


FOSSIL DINOFLAGELLATES: INDEX TO GENERA AND SPECIES, 1981 EDITION

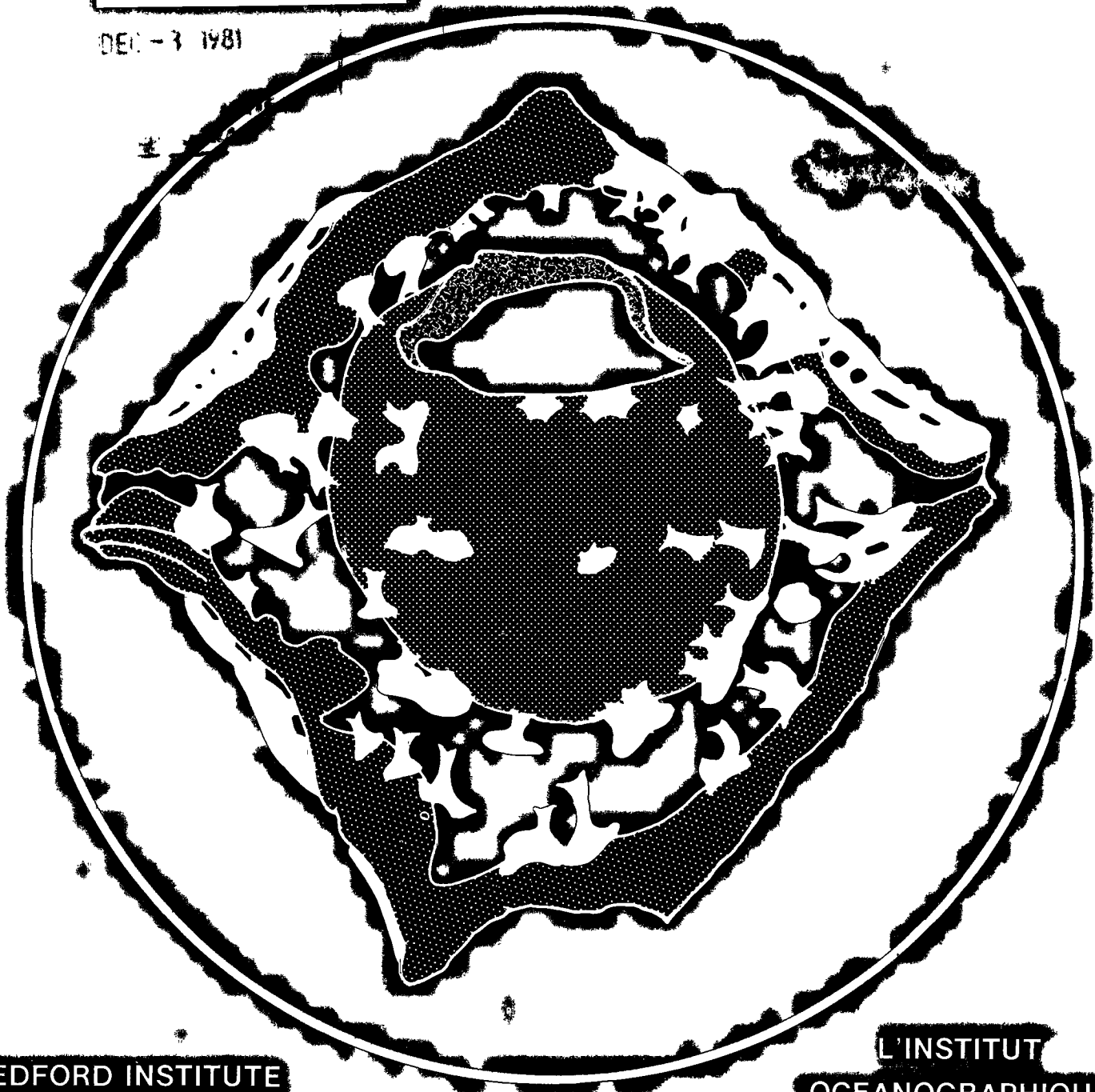
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FOSSIL DINOFLAGELLATES: INDEX TO GENERA AND SPECIES,

1981 EDITION

by

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ABSTRACT

The Index alphabetically lists all dinoflagellate cyst taxa at and below the generic rank, and known to the authors as of April 1, 1981: it includes 414 genera, 2210 species, 230 subspecies, and 2 varietates. Also listed are 73 generic names no longer considered legitimate. One hundred and seventeen new combinations are proposed, as well as 12 new names for junior homonyms and 9 changes of rank. New combinations are cross-referenced to the basionym and other combinations. All papers referenced in the text are included in the bibliography.

SOMMAIRE

Le répertoire est une liste en ordre alphabétique des taxons dinokystes fossiles au rang générique et sous ce rang, incluant ceux signalés par les auteurs au 1 avril 1981; il comprend 413 genres, 2210 espèces, 230 sous-espèces, et 2 variétés. On y trouve aussi 73 noms génériques, qui ne sont plus jugés valides. On propose 117 nouvelles combinaisons, ainsi que 12 nouveaux noms pour les homonymes de rang inférieur et 9 changements de rang. On renvoie les nouvelles combinaisons au "basonyme" et aux autres combinaisons. Tous les articles mentionnés dans le texte sont inscrits dans la bibliographie.

INTRODUCTION

The number of taxonomic papers on dinoflagellates has increased dramatically since the appearance of the last index, Lentin and Williams, 1977b. That publication represented an update of the first index of dinoflagellate genera and species, Lentin and Williams, 1973, which listed 292 genera and 1328 species. In the second edition, the number of taxa had risen to 342 genera and 1700 species. Now, a mere four years later, the latest index includes details on 413 genera, plus 73 no longer considered legitimate, and 2210 species. This update attempts to provide a current listing of all dinoflagellate cyst genera and species included in publications available to the authors as of April 1st, 1981. Although most of the taxa listed are fossil, we have included a few Recent dinoflagellates whose equivalent motile stage is unknown or uncertain.

Dinoflagellates have been described both as animals, necessitating their classification under the International Code of Zoological Nomenclature (I.C.Z.N.), and as plants which are subject to the International Code of Botanical Nomenclature (I.C.B.N.). Since a preponderance of species are autotrophic (synthesizing organic compounds from inorganic substances and containing chlorophyll like the green plants) dinoflagellates are regarded by botanists as plants, constituting the Class Dinophyceae within the Division Pyrrhophyta of the Algae. Throughout this Index, as in previous editions, they are regarded as plants and therefore the articles and recommendations of the I.C.B.N. have been applied to their nomenclature.

The format for this Index follows that used by Lentin and Williams, 1973. The genera are arranged in alphabetical order and the species and subspecies are presented in similar fashion within the genera and the species respectively. Taxa considered invalid, illegitimate or junior synonyms are denoted by quotation marks. For clarity and simplicity the abbreviated generic name is not repeated before each species, but the tabulated species names are indented so that no confusion will result from this omission. This practice is acceptable under Article 33, paragraphs 1-2 of the I.C.B.N. which allows, "...any topographical device which indicates that an epithet is associated with a particular generic or other name."

The species list includes the author, date, page number, plate and figure numbers for each species which remains within the original generic assignment. For species which have been assigned to a genus by later transfer the author, date and page number of the first valid transfer are listed, and citation of the original description is included in parentheses if the species is now currently assigned to that genus. When further transfer has been affected the complete citation of the original description is included in parentheses only for that genus to which the species is now validly assigned.

One exception to the author citation is Jiabo, 1978. This reference is a joint publication by several authors, including Sung Zhi-chen, He Cheng-quan, Qian Ze-shu, Pan Zhao-rin, Zheng Guo-guang and Zheng Yue-fang. The word Jiabo represents a collective name for the authors. We have recently been informed by He Cheng-quan that the individual contributions should be recognized. Thus *Bohaidina* Jiabo should preferably be cited as *Bohaidina* Sung, He, Qian, Pan,

G.G. Zheng and Y.F. Zheng, in Jiabo, 1978. Unfortunately, we received this information at too late a date to change the present index. It will, however, be borne in mind when compiling future issues.

In cases where a species has been assigned to more than two genera, the first generic name given is that of the original combination. If a species has been transferred out of the genus under which it is listed, the specific name is given in quotation marks and its current generic assignment is listed. The age appearing with each specific name is that of the type material. Every attempt has been made to cross reference all names for species and taxa of lower rank which have been included within two or more genera.

Although the present authors try to avoid detailed discussion of taxonomic papers, the magnitude of Stover and Evitt, 1978 and their adopted format demand some comment. For individual genera, these authors recognized: "type species"; "other accepted species"; "provisionally accepted species"; and "problematical species". These groupings, which are concisely defined by Stover and Evitt, *op.cit.*, are treated as follows in the Index. All "accepted species" are listed without reference to Stover and Evitt, *op.cit.* "Provisionally accepted species" are preceded by a question mark (?) with a note that Stover and Evitt, *op.cit.* considered each to be a "provisionally accepted species". The "problematical species" are listed without preface but are followed by the note that Stover and Evitt considered each to be a "problematical species".

In addition to describing several new genera, Stover and Evitt, 1978 emended several, and also provided "synopses" or "modified descriptions" for most. The latter two headings are not mentioned in the Index. It is our recommendation that the opinion of Stover and Evitt be closely adhered to in the determination of whether a generic diagnosis has been changed sufficiently to warrant the notation emend. in accordance with the I.C.B.N. Art. 47. By not following this course of action, considerable confusion may result in the determination of the correct circumscription for many genera.

Occasional comments on taxonomic problems are included immediately after the generic or specific entry. One such example is the status of *Meiourogonyaaulax* Sarjeant, 1966b, and its contained species. Gocht, 1975, p.353 considered this genus to be a junior synonym of *Lithodinia* Eisenack emend. Gocht. He did not, however, effect any formal transfer of species. Subsequently Gocht, 1976, p.334 invalidly (Stafleu, personal communication) transferred several species of *Meiourogonyaaulax* to *Lithodinia*. Lentin and Williams, 1977b, at the request of Hans Gocht, validly transferred the species of *Meiourogonyaaulax* to *Lithodinia*. Stover and Evitt, 1978, p.62-63, however, retained the genus *Meiourogonyaaulax*, differentiating it from *Lithodinia* on the nature of the archeopyle: in the latter genus, the individual paraplates of the operculum are free. In this issue of the Index we have accepted the opinion of Stover and Evitt and retained both *Lithodinia* and *Meiourogonyaaulax*.

Lentin and Williams, 1973 (p.3-5) discussed the infraspecific classification currently used for fossil dinoflagellates, and recommended that the terms

subspecies, variety and forma not be used indiscriminately. Their definitions for these infraspecific categories have been maintained in the present Index. This has necessitated the raising of infraspecific taxa previously described as varietates to the subspecies level, thus creating a "*stat. nov.*" or *status novus*. Sarjeant, 1976c (p.10) stated: "In my opinion, the name 'subspecies' carries evolutionary overtones that make its application inappropriate to the forms here treated with. I recognise that the definition of subspecies in the International Code of Botanical Nomenclature carries no such implications; but I prefer to apply the term 'subspecies' either to members of a population exhibiting a morphological feature whose development appears likely to link that species with another, or to geographically or stratigraphically isolated populations, all of whose members show a slight, but consistent, difference from typical forms." Lentin and Williams, 1977b did not concur with Sarjeant's reasoning which was based upon the recognition of evolutionary overtones. Bestowing such a connotation upon the subspecies, they reasoned, would lead to several erroneous conclusions. These authors therefore retained the variety only in the sense of Lentin and Williams, 1973, a course of action which is pursued in this present version of the Index.

It has always been the policy of the present authors to adhere to the International Code of Botanical Nomenclature. There is, however, one notable exception. Article 26 states that the author's name does not follow the citation of a subspecies name. Thus *Deflandrea phosphoritica* Eisenack subsp. *australis* Cookson and Eisenack var. *lata* Vozzhennikova is correctly written as *Deflandrea phosphoritica* Eisenack *australis lata*. Although we are cognizant of Article 26, we have provided full author citations for all intraspecific taxa in this and earlier versions of the index. Any other course of action, in our view, would deny the reader access to relevant and necessary information.

An additional difficulty resulting from Article 26 is the realization that each species has a subspecies with the same name and holotype; this subspecies is known as an autonym. In the Index, the autonym is not noted unless other subspecies have been added to a species. This is a commonly accepted procedure. Thus the species *Areosphaeridium diktyoplokus* (Klumpp) Eaton has the autonym *A. diktyoplokus* (Klumpp) Eaton *diktyoplokus*, because there exists the subspecies *A. diktyoplokus latum*. Since the autonym has never been used in the literature, it does not appear in this index. Only when it has appeared in the literature is the autonym included as with *Deflandrea phosphoritica* Eisenack *phosphoritica*. This policy, we feel, avoids unnecessary duplication while making the index easier to use.

A major responsibility in compiling an index is the necessity to provide correct orthography. We are indebted to Jan Jansonius for the correction of over 300 such errors which appeared in the first draft of Lentin and Williams, 1977b. One such example was *Canningia ringnesii* Manum and Cookson, 1964, named in honour of the Ringnes brothers who helped finance the second "Fram"-expedition. The correct orthographic representation of this species therefore is *Canningia ringnesiorum* Manum and Cookson, 1964. The species *Chatangiella bondarenkii* (Vozzhennikova, 1967) Lentin and Williams, 1976 named after the palynologist N.M. Bondarenko, is now listed as *Chatangiella bondarenkoi* (Vozzhennikova, 1967) Lentin and Williams, 1976. In the present Index, we are indebted once more to Jan Jansonius for additional orthographic corrections.

The first valid publication of a genus is not always immediately apparent. Lentin and Williams, 1973 (p.84) argued that *Kisselovia* Vozzhennikova, 1963, was a *nomen nudum*, the correct citation being *Kisselevia* Vozzhennikova, 1967. They based their conclusion on the failure of Vozzhennikova, 1963 to designate a holotype for the type of the genus. F.A. Stafleu (personal communication) confirmed that the correct orthography is *Kisselovia* Vozzhennikova, 1963. He stated: "A type cannot be validly published, only a name can be. Art. 37 says exactly what it means. In other words a type species indication of a genus may be to an invalidly published name, e.g. to a pre-starting point name of a species (see e.g. Code p.243, under the rejected homonym *Martensia*)."

Arguments concerning the advantages and disadvantages of the "dual system" of classification for motile dinoflagellates and dinoflagellate cysts are beyond the scope of this Index. The dual system has arisen from the independent study of dinoflagellate motile and cyst stages by neontologists and paleontologists respectively. Only in the last few years has the relationship of the two stages in the life cycle become apparent, especially where morphologically dissimilar cysts and thecae represent the same species. Reid, 1974 (p.583-584) presents several excellent arguments for retention of the dual system of classification. Within the Index we are not concerned with suprageneric classification, but only whether generic and specific dinoflagellate cyst names should be retained, where they are congeneric or conspecific with motile genera and species. We agree with Reid, *op.cit.* that for the present retention of a dual system of classification is preferable. The ultimate retention or rejection of this can be decided only after joint consultation of neontologists and paleontologists working together.

Definition of the taxonomic terms and symbols used herein are as follows:

I.C.B.N.: International Code of Botanical Nomenclature

I.C.Z.N.: International Code of Zoological Nomenclature

comb. nov., combinatio nova: Latin, new combination; a combination validly published for the first time

emend., emendatus, -a, -um: Latin, altered (by); indicates a change in circumscription of a taxon

jr hom., junior homonym: the latter published of two homonyms

jr syn., junior synonym: the latter published of two synonyms

nom. nov., nomen novum: Latin, new name; a new name replacing a junior homonym

nom. nud., nomen nudum: Latin, naked name; a name published without such associated descriptive matter as is required by the I.C.B.N. to satisfy the criteria of valid publication

nom. subst., nomen substitum: Latin, substitute name; a replacement name for a junior homonym

non: Latin, not

sp. nov., *species nova*: Latin, new species; a species validly published for the first time

stat. nov., *status novus*: Latin, new status; used to indicate that a taxon has been altered in rank but retains in its name the epithet from its name in the former rank. For purpose of author citation, *stat. nov.* is treated as *comb. nov.*

subsp., subspecies: Latin, subspecies

var., *varietas*: Latin, variety, variant

*: type species of the genus

"...": indicates epithet now correctly used in another combination or a taxon considered to be a *jr syn.*

O.C.: Orthographic change

op.cit., *opere citato*: Latin, previously referred to

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The authors are indebted to Jan Jansonius for concise interpretation of the I.C.B.N. and for the correction of numerous orthographic errors. Thanks are also extended to V.J. Williams for the demanding task of proof reading and to E.J. Davies and J.P. Bujak for helpful advice during the compilation stages. We are especially grateful to Jan Jansonius and Evan Kidson, the critical readers; it would have been impossible to produce the Index without their constant guidance and encouragement. We would like to acknowledge our indebtedness to Carol Mitchell who, expertly and without any complaint, typed the several versions of the manuscript.

Finally we are grateful to the Geological Survey of Canada and L.I.B. Consultants, Ltd. who shared the expense of this venture.



ACANTHAULAX Sarjeant, 1968, p.227 (*nom. subst. pro Acanthogonyaulax* Sarjeant, 1966b, p.132).

"*acanthosphaera*" (Sarjeant, 1961a) Sarjeant, 1968, p.227. NOW
?Meiourogonyaulax.

?*aceras* (Eisenack, 1958, p.391, pl.21, fig.1-2) Stover and Evitt,
1978, p.137. Aptian; formerly *Gonyaulax* and *Leptodinium*.

aculeata (Klement, 1960, p.42, pl.5, fig.6-9; text-fig.21) Stover
and Evitt, 1978, p.137. Early Kimmeridgian; formerly *Gonyaulax*
and *Gonyaulacysta*. We herein reject the transfer of this species
to the genus *Occisucysta* Gitmez by Below, 1981, p.60.

"*angulosa*" (Gitmez, 1970, p.252, pl.2, fig.4-5; text-fig.7a-b)
Stover and Evitt, 1978, p.137. *Jr syn.* of *Cribroperidinium*
granulatum (Klement) Stover and Evitt; see Fisher and Riley, 1980,
p.321; formerly *Gonyaulacysta*.

?*downiei* (Sarjeant, 1960a, p.138; holotype illustrated by Downie,
1957, pl.20, fig.10) Sarjeant, 1976c, p.6. Kimmeridgian;
formerly *Baltisphaeridium*. NOTE: Stover and Evitt, 1978, p.137
considered this to be a "provisionally accepted species".

?*paliuros* (Sarjeant, 1962a, p.260, pl.1, fig.7; text-fig.5)
Sarjeant, 1968, p.228-229. Oxfordian; formerly *Gonyaulax*.
NOTE: Stover and Evitt, 1978, p.137 considered this to be a
"provisionally accepted species".

senita Drugg, 1978, p.62, pl.3, fig.13; pl.4, fig.1-3. Oxfordian.

"?*spinosissima*" (Deflandre, 1938b) Sarjeant, 1972, p.22. NOW
?Pareodinia.

**venusta* (Klement, 1960, p.44-45, pl.5, fig.10-13; text-fig.22)
Sarjeant, 1968, p.227. Middle Oxfordian to Kimmeridgian;
formerly *Gonyaulax*. Lentin and Williams, 1973, p.9 rejected
the transfer of this species to *Gonyaulacysta* by Dodekova, 1971,
p.11.

"ACANTHOGONYAULAX" Sarjeant, 1966b, p.132, *non Acanthogonyaulax*
Kofoid, 1911. See *Acanthaulax* Sarjeant, 1968.

ACHILLEODINIUM Eaton, 1976, p.234. The contention by Duxbury, 1980,
p.119 that *Achilleodinium* is a *jr syn.* of *Florentinia* is herein
rejected because of the distinctive wall structure of *Achilleo-*
dinium.

ACHILLEODINIUM (cont'd)

**biformoides* (Eisenack, 1954, p.68, pl.11, fig.16-20) Eaton, 1976, p.234. Late Eocene-Early Oligocene; formerly *Hystrichosphaeridium*, *Baltisphaeridium* and *Hystrichokolpoma*. The transfer of this species to *Florentinia* by Duxbury, 1980, p.121 is herein rejected.

latispinosum (Davey and Williams, 1966b, p.88, pl.5, fig.8) Bujak et al., 1980, p.26. Early Eocene; formerly *Cordosphaeridium*.

ACHOMOSPHAERA Evitt, 1963, p.163.

alcicornu (Eisenack, 1954, p.65, pl.10, fig.1-2; text-fig.5) Davey and Williams, 1966a, p.50. Oligocene; formerly *Hystrichosphaeridium*. We do not agree with May, 1980, p.64 who suggested that this species is conspecific with *Spiniferites pseudofurcatus*.

andalousiensis Jan du Chêne, 1977, p.112, pl.1, fig.1-4. Late Miocene (Andalusian).

bullae Cookson and Eisenack, 1974, p.55, pl.23, fig.13. Paleocene.

"*canbra*" (Sah et al., 1970). NOW *Spiniferites*.

?*convexa* Sah et al., 1970, p.145-146, pl.1, fig.12-13. Late Cretaceous. NOTE: Stover and Evitt, 1978, p.139 considered this to be a "provisionally accepted species".

crassipellis (Deflandre and Cookson, 1955, p.265, pl.6, fig.2-3; text-fig.20) Stover and Evitt, 1978, p.138. Early Eocene; formerly *Hystrichosphaera* and *Spiniferites*.

?*delicata* Sah et al., 1970, p.144-145, pl.1, fig.4-5. Late Cretaceous. NOTE: Stover and Evitt, 1978, p.139 considered this to be a "provisionally accepted species".

?*globata* Sah et al., 1970, p.145, pl.1, fig.10-11. Late Cretaceous. NOTE: Stover and Evitt, 1978, p.139 considered this to be a "provisionally accepted species".

grallaeformis (Brosius, 1963, p.42, pl.5, fig.3; text-fig.2) Davey and Williams, 1969, p.4. Oligocene; formerly *Hystrichosphaeridium*.

heterostylis (Heisecke, 1970, p.238, pl.5, fig.1-4; pl.6, fig.4-5) Stover and Evitt, 1978, p.138. Danian; formerly *Hystrichosphaera* and *Spiniferites*.

"*hirundo*" (Eisenack, 1958) Davey and Williams, 1969, p.4. NOW ?*Cordosphaeridium*.

"*hyperacantha*" (Deflandre and Cookson, 1955) Davey and Williams, 1969, p.4. NOW *Spiniferites*.

ACHOMOSPHERA (cont'd)

linifera (Cookson and Eisenack, 1967b, p.253, pl.40, fig.9; pl.41, fig.7-8) Stover and Evitt, 1978, p.138-139. Late Paleocene; formerly *Baltisphaeridium* and *Taeniophora*.

mariannae (Philippot, 1949, p.56-57, fig.2) Stover and Evitt, 1978, p.139. Late Cretaceous; formerly *Hystriichosphaeridium* and *Baltisphaeridium*.

"*membraniphora*" (Agelopoulos, 1964) Eaton, 1976, p.237. NOW and formerly *Hystriichostrogylon*.

microreticulata Salujha and Kindra, 1981, p.51, pl.2, fig.47. Early Paleocene.

?*neptuni* (Eisenack, 1958, p.399, pl.26, fig.7-8; text-fig.8) Davey and Williams, 1966a, p.51-52, pl.3, fig.7; pl.9, fig.11. Early Cretaceous; formerly *Baltisphaeridium*. NOTE: Stover and Evitt, 1978, p.139 considered this to be a "provisionally accepted species", stating that the holotype has an apical archeopyle.

?*operculata* Sah *et al.*, 1970, p.144, pl.1, fig.1-2. Late Cretaceous. NOTE: Stover and Evitt, 1978, p.139 considered this to be a "provisionally accepted species".

**ramulifera* (Deflandre, 1937b, p.74, pl.14, fig.5-6; pl.17, fig.10) Evitt, 1963, p.163. Late Cretaceous; formerly *Hystriichosphaeridium* and *Baltisphaeridium*. The transfer of this species to *Spiniferites* by Reid, 1974, p.608-609 was rejected by Lentin and Williams, 1977b, p.2, and the same transfer by May, 1980, p.63 is herein rejected, since according to Davey and Williams, 1966a, p.46, parasutural lines have not been observed on the holotype, although one of the paratypes possesses very faint lines. Also the generic diagnosis for *Spiniferites* would have to be emended to accommodate taxa lacking visible expression of parasutures.

subsp. *gabonensis* (Boltenhagen, 1977) *stat. nov.*
1977 *Achomosphaera ramulifera* var. *gabonensis* Boltenhagen, p. 36-37, pl.3, fig.7-9. Campanian-Maastrichtian.

subsp. *perforata* (Davey and Williams, 1966a, p.50, pl.5, fig.1,5) Lentin and Williams, 1973, p.10. Early Eocene; formerly *Achomosphaera ramulifera* var. *perforata*.

recurvata Jain *et al.*, 1975, p.8, pl.3, fig.36-37,39. Maastrichtian.

reginensis Corradini, 1973, p.171, pl.27, fig.2; text-fig.8. Senonian.

ACHOMOSPHERA (cont'd)

?*robusta* Sah *et al.*, 1970, p.145, pl.1, fig.6-7. Late Cretaceous.

NOTE: Stover and Evitt, 1978, p.139 considered this to be a "provisionally accepted species".

sagena Davey and Williams, 1966a, p.51, pl.2, fig.1-2. Cenomanian.

We do not agree with May, 1980, p.64 who suggested that this species is conspecific with *Spiniferites crassipellis*.

"*septata*" (Cookson and Eisenack, 1967b) Stover and Evitt, 1978, p.139. The transfer of this species to *Achomosphaera* by Stover and Evitt, *op.cit.* is herein rejected and it is retained in *Hafniasphaera*.

triangulata (Gerlach, 1961, p.194-195, pl.29, fig.1) Davey and Williams, 1969, p.4. Miocene; formerly *Baltisphaeridium*.

"*tridactylites*" (Valensi, 1955a) Deflandre and Sarjeant, 1970, p.1. NOW *Florentinia*.

"*valianta*" (Sah *et al.*, 1970). NOW *Cordosphaeridium*.

ACTINISCUS (Ehrenberg, 1840, as a subgenus of *Dictyocha*) Ehrenberg, 1843, p.103 raised to generic rank.

?*discus* Ehrenberg, 1854, pl.21, fig.49. Pliocene. (No description given.)

elegans (Ehrenberg, 1840) Ehrenberg, 1854, pl.22, fig.31. Pliocene; formerly *Dictyocha*.

heptagonus (Ehrenberg, 1840) Ehrenberg, 1854, pl.20, fig.49. Pliocene; formerly *Dictyocha*.

**pentasterias* (Ehrenberg, 1840) Ehrenberg, 1854, pl.18, fig.61; pl.19, fig.45; pl.33 (XVII), fig.1 = *Dictyocha (Actiniscus) pentasterias*, Ehrenberg, 1840, p.111,149; fixed as type of the genus by Downie and Sarjeant, 1965, p.82. Pliocene.

?*rota* Ehrenberg, 1854, pl.21, fig.50. Pliocene. (No description given.)

sexfurcatus Ehrenberg, 1854, pl.35, fig.15. Recent. (No description given.)

sirius Ehrenberg, 1854, pl.33, fig.1. Miocene. (No description given.)

?*stella* (Ehrenberg, 1840) Ehrenberg, 1854, pl.22, fig.52. Pliocene; formerly *Dictyocha*.

ACTINISCUS (cont'd)

talmadgei Parke, 1974, p.81-82, pl.1, fig.1-9. Late Miocene.

tetrasterias Ehrenberg, 1854, pl.28, fig.62. Miocene. (No description given.)

ACTINOTHECA Cookson and Eisenack, 1960a, p.9.

**aphroditae* Cookson and Eisenack, 1960a, p.9, pl.2, fig.19-20. Turonian.

ornata Cookson and Eisenack, 1970a, p.147, pl.13, fig.1-2. Senonian.

?*rara* Corradini, 1973, p.183, pl.30, fig.1. Late Cretaceous-?Paleocene. NOTE: Stover and Evitt, 1978, p.200 considered this to be a "provisionally accepted species".

ADNATOSPHAERIDIUM Williams and Downie, 1966c, p.215.

aemulum (Deflandre, 1938b, p.187-189, pl.9, fig.12; pl.10, fig.5-8; pl.11, fig.1-7) Williams and Downie, 1969, p.17. Oxfordian; formerly *Hystriosphæridium* and *Cannosphæropsis*.

subsp. *integrum* (Cookson and Eisenack, 1958, p.47, pl.7, fig.6-7) Eisenack and Kjellström, 1971a, p.45. Late Jurassic; formerly *Cannosphæropsis aemula* subsp. *integra*.

apenninicum Corradini, 1973, p.163-164, pl.25, fig.4; pl.36, fig.1a-b. Late Cretaceous-Paleocene.

apiculatum (Cookson and Eisenack, 1960b, p.254, pl.39, fig.15) Lentini and Williams, 1973, p.11. Probably Tithonian; formerly *Cannosphæropsis*.

"*capilatum*" De Coninck, 1969, p.39, pl.11, fig.9-14, 21-24. Early Eocene. Eaton, 1976, p.306 considered this species (although excluding De Coninck, pl.11, fig.14) to be a *jr syn.* of *Impletosphæridium implicatum* Morgenroth.

caulleryi (Deflandre, 1938b, p.189, pl.11, fig.2-3) Williams and Downie, 1969, p.17. Oxfordian; formerly *Hystriosphæridium* and *Cannosphæropsis*.

?*chonetum* (Cookson & Eisenack, 1962b, p.493, pl.4, fig.8-10) Davey, 1969a, p.171. Late Albian-Cenomanian; formerly *Cannosphæropsis*. NOTE: Stover and Evitt, 1978, p.15 considered this to be a "provisionally accepted species".

"*delicatum*" (Horowitz, 1975) Stover and Evitt, 1978, p.15. Stover and Evitt, *op.cit.* erroneously included *Areoligera delicata* in *Adnatosphæridium* without effecting a transfer. These authors considered it to be a "problematical species". See *Areoligera delicata*.

ADNATOSPHAERIDIUM (cont'd)

filamentosum (Cookson & Eisenack, 1958, p.47, pl.7, fig.8-9; pl.8, fig.1-3) Williams and Downie, 1969, p.17. Middle-Late Jurassic; formerly *Cannosphaeropsis*.

filiferum (Cookson & Eisenack, 1958, p.46, pl.7, fig.4) Williams and Downie, 1969, p.17. Turonian-Early Maastrichtian; formerly *Cannosphaeropsis*.

hunnickeni Archangelsky, 1969b, p.201,203, pl.5, fig.5-7. Eocene. NOTE: Stover and Evitt, 1978, p.15 considered this to be a "problematical species".

multispinosum Williams and Downie, 1966c, p.216, pl.24, fig.5; text-fig.57. Early Eocene.

"*patulum*" (Williams and Downie, 1966c). NOW *Thalassiphora*.

paucispinum (Klement, 1960, p.72, pl.10, fig.9) Gitmez and Sarjeant, 1972, p.234. Late Oxfordian; formerly *Cannosphaeropsis*.

perforatum (Alberti, 1961, p.37, pl.9, fig.14) Riley and Sarjeant, 1972, p.3. ?Callovian; formerly *Cannosphaeropsis*.

reticulense (Pastiels, 1948, p.49, pl.5, fig.7-10) De Coninck, 1969, p.40. Early Eocene; formerly *Cannosphaeropsis*.

robustum (Morgenroth, 1966a, p.19, pl.4, fig.1) De Coninck, 1975, p.47-48. Early Eocene; formerly *Cannosphaeropsis*. The transfer of this species from *Cannosphaeropsis* to *Adnatosphaeridium* is not attributable to Eaton, 1976, p.239.

"*uncinatum*" (Norvick, 1976). NOW *Cyclonephelium*.

"*vetusculum*" (Davey, 1974). NOW *Nexosispinum*.

**vittatum* Williams and Downie, 1966c, p.215, pl.24, fig.3,7; text-fig.56. Early Eocene.

?*williereae* De Coninck, 1975, p.49, pl.2, fig.9-11. Ypresian. O.C. NOTE: Stover and Evitt, 1978, p.15 considered this to be a "problematical species".

"*AGERASPHAERA*" Harland, 1979a, p.28-29. *Jr syn.* of *Alisocysta* Stover and Evitt; see Harland, 1979a, p.35. The type of the genus, *Agerasphaera margarita*, was transferred to *Alisocysta* by Harland, 1979a, p.35. Harland *op.cit.*, p.29 also included in *Agerasphaera*, "*Eisenackia circumtabulata*" Drugg, 1967. This species is the nomenclatural type of *Alisocysta*.

AIORA Cookson and Eisenack, 1960a, p.9. We accept the treatment of Stover and Evitt, 1978, p.225 in retaining *Aiora* as a mono-specific genus with *A. fenestrata* as the type species. Stover and Evitt, *op.cit.*, indicated that they had emended the diagnosis of this genus; no emendation, however, is apparent. We reject the emendation of the genus *Aiora* and the retention of *A. fenestrata* in *Cannosphaeropsis* by Davey, 1978, p.893. It is contrary to the ICBN to retain the genus *Aiora* after including the type and single species of that genus in *Cannosphaeropsis*; nomenclaturally *Aiora* would then have to be a *jr syn.* of *Cannosphaeropsis*.

**fenestrata* (Deflandre and Cookson, 1955, p.283, pl.3, fig.2; text-fig.43) Cookson and Eisenack, 1960a, p.9. Turonian-Santonian; formerly *Cannosphaeropsis*. The retention of *Aiora fenestrata* in *Cannosphaeropsis* by Davey, 1978, p.893 is herein rejected.

"*perforata*" (Davey, 1978). NOW *Balteocysta*. Davey, 1978, p.892 erected the species *Aiora perforata* (as *A. perforare*) and designated it as the type of the genus. The holotype of *A. perforata* is *Aiora fenestrata* Deflandre and Cookson, 1955, *sensu* Cookson and Eisenack, 1960a, pl.2, fig.17. Subsequently Stover and Evitt, 1978, p.226 designated the same specimen as the holotype of the species *Balteocysta rotula*; this was the type and single species of the genus. *Balteocysta perforata comb. nov.* is therefore the *sr syn.* of *Balteocysta rotula* and is the correct name for the nomenclatural type of that genus. We assume that Davey named this species for the perforations it possesses: since it was "perforate", he used the Latin *perforare*, which is equivalent to the English infinitive "perforate"; the Latin for the past participle is *perforatus*. The species name should therefore be *perforata* and not *perforare* (ICBN Art 73:1; 23:5) since Davey indicated in his text that the name was not composed arbitrarily.

AIREIANA Cookson and Eisenack, 1965a, p.127.

salicta Damassa, 1979a, p.817-818, pl.1, fig.4-9; text-fig.2.
Early-Middle Eocene.

**verrucosa* Cookson and Eisenack, 1965a, p.127, pl.14, fig.11-13;
emend., Stover, 1975, p.43-44. Late Eocene.

ALASKADINIUM Duxbury, 1977, p.37. Duxbury *op.cit.* stated that *Alaskadinium* was a *nom. subst. pro Nelchinopsis* Wiggins, 1972, p.299. This is incorrect. The genus *Alaskadinium* was erected to include forms described as *Nelchinopsis kostromiensis* in Wiggins, 1972, p.301-302, and figured in pl.1, fig.A-F and text-fig.2. Duxbury *op.cit.* illustrated specimens very similar to *Gonycaulacysta kostromiensis* (Vozzhennikova) Sarjeant, and assigned them to this species, with the remark that his material showed

ALASKADINIUM (cont'd)

a normal *Gonyaulacysta* tabulation pattern "as described by Vozzhennikova". Vozzhennikova, 1967, stated that she did not observe an archeopyle; the illustrations of her holotype, however, appear to lack the apical horn. Wiggins, 1972, p.301-302, gave a detailed analysis of the tabulation of his material, which he also identified as *G. kostromiensis*. He assumed that the low ridges on the apical horn (also noted by Duxbury) reflect tabulation, and that detachment of the apical horn and possibly also the apical sulcal plate produced the archeopyle. The illustrated material of all three authors appears identical. Duxbury did not provide documentation for his interpretation that Wiggins's material is a different species than *G. kostromiensis*; however, on the basis of Wiggins's interpretation, he gave a new genus and species name to the Alaskan material: *Alaskadinium wigginsi* (Wiggins, 1972, p.301-302, pl.1, fig.A-F). The genus *Alaskadinium* is herein retained, pending reexamination of Wiggins's material.

**wigginsi* Duxbury, 1977, p.37 and illustrated in Wiggins, 1972, p.301-302, pl.1, fig.A-F, as *Nelchinopsis kostromiensis* (Vozzhennikova, 1967) Wiggins, text-fig.2 *non Gonyaulax kostromiensis* Vozzhennikova, 1967, p.85-86, pl.26, fig.1-6; pl.27, fig.1-2. Neocomian, probably Valanginian or Early Hauterivian.

ALASPHAERA Keupp, 1979b, p.285-287,289.

**caudata* Keupp, 1979b, p.285-287,289, text-fig.1-7. Hauterivian.

verrucosa Keupp, 1979c, p.656,658, pl.6, fig.1-5. Early Hauterivian.

"ALBERTIA" Vozzhennikova, 1967, p.151. *Jr hom.* of *Albertia* Schimper, 1837. The species "*Albertia curvicornis*" and "*Albertia recticornis*" are now included in *Alterbia*.

ALDORFIA Stover and Evitt, 1978, p.140.

**aldorfensis* (Gocht, 1970b, p.136-138, pl.30, fig.1-3; pl.31, fig.9-11; pl.32, fig.1-3; text-fig.5-9) Stover and Evitt, 1978, p.140. Early Bathonian; formerly *Gonyaulacysta*.

deflandrei (Clarke and Verdier, 1967, p.26-28, pl.3, fig.10-12; text-fig.10) Stover and Evitt, 1978, p.140. Cenomanian-Santonian; formerly *Gardodinium*.

dictyophora (Deflandre, 1938b, p.178, pl.8, fig.1-3) Stover and Evitt, 1978, p.140. Oxfordian; formerly *Palaeoperidinium* and *Gonyaulacysta*.

ALISOCYSTA Stover and Evitt, 1978, p.15-16.

**circumtabulata* (Drugg, 1967, p.15, pl.1, fig.12-13) Stover and Evitt, 1978, p.16. Danian; formerly *Eisenackia*. See also "*Hystriehokolpoma circumtabulata*".

margarita (Harland, 1979a, p.29,31,33, pl.1, fig.1-12; pl.2, fig.1-10) Harland, 1979a, p.35. Paleocene; formerly *Agerasphaera*.

ornata (Cookson and Eisenack, 1965a, p.124, pl.13, fig.1-8) Stover and Evitt, 1978, p.16. Late Eocene; formerly *Eisenackia*.

reticulata Damassa, 1979b, p.196,198,200, pl.3, fig.1-6; pl.4, fig.4-5; text-fig.3. Early Paleocene.

rugolirata Damassa, 1979b, p.193-194,196, pl.3, fig.7-13,21,23,27; text-fig.2. Early Paleocene.

ALTERBIA Lentin and Williams, 1976, p.47 *nom. subst. pro Albertia* Vozzhennikova, 1967 (*non Albertia* Schimper, 1837). The emendation of *Alterbia* by Lentin and Williams, 1976 was illegitimate, because they included the type species of two genera validly published before 1976: *Andalusiella mautheri* Riegel, 1974 and *Senegalinium bicavatum* Jain and Millepied, 1973. However, subsequent observations (Lentin and Williams, 1977b, p.7) indicate that the three genera *Alterbia*, *Andalusiella* and *Senegalinium* are distinct and separate entities, each to be maintained in its own right.

acribes (Davey and Verdier, 1971, p.38-39, pl.2, fig.10,12) Lentin and Williams, 1976, p.48. Early Albian; formerly *Deflandrea*. NOTE: Stover and Evitt, 1978, p.93 considered this to be a "problematical species".

"*acuminata*" (Cookson and Eisenack, 1958) Lentin and Williams, 1976, p.48. NOW *Isabelidinium*; formerly *Deflandrea*. The transfer of this species to *Senegalinium* by Loeblich and Tappan, 1977, p.365 is herein rejected.

**acutula* (Wilson, 1967b, p.225-226, fig.11-12) Lentin and Williams, 1976, p.48. ?Paleocene; formerly *Deflandrea*. The original type of the genus *Alterbia*, *A. recticornis*, is considered to be a *jr syn.* of *A. acutula* by Whitney, 1979, p.125; the latter species therefore becomes the type of the genus.

"*asymmetrica*" (Wilson, 1967a) Lentin and Williams, 1976, p.48. NOW ?*Senegalinium*; formerly *Deflandrea*.

"*balmei*" (Cookson and Eisenack, 1962b) Lentin and Williams, 1976, p.48; emend. Morgan, 1977, p.130. NOW *Isabelidinium*; formerly *Deflandrea*.

ALTERBIA (cont'd)

"*bicavata*" (Jain and Millepie, 1973) Lentin and Williams, 1976, p.49. NOW and formerly *Senegalinium*.

"*curvicornis*" (Vozzhennikova, 1967, p.151, pl.74, fig.1-3), *ex* Lentin and Williams, 1976, p.49. Campanian; formerly *Albertia*. Although Lentin and Williams, *op.cit.*, did not state that a new combination was being created, Stover and Evitt, 1978, p.93 accepted the 1976 new combination instead of the combination in Lentin and Williams, 1977b, p.6. Campanian. Whitney, 1979, p.125 considered *A. curvicornis* to be a *jr syn.* of *Alterbia acutula* (Wilson) Lentin and Williams.

daveyi Stover and Evitt, 1978, p.93 = *Deflandrea pirnaensis* Alberti, 1959b of Davey (1970, p.338-339, pl.1, fig.3-4) not *D. pirnaensis* of Alberti (1959b, p.100, pl.8, fig.1-5). Albian-Turonian.

"*dilwynensis*" (Cookson and Eisenack, 1965c), Lentin and Williams, 1976, p.49. NOW ?*Senegalinium*; formerly *Deflandrea*.

?*distincta* (Wilson, 1967a, p.63-64, fig.9-10) Lentin and Williams, 1976, p.49. Erratics, Early Tertiary; formerly *Deflandrea*. NOTE: Stover and Evitt, 1978, p.93 considered this to be a "provisionally accepted species".

"*ectorugosa*" (Archangelsky, 1969b) Lentin and Williams, 1976, p.49. NOW *Senegalinium*; formerly *Deflandrea*.

"*eyrensis*" (Cookson and Eisenack, 1971) Lentin and Williams, 1976, p.49. NOW *Eurydinium*; formerly *Deflandrea*.

"*foliacea*" (Eisenack and Cookson, 1960) Lentin and Williams, 1976, p.49. NOW *Subtilisphaera*; formerly *Deflandrea*.

"*ingramii*" (Cookson and Eisenack, 1970a) Lentin and Williams, 1976, p.49. NOW *Eurydinium*; formerly *Deflandrea*.

"*macrocysta*" (Cookson and Eisenack, 1960a) Lentin and Williams, 1976, p.49. NOW *Senegalinium*; formerly *Deflandrea*.

"*microgranulata*" (Stanley, 1965) Lentin and Williams, 1976, p.49. NOW *Senegalinium*; formerly *Deflandrea*.

minor (Alberti, 1959b, p.98, pl.9, fig.9-11) Lentin and Williams, 1976, p.49. Late Senonian; formerly *Deflandrea*.

montanaensis (Harland, 1977a) *comb. nov.*
1977a *Deflandrea montanaensis* Harland, p.184-185, pl.25, fig. 4,6-7,10-12. Late Campanian-Maastrichtian; also formerly *Spinidinium*.

