and Prins (1979a) and Crux (1982) has also been undertaken.

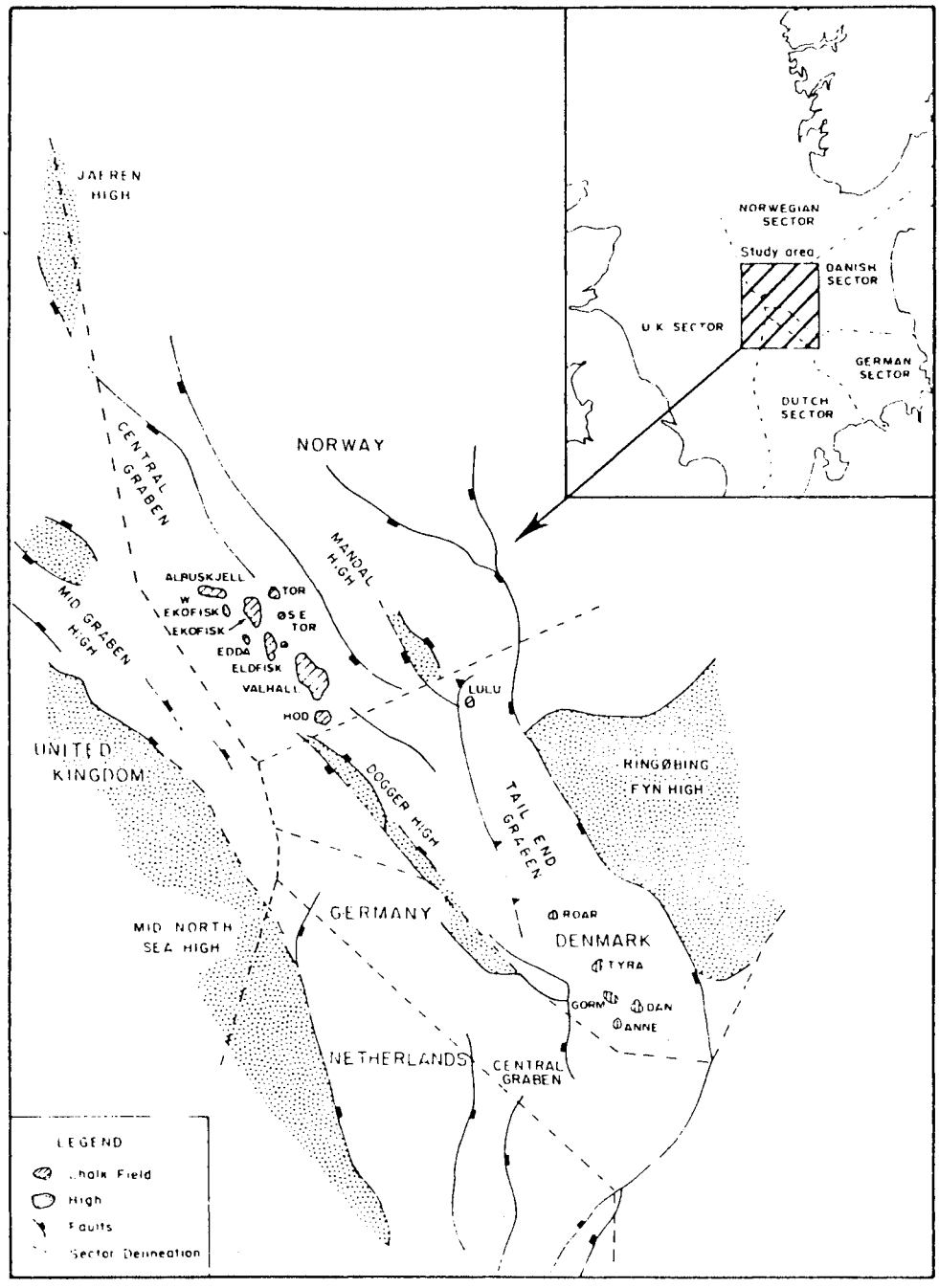


FIGURE 1 LOCATION MAP - SHOWING THE MAIN STRUCTURAL ELEMENTS FOR THE STUDY AREA

GENERALISED STRATIGRAPHY FOR THE UPPER PALAEOCENE TO MIDDLE ALBIAN INTERVAL FOR THE SOUTHERN NORWEGIAN AND DANISH CENTRAL GRABEN AREA