ALTERBIA (cont'd)

"*obscura*" (Drugg, 1967) Lentin and Williams, 1976, p.49. NOW *Senegalinium*; formerly *Deflandrea*.

?*pentaradiata* (Cookson and Eisenack, 1965c, p.139-140, pl.18, fig.1-2) Lentin and Williams, 1976, p.49. Paleocene; formerly *Deflandrea*. Lentin and Williams, 1976, p.49 discussed the reasons for questionably including this species in *Alterbia*.

subsp. *preceda* (Cookson and Eisenack, 1974, p.49, pl.20, fig.1-2) Lentin and Williams, 1976, p.50. Paleocene; formerly *Deflandrea pentaradiata* subsp. *preceda*.

pilosa (Davey, 1969b, p.9, pl.3, fig.2-5) Lentin and Williams, 1976, p.50. Campanian-Maastrichtian; formerly *Deflandrea*.

"*polymorpha*" (Malloy, 1972) Lentin and Williams, 1976, p.50. NOW *Andalusiella*.

"*raijae*" (Kjellström, 1973) Lentin and Williams, 1976, p.50. NOW *Eurydinium*; formerly *Deflandrea*.

"*recticornis*" (Vozzhennikova, 1967, p.151-152, pl.77, fig.1-4; pl.78, fig.1-3; pl.79, fig.1-2) Lentin and Williams, 1976, p.47. Turonian; formerly *Albertia*. We reject Stover and Evitt's (1978, p.93) contention that Vozzhennikova had not validly published this species: she (*op.cit.*, p.151) did designate a holotype, which apparently is illustrated in two different aspects. The designation by Stover and Evitt of a lectotype (Vozzhennikova, 1967, pl.77, fig.1) is superfluous. *Alterbia recticornis*, the original nomenclatural type of the genus *Alterbia*; is considered by Whitney, 1979, p.125, to be a *jr syn.* of *Alterbia acutula* (Wilson) Lentin and Williams. Consequently, we accept *Alterbia acutula* as the correct name for the type species of this genus.

"*rhombohedra*" (Benson, 1976) Lentin and Williams, 1977b, p.7. NOW *Andalusiella*; formerly *Deflandrea*.

AMBONOSPHERA Fensome, 1979, p.50-51.

**calloviana* Fensome, 1979, p.51-54, pl.7, fig.3,5-6,8-9; text-fig. 16-17. Callovian.

"*jurassica*" (Gitmez and Sarjeant, 1972) Fensome, 1979, p.51. The transfer of this species to *Ambonosphaera* is herein rejected. NOW and formerly *Senoniasphaera*.

AMICULOSPHERA Harland, 1979b, p.535.

**umbracula* Harland, 1979b, p.535, pl.1, fig.11-14,22-23; pl.2, fig.1-3. Middle Miocene-Pleistocene.

AMPHIDIADEMA Cookson and Eisenack, 1960a, p.4; emend. Lentin and Williams, 1976, p.60-61.

**denticulata* Cookson and Eisenack, 1960a, p.4, pl.1, fig.11.
Senonian.

nucula (Cookson and Eisenack, 1962b, p.486, pl.1, fig.13)
Lentin and Williams, 1976, p.61. Senonian; formerly
Deflandrea.

rectangularis (Cookson and Eisenack, 1962b, p.486, pl.1, fig.14-15) Lentin and Williams, 1976, p.61. Late Turonian-Middle Senonian; formerly *Deflandrea*. Stover and Evitt, 1978, p.94 erroneously considered this species to be a *jr syn.* of *Hystrichosphaeropsis quasicribrata* according to Gocht, 1976, p.322. However, only the specimen identified by Kjellström, 1973, fig.17 was considered synonymous.

subsp. "*samuelsonii*" (Kjellström, 1973, p.22, fig.18) Lentin and Williams, 1976, p.61. Maastrichtian; formerly *Deflandrea rectangularis* var. *samuelsonii* and *Deflandrea rectangularis* subsp. *samuelsonii*. Gocht, 1976, p.322 considered this taxon to be a *jr syn.* of *Hystrichosphaeropsis quasicribrata* (O. Wetzel) Gocht.

AMPHIDINIUM Claparède and Lachmann, 1859, p.276. Modern genus defined from the motile stage. Fossil cysts formerly included within this genus are listed below together with the present generic assignment.

"*mitratum*" (Vozzhennikova, 1967). NOW *Dinogymnium*.

"*sibiricum*" (Vozzhennikova, 1965) *nom. nud.* (no type figured).

AMPHOROSPHAERIDIUM Davey, 1969c, p.30.

"*bipolare*" (Cookson and Eisenack, 1965b) Davey, 1969c, p.35. NOW *Fibrocysta*.

**fenestratum* Davey, 1969c, p.30-32, pl.1, fig.6; pl.2, fig.2,4; pl.3, fig.1-3. Campanian-Maastrichtian.

subsp. *dividum* (Davey, 1969c, p.32-33, pl.2, fig.5-6; text-fig.2) Lentin and Williams, 1973, p.13. Campanian-Maastrichtian; formerly *Amphorosphaeridium fenestratum* var. *dividum*.

latitubulum Davey, 1969c, p.33-34, pl.4, fig.2,7; text-fig.1, no.4. Campanian-Maastrichtian.

multibrevum Davey, 1969c, p.34-35, pl.3, fig.5-6; pl.4, fig.1; text-fig.1, no.3. Campanian-Maastrichtian.

AMPHORULA Dodekova, 1969, p.19.

**metaelliptica* Dodekova, 1969, p.20, pl.4, fig.1-3. Tithonian.

ANDALUSIELLA Riegel, 1974, p.357. Lentin and Williams, 1976, p.149 and Loeblich and Tappan, 1977, p.368 erroneously concluded that *Andalusiella* and *Alterbia* were synonymous.

?*dubia* (Jain and Millepied, 1973, p.25, pl.2, fig.12-13) Lentin and Williams, 1980, p.41. Maastrichtian; formerly *Deflandrea* and *Senegalinium*.

laevigata (Malloy, 1972, p.64, pl.1, fig.1-7) Lentin and Williams, 1977b, p.8. Senonian; formerly *Deflandrea* and *Lejeunia*.

**mauthei* Riegel, 1974, p.357-360, pl.2, fig.1-7; text-fig.5-6. ?Senonian. The transfer of this species (as a *jr syn.* of *Andalusiella polymorpha*) to *Alterbia* by Lentin and Williams, 1976, p.149 was rejected by Lentin and Williams, 1977b, p.8, because of the distinctive nature of the antapical region.

polymorpha (Malloy, 1972, p.63-64, pl.1, fig.8-16,21) Lentin and Williams, 1977b, p.8. Maastrichtian, formerly *Svalbardella* and *Alterbia*.

rhombohedra (Benson, 1976, p.195, pl.9, fig.10-12) Stover and Evitt, 1978, p.95. Early Paleocene; formerly *Deflandrea* and *Alterbia*.

rhomboides (Boltenhagen, 1977, p.106-107, pl.20, fig.1-3) Lentin and Williams, 1980, p.41. Campanian; formerly *Svalbardella*.

spicata (May, 1980) *comb. nov.*
1980 *Deflandrea spicata* May, p.79, pl.9, fig.18-20. Campanian-Maastrichtian.

vozhennikovae (Boltenhagen, 1977, p.108, pl.19, fig.5-7)
Lentin and Williams, 1980, p.41. Campanian; formerly ?*Svalbardella*.

"*ANHYSTRICHOSPHERIDIUM*" Deflandre in West, 1961, p.452 *nom. nud.*
No diagnosis given.

ANTHOSPHERIDIUM Cookson and Eisenack, 1968, p.115.

**convolvuloides* Cookson and Eisenack, 1968, p.115, fig.4A-D.
Santonian-Early Campanian.

APECTODINIUM (Costa and Downie, 1976, p.608) Lentin and Williams, 1977b, p.8; formerly *Wetzeliella* subgen. *Apectodinium*. This taxon was raised to the generic level by Lentin and Williams, 1977b, p.8.

APECTODINIUM (cont'd)

augustum (Harland, 1979c) *comb. nov.*

1979c *Wetzeliella* (*Apectodinium*) *augusta* Harland, p.63, pl.2, fig.13-15. Late Paleocene.

caiobense (Regali et al., 1974) *comb. nov.*

1974 *Hystrichosphaeridium caiobense* Regali et al., p.290, pl.24, fig.4. Paleocene.

**homomorphum* (Deflandre and Cookson, 1955, p.254, pl.5, fig.7; text-fig.19) Lentin and Williams, 1977b, p.8; emend. Harland, 1979c, p.64. Early Eocene; formerly *Wetzeliella*. Costa and Downie, 1976, p.608 designated this species as the type of *Wetzeliella* subgen. *Apectodinium*.

subsp. "*quinquelatum*" (Williams and Downie, 1966b) Lentin and Williams, 1977b, p.8. NOW *Apectodinium quinquelatum*; formerly *Wetzeliella homomorpha* var. *quinquelata* and *Wetzeliella homomorpha* subsp. *quinquelata* (Williams and Downie) Lentin and Williams, 1973.

subsp. *tesselatum* Châteauneuf and Gruas-Cavagnetto, 1978, p.65-66, pl.1, fig.1-2. Early Eocene (Sparnacian).

hyperacanthum (Cookson and Eisenack, 1965b, p.134-135, pl.16, fig.3-6) Lentin and Williams, 1977b, p.8. Paleocene; formerly *Wetzeliella*. Costa and Downie, 1976, p.609 transferred this species to *Wetzeliella* subgen. *Apectodinium*.

quinquelatum (Williams and Downie, 1966b, p.191-192, pl.18, fig.7) Costa and Downie, 1979, p.43. Early Eocene; formerly *Wetzeliella homomorpha* var. *quinquelata*, *Wetzeliella homomorpha* subsp. *quinquelata* and *Apectodinium homomorphum* subsp. *quinquelatum*.

paniculatum (Costa and Downie, 1976, p.608-609, pl.92, fig.1) Lentin and Williams, 1977b, p.9. Early Eocene; formerly *Wetzeliella*.

parvum (Alberti, 1961, p.8-9, pl.1, fig.14-18; pl.12, fig.10-11) Lentin and Williams, 1977b, p.9; emend. Harland, 1979c, p.66. Eocene; formerly *Wetzeliella*. Costa and Downie, 1976, p.609 transferred this species to *Wetzeliella* subgen. *Apectodinium*.

summissum (Harland, 1979c) *comb. nov.*

1979c *Wetzeliella* (*Apectodinium*) *summissa* Harland, p.66-67, pl.1, fig.12. Late Paleocene.

verrucosum Oleinik, 1976a, p.85, pl.1, fig.1-3. Late Eocene.

?*williereae* (Boltenhagen, 1977) *comb. nov.*

1977 *Polysphaeridium williereae* Boltenhagen, p.42-43, pl.3, fig.3-6. Paleocene.

APROBOLOCYSTA Duxbury, 1977, p.52; emend. Duxbury, 1980, p.112.

**eilema* Duxbury, 1977, p.52-53, pl.14, fig.4-5,8; text-fig.19.
Hauterivian.

neistosa Duxbury, 1980, p.112-113, pl.2, fig.8-9; text-fig.5.
Barremian.

variigranosa Duxbury, 1977, p.53-54, pl.14, fig.6-7; text-fig.20.
Valanginian-Early Hauterivian.

APTEA Eisenack, 1958, p.393; emend. Davey and Verdier, 1974,
p.640-641; emend. Dörhöfer and Davies, 1980, p.33.

anaphrissa (Sarjeant, 1966c, p.206, pl.22, fig.8; pl.23, fig.6;
text-fig.55) Sarjeant and Stover, 1978, p.51. Early Barremian;
formerly "*Doidyx*" and "*Tenua*".

"*attadalica*" (Cookson and Eisenack, 1962b) Davey and Verdier, 1974,
p.643. NOW *Canningia*; also formerly *Cyclonephelium*.

"*eisenackii*" (Davey, 1969a, p.170, pl.8, fig.3-4; pl.9, fig.4;
text-fig.16a-b) Davey and Verdier, 1974, p.643. Albian; for-
merly *Cyclonephelium*. Cookson and Eisenack, 1974, p.74 consid-
ered this species to be a *jr syn.* of *Aptea polymorpha* Eisenack.

**polymorpha* Eisenack, 1958, p.394, pl.22, fig.5-12; pl.24, fig.5;
emend. Dörhöfer and Davies, 1980, p.34-36. Early Cretaceous.

"*rugulosa*" (Clarke and Verdier, 1967). NOW *Canningia*.

securigera Davey and Verdier, 1974, p.642-643, pl.91, fig.2-3;
text-fig.5(vii). Early Aptian.

APTEODINIUM Eisenack, 1958, p.385.

?*albertii* nom. nov., nom. subst. pro *A. spinosum* (Alberti, 1961,
p.24, pl.4, fig.16 (as *Pareodinia*)) Stover and Evitt, 1978,
p.142 non *A. spinosum* Jain and Millepied, 1975, p.139-140. Late
Barremian. NOTE: Stover and Evitt, 1978, p.142 considered this
(as ?*Apteodinium spinosum*) to be a "provisionally accepted
species".

apiatum McIntyre and Brideaux, 1980, p.11-12, pl.2, fig.1-7.
Valanginian.

australiense (Deflandre and Cookson, 1955, p.248, pl.5, fig.1)
Williams, 1978, p.794. Middle Miocene; formerly *Gymmodinium*
and *Scriniodium*.

"*ciliatum*" Gocht, 1959, p.65, pl.8, fig.5-6. Clarke and Verdier,
1967, p.19 considered this species to be a *jr syn.* of *Trichodinium*
castaneum (Deflandre) Clarke and Verdier. "*Apteodinium ciliatum*"
was transferred to *Trichodinium* by Eisenack, 1964, p.811.

APTEODINIUM (cont'd)

- conjunctum* Eisenack and Cookson, 1960, p.5, pl.1, fig.7-8.
Aptian.
- cornutum* Cookson and Eisenack, 1974, p.51, pl.24, fig.9. Paleocene.
- ?*cribrosum* Cookson and Eisenack, 1968, p.112, Fig.1L. Santonian-
Early Campanian. NOTE: Stover and Evitt, 1978, p.142 considered
this to be a "provisionally accepted species".
- emslandense* (Gerlach, 1961, p.172-173, pl.26, fig.13-14) Stover
and Evitt, 1978, p.141. Middle Oligocene-Middle Miocene;
formerly *Emslandia*.
- fallax* (Morgenroth, 1968, p.536, pl.41, fig.4-6) Stover and Evitt,
1978, p.142. Danian; formerly *Gonyaulacysta*.
- frontierense* (Burgess, 1971, p.81, pl.1, fig.6,9; text-fig.13)
Stover and Evitt, 1978, p.142. Albian-Early Cenomanian; for-
merly *Coniferatium*.
- grande* Cookson and Hughes, 1964, p.52, pl.6, fig.8-9. Late
Albian-Early Cenomanian. We reject the contention of Below,
1981, p.25 that this is a subspecies of *Apteodinium maculatum*.
- **granulatum* Eisenack, 1958, p.386, pl.23, fig.8-14. Aptian.
- ?*indicosum* (Brideaux, 1971, p.83 *nom. subst. pro Palaeoperidinium*
granulatum Singh, 1964, p.135, pl.18, fig.2-3) Stover and Evitt,
1978, p.142. Middle-Late Albian; formerly *Gonyaulacysta*. NOTE:
Stover and Evitt, 1978, p.142 considered this to be a "provision-
ally accepted species".
- maculatum* Eisenack and Cookson, 1960, p.4, pl.2, fig.1. Albian.

subsp. "*grande*" (Cookson and Hughes, 1964) Below, 1981, p.25.
We herein reject this transfer and retain this taxon as a
species of *Apteodinium*.
- micracanthum* Cookson and Eisenack, 1974, p.51-52. Albian-Senonian.
NOTE: Stover and Evitt, 1978, p.142 considered this to be a
"problematical species".
- nuciforme* (Deflandre, 1938b, p.180, pl.8, fig.4-6) Stover and
Evitt, 1978, p.142. Oxfordian; formerly *Gonyaulacysta*, *Gonyau-*
lax and *Palaeoperidinium*.
- reticulatum* Singh, 1971, p.312, pl.47, fig.1-4. Late Albian.
- "*sarjeantii*" (Habib, 1972) Stover and Evitt, 1978, p.142. This
transfer is herein rejected and the species is retained in
Archeotectatum.

APTÉODINIUM (cont'd)

"*senegalense*" Stover and Evitt, 1978, p.142. This name designated as a *nom. subst.* for ?*Apteodinium spinosum* Jain and Millepied, 1975, is herein rejected; see ICBN Article 64.

spinosum Jain and Millepied, 1975, p.139-140, pl.2, fig.27. Aptian-Albian. The name *A. senegalense* Stover and Evitt, 1978, p.142 as a *nom. subst.* for *Apteodinium spinosum* is herein rejected; see ICBN Article 64.

"?*spinosum*" (Alberti, 1961) Stover and Evitt, 1978, p.142 *non A. spinosum* Jain and Millepied, 1975, p.139-140. The transfer of the former species from *Pareodinia* to *Apteodinium* necessitates the erection of a *nom. subst.*, *A. albertii*, since *A. spinosum* Jain and Millepied has priority. See *Apteodinium albertii*.

spiridoides Benedek, 1972, p.5, pl.2, fig.1; pl.15, fig.1-6. Middle Oligocene.

spongiosum McIntyre and Brideaux, 1980, p.12, pl.2, fig.8-12. Valanginian.

?*tamboviense* Vozzhennikova, 1967, p.61, pl.41, fig.1. Barremian. NOTE: Stover and Evitt, 1978, p.142 considered this to be a "provisionally accepted species".

tectatum Piasecki, 1980, p.63,66, pl.2, fig.1-6. Middle Miocene.

tuberculatum Cookson and Eisenack, 1970a, p.146-147, pl.12, fig.14. Senonian.

verrucosum Oleinik, 1976a, p.85, pl.1, fig.1-3. Late Eocene.

AQUADULCUM Harland and Sarjeant, 1970, p.220-221.

myalupense (Churchill and Sarjeant, 1963, p.38-40, fig.5,22-23) Harland and Sarjeant, 1970, p.221-222. Holocene; formerly *Palaeohystrichophora*.

pikeae (Churchill and Sarjeant, 1963, p.40-41, fig.6,24) Harland and Sarjeant, 1970, p.222. Holocene; formerly *Palaeohystrichophora*.

**serpens* Harland and Sarjeant, 1970, p.221, pl.21, fig.7-8; text-fig.5. Holocene.

?*yanchepeense* Harland and Sarjeant, 1970, p.222-223, pl.22, fig.3. Holocene.

ARANEOSPHAERA Eaton, 1976, p.239-240.

**araneosa* Eaton, 1976, p.240,242, pl.2, fig.5-8; text-fig.6.
Middle-Late Eocene.

ARCHEOTECTATUM Habib, 1972, p.375-376. According to Habib (pers. comm.) the wall structure of this genus differs from that found in the type of the genus *Apteodinium*, *A. granulatum*. We therefore refute the contention of Stover and Evitt, 1978, p.142 that *Archeotectatum* is a *jr syn.* of *Apteodinium*.

**sarjeantii* Habib, 1972, p.376, pl.5, fig.3-4. Oxfordian-Kimmeridgian.

AREOLIGERA Lejeune-Carpentier, 1938, p.164; emend. Williams and Downie, 1966c, p.227-228.

"*biramum*" Maier, 1959, p.304, pl.29, fig.2. Oligocene. *Jr syn.* of *Spiniferites ramosus*. See Morgenroth, 1968, p.550, and Stover and Evitt, 1978, p.190.

campoensis Caro, 1973, p.344,347-348, pl.1, fig.2. Middle Paleocene.

"*cassicula*" (Drugg, 1970b). NOW *Gerdiocysta*.

coronata (O. Wetzel, 1933b, p.41, pl.4, fig.17) Lejeune-Carpentier, 1938, p.168. Senonian; formerly *Hystrichosphaera penicillata* forma *coronata* and *Hystrichosphaeridium coronatum*.

crescentis Damassa, 1979b, p.192-193, pl.1, fig.1-13. Early Paleocene.

"*danica*" (W. Wetzel, 1952). NOW *Cleistosphaeridium*.

?*delicata* Horowitz, 1975, p.24, pl.1, fig.2. Late Triassic.
NOTE: Stover and Evitt, 1978, p.19 considered this to be a "provisionally accepted species" and also erroneously included it in *Adnatosphaeridium* (*op.cit.*, p.15) without effecting a transfer.

"*dermatica*" Maier, 1959, p.305, pl.29, fig.3. Oligocene. *Jr syn.* of *Spiniferites ramosus*; see Morgenroth, 1968, p.550, and Stover and Evitt, 1978, p.190.

espiritasantensis (Regali *et al.*, 1974) *comb. nov.*
1974 *Hystrichosphaeridium espiritasantensis* Regali *et al.*, p.290, pl.24, fig.3. Maastrichtian.

?*galea* (Maier, 1959, p.306, pl.29, fig.4) Davey *et al.*, 1969, p.15. Oligocene; formerly *Galea*. NOTE: Stover and Evitt, 1978, p.19 considered this to be a "provisionally accepted species".

AREOLIGERA (cont'd)

- "*incerta*" Klumpp, 1953, p.389-390, pl.17, fig.1-2. Late Eocene.
Syn. of *Spiniferites pseudofurcatus*; see Gocht, 1969, p.32.
- lemniscata* (Stanley, 1965, p.229-230, pl.24, fig.1-6) Stover and
Evitt, 1978, p.18. Paleocene; formerly *Cyclonephelium*.
- lychnea* (Maier, 1959, p.310, pl.30, fig.6) Davey *et al.*, 1969,
p.15. Miocene; formerly *Galea*. NOTE: Stover and Evitt, 1978,
p.19 considered this to be a "problematical species".
- "*medusettiformis*" (O. Wetzel, 1933b, p.41, pl.4, fig.19) Lejeune-
Carpentier, 1938, p.169. That author considered this species
to be conspecific with both *A. rhizopodiphora* (O. Wetzel, 1933b)
and *A. coronata* (O. Wetzel, 1933b), the latter having priority.
Senonian.
- "*rhizopodiphora*" (O. Wetzel, 1933b, p.41, pl.4, fig.18) Lejeune-
Carpentier, 1938, p.169. That author considered this species
to be conspecific with both *A. medusettiformis* (O. Wetzel,
1933b) and *A. coronata* (O. Wetzel, 1933b), the latter having
priority.
- semicirculata* (Morgenroth, 1966b, p.9-10, pl.2, fig.3-4) Stover
and Evitt, 1978, p.18. Middle Oligocene; formerly *Cyclone-
phelium*.
- **senonensis* Lejeune-Carpentier, 1938, p.164-166, text-fig.1-3.
Senonian.
- sentosa* Eaton, 1976, p.246, pl.4, fig.1-2; pl.5, fig.1,3;
text-fig. 8A. Middle-Late Eocene.
- tauloma* Eaton, 1976, p.247, pl.4, fig.3,5; pl.5, fig.5-6;
text-fig.8B. Middle-Late Eocene.
- tenuicapillata* (O. Wetzel, 1933b, p.42, pl.4, fig.20-22)
Lejeune-Carpentier, 1938, p.167. Senonian; formerly
Hystriosphera.
- subsp. "*irregularis*" (O. Wetzel, 1933b, p.42-43, pl.4, fig.20)
Lentin and Williams, 1973, p.16. Senonian; formerly
Hystriosphera tenuicapillata forma *irregularis*. Transfer
of the forma to *Areoligera* was effected by Lejeune-Carpentier,
1938, p.167. O. Wetzel, 1933b cited the same holotype for
Areoligera tenuicapillata and *Areoligera tenuicapillata* subsp.
irregularis; the latter taxon is therefore illegitimate.
- subsp. *pinopallina* (O. Wetzel, 1933b, p.42-43, pl.4, fig.22)
Lentin and Williams, 1973, p.16. Senonian; formerly *Hystricho-
sphaera tenuicapillata* forma *pinopallina*. Transfer of the forma
to *Areoligera* was effected by Lejeune-Carpentier, 1938, p.167.

AREOLIGERA tenuicapillata (cont'd)

subsp. *turbilineata* (O. Wetzel, 1933b) *stat. nov.*

1933b *Hystriosphæra tenuicapillata* subsp. *turbilineata*
O. Wetzel, p.42, pl.4, fig.21. Senonian. Transfer of the
forma to *Areoligera* was effected by Lejeune-Carpentier,
1938, p.167.

"*turbilineata*" (O. Wetzel, 1933b). As pointed out by Stover and
Evitt, 1978, p.19 this form has never been raised to the
species level. It is a subsp. of *Areoligera tenuicapillata*.

twistringensis (Maier, 1959, p.308-309, pl.30, fig.3-4) Davey
et al., 1969, p.15. Oligocene; formerly *Galea* and
Baltisphaeridium. NOTE: Stover and Evitt, 1978, p.19
considered this to be a "problematical species".

"*undulata*" (Eaton, 1976). NOW *Glaphyrocysta*.

vermiculata Corradini, 1973, p.159-160, pl.24, fig.6-7; pl.34,
fig.5. Late Cretaceous-Paleocene.

volata Drugg, 1967, p.21, pl.3, fig.11-13; pl.9, fig.4.
Danian.

AREOSPHERIDIUM Eaton, 1971, p.357-358.

?*actinocoronatum* (Benedek, 1972, p.34, pl.12, fig.13; text-fig.13)
Stover and Evitt, 1978, p.20. Middle-Late Oligocene; formerly
Cleistosphaeridium.

arcuatum Eaton, 1971, p.360-361, pl.3, fig.1-9; text-fig.4-5.
Middle Eocene.

capricornum (Cookson and Eisenack, 1965, p.128-129, pl.15, fig.
1-9) Stover and Evitt, 1978, p.20. Late Eocene; formerly
Cordosphaeridium and ?*Systematophora*.

**diktyoplokus* (Klumpp, 1953, p.392, pl.18, fig.3-7) Eaton, 1971,
p.358-359. Eocene; formerly *Hystriosphæridium* and
Cordosphaeridium.

subsp. *latum* (Klumpp, 1953, p.392, pl.18, fig.18-19) Lentin and
Williams, 1973, p.16. Eocene; formerly *Hystriosphæridium*
diktyoplokus subsp. *latum*.

fenestratum Bujak, 1976, p.107, pl.2, fig.9-12; pl.3, fig.1-4;
text-fig.3D-F. Late Eocene.

multicornutum Eaton, 1971, p.363-364, pl.4, fig.1-7; text-fig.6.
Middle Eocene.

AREOSPHAERIDIUM (cont'd)

?*pectiniforme* (Gerlach, 1961, p.195, pl.28, fig.14; text-fig.18)
Stover and Evitt, 1978, p.20. Oligocene; formerly *Baltisphaeridium* and *Cleistosphaeridium*.

"*ARPELLIDINIUM*" Beju, 1979, p.1,4. *Jr syn.* of *Sirmiodiniopsis* Drugg;
Beju, personal communication. The type of the genus and single
species, *Arkellidium triapertum*, is herein transferred to
Sirmiodiniopsis.

ARPYLORUS Calandra, 1964, p.4114; emend. Sarjeant, 1978b, p.173.

**antiquus* Calandra, 1964, p.4114, fig.1-3; emend. Sarjeant, 1978b,
p.174. Silurian.

ARTEMISIOCYSTA Benedek, 1972, p.49.

**cladodichotoma* Benedek, 1972, p.49, pl.12, fig.8; text-fig.23.
Middle-Late Oligocene.

singlongtaiensis Jiabo, 1978, p.95, pl.26, fig.1. Early Tertiary.

ASCODINIUM Cookson and Eisenack, 1960a, p.5

**acrophorum* Cookson and Eisenack, 1960a, p.5, pl.1, fig.19-20.
Late Albian-Cenomanian.

"*hialinum*" Baltes, 1963, p.585, *nom. nud.* Holotype not designated
by Baltes.

"*lordii*" (Cookson and Eisenack, 1968). NOW *Senoniasphaera*.

?*midroreticulatum* Jiabo, 1978, p.90, pl.6, fig.13. Early Tertiary.

"*ovale*" (Cookson and Eisenack, 1970a). NOW *Ovoidinium*. The re-
tention of this species in *Ascodinium* by Stover and Evitt, 1978,
p.201 is herein rejected.

parvum (Cookson and Eisenack, 1958, p.28, pl.4, fig.12-13)
Cookson and Eisenack, 1960a, p.5. Late Albian-Cenomanian;
formerly *Deflandrea*.

"*pontis-mariae*" (Deflandre, 1936b) Deflandre, 1966, p.3. NOW
Subtilisphaera.

"*scabrosum*" (Cookson & Hughes, 1964). NOW *Ovoidinium*.

serratum Cookson and Eisenack, 1960a, p.5, pl.1, fig.21-22.
Cenomanian.

"*stagonoides*" (Benedek, 1972). NOW *Deflandrea*.

ASCODINIUM (cont'd)

"*trendallii*" (Cookson and Eisenack, 1970a). NOW ?*Subtilisphaera*.

"*verrucosum*" (Cookson & Hughes, 1964). NOW *Ovoidinium*.

ASCOSTOMOCYSTIS Drugg and Loeblich, 1967, p.187.

granulata Châteauneuf, 1980, p.133, pl.19, fig.8,11. Late Eocene (Auversian)-Oligocene (Stampian).

**hydria* Drugg and Loeblich, 1967, p.187, pl.3, fig.13-15; text-fig.5. Early Eocene.

laevigata Châteauneuf, 1980, p.133, pl.19, fig.6,9. Late Eocene (Auversian).

maxima Singh, 1971, p.425-426, pl.79, fig.3-4. Late Albian.

potana Drugg and Loeblich, 1967, p.187-188, pl.3, fig.10-12; text-fig.6. Oligocene.

"ASTROCYSTA" Davey, 1970, p.359. Lentin and Williams, 1976, p.150 considered this genus to be a *jr syn.* of *Palaeoperidinium* Deflandre emend. Sarjeant. All species, with the exception of *A. tricuspis* (O. Wetzel, 1933a) which was returned to *Lejeunia* (now included in the genus *Phelodinium*), have been transferred to *Palaeoperidinium*. The type of the genus *Astrocyta* was *A. cretacea* (Pocock) Davey.

ATAXIODINIUM Reid, 1974, p.588.

**choanum* Reid, 1974, p.588-589, pl.1, fig.1-2. Recent.

"ATHIGMATOCYSTA" Duxbury, 1977, p.23-24. Below, 1981, p.48 considered this genus to be a *jr syn.* of *Endoscrinium* (Klement) Vozzhennikova. Accordingly he transferred the type of the genus, *Athigmatocysta glabra*, to *Endoscrinium*. *Athigmatocysta granulata* (Raynaud) is herein transferred to *Endoscrinium*.

ATOPODINIUM Drugg, 1978, p.62.

**prostatum* Drugg, 1978, p.63, pl.1, fig.1-7; text-fig.1A-D. Callovian-Early Oxfordian.

"AUSTRALIELLA" Vozzhennikova, 1967, p.129-130. Lentin and Williams, 1976, p.151-152 considered this genus to be a *jr syn.* of *Chatangiella* Vozzhennikova. Accordingly they transferred all the species, apart from "*Australiella cooksoniae*", to *Chatangiella*. "*Australiella cooksoniae*" and "*Australiella spastica*" are now included in *Isabelidinium*. The type of the genus *Australiella* was *A. tripartita* (Cookson and Eisenack) Vozzhennikova.

AUSTRALISPHAERA Davey, 1978, p.892.

**verrucosa* Davey, 1978, p.893, pl.2, fig.1-5. Campanian-Maastrichtian.

AVELLODINIUM Duxbury, 1977, p.24. Because of the distinctive nature of the processes, we herein reject the contention of Below, 1981, p.27 that *Avellodium* is a *jr syn.* of *Callaiosphaeridium* Davey and Williams.

**falsificum* Duxbury, 1977, p.24-26, pl.5, fig.1-3; text-fig.4. Berriasian-Barremian. We herein reject the transfer of this species to *Callaiosphaeridium* by Below, 1981, p.28.

B

BACCHIDINIUM Davey, 1979b, p.555.

**polypes* (Cookson and Eisenack, 1962b, p.491, pl.4, fig.11-13) Davey, 1979b, p.555. Albian-Cenomanian; formerly *Hystrichosphaeridium recurvatum* subsp. *polypes* and *Cleistosphaeridium polypes*.

subsp. *clavulum* (Davey, 1969a) *comb. nov.*

1969a *Cleistosphaeridium polypes* var. *clavulum* Davey, p.154, pl.6, fig.9-10. Cenomanian. This taxon was elevated to subspecies rank, as *Cleistosphaeridium polypes* subsp. *clavulum*, by Lentin and Williams, 1973, p.30. Davey, 1979b, p.553 did not correctly transfer this subspecies to *Bacchidinium*.

sarmentum Davey, 1979b, p.555, pl.1, fig.8-12. Aptian.

BALCATTIA Cookson and Eisenack, 1974, p.78.

**cirrifera* Cookson and Eisenack, 1974, p.78, pl.24, fig.8; pl.28, fig.16. Albian-Cenomanian.

BALTEOCYSTA Stover and Evitt, 1978, p.226.

**perforata* (Davey, 1978) *comb. nov.*

1978 *Aiora perforata* Davey, p.892 = *Aiora fenestrata* of Cookson and Eisenack, 1960a, p.9, pl.2, fig.17-18 non *Carnosphaeropsis fenestrata* Deflandre and Cookson, 1955, p.283, pl.3, fig.2. Turonian. *Sr syn.* of *Balteocysta rotula*; *B. perforata* therefore becomes the type of the genus. For discussion of name see *Aiora perforata*. O.C.

"*rotula*" Stover and Evitt, 1978. p.226 = *Aiora fenestrata* of Cookson and Eisenack, 1960a, p.9, pl.2, fig.17-18 non *Carnosphaeropsis fenestrata* Deflandre and Cookson, 1955, p.283, pl.3, fig.2. Turonian. *Jr syn.* of *Balteocysta perforata*, which is the correct name for the designated type of the genus.

BATIACASPHERA Drugg, 1970b. p.813. The emendation of this genus by Dörhöfer and Davies, 1980, p.40 is herein rejected because of the prior erection of the genus *Sentusidinium* by Sarjeant and Stover, 1978, p.49-50. NOTE: Stover and Evitt, 1978, did not emend this genus as suggested by Burger, 1980a.

baculata Drugg, 1970b. p.814, fig.6F. Late Eocene.

"*capitata*" (Cookson and Eisenack, 1960b) Dörhöfer and Davies, 1980, p.40. The transfer of this species from *Tenua* to *Batiacasphaera* is herein rejected since we accept the treatment of Singh, 1971, and Stover and Evitt, 1978. The species is accordingly retained in *Prolixosphaeridium*.

BATIACASPHAERA (cont'd)

?*cephala* (Kar, 1979) *comb. nov.*

1979 *Polysphaeridium cephalum* Kar, p.34, pl.4, fig.66a-b,67.
Oligocene.

"*circularis*" (Cookson and Eisenack, 1971) Dörhöfer and Davies, 1980, p.40. The transfer of this species from *Canningia* to *Batiacasphaera* is herein rejected since we accept the generic circumscription of *Batiacasphaera* as given by Stover and Evitt, 1978, p.21.

**compta* Drugg, 1970b, p.813-814, fig.6A-E; 7A-B. Late Eocene.

"*dictydia*" (Sarjeant, 1972) Davey, 1979d, p.217.

NOW *Escharisphaeridia*; formerly *Chytroeisphaeridia*.

"*echinata*" (Gitmez and Sarjeant, 1972) Dörhöfer and Davies, 1980, p.40. The transfer of this species from *Tenua* to *Batiacasphaera* is herein rejected since we accept the treatment of Sarjeant and Stover, 1978. The species is accordingly retained in *Sentusidinium*.

euteiches (Davey, 1969a, p.141, pl.3, fig.8-9) Davey, 1979d, p.217.
Cenomanian; formerly *Chytroeisphaeridia*.

hirsuta Stover, 1977, p.72-73, pl.1, fig.1-3. Middle Oligocene-
Early Miocene.

macrogranulata Morgan, 1975, p.162, pl.2, fig.3a-d. Neocomian.

micropapillata Stover, 1977, p.73, pl.1, fig.7-8. Middle Oligocene-
Early Miocene.

"*minor*" (Cookson and Hughes, 1964) Dörhöfer and Davies, 1980, p.40.
The transfer of this species from ?*Canningia* to *Batiacasphaera* is herein rejected since we accept the generic circumscription of *Batiacasphaera* as given by Stover and Evitt, 1978, p.21.

"*pilosa*" (Ehrenberg, 1843) Dörhöfer and Davies, 1980, p.40. The transfer of this species from *Tenua* to *Batiacasphaera* is herein rejected since we accept the treatment of Sarjeant and Stover, 1978. The species is accordingly retained in *Sentusidinium*.

reticulata (Davey, 1969b, p.14, pl.4, fig.3-4,6) Davey, 1979d, p.217. Campanian-Maastrichtian; formerly *Chytroeisphaeridia* and *Fromea*.

"*ringnesiorum*" (Manum and Cookson, 1964) Dörhöfer and Davies, 1980, p.40. The transfer of this species from *Canningia* to *Batiacasphaera* is herein rejected since we accept the generic circumscription of *Batiacasphaera* as given by Stover and Evitt, 1978, p.21. O.C.

BATIACASPHAERA (cont'd)

"*rioultii*" (Sarjeant, 1968) Dörhöfer and Davies, 1980, p.41. The transfer of this species from *Temua* to *Batiacasphaera* is herein rejected since we accept the treatment of Sarjeant and Stover, 1978. The species is accordingly retained in *Sentusidinium*.

"*rotundata*" (Cookson and Eisenack, 1961a) Dörhöfer and Davies, 1980, p.41. The transfer of this species from *Cunningia* to *Batiacasphaera* is herein rejected since we accept the generic circumscription of *Batiacasphaera* as given by Stover and Evitt, 1978, p.21.

saidensis Below, 1981, p.26, pl.10, fig.1-2; text-fig.15.
Hauterivian-Bedoulian.

scrobiculata (Deflandre and Cookson, 1955, p.291, pl.3, fig.3; text-fig.57) Burger, 1980b, p.268. Santonian-Eocene; formerly *Leiosphaera*, *Leiosphaeridia* and *?Pyxidiella*.

sphaerica Stover, 1977, p.73, pl.1, fig.4-6. Early Miocene.

"*taugourdeaui*" (Varma and Dangwal, 1964) Dörhöfer and Davies, 1980, p.41. The transfer of this species from *Temua* to *Batiacasphaera* is herein rejected since we accept the transfer of the species from *Temua* to *?Hemicystodinium* by Stover and Evitt, 1978, p.51. We also agree with Sarjeant and Stover, 1978, p.51 that this species is conspecific with *Polysphaeridium zoharyi*.

"*torulosa*" (Davey and Verdier, 1973) Dörhöfer and Davies, 1980, p.41. The transfer of this species from *Cunningia* to *Batiacasphaera* is herein rejected since we accept the circumscription of *Batiacasphaera* as given by Stover and Evitt, 1978, p.21.

"*verrucosa*" (Sarjeant, 1968) Dörhöfer and Davies, 1980, p.41. The transfer of this species from *Temua* to *Batiacasphaera* is herein rejected since we accept the generic treatment of Sarjeant and Stover, 1978. The species is accordingly retained in *Sentusidinium*.

"*villersensis*" (Sarjeant, 1968) Dörhöfer and Davies, 1980, p.41. The transfer of this species from *Temua* to *Batiacasphaera* is herein rejected since we accept the generic treatment of Sarjeant and Stover, 1978. The species is accordingly retained in *Sentusidinium*.

"BATIOLADINIUM" Brideaux, 1975, p.1241. *Jr syn.* of *Imbatodinium*; see Dörhöfer and Davies, 1980, p.36. The genus "*Necrobroomea*" Wiggins, 1975, is a *jr syn.* of *Batioladinium*.

"*?exiguum*" (Alberti, 1961) Brideaux, 1975, p.1240. NOW *Imbatodinium*; formerly *Broomea*.

"BATIOLODINIUM" (cont'd)

"?gochti" (Alberti, 1961) Lentin and Williams, 1977b, p.14. NOW
Imbatodinium; formerly *Broomea*.

"*jaegeri" (Alberti, 1961) Brideaux, 1975, p.1240. NOW *Imbatodinium*;
formerly *Broomea*.

"longicornutum" (Alberti, 1961) Brideaux, 1975, p.1240. NOW
Imbatodinium; formerly *Broomea*.

"micropodum" (Eisenack and Cookson) Brideaux, 1975, p.1240. NOW
Imbatodinium; formerly *Broomea*.

"?pelliferum" (Alberti, 1961) Brideaux, 1975, p.1240. NOW *Imbatodinium*;
formerly *Broomea*.

"?tricornoides" (Alberti, 1961) Lentin and Williams, 1977b, p.14.
NOW *Imbatodinium*; formerly *Broomea*.

BELODINIUM Cookson and Eisenack, 1960b, p.249; emend. Dodekova, 1975,
p.23.

asaphum Drugg, 1978, p.63-64, pl.2, fig.8-10. Oxfordian.

**dysculum* Cookson and Eisenack, 1960b, p.250, pl.37, fig.14;
pl.39, fig.10. Probably Tithonian.

obsoletum Dodekova, 1975, p.23-24, pl.4, fig.1-2; text-fig.5.
Late Bathonian.

BICARINELLUM Deflandre, 1948, p.212.

calvum Keupp, 1979a, p.38-39, pl.10, fig.1-10. Early Barremian.

**castaninum* Deflandre, 1948, p.212, fig.28-31,34. Middle Eocene.

BIECHELERELLA Deflandre, 1948, p.209-210.

**jurassica* Deflandre, 1948, p.210-211; text-fig.26-27. Late
Jurassic.

BIORBIFERA Habib, 1972, p.377.

**johnewingii* Habib, 1972, p.377-378, pl.10, fig.2-3. Early
Cretaceous.

BIPOLARIBUCINA Jiabo, 1978, p.57.

conicosa Jiabo, 1978, p.57, pl.29, fig.4-5. Early Tertiary.

huanghuaensis Jiabo, 1978, p.57, pl.29, fig.9-10. Early Tertiary.

BIPOLARIBUCINA (cont'd)

liaoningensis Jiabo, 1978, p.58, pl.29, fig.6-8. Early Tertiary.

oblongata Jiabo, 1978, p.58, pl.29, fig.1-3. Early Tertiary.

paradoxa (Brosius, 1963, p.41, pl.4, fig.1,6; text-fig.2, no.1a-c)
Jiabo, 1978, p.58. Late Oligocene; formerly *Hystrichosphaeridium*,
?Oligosphaeridium, *Tanyosphaeridium* and *Distatodinium*.

tianjinensis Jiabo, 1978, p.59, pl.29, fig.13-14. Early Tertiary.

BITECTATODINIUM Wilson, 1973, p.351.

**tepikiense* Wilson, 1973, p.351-353, fig.2, no.1-12.
Middle Pleistocene.

BOHAIDINA Jiabo, 1978, p.37.

apicornicula Jiabo, 1978, p.39, pl.8, fig.7. Early Tertiary.

asymmetrosa Jiabo, 1978, p.39, pl.9, fig.2. Early Tertiary.

dorsiprominentis Jiabo, 1978, p.39, pl.15, fig.1a-3c. Early
Tertiary.

fusiforma Jiabo, 1978, p.39-40, pl.8, fig.6. Early Tertiary.

granulata Jiabo, 1978, p.40-41, pl.8, fig.8; pl.11, fig.1-3,5;
pl.12, fig.1-8; pl.13, fig.4-9. Early Tertiary.

subsp. *biconica* Jiabo, 1978, p.40, pl.12, fig.1,4; pl.13,
fig.4-9. Early Tertiary.

subsp. *granulata* Jiabo, 1978, p.40, pl.12, fig.2-3,5-8. Early
Tertiary.

subsp. *minor* Jiabo, 1978, p.40-41, pl.11, fig.1-3. Early
Tertiary.

**laevigata* Jiabo, 1978, p.38-39, pl.13, fig.1-3; pl.14, fig.1-10.
Early Tertiary.

subsp. *biconica* Jiabo, 1978, p.38, pl.13, fig.3. Early Tertiary.

subsp. *laevigata* Jiabo, 1978, p.38, pl.13, fig.1-2; pl.14, fig.
7-10. Early Tertiary.

subsp. *minor* Jiabo, 1978, p.38-39, pl.14, fig.1-6. Early
Tertiary.

microreticulata Jiabo, 1978, p.41, pl.10, fig.1-8b. Early Tertiary.

BOHAIDINA (cont'd)

retirugosa Jiabo, 1978, p.41, pl.7, fig.7-11; pl.8, fig.1-5; pl.9, fig.3-9; pl.10, fig.9-10; pl.11, fig.7-12. Early Tertiary.

subsp. *brachorhombica* Jiabo, 1978, p.41-42, pl.10, fig.9-10.
Early Tertiary.

subsp. *minor* Jiabo, 1978, p.42, pl.11, fig.7-12. Early Tertiary.

subsp. *retirugosa* Jiabo, 1978, p.41, pl.7, fig.7-11; pl.8, fig.1-5; pl.9, fig.3-9. Early Tertiary.

rivularisa Jiabo, 1978, p.42, pl.11, fig.4. Early Tertiary.

rugosa Jiabo, 1978, p.42, pl.9, fig.1. Early Tertiary.

BOREOCYSTA Stover and Evitt, 1978, p.22-23.

**butticula* (Wiggins, 1969, p.150, pl.2, fig.1-5) Stover and Evitt, 1978, p.23. Neocomian, probably Late Valanginian or Early Hauterivian; formerly *Omatia*.

BOURKIDINIUM Morgan, 1975, p.160.

**granulatum* Morgan, 1975, p.160-161, pl.2, fig.2a-c. Late Aptian-Albian.

BREEDOXELLA Norris, 1978, p.12.

**caperata* (Brideaux, 1977, p.19-20, pl.7, fig.7-11) Norris, 1978, p.12. Aptian-Early Albian; formerly *Mendicodinium*.

BRIGANTEDINIUM Reid, 1977, p.432. This genus was valid when published; it is a cyst form taken from sediments of questionable age and was treated as a fossil. The contention by Harland and Reid, 1980, p.222, that a Latin diagnosis is required, is herein rejected.

aurantaeum Reid, 1977, p.432-433, pl.1, fig.1. Recent.

cariacoense (Wall, 1967, p.113, pl.16, fig.13-14) Reid, 1977, p.434. Quaternary; formerly *Chytroeisphaeridia*.

majusculum Reid, 1977, p.434-435, pl.1, fig.5. Recent.

**simplex* (Wall, 1965b, p.308, text-fig.7,20) Reid 1977, p.435. Recent; formerly *Chytroeisphaeridia*. This species was valid when published. The contention by Harland and Reid, 1980, p.222, that a Latin diagnosis is required, is herein rejected.

BROOMEA Cookson and Eisenack, 1958, p.41; emend. Lentin and Williams, 1976, p.143-144. Wiggins, 1975, p.102 considered *Broomea* to be a *jr syn.* of the genus *Pareodinia* Deflandre emend. Wiggins. This was rejected by Lentin and Williams, 1976, p.144.

"*exigua*" (Alberti, 1961). NOW *Imbatodinium*.

"*gochti*" (Alberti, 1961). NOW *Imbatodinium*.

"*jaegeri*" (Alberti, 1961). NOW *Imbatodinium*.

"*longicornuta*" (Alberti, 1961). NOW *Imbatodinium*.

"*micropoda*" (Eisenack and Cookson, 1960). NOW *Imbatodinium*.

"*pellifera*" (Alberti, 1961). NOW *Imbatodinium*.

**ramosa* Cookson and Eisenack, 1958, p.41-42, pl.6, fig.6-8. Middle-Late Jurassic. See also "*Pareodinia ramosa*".

"*seelandica*" (Lange, 1969). NOW *Isabelidinium*.

simplex Cookson and Eisenack, 1958, p.42, pl.6, fig.9. Late Jurassic.

"?*tricornoides*" (Alberti, 1961). NOW ?*Imbatodinium*.

"*BROTZENIA*" Horowitz, 1975, p.25. *Jr syn.* of *Ctenidodinium*; see Stover and Evitt, 1978, p.203. These authors transferred the type and single species of the genus, *Brotzenia cristata*, to ?*Ctenidodinium*.

BULBODINIUM O. Wetzel, 1960, p.82. Klement, 1961, p.489-492, concluded that one species was referable to *Scriniodinium* and the remaining were species of *Deflandrea*. However, he did not effect any transfers. For complete discussion see Lentin and Williams, 1976, p.93-94.

altipetax O. Wetzel, 1960, p.83, pl.1, fig.3,5,9. Senonian.

oistoides O. Wetzel, 1960, p.83-84, pl.1, fig.6-7. Senonian.

**seitzii* O. Wetzel, 1960, p.82-83, pl.1, fig.1-2,4,8,10-13. Senonian.



CADDASPHAERA Fenton *et al.*, 1980, p.164.

**halosa* (Filatoff, 1975, p.91, pl.29, fig.10-11) Fenton *et al.*, 1980, p.164. Bajocian; formerly *Kalyptea*.

CALCICARPINUM Deflandre, 1948, p.216.

mutterlosei Keupp, 1979a, p.41, pl.10, fig.11-12; pl.11, fig.1-5. Early Barremian.

**tetraedricum* Deflandre, 1948, p.216,218; text-fig.35-37. Eocene.

CALCIGONELLUM Deflandre, 1948, p.206.

dolium Keupp, 1979a, p.39-40, pl.9, fig.7-9. Early Barremian.

**infula* Deflandre, 1948, p.206, fig.13-18. Late Miocene.

sulcatum Keupp, 1979c, p.658, pl.6, fig.16-21. Early Hauterivian.

CALCIODINELLUM Deflandre, 1947b, p.1781-1782.

**operosum* Deflandre, 1947b, p.1781-1782, fig.1-6. Late Miocene.

CALCIOGRANELLUM Deflandre, 1948, p.204.

**limbatum* Deflandre, 1948, p.204, fig.10-12. Late Miocene.

CALCIPTERELLUM Deflandre, 1948, p.207.

**colomi* Deflandre, 1948, p.208, fig.19-21. Late Miocene.

CALCISPHAERELLUM Deflandre, 1948, p.215.

**flosculus* Deflandre, 1948, p.215-216, text-fig.32-33. Oxfordian.

"*CALEDONIDINIUM*" Reid, 1974, p.589. Harland, 1977b, p.93 considered the type and single species of the genus, *Caledonidinium vermiculatum*, to be a *jr syn.* of *Bitectatodinium tepikiense*, thus making *Caledonidinium* a superfluous genus.

"**vermiculatum*" Reid, 1974, p.589-590, pl.1, fig.3-5. Recent. *Jr syn.* of *Bitectatodinium tepikiense*; see Harland, 1977b, p.93.

CALIGODINIUM Drugg, 1970b, p.814-815.

aceras (Manum and Cookson, 1964, p.27-28, pl.6, fig.9-11) Lentin and Williams, 1973, p.21. Cenomanian; formerly *Kalyptea*. The transfer of this species to *Pareodinia* by Davey and Verdier, 1974, p.645, was rejected by Lentin and Williams, 1975, p.2148. Assignment to *Kalyptea*, as originally and by Jain and Millepied, 1975, p.145, is inappropriate because the archeopyle of *C. aceras* is not intercalary.

**amiculum* Drugg, 1970b, p.815, fig.8A-B,9A-E. Danian. The transfer of this species to *Kalyptea* by Jain and Millepied, 1975, p.145 was rejected by Lentin and Williams, 1977b, p.17, since *C. amiculum* has an apical archeopyle.

granulatum (Jiabo, 1978) *comb. nov.*

1978 *Kalyptea granulata* Jiabo, p.91, pl.6, fig.20. Early Tertiary.

CALLAIOSPHAERIDIUM Davey and Williams, 1966b, p.103; emend. Duxbury, 1980, p.113; emend. Below, 1981, p.27. "*Hexasphaera*" Clarke and Verdier, 1967 is a *jr syn.* of this genus. See Clarke *et al.*, 1968, p.181.

**asymmetricum* (Deflandre and Courteville, 1939, p.100, pl.4, fig.1-2) Davey and Williams, 1966b, p.104. Senonian; formerly *Hystriosphæridium*.

"*falsificum*" (Duxbury, 1977) Below, 1981, p.28. We herein reject this transfer and retain the species in *Avellodinium*.

trycherium Duxbury, 1980, p.114, pl.11, fig.6,9. Barremian.

CANNINGIA Cookson and Eisenack, 1960b, p.251; emend. Dörhöfer and Davies, 1980, p.36; emend. Below, 1981, p.30.

"*aspera*" (Singh, 1971). NOW *Cyclonephelium*. NOTE: Stover and Evitt, 1978, p.25 considered this to be a "provisionally accepted species" of *Canningia*.

attadalica (Cookson and Eisenack, 1962b, p.495, pl.5, fig.12-15) Stover and Evitt, 1978, p.24-25. Aptian-Albian; formerly *Aptea* and *Cyclonephelium*.

"*brevispinosa*" (Pocock, 1962) Stover and Evitt, 1978, p.25. NOW *Cyclonephelium*; formerly *Palaeohystriochophora* and *Tenua*. NOTE: Stover and Evitt, 1978, p.25 considered this to be a "provisionally accepted species".

?*circularis* Cookson and Eisenack, 1971, p.219, pl.8, fig.6. Middle Cretaceous. NOTE: Stover and Evitt, 1978, p.25 considered this to be a "provisionally accepted species".

colliveri Cookson and Eisenack, 1960b, p.251, pl.38, fig.3-4. Aptian.

CANNINGIA (cont'd)

crassicingulata Burger, 1980b, p.268, fig.4C-D. Neocomian.

dicryptos (Gitmez and Sarjeant, 1972, p.225-226, pl.7, fig.6; text-fig.22) Below, 1981, p.31. Kimmeridgian; formerly *Meiourogonyaulax* and *Lithodinia*.

granulata Morgenroth, 1966a, p.12, pl.2, fig.10. Early Eocene. Stover and Evitt, 1978, p.25 considered this to be a "pro-blematical species".

"*hirtella*" (Alberti, 1961) Millioud, 1969, p.425. NOW *Cyclonephelium*; formerly *Circulodinium*.

microbaculata Jiabo, 1978, p.54, pl.7, fig.1-2. Early Tertiary.

microciliata Jain, 1977, p.178, pl.3, fig.25; pl.6, fig.78. Early Albian.

"*microreticulata*" (Brideaux and McIntyre, 1975) Below, 1981, p.31. We herein reject this transfer and retain the species in *Senoniasphaera*.

?*minor* Cookson and Hughes, 1964, p.43, pl.8, fig.1-3,5. Late Albian-Early Cenomanian. See also *Batiacasphaera*. NOTE: Stover and Evitt, 1978, p.25 considered this to be a "provisionally accepted species".

subsp. *psilata* (Burger, 1980a) *stat. nov.*
1980a *Canningia minor* var. *psilata* Burger, p.71, pl.26, fig.1-4. Aptian-Albian.

"*palliata*" (Brideaux, 1977). NOW *Cyclonephelium*.

**reticulata* Cookson and Eisenack, 1960b, p.251, pl.38, fig.1-2; emend. Below, 1981, p.32. Tithonian.

?*ringnesiorum* Manum and Cookson, 1964, p.15, pl.2, fig.10. Campanian-Maastrichtian. O.C. This plural ending is necessary because the species is named in honor of the Ringnes brothers. See also *Batiacasphaera*. NOTE: Stover and Evitt, 1978, p.25 considered this to be a "provisionally accepted species".

?*rotundata* Cookson and Eisenack, 1961a, p.72, pl.12, fig.1-5. Senonian. See also *Batiacasphaera*. NOTE: Stover and Evitt, 1978, p.25 considered this to be a "provisionally accepted species".

rugulosa (Clarke and Verdier, 1967, p.57-58, pl.12, fig.5-6; text-fig.23) Stover and Evitt, 1978, p.25. Santonian; formerly *Aptea*.

CANNINGIA (cont'd)

scabrosa Cookson and Eisenack, 1970a, p.146, pl.13, fig.6-7.
Senonian.

senonica Clarke and Verdier, 1967, p.20-21, pl.1, fig.12-14;
text-fig.7. Santonian.

spumosa Brideaux, 1977, p.12, pl.3, fig.9-14. Albian.

torulosa Davey and Verdier, 1973, p.180,183, pl.1, fig.2,5,8.
Late Albian-Early Cenomanian. See also *Batiacasphaera*.

?*turrita* Brideaux, 1977, p.13, pl.4, fig.1-9. Barremian.

CANNINGINOPSIS Cookson and Eisenack, 1962b, p.488.

**denticulata* Cookson and Eisenack, 1962b, p.488, pl.1, fig.16-19;
text-fig.2. Albian-Cenomanian.

"*ovalis*" (Vozzhennikova, 1967). NOW *Spinidinium*.

"*tabulata*" (Davey and Verdier, 1974) Duxbury, 1977, p.27. NOW
Cerbia; formerly *Cyclonephelium*.

CANNOSPHAEROPSIS O. Wetzel, 1933b, p.6; emend. Williams and Downie,
1966c, p.222; emend. May, 1980, p.45; emend. Duxbury, 1980,
p.114.

"*aemula*" (Deflandre, 1938b). NOW *Adnatosphaeridium*.

"*apiculata*" (Cookson and Eisenack, 1960b). NOW *Adnatosphaeridium*.

"*caulleryi*" (Deflandre, 1938b). NOW *Adnatosphaeridium*.

"*choneta*" (Cookson and Eisenack, 1962b). NOW *Adnatosphaeridium*.

densa Cookson and Eisenack, 1962b, p.493, pl.4, fig.1-3.
Late Albian-Cenomanian. NOTE: Stover and Evitt, 1978, p.144
considered this to be a "problematical species".

densifilosa Cookson and Eisenack, 1974, p.70, pl.24, fig.13.
Late Jurassic-Early Cretaceous. NOTE: Stover and Evitt, 1978,
p.144 considered this to be a "problematical species".

"*densiradiata*" (Cookson and Eisenack, 1962b). NOW *Nematosphaeropsis*.

elegantula Drugg, 1967. p.25, pl.4, fig.17. Danian. NOTE: Stover
and Evitt, 1978, p.144 considered this to be a "problematical
species".

"*fenestrata*" (Deflandre and Cookson, 1955). NOW *Aiora*.

CANNOSPHAEROPSIS (cont'd)

"*filamentosa*" (Cookson and Eisenack, 1958). NOW *Adnatosphaeridium*.

"*filiifera*" (Cookson and Eisenack, 1958). NOW *Adnatosphaeridium*.

franciscana Damassa, 1979b, p.204-205, pl.4, fig.9; pl.5, fig.1-11.
Early Paleocene.

glabra Cookson and Eisenack, 1974, p.70, pl.24, fig.12. Middle
Cretaceous. NOTE: Stover and Evitt, 1978, p.144 considered
this to be a "problematical species".

hyperacantha Cookson and Eisenack, 1960a, p.9, pl.2, fig.14-15.
Campanian. NOTE: Stover and Evitt, 1978, p.144 considered this
to be a "problematical species".

"*mirabilis*" (Cookson and Eisenack, 1958). NOW *Peridictyocysta*.

"*paucispina*" (Klement, 1960). NOW *Adnatosphaeridium*.

"*perforata*" (Alberti, 1961). NOW *Adnatosphaeridium*.

"*peridictya*" (Eisenack and Cookson, 1960). NOW *Hapsocysta*.
NOTE: Stover and Evitt, 1978, p.144 considered this to be
a "provisionally accepted species" of *Cannosphaeropsis*.

"*philippotii*" (Deflandre, 1947a). NOW *Nematosphaeropsis*.

?*praetexta* Corradini, 1973, p.163, pl.25, fig.7a-b,8, pl.35,
fig.5. Late Cretaceous-Paleocene. NOTE: Stover and Evitt,
1978, p.144 considered this to be a "provisionally accepted
species".

pulchra Alberti, 1961, p.37, pl.10, fig.5. Coniacian. NOTE:
Stover and Evitt, 1978, p.144 considered this to be a "pro-
blematical species".

"*pusulosa*" (Morgenroth, 1966b). NOW *Nematosphaeropsis*.

"*reticulensis*" (Pastiels, 1948). NOW *Adnatosphaeridium*.

"*robusta*" (Morgenroth, 1966a). NOW *Adnatosphaeridium*.

scaffoldi (Baksi, 1962, p.17, pl.2, fig.25) Downie and Sarjeant,
1965, p.101. Eocene; formerly *Hystriichosphaeridium*. NOTE:
Stover and Evitt, 1978, p.144 considered this to be a "pro-
blematical species".

speciosa Alberti, 1961, p.37, pl.9, fig.13. Late Dogger
(Bathonian-Callovian). The transfer of this species to
Polystephanephorus by Riley and Sarjeant, 1972, p.3 was rejected
by Stover and Evitt, 1978, p.144.

CANNOSPHAEROPSIS (cont'd)

tutulosa Cookson and Eisenack, 1960a, p.8, pl.2, fig.12-13.
Cenomanian. NOTE: Stover and Evitt, 1978, p.144 considered this to be a "problematical species".

urnaformis (Cookson, 1953). NOW *Emmetrocysta*.

ursulae (Morgenroth, 1966a). NOW *Eatonicysta*.

**utinensis* O. Wetzel, 1933b, p.6, pl.3, fig.9-17; text-fig.12;
emend. Duxbury, 1980, p.114-115. Senonian.

CANTULODINIUM Alberti, 1961, p.23.

?*protuberatum* Wall, 1965a, p.160, pl.4, fig.14-20; pl.8, fig.8.
Pliensbachian-Toarcian (Lias). Stover and Evitt, 1978, p.98 considered this a "problematical species"; they further suggested that the species may be an acritarch.

**speciosum* Alberti, 1961, p.23, pl.3, fig.20-23; pl.12, fig.3.
Valanginian.

CARPATELLA Grigorovich, 1969a, p.74.

**cornuta* Grigorovich, 1969a, p.74, pl.1, fig.1-6. Paleocene (Danian).

CARPATHODINIUM Drugg, 1978, p.64.

**predae* (Beju, 1971, p.288-289, pl.4, fig.4-7; text-fig.5) Drugg, 1978, p.64. Callovian-Oxfordian; formerly *Lithodinia* and *Meiourogonyaux*.

CARPODINIUM Cookson and Eisenack, 1962b, p.489; emend. Leffingwell and Morgan, 1977, p.297.

**granulatum* Cookson and Eisenack, 1962b, p.489, pl.1, fig.6-10; emend. Leffingwell and Morgan, 1977, p.297-298. Albian.

obliquicostatum Cookson and Hughes, 1964, p.48, pl.6, fig.1-6.
Late Albian-Early Cenomanian.

CASSICULOSPHERIDIA Davey, 1969a, p.141.

altomurata Courtinat and Gaillard, 1980, p.11-12, pl.2, fig.16; pl.5, fig.7. Late Oxfordian.

magna Davey, 1974, p.46, pl.1, fig.3-7. Barremian.

**reticulata* Davey, 1969a, p.142, pl.3, fig.7; pl.4, fig.3.
Cenomanian.

CASSICULOSPHAERIDIA (cont'd)

tazadensis Below, 1981, p.33-34, pl.10, fig.8-10; pl.12, fig.16.
Hauterivian-Gargasian.

CASSIDIUM Drugg, 1967, p.22.

**fragile* (Harris, 1965, p.97, pl.27, fig.4-5) Drugg, 1967, p.22.
Early Eocene; formerly *Ovoidites*, a pollen genus, to which this
species was originally and erroneously assigned.

"*hexalobosum*" (Cookson and Eisenack, 1974). NOW *Cyclonephelium*.

CATILLOPSIS Drugg, 1970b, p.821.

**abditata* Drugg, 1970b, p.821, fig.17D-F; 18A-C; 19A-B.
Early Eocene.

CAUCA Davey and Verdier, 1971, p.14.

**parva* (Alberti, 1961, p.16, pl.9, fig.1-4) Davey and Verdier,
1971, p.14-15. Early Aptian-Albian; formerly *Hystriochodinium*.

CERATIOPSIS Vozzhennikova, 1963, p.181; emend. Bujak *et al.*, 1980,
p.27. Lentin and Williams, 1976, p.153 considered this genus
to be a *jr syn.* of *Deflandrea*. However, that view was rejected
by Lentin and Williams, 1977b, p.20 because of the nature of the
hexa 2a archeopyle. We herein also reject the contention of
Stover and Evitt, 1978, p.99 that *Ceratiopsis* is a *jr syn.* of
Deflandrea.

albertii (Corradini, 1973, p.174-175, pl.27, fig.7a-b,8; pl.28,
fig.2) Lentin and Williams, 1977b, p.20. Late Cretaceous-
Paleocene; formerly *Deflandrea*. The retention of this species
in *Deflandrea* by Stover and Evitt, 1978, p.100 is herein re-
jected.

baltica (Vozzhennikova, 1967, p.154, pl.11, fig.2a-b) Lentin
and Williams, 1977b, p.20. Eocene; formerly *Cerodinium* and
Deflandrea. The retention of this species in *Deflandrea*
by Stover and Evitt, 1978, p.100 is herein rejected.

boloniensis (Riegel, 1974, p.354-355, pl.1, fig.6-10; text-fig.3)
Lentin and Williams, 1977b, p.20. ?Senonian; formerly
Deflandrea. The transfer of this species to *Senegalinium* by
Stover and Evitt, 1978, p.123 is herein rejected.

cordifera (May, 1980) *comb. nov.*

1980 *Deflandrea cordifera* May, p.74-75, pl.8, fig.4. Maastrichtian.

crassistriata (Jain *et al.*, 1975, p.8-9, pl.6, fig.64-65) Lentin
and Williams, 1977b, p.20. Danian; formerly *Deflandrea*. The
retention of this species in *Deflandrea* by Stover and Evitt,
1978, p.100 is herein rejected.

CERATIOPSIS (cont'd)

dartmooria (Cookson and Eisenack, 1965b) *comb. nov.*

1965b *Deflandrea dartmooria* Cookson and Eisenack, p.133-134, pl.16, fig.1-2; text-fig.1. Paleocene.

depressa (Morgenroth, 1966a, p.8, pl.1, fig.2) Lentin and Williams, 1977b, p.20. Early Eocene; formerly *Deflandrea*. The retention of this species in *Deflandrea* by Stover and Evitt, 1978, p.100 is herein rejected.

diebelii (Alberti, 1959b, p.99, pl.9, fig.18-21) Vozzhennikova, 1967, p.159. Late Senonian-Paleocene; formerly *Deflandrea*. O.C. The retention of this species in *Deflandrea* by Stover and Evitt, 1978, p.100 is herein rejected.

subsp. "*brevicornis*" Vozzhennikova, 1967, p.160, *nom. nud.* (described but not figured).

subsp. *rigida* (May, 1980) *comb. nov.*

1980 *Deflandrea diebelii* subsp. *rigida* May, p.75-76, pl.8, fig.9-10,15. Maastrichtian.

elongata (Jiabo, 1978) *comb. nov.*

1978 *Lejeunia elongata* Jiabo, p.54-55, pl.1, fig.5-7. Early Tertiary.

fissurata (Jiabo, 1978) *comb. nov.*

1978 *Lejeunia fissurata* Jiabo, p.55, pl.1, fig.4,8-10. Early Tertiary.

granulostriata Jain and Millepied, 1973, p.24-25, pl.1, fig.7-11; pl.2, fig.18; pl.3, fig.29) Lentin and Williams, 1977b, p.21. Maastrichtian; formerly *Deflandrea* and *Senegalinium*. The retention of this species in *Senegalinium* by Stover and Evitt, 1978, p.123 is herein rejected.

**leptoderma* Vozzhennikova, 1963, p.180; text-fig.8. Paleocene.

The transfer of this species to *Deflandrea* by Lentin and Williams, 1976, p.41 was rejected by Lentin and Williams, 1977b, p.21. The retention of this species in *Deflandrea* by Stover and Evitt, 1978, p.101 is herein rejected.

markovae Vozzhennikova, 1967, p.159, pl.119, fig.5,7; pl.120, fig.1-4. Paleocene-Eocene. The transfer of this species to

Deflandrea by Lentin and Williams, 1976, p.42 was rejected by Lentin and Williams, 1977b, p.21 since *C. markovae* does not have a broad hexa 2a intercalary archeopyle. The retention of this species in *Deflandrea* by Stover and Evitt, 1978, p.101 is herein rejected.

CERATIOPSIS (cont'd)

- obliquipes* (Deflandre and Cookson, 1955, p.252, pl.4, fig.6)
Lentin and Williams, 1980, p.41. Middle Paleocene-Early Eocene;
formerly *Deflandrea*.
- pannucea* (Stanley, 1965, p.220, pl.22, fig.1-4,8-10) Lentin and
Williams, 1977b, p.21. Paleocene; formerly *Deflandrea*. The
retention of this species in ?*Deflandrea* by Stover and Evitt,
1978, p.101 is herein rejected.
- ?*prutensis* Grigorovich, 1971, p.92,94, pl.2, fig.2. Paleocene.
The transfer of this species to ?*Deflandrea* by Stover and
Evitt, 1978, p.101 is herein rejected.
- sibirica* (Vozzhennikova, 1963, p.181; text-fig.9-10) Lentin and
Williams, 1977b, p.21. Paleocene-Eocene; formerly *Cerodinium*
and *Deflandrea*. Lentin and Williams, 1976, p.37-38 considered
the genus *Cerodinium* to be a *jr syn.* of *Deflandrea* and trans-
ferred its type species "*Cerodinium sibirica*" to that genus.
Lentin and Williams, 1977b, p.21 considered the genus *Cerodinium*
to be synonymous with *Ceratiopsis*. *Ceratiopsis* was given pri-
ority because it appeared first in the original publication
(Vozzhennikova, 1963) where both genera were erected, and be-
cause the type of the genus *Ceratiopsis*, *C. leptoderma*, was
considered to better illustrate the most important features of
the plexus of fossils which make up the genus. The retention of
Ceratiopsis sibirica in *Deflandrea* by Stover and Evitt, 1978,
p.101 is herein rejected.
- speciosa* (Alberti, 1959b, p.97, pl.9, fig.12-13) Lentin and
Williams, 1977b, p.21. Late Paleocene; formerly *Deflandrea*.
The retention of this species in *Deflandrea* by Stover and Evitt,
1978, p.101 is herein rejected.
- subsp. *glabra* (Gocht, 1969, p.10, text-fig.12-13) Lentin and
Williams, 1977b, p.21. Late Paleocene; formerly *Deflandrea*
speciosa forma *glabra*. This taxon was raised to the sub-
species level by Lentin and Williams, 1973, p.45. The trans-
fer of the subspecies to *Deflandrea* by Stover and Evitt, 1978,
p.101 is herein rejected.
- striata* (Drugg, 1967, p.18, pl.2, fig.13-17) Lentin and Williams,
1977b, p.21. Early Paleocene; formerly *Deflandrea*. The re-
tention of this species in *Deflandrea* by Stover and Evitt, 1978,
p.101 is herein rejected.
- subquadra* (Corradini, 1973, p.175-176, pl.28, fig.1) Lentin and
Williams, 1977b, p.22. Senonian; formerly *Deflandrea*. The
retention of this species in *Deflandrea* by Stover and Evitt,
1978, p.101 is herein rejected.

CERATIOPSIS (cont'd)

wardenensis (Williams and Downie, 1966c, p.233, pl.26, fig.5)
Bujak *et al.*, 1980, p.27. Early Eocene; formerly *Deflandrea*.

warrenii (Schumacker-Lambry, 1978) *comb. nov.*
1978 *Deflandrea warrenii* Schumacker-Lambry, p.40-41, pl.4,
fig.5-6. Paleocene (Landenian).

CERATIUM Schrank, 1793, p.34. Modern genus defined from the motile stage. Fossil cysts formerly included within this genus have been transferred to *Palaeocystodinium*.

CERATOCORYS Stein, 1883. Modern genus, all fossil forms transferred to *Microdinium*.

CERATOCYSTIDIOPSIS Deflandre, 1937b, p.89.

"*incerta*" (Deflandre-Rigaud, 1954). NOW *Odontochitinopsis*.

"*ludbrookii*" (Cookson and Eisenack, 1958). NOW *Endoceratium*.

"*molesta*" (Deflandre, 1937b). NOW *Odontochitinopsis*.

**simplex* Deflandre, 1937b, p.89-90, pl.17, fig.1. Late Cretaceous.

CERBIA Below, 1981, p.8.

cauda Below, 1981, p.8-9, pl.4, fig.3,5; pl.12, fig.20; text-fig. 6a-c,g. Barremian.

**tabulata* (Davey and Verdier, 1974, p.630, pl.92, fig.1-4; pl.93, fig.6) Below, 1981, p.9. Aptian; formerly *Cyclonephelium* and *Canninginopsis*.

CEREBROCYSTA Bujak, 1980, p.42.

**bartonensis* Bujak, 1980, p.42, pl.13, fig.4-11. Late Eocene.

"*CERODINIUM*" Vozzhennikova, 1963, p.181. Lentin and Williams, 1976, p.154 considered this genus to be a *jr. syn.* of *Deflandrea* Eisenack; emend. Lentin and Williams. Accordingly, they transferred the two species *Cerodinium sibiricum*, the type of the genus, and *C. balticum* to *Deflandrea*. Both these species were transferred to *Ceratiopsis* by Lentin and Williams, 1977b, p.20 and 21 respectively.

CHATANGIELLA Vozzhennikova, 1967, p.128-129; emend. Lentin and Williams, 1976, p.51-52.

CHATANGIELLA (cont'd)

- ?*armata* (Cookson and Eisenack, 1970a, p.142-143, pl.13, fig.9)
Lentin and Williams, 1976, p.53. Senonian; formerly *Deflandrea*.
NOTE: Stover and Evitt, 1978, p.99 considered this to be a
"provisionally accepted species".
- ?*biapertura* (McIntyre, 1975, p.66, pl.3, fig.5-8) Lentin and
Williams, 1976, p.53. Campanian-Maastrichtian; formerly
Deflandrea.
- bondarenkoi* (Vozzhennikova, 1967, p.130-131, pl.59, fig.1a-b;
pl.60, fig.2) Lentin and Williams, 1976, p.53. Santonian;
formerly *Australiella*. O.C.
- campbellensis* (Wilson, 1967b, p.225, fig.2-3) Lentin and
Williams, 1976, p.53. Paleocene; formerly *Deflandrea*.
- chetiensis* (Vozzhennikova, 1967, p.131, pl.60, fig.1a-b)
Lentin and Williams, 1976, p.54. Santonian; formerly
Australiella.
- coronata* (McIntyre, 1975, p.64-65, pl.3, fig.1-4) Lentin
and Williams, 1976, p.54. Campanian; formerly *Deflandrea*.
- ?*dakotaensis* (Stanley, 1965, p.217-218, pl.19, fig.1-3) Stover
and Evitt, 1978, p.99. Paleocene; formerly *Deflandrea* and
Isabelidinium.
- decorosa* (McIntyre, 1975, p.63-64, pl.2, fig.1-4) Lentin
and Williams, 1976, p.54. Campanian-Maastrichtian; formerly
Deflandrea.
- ditissima* (McIntyre, 1975, p.62-63, pl.1, fig.1-4) Lentin
and Williams, 1976, p.54. Santonian-Maastrichtian; formerly
Deflandrea.
- granulifera* (Manum, 1963, p.61, pl.3, fig.5-9) Lentin and
Williams, 1976, p.54. Senonian; formerly *Deflandrea* and
Australiella.
- subsp. *tenuis* (Davey, 1970, p.340-341, pl.2, fig.1) Lentin and
Williams, 1976, p.54. Albian; formerly *Australiella granulifera*
subsp. *tenuis* and *Deflandrea granulifera* var. *tenuis*.
The variety was raised to the subspecies level by Lentin and
Williams, 1973, p.18.
- madura* Lentin and Williams, 1976, p.54 *nom. subst. pro*
Chatangiella marumii (Cookson and Eisenack, 1970a, p.141-142,
pl.11, fig.10-11) Lentin and Williams, 1976, p.54, *non*
Chatangiella marumii (Vozzhennikova, 1967, p.184-185, pl.107,
fig.1-4) Lentin and Williams, 1976, p.54. Senonian; formerly
Deflandrea marumii.

CHATANGIELLA (cont'd)

"magna" (Davey, 1970) Lentin and Williams, 1976, p.54. NOW *Isabelidinium*; formerly *Deflandrea*.

manumi (Vozzhennikova, 1967, p.184-185, pl.107, fig.1-4) Lentin and Williams, 1976, p.54. Turonian-Campanian; formerly *Cooksoniella*.

"*manumi*" (Cookson and Eisenack, 1970a) Lentin and Williams, 1976, p.54. NOW *Chatangiella madura*; formerly *Deflandrea manumae*.

micracantha (Cookson and Eisenack, 1960a, p.3, pl.1, fig.9) Lentin and Williams, 1976, p.54. Campanian; formerly *Deflandrea* and *Australiella*.

?*multispinosa* (Cookson and Eisenack, 1970a, p.141, pl.11, fig.7-9) Lentin and Williams, 1976, p.54. Albian-Cenomanian; formerly *Deflandrea*. NOTE: Stover and Evitt, 1978, p.99 considered this to be a "provisionally accepted species".

**niiga* Vozzhennikova, 1967, p.129, pl.56, fig.1-4; pl.58, fig.1-4. Santonian.

?*robusta* (Benson, 1976, p.192,200,202, pl.11, fig.9-12; pl.12, fig.1) Stover and Evitt, 1978, p.99. Late Maastrichtian; formerly *Trithyrodinium*.

?*scheii* (Manum, 1963, p.56-58, pl.1, fig.1-16; text-fig.1) Lentin and Williams, 1976, p.54. Middle Cretaceous; formerly *Deflandrea* and *Cooksoniella*. Lentin and Williams, 1976, p.54 tentatively placed this species in the genus *Chatangiella* due to the presence of parasutural ridges which are not typical of the genus.

serratura (Cookson and Eisenack, 1958, p.28, pl.4, fig.4) Lentin and Williams, 1976, p.55. Campanian-Early Maastrichtian; formerly *Deflandrea*.

spectabilis (Alberti, 1959b, p.99, pl.9, fig.78) Lentin and Williams, 1976, p.55. Late Senonian; formerly *Deflandrea* and *Australiella*.

tripartita (Cookson and Eisenack, 1960a, p.2, pl.1, fig.10) Lentin and Williams, 1976, p.55. Senonian; formerly *Deflandrea* and *Australiella*. This species is the type species of *Australiella*, which Lentin and Williams, 1976, p.151 considered to be a *jr syn.* of *Chatangiella* Vozzhennikova.

verrucosa (Manum, 1963, p.60, pl.3, fig.1-4) Lentin and Williams, 1976, p.55. Middle Cretaceous; formerly *Deflandrea* and *Australiella*.

CHATANGIELLA (cont'd)

victoriensis (Cookson and Manum, 1964, p.522, pl.76, fig.3-8)
Lentin and Williams, 1976, p.55. Senonian; formerly
Deflandrea and *Australiella*.

vnigri (Vozzhennikova, 1967, p.185, pl.59, fig.2; pl.79, fig.3;
pl.107, fig.1; pl.109, fig.1-2; pl.110, fig.2-3) Lentin and
Williams, 1976, p.55. Turonian-Santonian; formerly *Cooksoni-*
ella. This species is the type species of *Cooksoniella*,
which Lentin and Williams, 1976, p.155 considered to be a *jr*
syn. of *Chatangiella* Vozzhennikova.

"CHELINOCYSTA" Sarjeant, 1967a, p.327, *nom. nud.* No diagnosis
given. See Clarke *et al.*, 1968, p.182 for discussion. The
single species, *C. lita nom. nud.*, is a *syn.* of *Ellipsodinium*
rugulosum.

CHICHAOUADINIUM Below, 1981, p.122-123.

**arabicum* Below, 1981, p.123-124, pl.10, fig.11-13,15-17; text-fig.
81. Albian.

"*limpidum*" (Singh, 1971) Below, 1981, p.123. See *Deflandrea limpida*.

CHIROPTERIDIUM Gocht, 1960, p.221.

"*aspinatum*" (Gerlach, 1961) Brosius, 1963, p.48. NOW and formerly
Membranophoridium.

conispinum Williams, 1978, p.794,797, pl.2, fig.1-6. Oligocene.

dispersum Gocht, 1960, p.227, pl.18, fig.1-16; text-fig.16-27.
Middle Oligocene.

"*inornatum*" (Drugg, 1970b). NOW *Senoniasphaera*.

?*korykum* (Maier, 1959, p.310, pl.30, fig.78) Lentin and
Williams, 1973, p.25. Middle Miocene; formerly *Galea*.

**lobospinosum* (Gocht in Weiler, 1956, p.138, pl.12, fig.1-3;
text-fig.8) Gocht, 1960, p.222. Middle Oligocene; formerly
Baltisphaeridium and *Hystrichosphaeridium*.

mespilanum (Maier, 1959, p.306-307, pl.29, fig.5-6) Lentin and
Williams, 1973, p.26. Middle Oligocene-Middle Miocene; formerly
Galea.

partispinatum (Gerlach, 1961, p.201, pl.29, fig.6) Brosius,
1963, p.48. Middle-Late Oligocene; formerly *Membranophoridium*.

CHLAMYDOPHORELLA Cookson and Eisenack, 1958, p.56.

"*alberti*" (Neale and Sarjeant, 1962) Davey, 1978, p.893. The trans-
fer of this species from *Gardodinium* to *Chlamydophorella* is herein
rejected and the species is retained in *Gardodinium*.

CHLAMYDOPHORELLA (cont'd)

- ?*apiculata* Cookson and Eisenack, 1970a, p.150-151, pl.13, fig.3. Albian-Cenomanian. NOTE: Stover and Evitt, 1978, p.28 considered this to be a "provisionally accepted species".
- discreta* Clarke and Verdier, 1967, p.24, pl.2, fig.9-10; text-fig.9. Cenomanian.
- "*elongata*" (Singh, 1971) Davey, 1978, p.893. The transfer of this species from *Gardodinium* to *Chlamydophorella* is herein rejected; we concur with Brideaux and McIntyre, 1975, p.33 that "*Gardodinium elongatum*" is a *jr syn.* of *Gardodinium trabeculosum* (Gocht) Alberti.
- grossa* Manum and Cookson, 1964, p.17, pl.5, fig.1-2. Cenomanian.
- "*huguoniotii*" (Valensi, 1955a) Davey, 1978, p.893. The transfer of this species to *Chlamydophorella* by Davey, *op.cit.* is herein rejected and the species is retained in *Cleistosphaeridium*; see discussion in Stover and Evitt, 1978, p.32.
- lagena* Cookson and Eisenack, 1970a, p.151, pl.13, fig.4. Albian-Cenomanian.
- largissima* Singh, 1971, p.378, pl.67, fig.5-6. Middle Albian. We reject the contention of Below, 1981, p.34 that this is a subspecies of *Chlamydophorella nyei*.
- ?*membranoidea* Vozzhennikova, 1967, p.114-115, pl.48, fig.1-10. Late Jurassic. NOTE: Stover and Evitt, 1978, p.28 considered this to be a "provisionally accepted species".
- **nyei* Cookson and Eisenack, 1958, p.56, pl.11, fig.1-3. Aptian-Turonian.
- subsp. "*largissima*" (Singh, 1971) Below, 1981, p.34. We herein reject this transfer and retain this taxon as a species of *Chlamydophorella*.
- "*ordinalis*" (Davey, 1974) Davey, 1978, p.893. The transfer of this species from *Gardodinium* to *Chlamydophorella* is herein rejected and the species is retained in *Gardodinium*.
- "*pyriformis*" (Vozzhennikova, 1967) Davey, 1978, p.893. The transfer of this species from *Gardodinium* to *Chlamydophorella* is herein rejected and the species is retained in *Gardodinium*.
- raritubula* Dodekova, 1975, p.27-28, pl.1, fig.7-10; pl.6, fig.13-16; text-fig.6. Late Bathonian.
- ?*tabulata* Singh, 1971, p.379, pl.67, fig.7. Middle Albian. NOTE: Stover and Evitt, 1978, p.28 considered this to be a "provisionally accepted species".

CHLAMYDOPHORELLA (cont'd)

"*trabeculosa*" (Gocht, 1959) Davey, 1978, p.893. The transfer of this species from *Gardodinium* to *Chlamyдохorella* is herein rejected and the species is retained in *Gardodinium*.

?*urna* Cookson and Eisenack, 1960a, p.10, pl.3, fig.7. Late Albian-Cenomanian. NOTE: Stover and Evitt, 1978, p.28 considered this to be a "provisionally accepted species".

wallala Cookson and Eisenack, 1960b, p.255, pl.38, fig.13; pl.39, fig.11. Oxfordian to Early Kimmeridgian.

CHONESPHAERA Klumpp, 1953, p.395.

**incerta* Klumpp, 1953, p.395, pl.19, fig.9. Eocene.

CHYTROEISPHAERIDIA (Sarjeant, 1962a, p.492) Downie and Sarjeant, 1965, p.102; emend. Pocock, 1972, p.99-100; emend. Davey, 1979d, p.211.

?*baetica* Riegel, 1974, p.349-350, 353-354, pl.1, fig.1-5; text-fig.2. ?Senonian. This species was tentatively retained in *Chytroeisphaerida* by Davey, 1979d, p.216.

caddaensis Filatoff, 1975, p.89-90, pl.29, fig.7-9. Bajocian.

"*cariacoensis*" (Wall, 1967). NOW *Brigantedinium*.

cerastes Davey, 1979d, p.212, 214, pl.2, fig.8-9. Early Oxfordian.

**chytroeides* (Sarjeant, 1962a, p.493, pl.70, fig.13, 16) Downie and Sarjeant, 1965, p.103; emend. Davey, 1979d, p.211, Oxfordian.

"*dictydia*" (Sarjeant, 1972). NOW *Escharisphaeridia*.

"*euteiches*" (Davey, 1969a). NOW *Batiacasphaera*.

explanata Bujak, 1980, p.44, pl.13, fig.13-14. Late Eocene.

granulata Courtinat and Gaillard, 1980, p.13-14, pl.1, fig.4, 6; text-fig.2b. Late Oxfordian.

hyalina (Raynaud, 1978) *comb. nov.*
1978 *Tapeinosphaeridium hyalinum* Raynaud, p.394-395, pl.2, fig.18. Callovian.

"*kendelbachia*" (Morbey, 1975) Stover and Evitt, 1978. NOW *Heibergella*.

?*mantellii* Gitmez and Sarjeant, 1972, p.186, pl.1, fig.3-4; pl.12, fig.3. Early Kimmeridgian. NOTE: Stover and Evitt, 1978, p.28 considered this to be a "provisionally accepted species".

CHYTROEISPHAERIDIA (cont'd)

pericompsa (Ioannides *et al.*, 1977, p.463, pl.5, fig.1-4; text-fig. 13) Davey, 1979d, p.216. Kimmeridgian; formerly *Tapeinosphaeridium*.

"*pocockii*" (Sarjeant, 1968). NOW *Escharisphaeridia*.