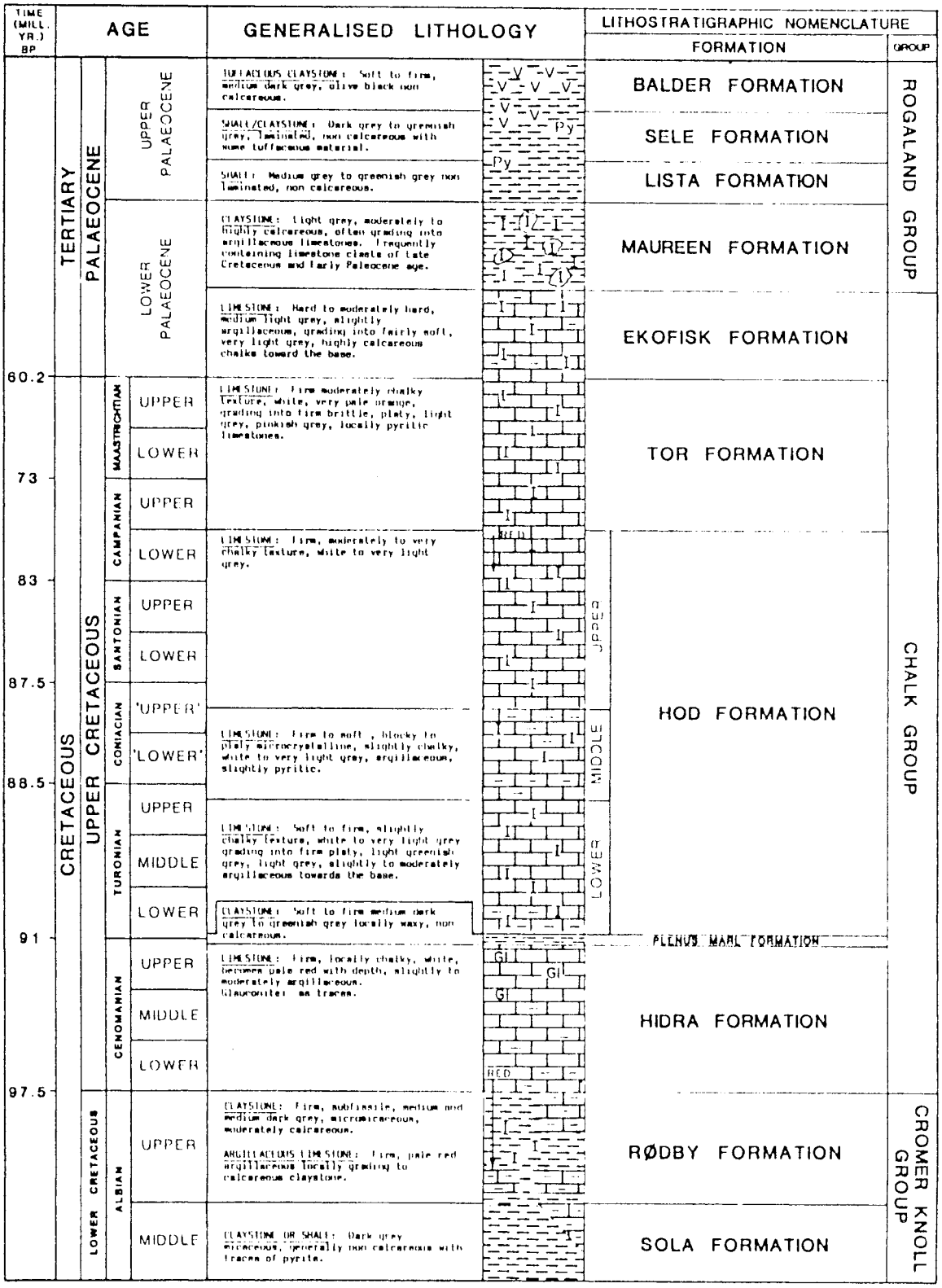
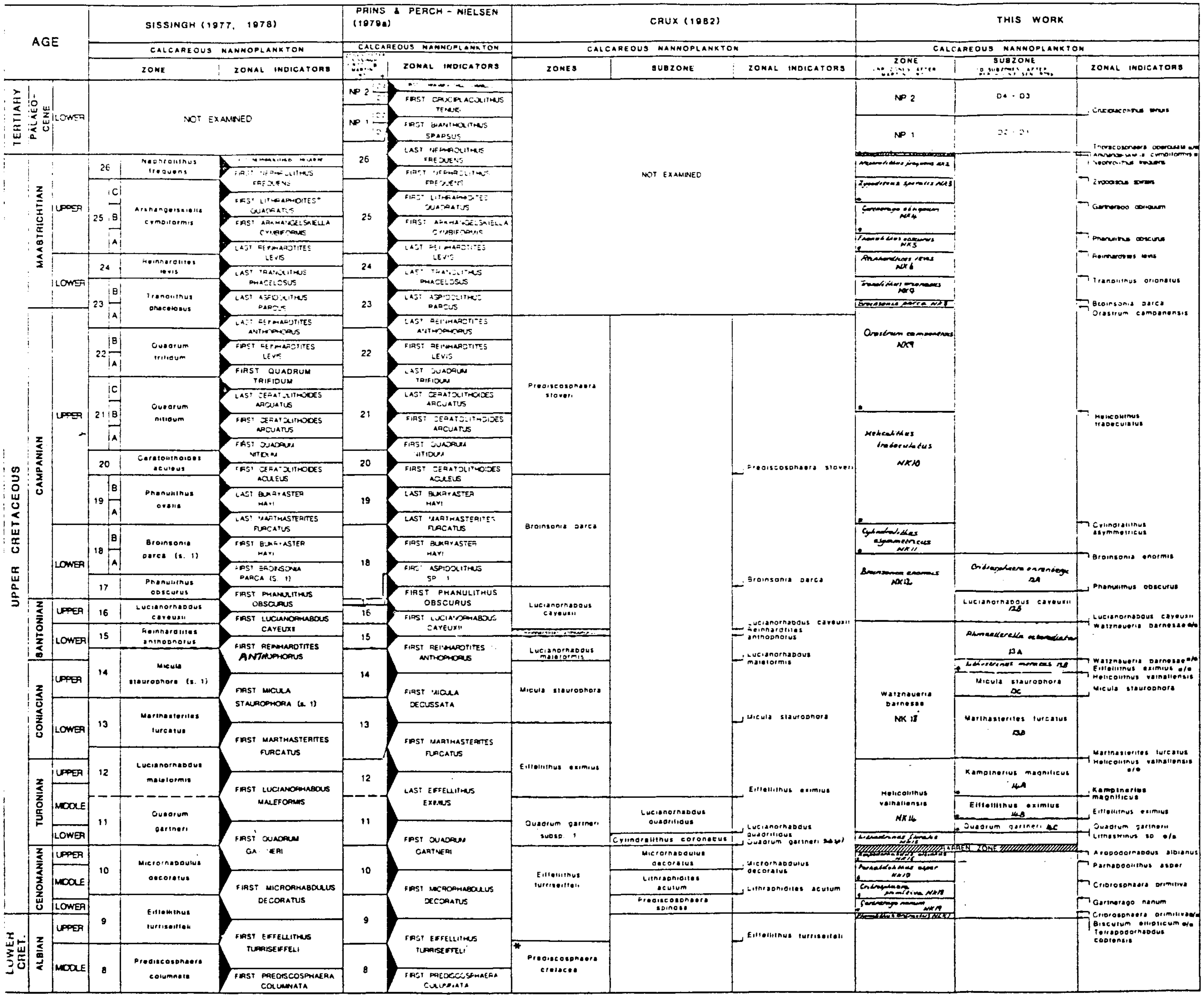


Fig. 2 Lithostratigraphic nomenclature after Deegan & Scull (1977) except for the Sola Formation which has been taken from Hesjedal & Hamar (1983).

Figure 3

COMPARISON OF THE LATE CRETACEOUS ZONAL SCHEMES USED BY SISSINGH (1977, 1978), PERCH - NIELSEN AND PRINS (1979a), CRUX (1982) AND THIS WORK



First downhole occurrence
Last downhole occurrence

● abundant
● common

• exact relationship between zonal boundaries used in this study and the zones used by Sissingh (1977, 1978) are uncertain.

* Lower Cretaceous zonation scheme after Taylor (1982)

+ D subzones after Perch - Nielsen, 1979b

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