"*reticulata*" (Davey, 1969b). NOW *Batiacasphaera*.

rugosa Courtinat and Gaillard, 1980, p.15-16, pl.1, fig.12; pl.2, fig.1; text-fig.2d. Late Oxfordian.

scabrata Pocock, 1972, p.100, pl.27, fig.23-25. Late Bajocian. This species is questionably retained in *Chytroeisphaeridia* although Pocock implied that the archeopyle is precingular. NOTE: Stover and Evitt, 1978, p.28 considered this to be a "problematical species".

"*simplica*" (Wall, 1965b). NOW *Brigantedinium*.

"*spinosa*" (Boltenhagen, 1977). NOW ?*Cleistosphaeridium*.

"?*variabilis*" (Pocock, 1972). NOW *Gonyaulacysta*.

"CILIOSPHAERIDIUM" Grigorovich, 1971, p.94. *Jr syn.* of *Impletosphaeridium*; see Stover and Evitt, 1978, p.232-233. These authors transferred the type and single species of the genus, *Ciliosphaeridium cingulatum*, to *Impletosphaeridium*.

"CIRCULODINIUM" Alberti, 1961, p.28. Millioud, 1969, p.425 transferred the type of the genus, "*Circulodinium hirtellum*", to *Canningia*. Subsequently Davey, 1978, p.894 transferred "*Circulodinium hirtellum*" to *Cyclonephelium*. The remaining species, *Circulodinium deflandrei*, was considered by Millioud, 1969, p.427, to be a *jr syn.* of *Cyclonephelium distinctum* Deflandre and Cookson.

CIRRIFERA Cookson and Eisenack, 1960a, p.10.

**unilateralis* Cookson and Eisenack, 1960a, p.10, pl.3, fig.8. Late Albian-Cenomanian.

CLADOPYXIDIUM McLean, 1972, p.862.

exilimuratum Schumacker-Lambry, 1978, p.37, pl.2, fig.5-8. Paleocene (Landenian).

**saeptum* (Morgenroth, 1968, p.536-537, pl.41, fig.7-9; pl.42, fig.1) Stover and Evitt, 1978, p.30. Danian; formerly *Microdinium*. Stover and Evitt, *op.cit.* p.30 considered the original type of the genus *Cladopyxidium*, *C. septatum* to be a *jr syn.* of *C. saeptum*. Accordingly *C. saeptum* becomes the correct name for the nomenclatural type of the genus.

CLADOPYXIDIUM (cont'd)

"septatum" McLean, 1972, p.862-863, pl.1, fig.1-3,5-8,10-12.
Stover and Evitt, 1978, p.30 considered *Cladopyxidium septatum*
to be a *jr syn.* of *Cladopyxidium saeptum* (Morgenroth) Stover
and Evitt.

CLATHROCTENOCYSTIS Wiggins, 1972, p.302-303.

**elegans* Wiggins, 1972, p.303-304, pl.2-3; text-fig.3. Neocomian,
probably Valanginian or Early Hauterivian.

CLEISTOSPHAERIDIUM Davey *et al.*, 1966, p.166.

?*aciculare* Davey, 1969a, p.158, pl.6, fig.11-12. Cenomanian.
Brideaux, 1971, p.93-94 stated that *C. ?aciculare* is a
partial synonym of *Cleistosphaeridium multispinosum* (Singh)
Brideaux.

"*actinocoronatum*" (Benedek, 1972). NOW ?*Areosphaeridium*.

"*ambiguum*" (Deflandre, 1937b) Jiabo, 1978, p.60. The transfer of
this species from *Micrhystridium* to *Cleistosphaeridium* is
herein rejected because of the uncertainty of the presence
of an archeopyle.

ancoriferum (Cookson and Eisenack, 1960a, p.8, pl.2, fig.11)
Davey *et al.*, 1966, p.167; emend. Cookson and Eisenack, 1968,
p.119-120. Albian-Cenomanian; formerly *Hystriosphæridium*.
Clarke and Verdier, 1967, p.54 and Davey, 1978, p.893 con-
sidered this species to be a *jr syn.* of *Chlamydophorella*
huguoniotii (Valensi) Davey. Clarke and Verdier included the
two species in *Hystriosphæridium*, their original generic
assignment. Cookson and Eisenack, 1974, p.66 refuted Clarke and
Verdier's synonymy and retained *Cleistosphaeridium ancoriferum*
as a separate species.

araneosum Brideaux, 1977, p.22-23, pl.9, fig.1-3. Aptian-Albian.

armatum (Deflandre, 1937b, p.76, pl.16, fig.6-7) Davey, 1969a,
p.153. Late Senonian; formerly *Baltisphaeridium* and
Hystriosphæridium.

"*ashdodense*" Rossignol, 1962, p.132, pl.2, fig.2 (first figured
in Rossignol, 1961, pl.1, fig.9). Pleistocene. Wall, 1967,
p.109 considered this species to be a *jr syn.* of *Lingulodinium*
machaerophorum; formerly *Hystriosphæridium* and *Baltisphaeri-*
dium.

australe Burger, 1980b, p.268-269, fig.5C-D,6A. Neocomian.

?*bahiaense* (Regali *et al.*, 1974) *comb. nov.*
1974 *Hystriosphæridium bahiaense* Regali *et al.*, p.289-290,
pl.23, fig.5. Eocene-Oligocene.

CLEISTOSPHAERIDIUM (cont'd)

"*bergmannii*" (Archangelsky, 1969a). NOW *Operculodinium*.

?*bifide* (Jiabo, 1978) *comb. nov.*

1978 *Tenua bifidis* Jiabo, p.51-52, pl.22, fig.7-16. Early Tertiary.

bifurcatum Jiabo, 1978, p.60-61, pl.20, fig.11-12. Early Tertiary.

?*brevispinosum* Jain and Millepied, 1975, p.150, pl.5, fig.80-82.

Early-Late Aptian. NOTE: Stover and Evitt, 1978, p.31 considered this to be a "provisionally accepted species".

"*centrocarpum*" (Deflandre and Cookson, 1955) Jiabo, 1978, p.61.

The transfer of this species to *Cleistosphaeridium* is herein rejected and it is retained in *Operculodinium*.

commixtum Jiabo, 1978, p.61-62, pl.21, fig.3-5. Early Tertiary.

danicum (W. Wetzel, 1952, p.396, pl.A, fig.5; text-fig.8) Davey *et al.*, 1969, p.15. Paleocene; formerly *Baltisphaeridium*, *Hystriichosphaeridium* and *Areoligera*. NOTE: Stover and Evitt, 1978, p.32 considered this to be a "problematical species".

"*disjunctum*" Davey *et al.*, 1966, p.169, pl.11, fig.9. Reid, 1974, p.591 considered this species to be a *jr syn.* of *Lingulodinium machaerophorum* (Deflandre and Cookson) Wall.

**diversispinosum* Davey *et al.*, 1966, p.167, pl.10, fig.7.

Early Eocene.

echinoides (Maier, 1959, p.318, pl.32, fig.5-6) Davey *et al.*,

1969, p.15. Oligocene; formerly *Baltisphaeridium* and *Hystriichosphaeridium*. NOTE: Stover and Evitt, 1978, p.32 considered this to be a "problematical species".

ehrenbergii (Deflandre, 1947c, text-fig.1, no.5) Davey *et al.*,

1969, p.16. Oxfordian; formerly *Baltisphaeridium* and *Hystriichosphaeridium*. NOTE: Stover and Evitt, 1978, p.32 considered this to be a "problematical species".

?*erectum* (Manum and Cookson, 1964, p.14, pl.3, fig.5-6) Stover and

Evitt, 1978, p.31. Cretaceous; formerly *Hystriichosphaeridium* and ?*Cordosphaeridium*. Stover and Evitt, 1978, p.31 considered this to be a "provisionally accepted species".

?*flexuosum* Davey *et al.*, 1966, p.169, pl.2, fig.5. Cenomanian.

giganteum (Caro, 1973, p.360-361, pl.2, fig.12) Stover and Evitt, 1978, p.31. Early Eocene; formerly *Polysphaeridium*.

granulatum Burger, 1980a, p.77, pl.33, fig.2-4,6-10. Albian.

CLEISTOSPHAERIDIUM (cont'd)

"heteracanthum" (Deflandre and Cookson, 1955) Davey *et al.*, 1966, p.168. NOW ?*Heterosphaeridium*.

huguoniotii (Valensi, 1955a, p.38, text-fig.2a) Davey, 1969a, p.135. Late Cretaceous; formerly *Hystriichosphaeridium* and *Baltisphaeridium*. The transfer of this species to *Chlamydo-phorella* by Davey, 1978, p.893 is herein rejected; see discussion in Stover and Evitt, 1978, p.32. NOTE: Stover and Evitt, 1978, p.32 considered this to be a "problematical species".

subsp. *pertusum* (Davey, 1969a, p.156, pl.7, fig.6-7,9)
Lentin and Williams, 1973, p.28. Cenomanian; formerly
Cleistosphaeridium huguoniotii var. *pertusum*.

?*insolitum* (Eaton, 1976, p.308, pl.21, fig.5,8; text-fig.25B)
Stover and Evitt, 1978, p.31. Early-Late Eocene; formerly
Impletosphaeridium. NOTE: Stover and Evitt, 1978, p.31 considered this to be a "provisionally accepted species".

leve (Maier, 1959, p.308, pl.30, fig.1-2) Davey *et al.*, 1969, p.16. Oligocene-Miocene; formerly *Galea* and *Baltisphaeridium*. NOTE: Stover and Evitt, 1978, p.32 considered this to be a "problematical species".

lumectum (Sarjeant, 1960a, p.139-140, pl.6, fig.1; text-fig.2)
Davey *et al.*, 1969, p.16. Late Oxfordian; formerly *Baltisphaeridium*. NOTE: Stover and Evitt, 1978, p.32 considered this to be a "problematical species".

mediterraneum Corradini, 1973, p.137-138, pl.19, fig.5a-b;
text-fig.4. Senonian.

microcystum (Bujak, 1980) *comb. nov.*
1980 *Tenua microcysta* Bujak, p.88,90, pl.22, fig.2-5. Late Eocene.

mikiril Mehrotra, 1981, p.14-15, pl.1, fig.2-5. Middle Eocene.

minor Jiabo, 1978, p.62, pl.20, fig.13-16. Early Tertiary.

?*mojsisovicsii* Morbey, 1975, p.40, pl.15, fig.5-9. Rhaetian-Hettangian. NOTE: Stover and Evitt, 1978, p.31 considered this to be a "provisionally accepted species"; they further suggested that it may be an acritarch.

?*multifurcatum* (Deflandre, 1937b, p.76, pl.16, fig.1-3) Davey *et al.*, 1969, p.16. Late Cretaceous; formerly *Hystriichosphaeridium* and *Baltisphaeridium*. NOTE: Stover and Evitt, 1978, p.31 considered this to be a "provisionally accepted species".

CLEISTOSPHAERIDIUM (cont'd)

- ?*multispinosum* (Singh, 1964, p.141, pl.20, fig.1-2) Brideaux, 1971, p.93. Middle Albian-Early Cenomanian; formerly *Baltisphaeridium*. NOTE: Stover and Evitt, 1978, p.31 considered this to be a "provisionally accepted species".
- ?*oligacanthum* (W. Wetzel, 1952, p.402, pl.A, fig.8; text-fig.21-22) Davey *et al.*, 1969, p.16. Paleocene; formerly *Hystriosphae-ridium* and *Baltisphaeridium*. NOTE: Stover and Evitt, 1978, p.31 considered this to be a "provisionally accepted species".
- subsp. *complanatum* (W. Wetzel, 1952, p.404-405, pl.A, fig.11a-b) Lentin and Williams, 1973, p.29. Paleocene; formerly *Hystriosphae-ridium oligacanthum* subsp. *complanatum*.
- subsp. *granulatum* (W. Wetzel, 1952, p.404; text-fig.25) Lentin and Williams, 1973, p.29. Paleocene; formerly *Hystriosphae-ridium oligacanthum* subsp. *granulatum*.
- subsp. *stella* (W. Wetzel, 1952, p.403, pl.A, fig.4; text-fig.23) Lentin and Williams, 1973, p.29. Paleocene; formerly *Hystriosphae-ridium oligacanthum* subsp. *stella*.
- subsp. *velatum* (W. Wetzel, 1952, p.403-404, pl.A, fig.7; text-fig.24) Lentin and Williams, 1973, p.29. Paleocene; formerly *Hystriosphae-ridium oligacanthum* subsp. *velatum*.
- panniforme* (Gerlach, 1961, p.196, pl.28, fig.13) Stover and Evitt, 1978, p.31. Middle Oligocene; formerly *Baltisphaeridium* and *Impletosphaeridium*.
- panshanense* Jiabo, 1978, p.63, pl.22, fig.1-6. Early Tertiary.
- "*parvum*" Davey, 1969a, p.157, pl.7, fig.11-12. Cenomanian. *Jr* syn. of *Diacrocanthidium echinulatum*; see Bujak, 1980, p.52.
- patagonicum* Archangelsky, 1969b, p.200-201, pl.3, fig.9-10. Eocene. NOTE: Stover and Evitt, 1978, p.32 considered this to be a "problematical species".
- "*pectiniforme*" (Gerlach, 1961) Davey *et al.*, 1969, p.16. NOW ?*Areosphae-ridium*; also formerly *Baltisphaeridium*.
- "*pilosum*" (Ehrenberg, 1843). Invalidly transferred to *Cleisto-sphaeridium* by Davey *et al.*, 1966, p.170. NOW *Sentusidinium*.
- ?*polyacanthum* Gitmez, 1970, p.284-286, pl.12, fig.10; text-fig.22. Early Kimmeridgian. NOTE: Stover and Evitt, 1978, p.31 considered this to be a "provisionally accepted species".
- ?*polyozon* (Brosius, 1963, p.45, pl.1, fig.6; pl.6, fig.5; text-fig. 2a-d) Stover and Evitt, 1978, p.31-32. Late Oligocene; formerly *Baltisphaeridium*.

CLEISTOSPHAERIDIUM (cont'd)

"*polypes*" (Cookson and Eisenack, 1962b) Davey, 1969a, p.154.

NOW *Bacchidinium*; formerly *Hystriosphæridium recurvatum* subsp. *polypes*.

subsp. "*clavulum*" (Davey, 1969a) Lentin and Williams, 1973, p.30. NOW *Bacchidinium polypes* subsp. *clavulum*; formerly *Cleistosphæridium polypes* var. *clavulum*.

polytrichum (Valensi, 1947, p.818, text-fig.4) Davey *et al.*, 1969, p.16. Late Bathonian; formerly *Baltisphaeridium* and *Hystriosphæridium*.

"*separatum*" (McIntyre and Brideaux, 1980). NOW *Sentusidinium*.

sphericum Horowitz, 1975, p.24, pl.1, fig.5. Late Jurassic.
NOTE: Stover and Evitt, 1978, p.32 considered this to be a "problematical species".

?*spinosum* (Boltenhagen, 1977) *comb. nov.*

1977 *Chytroeisphaeridia spinosa* Boltenhagen, p.54-55, pl.7, fig.1-5. Cenomanian-Turonian.

spiralisetum (de Wit, 1943, p.383, text-fig.2,11) Davey *et al.*, 1969, p.16. Late Cretaceous; formerly *Hystriosphæridium* and *Baltisphaeridium*. NOTE: Stover and Evitt, 1978, p.32 considered this to be a "problematical species".

"*spissum*" (McIntyre and Brideaux, 1980). NOW ?*Prolixosphæridium*.

tenuë Harris, 1974, p.164, pl.2, fig.7-9. Paleocene. O.C.

"*tiara*" (Klumpp, 1953) Davey *et al.*, 1969, p.16. NOW *Operculodinium*; formerly *Baltisphaeridium*, *Hystriosphæridium* and *Cordosphæridium*.

subsp. "*centrocarpum*" (Deflandre and Cookson, 1955) Morgenroth, 1966a, p.26. NOW *Operculodinium centrocarpum*.

?*tribuliferum* (Sarjeant, 1962a, p.487, pl.70, fig.4; text-fig.6c-7) Davey *et al.*, 1969, p.16. Oxfordian; formerly *Baltisphaeridium*.
NOTE: Stover and Evitt, 1978, p.32 considered this to be a "provisionally accepted species".

?*williamsi* (Boltenhagen, 1977) *comb. nov.*

1977 *Polysphaeridium williamsi* Boltenhagen, p.41-42, pl.2, fig.6-7. Cenomanian-Early Turonian.

COBRICOSPHAERIDIUM Harland and Sarjeant, 1970, p.216-217.

**hebes* Harland and Sarjeant, 1970, p.217-218, pl.21, fig.1-2; text-fig.2. Holocene.

COBRICOSPHAERIDIUM (cont'd)

spiniiferum Harland and Sarjeant, 1970, p.218-219, pl.21,
fig.3-6; text-fig.3-4. Holocene.

subsp. *elegans* Harland and Sarjeant, 1970, p.219-220, pl.21,
fig.4-5; text-fig.4. Holocene.

subsp. *spiniiferum* Harland and Sarjeant, 1970, p.218-219,
pl.21, fig.3,6; text-fig.3. Holocene.

"*CODONIA*" Cookson and Eisenack, 1960a, p.11. *Jr hom.* of *Codonia*
Huebner, 1823. SEE *Codoniella*.

CODONIELLA Cookson and Eisenack, 1961a, p.75; emend. Davey, 1979b,
p.555 (*nom. subst. pro Codonia* Cookson and Eisenack, 1960a
non Huebner, 1823).

**campanulata* (Cookson and Eisenack, 1960a, p.11, pl.3, fig.1-3)
Downie and Sarjeant, 1965, p.103; emend. Davey, 1979b,
p.556. Santonian; formerly *Codonia*.

?*langparensis* Jain *et al.*, 1975, p.12, pl.4, fig.56, pl.5, fig.
57-58. Danian. NOTE: Stover and Evitt, 1978, p.227 considered
this to be a "provisionally accepted species".

psygma Davey, 1979b, p.556, pl.2, fig.9-14. Aptian-Albian.

COMETODINIUM Deflandre and Courteville, 1939, p.98.

**obscurum* Deflandre and Courteville, 1939, p.99, pl.2, fig.1.
Turonian.

?*whitei* (Deflandre and Courteville, 1939, p.103, pl.3, fig.5-6)
Stover and Evitt, 1978, p.227. Senonian; formerly *Balti-*
sphaeridium, *Hystriosphaeeridium* and *Impletosphaeeridium*.
NOTE: Stover and Evitt, 1978, p.227 considered this to be
a "provisionally accepted species".

COMPARODINIUM Morbey, 1975, p.43.

aquilonium Dörhöfer and Davies, 1980, p.24,26, fig.26E,I;28A-H.
Toarcian-Bajocian/Bathonian.

diacrorhaetium Morbey, 1975, p.44, pl.16, fig.3-6; text-fig.20.
Rhaetian.

**koessenium* Morbey, 1975, p.44, pl.15, fig.14; pl.16, fig.1-2;
text-fig.19a,b1. Rhaetian-Hettangian.

lineatum Wille and Gocht, 1979, p.235,237, fig.13-16,27(7-11),
28(1). Pliensbachian-Toarcian.

COMPARODINIUM (cont'd)

perpunctatum Wille and Gocht, 1979, p.238, fig.28(7-8).
Pliensbachian.

punctatum Wille and Gocht, 1979, p.228-231, fig.3-10,26(1-12),
27(1-6). Pliensbachian-Toarcian.

subsp. *magnum* (Wille and Gocht, 1979) *stat. nov.*
1979 *Comparodinium punctatum* var. *magnum* Wille and Gocht,
p.231, fig.26(11). Toarcian.

scalatum Wille and Gocht, 1979, p.231,233-234, fig.11-12,28(2-6).
Pliensbachian-Toarcian.

stipulatum Wille and Gocht, 1979, p.237-238, fig.17,28(9-12).
Pliensbachian.

COMPOSITOSPHAERIDIUM Dodekova, 1974, p.25-26. When published this genus was monotypic, with *Hystrichosphaeridium costatum* Davey and Williams being its nomenclatural type. Beju, 1971, p.292 considered this species to be a *jr syn.* of *Hystrichosphaeridium polonicum* Gorka, 1965, p.306. Dodekova, 1974 did not include Beju, 1971 in her bibliography. Erkmen and Sarjeant, 1980, p.65-67 supported the synonymy given by Beju, 1971 and proposed the new name *Compositosphaeridium bulgaricum* Erkmen and Sarjeant for the specimens described and illustrated in Dodekova, 1974. They also included in the genus *C. polonicum* (= *C. costatum*), but proposed the notion that *C. bulgaricum* should rightfully be considered as the type species, because it was on the basis of this material that Dodekova had formalized her concept of the new genus *Compositosphaeridium*. This is contrary, however, to the ICBN, according to which a name is irrevocably linked to its nomenclatural type (even if the latter may change its name as a consequence of better knowledge and understanding). Thus, the correct name of the type species is now *Compositosphaeridium polonicum* (Gorka) Erkmen and Sarjeant.

bulgaricum Erkmen and Sarjeant, 1980, p.66-67 pro *Composito-*
sphaeridium costatum Dodekova, 1974, p.26-29, pl.1, fig.1-11;
pl.2, fig.1-9; text-fig.1-2, *non* Davey and Williams, 1966.
Bathonian.

"*costatum*" (Davey and Williams, 1966b, p.62, pl.10, fig.4)
Dodekova, 1974, p.26. Oxfordian; formerly *Hystrichosphaeridium*
and *Cordosphaeridium*. Erkmen and Sarjeant, 1980, p.66 concur-
red with Beju's (1971, p.292) contention that *Hystrichosphaeri-*
dium costatum is a *jr syn.* of *Hystrichosphaeridium polonicum*
Gorka, 1965 and transferred the last named species to *Composito-*
sphaeridium.

**polonicum* (Gorka, 1965, p.306-307, pl.3, fig.5-6) Erkmen and
Sarjeant, 1980, p.67-69. Oxfordian; formerly *Hystrichosphaeri-*
dium. Erkmen and Sarjeant (*op.cit.*) provided an emended diagnosis.

CONICOIDIDIUM Jiabo, 1978, p.45-46.

granorugosum Jiabo, 1978, p.46, pl.18, fig.11-12. Early Tertiary.

laevigatum Jiabo, 1978, p.46, pl.18, fig.1. Early Tertiary.

**tuberculatum* Jiabo, 1978, p.46, pl.18, fig.5-10; text-fig.7.
Early Tertiary.

"*CONIFERATIUM*" Burgess, 1971, p.80-81. *Jr syn.* of *Apteodinium*;
see Stover and Evitt, 1978, p.142, who transferred the type and
single species of the genus, *C. frontierense*, to *Apteodinium*.

CONNEXIMURA May, 1980, p.45-46.

**fimbriata* (Morgenroth, 1968, p.547-548, pl.45, fig.7-8) May, 1980,
p.46. Danian; formerly *Danea* and ?*Hystriochokolpoma*.

CONOSPHAERIDIUM Cookson and Eisenack, 1969, p.5. The genus
Conosphaeridium was erected by Cookson and Eisenack, 1969,
p.5, with *Hystriochosphaeridium striatoconus* (Deflandre and
Cookson, 1955) as the type of the genus. Sarjeant, 1969, p.14,
transferred *H. striatoconus* to ?*Litosphaeridium* thus making
Conosphaeridium a superfluous genus. Lentin and Williams, 1973,
p.31 rejected the transfer of Sarjeant, 1969 and retained
Conosphaeridium as a separate genus.

**striatoconus* (Deflandre and Cookson, 1955, p.275, pl.2, fig.10)
Cookson and Eisenack, 1969, p.5. Albian-Cenomanian; formerly
Baltisphaeridium, *Hystriochosphaeridium* and ?*Litosphaeridium*.

"*tubulosum*" (Cookson and Eisenack, 1969). NOW *Kleithriasphaeridium*.

"*COOKSONIELLA*" Vozzhennikova, 1967, p.183. Lentin and Williams,
1976, p.155 considered this genus to be a *jr syn.* of
Chatangiella Vozzhennikova; emend. Lentin and Williams.

"*damasii*" (Lejeune-Carpentier, 1942) Lentin and Williams, 1973,
p.31. NOW *Palaeoperidinium*; formerly *Peridinium*.

"*larjakiensis*" (Vozzhennikova, 1967, p.71-72, pl.16, fig.1-2)
Harker and Sarjeant, 1975, p.224. NOW *Palaeoperidinium*
larjakiense; formerly *Peridinium conicum* var. *larjakiensis*
and *Palaeoperidinium deflandrei* subsp. *larjakiense*. The transfer
of this taxon to "*Cooksoniella*" was rejected by Lentin and
Williams, 1977b, p.31. Species of *Palaeoperidinium*, including
the type of the genus *P. pyrophorum*, commonly possess an endo-
cyst. Therefore Harker and Sarjeant, 1975 were incorrect in
assuming that the presence of an endocyst in *P. larjakiense*
precludes its assignment to the genus *Palaeoperidinium*. Also
the evidence for an intercalary archeopyle resulting from the
loss of paraplate 2a is inconclusive in the line drawings of
Vozzhennikova, 1967, pl.16, fig.1-2.

COOKSONIELLA (cont'd)

"*manumii*" (Vozzhennikova, 1967). NOW *Chatangiella*.

"?*paleocenica*" (Cookson and Eisenack, 1965c) Lentin and Williams, 1973, p.31. NOW *Gingiodinium*.

"*scheii*" (Manum, 1963) Lentin and Williams, 1973, p.31. NOW ?*Chatangiella*.

"**vigneri*" (Vozzhennikova, 1967). NOW *Chatangiella*.

CORDOSPHAERIDIUM Eisenack, 1963b, p.261; emend. Davey, 1969c, p.35.

"*axiale*" (Eisenack, 1965). NOW *Fibrocysta*.

biarmatum Morgenroth, 1966a, p.21, pl.4, fig.6-7. Early Eocene.

"*bipolare*" (Cookson and Eisenack, 1965b). NOW *Fibrocysta*.

?*callosum* Morgenroth, 1966a, p.21, pl.4, fig.8-10. Early Eocene.

NOTE: Stover and Evitt, 1978, p.147 considered this to be a "provisionally accepted species".

cantharellum (Brosius, 1963, p.41, pl.6, fig.1) Gocht, 1969, p.45. Late Oligocene; formerly *Hystriosphæridium*.

capillaceum Schumacker-Lambry, 1978, p.37-38, pl.2, fig.10-12. Paleocene (Landenian).

"*capricornum*" (Cookson and Eisenack, 1965a). NOW *Areosphaeridium*.

"*centrocarpum*" (Deflandre and Cookson, 1955). NOW *Operculodinium*.

commune Corradini, 1973, p.151, pl.22, fig.1a-b; pl.33, fig.1-2. Late Cretaceous-Paleocene.

"*costatum*" (Davey and Williams, 1966b) Gorka, 1970, p.489-490. NOW *Compositosphaeridium*.

?*cracenospinosum* Davey and Williams, 1966b, p.87, pl.3, fig.4. Early Eocene. NOTE: Stover and Evitt, 1978, p.147 considered this to be a "provisionally accepted species".

"*diktyoplokus*" (Klump, 1953). NOW *Areosphaeridium*.

"*divergens*" (Eisenack, 1954) Eisenack, 1963b, p.262. NOW *Operculodinium*; formerly *Baltisphaeridium* and *Hystriosphæridium*.

"*eoinodes*" (Eisenack, 1958) Eisenack, 1963b, p.262. NOW *Kleithriasphaeridium*.

CORDOSPHERIDIUM (cont'd)

"*erectum*" (Manum and Cookson, 1964) Davey and Williams, 1969, p.6.
NOW ?*Cleistosphaeridium*; formerly *Hystriospheridium*.

exilimum Davey and Williams, 1966b, p.87, pl.11, fig.2.
Early Eocene.

"*fasciatum*" (Davey and Williams, 1966b). NOW *Kleithriasphaeridium*.

fibrospinosum Davey and Williams, 1966b, p.86, pl.5, fig.5.
Early Eocene.

"*filosum*" (Wilson, 1967a). NOW *Turbiosphaera*.

"*floripes*" (Deflandre and Cookson, 1955) Eisenack, 1963b, p.262.
NOW *Homotryblium*.

subsp. "*breviradiatum*" (Cookson and Eisenack, 1961b) Eisenack,
1963, p.262. NOW *Homotryblium*.

funiculatum Morgenroth, 1966a, p.22-23, pl.6, fig.2-3. Early
Eocene.

gracile (Eisenack, 1954, p.66, pl.8, fig.17; pl.10, fig.3-8;
pl.12, fig.7,21) Davey and Williams, 1966b, p.84. Oligocene;
formerly *Hystriospheridium inodes* var. *gracile* and
Cordosphaeridium inodes var. *gracile*.

?*hirundo* (Eisenack, 1958, p.404-405, pl.24, fig.12) Stover and
Evitt, 1978, p.147. Early Cretaceous; formerly *Achomosphaera*,
Hystriospheridium and *Lanternosphaeridium*. Stover and Evitt,
1978, p.47 considered this to be a "provisionally accepted
species".

**inodes* (Klumpp, 1953, p.391, pl.18, fig.1-2) Eisenack, 1963b,
p.261; emend. Morgenroth, 1968, p.549-550. Late Eocene;
formerly *Hystriospheridium*.

var. "*gracile*" (Eisenack, 1954). NOW *Cordosphaeridium*
gracile.

subsp. *inodes* Klumpp, 1953, p.391, pl.18, fig.1-2. Late Eocene.

subsp. *longipes* Hansen, 1977, p.17,19, fig.17C-E. Early Paleocene.

subsp. "*minimum*" (Morgenroth, 1966a). NOW *Cordosphaeridium*
minimum.

subsp. *minus* Morgenroth, 1966a, p.24, pl.5, fig.4-5. Early
Eocene.

subsp. *robustum* Gocht, 1969, p.42, pl.2, fig.1-2. Eocene.

CORDOSPHAERIDIUM (cont'd)

"*klumppiae*" (Corradini, 1973). NOW *Fibrocysta*.

"*latispinosum*" (Davey and Williams, 1966b). NOW *Achilleodinium*.

?*lemniscatum* Corradini, 1973, p.152-153, pl.22, fig.4a-b,5;
pl.33, fig.2,4; pl.39, fig.2. Late Cretaceous-Paleocene.
NOTE: Stover and Evitt, 1978, p.147 considered this to be
a "provisionally accepted species".

"*major*" (Lejeune-Carpentier, 1940) Corradini, 1973, p.149. NOW
?*Dapsilidinium*. The transfer of this species from *Polysphaeridium*
to *Cordosphaeridium* was rejected by Stover and Evitt, 1978,
p.76.

microtriainum (Klumpp, 1953, p.390, pl.17, fig.6-7) Eisenack
1963b, p.263. Late Eocene; formerly *Hystrichosphaeridium*.
NOTE: Stover and Evitt, 1978, p.147 considered this to be
a "problematical species".

subsp. "*centrocarpum*" (Deflandre and Cookson, 1955) De Coninck,
1969, p.32. Lentin and Williams, 1973, p.33 rejected this
interpretation by De Coninck and retained the species
centrocarpum as the type of the genus *Operculodinium*.

subsp. *nanum* (Rozen, 1965, p.311, pl.2, fig.7-8; text-fig.21)
Lentin and Williams, 1973, p.33. Late Eocene; formerly
Cordosphaeridium microtriaina var. *nanum*.

minimum (Morgenroth, 1966a, p.24, pl.5, fig.6-7) Benedek, 1972,
p.25-26. Early Eocene; formerly *Cordosphaeridium inodes*
subsp. *minimum*.

multispinosum Davey and Williams, 1966b, p.89-90, pl.3, fig.6.
Early Eocene.

"*palmatum*" (White, 1842) De Coninck, 1965, p.32. NOW *Hystricho-*
sphaeridium.

senegalense Jain and Millepied, 1975, p.149, pl.5, fig.68.
Campanian-Maastrichtian.

?*simplex* Michael, 1964, p.32-33, pl.3, fig.4. Early Barremian.
NOTE: Stover and Evitt, 1978, p.147 considered this to be a
"provisionally accepted species".

"*solaster*" (Morgenroth, 1966a). NOW ?*Exochosphaeridium*.

"*spinosum*" (White, 1842). NOW *Exochosphaeridium*.

?*tenuistriatum* Heisecke, 1970, p.245, pl.7, fig.1; pl.12, fig.3-4.
Early Paleocene. NOTE: Stover and Evitt, 1978, p.147 considered
this to be a "provisionally accepted species".

CORDOSPHAERIDIUM (cont'd)

"*tiara*" (Klumpp, 1953). NOW *Operculodinium*.

truncigerum (Deflandre, 1937b, p.71-72, pl.13, fig.6-7) De Coninck, 1975, p.80. Senonian; formerly *Hystrichosphaeridium* and ?*Litosphaeridium*. The transfer of this species to *Exochosphaeridium* by Davey, 1978, p.894 is herein rejected.

uncinispinosum De Coninck, 1969, p.32-33, pl.9, fig.6-8. Early Eocene. NOTE: Stover and Evitt, 1978, p.147 considered this to be a "problematical species".

valiantum (Sah *et al.*, 1970, p.145, pl.1, fig.8-9) Stover and Evitt, 1978, p.147. Late Cretaceous; formerly *Achomosphaera*.

varians May, 1980, p.47-48, pl.2, fig.4,7-8; pl.14, fig.1-3; pl.15, fig.2a-b,3a-d; pl.16, fig.6a-10b. Campanian-Maastrichtian.

"*xanthium*" (Benedek, 1972). NOW *Operculodinium*.

CORNUDINIUM Pocock, 1972, p.93.

**stavelyense* Pocock, 1972, p.94, pl.24, fig.15-16. Late Bajocian.

CORONIFERA Cookson and Eisenack, 1958, p.45; emend. Davey, 1974, p.47.

albertii Millioud, 1969, p.425-426, pl.1, fig.4. Late Hauterivian.

caperata Jiabo, 1978, p.65, pl.23, fig.18; text-fig.10. Early Tertiary.

kaiseri Ashraf, 1979, p.139-140, pl.8, fig.7-8. Early Cretaceous.

monstruosa (Tasch, 1964, p.195, pl.1, fig.12) Stover and Evitt, 1978, p.148. Albian; formerly *Hystrichosphaeridium* and ?*Diphyes*.

**oceanica* Cookson and Eisenack, 1958, p.45, pl.12, fig.6; emend. May, 1980, p.48-49. Albian.

ovata Jiabo, 1978, p.66, pl.23, fig.19. Early Tertiary.

striolata (Deflandre, 1937b, p.72, pl.15, fig.1-2) Stover and Evitt, 1978, p.148. Late Cretaceous; formerly *Hystrichosphaeridium*, *Baltisphaeridium* and *Exochosphaeridium*.

?*tubulosa* Cookson and Eisenack, 1974, p.73, pl.28, fig.12. Paleocene. O.C. NOTE: Stover and Evitt, 1978, p.148 considered this to be a "provisionally accepted species".

CORRUDINIUM Stover and Evitt, 1978, p.148-149.

cristatum Châteauneuf, 1980, p.136, pl.21, fig.3-4,6. Late Eocene (Auversian).

**incompositum* (Drugg, 1970b, p.810-811, fig.1E-0,2A) Stover and Evitt, 1978, p.149. Oligocene; formerly *Gonyaulacysta* and *Leptodinium*.

CRASPEDODINIUM Cookson and Eisenack, 1974, p.75. Lentin and Williams, 1976, p.157 considered this genus to be a *jr syn.* of *Ovoidinium*. Stover and Evitt, 1978, p.34 refuted this on the basis of the archeopyle, the shape of the pericyst, and the relationship of the endocyst to the pericyst.

americanum (Habib, 1970, p.372, pl.10, fig.10) Stover and Evitt, 1978, p.34. Albian-Cenomanian; formerly *Xenikoon*.

**indistinctum* Cookson and Eisenack, 1974, p.76, pl.25, fig.6-8. Aptian-Albian; see also *Ovoidinium*.

CRIBROPERIDINIUM Neale and Sarjeant, 1962, p.443; emend. Davey, 1969a, p.125.

auctificum (Brideaux, 1971, p.82-83, pl.23, fig.40-41; text-fig. 9a-b) Stover and Evitt, 1978, p.150. Late Albian; formerly *Gonyaulacysta*.

comptum (Duxbury, 1980) *comb. nov.*

1980 *Gonyaulacysta compta* Duxbury, p.122-123, pl.2, fig.1-2,4. Barremian.

cooksoniae Norvick, 1976, p.36-37, pl.1, fig.1-3; text-fig.13. Cenomanian. O.C.

cornutum Davey, 1974, p.48-49, pl.2, fig.1-5. Middle-Late Barremian. We herein reject the transfer of this species to the genus *Occisucysta* Gitmez by Below, 1981, p.60.

"*crispum*" (W. Wetzel, 1967) Fenton, 1981, p.255. The transfer of this species to *Cribroperidinium* is herein rejected and the species is retained in *Hystrihogonyaulax*.

diaphane (Cookson and Eisenack, 1958, p.36, pl.3, fig.13-14; text-fig.10-11) Stover and Evitt, 1978, p.150. Aptian; formerly *Gonyaulax* and *Gonyaulacysta*.

edwardsii (Cookson and Eisenack, 1958, p.32, pl.3, fig.5-6; text-fig.7) Davey, 1969a, p.128. Albian-Early Turonian; formerly *Gonyaulax* and *Gonyaulacysta*.

exilicristatum (Davey, 1969a, p.121, pl.1, fig.1-2; text-fig. 9A-B) Stover and Evitt, 1978, p.150. Cenomanian; formerly *Gonyaulacysta*.

CRIBROPERIDINIUM (cont'd)

- granulatum* (Klement, 1960, p.39, pl.4, fig.10-13; text-fig.18-20) Stover and Evitt, 1978, p.150. Middle Oxfordian-Early Kimmeridgian; formerly *Gonyaulax* and *Gonyaulacysta*.
- "*granuligerum*" (Klement, 1960) Stover and Evitt, 1978, p.150. Jr syn. of *Cribroperidinium granulatum* (Klement) Stover and Evitt; see Fisher and Riley, 1980, p.321; formerly *Gonyaulax* and *Gonyaulacysta*. For complete citation see *Gonyaulacysta granuligera*.
- intricatum* Davey, 1969a, p.125-128, pl.2, fig.1-3; text-fig.11-12. Albian.
- muderongense* (Cookson and Eisenack, 1958, p.32, pl.3, fig.3-4) Davey, 1969a, p.128. Aptian; formerly *Gonyaulax*.
- "*orthoceras*" (Eisenack, 1958, p.388, pl.21, fig.3-11; pl.24, fig.1) Davey, 1969a, p.128-129. Aptian; formerly *Gonyaulax*. Davey and Verdier, 1971, p.17 considered *Cribroperidinium orthoceras* to be a jr syn. of *Cribroperidinium edwardsii* (Cookson and Eisenack) Davey. However, they did not give a correct citation. Stover and Evitt, 1978, p.150 concurred with this opinion. Singh, 1971, p.307 and Dodekova, 1971, p.8 included *C. orthoceras* in *Gonyaulacysta*. Lentin and Williams, 1973, p.35 rejected the above transfers on the basis of the morphology of *C. orthoceras* which conforms to that of the genus *Cribroperidinium*. We herein reject the contention of Below, 1981, p.39-40 that the species is not a jr syn. of *C. edwardsii*.
- perforans* (Cookson and Eisenack, 1958, p.30, pl.2, fig.1-4,7-8; text-fig.8-9) Below, 1981, p.40. Late Jurassic; formerly *Gonyaulax*, *Gonyaulacysta* and ?*Leptodinium*.
- ?*pyrum* (Drugg, 1967, p.14, pl.1, fig.17; pl.9, fig.6a-b) Stover and Evitt, 1978, p.150. Maastrichtian-Danian; formerly *Gonyaulax* and *Gonyaulacysta*. Stover and Evitt, 1978, p.150 considered this to be a "provisionally accepted species".
- **sepimentum* Neale and Sarjeant, 1962, p.443, pl.19, fig.4; text-fig.3. Hauterivian.
- systemmatum* (Gitmez and Sarjeant, 1972, p.204-205, pl.5, fig.7-8) Stover and Evitt, 1978, p.150. Early Kimmeridgian; formerly *Gonyaulacysta*.
- tensiftense* Below, 1981, p.41-42, pl.1, fig.10-11; pl.13, fig.3-5; text-fig.24. Barremian-Albian.
- ventriosum* (O. Wetzel, 1933a, p.161-162, pl.2, fig.4-6; text-fig.1,8) Lentin and Williams, 1973, p.35. Senonian; formerly *Peridinium* and *Palaeoperidinium*.

- CRYPTARCHAODINIUM* Deflandre, 1939, p.145; emend. Gitmez, 1970, p.246; emend. Stover and Evitt, 1978, p.228.
- **calcaratum* Deflandre, 1939, p.145, pl.6, fig.6; emend. Gitmez, 1970, p.246-248. Kimmeridgian.
- CTENIDODINIUM* Deflandre, 1938b, p.181; emend. Sarjeant, 1966b, p.154; emend. Sarjeant, 1975a, p.55.
- adela* (Fenton *et al.*, 1980) *comb. nov.*
1980 *Dichadogonyaulax adela* Fenton *et al.*, p.155-156, pl.14, fig.1-4; text-fig.3. Late Bajocian. O.C.
- chondrum* Drugg, 1978, p.66, pl.1, fig.8-11. Early Kimmeridgian.
- combazii* Dupin, 1968, p.2, pl.1, fig.1-6. Middle and Late Bathonian.
- continuum* Gocht, 1970b, p.141-142, pl.26, fig.3; pl.27, fig.5; pl.29, fig.1-2; pl.32, fig.15; pl.33, fig.8. Early Bathonian.
- ?*cristatum* (Horowitz, 1975, p.25, pl.1, fig.8) Stover and Evitt, 1978, p.204. Late Triassic; formerly *Brotzenia*. NOTE: Stover and Evitt, 1978, p.204 considered this to be a "provisionally accepted species".
- culmulum* (Norris, 1965, p.793-795, fig.1-2,6-9) Lentin and Williams, 1973, p.35. Portlandian; formerly *Gonyaulax* and *Dichadogonyaulax*. The transfer of this species from *Dichadogonyaulax* to *Ctenidodinium* was rejected by Sarjeant, 1975a, p.50-51. Stover and Evitt, 1978, p.204, however, concurred with Lentin and Williams, 1973, p.35.
- elegantulum* Millioud, 1969, p.427, pl.2, fig.1-3; emend. Below, 1981, p.42. Late Hauterivian-Barremian.
- gochti* (Sarjeant, 1976a, p.11,13, pl.2, fig.1; pl.3, fig.4; text-fig.2A-C) Stover and Evitt, 1978, p.204. Bathonian; formerly *Dichadogonyaulax*.
- kettonense* (Sarjeant, 1976a, p.13,15, pl.1, fig.1-2; pl.3, fig.1-2; pl.6, fig.1; text-fig.3A-D) Stover and Evitt, 1978, p.204. Bathonian; formerly *Dichadogonyaulax*.
- mosaicum* Dodekova, 1975, p.18-19, pl.1, fig.1-6; pl.2, fig.1-3,6. Late Bathonian.
- norrisii* (Pocock, 1972, p.92-93, pl.24, fig.1,9-10,12; text-fig.9) Stover and Evitt, 1978, p.204. Callovian; formerly *Dichadogonyaulax* and *Leptodinium*.

CTENIDODINIUM (cont'd)

**ornatum* (Eisenack, 1935, p.176, pl.4, fig.9-10) Deflandre, 1938b, p.181. Oxfordian; formerly *Lithodinia jurassica* var. *ornata*. Lentin and Williams, 1973, p.35 rejected the transfer of this species to *Gonyaulacysta* by Pocock, 1972, p.87-88. *Ctenidodinium ornatum* has an epicystal archeopyle (combination A-P) whilst forms within *Gonyaulacysta* have a simple precingular archeopyle.

?*pachydermum* (Deflandre, 1938b, p.176, pl.7, fig.6-10; text-fig. 7-10) Gocht, 1970b, p.142-143. Oxfordian; formerly *Gonyaulax* and *Gonyaulacysta*. NOTE: Stover and Evitt, 1978, p.204 considered this to be a "provisionally accepted species".

parneum (Norris, 1965, p.796-798, fig.3,10-13) Lentin and Williams, 1973, p.36. Kimmeridgian-Portlandian; formerly *Dichadogonyaulax* and *Leptodinium*. The transfer of this species from *Dichadogonyaulax* to *Ctenidodinium* was rejected by Sarjeant, 1975a, p.55. Stover and Evitt, 1978, p.204, however, concurred with Lentin and Williams, 1973, p.36.

rotundum Dodekova, 1975, p.19-20, pl.4, fig.13-14; text-fig.1. Late Bathonian.

schizoblatum (Norris, 1965, p.798-800, fig.4-5,14-17) Lentin and Williams, 1978, p.36. Portlandian; formerly *Dichadogonyaulax* and *Leptodinium*. The transfer of this species from *Dichadogonyaulax* to *Ctenidodinium* was rejected by Sarjeant, 1975a, p.55. Stover and Evitt, 1978, p.204, however, concurred with Lentin and Williams, 1973, p.36.

scissum McIntyre and Brideaux, 1980, p.21, pl.8, fig.6-9; pl.9, fig.1-6. Valanginian.

sellwoodii (Sarjeant, 1975a, p.52,55, pl.1, fig.A-H; pl.2, fig. I-K; pl.3, fig.L-Q) Stover and Evitt, 1978, p.204. Bathonian; formerly *Dichadogonyaulax*.

stauromatos (Sarjeant, 1976a, p.9-11, pl.2, fig.4; pl.3, fig. 5-6; text-fig.1A-C) Stover and Evitt, 1978, p.204. Bathonian; formerly *Dichadogonyaulax*.

tenellum Deflandre, 1938b, p.182, pl.9, fig.9-10. Oxfordian.

"CUBICULOSPHERA" Harris, 1974, p.163-164. *Jr syn.* of *Geiselodinium*; see Stover and Evitt, 1978, p.230-231. These authors transferred the type and single species of the genus, *Cubiculosphaera maslinensis*, to *Geiselodinium*.

CUPRITIA Courtinat and Gaillard, 1980, p.23.

**minima* Courtinat and Gaillard, 1980, p.23-24, pl.2, fig.7,10; text-fig.3. Late Oxfordian.

CYCLAPOPHYSIS Benson, 1976, p.182.

**mor-mouthensis* Benson, 1976, p.183, pl.1, fig.9-12; pl.2, fig.1.
Late Maastrichtian-Early Paleocene.

CYCLODICTYON Cookson and Eisenack, 1958, p.58.

minor Pocock, 1972, p.101, pl.23, fig.10. Callovian. According to Jansonius (pers. comm.) this is possibly an acritarch.

**paradoxum* Cookson and Eisenack, 1958, p.58-59, pl.12, fig.1-2.
Cenomanian-Early Turonian.

CYCLONEPHELIUM Deflandre and Cookson, 1955, p.285; emend. Williams and Downie, 1966c, p.223; emend. Ioannides, *et al.*, 1976, p.450; emend. Sarjeant and Stover, 1978, p.51; emend. Stover and Evitt, 1978, p.35. The emendation of Dörhöfer and Davies, 1980, p.41 is herein rejected.

areolatum Cookson and Eisenack, 1960b, p.253, pl.38, fig.7-8.
Tithonian.

asperum (Singh, 1971, p.322, pl.50, fig.1) Below, 1981, p.10.
Middle Albian; formerly *Canningia*.

?*assamicum* Jain *et al.*, 1975, p.11, pl.5, fig.61-62; pl.6, fig.73.
Danian. NOTE: Stover and Evitt, 1978, p.36 considered this to be a "provisionally accepted species".

asymmetricum Burger, 1980b, p.270, fig.6c,7a-c. Neocomian.

"?*attadalicum*" (Cookson and Eisenack, 1962b). NOW *Canningia*. The retention of this genus in *Cyclonephelium* by Sarjeant and Stover, 1978, p.52 is herein rejected.

brevispinatum (Millioud, 1969, p.427-428, pl.1, fig.8-9) Below, 1981, p.11. Late Hauterivian-Early Aptian; formerly *Cyclonephelium distinctum* var. *brevispinatum* and *Cyclonephelium distinctum* subsp. *brevispinatum*.

brevispinosum (Pocock, 1962) *comb. nov.*
1962 *Palaeohystrichophora brevispinosa* Pocock, p.81, pl.14, fig.222-223; emend. Brideaux, 1977, p.15-16; the latter author included the species in *Tenua*. Barremian; also formerly ?*Canningia*.

castelcasiense Corradini, 1973, p.161, pl.24, fig.2,5a-b;
pl.35, fig.1-2. Late Cretaceous-Paleocene.

chabaca Below, 1981, p.12-13, pl.4, fig.9-11; pl.9, fig.2-3; pl.15, fig.25. Aptian-Cenomanian.

CYCLONEPHELIUM (cont'd)

elathromarginatum Cookson and Eisenack, 1962b, p.495, pl.6, fig.1-4. Late Albian-Cenomanian.

"*combinatum*" (Jiabo, 1978). NOW *Glaphyrocysta*.

**compactum* Deflandre and Cookson, 1955, p.285, pl.2, fig.11-13; text-fig.44-46. Albian-Santonian.

crassimarginatum Cookson and Eisenack, 1974, p.74-75, pl.28, fig.1-4. Middle Cretaceous.

deconinckii Boltenhagen, 1977, p.52-53, pl.4, fig.5-6. Campanian.

densebarbatum Cookson and Eisenack, 1960b, p.253, pl.38, fig.10. Tithonian.

distinctum Deflandre and Cookson, 1955, p.285-286, pl.2, fig.14; text-fig.47-48. Senonian.

subsp. "*brevispinatum*" (Millioud, 1969) Lentin and Williams, 1973, p.36. NOW *Cyclonephelium brevispinatum*; formerly *Cyclonephelium distinctum* var. *brevispinatum*.

subsp. *distinctum* Deflandre and Cookson, 1955, p.285-286, pl.2, fig.14; text-fig.47-48. Senonian.

subsp. *longispinatum* Davey, 1978, p.894, pl.3, fig.4,7-8. Turonian.

"*divaricatum*" (Williams and Downie, 1966c). NOW *Glaphyrocysta*.

"*downiei*" (Sarjeant, 1960a, p.138; holotype illustrated by Downie, 1957, p.425, pl.20, fig.10) Ioannides *et al.*, 1977, p.451. The above transfer was rejected by Lentin and Williams, 1977b, p.37, the species being retained in *Acanthaulax*, since Sarjeant, 1976c, p.6 stated that the archeopyle is precingular, resulting from the loss of paraplate 3". Sarjeant and Stover, 1978, p.52 concurred with the opinion of Lentin and Williams, *op.cit.*

dubium (Jain and Millepied, 1975, p.152, pl.5, fig.75-76) Sarjeant and Stover, 1978, p.52. Campanian-Maastrichtian; formerly *Tenua*.

"*eisenackii*" Davey, 1969a, p.170, pl.8, fig.3-4; pl.9, fig.4; text-fig.16a-b. Albian. Cookson and Eisenack, 1974, p.74 considered this species to be a *jr syn.* of *Aptea polymorpha* Eisenack. O.C.

expansum Corradini, 1973, p.161-162, pl.24, fig.8a-b; text-fig.7. Late Cretaceous-Paleocene. Stover and Evitt, 1978, p.36 considered this to be a "problematical species".

CYCLONEPHELIUM (cont'd)

- "*exuberans*" (Deflandre and Cookson, 1955). NOW *Glaphyrocysta*;
formerly *Membranilarnax pterospermoides* O. Wetzel sensu
Pastiels, 1948, p.46, pl.5, fig.11,13-14.
- ?*granulatum* (Horowitz, 1975, p.25, pl.1, fig.4) Stover and Evitt,
1978, p.36. Late Triassic; formerly *Doidyx*. O.C.
- hexalobosum* (Cookson and Eisenack, 1974, p.76, pl.26, fig.6-7)
Stover and Evitt, 1978, p.36. Middle Cretaceous-Senonian;
formerly *Cassidium*.
- hirtellum* (Alberti, 1961, p.28, pl.4, fig.20) Davey, 1978, p.894.
Valanginian-Hauterivian; formerly *Canningia* and *Circulodinium*.
- hughesi* Clarke and Verdier, 1967, p.21-22, pl.2, fig.6;
text-fig.8. Cenomanian-Early Turonian.
- hystrix* (Eisenack, 1958, p.410, pl.23, fig.1-4; text-fig.10)
Davey, 1978, p.894. Aptian; formerly *Tenua*. The transfer of
this species to *Cyclonephelium* is not attributable to
Sarjeant and Stover, 1978, p.52.
- "*incultum*" (Morgenroth, 1966b). NOW *Glaphyrocysta*.
- "*intricatum*" (Eaton, 1971). NOW *Glaphyrocysta*.
- "*laciniiforme*" (Gerlach, 1961). NOW *Glaphyrocysta*.
- "*lemniscatum*" (Stanley, 1965). NOW *Areoligera*.
- maugaad* Below, 1981, p.15, pl.11, fig.2-3; pl.15, fig.20.
Hauterivian-Aptian.
- membraniphorum* Cookson and Eisenack, 1962b, p.495, pl.6, fig.8-14.
Albian-Cenomanian.
- "*microfenestratum*" (Bujak, 1976). NOW *Glaphyrocysta*.
- "*ordinatum*" (Williams and Downie, 1966c). NOW *Glaphyrocysta*.
- palliatum* (Brideaux, 1977, p.11-12, pl.3, fig.1-8) Below, 1981,
p.10. Barremian; formerly *Canningia*.
- "*pastielsii*" (Deflandre and Cookson, 1955). NOW *Glaphyrocysta*;
formerly *Membranilarnax* cf. *liradisoides* O. Wetzel sensu
Pastiels, 1948, p.47, pl.5, fig.15. The references to Pastiels,
1948 in Downie and Sarjeant, 1965 (as pl.5, fig.5) and in
Harker and Sarjeant, 1975, p.226 (as p.47, pl.15, fig.5) are
incorrect.
- paucimarginatum* Cookson and Eisenack, 1962b, p.494, pl.6, fig.57.
?Late Albian-Cenomanian.

CYCLONEPHELIUM (cont'd)

- paucispinum* Davey, 1969a, p.170, pl.9, fig.1-2. Cenomanian.
- reductum* Châteauneuf, 1980, p.136, pl.21, fig.10. Late Eocene (Marinesian-Ludian).
- "*regulatum*" (Jiabo, 1978). NOW ?*Membranophoridium*.
- "*reticulosum*" (Gerlach, 1961). NOW *Glaphyrocysta*.
- "*retiintextum*" (Cookson, 1965a). NOW *Glaphyrocysta*.
- "*semicirculatum*" (Morgenroth, 1966b). NOW *Areoligera*.
- "*semitectum*" (Bujak, 1980). NOW *Glaphyrocysta*.
- "*spinetum*" (Eaton, 1976). NOW *Glaphyrocysta*.
- "*tabulatum*" (Davey and Verdier, 1974). NOW *Cerbia*. The retention of this species in *Cyclonepkelium* by Sarjeant and Stover, 1978, p.52 is herein rejected.
- "*textum*" (Bujak, 1976). NOW *Glaphyrocysta*.
- uncinatum* (Norvick, 1976, p.74-75, pl.8, fig.11-12) Stover and Evitt, 1978, p.36. Cenomanian; formerly *Adnatosphaeridium*.
- vannophorum* Davey, 1969a, p.168-170, pl.9, fig.3; pl.11, fig.11-12; text-fig.16E. Cenomanian.
- "*variabile*" (Cookson and Eisenack, 1967a). NOW *Systematophora*.
- "*variatum*" (Jiabo, 1978). NOW *Membranophoridium*.
- "*vicinum*" (Eaton, 1976). NOW *Glaphyrocysta*.
- "*vitulare*" (Cookson, 1965b). NOW *Renidinium*.

CYCLOPSIELLA Drugg and Loeblich, 1967, p.188-190.

- **elliptica* Drugg and Loeblich, 1967, p.190, pl.3, fig.1-6; text-fig.7. Oligocene.
- ornamenta* Jain, 1977, p.187, pl.6, fig.72. Early Albian.
- trematophora* (Cookson and Eisenack, 1967a, p.136, pl.19, fig.13) Lentin and Williams, 1977b, p.39. Late Eocene; formerly *Leiosphaeridia*.
- vieta* Drugg and Loeblich, 1967, p.192,194, pl.3, fig.7-9; text-fig.8. Oligocene.

CYSTIDIOPSIS Nagy, 1965, p.209.

**certa* Nagy, 1965, p.209-210, pl.5, fig.27-30. Middle Miocene.
O.C.

"*CYSTODINIOPSIS*" Vozzhennikova, 1963, p.185, *nom. nud.* See
Loeblich and Loeblich, 1969, p.194. The type of the genus and
single species, "*C. hyperxantha*", is now included in ?*Palaeocy-*
stodinium.



DANEA Morgenroth, 1968, p.541-542.

**californica* (Drugg, 1967, p.30, pl.5, fig.14-15; pl.9, fig.8) Stover and Evitt, 1978, p.152. Danian; formerly *Palmnickia* and *Samlandia*. The original type of the genus *Danea*, *D. mutabilis*, was considered to be a *jr syn.* of *D. californica* by Damassa, 1979b, p.193; the latter species therefore becomes the type of the genus.

chibanis Below, 1981, p.43-45, pl.6, fig.3-4; pl.15, fig.1-2; text-fig.33-39. Gargasian.

"*fimbriata*" (Morgenroth, 1968) Stover and Evitt, 1978, p.152. NOW *Conneximura*; formerly *Hystriehokolpoma*.

impages Damassa, 1979a, p.821-822, pl.1, fig.1-3; pl.2, fig.1-9; text-fig.3. Early-Middle Eocene.

"*mutabilis*" Morgenroth, 1968, p.542-544, pl.43, fig.5-9; pl.44, fig.1-3. Danian. This species, the original type of the genus, was considered to be a *jr syn.* of *Danea californica* (Drugg, 1967) Stover and Evitt, 1978, by Damassa, 1979b, p.193. *Danea californica* therefore becomes the type of the genus.

DAPCODINIUM Evitt, 1961a, p.996; emend. Dörhöfer and Davies, 1980, p.23.

inornatum (Morgenroth, 1970, p.354-355, pl.13, fig.5-8) Dörhöfer and Davies, 1980, p.23. Late Pliensbachian; formerly *Maturodinium*.

**priscum* Evitt, 1961a, p.996-1001, pl.19, fig.1-14; text-fig.1-20. Hettangian (Lias).

semitabulatum (Morgenroth, 1970, p.352-353, pl.12, fig.3-6; pl.13, fig.1-4) Dörhöfer and Davies, 1980, p.23. Late Pliensbachian; formerly *Mancodinium*.

DAPSILIDINIUM Bujak *et al.*, 1980, p.27-28.

?*amalthei* (W. Wetzel, 1966) *comb. nov.*
1966 *Hystriehosphaeridium amalthei* W. Wetzel, p.317, pl.31, fig.2, 2a-b. Lias (Late Toarcian); also formerly ?*Polysphaeridium*.

asperum (Maier, 1959, p.319, pl.33, fig.2) Bujak *et al.*, 1980, p.28. Middle Miocene; formerly *Hystriehosphaeridium* and ?*Polysphaeridium*.

DAKSIDINIUM (cont'd)

- ?*belgicum* (Sarjeant, 1969) *comb. nov.*
1969 *Polysphaeridium belgicum* Sarjeant, p.15 = *Hystriosphae-
ridium fluctuans sensu* Pastiels, 1948, p.40, pl.3, fig.16 *non*
Eisenack, 1938, p.230-231, pl.16, fig.1. Early Eocene.
- ?*caminuspinum* (Wall, 1965a) *comb. nov.*
1965a *Hystriosphae-
ridium caminuspinum* Wall, p.165, pl.9, fig.3.
Lias (Early Sinemurian); also formerly ?*Polysphaeridium*. Stover
and Evitt, 1978, p.76 considered this to be an acritarch.
- ?*conispinum* (Davey and Verdier, 1973) *comb. nov.*
1973 *Litosphaeridium conispinum* Davey and Verdier, p.193-194,
pl.4, fig.4,6,8-9. Late Albian; also formerly ?*Polysphaeridium*.
- ?*daveyi* (Boltenhagen, 1977) *comb. nov.*
1977 *Polysphaeridium daveyi* Boltenhagen, p.37-38,40, pl.2,
fig.3-4. Late Cenomanian-Turonian.
- ?*deflandrei* (Valensi, 1947) *comb. nov.*
1947 *Hystriosphae-
ridium deflandrei* Valensi, p.817, text-
fig.3. Middle Jurassic; also formerly ?*Polysphaeridium*.
- ?*elongatum* (Jain and Millepied, 1975) *comb. nov.*
1975 *Polysphaeridium elongatum* Jain and Millepied, p.150-151,
pl.5, fig.73-74. Maastrichtian.
- ?*fucosum* (Valensi, 1955a) *comb. nov.*
1955a *Micrhystridium fucosum* Valensi, p.40, text-fig.2b. Late
Cretaceous; also formerly *Hystriosphae-
ridium* and ?*Polysphae-
ridium*.
- ?*granulosum* (Jain and Millepied, 1975) *comb. nov.*
1975 *Polysphaeridium granulosum* Jain and Millepied, p.151-152,
pl.5, fig.69-70. Campanian-Maastrichtian.
- ?*laminaspinosum* (Davey and Williams, 1966b) *comb. nov.*
1966b *Polysphaeridium laminaspinosum* Davey and Williams, p.94-
95, pl.8, fig.8. Cenomanian.
- ?*langii* (Wall, 1965a) *comb. nov.*
1965a *Hystriosphae-
ridium langii* Wall, p.165, pl.6, fig.9-11;
pl.9, fig.9; emend. Morbey, 1975, p.41-42. Hettangian-Sinemurian;
also formerly ?*Polysphaeridium*. O.C.
- ?*major* (Lejeune-Carpentier, 1940, p.220, text-fig.13) Davey and
Williams, 1969, p.6. Senonian; formerly *Cordosphaeridium*,
*Hystriosphae-
ridium* and *Polysphaeridium*.
- ?*multispinosum* (Davey, 1974, p.60, pl.7, fig.4) Bujak *et al.*,
1980, p.28. Early Barremian; formerly *Polysphaeridium*.
- **pastielsii* (Davey and Williams, 1966b, p.92-93, pl.4, fig.10)
Bujak *et al.*, 1980, p.28. Early Eocene; formerly *Polysphae-
ridium*. O.C.

DAPSILIDINIUM (cont'd)

?*paulinae* (Valensi, 1953) *comb. nov.*

1953 *Hystriosphæridium paulinae* Valensi, p.48, pl.12, fig.6.
Middle Jurassic, also formerly ?*Polysphaeridium*.

?*pseudocolligerum* (Stover, 1977, p.74-75, pl.1, fig.14-19) Bujak
et al., 1980, p.28. Early Oligocene-Early Miocene; formerly
Polysphaeridium.

?*pumilum* (Davey and Williams, 1966b) *comb. nov.*

1966b *Polysphaeridium pumilum* Davey and Williams, p.93-94,
pl.7, fig.3-4. Cenomanian.

?*punctatum* (Jain and Millepied, 1975) *comb. nov.*

1975 *Polysphaeridium punctatum* Jain and Millepied, p.151, pl.5,
fig.71-72. Maastrichtian.

?*rhabdophorum* (Valensi, 1955b) *comb. nov.*

1955 *Hystriosphæridium rhabdophorum* Valensi, p.593, pl.3,
fig.7. Late Cretaceous; also formerly *Polysphaeridium*.

?*simplex* (White, 1842, p.38, pl.4, div.3, fig.10) Bujak *et al.*,
1980, p.28. Late Cretaceous, formerly *Hystriosphæridium*,
? *Polysphaeridium* and *Xanthidium*.

?*warreni* (Habib, 1976) *comb. nov.*

1976 *Polysphaeridium warreni* Habib, p.383, pl.2, fig.4,6a-b.
Berriasian-Aptian?

DEFLANDREA Eisenack, 1938, p.187; emend. Williams and Downie,
1966c, p.231; emend. Lentin and Williams, 1976, p.35-36.

"*acribes*" (Davey and Verdier, 1971). NOW *Alterbia*.

"*acuminata*" (Cookson and Eisenack, 1958). NOW *Isabelidinium*.

"*acutula*" (Wilson, 1967b). NOW *Alterbia*.

"*aenigmatica*" (Boltenhagen, 1977). NOW *Senegalinium*.

"*alberti*" (Corradini, 1973). NOW *Ceratiopsis*.

"*amphiata*" (McIntyre, 1975). NOW ?*Isabelidinium*.

?*andromiensis* Vozzhennikova, 1967, p.142-143, pl.71, fig.3-4;
pl.72, fig.1-2. Eocene.

?*antarctica* Wilson, 1967a, p.58,60, fig.23-24,26-27. Erratics,
probably Eocene.

?*apicidentata* Jiabo, 1978, p.81, pl.2, fig.11. Early Tertiary.

DEFLANDREA (cont'd)

arcuata Vozzhennikova, 1967, p.143-144, pl.66, fig.1; pl.68, fig.3a-b. Late Eocene-Early Oligocene.

subsp. *oporiensis* Grigorovich, 1971, p.92, pl.1, fig.5)
Lentin and Williams, 1977b, p.40. Eocene; formerly
Deflandrea arcuata forma oporiensis.

"*armata*" (Cookson and Eisenack, 1970a). NOW *Chatangiella*.

"*asymmetrica*" (Wilson, 1967a). NOW ?*Senegalinium*.

"*asymmetrica*" (Davey and Verdier, 1971). NOW *Subtilisphaera deformans*. Lentin and Williams, 1976, p.119 reasoned that with the transfer of this species from *Deflandrea* to *Subtilisphaera* the original name was no longer a *jr hom.*; therefore the *nom. subst.* *Deflandrea daveyi* and *Deflandrea deformans* became superfluous. Since *Deflandrea asymmetrica* was illegitimate when proposed, Stover and Evitt, 1978, p.239 pointed out that this was an incorrect assumption.

"*bakeri*" (Deflandre and Cookson, 1955). NOW *Isabelidinium*.

forma pellucida (Deflandre and Cookson, 1955). NOW
Isabelidinium pellucidum.

"*balcattensis*" (Cookson and Eisenack, 1969). NOW *Subtilisphaera*.

"*balmei*" (Cookson and Eisenack, 1962b). NOW *Isabelidinium*.

"*baltica*" (Vozzhennikova, 1967) Lentin and Williams, 1976, p.38.
NOW *Ceratiopsis*; formerly *Cerodinium*.

"*belfastensis*" (Cookson and Eisenack, 1961a). NOW *Isabelidinium*.

"*biapertura*" (McIntyre, 1975). NOW ?*Chatangiella*.

"*bicavata*" (Jain and Millepied, 1973) Herngreen, 1975, p.61.
The transfer of this species from *Senegalinium* to *Deflandrea*
was rejected by Lentin and Williams, 1977b, p.40, because the
archoeopyle is a standard hexa 2a intercalary.

"*boloniensis*" (Riegel, 1974). NOW *Ceratiopsis*.

"*campbellensis*" (Wilson, 1967b). NOW *Chatangiella*.

carpatica Grigorovich, 1969b, p.68-69, pl.1, fig.2. Paleocene.

"*cineta*" (Cookson and Eisenack, 1958). NOW *Ovoidinium*.

"*conica*" Vozzhennikova, 1960, *nom. nud.* No description.

DEFLANDREA (cont'd)

- "*conorata*" (Stover, 1973). NOW *Furydinium*.
- "*cooksoniae*" (Alberti, 1959b). NOW *Isabelidinium*.
- "*cordifera*" (May, 1980). NOW *Ceratiopsis*.
- cornumammillata* Jan du Chêne and Châteauneuf, 1975, p.31-32, pl.2, fig.1-13. Early Ilerdian (Late Paleocene).
- "*coronata*" (McIntyre, 1975). NOW *Chatangiella*.
- "*crassistriata*" (Jain *et al.*, 1975). NOW *Ceratiopsis*.
- "*cretacea*" (Cookson, 1956). NOW *Isabelidinium*.
- "*cwillieri*" (Boltenhagen, 1977). NOW *Senegalinium*.
- cygniiformis* Pöthe de Baldis, 1966, p.221, pl.2, fig.C. Early Tertiary.
- "*dakotaensis*" (Stanley, 1965). NOW *Chatangiella*.
- danica* Lange, 1969, p.114-115, pl.1, fig.6. Danian.
- "*dartmooria*" (Cookson and Eisenack, 1965b). NOW *Ceratiopsis*.
- "*daveyi*" (Lentin and Williams, 1973, p.40). This name designated as a *nom. subst.* for *Deflandrea asymmetrica* Davey and Verdier, 1971 (*non* Wilson, 1967), is a *jr syn.* of "*Deflandrea deformans*" Davey and Verdier, 1973. The latter species was transferred to *Subtilisphaera* by Lentin and Williams, 1976, p.119 as *Subtilisphaera deformans*.
- "*decorosa*" (McIntyre, 1975). NOW *Chatangiella*.
- "*deformans*" Davey and Verdier, 1973, p.197, *nom. nov. pro D. asymmetrica* Davey and Verdier, 1971, p.39-40, pl.2, fig.4,6; *non D. asymmetrica* Wilson, 1967a, p.62-63. Lentin and Williams, 1976, p.119 reasoned that with the transfer of the former species from *Deflandrea* to *Subtilisphaera*, the original name was no longer a *jr hom.*; therefore the *nom. subst.* *Deflandrea deformans* became superfluous. Stover and Evitt, 1978, p.239 correctly retained the species as *Subtilisphaera deformans*.
- "*delicata*" (Baltes *ex* Lentin and Williams, 1973). NOW *Isabelidinium*.
- delineata* Cookson and Eisenack, 1965c, p.140-141, pl.18, fig.3-5; text-fig.1. Paleocene.

DEFLANDREA (cont'd)

- denticulata* Alberti, 1959b, p.102-103, text-fig.1. Paleocene-Early Eocene.
- subsp. *minor* (De Coninck, 1969, p.16, pl.1, fig.16-17; pl.2, fig.1-2) Lentin and Williams, 1973, p.40. Early Eocene; formerly *Deflandrea denticulata* forma *minor*.
- "*depressa*" (Morgenroth, 1966a). NOW *Ceratiopsis*.
- "*diebeli*" (Alberti, 1959b). NOW *Ceratiopsis*.
- subsp. "*rigida*" (May, 1980). NOW *Ceratiopsis diebeli* subsp. *rigida*.
- "*dilwynensis*" (Cookson and Eisenack, 1965c). NOW ?*Senegalinium*.
- dissoluta* Vozzhennikova, 1967, p.144, pl.73, fig.1-4. Eocene.
- "*distincta*" (Wilson, 1967a). NOW ?*Alterbia*.
- "*ditissima*" (McIntyre, 1975). NOW *Chatangiella*.
- dongyingensis* Jiabo, 1978, p.82, pl.4, fig.6-9; pl.5, fig.1-6. Early Tertiary.
- "*druggi*" (Stover, 1973). NOW *Isabelidinium*.
- "?*dubia*" (Jain and Millepied, 1973) Herngreen, 1975, p.61. NOW ?*Andalusiella*; formerly *Senegalinium*. The transfer of this species from *Senegalinium* to ?*Deflandrea* was not attributable to Lentin and Williams, 1976, p.40. NOTE: Stover and Evitt, 1978, p.101 considered this to be a "problematical species" of *Deflandrea*.
- "*echinoidea*" (Cookson and Eisenack, 1960a). NOW *Spinidinium*.
- "*ectorugosa*" (Archangelsky, 1969b). NOW *Senegalinium*.
- "*endopapillata*" Archangelsky, 1969b, p.192-193, pl.1, fig.8-9; pl.2, fig.3-4. Late Eocene. *Jr syn.* of *Deflandrea heterophlycta*; see Stover and Evitt, 1978, p.101.
- eocenica* Baltés ex Lentin and Williams, 1973, p.40, *Deflandrea eocenica* (provisional designation) Baltés, 1969, p.34, pl.5, fig.8-9; Holotype - fig.9. Early Eocene.
- "*euthema*" (Davey and Verdier, 1971). NOW *Eurydinium*.
- "*extensa*" (Stover, 1974). NOW ?*Vozzhennikovia*.
- "*extrema*" (Cookson and Eisenack, 1974). NOW ?*Isabelidinium*.

DEFLANDREA (cont'd)

- "*eyrensis*" (Cookson and Eisenack, 1971). NOW *Eurydinium*.
- "*fili-grana*" (Benedek, 1972). NOW ?*Vozzhennikovia*.
- flounderensis* Stover, 1974, p.174-175, pl.3, fig.1a-c,2.
Early Eocene.
- "*foliacea*" (Eisenack and Cookson, 1960). NOW *Subtilisphaera*.
- fuegiensis* Menendez, 1965, p.8-9, pl.1, fig.1-3; pl.3, fig.16.
Late Cretaceous.
- "*gaditana*" (Riegel, 1974). NOW *Phelodinium*. The transfer of this species to *Senegalinium* by Harland, 1977a, p.189 was rejected by Lentin and Williams, 1977b, p.42. The transfer of this species to *Lejeunia* by Lentin and Williams, 1980, p.41 is herein rejected.
- galeata* (Lejeune-Carpentier, 1942, p.186-188, fig.15-20) Lentin and Williams, 1973, p.41. Senonian; formerly *Peridinium*.
- "*gallia*" (Davey and Verdier, 1973). NOW *Isabelidinium*.
- "*gambangensis*" (Cookson and Eisenack, 1970a). NOW *Eucladinium*.
- "*glabra*" (Cookson and Eisenack, 1969). NOW *Isabelidinium*.
- "*globosa*" (Davey, 1970). NOW ?*Isabelidinium*.
- "*glomerata*" (Davey, 1970). NOW *Eurydinium*.
- granulata* Menendez, 1965, p.9-10, pl.1, fig.4. Eocene-Oligocene.
- "*granulifera*" (Manum, 1963). NOW *Chatangiella*.
- "*granulosa*" Cookson and Eisenack, 1965a, p.122, pl.11, fig.8-9.
Late Eocene. *Jr syn.* of *Deflandrea phosphoritica*; see Stover, 1973, p.177.
- "*granulostriata*" (Jain and Millepied, 1973) Lentin and Williams, 1976, p.41. NOW *Ceratiopsis*; formerly *Senegalinium*.
- heterophlycta* Deflandre and Cookson, 1955, p.249, pl.5, fig.6; text-fig.5. Late Eocene.
- subsp. "*pusulosa*" (Rozen, 1965, p.293-294, pl.1, fig.3-4; text-fig.2) Lentin and Williams, 1973, p.41. This is considered to be a *jr syn.* of *Deflandrea phosphoritica* by Lentin and Williams, 1976, p.41.

DEFLANDREA (cont'd)

hialina Baltes ex Lentin and Williams, 1973, p.41, *Deflandrea hialina* (provisional designation) Baltes, 1969, p.34, pl.1, fig.3-4; Holotype - fig.4. Oligocene-Early Miocene.

"*ingramii*" (Cookson and Eisenack, 1970a). NOW *Eurydinium*.

"*irmoechinata*" (Heisecke, 1970). NOW ?*Spinidinium*.

"?*kansana*" (Tasch, 1964) Lentin and Williams, 1973, p.42. NOW ?*Ovoidinium*.

"*korojonensis*" (Cookson and Eisenack, 1958). NOW *Isabelidinium*.

"*laevigata*" (Malloy, 1972). NOW *Andalusiella*.

"*lata*" (Cookson and Eisenack, 1968). NOW *Isabelidinium*.

"*leptoderma*" (Vozzhennikova, 1963). The transfer of this species from *Ceratiopsis* to *Deflandrea* by Lentin and Williams, 1976, p.41 was rejected by Lentin and Williams, 1977b, p.21.

leptodermata Cookson and Eisenack, 1965a, p.121-122, pl.11, fig.6-7. Late Eocene.

"*limpida*" Singh, 1971, p.359-361, pl.61, fig.1-12; text-fig.62. Lentin and Williams, 1973, p.43 considered this species to be a *jr syn.* of *Spinidinium vestitum* Brideaux. NOTE: Below, 1981, p.123, transferred this species to *Chichaouadinium*.

"*longispinosa*" (Wilson, 1968). NOW *Wetzeliella*.

"*macmurdoensis*" (Wilson, 1967a). NOW *Spinidinium*.

"*macrocyta*" (Cookson and Eisenack, 1960a). NOW *Senegalinium*.

"*madurensis*" (Cookson and Eisenack, 1970a). NOW *Eucladinium*.

"*magna*" (Davey, 1970). NOW *Isabelidinium*.

"*magnifica*" (Stanley, 1965). NOW *Phelodinium*.

"*marumae*" (Cookson and Eisenack, 1970a). NOW *Chatangiella madura*.

"*markovae*" (Vozzhennikova, 1967). NOW *Ceratiopsis*.

medcalfi Stover, 1974, p.175-176, pl.3, fig.3a-c. Middle Paleocene. The designation of *D. medcalfi* as a subspecies of *Deflandrea dartmooria* by Lentin and Williams, 1976, p.39 is herein rejected.

"*menendezii*" Pöthe de Baldis, 1966, p.223, pl.2, fig.A. This species, which is based on the observation of one specimen, is considered to be a *jr syn.* of *Deflandrea phosphoritica* by Lentin and Williams, 1976, p.42.

DEFLANDREA (cont'd)

- "*micracantha*" (Cookson and Eisenack, 1960a). NOW *Chatangiella*.
- "*microarma*" (McIntyre, 1975). NOW *Isabelidinium*.
- "*microgranulata*" (Stanley, 1965). NOW *Senegalinium*.
- "*micropoda*" Cookson and Eisenack, 1974, p.49, pl.47, fig.11.
Late Eocene. *Jr syn.* of *Deflandrea leptodermata*; see Stover and Evitt, 1978, p.101.
- "*microspinoso*" (Boltenhagen, 1977). NOW *Senegalinium*.
- "*minor*" (Alberti, 1959b). NOW *Alterbia*.
- "*minor*" (Cookson and Eisenack, 1960a). *Jr hom.* of *D. minor* Alberti, 1959. NOW *Isabelidinium balmei*.
- minuta* Jiabo, 1978, p.83, pl.3, fig.10-11. Early Tertiary.
- "*montanaensis*" (Harland, 1977a). NOW *Alterbia*.
- "*multispinosa*" (Cookson and Eisenack, 1970a). NOW ?*Chatangiella*.
- "*nucula*" (Cookson and Eisenack, 1962b). NOW *Amphidiadema*.
- "?*obliquipes*" (Deflandre and Cookson, 1955). NOW *Ceratiopsis*.
NOTE: Stover and Evitt, 1978, p.101 considered this to be a "provisionally accepted species" of *Deflandrea*.
- "*obscura*" (Drugg, 1967). NOW *Senegalinium*.
- oebisfeldensis* Alberti, 1959b, p.95-96, pl.8, fig.10-13.
Paleocene-Early Eocene.
- subsp. *angustata* (Vozzhennikova, 1967, p.146-147, pl.72, fig.3-4) Lentini and Williams, 1973, p.43. Eocene; formerly *Deflandrea oebisfeldensis* forma *angustata*.
- subsp. *oebisfeldensis* Alberti, 1959b, p.95-96, pl.8, fig.10-13.
Paleocene-Early Eocene.
- subsp. *ovalis* (Vozzhennikova, 1967, p.146, pl.71, fig.2) Lentini and Williams, 1973, p.43. Eocene; formerly *Deflandrea oebisfeldensis* forma *ovalis*.
- "*ornata*" (May, 1980). NOW *Spinidinium*.
- ovata* Jiabo, 1978, p.84, pl.4, fig.1-3. Early Tertiary.
- ?*pachyceros* Deflandre and Cookson, 1955, p.252, pl.4, fig.7.
Late Paleocene-Early Eocene. NOTE: Stover and Evitt, 1978, p.101 considered this to be a "provisionally accepted species".

DEFLANDREA (cont'd)

"*pannucea*" (Stanley, 1965). NOW *Ceratiopsis*.

?*papillata* Oleinik, 1976b, p.226-227, pl.1, fig.6-7. Late Eocene.
There is considerable uncertainty as to the morphology of this species.

"*parva*" (Cookson and Eisenack, 1958). NOW *Ascodinium*.

"*pellucida*" (Deflandre and Cookson, 1955). NOW *Isabelidinium*;
formerly *Deflandrea bakeri* forma *pellucida*.

"*pentagonalis*" (Corradini, 1973). NOW *Phelodinium*.

"*pentaradiata*" (Cookson and Eisenack, 1965c). NOW ?*Alterbia*.

"*perlucida*" (Alberti, 1959b). NOW *Subtilisphaera*.

**phosphoritica* Eisenack, 1938, p.187, text-fig.6. Late Eocene-
Early Oligocene.

subsp. *australis* Cookson and Eisenack, 1961b, p.39-40, pl.1,
fig.2-3. Eocene.

var. *lata* (Vozzhennikova, 1967, p.142, pl.69, fig.5-6)
Lentin and Williams, 1973, p.44. Eocene-Early Oligocene;
formerly *Deflandrea phosphoritica australis* forma *lata*.

subsp. *phosphoritica* Eisenack, 1938, p.187, text-fig.6.
Late Eocene-Early Oligocene.

var. *attenuata* (Vozzhennikova, 1967, p.140-141, pl.65,
fig.2-4; pl.67, fig.2-4; pl.69, fig.4; pl.70, fig.1,4,6-7,10)
Lentin and Williams, 1973, p.44. Eocene-Early Oligocene;
formerly *Deflandrea phosphoritica phosphoritica* forma
attenuata.

subsp. *vozhennikovae* Grigorovich, 1972, p.66, pl.1, fig.3.
Early Miocene. Lentin and Williams, 1976, p.43 questioned the
age assignment of this subspecies.

"*pilosa*" (Davey, 1969b). NOW *Alterbia*.

"*pirnaensis*" (Alberti, 1959b). NOW *Subtilisphaera*.

?*plea* (Tasch, 1964, p.196, pl.1, fig.15) Lentin and Williams, 1973,
p.44. Albian. The transfer of this species to ?*Gonyaulacysta*
by Lentin and Williams, 1976, p.43 was rejected by Stover and
Evitt, 1978, p.160. See also *Peridinium*.

"*pontis-mariae*" (Deflandre, 1936b). NOW *Subtilisphaera*.

DEFLANDREA (cont'd)

"?prutensis" (Grigorovich, 1971) Stover and Evitt, 1978, p.101.

The transfer of this species from ?*Ceratiopsis* to ?*Deflandrea* by Stover and Evitt, *op.cit.* is herein rejected.

"pulchra" (Benson, 1976). NOW *Spinidinium*.

"raijae" (Kjellström, 1973). NOW *Eurydinium*.

"rectangularis" (Cookson and Eisenack, 1962b). NOW *Amphidiadema*.

subsp. "*samuelsonii*" (Kjellström, 1973) Lentin and Williams, 1975, p.2149; formerly *Deflandrea rectangularis* var. *samuelsonii*. Gocht, 1976, p.322 considered this taxon to be a *jr syn.* of *Hystriochosphaeropsis quasicrobrata* (O. Wetzel) Gocht. For complete citation see *Amphidiadema rectangularis* subsp. *samuelsonii*.

"rhombica" (Cookson and Eisenack, 1974). NOW *Spinidinium echinoideum* subsp. *rhombicum*.

"rhombohedra" (Benson, 1976). NOW *Andalusiella*.

"rhombovalis" (Cookson and Eisenack, 1970a). NOW ?*Isabelidinium*.

robusta Deflandre and Cookson, 1955, p.250, pl.4, fig.9. Eocene.

"rotundata" (Eisenack and Cookson, 1960). NOW *Subtilisphaera*.

"sagittula" (Drugg, 1970b). NOW *Spinidinium*.

"scheii" (Manum, 1963). NOW ?*Chatangiella*.

scolensis Grigorovich, 1971, p.92, pl.1, fig.3. Eocene.

"sergipensis" (Herngreen, 1975). NOW *Senegalinium*.

"serratulula" (Cookson and Eisenack, 1958). NOW *Chatangiella*.

severnensis Benson, 1976, p.195-196, pl.10, fig.1-3. Late Maastrichtian.

"sibirica" (Vozzhennikova, 1963) Lentin and Williams, 1976, p.44. NOW *Ceratiopsis*; also formerly *Cerodinium*.

"speciosa" (Alberti, 1959b). NOW *Ceratiopsis*.

subsp. "*glabra*" (Gocht, 1969). NOW *Ceratiopsis*; formerly *Deflandrea speciosa* forma *glabra*.

"spectabilis" (Alberti, 1959b) Lentin and Williams, 1973, p.45. NOW *Chatangiella*.

DEFLANDREA (cont'd)

- "*spicata*" (May, 1980). NOW *Andalusiella*.
- "*spinosissima*" (Cookson and Eisenack, 1970a). NOW *Eucladinium*.
- spinulosa* Alberti, 1959b, p.95, pl.8, fig.8-9. Middle-Late Oligocene.
- stagonoides* (Benedek, 1972, p.10, pl.2, fig.12; text-fig.5) Lentin and Williams, 1976, p.44. Late Oligocene; formerly *Ascodinium*.
- "*striata*" (Drugg, 1967). NOW *Ceratiopsis*.
- "*subquadra*" (Corradini, 1973). NOW *Ceratiopsis*.
- "*sverdrupiana*" (Manum, 1963). NOW *Spinidinium*.
- "?*tenera*" (Kruttsch, 1962). NOW *Geiselodinium*.
- "*terrula*" (Davey, 1974). NOW ?*Subtilisphaera*.
- "*thomasi*" (Cookson and Eisenack, 1961a). NOW *Isabelidinium*.
- translucida* Châteauneuf, 1980, p.138, pl.22, fig.9; pl.23, fig.6. Late Eocene (Lutetian-Ludian).
- "*tripartita*" (Cookson and Eisenack, 1960a). NOW *Chatangiella*.
- truncata* Stover, 1974, p.176-177, pl.5, fig.2,3a-c. Early Eocene.
- "*ventriosa*" (Alberti, 1959b). NOW *Subtilisphaera*.
- "*verrucosa*" (Manum, 1963). NOW *Chatangiella*.
- "*vestita*" (Brideaux, 1971). NOW ?*Spinidinium*.
- "*victoriensis*" (Cookson and Manum, 1964). NOW *Chatangiella*.
- "*wardenensis*" (Williams and Downie, 1966c). NOW *Ceratiopsis*.
- "*warrenii*" (Schumacker-Lambry, 1978). NOW *Ceratiopsis*.
- "?*wellingtoniana*" (Tasch, 1963). This species is based on a mineral grain; see Stover and Evitt, 1978, p.265. For complete citation see *Nannoceratopsiella wellingtoniana*.
- "*wetzeli*" (Morgenroth, 1966a). NOW *Lentinia*.
- DEFLANDRIDIVM Nagy, 1969, p.294.
- **stellatum* Nagy, 1969, p.294, pl.2, fig.1,3-4,6. Late Miocene.

DIACANTHUM Habib, 1972, p.376. We herein accept the generic circumscription of Stover and Evitt, 1978, p.152 and accordingly reject the contention of Below, 1981, p.59 that *Diacanthum* is a *jr syn.* of *Occisucysta* Gitmez.

filapicatum (Gocht, 1970b, p.134-135, pl.26, fig.4,6-9; pl.27, fig.1-3,7; pl.28, fig.3; pl.31, fig.1-5; text-fig.2a,3-4) Stover and Evitt, 1978, p.152. Early Bathonian; formerly *Gonyaulacysta*.

**hollisteri* Habib, 1972, p.376-377, pl.9, fig.1,3; pl.10, fig.1; text-fig.2. probably Valanginian. We herein reject the transfer of this species to the genus *Occisucysta* Gitmez by Below, 1981, p.60.

tenuiceras (Eisenack, 1958, p.389, pl.21, fig.14-15, pl.22, fig.1-3; pl.24, fig.2) Stover and Evitt, 1978, p.152. Late Barremian-Aptian; formerly *Gonyaulax* and *Gonyaulacysta*. We herein reject the transfer of this species to the genus *Occisucysta* Gitmez by Below, 1981, p.63.

DIACROCANTHIDIUM Deflandre and Foucher, 1967, p.3. The type of this genus "*D. echinulatum*" was invalidly transferred from *Palaeostomocystis*. See Loeblich and Loeblich, 1970, p.200.

**echinulatum* (Deflandre, 1937b, p.55, pl.11, fig.9) Loeblich and Loeblich, 1970, p.200. Late Cretaceous; formerly *Palaeostomocystis*. O.C.

spinigerum De Coninck, 1969, p.43-44, pl.13, fig.11-13. Early Eocene.

ungaricum Theodorova-Shakhmundes, 1976, p.93-94, pl.1, fig.1. Early Valanginian.

"*DICHADOGONYAULAX*" Sarjeant, 1966b, p.153; emend. Sarjeant, 1975a, p.50. Lentin and Williams, 1973, p.46 considered this genus to be a *jr syn.* of *Ctenidodinium* Deflandre; emend Sarjeant. Sarjeant, 1975a, p.50, however, refuted the above authors' findings, preferring to retain *Dichadogonyaulax* as a distinct and separate genus. Stover and Evitt, 1978, p.204 agreed with Lentin and Williams, 1973 and, where necessary, transferred the species to *Ctenidodinium*.

"*adela*" (Fenton *et al.*, 1980). NOW *Ctenidodinium*.

"**culmula*" (Norris, 1965) Loeblich and Loeblich, 1968, p.211. NOW *Ctenidodinium*; formerly *Gonyaulax*.

"*gochti*" (Sarjeant, 1976a). NOW *Ctenidodinium*.

"*kettonensis*" (Sarjeant, 1976a). NOW *Ctenidodinium*.

"DICHADOGONYAULAX" (cont'd)

"*norrisi*" (Pocock, 1972) Sarjeant, 1975a, p.55. NOW *Ctenidodinium*; formerly *Leptodinium*.

"*parnea*" (Norris, 1965) Sarjeant, 1969, p.14. Kimmeridgian-Portlandian; NOW *Ctenidodinium*; formerly *Leptodinium*.

"*schizoblata*" (Norris, 1965) Sarjeant, 1969, p.14. NOW *Ctenidodinium*; formerly *Leptodinium*.

"*sellwoodi*" (Sarjeant, 1975a). NOW *Ctenidodinium*.

"*stauromatos*" (Sarjeant, 1976a). NOW *Ctenidodinium*.

DICONODINIUM Eisenack and Cookson, 1960, p.3; emend. Morgan, 1977, p.125.

"*acutum*" Jain and Millepied, 1973, p.30, pl.3, fig.41-42. Aptian. *Jr syn.* of *Laciniadinium arcticum*; see Morgan, 1977, p.126.

"*arcticum*" (Manum and Cookson, 1964). NOW *Laciniadinium*.

?*caulleryi* (Deflandre, 1935, p.229, pl.6, fig.4) Deflandre, 1966, p.4. Senonian; formerly *Palaeoperidinium*. This species was questionably retained in *Diconodinium* by Morgan, 1977, p.129.

cristatum Cookson and Eisenack, 1974, p.77, pl.24, fig.3-5; emend. Morgan, 1977, p.126. Albian-Cenomanian.

dabendorfense (Alberti, 1961, p.5, pl.3, fig.4) Lentin and Williams, 1973, p.46. Valanginian; formerly *Gymmodinium*. Morgan, 1977, p.129 retained this species in *Diconodinium* only because, "it is too poorly known for confident transfer elsewhere".

davidii Morgan, 1975, p.157-159, pl.1, fig.1a-b,2a-d. Aptian-Albian.

dispersum (Cookson and Eisenack, 1958, p.39, pl.10, fig.12,14) Eisenack and Cookson, 1960, p.3; emend. Morgan, 1977, p.127. Albian-Cenomanian; formerly *Palaeohystriochophora*.

distinctum Jain and Millepied, 1975, p.154-155, pl.6, fig.98-99. Campanian-Maastrichtian.

?*fehmannense* (Morgenroth, 1966a, p.4-5, pl.1, fig.1) Lentin and Williams, 1973, p.46. Early Eocene; formerly *Gymmodinium*. Morgan, 1977, p.129 retained this species in *Diconodinium* only because, "it is too poorly known for confident transfer elsewhere".

"*firmum*" (Harland, 1973). NOW *Laciniadinium*.

DICONODINIUM (cont'd)

- ?*glabrum* Eisenack and Cookson, 1960, p.3-4, pl.1, fig.11. Late Albian-Cenomanian. This species was questionably retained in *Diconodinium* by Morgan, 1977, p.129.
- gracile* Oleinik, 1976b, p.224-225, pl.1, fig.1-2. Late Eocene-Late Oligocene.
- "*inequicornutum*" (Baltes, 1971 ex Stover and Evitt, 1978). NOW *Pontiadinium*.
- "*inflatum*" (Eisenack and Cookson, 1960). NOW ?*Laciniadinium*.
- minutum* (Deflandre and Cookson, 1955, p.257, fig.4) Deflandre and Deflandre-Rigaud, 1966. Santonian; formerly *Palaeohystriochophora*. Since the holotype and only specimen of this species is lost, we cannot concur with Morgan, 1977, p.130 in his statement that *D. minor* is conspecific with *Alterbia balmei*.
- **multispinum* (Deflandre and Cookson, 1955, p.257, pl.1, fig.5) Eisenack and Cookson, 1960, p.3; emend. Morgan, 1977, p.127-128. Santonian; formerly *Palaeohystriochophora*.
- paucigranulatum* Burger, 1980a, p.86, pl.44, fig.1-3. Aptian.
- pelliferum* (Cookson and Eisenack, 1958, p.38, pl.10, fig.11) Eisenack and Cookson, 1960, p.3; emend. Morgan, 1977, p.128. Albian; formerly *Palaeohystriochophora*.
- psilatum* Morgan, 1977, p.128, pl.1, fig.5. Albian-Maastrichtian.
- "*pusillum*" Singh, 1971, p.383-384, pl.68, fig.5-8. Middle-Late Albian. *Jr syn.* of *Diconodinium multispinum*; see Morgan, 1977, p.127.
- ?*rhomboforme* Vozzhennikova, 1967, p.50, pl.7, fig.1-4; pl.15, fig.5. Turonian. O.C. This species was questionably retained in *Diconodinium* by Morgan, 1977, p.129.
- "*tenuistriatum*" (Eisenack and Cookson, 1960). NOW *Laciniadinium*.
- ventriosum* (Alberti, 1961, p.5-6, pl.3, fig.5) Lentin and Williams, 1973, p.47. Turonian; formerly *Gymmodinium*. Morgan, 1977, p.130 was in error when he stated that "*Gymmodinium ventriosum*" was transferred to *Subtilisphaera* by Jain and Millepied, 1973, p.27.
- "DICTYOPYXIDIA" Eisenack, 1961, p.316 (*nom. subst. pro Dictyopyxis* Cookson and Eisenack, 1960b (March)). Sarjeant, 1976a, p.23-24 considered this genus to be a *jr syn.* of *Ellipsoidictyum* Klement, 1960 (February). Sarjeant, *op.cit.* also considered

"*DICTYOPYXIDIA*" (cont'd)

the type of the genus "*Dictyopyxidia*", "*D. areolata*", to be a *jr syn.* of *Ellipsoidictyum cinctum* Klement. The three remaining species in "*Dictyopyxidia*" were transferred to *Ellipsoidictyum* by Lentin and Williams, 1977b, p.56. *Dictyopyxidia punctata* Jain, 1977, was transferred to *Ellipsoidictyum* by Below, 1981, p.47.

"*DICTYOPYXIS*" Cookson and Eisenack, 1960b, p.255. *Non Dictyopyxis* Ehrenberg - (a diatom). SEE *Dictyopyxidia*. Sarjeant, 1976a, p.23-24 gave a very thorough review of the above genera.

DICTYOSPHAERIDIUM W. Wetzel, 1952, p.406.

**deflandrei* W. Wetzel, 1952, p.406, pl.A, fig.12. Late Cretaceous.

DIMIDIADINIUM Brideaux, 1977, p.37.

**dangeardii* (Sarjeant, 1968, p.226-227, pl.1, fig.21; pl.3, fig.8-15; text-fig.3) Brideaux, 1977, p.37. Oxfordian; formerly *Gonyaula-cysta* and *Tubotuberella*.

sphaerocephalis (Vozzhennikova, 1967, p.181, pl.103, fig.1-3; pl.104, fig.4,5a-b) Brideaux, 1977, p.38. Late Jurassic; formerly *Tubotuberella*. O.C.

uncinatum Brideaux, 1977, p.38-39, pl.15, fig.2-5,7-8. Hauterivian-Barremian.

DIMORPHOSPHAERA Keupp, 1979a, p.21.

**aequatoriana* Keupp, 1979a, p.21,23, pl.3, fig.1-3. Early Barremian.

pogonias Keupp, 1979c, p.658,660, pl.6, fig.13-15. Middle Barremian.

DINGODINIUM Cookson and Eisenack, 1958, p.39.

?*albertii* Sarjeant, 1966c, p.210-211, pl.21, fig.3; pl.23, fig.1. Early Barremian. Habib, 1976, p.382 considered this species to be a *jr syn.* of *Dingodinium cerviculum* Cookson and Eisenack. Davey, 1978, p.894 refuted this, preferring to retain *D. albertii* as a separate and distinct species.

cerviculum Cookson and Eisenack, 1958, p.40, pl.1, fig.12-14. Late Neocomian-Aptian.

cooksoniae Pocock, 1972, p.99, pl.23, fig.9; text-fig.16. Oxfordian-Kimmeridgian. O.C.

europaewm Eisenack, 1958, p.392-393, pl.24, fig.4. Late Aptian.

DINGODINIUM (cont'd)

exiguum nom. nov., nom. subst. pro *Dingodinium minutum* Jiabo, 1978, p.87, pl.6, fig.11 non *D. minutum* Dodekova, 1975, p.25, pl.5, fig.13-15. Early Tertiary.

**jurassicum* Cookson and Eisenack, 1958, p.39, pl.1, fig.10-11. Late Jurassic.

magnum Jiabo, 1978, p.87, pl.6, fig.21. Early Tertiary.

minutum Dodekova, 1975, p.25, pl.5, fig.13-15. Late Bathonian.

"*minutum*" (Jiabo, 1978). Jr hom. of *D. minutum* Dodekova, 1975. NOW *Dingodinium exiguum*.

ovatum Jiabo, 1978, p.87, pl.6, fig.18. Early Tertiary.

spinosum (Duxbury, 1977, p.46-47, pl.9, fig.3; text-fig.17) Davey, 1979c, p.60. Berriasian; formerly *Parvocavatus*.

tuberosum (Gitmez, 1970, p.307-308, pl.6, fig.9; text-fig.31) Fisher and Riley, 1980, p.319-320. Early Kimmeridgian; formerly *Parvocavatus*.

DINOGYMNIUM Evitt et al., 1967, p.4-8.

**acuminatum* Evitt et al., 1967, p.8-16, pl.1&2; pl.3, fig.1-8,10,12,20; text-fig.11-23. Maastrichtian.

albertii Clarke and Verdier, 1967, p.33, pl.17, fig.3-4; text-fig.13. Santonian.

?*amphidoxosum* Jiabo, 1978, p.93, pl.6, fig.2. Early Tertiary.

assanicum Jain et al., 1975, p.4, pl.2, fig.28-29. Maastrichtian.

avellanum (Lejeune-Carpentier, 1951, p.B-309; text-fig.3) Evitt et al., 1967, p.16-17. Maastrichtian; formerly *Gymmodinium*. The transfer of this species to *Dinogymnium* is not attributable to Boltenhagen, 1977, p.76.

biconicum Jain and Millepied, 1975, p.136, pl.1, fig.3-4. Campanian-Maastrichtian.

cerviculum Cookson and Eisenack, 1970a, p.138, pl.10, fig.6. Senonian.

cooksoniae Boltenhagen, 1977, p.75-76, pl.11, fig.5-7. Campanian.

cretaceum (Deflandre, 1935, p.225, pl.5, fig.6-8; text-fig.4-5) Evitt et al., 1967, p.17-18. ?Senonian; formerly *Gymmodinium*.

DINOGYMNIUM cretaceum (cont'd)

subsp. *undulacostatum* (Boltenhagen, 1977) *comb. nov.*

1977 *Dinogymnium cretaceum* var. *undula-costatum* Boltenhagen, p.68-69, pl.10, fig.1-5. Turonian-Maastrichtian.

curvatum (Vozzhennikova, 1967, p.43, pl.1, fig.10-12; pl.4, fig.2-3) Lentin and Williams, 1973, p.48. Senonian; formerly *Gymnodinium*. The transfer of this species to *Dinogymnium* is not attributable to Boltenhagen, 1977, p.69.

decorum (Deflandre, 1943, p.503, pl.17, fig.2; text-fig.8-9) Evitt *et al.*, 1967, p.18. Senonian; formerly *Gymnodinium*.

deflandrei Boltenhagen, 1977, p.67-68, pl.9, fig.1-4. Late Senonian.

denticulatum (Alberti, 1961, p.5, pl.3, fig. 2-3) Evitt *et al.*, 1967, p.18. Senonian; formerly *Gymnodinium*. Hengreen, 1975, p.63 postulated that this species may be a *sr syn.* of *Dinogymnium undulosum* Cookson and Eisenack. The transfer of this species to *Dinogymnium* is not attributable to Boltenhagen, 1977, p.73.

digitus (Deflandre, 1935, p.225, text-fig.7-8) Evitt *et al.*, 1967, p.18-19. Senonian; formerly *Gymnodinium*.

subsp. *crassum* (Vozzhennikova, 1967, p.44, pl.5, fig.3,9-10) Lentin and Williams, 1973, p.49. Turonian; formerly *Gymnodinium digitus* var. *crassum*. O.C.

downiei Boltenhagen, 1977, p.77-78, pl.11, fig.8-10. Campanian-Maastrichtian.

elongatum May, 1977, p.112,114, pl.2, fig.11-12. Late Campanian-Early Maastrichtian.

euclaense Cookson and Eisenack, 1970a, p.139, pl.10, fig.9-12. Senonian.

evittii Boltenhagen, 1977, p.66-67, pl.8, fig.9-11. Senonian.

granulatum Jiabo, 1978, p.94, pl.6, fig.7-8. Early Tertiary.

heterocostatum (Deflandre, 1935, p.225, text-fig.6) Evitt *et al.*, 1967, p.19-20. ?Senonian; formerly *Gymnodinium*.

subsp. *kolpaschevi* (Vozzhennikova, 1967, p.45, pl.3, fig.5) Lentin and Williams, 1973, p.49. Senonian; formerly *Gymnodinium heterocostatum* var. *kolpaschevi*. O.C.

hexagonum (Deflandre-Rigaud, 1954, p.58, text-fig.1-2) Evitt *et al.*, 1967, p.20. Campanian-?Maastrichtian; formerly *Gymnodinium*. NOTE: Stover and Evitt, 1978, p.38 considered this to be a "problematical species".

DINOGYMNIUM (cont'd)

- hyalinum* (Vozzhennikova, 1967, p.45, pl.1, fig.9; pl.2, fig.6; pl.3, fig.4; pl.5, fig.11) Lentin and Williams, 1973, p.49. Senonian; formerly *Gymmodinium*.
- kasachstanicum* (Vozzhennikova, 1967, p.45-46, pl.2, fig.4a-b; pl.3, fig.9a-b) Lentin and Williams, 1973, p.49. Campanian-Maastrichtian. Formerly *Gymmodinium*.
- lanceolatum* May, 1977, p.115, pl.2, fig.9-10. Late Campanian-Early Maastrichtian.
- laticinctum* (Deflandre, 1943, p.501, pl.17, fig.3; text-fig.11) Evitt *et al.*, 1967, p.20. ?Senonian; formerly *Gymmodinium*. The transfer of this species is not attributable to Boltenhagen, 1977, p.74.
- longicornis* (Vozzhennikova, 1967, p.46, pl.1, fig.8; pl.3, fig.6; pl.4, fig.6a-b,7) Harland, 1973, p.678. Senonian; formerly *Gymmodinium*. This predates the same combination by Lentin and Williams, 1973, p.49.
- major* Jain and Millepied, 1975, p.135-136, pl.1, fig.1-2. Campanian-Maastrichtian.
- marthae* (Deflandre, 1943, p.500, pl.17, fig.1; text-fig.1-4) Evitt *et al.*, 1967, p.21. Senonian; formerly *Gymmodinium*.
- microgranulosum* Clarke and Verdier, 1967, p.34-35, pl.5, fig.7-10; text-fig.14. Santonian.
- mitratum* (Vozzhennikova, 1967, p.40, pl.1, fig.2) Lentin and Williams, 1973, p.49. Turonian-Senonian; formerly *Amphidinium*.
- muticum* (Vozzhennikova, 1967, p.46-47, pl.1, fig.6-7; pl.2, fig.9) Lentin and Williams, 1973, p.49. Senonian; formerly *Gymmodinium*.
- nelsonense* (Cookson, 1956, p.183, pl.1, fig.8-11) Evitt *et al.*, 1967, p.21-23. Senonian; formerly *Gymmodinium*.
- ovatum* Jiabo, 1978, p.94, pl.6, fig.1. Early Tertiary.
- pustulicostatum* May, 1977, p.115-118, pl.1, fig.1-13; pl.3, fig.1, 3a-b,4a-b. Late Campanian-Early Maastrichtian.
- rigaudiae* Boltenhagen, 1977, p.73, pl.11, fig.1-4. Campanian-Maastrichtian.
- sibiricum* (Vozzhennikova, 1967, p.47-48, pl.2, fig.2-3b; pl.3, fig.2-3) Lentin and Williams, 1973, p.50. Senonian; formerly *Gymmodinium*. Since this species was a *nomen nudum* when first erected by Vozzhennikova, 1963, its transfer to *Dinogymnium* by Evitt *et al.*, 1967, p.23 was invalid. Vozzhennikova validated the species in 1967.

DINOGYMNIUM (cont'd)

sphaerocephalum (Vozzhennikova, 1967, p.48, pl.2, fig.7; pl.3, fig.1) Lentin and Williams, 1973, p.50. Senonian; formerly *Gymnodinium*.

subsp. *laeve* (Vozzhennikova, 1967, p.48, pl.1, fig.4; pl.2, fig.5) Lentin and Williams, 1973, p.50. Senonian; formerly *Gymnodinium sphaerocephalum* var. *laevis*.

strombomorphum (Deflandre, 1943, p.501, pl.17, fig.4-6; text-fig.5-7) Evitt *et al.*, 1967, p.23. ?Senonian; formerly *Gymnodinium*.

undulosum Cookson and Eisenack, 1970a, p.138, pl.10, fig.3. Senonian.

vozhennikovae Lentin and Williams, 1973, p.50, *nom. subst. pro Gymnodinium alberti* Vozzhennikova, 1967, p.41-42, pl.5, fig. 7-8 *non Dinogymnium alberti* Clarke and Verdier, 1967, p.33. Turonian.

westralium (Cookson and Eisenack, 1958, p.25, pl.1, fig.9) Evitt *et al.*, 1967, p.23-24; emend. May, 1977, p.118. Senonian; formerly *Gymnodinium*.

DINOPTERYGIUM Deflandre, 1935, p.231; emend. Stover and Evitt, 1978, p.205. *Oodnadattia* Eisenack and Cookson, 1960, p.6 is a *jr syn.* of this genus; see discussion in Norris and Sarjeant, 1965, p.44. Also Clarke and Verdier, 1967, p.36 listed the type of the genus *Oodnadattia*, *O. tuberculata*, as a *jr syn.* of *Dinopterygium cladoides*: Stover and Evitt, 1978, p.205 refuted this.

absidatum Drugg, 1978, p.66-67, pl.4, fig.7-9. Callovian-Early Oxfordian.

bicuneatum (Deflandre, 1938b) *comb. nov.*
1938b *Palaeoperidinium bicuneatum* Deflandre, p.180, pl.8, fig.7. Oxfordian; formerly *Palaeoperidinium*, *Scriniodinium* and *Glossodinium*.

**cladoides* Deflandre, 1935, p.231, pl.8, fig.6. Senonian.

cooksoniae (Kiyai, 1966, p.471, pl.2, fig.21) Lentin and Williams, 1973, p.50. Cenomanian; formerly *Oodnadattia*. O.C.

"*dimorphum*" (Ioannides *et al.*, 1977) Drugg, 1978, p.67. This transfer was rejected by Courtinat and Gaillard, 1980, p.30, who retained the species in *Glossodinium*.

DINOPTERYGIUM (cont'd)

fehmannense (Lentin and Williams, 1973, p.67; description and holotype, Morgenroth, 1966a, p.7, pl.2, fig.7-8) Stover and Evitt, 1978, p.205. Early Eocene; formerly *Heteraulacacysta*. Morgenroth, 1966a included his specimens from the Eocene in *Goniodoma polyedricum* which is a modern motile species. Eisenack and Kjellström, 1971a, p.445 transferred *G. polyedricum* to the fossil genus *Heteraulacacysta*, including all modern forms and Morgenroth's fossil forms. Lentin and Williams, 1973, p.67-68 rejected this transfer on the basis that *Heteraulacacysta* is a fossil cyst genus and erected the species *H. fehmannensis* for fossil cysts which resemble *Goniodoma polyedricum*. Subsequently, Stover and Evitt, 1978, p.205 transferred the species to *Dinopterygium*.

medusoides (Cookson and Eisenack, 1960a, p.14, pl.3, fig.11-12) Stover and Evitt, 1978, p.205. Senonian; formerly *Toolongia*.

"*perforatum*" (Clarke and Verdier, 1967). NOW ?*Maghrebinia*.

pterophorum (Deflandre and Courteville, 1939) *comb. nov.*
1939 *Hystriosphæridium pterophorum* Deflandre and Courteville, p.102, pl.2, fig.4-5. Senonian.

tuberculatum (Eisenack and Cookson, 1960, p.6-7, pl.2, fig.10-14; text-fig.1) Stover and Evitt, 1978, p.205. Albian; formerly *Oodnadattia*. Stover and Evitt, *op.cit.*, did not agree with Clarke and Verdier, 1967, p.36 that *D. tuberculatum* is a *jr syn.* of *Dinopterygium cladoides*.

"*verriculum*" (Piasecki, 1980). NOW *Heteraulacacysta*. This species is herein transferred from *Dinopterygium* to *Heteraulacacysta* because it more closely conforms to the diagnosis of the latter genus, as circumscribed by Stover and Evitt, 1978, p.209.

DIOXYA Cookson and Eisenack, 1958, p.59; emend. Morgan, 1977, p.131. We do not agree with Morgan, *op.cit.* that *Vozzhemnikovia* is a *jr syn.* of *Dioxya*, the two species of which are morphologically distinct Albian taxa.

**armata* Cookson and Eisenack, 1958, p.59, pl.11, fig.11; text-fig.20; emend. Morgan, 1977, p.131-132. Albian.

"*filigrana*" (Benedek, 1972) Morgan, 1977, p.131. The transfer of this species to *Dioxya* by Morgan, *op.cit.* is herein rejected and the species is retained in ?*Vozzhemnikovia*.

villosa Eisenack and Cookson, 1960, p.10, pl.2, fig.15-16; emend. Morgan, 1977, p.134,136. Albian. The transfer of this species to *Vozzhemnikovia* by Stover and Evitt, 1978, p.130 and Burger, 1980a, p.85 is herein rejected.

DIPHASIOSPHAERA Duxbury, 1980, p.115-116.

**stolidota* Duxbury, 1980, p.116-117, pl.1, fig.5,9; text-fig.6.
Barremian.

DIPHYES Cookson, 1965a, p.85; emend. Davey and Williams, 1966b,
p.95-96.

appendiculare Cookson and Eisenack, 1970a, p.149, pl.13, fig.5.
Senonian. O.C.

**colligerum* (Deflandre and Cookson, 1955, p.278, pl.7, fig.3)
Cookson, 1965a, p.86-87. Early Eocene; formerly *Baltisphaeridium*
and *Hystriosphæridium*.

latiusculum Matsuoka, 1974, p.329, pl.44, fig.6. Early-Middle
Miocene. O.C.

"?*monstruosum*" (Tasch, 1964) Davey and Williams, 1969, p.7. NOW
Coronifera; formerly *Hystriosphæridium*.

"*nudum*" (Cookson, 1965a). NOW *Duosphaeridium*.

recurvatum May, 1980, p.50-51, pl.1, fig.18-20. Maastrichtian.

spinulum (Drugg, 1970b, p.817-818, fig.10G,11D-E,12A-B) Stover
and Evitt, 1978, p.39. Early Eocene. NOTE: This was the type
of the genus *Lingulasphaera* Drugg, 1970b, which was considered
by Stover and Evitt, 1978 to be a *jr syn.* of *Diphyes*.

DIPLOFUSA Cookson and Eisenack, 1960a, p.10.

**gearlensis* Cookson and Eisenack, 1960a, p.10, pl.3, fig.10.
Cenomanian.

"*DIPLOTESTA*" (Cookson and Eisenack, 1960b, *non* Brongniart, 1874.)
NOW *Wallodinium*.

DISCORSIA Duxbury, 1977, p.30.

**nanna* (Davey, 1974, p.59, pl.4, fig.9-10) Duxbury, 1977, p.31.
Barremian; formerly *Oligosphaeridium*. This species was emended
by Duxbury at the time of the transfer.

DISPHAERIA Cookson and Eisenack, 1960a, p.11; emend. Norvick,
1973, p.45. Norvick in his emendation of *Disphaeria* transferred
Thalassiphora delicata (Williams and Downie), *Thalassiphora*
pelagica (Eisenack), *Thalassiphora reticulata* (Morgenroth), and
Thalassiphora succincta (Morgenroth) to *Disphaeria*. The trans-
fer of the type species of *Thalassiphora*, *T. pelagica*, to
Disphaeria makes the first genus a *jr syn.* of the latter.
Norvick stated in his introduction that the type of *Disphaeria*,
D. macropyla, has a "possible" archeopyle, whereas Gocht, 1968,

DISPHAERIA (cont'd)

p.153, and Gocht, 1969, p.67 and text-figs 46 and 47, demonstrated conclusively that *Thalassiphora pelagica* has a pre-cingular archeopyle resulting from the loss of paraplate 3". *Thalassiphora delicata*, *T. reticulata*, and *T. succincta* also have been shown to have a precingular archeopyle. In view of the uncertainty concerning the nature of the archeopyle in *Disphaeria*, the transfer of the species *Thalassiphora pelagica*, *T. delicata*, *T. reticulata*, and *T. succincta* to *Disphaeria* was rejected by Lentin and Williams, 1977b, p.54.

balcanica" (Baltes, 1971) Norvick, 1976, p.99. This transfer was rejected by Lentin and Williams, 1977b, p.162 and the species was retained in *Thalassiphora*.

**macropylla* Cookson and Eisenack, 1960a, p.11, pl.3, fig.13-14; emend. Norvick, 1976, p.99-101. Turonian.

munda (Davey and Verdier, 1973, p.38, pl.3, fig.5,7,10) Norvick, 1976, p.99. Albian-Cenomanian; formerly *Thalassiphora*. We reject the retention of this species in *Thalassiphora* by Stover and Evitt, 1978, p.230.

DISPHAEROGENA O. Wetzel, 1933b, p.51.

**carposphaeropsis* O. Wetzel, 1933b, p.51, pl.4, fig.34. Late Cretaceous.

DISSILIODINIUM Drugg, 1978, p.67-68.

**globulum* Drugg, 1978, p.68, pl.4, fig.4-6. Early Kimmeridgian.

DISTATODINIUM Eaton, 1976, p.262.

**craterum* Eaton, 1976, p.263-264, pl.9, fig.1-5. Late Eocene.

ellipticum (Cookson, 1965a, p.87, pl.11, fig.1-3a) Eaton, 1976, p.264. Late Eocene; formerly *Hystrichosphaeridium* and *Tanyosphaeridium*.

"*paradoxum*" (Brosius, 1963) Eaton, 1976, p.265. NOW *Bipolaribucina*; formerly *Hystrichosphaeridium*, *Tanyosphaeridium* and ?*Oligosphaeridium*.

parisiense Châteauneuf, 1980, p.137, pl.21, fig.11-12. Late Eocene (Lutetian-Marinesian).

scariosum Liengjarern *et al.*, 1980, p.477,481, pl.54, fig.3. Early Oligocene.

solidum Châteauneuf, 1980, p.137, pl.22, fig.1-2. Late Eocene (Lutetian-Ledian).

DISTATODINIUM (cont'd)

tenerum (Benedek, 1972, p.35, pl.10, fig.13-14; text-fig.14)
Eaton, 1976, p.263. Middle Oligocene; formerly *Tanyosphaeridium*.

virgatum Stover, 1977, p.75-76, pl.1, fig.20-21. Early Oligocene.

"*DIVERSISPINA*" Benson, 1976, p.184. *Jr syn.* of *Kleithriasphaeridium*;
see Stover and Evitt, 1978, p.168 who transferred the type and
single species of the genus, *Diversispina truncata*, to *Kleithria-*
sphaeridium.

DODEKOVIA Dörhöfer and Davies, 1980, p.26.

gochti (Dodekova, 1975, p.31, pl.3, fig.8,10-13) Dörhöfer and
Davies, 1980, p.26. Late Bathonian; formerly *Tectatodinium*.

**syzygia* Dörhöfer and Davies, 1980, p.26, fig.11,23B,E,H;26A-D,
F-G. Toarcian-Bathonian.

"*DOIDYX*" Sarjeant, 1966c, p.205. *Jr syn.* of *Aptea* Eisenack 1958;
emend. Davey and Verdier, 1974; see Sarjeant and Stover, 1978,
p.51. These authors, *op.cit.* transferred the type of the
genus *Doidyx*, *D. anaphrissa*, to *Aptea*. The remaining species
Doidyx granulata Horowitz, 1975 was transferred to *?Cyclone-*
phelium by Stover and Evitt, 1978, p.36.

DOMASTELLA Eisenack, 1969, p.111.

**discophora* (Cookson and Eisenack, 1962b, p.492, pl.7, fig.17-21)
Loeblich and Loeblich, 1970, p.200. Aptian-Albian; formerly
Domasia, an acritarch.

DOROCYSTA Davey, 1970, p.358.

**litotes* Davey, 1970, p.358-359, pl.5, fig.6-7; text-fig.2A.
Cenomanian.

DRACODINIUM Gocht, 1955, p.87; emend. Bujak *et al.*, 1980, p.28.
Williams and Downie, 1966b, p.195 transferred the single
species of *Dracodinium*, *D. solidum*, to *Wetzeliella* subgen.
Wetzeliella, thus making *Dracodinium* a *jr syn.* of *Wetzeliella*.
Lentin and Williams, 1976, p.158 also considered *Dracodinium*
to be a *jr syn.* of *Wetzeliella*. Costa and Downie, 1979, p.36
retained *Dracodinium* for forms similar to *Wetzeliella* but
distinguished by a thick endophragm, reduced apical horn and a
wide endoarcheopyle. Bujak *et al.*, 1980, p.28 also recommended
retention of the genus *Dracodinium* for forms differing from
Wetzeliella in having a triangular to subtriangular pericyst
outline with a single prominent antapical horn, and in lacking
a distinct apical horn.

DRACODINIUM (cont'd)

condylos (Williams and Downie, 1966b, p.193-194, pl.20, fig.1-2) Costa and Downie, 1979, p.43. Early Eocene; formerly *Rhombodinium* and *Wetzeliella*. The transfer of this species from *Wetzeliella* to *Dracodinium* is not attributable to Bujak *et al.*, 1980, p.29.

granulatum (Wilson, 1967c) *comb. nov., stat. nov.*
1967c *Wetzeliella (Rhombodinium) glabra* var. *granulata* Wilson, p.493, fig.29-30. Late Eocene; also formerly *Rhombodinium*.

pachyderma (Caro, 1973, p.365, pl.3, fig.4-6) Costa and Downie, 1979, p.44. Early Eocene; formerly *Wetzeliella*. O.C.

politum Bujak *et al.*, 1980, p.29, pl.11, fig.1. Early Eocene.

rhomboidesum (Alberti, 1961, p.10, pl.1, fig.1-5; pl.12, fig.9) Costa and Downie, 1979, p.44. Late Eocene; formerly *Wetzeliella (Rhombodinium)* and *Rhombodinium*.

samlandicum (Eisenack, 1954, p.59, pl.8, fig.11-12) Costa and Downie, 1979, p.44. Early Oligocene; formerly *Wetzeliella*.

simile (Eisenack, 1954, p.58-59, pl.8, fig.8-10) Costa and Downie, 1979, p.44. Early Oligocene; formerly *Wetzeliella*.

**solidum* Gocht, 1955, p.88, text-fig.3a-b,4a-c,5a-c. Eocene or Oligocene; see also *Wetzeliella*.

varielongitudum (Williams and Downie, 1966b, p.196-197, pl.20, fig.4,8) Costa and Downie, 1979, p.44. Early Eocene; formerly *Wetzeliella*.

waipawaense (Wilson, 1967c, p.493-494, fig.18,20) Costa and Downie, 1979, p.44. Early Eocene; formerly *Wetzeliella (Rhombodinium)* and *Rhombodinium*.

DRUGGIDIUM Habib, 1973, p.49,51.

**apicopaucicum* Habib, 1973, p.51-52, pl.1, fig.1-3; pl.3, fig.1-3; text-fig.3. Berriasian-Barremian.

deflandrei (Millioud, 1969, p.429-430, pl.2, fig.5-7) Habib, 1973, p.52-53. Barremian; formerly *Microdinium*. This species was emended by Habib at the time of the transfer.

jubatam Duxbury, 1980, p.117, pl.3, fig.3-4. Barremian.

rhabdoreticulatum Habib, 1973, p.53, pl.2, fig.3-7. Valanginian-Albian.

DUBRIDINIUM Reid, 1977, p.449.

caperatum Reid, 1977, p.451-452, pl.4, fig.38-41,44. Recent.

cassiculum Reid, 1977, p.452-453, pl.4, fig.42-43,45. Recent.

**cavatum* Reid, 1977, p.449-450, pl.3, fig.35-37. Recent.

ulsterum Reid, 1977, p.453-454, pl.4, fig.46-48. Recent.

DUOSPHERIDIUM Davey and Williams, 1966b, p.97.

**nudum* (Cookson, 1965a, p.87, pl.10, fig.1-4) Loeblich and Loeblich, 1968, p.211. Late Eocene; formerly *Diphyes*.

rugosum Drugg, 1970b, p.816-817, fig.11A-C. Danian.



EATONICYSTA Stover and Evitt, 1978, p.41.

**ursulae* (Morgenroth, 1966a, p.20, pl.3, fig.11-13) Stover and Evitt, 1978, p.41. Early Eocene; formerly *Cannosphaeropsis* and *Membranilarnacia*.

EGMONTODINIUM Gitmez and Sarjeant, 1972, p.228-229.

ovatum (Gitmez and Sarjeant, 1972, p.237, pl.14, fig.1-3) Riley, 1979, p.221. Kimmeridgian; formerly *?Systematophora*.

**polyplacophorum* Gitmez and Sarjeant, 1972, p.229-231, pl.8, fig.1-4; pl.9, fig.3; pl.11, fig.5-6,8; text-fig.24. Middle-Late Kimmeridgian.

torynum (Cookson and Eisenack, 1960b, p.252, pl.38, fig.6,15) Davey, 1979c, p.60. Tithonian-Neocomian; formerly *Hystrichosphaeridium*, *?Prolixosphaeridium* and *Tanyosphaeridium*.

EISENACKIA Deflandre and Cookson, 1955, p.258; emend. Sarjeant, 1966b, p.152; emend. McLean, 1973a, p.262; emend. Stover and Evitt, 1978, p.42.

"*circumtabulata*" (Drugg, 1967). NOW *Alisocysta*. The transfer of this species to *Hystrichokolpoma* by Schumacker-Lambry, 1978, p.42 is herein rejected.

**crassitabulata* Deflandre and Cookson, 1955, p.258,261, pl.5, fig.2; text-fig.6-16; emend. McLean, 1973a, p.262. Paleocene-Early Eocene.

"*ornata*" (Cookson and Eisenack, 1965a). NOW *Alisocysta*.

scrobiculata Morgenroth, 1966a, p.12-13, pl.2, fig.12; pl.3, fig.1. Early Eocene. NOTE: Stover and Evitt, 1978, p.43 considered this to be a "problematical species".

ELLIPSODINIUM Clarke and Verdier, 1967, p.68-69.

reticulatum Duxbury, 1980, p.117-118, pl.47, fig.4,8. Barremian.

**rugulosum* Clarke and Verdier, 1967, p.69, pl.14, fig.4-6; text-fig.29. Cenomanian-Santonian. The same species as *Chelinocysta lita*, nom. nud. Sarjeant; 1967a, p.327.

ELLIPSOIDICTYUM Klement, 1960, p.78.

**cinctum* Klement, 1960, p.78-80, pl.6, fig.15-16; pl.7, fig.1-2; text-fig.36-37. Middle Oxfordian.

ELLIPSOIDICTYUM (cont'd)

circulatum (Clarke and Verdier, 1967, p.67-68, pl.1, fig.11; pl.2, fig.3; text-fig.28) Lentin and Williams, 1977b, p.56. Cenomanian-Santonian; formerly *Dictyopyxidia*.

gochti Fensome, 1979, p.20-22, pl.2, fig.8-9,11-12; text-fig.8. Bajocian-Callovian.

imperfectum (Brideaux and McIntyre, 1975, p.25-26, pl.7, fig.1-5) Lentin and Williams, 1977b, p.56. Early-Middle Albian; formerly *Dictyopyxidia*.

punctatum (Jain, 1977, p.186-187, pl.4, fig.51-52) Below, 1981, p.47. Early Albian; formerly *Dictyopyxidia*.

reticulatum (Valensi, 1953, p.28, pl.2, fig.4-5,14,19; pl.13, fig.6; text-fig.2d ex Deflandre and Deflandre, 1966, fiche 3224) Lentin and Williams, 1977b, p.56. Bajocian; formerly *Palaeoperidinium* and *Dictyopyxidia*. The transfer of this genus to *Ellipsoidictyum* is not attributable to Sarjeant, 1978, p.18.

ELYTROCYSTA Stover and Evitt, 1978, p.43-44.

**druggii* Stover and Evitt, 1978, p.44. Danian; as *Membranosphaera maastrichtica* Samoilovich in Drugg, 1967, p.29-30, pl.5, fig.12-13.

EMMETROCYSTA Stover, 1975, p.42.

sarjeantii (Gitmez, 1970, p.291-292, pl.11, fig.4; text-fig.25) Stover and Evitt, 1978, p.45. Early Kimmeridgian; formerly *Polystephanophorus*; see also *Hystrichosphaerina*.

**urnaformis* (Cookson, 1953, p.118, pl.2, fig.41-43) Stover, 1975, p.42. Oligocene; formerly *Cannosphaeropsis* and *Polystephanophorus*.

"EMSLANDIA" Gerlach, 1961, p.171, superfluous name. *Jr syn.* of *Apteodinium*. See Stover and Evitt, 1978, p.141, who transferred the type and single species of the genus, *E. emslandensis*, to *Apteodinium*. The species *Scriniodinium australiense* (now *Apteodinium*) was invalidly transferred to *Emslandia* by Nagy, 1965, p.202.

ENDOCERATIUM Vozzhennikova, 1965, p.89.

dettmanniae (Cookson and Hughes, 1964, p.51-52, pl.7, fig.1-4) Stover and Evitt, 1978, p.45. Late Albian-Early Cenomanian; formerly *Pseudoceratium*.

**ludbrookiae* (Cookson and Eisenack, 1958, p.52-54, pl.5, fig.7-8) Loeblich and Loeblich, 1966, p.93. Albian; formerly *Ceratocystidiopsis* and *Pseudoceratium*. O.C.

ENDOCERATIUM (cont'd)

"*perforatum*" Vozzhennikova, 1967, p.188, pl.112, fig.1a-b,3; pl.113, fig.1. Late Cretaceous. *Jr syn.* of *Xenascus ceratioides*; see Davey and Verdier, 1971, p.27.

turneri (Cookson and Eisenack, 1958, p.55, pl.5, fig.2-6) Stover and Evitt, 1978, p.45. Aptian-Albian; formerly *Pseudoceratium*.

ENDOSCRINIUM (Klement, 1960, p.18) Vozzhennikova, 1967, p.174. We reject the listing of *Endoscrinium* as a *jr syn.* of *Scriniodinium* by Stover and Evitt, 1978, p.187, since the relationship of *Spiniferites* to *Achomosphaera* is analogous and both of these genera are retained by Stover and Evitt *op.cit.*

amalthei (W. Wetzel, 1966) *comb. nov.*

1966 *Membranilarmacia amalthei* W. Wetzel, p.318, pl.31, fig.6. Late Pliensbachian (Lias); also formerly *Scriniodinium*. The species was emended by Sarjeant, 1980b, p.117-118 when he transferred it from *Membranilarmacia* to *Scriniodinium*.

anceps Raynaud, 1978, p.392, pl.1, fig.17. Late Kimmeridgian-Valanginian.

bessebae Below, 1981, p.48-49, pl.7, fig.4-8; pl.14, fig.6-8; text-fig.48-51. Barremian.

campanulum (Gocht, 1959, p.61, pl.4, fig.6; pl.5, fig.1) Vozzhennikova, 1967, p.175. Hauterivian; formerly *Scriniodinium*. The retention of this species in *Scriniodinium* by Stover and Evitt, 1978, p.187 is herein rejected.

subsp. *nichan* Below, 1981, p.50-51, pl.7, fig.2. Hauterivian.

"*eisenackii*" (Deflandre, 1938b) Gocht, 1970b, p.146-147. NOW *Trubotuberella*; formerly *Gonyaulax* and *Gonyaulacysta*. O.C.

subsp. "*oligodentatum*" (Cookson and Eisenack, 1958) Gocht, 1970b, p.146. NOW *Trubotuberella eisenackii* subsp. *oligodentata*. O.C.

**galeritum* (Deflandre, 1938b, p.167, pl.5, fig.7-9; text-fig.1) Vozzhennikova, 1967, p.176. Oxfordian; formerly *Gymnodinium* and *Scriniodinium*. The retention of this species in *Scriniodinium* by Stover and Evitt, 1978, p.187 is herein rejected.

subsp. *fornicatum* (Klement, 1960, p.25-26, pl.1, fig.7-12) Lentin and Williams, 1973, p.54. Middle Oxfordian; formerly *Scriniodinium galeritum* subsp. *fornicatum*. The retention of this subspecies in *Scriniodinium* by Stover and Evitt, 1978, p.187 is herein rejected.

ENDOSCRINIUM galeritum (cont'd)

subsp. *galeritum* (Deflandre, 1938b, p.167, pl.5, fig.7-9; text-fig.1) Vozzhennikova, 1967, p.176-177. Oxfordian formerly *Scriniodinium galeritum* subsp. *galeritum*. The retention of this subspecies in *Scriniodinium* by Stover and Evitt, 1978, p.187 is herein rejected.

subsp. *reticulatum* (Klement, 1960, p.26-27, pl.2, fig.1-2) Lentin and Williams, 1973, p.54. Middle Oxfordian; formerly *Scriniodinium galeritum* subsp. *reticulatum*. The retention of this subspecies in *Scriniodinium* by Stover and Evitt, 1978, p.187 is herein rejected.

glabrum Duxbury, 1977, p.24, pl.11, fig.1-6; text-fig.3) Below, 1981, p.48. Berriasian-Barremian; formerly *Athigmatocysta*.

gochti (Pocock, 1972, p.90, pl.22, fig.12; text-fig. 6) Muir and Sarjeant, 1978, p.205. Late Bajocian; formerly *Scriniodinium*. NOTE: Sarjeant, 1978, p.29 also transferred this species to *Endoscrinium*.

granulatum (Raynaud, 1978) *comb. nov.*
1978 *Athigmatocysta granulata* Raynaud, p.391, pl.2, fig.6,12. Late Kimmeridgian-Portlandian.

klementii (Pocock, 1972, p.91, pl.23, fig.1-2; text-fig.7) Sarjeant, 1978, p.29. Callovian; formerly *Scriniodinium*.

luridum (Deflandre, 1938b, p.166, pl.5, fig.4-6) Gocht, 1970b, p.144-146. Early Oxfordian; formerly *Scriniodinium* and *Gymmodinium*. The retention of this species in *Scriniodinium* by Stover and Evitt, 1978, p.187 is herein rejected.

"*oxfordianum*" (Sarjeant, 1962a) Vozzhennikova, 1967, p.177.
NOW *Simiodinium*; formerly *Scriniodinium*.

pharo Duxbury, 1977, p.32, pl.9, fig.5; text-fig.8. Berriasian-Valanginian.

rostratum (Brideaux and McIntyre, 1975, p.33-34, pl.10, fig.6-14; pl.11, fig.1-3) Below, 1981, p.51. Middle Albian; formerly *Scriniodinium*.

subvallare (Sarjeant, 1962b, p.262-263, pl.1, fig.10; text-fig. 7) Lentin and Williams, 1973, p.54. Late Oxfordian; formerly *Scriniodinium*. The retention of this species in *Scriniodinium* by Stover and Evitt, 1978, p.187 is herein rejected.

ENERGLYNIA Sarjeant, 1976b, p.164.

**acollaris* (Dodekova, 1975, p.20-21, pl.2, fig.9-10; pl.3, fig.1-7, 9; text-fig.2) Sarjeant, 1978, p.14. Late Bathonian; formerly *Wanaea*. The original type of the genus *Energlynia*, *E. kyrbasia*, was considered to be a *jr syn.* of *E. acollaris* by Fensome, 1981, p.50; the latter species therefore becomes the type of the genus.

ENERGLYNIA (cont'd)

indotata (Drugg, 1978, p.74-75, pl.8, fig.11-14) Fensome, 1981, p.51. Bajocian-Callovian; formerly *Wanaea*.

"*kyrbasia*" Sarjeant, 1976b, p.166,168,170,172, fig.1-16. Late Bathonian. This species, the original type of the genus, was considered to be a *jr syn.* of *Energlynia acollaris* (Dodekova, 1975) Sarjeant, 1978, by Fensome, 1981, p.50. *Energlynia acollaris* therefore becomes the type of the genus.

EOCLADOPYXIS Morgenroth, 1966a, p.7; emend. Stover and Evitt, 1978, p.206-207.

**peniculata* Morgenroth, 1966a, p.7-8, pl.3, fig.2-3. Early Eocene. See McLean, 1976, p.348 for revised description. O.C.

tessellata Liengjarern *et al.*, 1980, p.481-482, pl.53, fig.6. Late Eocene.

EODINIA Eisenack, 1936, p.73; emend. Gocht, 1975a, p.27.

**pachythea* Eisenack, 1936, p.73, text-fig.1-6; emend. Gocht, 1975a, p.27. Callovian.

EOPSEUDOCERATIUM (Neale and Sarjeant, 1962, p.446) Lentin and Williams, 1973, p.54; formerly *Pseudoceratium* subgenus *Eopseudoceratium*. We do not accept the opinion of Stover and Evitt, 1978, p.77 that *Eopseudoceratium* is a *jr syn.* of *Pseudoceratium*.

**gochti* Neale and Sarjeant, 1962, p.446,448, pl.20, fig.3-4; text-fig.5. Late Hauterivian-Middle Barremian. O.C. See also *Pseudoceratium gochti*.

EPELIDOSPHAERIDIA Davey, 1969a, p.142.

**spinosa* (Cookson and Hughes, 1964, p.49, pl.8, fig.6-8) Davey, 1969a, p.143. Early Cenomanian; formerly *Palaeoperidinium*.

EPICEPHALOPYXIS Deflandre, 1935, p.234.

**adhaerens* Deflandre, 1935, p.234, pl.9, fig.5-6. Late Cretaceous.

"*indentata*" (Deflandre and Cookson, 1955). NOW *Paralecaniella*, which was questionably included in the Chlorophyta by Cookson and Eisenack, 1970b, p.323. Elsik, 1977, p.96 considered *Paralecaniella* to be a dinoflagellate.

"*spectabilis*" (Deflandre and Cookson, 1955). NOW *Wanaea*.

EPIPILOSPHAERA Klement, 1960, p.73.

areolata Klement, 1960, p.76-77, pl.8, fig.5-9. Early Kimmeridgian.

EPIPLOSPHAERA (cont'd)

**bireticulata* Klement, 1960, p.74-75, pl.8, fig.1-4. Early Kimmeridgian.

reticulospinosa Klement, 1960, p.75-76, pl.8, fig.10-12. Early Kimmeridgian.

"ERIKANIA" Morgenroth, 1966a, p.27. *Jr syn.* of *Thalassiphora*; see Stover and Evitt, 1978, p.194. These authors (p.195) transferred the type of the genus, *Erikania dynamica*, to *Thalassiphora*.

ESCHARISPHAERIDIA Erkmen and Sarjeant, 1980, p.62-63.

dictydia (Sarjeant, 1972, p.41, pl.3, fig.3; pl.6, fig.6) Erkmen and Sarjeant, 1980, p.63. Bathonian-Callovian; formerly *Batiacasphaera* and *Chytroeisphaeridia*.

**pocockii* (Sarjeant, 1968, p.230, pl.3, fig.9) Erkmen and Sarjeant, 1980, p.62. Late Callovian; formerly *Chytroeisphaeridia* and *Lithodinia*.

EUCLADINIUM Stover and Evitt, 1978, p.104.

gambangense (Cookson and Eisenack, 1970a, p.140, pl.11, fig.1-2) Stover and Evitt, 1978, p.104. Senonian; formerly *Deflandrea* and *Isabelidinium*.

**madurensense* (Cookson and Eisenack, 1970a, p.140, pl.11, fig.3-4) Stover and Evitt, 1978, p.104. Senonian; formerly *Deflandrea* and *Isabelidinium*.

spinosissimum (Cookson and Eisenack, 1970a, p.141, pl.11, fig. 5-6) Stover and Evitt, 1978, p.104. Senonian; formerly *Deflandrea* and *Isabelidinium*.

EURYDINIUM Stover and Evitt, 1978, p.104-105.

conoratum (Stover, 1974, p.171-172, pl.1, fig.8a-b) Stover and Evitt, 1978, p.105. Early-Middle Paleocene; formerly *Deflandrea* and *Isabelidinium*.

euthemum (Davey and Verdier, 1971, p.40, pl.3, fig.1-3) Stover and Evitt, 1978, p.105. Middle-Late Albian; formerly *Deflandrea* and ?*Subtilisphaera*.

eyrense (Cookson and Eisenack, 1971, p.217-218, pl.7, fig.2-3) Stover and Evitt, 1978, p.105. Albian-Cenomanian; formerly ?*Alterbia* and *Deflandrea*.

glomeratum (Davey, 1970, p.343-344, pl.1, fig.7-9) Stover and Evitt, 1978, p.105. Cenomanian; formerly *Deflandrea* and *Isabelidinium*.

EURYDINIUM (cont'd)

**ingrami* (Cookson and Eisenack, 1970a, p.143, pl.12, fig.7-9)
Stover and Evitt, 1978, p.105. Senonian; formerly *Alterbia*
and *Deflandrea*; see also *Senegalinium ingrami*.

raijae (Kjellström, 1973, p.20-22, fig.16) Stover and Evitt,
1978, p.105. Middle-Late Maastrichtian; formerly *Alterbia*
and *Deflandrea*.

EVANSIA Pocock, 1972, p.95.

?*erregulensis* Filatoff, 1975, p.90, pl.29, fig.12-14. Bajocian.
NOTE: Stover and Evitt, 1978, p.230 considered this to be a
"provisionally accepted species".

**granulata* Pocock, 1972, p.95, pl.24, fig.7; text-fig.12.
Late Bajocian.

"*EVITTIA*" Pocock, 1972, p.93. *Jr hom.* of the acritarch genus
Evittia Brito, 1967, p.477. See *Pocockia nom. subst.*

"*EVITTODINIUM*" Deflandre, 1964, p.5030. Lentin and Williams, 1976,
p.159, following the observations of Evitt (personal communica-
tion), considered *Evittodinium* to be a *nomen dubium*. We cannot
concur with Stover and Evitt, 1978, p.105 who retained this
genus.

**giselae* Deflandre, 1964, p.5030, fig.1-5. Senonian. Lentin
and Williams, 1976, p.159 considered this species to be a
nomen dubium.

EVITTOSPHERULA Manum, 1979, p.242-243.

**paratabulata* Manum, 1979, p.243,246, pl.2, fig.1-12; text-fig.3-
4. Middle Oligocene-Early Miocene.

EXIGUISPHAERA Duxbury, 1979a, p.198-199. See also discussion in
Duxbury, 1980, p.118 concerning apparent similarity of this
genus to *Diacanthum*.

**phragma* Duxbury, 1979a, p.199, pl.2, fig.2-3,5; text-fig.1-2.
Early Hauterivian.

plectilis Duxbury, 1980, p.118-119, pl.3, fig.5,8,11. Barremian.

EXOCHOSPHERIDIUM Davey *et al.*, 1966, p.165.

arnace Davey and Verdier, 1973, p.184-185, pl.1, fig.3,6.
Late Albian-Early Cenomanian.

bifidum (Clarke and Verdier, 1967, p.72, pl.17, fig.5-6;
text-fig.30) Clarke *et al.*, 1968, p.182. Cenomanian-
Campanian; formerly *Baltisphaeridium*.

EXOCHOSPHAERIDIUM (cont'd)

- subsp. *involutum* (Davey, 1969c, p.29, pl.2, fig.1-3) Lentin and Williams, 1973, p.56. Campanian-Maastrichtian; formerly *Exochosphaeridium bifidum* var. *involutum*.
- ?*brevispinum* Norvick, 1976, p.53, pl.4, fig.5-6. Cenomanian. NOTE: Stover and Evitt, 1978, p.154 considered this to be a "provisionally accepted species".
- ?*caputmedusae* Cookson and Eisenack, 1974, p.68, pl.25, fig.16. Senonian. NOTE: Stover and Evitt, 1978, p.154 considered this to be a "provisionally accepted species".
- ?*cenomaniense* Norvick, 1976, p.52-53, pl.4, fig.4,8. Cenomanian. NOTE: Stover and Evitt, 1978, p.154 considered this to be a "provisionally accepted species".
- ?*indicum* Jain and Taugourdeau-Lantz, 1973, p.63, pl.3, fig.7. Early Cretaceous. NOTE: Stover and Evitt, 1978, p.154 considered this to be a "provisionally accepted species".
- ?*palmatum* (Deflandre and Courteville, 1939, p.101, pl.3, fig.1) Davey *et al.*, 1969, p.16. Late Cretaceous; formerly *Baltisphaeridium* and *Hystriichosphaeridium*. NOTE: Stover and Evitt, 1978, p.154 considered this to be a "provisionally accepted species".
- **phragmites* Davey *et al.*, 1966, p.165-166, pl.2, fig.8-10. Cenomanian.
- ?*pseudhystriichodinium* (Deflandre, 1937b, p.73, pl.15, fig.3-4) Davey *et al.*, 1969, p.16-17. Late Cretaceous; formerly *Baltisphaeridium* and *Hystriichosphaeridium*. NOTE: Stover and Evitt, 1978, p.154 considered this to be a "provisionally accepted species".
- scitulum* Singh, 1971, p.346-347, pl.57, fig.8-9. Middle Albian.
- ?*solaster* (Morgenroth, 1966a, p.25, pl.5, fig.8-9) Stover and Evitt, 1978, p.154. Early Eocene; formerly *Cordosphaeridium*. NOTE: Stover and Evitt, 1978, p.154 considered this to be a "provisionally accepted species".
- ?*spinosum* (White, 1842, p.237, pl.4, fig.6) Davey 1969a, p.166. Late Cretaceous; formerly *Xanthidium*, *Hystriichosphaeridium*, *Baltisphaeridium* and *Cordosphaeridium*. NOTE: Stover and Evitt, 1978, p.154 considered this to be a "provisionally accepted species".
- subsp. *deflandrei* (Lejeune-Carpentier, 1941, p.84, fig.6-7) Lentin and Williams, 1973, p.56. Late Cretaceous; formerly *Hystriichosphaeridium spinosum* var. *deflandrei*.

EXOCHOSPHAERIDIUM (cont'd)

"*striolatum*" ((Deflandre, 1937b) Davey, 1969a, p.164. NOW *Coronifera*; formerly *Hystrichosphaeridium* and *Baltisphaeridium*.

subsp. "*truncatum*" (Davey, 1969a) Lentin and Williams, 1973, p.56. NOW *Exochosphaeridium truncatum*; formerly *Exochosphaeridium striolatum* var. *truncatum*. This taxon was raised to the species level by Stover and Evitt, 1978, p.154.

truncatum (Davey, 1969a, p.164-166, pl.7, fig.1-3) Stover and Evitt, 1978, p.154. Cenomanian; formerly *Exochosphaeridium striolatum* var. *truncatum* and *Exochosphaeridium striolatum* subsp. *truncatum*.

"*truncigerum*" (Deflandre, 1937b) Davey, 1978, p.894. The transfer of this species to *Exochosphaeridium* is herein rejected and the species retained in *Cordosphaeridium*.

EYACHIA Gocht, 1979, p.307-308.

**prisca* Gocht, 1979, p.308,310,312-317. fig.1-10. Aalenian.



FACETODINIUM Bjaerke, 1980, p.69.

**faustum* Bjaerke, 1980, p.69, pl.2, fig.1-6; text-fig.4. Toarcian.

inflatum Bjaerke, 1980, p.69-71, pl.3, fig.1-13; text-fig.5.
Toarcian.

"*FAVILARNAX*" Sarjeant, 1963a, p.720; *jr syn.* of *Valensiella*.

See Sarjeant, 1964a, p.172-173, and Loeblich and Loeblich, 1966, p.30.

FIBRADINIUM Morgenroth, 1968, p.537-538.

**annetorpense* Morgenroth, 1968, p.538, pl.42, fig.4-7; text-fig.1-2. Danian.

FIBROCYSTA Stover and Evitt, 1978, p.155.

axialis (Eisenack, 1965, p.150, pl.6, fig.4-5) Stover and Evitt 1978, p.155. Late Eocene-Early Oligocene; formerly *Cordosphaeridium* and *Lanternosphaeridium*.

**bipolaris* (Cookson and Eisenack, 1965b, p.135, pl.16, fig.7-8) Stover and Evitt, 1978, p.155. Early Eocene; formerly *Cordosphaeridium* and *Lanternosphaeridium*.

klumppiae (Corradini, 1973, p.152, pl.22, fig.2a-c) Stover and Evitt, 1978, p.155. Late Cretaceous-Paleocene; formerly *Cordosphaeridium*.

lappacea (Drugg, 1970b, p.812-813, fig.4A-D,5A-D) Stover and Evitt, 1978, p.155. Early Eocene; formerly *Lanternosphaeridium*.

licia (Jain *et al.*, 1975, p.10, pl.4, fig.51-53) Stover and Evitt, 1978, p.155. Danian; formerly *Lanternosphaeridium*.

morgenrothii (Corradini, 1973, p.155, pl.23, fig.1) Stover and Evitt, 1978, p.155. Senonian; formerly *Lanternosphaeridium*.

?*mutinensis* (Corradini, 1973, p.155-156, pl.23, fig.2,9; pl.34, fig.2,3a-b) Stover and Evitt, 1978, p.155. Senonian; formerly *Lanternosphaeridium*. NOTE: Stover and Evitt, 1978, p.155 considered this to be a "provisionally accepted species".

ovalis (Hansen, 1977) *comb. nov.*

1977 *Lanternosphaeridium ovale* Hansen, p.17, fig.19F-G.
Maastrichtian-Early Paleocene (Danian).

FIBROCYSTA (cont'd)

radiata (Morgenroth, 1966a, p.37-38, pl.10, fig.7-9) Stover and Evitt, 1978, p.155. Early Eocene; formerly *Lanternosphaeridium*.

vectensis (Eaton, 1976, p.275-276, pl.12, fig.4-6) Stover and Evitt, 1978, p.155. Middle-Late Eocene; formerly *Lanternosphaeridium*.

FLORENTINIA Davey and Verdier, 1973, p.185-186; emend. Duxbury, 1980, p.119.

buspina (Davey and Verdier, 1976, p.321-322, pl.2, fig.1-6; text-fig.3) Duxbury, 1980, p.121. Senonian; formerly *Silicisphaera*.

clavigera (Deflandre, 1937b, p.71, pl.11, fig.1-2) Davey and Verdier, 1973, p.192; emend. Davey and Verdier, 1976, p.315. Senonian; formerly *Hystriichosphaeridium*, *Baltisphaeridium*, *Hystriichosphaera* and *Hystriichokolpoma*.

cooksoniae (Singh, 1971, p.329-330, pl.51, fig.7-8; pl.52, fig.1-4) Duxbury, 1980, p.120. Late Albian; formerly *Hystriichosphaeridium*. The species was emended by Duxbury at the time of the transfer.

deanei (Davey and Williams, 1966b, p.58, pl.6, fig.4,8) Davey and Verdier, 1973, p.187. Cenomanian; formerly *Hystriichosphaeridium*.

ferox (Deflandre, 1937b, p.72, pl.11, fig.3-4) Duxbury, 1980, p.121. Senonian; formerly *Baltisphaeridium*, *Hystriichokolpoma*, *Hystriichosphaeridium* and *Silicisphaera*.

?*flosculus* (Deflandre, 1937b) *comb. nov.*
1937b *Hystriichosphaeridium flosculus* Deflandre, p.75, pl.15, fig.5-6. Senonian; also formerly ?*Iitosphaeridium* and *Silicisphaera*.

interrupta Duxbury, 1980, p.121, pl.12, fig.3; text-fig.8.
Barremian.

**laciniata* Davey and Verdier, 1973, p.186-187, pl.2, fig.1,3-4,6-7,9. Late Albian-Early Cenomanian.

mantellii (Davey and Williams, 1966b, p.66, pl.6, fig.6) Davey and Verdier, 1973, p.191. Late Cenomanian; formerly *Hystriichosphaeridium*.

radiculata (Davey and Williams, 1966b, p.65, pl.7, fig.9; pl.9, fig.6) Davey and Verdier, 1973, p.191; emend. Davey and Verdier, 1976, p.318. Late Cenomanian; formerly *Hystriichosphaeridium*.

FLORENTINIA (cont'd)

ramulus (May, 1980) *comb. nov.*

1980 *Silicisphaera ramulus* May, p.66-67, pl.2, fig.13-16.
Maastrichtian.

resex Davey and Verdier, 1976, p.319-320, pl.4, fig.1-3;
text-fig.2. Turonian.

tenera (Davey and Verdier, 1976, p.326-327, pl.3, fig.8-12; text-
fig.6) Duxbury, 1980, p.122. Senonian; formerly *Silicisphaera*.

?*torulosa* (Davey and Verdier, 1976) *comb. nov.*

1976 ?*Silicisphaera torulosa* Davey and Verdier, p.328, pl.4,
fig.10-12. Turonian.

tridactylites (Valensi, 1955a, p.37, fig.1D) Duxbury, 1980, p.122.
Cretaceous; formerly *Achomosphaera*, *Baltisphaeridium*, *Hystricho-*
sphaeridium and *Silicisphaera*.

FROMEA Cookson and Eisenack, 1958, p.55.

acambra Sah *et al.*, 1970, p.148, pl.2, fig.28. Late Cretaceous.

**amphora* Cookson and Eisenack, 1958, p.56, pl.5, fig.10-11.
Albian-Cenomanian.

?*apiculata* (Cookson and Eisenack, 1960a, p.12, pl.3, fig.15)
Stover and Evitt, 1978, p.48. Santonian-Campanian; formerly
Palaeostomocystis.

complicata Brideaux, 1977, p.18-19, pl.7, fig.1-6. Aptian-
Albian.

chytra (Drugg, 1967, p.35, pl.6, fig.12) Stover and Evitt,
1978, p.48. Maastrichtian-Danian; formerly *Palaeostomocystis*.

?*cylindrica* (Cookson and Eisenack, 1960b, p.258, pl.39, fig.16)
Stover and Evitt, 1978, p.48. Late Jurassic-Neocomian;
formerly *Palaeostomocystis*.

"?*elongata*" (Beju, 1971). NOW *Walloodinium*. This species and
others that appeared in 1969 in a privately circulated manu-
script by Beju were listed as *nom. nud.* by Lentin and Williams,
1973. Unfortunately, these authors were not aware of Beju,
1971, in which the species were validly published.

"?*elongata*" (Jain and Millepied, 1975). *Jr hom.* of *F. elongata*
Beju, 1971. NOW *Fromea granulata*.

expolita (Brideaux, 1977) *comb. nov.*

1977 *Palaeostomocystis expolita* Brideaux, p.20, pl.7, fig.12-
14. Barremian.

PROMIWA (cont'd)

- fragilis* (Cookson and Eisenack, 1962b, p.496-497, pl.7, fig.10-11) Stover and Evitt, 1978, p.48. Aptian-Cenomanian; formerly *Palaeostomocystis*.
- glabella* (Singh, 1971) *comb. nov.*
1971 *Palaeostomocystis glabella* Singh, p.428-429, pl.80, fig.4. Late Albian.
- granulata* Lentini and Williams, 1977b, p.61 *nom. subst. pro F. elongata* Jain and Millepied, 1975 (p.141, pl.2, fig.29-30; holotype fig.30) *non F. elongata* Beju, 1971, p.289-290. Aptian-Albian. The *nom. subst. F. senegalensis* Jain and Millepied, 1977, p.284, postdates the Lentini and Williams name by one month.
- granulosa* (Cookson and Eisenack, 1974, p.79, pl.28, fig.10) Stover and Evitt, 1978, p.48. Albian-Cenomanian; formerly *Palaeostomocystis*.
- irregulare* Courtinat and Gaillard, 1980, p.27-28, pl.3, fig.8. Late Oxfordian.
- ?*laevigata* (Drugg, 1967, p.35, pl.6, fig.14-15) Stover and Evitt, 1978, p.48. Maastrichtian-Danian; formerly *Palaeostomocystis*.
- "*laevigata*" (Jiabo, 1978). *Jr hom.* of *F. laevigata* (Drugg, 1967) Stover and Evitt, 1978. NOW *Fromea psilata*.
- microgranulosa* Jain, 1977, p.176, pl.6, fig.74. Early Albian.
- minor* (Jiabo, 1978) *comb. nov.*
1978 *Palaeostomocystis minor* Jiabo, p.127, pl.32, fig.14-21. Early Tertiary.
- oblonga* (Deflandre, 1945, card 852) Stover and Evitt, 1978, p.48. Late Cretaceous; formerly *Palaeostomocystis*.
- pachyderma* Kar, 1979, p.35, pl.4, fig.75. Oligocene.
- psilata* *nom. nov.*, *nom. subst. pro Fromea laevigata* (Jiabo, 1978 p.126-127, pl.32, fig.23) *non F. laevigata* (Drugg, 1967, p.35, pl.6, fig.14-15) Stover and Evitt, 1978, p.48. Early Tertiary.
- quadrugata* Duxbury, 1980, p.134, pl.4, fig.12-15; text-fig.15. Barremian.
- "*reticulata*" (Davey, 1969b) Stover and Evitt, 1978, p.48. NOW *Batiacasphaera*; formerly *Chytroeisphaeridia*.

FROMEA (cont'd)

scabrata (Jiabo, 1978) *comb. nov.*

1978 *Palaeostomocystis scabratus* Jiabo, 1978, p.127, pl.32, fig.24-25; pl.46, fig.3a-b. Early Tertiary.

"*senegalensis*" Jain and Millepied, 1977, p.284. *Jr syn.* of *Fromea granulata*.

senilis (McIntyre and Brideaux, 1980) *comb. nov.*

1980 *Palaeostomocystis senilis* McIntyre and Brideaux, p.18, pl.5, fig.12; pl.6, fig.1. Valanginian.

staveia Elsik, 1977, p.100, 102, pl.2, fig.12-14. Late Eocene.

tornatilis (Drugg, 1978) *comb. nov.*

1978 *Palaeostomocystis tornatilis* Drugg, p.71-72, pl.7, fig. 4-6. Callovian-Oxfordian.

triquetra (Brideaux, 1977) *comb. nov.*

1977 *Palaeostomocystis triquetra* Brideaux, p.20-21, pl.8, fig.1-6. Barremian.

"*warlinghamensis*" Gitmez and Sarjeant, 1972, p.188-189, pl.1, fig.6,8; pl.9, fig.5-6. Kimmeridgian. *Jr syn.* of *Fromea amphora*; see Riley, 1979, p.221.

FUSIFORMACYSTA Morgan, 1975, p.161.

**salasii* Morgan, 1975, p.161, pl.2, fig.4a-c,5a-b. Early Neocomian.



"GALEA" Maier, 1959, p.305. *Jr hom.* of *Galea*, Meuschen, 1787.

The type of the genus *Galea galea* was transferred to *Areoligera* by Davey *et al.*, 1969, p.15. For present assignment of other species of *Galea* refer to the Appendix.

GARDODINIUM Alberti, 1961, p.18. Davey, 1978, p.893 transferred the type of the genus *Gardodinium*, *G. trabeculosum*, to *Chlamyдохorella*, thereby making *Gardodinium* a superfluous genus. The transfer of *G. trabeculosum* to *Chlamyдохorella* is herein rejected and the generic circumscription of *Gardodinium* by Stover and Evitt, 1978, p.48 retained.

albertii Neale and Sarjeant, 1962, p.445-446, pl.19, fig.8; text-fig.4. Hauterivian. The transfer of this species to *Chlamyдохorella* by Davey, 1978, p.893 is herein rejected.

"*deflandrei*" (Clarke and Verdier, 1967). NOW *Aldorfia*.

"*eisenackii*" Alberti, 1961, p.18, pl.3, fig.8-13. Hauterivian-Aptian. This species, the original type of the genus, was considered to be a *jr syn.* of *Gardodinium trabeculosum* (Gocht, 1959) Alberti, 1961, by Davey, 1974, p.51. *Gardodinium trabeculosum* therefore becomes the correct name for the nomenclatural type of the genus.

"*elongatum*" Singh, 1971, p.381-383, pl.68, fig.3-4. Brideaux and McIntyre, 1975, p.33 considered this species to be a *jr syn.* of "*Gardodinium eisenackii*" Alberti, which Davey, 1974, p.51 considered to be a *jr syn.* of *Gardodinium trabeculosum* (Gocht) Alberti. The transfer of "*Gardodinium elongatum*" to *Chlamyдохorella* by Davey, 1978, p.893 is herein rejected.

ordinale Davey, 1974, p.51, pl.3, fig.5-6. Middle-Late Barremian. The transfer of this species to *Chlamyдохorella* by Davey, 1978, p.893 is herein rejected.

pyriforme Vozzhennikova, 1967, p.179, pl.100, fig.1,4. Barremian. The transfer of this species to *Chlamyдохorella* by Davey, 1978, p.893 is herein rejected.

**trabeculosum* (Gocht, 1959, p.62, pl.4, fig.5) Alberti, 1961, p.18. Hauterivian; formerly *Scriniodinium*. The original type of the genus *Gardodinium*, *G. eisenackii*, was considered to be a *jr syn.* of *G. trabeculosum* by Davey, 1974, p.51; the latter therefore becomes the correct name for the nomenclatural type of the genus. The transfer of this species to *Chlamyдохorella* by Davey, 1978, p.893 is herein rejected.

GEISELODINIUM Krutzsch, 1962, p.42.

eocenicum Krutzsch, 1962, p.44, pl.11, fig.17-19; text-fig.1d.
Middle Eocene.

**geiseltalense* Krutzsch, 1962, p.43, pl.11, fig.8-13; text-fig.1b.
Middle Eocene.

hallense Krutzsch, 1962, p.44, pl.11, fig.14-16; text-fig.1c.
Middle Eocene.

inaffectum Drugg, 1978, p.68, pl.3, fig.10-12. Kimmeridgian.

maslinense (Harris, 1974, p.164, pl.2, fig.10) Stover and
Evitt, 1978, p.231. Middle Eocene; formerly *Cubiculosphaera*.

?*miocenicum* Nagy, 1965, p.201, pl.1, fig.3; pl.2, fig.11.
Middle Miocene. NOTE: Stover and Evitt, 1978, p.231 con-
sidered this to be a "provisionally accepted species".

paeminosum Drugg, 1978, p.68-69, pl.3, fig.5-9. Middle
Kimmeridgian.

psilatatum Jain and Millepied, 1973, p.29-30, pl.2, fig.20-21.
Campanian-Maastrichtian. NOTE: Stover and Evitt, 1978,
p.231 considered this to be a "problematical species".

tenerum (Krutzsch, 1962, p.44, pl.11, fig.20-22; text-fig.
1e) Stover and Evitt, 1978, p.231. Middle Eocene; formerly
?*Deflandrea* and *Vozzhennikovia*.

tyonekense Engelhardt, 1976, p.122, pl.1, fig.1-14. Miocene.

GERDIOCYSTA Liengjarern *et al.*, 1980, p.482.

aciculata Châteauneuf, 1980, p.139, pl.24, fig.2,5. Late
Eocene-Oligocene (Lutetian-Stampian).

cassicula (Drugg, 1970b, p.811, fig.2B,3A-B) Liengjarern
et al., 1980, p.483. Early Eocene; formerly *Areoligera*.

**conopeum* Liengjarern *et al.*, 1980, p.483, pl.53, fig.1-2.
Early Oligocene.

GILLINIA Cookson and Eisenack, 1960a, p.11-12.

**hymenophora* Cookson and Eisenack, 1960a, p.12, pl.3, fig.4-6;
text-fig.5. ?Turonian-Maastrichtian.

GINGINODINIUM Cookson and Eisenack, 1960a, p.7; emend. Lentin and
Williams, 1976, p.95-96.

ornatum (Felix and Burbridge, 1973, p.23-24, pl.4, fig.12)
Lentin and Williams, 1976, p.97. Maastrichtian; formerly
Trithyrodinium.

GINGINODINIUM (cont'd)

paleocenicum (Cookson and Eisenack, 1965c, p.142-143, pl.19, fig.1-4) Stover and Evitt, 1978, p.106. Middle Paleocene; formerly ?*Cooksoniella*, *Palaeoperidinium* and *Peridinium*.

**spinulosum* Cookson and Eisenack, 1960a, p.7, pl.2, fig.9. Late Albian-Cenomanian.

tabulatum Cookson and Eisenack, 1965c, p.143-144, pl.19, fig. 5-8; text-fig.3. Middle Paleocene. See also *Palaeoperidinium*.

GLABRIDINIUM Brideaux, 1977, p.35.

**apatelum* (Cookson and Eisenack, 1960b, p.249, pl.37, fig.12-13) Brideaux, 1977, p.35. Late Jurassic; formerly *Psalignonyaulax*, *Seriniodinium* and *Tubotuberella*.

GLAPHYROCYSTA Stover and Evitt, 1978, p.49-50.

combinata (Jiabo, 1978) *comb. nov.*
1978 *Cyclonephelium combinatum* Jiabo, p.78, pl.27, fig.3. Early Tertiary.

divaricata (Williams and Downie, 1966c, p.223-224, pl.25, fig.1; text-fig.60) Stover and Evitt, 1978, p.50. Early Eocene; formerly *Cyclonephelium*.

exuberans (Deflandre and Cookson, 1955, p.285) Stover and Evitt, 1978, p.50. Early Eocene; formerly *Membrani larnax pterospermoides* O. Wetzel *sensu* Pastiels, 1948, p.46, pl.5, fig.11,13-14, and *Cyclonephelium*.

inculta (Morgenroth, 1966b, p.9, pl.2, fig.5) Stover and Evitt, 1978, p.50. Early Oligocene; formerly *Cyclonephelium*.

intricata (Eaton, 1971, p.365, pl.4, fig.8-10) Stover and Evitt, 1978, p.50. Middle Eocene; formerly *Cyclonephelium*.

laciniiformis (Gerlach, 1961, p.206, pl.29, fig.4) Stover and Evitt, 1978, p.50. Middle-Late Oligocene; formerly *Cyclonephelium*.

microfenestrata (Bujak, 1976, p.112, pl.3, fig.12; pl.4, fig.1-7; text-fig.3I) Stover and Evitt, 1978, p.50. Late Eocene; formerly *Cyclonephelium*.

ordinata (Williams and Downie, 1966c, p.225-227, pl.25, fig.3; text-fig.62) Stover and Evitt, 1978, p.50. Early Eocene; formerly *Cyclonephelium*.

GLAPHYROCYSTA (cont'd)

pastielsii (Deflandre and Cookson, 1955, p.285) Stover and Evitt, 1978, p.50. Early Eocene; formerly *Membranilarnax* cf. *liradi-scooides* O. Wetzel *sensu* Pastiels, 1948, p.47, pl.5, fig.15. The references to Pastiels, 1948 in Downie and Sarjeant, 1965, (as pl.5, fig.5) and in Harker and Sarjeant, 1975, p.226 (as p.47, pl.15, fig.5) are incorrect. The correct citation is Pastiels, 1948, p.47, pl.5, fig.15. Also formerly *Cyclonephelium*.

paupercula Liengjarern *et al.*, 1980, p.483-484,486, pl.53, fig. 3,5. Early Oligocene.

?*reticulosa* (Gerlach, 1961, p.204, pl.29, fig.2) Stover and Evitt, 1978, p.50. Middle-Late Oligocene; formerly *Cyclonephelium*.

**retiintexta* (Cookson, 1965a, p.88, pl.11, fig.4) Stover and Evitt, 1978, p.50. ?Senonian; formerly *Cyclonephelium*.

semitecta (Bujak, 1980) *comb. nov.*
1980 *Cyclonephelium semitectum* Bujak, p.46,48,50, pl.14, fig. 2-9; text-fig.13. Late Eocene.

?*spineta* (Eaton, 1976, p.259-260, pl.8, fig.3; text-fig.12) Stover and Evitt, 1978, p.50. Early-Middle Eocene; formerly *Cyclonephelium*.

texta (Bujak, 1976, p.110, pl.3, fig.6-11; text-fig.3G-H) Stover and Evitt, 1978, p.50. Late Eocene; formerly *Cyclonephelium*.

?*undulata* (Eaton, 1976, p.248, pl.4, fig.4,6; pl.5, fig.2,4; text-fig.8c,9) Stover and Evitt, 1978, p.50. Middle-Late Eocene; formerly *Areoligera*. NOTE: Stover and Evitt, 1978, p.50 considered this to be a "provisionally accepted species".

?*vicina* (Eaton, 1976, p.260-261, pl.8, fig.4-5; text-fig.13) Stover and Evitt, 1978, p.50. Early-Late Eocene; formerly *Cyclonephelium*.

GLENODINIUM Ehrenberg, 1837, p.174. Modern genus defined from the motile stage.

smrecyniense Woloszynska, 1928. Modern species recorded by Macko, 1957, p.117, pl.A, fig.1; pl.73, fig.15-16. Miocene. Since the detailed morphology of Macko's specimens is unknown, they are retained in *Glenodinium* pending further examination.

"*GLMODINIUM*" Dodekova, 1975, p.26. *Jr syn.* of *Pareodinia*; see Stover and Evitt, 1978, p.116-117 who transferred the type of the genus and single species, *Glomodinium reticulopilosum*, to *Pareodinia*. Dörhöfer and Davies, 1980, p.12 preferred to retain the genus *Glomodinium* for species with a 3I archeopyle. This view is herein rejected.

GLOSSODINIUM Ioannides *et al.*, 1977, p.452-453; emend. Courtinat and Gaillard, 1980, p.30. Drugg, 1978, p.67 considered this genus to be a *jr syn.* of *Dinopterygium* and transferred the type of the genus, *Glossodinium dimorphum*, to *Dinopterygium*. Courtinat and Gaillard (*op.cit.*) emphasized the distinctive nature of the archeopyle in *G. dimorphum* and retained that species in *Glossodinium*. The remaining species, "*Glossodinium bicuneatum*" (Deflandre, 1938b) Ioannides *et al.*, 1977, p.453, is herein transferred to *Dinopterygium*.

**dimorphum* Ioannides *et al.*, 1977, p.453, pl.2, fig.13-14; text-fig. 8. Kimmeridgian; see also *Dinopterygium*.

GLYPHANODINIUM Drugg, 1964, p.237-238.

**facetum* Drugg, 1964, p.238-239, fig.1-6. Danian.

GOCHTEODINIA Norris, 1978, p.7.

judilentinae McIntyre and Brideaux, 1980, p.23-24, pl.11, fig. 4-9. Valanginian.

verrucosa (Vozzhennikova, 1967, p.56, pl.12, fig.6) Dörhöfer and Davies, 1980, p.30. Late Jurassic; formerly *Imbatodinium* and *Pareodinia*.

**villosa* (Vozzhennikova, 1967, p.56, pl.12, fig.1-3; pl.13, fig.1-3; pl.14, fig.1-2; pl.15, fig.1-2) Norris, 1978, p.7. Late Jurassic; formerly *Imbatodinium villosum* and *Pareodinia dasyforma*.

GOCHTODINIUM Bujak, 1979, p.310-312.

**simplex* Bujak, 1979, p.312-313, pl.2, fig.10; pl.3, fig.1-12; text-fig.4B,8F. Late Eocene.

spinula Bujak, 1979, p.313, pl.2, fig.3-9; text-fig.8E. Late Eocene.

GONGYLODINIUM Fenton *et al.*, 1980, p.158.

**erymnoteichos* Fenton *et al.*, 1980, p.158-159, pl.14, fig.6-8. Late Bajocian-Early Bathonian.

hocneratum Fenton *et al.*, 1980, p.159-160, pl.16, fig.2. Late Bajocian.

GONIODOMA Stein, 1883, p.9,13,16,19,21. Modern genus defined from the motile stage. Fossil cysts formerly included within this genus have been transferred to *Dinopterygium*.

GONYAULACYSTA Deflandre, 1964, p.5030; emend. Sarjeant, 1969, p.7-8; emend. Stover and Evitt, 1978, p.157-158.

"*aculeata*" (Klement, 1960) Sarjeant, 1969, p.8. NOW *Acanthaulax*; formerly *Gonyaulax*.

"*aichmetes*" (Sarjeant, 1966b). NOW *Millioudodinium*.

"*aldorfensis*" (Gocht, 1970b). NOW *Aldorfia*.

"*amabilis*" (Deflandre, 1939) Dodekova, 1971, p.7. NOW *Leptodinium*.

"*ambigua*" (Deflandre, 1939) Sarjeant, 1969, p.8. NOW *Millioudodinium*; formerly *Gonyaulax*.

"*angulosa*" Gitmez, 1970, p.252, pl.2, fig.4-5; text-fig.7a-b. Early Kimmeridgian. *Jr syn.* of *Cribroperidinium granulatum* (Klement) Stover and Evitt according to Fisher and Riley, 1980, p.321. The transfer of *G. angulosa* to *Acanthaulax* by Stover and Evitt, 1978, p.137 was therefore unnecessary.

"*apionis*" (Cookson and Eisenack, 1958) Sarjeant, 1969, p.8. NOW *Millioudodinium*; formerly *Gonyaulax*.

"*areolata*" Sarjeant, 1961a, p.95. Erected as *Gonyaulax areolata*, which was a *jr hom.*; it was subsequently given the name *Gonyaulacysta scarburghensis* by Sarjeant, 1964c, p.472-473. A *jr hom.* can be validly published, but is illegitimate (ICBN Art. 6.4; Art. 64.1). Therefore, a *nom. nov.* must replace it, in this case *Gonyaulacysta scarburghensis*. This *nom. nov.* is the oldest legitimate name (Art. 6.3). According to Art. 55, when a species is transferred, the legitimate epithet is transferred to the new generic name. NOW *Gonyaulacysta scarburghensis*.

"*auctifica*" (Brideaux, 1971). NOW *Cribroperidinium*.

axicerastes Sarjeant, 1966b, p.114-116, pl.13, fig.11-12; text-fig.25. Middle Barremian.

"*birkelundii*" (Fensome, 1979). NOW *Millioudodinium*.

"*boreas*" (Davey, 1974). NOW ?*Millioudodinium*.

"*canadensis*" Pocock, 1972, p.89, pl.24, fig.1-2; text-fig.4. Oxfordian-Kimmeridgian. *Jr syn.* of *Hystrihogonyaulax cladophora* (Deflandre) Stover and Evitt according to Fisher and Riley, 1980, p.320. The transfer of "*G. canadensis*" to *Hystrihogonyaulax* by Stover and Evitt, 1978, p.162 was therefore unnecessary.

cassidata (Eisenack and Cookson, 1960, p.3, pl.1, fig.5-6) Sarjeant, 1966b, p.125-126. Aptian-Cenomanian; formerly *Gonyaulax helicoidea* subsp. *cassidata*.

GONYAULACYSTA (cont'd)

"*cauda*" (Gitmez and Sarjeant, 1972). NOW *Millioudodinium*.

"*caytonensis*" (Sarjeant, 1959). NOW *Meiourogonyaulax*.

"*cladophora*" (Deflandre, 1938b) Dodekova, 1967, p.17-18. NOW *Hystrihogonyaulax*; formerly *Gonyaulax*.

subsp. "*cladophora*" (Deflandre, 1938b) Lentin and Williams, 1973, p.59. NOW *Hystrihogonyaulax cladophora* subsp. *cladophora*; formerly *Gonyaulax cladophora* subsp. *cladophora*.

subsp. "*extensa*" (Klement, 1960) Lentin and Williams, 1973, p.60. NOW *Hystrihogonyaulax cladophora* subsp. *extensa*; formerly *Gonyaulax cladophora* subsp. *extensa*.

subsp. "*hemipolyedrica*" (Klement, 1960) Lentin and Williams, 1973, p.60. NOW *Hystrihogonyaulax cladophora* subsp. *hemipolyedrica*; formerly *Gonyaulax cladophora* subsp. *hemipolyedrica*.

subsp. "*isovalvata*" (Klement, 1960) Lentin and Williams, 1973, p.60. NOW *Hystrihogonyaulax cladophora* subsp. *isovalvata*; formerly *Gonyaulax cladophora* subsp. *isovalvata*.

"*clathrata*" (Cookson and Eisenack, 1960b). NOW *Leptodinium*.

"*compta*" (Duxbury, 1980). NOW *Cribroperidinium*.

confossa Duxbury, 1977, p.33, pl.2, fig.2-4. Hauterivian.

"*confusa*" (Vozzhennikova, 1967) Sarjeant, 1969, p.9. NOW ?*Millioudodinium*; formerly *Gonyaulax*.

?*crassicornuta* (Klement, 1960, p.38, pl.5, fig.1) Sarjeant, 1969, p.9. Early Kimmeridgian; formerly *Gonyaulax*. NOTE: Stover and Evitt, 1978, p.158 considered this to be a "provisionally accepted species". We herein reject the transfer of this species to the genus *Rhynchodiniopsis* Deflandre by Below, 1981, p.118.

cretacea (Neale and Sarjeant, 1962, p.441, pl.19, fig.1-2; text-fig.2) Sarjeant, 1969, p.9. Hauterivian; formerly *Gonyaulax*.

"*crispa*" (W. Wetzel, 1967) Sarjeant, 1969, p.9. NOW *Hystrihogonyaulax*; formerly *Gonyaulax*.

"*cristata*" (Riley in Fisher and Riley, 1980). NOW *Leptodinium*.

"*dangeardii*" (Sarjeant, 1968). NOW *Dimidiadinium*. The transfer of this species to *Tubotuberella* by Stover and Evitt, 1978, p.197 is herein rejected.

GONYAULACYSTA (cont'd)

"*deflandrei*" (Sarjeant, 1966b) Below, 1981, p.53. The transfer of this species to *Gonyaulacysta* by Below *op.cit.* is herein rejected and it is retained in *Psaligonyaulax*.

"*deflandrei*" (Riley in Fisher and Riley, 1980). NOW *Leptodinium*.

"*delicata*" (Davey, 1969a). NOW *Leptodinium*.

diamanta (Churchill and Sarjeant, 1963, p.34-36, pl.1, fig.19; text-fig.3) Lentin and Williams, 1976, p.76. Holocene; formerly *Peridinium* and ?*Phthanoperidinium*.

"*diaphanis*" (Cookson and Eisenack, 1958) Sarjeant, 1969, p.9. NOW *Cribroperidinium*; formerly *Gonyaulax*.

"*dictyophora*" (Deflandre, 1938b) Sarjeant, 1967b, p.249. NOW *Aldorfia*; formerly *Palaeoperidinium*.

diutina Duxbury, 1977, p.34-35, pl.1, fig.3-4; text-fig.9. Berriasian-Hauterivian.

"*downiei*" Pocock, 1972, p.87, pl.22, fig.1-2; text-fig.2. Oxfordian-Kimmeridgian. *Jr syn.* of *Hystrihogonyaulax cladophora* (Deflandre) Stover and Evitt, according to Fisher and Riley, 1980, p.320. The transfer of *G. downiei* to *Hystrihosphaeropsis* by Stover and Evitt, 1978, p.164 was therefore unnecessary.

dualis (Brideaux and Fisher, 1976, p.18-20, pl.1, fig.4-6,8-12; pl.2, fig.1-2) Stover and Evitt, 1978, p.158. Late Oxfordian-Late Kimmeridgian; formerly *Psaligonyaulax*.

"*edwardsii*" (Cookson and Eisenack, 1958) Clarke and Verdier, 1967, p.31. NOW *Cribroperidinium*.

"*ehrenbergii*" (Gitmez, 1970). NOW *Millioudodinium*.

"*eisenackii*" (Deflandre, 1938b). NOW *Tubotuberella*.

subsp. "*oligodentata*" (Cookson and Eisenack, 1958) Sarjeant, 1972, p.17. This transfer was rejected by Lentin and Williams, 1977b, p.65 and the subspecies retained in *Tubotuberella eisenackii*.

elamii Horowitz, 1975, p.25-26, pl.1, fig.9. Late Triassic. NOTE: Stover and Evitt, 1978, p.158 considered this to be a "problematical species".

"*episoma*" (Sarjeant, 1966b). NOW *Millioudodinium*.

"*evittii*" (Dodekova, 1969). NOW *Occisucysta*.

GONYAULACYSTA (cont'd)

"*exilicristata*" (Davey, 1969a). NOW *Cribroperidinium*.

exsanguia Duxbury, 1977, p.35-36, pl.1, fig.6-7; text-fig.10.
Hauterivian-Barremian.

"*extensa*" Clarke and Verdier, 1967, p.30, pl.4, fig.7-9; text-
fig.11. *Jr syn.* of *Psaligonyaulax deflandrei* Sarjeant,
1966b according to Clarke *et al.*, 1968, p.181.

"*fallax*" (Morgenroth, 1968). NOW *Apteodinium*.

fastigiata Duxbury, 1977, p.36-37, pl.1, fig.8-9,12; text-fig.11.
Hauterivian-Barremian.

"*fetchamensis*" (Sarjeant, 1966b). NOW *Millioudodinium*.

"*filapicata*" (Gocht, 1970b). NOW *Diacanthum*.

"*fimbriata*" (Duxbury, 1980). NOW *Rhynchodiniopsis*.

"*fragosa*" Brideaux, 1971, p.83, pl.23, fig.42; pl.24, fig.44-45;
text-fig.8c-d. Harker and Sarjeant, 1975, p.224 and Brideaux
and McIntyre, 1975, p.33 considered this species to be a *jr syn.*
of *Endoscrinium campanulum* (Gocht) Vozzhennikova.

giga Horowitz, 1970, p.178, pl.4, fig.2G. Late Jurassic-Early
Cretaceous. NOTE: Stover and Evitt, 1978, p.158 considered
this to be a "problematical species".

"*gigas*" (Raynaud, 1978). NOW *Millioudodinium*.

"*giuseppeii*" (Morgenroth, 1966a) Sarjeant, 1969, p.9. NOW
?Millioudodinium; formerly *Gonyaulax*.

subsp. "*major*" (Morgenroth, 1966a) Lentin and Williams, 1973,
p.61. NOW *?Millioudodinium giuseppeii* subsp. *major*; formerly
Gonyaulax giuseppeii subsp. *major*.

"*globata*" (Gitmez and Sarjeant, 1972). NOW *Millioudodinium*.

"*globosa*" (Brideaux, 1971). NOW *?Millioudodinium*.

"*gongylos*" (Sarjeant, 1966b). NOW *?Leptodinium*.

"*gottisii*" (Dupin, 1968). NOW *?Millioudodinium*.

"*granulata*" (Klement, 1960) Sarjeant, 1969, p.9. NOW
Cribroperidinium; formerly *Gonyaulax*.

GONYAULACYSTA (cont'd)

"*granuligera*" (Klement, 1960, p.41, pl.5, fig.4-5) Sarjeant, 1969, p.10. Middle Oxfordian-Early Kimmeridgian; formerly *Gonyaulax*. Jr syn. of *Cribroperidinium granulatum* (Klement) Stover and Evitt according to Fisher and Riley, 1980, p.321. The transfer of *G. granuligera* to *Cribroperidinium* by Stover and Evitt, 1978, p.150 was therefore unnecessary.

"*hadra*" (Sarjeant, 1966b). NOW *Millioudodinium*.

helicoidea (Eisenack and Cookson, 1960, p.2, pl.1, fig.4,9) Sarjeant, 1966b, p.116-117. Neocomian-Aptian; formerly *Gonyaulax*.

subsp. *tuberculata* (Vozzhennikova, 1967, p.83, pl.41, fig.3a-b) Lentin and Williams, 1973, p.62. Tithonian; formerly *Gonyaulax helicoidea* var. *tuberculata*. Variety correctly transferred to *Gonyaulacysta* by Dodekova, 1971, p.10.

hyaloderma (Deflandre, 1939, p.144, pl.6, fig.3-4) Sarjeant, 1967b, p.252. Kimmeridgian; formerly *Palaeoperidinium*. NOTE: Stover and Evitt, 1978, p.158 considered this to be a "problematical species".

"*hyalodermopsis*" (Cookson and Eisenack, 1958) Sarjeant, 1969, p.10. NOW ?*Leptodinium*; formerly *Gonyaulax*.

"*incomposita*" (Drugg, 1970b). NOW *Corrudinium*.

"*indicosa*" Brideaux, 1971, p.83, nom. subst. pro *Palaeoperidinium granulatum* Singh, 1964, p.135, pl.18, fig.2-3. NOW ?*Apteodinium*. Middle-Late Albian.

"*irmoechinata*" (Heisecke, 1970) Lentin and Williams, 1976, p.41. NOW ?*Spinidinium*; formerly *Deflandrea*.

"*italica*" (Corradini, 1973). NOW ?*Millioudodinium*.

**jurassica* (Deflandre, 1938b, p.168, pl.6, fig.2-6; text-fig.1-2) Norris and Sarjeant, 1965, p.65. Oxfordian; formerly *Gonyaulax*.

subsp. *brevis* (Johnson and Hills, 1973, p.206, pl.1, fig.11,14) Lentin and Williams, 1975, p.2151. ?Late Callovian-Early Oxfordian; formerly *Gonyaulacysta jurassica* var. *brevis*.

subsp. *longicornis* (Deflandre, 1938b, p.171, pl.6, fig.6) Lentin and Williams, 1973, p.62. Oxfordian; formerly *Gonyaulacysta jurassica* var. *longicornis* and *Gonyaulax jurassica* var. *longicornis*. Subspecies transferred as a variety to the genus *Gonyaulacysta* by Gitmez, 1970, p.260. The retention of this taxon as a *varietas* by Fensome, 1979, p.38 is herein rejected.

GONYAULACYSTA (cont'd)

- kostroniensis* (Vozzhennikova, 1967, p.85, pl.26, fig.1-6; pl.27, fig.1-2) Sarjeant, 1969, p.10. Valanginian; formerly *Gonyaulax*. The transfer of this species to *Nelchinopsis* by Wiggins, 1972, p.301-302 was rejected by Duxbury, 1977, p.37.
- ?*longicornis* (Downie, 1957, p.420, pl.20, fig.8) Sarjeant, 1969, p.10. Late Kimmeridgian; formerly *Gonyaulax*. NOTE: Stover and Evitt, 1978, p.158 considered this to be a "provisionally accepted species".
- "?mamillifera" (Deflandre, 1939) Sarjeant, 1969, p.10. NOW ?*Millioudodinium*; formerly *Gonyaulax*.
- "?mecsekensis" (Nagy, 1969) Lentin and Williams, 1976, p.110. NOW ?*Millioudodinium*; formerly *Palaeoperidinium*. O.C.
- microceras* (Eisenack, 1958, p.391, pl.21, fig.13) Clarke and Verdier, 1967, p.31. Late Aptian; formerly *Gonyaulax*.
- "*mirabilis*" (Klement, 1960) Dodekova, 1967, p.19. NOW and formerly *Leptodinium*.
- "*monacantha*" (Deflandre, 1935) Lentin and Williams, 1976, p.110. NOW *Millioudodinium*; formerly *Palaeoperidinium*. Sarjeant, 1967b, p.252 recommended transfer of this species to *Gonyaulacysta*.
- "*mosaica*" (Downie, 1957). NOW ?*Leptodinium*.
- nannotrix* (Deflandre, 1939, p.143, pl.6, fig.7) Sarjeant, 1969, p.10. Kimmeridgian; formerly *Gonyaulax*. NOTE: Stover and Evitt, 1978, p.159 considered this to be a "problematical species".
- "*nuciformis*" (Deflandre, 1938b) Sarjeant, 1968, p.227. NOW *Apteodinium*; formerly *Gonyaulax* and *Palaeoperidinium*.
- "?nuda" (Nagy, 1969) Lentin and Williams, 1976, p.110. NOW ?*Tectatodinium*. See discussion under "*Palaeoperidinium pannonium*".
- "*obesa*" (Brideaux, 1971). NOW *Millioudodinium*.
- ?*obscura* (Lejeune-Carpentier, 1946, p.B191, fig.3-5) Sarjeant, 1969, p.10. Senonian; formerly *Gonyaulax*. NOTE: Stover and Evitt, 1978, p.158 considered this to be a "provisionally accepted species".
- ordocava* Duxbury, 1977, p.37-38, pl.1, fig.10-11; text-fig.12. Hauterivian.
- "*ornata*" (Eisenack, 1935). NOW *Ctenidodinium*.

GONYAULACYSTIDA (cont'd)

"*orthoceras*" (Eisenack, 1958) Sarjeant, 1966b, p.121. NOW *Cribroperidinium*.

"*pachyderma*" (Deflandre, 1938b) Sarjeant, 1969, p.10. NOW *Ctenidodinium*.

"*palla*" (Sarjeant, 1966b). NOW *Millioudodinium*.

"*parannonica*" (Nagy, 1965) Lentin and Williams, 1973, p.63. NOW ?*Millioudodinium*; formerly *Gonyaulax*.

"*parorthoceras*" (Davey, 1968). NOW *Millioudodinium*.

"*pectinigera*" (Gocht, 1970) Fensome, 1979, p.43. Fensome's emendation of this species is accepted herein, but not his transfer to *Gonyaulacysta*. See *Hystrihogonyaulax pectinigera*.

"*pennata*" (Riley in Fisher and Riley, 1980). NOW *Hystrihogonyaulax*.

"*perforans*" (Cookson and Eisenack, 1958) Sarjeant, 1969, p.10. NOW *Cribroperidinium*; also formerly ?*Leptodinium* and *Gonyaulax*.

perforobtusa Duxbury, 1977, p.39, pl.1, fig.1; text-fig.13. Hauterivian.

"*pila*" (Gocht, 1959). NOW ?*Leptodinium*.

piriformis (Conrad, 1941, p.9, pl.1, fig.G) Lentin and Williams, 1976, p.111. Maastrichtian; formerly *Palaeoperidinium*. Sarjeant 1967b, p.255 recommended transfer of this species to *Gonyaulacysta*.

"?*plea*" (Tasch, 1964) Lentin and Williams, 1976, p.43; formerly *Peridinium*. NOW and formerly *Deflandrea*.

polythyris Davey, 1979b, p.556, pl.3, fig.1-3. Albian.

"*pyra*" (Drugg, 1967) Sarjeant, 1969, p.11. NOW ?*Cribroperidinium*; formerly *Gonyaulax*.

rara Kar *et al.*, 1972, p.147, pl.1, fig.4-5. Tertiary. NOTE: Stover and Evitt, 1978, p.159 considered this to be a "problematical species".

"*sarjeantii*" (Vozzhennikova, 1967) Sarjeant, 1969, p.11. NOW *Millioudodinium*; formerly *Gonyaulax* and *Gonyaulacysta*. O.C.

subsp. "*sphaerica*" (Vozzhennikova, 1967) Lentin and Williams, 1973, p.63. NOW *Millioudodinium sarjeantii* subsp. *sphaericum*; formerly *Gonyaulax sarjeanti* var. *sphaericum*.

GONYAULACYSTA (cont'd)

- scarburghensis* Sarjeant, 1964c, p.472-473, *nom. nov. pro Gonyaulax areolata* Sarjeant, 1961a, p.95-96, pl.13, fig.13; text-fig.5.
Late Callovian-Early Oxfordian. See also "*Gonyaulacysta areolata*".
- "*scottii*" (Cookson and Eisenack, 1958) Sarjeant, 1969, p.11.
NOW ?*Millioudodinium*; formerly *Gonyaulax*. O.C.
- "*serrata*" (Cookson and Eisenack, 1958) Sarjeant, 1969, p.11. NOW
Hystrihogonyaulax; formerly *Gonyaulax*.
- "*setcheyensis*" (Sarjeant, 1976c). NOW *Leptodinium*.
- "*striata*" (Clarke and Verdier, 1967). NOW *Impagidinium*.
- "*superornata*" (W. Wetzel, 1967) Eisenack and Kjellström, 1971b,
p.306g. NOW *Meiourogonyaulax*.
- "*systemmata*" (Gitmez and Sarjeant, 1972). NOW *Cribroperidinium*.
teicha Davey, 1974, p.53-54, pl.4, fig.5-7. Early Barremian.
- "*tenuiceras*" (Eisenack, 1958) Sarjeant, 1969, p.11. NOW
Diacanthum; formerly *Gonyaulax*.
- "*tenuicornuta*" (Cookson and Eisenack, 1962b) Sarjeant, 1969, p.11.
NOW and formerly ?*Leptodinium*.
- "*tenuitabulata*" (Gerlach, 1961) De Coninck, 1969, p.23. NOW
Millioudodinium; formerly *Gonyaulax*.
- transparens* (Sarjeant, 1959, p.334, pl.13, fig.3; text-fig.3)
Sarjeant, 1969, p.11. Early Callovian; formerly *Gonyaulax*.
NOTE: Stover and Evitt, 1978, p.159 considered this to be a
"problematical species".
- variabilis* (Pocock, 1972, p.100, pl.23, fig.14-16) Davey, 1979d,
p.217. Late Bajocian; formerly ?*Chytroeisphaeridia*.
- ?*wetzelii* (Lejeune-Carpentier, 1939, p.B526, text-fig.1-2)
Sarjeant, 1969, p.11. ?Senonian; formerly *Gonyaulax*. O.C.
NOTE: Stover and Evitt, 1978, p.159 considered this to be a
"provisionally accepted species".
- "*whatleyi*" (Sarjeant, 1972). NOW *Tubotuberella*.
- "*whitei*" (Sarjeant, 1966b). NOW ?*Impagidinium*.
- GONYAULAX Diesing, 1866, p.305,382. Modern genus defined from the
motile stage. The current generic assignment of fossil dino-
flagellates formerly included in *Gonyaulax* is given below.
- "*acanthosphaera*" (Sarjeant, 1961a). NOW ?*Meiourogonyaulax*.

GONYAULAX (cont'd)

- "*aceras*" (Eisenack, 1958). NOW *Acanthaulax*.
- "*aculeata*" (Klement, 1960). NOW *Acanthaulax*.
- "*amabilis*" (Deflandre, 1939). NOW *Leptodinium*.
- "*ambigua*" (Deflandre, 1939). NOW *Millioudodinium*.
- "*apionis*" (Cookson and Eisenack, 1958). NOW *Millioudodinium*.
- "*areolata*" (Sarjeant, 1961a). NOW *Gonyaulacysta scarburghensis*.
- "*bulloidea*" (Cookson and Eisenack, 1960b). NOW *Meiourogonyaulax*.
- "*caytonensis*" (Sarjeant, 1959). NOW *Meiourogonyaulax*.
- "*chaloneri*" (Sarjeant, 1963b). NOW *Rhaetogonyaulax rhaetica*
subsp. *chaloneri*.
- "*cladophora*" (Deflandre, 1938b). NOW *Hystrihogonyaulax*.
- subsp. "*cladophora*" (Deflandre, 1938b). NOW *Hystrihogonyaulax*
cladophora subsp. *cladophora*.
- subsp. "*extensa*" (Klement, 1960). NOW *Hystrihogonyaulax*
cladophora subsp. *extensa*.
- subsp. "*hemipolyedrica*" (Klement, 1960). NOW *Hystrihogonyaulax*
cladophora subsp. *hemipolyedrica*.
- subsp. "*isovalvata*" (Klement, 1960). NOW *Hystrihogonyaulax*
cladophora subsp. *isovalvata*.
- "*clathrata*" (Cookson and Eisenack, 1960b). NOW *Leptodinium*.
- "*confusa*" (Vozzhennikova, 1967). NOW ?*Millioudodinium*.
- "*cornigera*" (Valensi, 1953). NOW *Hystrihogonyaulax*.
- "*crassicornuta*" (Klement, 1960). NOW ?*Gonyaulacysta*.
- "*cretacea*" (Neale and Sarjeant, 1962). NOW *Gonyaulacysta*.
- "*crispa*" (W. Wetzel, 1967). NOW *Hystrihogonyaulax*.
- "*cristulata*" (Sarjeant, 1959). NOW ?*Meiourogonyaulax*.
- "*culmula*" (Norris, 1965). NOW *Ctenidodinium*.
- "*decapitata*" (W. Wetzel, 1967). NOW *Meiourogonyaulax*.
- "*diaphanis*" (Cookson and Eisenack, 1958). NOW *Cribroperidinium*.

GONYAULAX (cont'd)

- "edwardsii" (Cookson and Eisenack, 1958). NOW *Cribroperidinium*.
- "eisenackii" (Deflandre, 1938b). NOW *Tubotuberella*.
- "eumorpha" (Cookson and Eisenack, 1960b). NOW *Leptodinium*.
- "freakei" (Sarjeant, 1963c). NOW *Leptodinium*.
- "giuseppeii" (Morgenroth, 1966a). NOW ?*Millioudodinium*.
- subsp. "major" (Morgenroth, 1966a). NOW ?*Millioudodinium giuseppeii* subsp. *major*.
- "granulata" (Klement, 1960). NOW *Cribroperidinium*.
- "granuligera" (Klement, 1960). See "*Cribroperidinium granuligerum*".
- "helicoidea" (Eisenack and Cookson, 1960). NOW *Gonyaulacysta*.
- subsp. "cassidata" (Eisenack and Cookson, 1960). NOW *Gonyaulacysta cassidata*.
- var. "tuberculata" (Vozzhennikova, 1967). NOW *Gonyaulacysta helicoidea* subsp. *tuberculata*.
- "heslertonensis" (Neale and Sarjeant, 1962). NOW *Heslertonia*.
- "hyalodermopsis" (Cookson and Eisenack, 1958). NOW ?*Leptodinium*.
- "jurassica" (Deflandre, 1938b). NOW *Gonyaulacysta*.
- var. "longicornis" (Deflandre, 1938b). NOW *Gonyaulacysta jurassica* subsp. *longicornis*.
- "kostromiensis" (Vozzhennikova, 1967). NOW *Gonyaulacysta*.
- "longicornis" (Downie, 1957). NOW ?*Gonyaulacysta*.
- "mamillifera" (Deflandre, 1939). NOW ?*Millioudodinium*.
- "margaritifera" (Cookson and Eisenack, 1960a). NOW *Impagidinium*.
- "microceras" (Eisenack, 1958). NOW *Gonyaulacysta*.
- "millioudii" (Sarjeant, 1963c). NOW *Leptodinium*.
- "muderongensis" (Cookson and Eisenack, 1958). NOW *Cribroperidinium*.
- "nannotrix" (Deflandre, 1939). NOW *Gonyaulacysta*.
- "nealei" (Sarjeant, 1962a). NOW ?*Hystrihogonyaulax*.

GONYAULAX (cont'd)

"*nuciformis*" (Deflandre, 1938b) Sarjeant, 1962a, p.482-483.
NOW *Apteodinium*.

"*obscura*" (Lejeune-Carpentier, 1946). NOW ?*Gonyaulacysta*.

"*orthoceras*" (Eisenack, 1958). See *Cribroperidinium orthoceras*.

"*pachyderma*" (Deflandre, 1938b). NOW *Ctenidodinium*.

"*paliuros*" (Sarjeant, 1962a). NOW ?*Acanthaulax*.

"*pannonica*" (Nagy, 1965). NOW *Millioudodinium*.

"*perforans*" (Cookson and Eisenack, 1958). NOW *Cribroperidinium*.

"*porosa*" (Lejeune-Carpentier, 1946). NOW *Leptodinium*.

"*pyra*" (Drugg, 1967). NOW ?*Cribroperidinium*.

"*reticulata*" (Nagy, 1969). NOW *Leptodinium*.

"*rhaetica*" (Sarjeant, 1963b). NOW *Rhaetogonyaulax*.

"*sarjeantii*" (Vozzhennikova, 1967). NOW *Millioudodinium*.

var. "*sphaericum*" (Vozzhennikova, 1967). NOW *Millioudodinium sarjeantii* subsp. *sphaericum*.

"*scarburghensis*" (Sarjeant, 1964c). NOW *Gonyaulacysta*; formerly *Gonyaulax areolata*.

"*scottii*" (Cookson and Eisenack, 1958). NOW ?*Millioudodinium*.

"*serrata*" (Cookson and Eisenack, 1958). NOW *Hystrihogonyaulax*.

"*superornata*" (W. Wetzel, 1967). NOW *Meiourogonyaulax*.

"*tenuiceras*" (Eisenack, 1958). NOW *Diacanthum*.

"*tenuitabulata*" (Gerlach, 1961). NOW *Millioudodinium*.

"*transparens*" (Sarjeant, 1959). NOW *Gonyaulacysta*.

"*venusta*" (Klement, 1960). NOW *Acanthaulax*.

"*wetzelii*" (Lejeune-Carpentier, 1939). NOW ?*Gonyaulacysta*.

GORKADINIUM Loeblich and Loeblich, 1966, p.93. *nom. subst. pro*
Tetrasphaera Gorka, 1965.

**rarum* (Gorka, 1965, p.307, pl.2, fig.6a-b) Loeblich and Loeblich,
1966, p.93. Early Kimmeridgian; formerly *Tetrasphaera*. O.C.

GYMNODINIUM Stein, 1878, p.89-91,97. Modern genus defined from the motile stage. The current generic assignment of fossil dinoflagellates formerly included in *Gymnodinium* is given below.

"*albertii*" (Vozzhennikova, 1967). NOW *Dinogymnium vozzhennikovae*.

"*attadalense*" (Cookson and Eisenack, 1958). NOW *Scriniodinium*.

"*australiense*" (Deflandre and Cookson, 1955). NOW *Apteodinium*.

"*avellanum*" (Lejeune-Carpentier, 1951). NOW *Dinogymnium*.

"*cretaceum*" (Deflandre, 1935). NOW *Dinogymnium*.

"*crystallinum*" (Deflandre, 1938b). NOW *Scriniodinium*.

"*curvatum*" (Vozzhennikova, 1967). NOW *Dinogymnium*.

"*dabendorfense*" (Alberti, 1961). NOW *Diconodinium*.

"*decorum*" (Deflandre, 1943). NOW *Dinogymnium*.

"*denticulatum*" (Alberti, 1961). NOW *Dinogymnium*.

"*digitus*" (Deflandre, 1935). NOW *Dinogymnium*.

var. "*crassum*" (Vozzhennikova, 1967). NOW *Dinogymnium digitus* subsp. *crassum*.

"*dorsispirale*" (Churchill and Sarjeant, 1963). NOW *Muiradinium*.

"*fehmannense*" (Morgenroth, 1966a). NOW ?*Diconodinium*.

"*galeritum*" (Deflandre, 1938b). NOW *Endoscrinium*.

"*heterocostatum*" (Deflandre, 1935). NOW *Dinogymnium*.

var. "*kolpaschevi*" (Vozzhennikova, 1967). NOW *Dinogymnium heterocostatum* subsp. *kolpaschevi*.

"*hexagonum*" (Deflandre-Rigaud, 1954). NOW *Dinogymnium*.

"*hyalinum*" (Vozzhennikova, 1967). NOW *Dinogymnium*.

"*kasachstanicum*" (Vozzhennikova, 1967). NOW *Dinogymnium*.

"*laticinctum*" (Deflandre, 1943). NOW *Dinogymnium*.

"*longicornis*" (Vozzhennikova, 1967). NOW *Dinogymnium*.

"*luridum*" (Deflandre, 1938b). NOW *Endoscrinium*.

"*marthae*" (Deflandre, 1943). NOW *Dinogymnium*.

GYMNODINIUM (cont'd)

- "*muticum*" (Vozzhennikova, 1967). NOW *Dinogymnium*.
- "*nelsonense*" (Cookson, 1956). NOW *Dinogymnium*.
- "*parvimarginatum*" (Cookson and Eisenack, 1958). NOW *Scriniodium*.
- "*pontis-mariae*" (Deflandre, 1936b). NOW *Subtilisphaera*.
- "*sibiricum*" (Vozzhennikova, 1967). NOW *Dinogymnium*.
- "*sphaerocephalum*" (Vozzhennikova, 1967). NOW *Dinogymnium*.
- var. "*laeve*" (Vozzhennikova, 1967). NOW *Dinogymnium*
 sphaerocephalum subsp. *laeve*.
- "*strombomorphum*" (Deflandre, 1943). NOW *Dinogymnium*.
- "*torulosum*" (Deflandre, 1943). NOW ?*Scriniodium*.
- "*ventriosum*" (Alberti, 1961). NOW *Diconodinium*.
- "*westralium*" (Cookson and Eisenack, 1958). NOW *Dinogymnium*.



HAFNIASPHERA Hansen, 1977, p.13-14.

cryptovesiculata Hansen, 1977, p.14-15, fig.9-10;18C,E-F,19A-B.
Early Paleocene (Danian).

fluens Hansen, 1977, p.16, fig.13-14,19C-D. Maastrichtian-Early
Paleocene (Danian).

graciosa Hansen, 1977, p.15, fig.11-12,18B,D. Early Paleocene
(Danian).

**hyalospinosa* Hansen, 1977, p.14, fig.7-8,18A. Early Paleocene
(Danian).

septata (Cookson and Eisenack, 1967b, p.253, pl.42, fig.6-10)
Hansen, 1977, p.16. Late Paleocene; formerly *Achomosphaera*,
Baltisphaeridium and *Spiniferites*.

HALOPHORIDIA Cookson and Eisenack, 1962a, p.271.

**xena* Cookson and Eisenack, 1962a, p.271, pl.37, fig.6-8. Albian-
Cenomanian.

HAPSIDAULAX Sarjeant, 1975b, p.143-144.

**margarethae* Sarjeant, 1975b, p.144-147, pl.1a-d; text-fig.1-3.
Bathonian.

HAPSOCYSTA Davey, 1979b, p.556.

dictyota Davey, 1979b, p.557, pl.3, fig.5-10,13-14. Albian.

**peridictya* (Eisenack and Cookson, 1960, p.8, pl.3, fig.5-6)
Davey, 1979b, p.556. Late Albian-Cenomanian; formerly *Canno-*
sphaeropsis. The species was emended by Davey at the time of
the transfer.

HEBECYSTA Bujak and Fisher, 1976, p.64.

**brevicornuta* Bujak and Fisher, 1976, p.64, pl.9, fig.11-15;
text-fig.6A-B. Norian.

HEIBERGELLA Bujak and Fisher, 1976, p.52,54.

aculeata Bujak and Fisher, 1976, p.56,58, pl.8, fig.14-20;
text-fig.4D. Carnian-Norian.

HEIBERGELLA (cont'd)

**asymmetrica* Bujak and Fisher, 1976, p.54,56, pl.8, fig.1-8;
text-fig.4A-B. Carnian-Norian.

kendelbachia (Morbey, 1975) *comb. nov.*

1975 *Rhombodella kendelbachia* Morbey, p.38, pl.14, fig.1-4;
pl. 17, fig.1-3. Rhaetian. The transfer of this species to
Chytroeisphaerida by Stover and Evitt, 1978, p.29 is herein
rejected.

salebrosacea Bujak and Fisher, 1976, p.56, pl.8, fig.9-13;
text-fig.4C. Carnian-Norian.

"*HELIODINIUM*" Alberti, 1961, p.33; emend. Sarjeant, 1966b, p.142.
Jr syn. of *Hystriochodinium* Deflandre, 1935. Davey, 1974, p.54
transferred the type of the genus *Heliodium*, *H. voigti*,
to *Hystriochodinium*. The remaining species *Heliodium patri-*
ciae Neale and Sarjeant, 1962, was transferred to *Hystrioch-*
odinium by Lentin and Williams, 1975, p.2151. The retention of
Heliodium by Harker and Sarjeant, 1975, p.225 was rejected by
Lentin and Williams, 1977b, p.72, since the difference in
process construction between *Heliodium* and *Hystriochodinium*,
as specified by Sarjeant, 1966b, p.142, cannot be determined
with certainty with the light microscope.

"*HEMICYSTODINIUM*" Wall, 1967, p.110. *Jr syn.* of *Polysphaeridium*;
see Bujak *et al.*, 1980, p.34. The type species, *Hemicystodinium*
zoharyi, and the species *H. congregatum* were transferred to
Polysphaeridium by Bujak *et al.*, 1980, p.34. *Hemicystodinium*
zoharyi subsp. *ktana* is herein transferred to *Polysphaeridium*.

"*congregatum*" (Stover, 1977). NOW *Polysphaeridium*.

"*?taugourdeawi*" (Varma and Dangwal, 1964, p.68, pl.2, fig.9)
Sarjeant and Stover, 1978, p.51. Eocene-Oligocene; formerly
Tenua. Sarjeant and Stover, 1978, p.51 suggested that *?Hemi-*
cystodinium taugourdeawi may be conspecific with *Polysphaeri-*
dium zoharyi. That view is accepted herein; see also
Batiacasphaera.

"**zoharyi*" (Rossignol, 1962) Wall, 1967, p.110. NOW *Polysphaeri-*
dium; formerly *Hystriochosphaeridium*.

subsp. "*ktana*" (Rossignol, 1964) Lentin and Williams, 1973,
p.67. NOW *Polysphaeridium zoharyi* subsp. *ktana*; formerly
Hystriochosphaeridium zoharyi var. *ktana*.

HEMIPLACOPHORA Cookson and Eisenack, 1965a, p.125.

**semilunifera* Cookson and Eisenack, 1965a, p.126, pl.14, fig.4-
9,16. Late Eocene.

HEMISPHAERIDIUM Bujak, 1980, p.56.

**fenestratum* Bujak, 1980, p.56,58, pl.15, fig.7-9. Late Eocene.

HEPTASPHERA Keupp, 1979a, p.41-42.

**michaeli* Keupp, 1979a, p.42-43, pl.11, fig.6-12. Early Barremian.

"*HERENDEENIA*" Wiggins, 1969, p.145-146. *Jr syn.* of *Omatia*; see Stover and Evitt, 1978, p.280. These authors retained the type of the genus, *Herendeenia pisciformis*, in the genus *Omatia*.

HESLERTONIA Sarjeant, 1966b, p.133; emend. Duxbury, 1980, p.123.

**heslertonensis* (Neale and Sarjeant, 1962, p.440, pl.19, fig.5; pl.20, fig.5) Sarjeant, 1966b, p.133; emend. Duxbury, 1980, p.124. Hauterivian-Barremian; formerly *Gonyaulax*.

pellucida Gitmez, 1970, p.297-299, pl.4, fig.12; pl.14, fig.2; text-fig.26. Early Kimmeridgian.

striata (Cookson and Eisenack, 1960a, p.9, pl.3, fig.10-11) Norvick, 1976, p.47. Cenomanian; formerly *Cymatiosphaera*.

teichophera (Sarjeant, 1961a, p.107-108, pl.15, fig.9; text-fig. 9a-b) Sarjeant, 1976c, p.8. Oxfordian; formerly *Cymatiosphaera*.

HETERAULACACYSTA Drugg and Loeblich, 1967, p.183; emend Bujak, 1980, p.58.

**campanula* Drugg and Loeblich, 1967, p.183-184, pl.1, fig.6-8c; text-fig.2. Middle Eocene.

"*fehmannensis*" (Lentin and Williams, 1973). NOW *Dinopterygium*.

?*leptalea* Eaton, 1976, p.305-306, pl.21, fig.1-2. Middle-Late Eocene.

porosa Bujak, 1980, p.62, pl.15, fig.10-13; text-fig.14B-C. Late Eocene.

verricula (Piasecki, 1980) *comb. nov.*

1980 *Dinopterygium verriculum* Piasecki, p.66-67, pl.1, fig.4-8; pl.5, fig.5-6. Late Miocene. This species is herein transferred from *Dinopterygium* to *Heteraulacacysta* because it more closely conforms to the diagnosis of the latter genus, as circumscribed by Stover and Evitt, 1978, p.209.

HETEROSPHERIDIUM Cookson and Eisenack, 1968, p.115.

**conjunctum* Cookson and Eisenack, 1968, p.115; text-fig.4G-H. Santonian-Early Campanian.

HETEROSPHAERIDIUM (cont'd)

?*heteracanthum* (Deflandre and Cookson, 1955, p.276, pl.2, fig.5-6; text-fig.40-41) Eisenack and Kjellström, 1971a, p.451. ?Late Cretaceous-Early Eocene; formerly *Baltisphaeridium*, *Hystriosphae-ridium* and *Cleistosphaeridium*. NOTE: Stover and Evitt, 1978, p.52 considered this to be a "provisionally accepted species".

subsp. *sparsiprocessum* (Varma and Dangwal, 1964, p.64, pl.1, fig.7) Eisenack and Kjellström, 1971a, p.453. Eocene-Oligocene; formerly *Hystriosphae-ridium heteracanthum* subsp. *sparsiprocessum*.

HEXAGONIFERA Cookson and Eisenack, 1961a, p.73; emend. Cookson and Eisenack, 1962b, p.496; emend. Stover and Evitt, 1978, p.107-108.

"?*chlamydata*" (Cookson and Eisenack, 1962b). NOW *Leberidocysta*.

"*cylindrica*" (Habib, 1970, p.374, pl.10, fig.2). Lentin and Williams, 1976, p.84 rejected the transfer of this species from *Prismatocystis* to *Hexagonifera* by Habib, 1972, p.378.

"*defloccata*" (Davey and Verdier, 1973). NOW *Leberidocysta*.

**glabra* Cookson and Eisenack, 1961a, p.74, pl.12, fig.9-13. Senonian.

"*jurassica*" (Gitmez and Sarjeant, 1972). NOW *Senoniasphaera*.

"?*laticaudata*" (Vozzhennikova, 1967). NOW ?*Leberidocysta*. Lentin and Williams, 1976, p.85 recommended that the species name *H. laticaudata* not be used because of the extremely poor illustration of the holotype which renders morphological elucidation impossible.

"?*scabrata*" (Jain and Taugourdeau-Lantz, 1973). NOW ?*Leberidocysta*.

"*suspecta*" (Manum and Cookson, 1964). NOW *Trithyrodinium*.

"*vermiculata*" (Cookson and Eisenack, 1961a). NOW *Trithyrodinium*.

"HEXASPHAERA" Clarke and Verdier, 1967, p.42. Clarke *et al.*, 1968, p.181 considered this genus to be a *jr syn.* of *Callaiosphaeridium*. The type and single species of the genus *Hexasphaera*, *H. asymmetrica*, is included in *Callaiosphaeridium*.

HISTIOCYSTA Davey, 1969a, p.138.

outananensis Below, 1981, p.55-56, pl.10, fig.18-20; pl.15, fig.8-9; text-fig.54-58. Hauterivian.

**palla* Davey, 1969a, p.138-140, pl.1, fig.5-6; text-fig.14A-B. Cenomanian.

HISTIOPHORA Klement, 1960, p.51.

**ornata* Klement, 1960, p.51-53, pl.16, fig.11-14; text-fig.28-30.
Late Jurassic.

HOMOTRYBLIUM Davey and Williams, 1966b, p.100.

abbreviatum Eaton, 1976, p.267-268, pl.10, fig.2-4. Early-
Late Eocene.

aculeatum Williams, 1978, p.797, pl.4, fig.5-6,8-9. Eocene.

bifurcatum Caro, 1973, p.354,357, pl.2, fig.6. Middle Paleocene.
NOTE: Stover and Evitt, 1978, p.210 considered this to be a
"problematical species".

caliculum Bujak, 1980, p.62,64, pl.16, fig.1. Late Eocene.

distinctum Salujha and Kindra, 1981, p.51, pl.2, fig.45. Early
Paleocene.

floripes (Deflandre and Cookson, 1955, p.276, pl.7, fig.1-2,7)
Stover, 1975, p.36. Early Tertiary; formerly *Hystriichosphaer-
idium* and *Cordosphaeridium*.

subsp. *breviradiatum* (Cookson and Eisenack, 1961b, p.44, pl.2,
fig.10-11) Lentini and Williams, 1977b, p.75. Late Eocene;
formerly *Hystriichosphaeridium floripes* subsp. *breviradiatum*
and *Cordosphaeridium*.

giganteum Salujha and Kindra, 1981, p.50-51, pl.2, fig.42. Early
Paleocene.

oceanicum Eaton, 1976, p.268, pl.10, fig.5-8. Middle-Late Eocene.

pallidum Davey and Williams, 1966b, p.102-103, pl.12, fig.4,6;
text-fig.22. Early Eocene.

"*plectilum*" Drugg and Loeblich, 1967, p.184-186, pl.2, fig.1-9;
text-fig.3. Oligocene. *Jr syn.* of *Homotryblium floripes*;
see Bujak, 1980, p.64.

tasmaniense Cookson and Eisenack, 1967a, p.133-134, pl.20,
fig.1-2. Paleocene.

**tenuispinosum* Davey and Williams, 1966b, p.101-102, pl.4, fig.11;
pl.12, fig.1,5,7; text-fig.21. Early Eocene.

vallum Stover, 1977, p.79-80, pl.3, fig.45-53. Early Oligocene-
Early Miocene.

variabile Bujak, 1980, p.64,66, pl.16, fig.4-9. Late Eocene.

HOROLOGINELLA Cookson and Eisenack, 1962a, p.271; emend. Stover and Evitt, 1978, p.53-54. NOTE: Stover and Evitt, 1978, p.54 regarded only *H. lineata* as a dinoflagellate and referred to an anticipated paper which will remove all species but the type from *Horologinella*.

apiculata Cookson and Eisenack, 1962a, p.272, pl.37, fig.4.
Campanian.

biconvexa Jiabo, 1978, p.95, pl.29, fig.20-21. Early Tertiary.

?*extrema* Cookson and Eisenack, 1962a, p.272-273, pl.37, fig.10.
Cenomanian.

incurvata Cookson and Eisenack, 1962a, p.272, pl.37, fig.5.
Early Eocene.

**lineata* Cookson and Eisenack, 1962a, p.272, pl.37, fig.1-3.
Aptian-?Albian.

?*obliqua* Cookson and Eisenack, 1962a, p.273, pl.37, fig.9.
?Late Albian-Cenomanian.

?*spinosa* Cookson, 1965a, p.89, pl.10, fig.10-12; pl.11, fig.10.
Late Eocene.

spinosigibberosa Brideaux and Fisher, 1976, p.22-24, pl.4, fig.9;
pl.5, fig.1-16. Late Oxfordian-?Portlandian.

HYSTRICHODINIUM Deflandre, 1935, p.182; emend. Clarke and Verdier,
1967, p.37-38.

"*alatum*" (Cookson and Eisenack, 1962b). NOW *Xiphophoridium*.

"?*amphiacanthum*" (Cookson and Eisenack, 1958). NOW *Omatidium*.
NOTE: Stover and Evitt, 1978, p.161-162 considered this to be a
"provisionally accepted species" of *Hystriochodinium*.

compactum Alberti, 1961, p.15, pl.9, fig.5-6. Valanginian.

?*dasys* Davey, 1969a, p.175-176, pl.10, fig.8-9. Cenomanian.
NOTE: Stover and Evitt, 1978, p.162 considered this to be
a "provisionally accepted species".

furcatum Alberti, 1961, p.16, pl.9, fig.7-8. Hauterivian.

?*infundibulum* Jain *et al.*, 1975, p.11-12, pl.3, fig.35.
Maastrichtian. NOTE: Stover and Evitt, 1978, p.162 considered
this to be a "provisionally accepted species".

isodiametricum (Cookson and Eisenack, 1958, p.38, pl.12, fig.
11-12) Stover and Evitt, 1978, p.161. Campanian-Early
Maastrichtian; formerly *Palaeohystriochophora*.

HYSTRICHODINIUM (cont'd)

oligacanthum Deflandre and Cookson, 1955, p.255-257, pl.1, fig.1; text-fig.2-3. Albian.

"*parvum*" (Alberti, 1961). NOW *Cauca*.

patriciae (Neale and Sarjeant, 1962, p.451-452, pl.19, fig.3; text-fig.7) Lentin and Williams, 1975, p.2151. Hauterivian; formerly *Heliodinium*.

**pulchrum* Deflandre, 1935, p.229-230, pl.5, fig.1; text-fig.9-11. Senonian.

subsp. *densispinum* (Deflandre, 1936a, p.35-36, pl.9, fig.3) Lentin and Williams, 1973, p.70. Senonian; formerly *Hystriochodinium pulchrum* var. *densispinum*.

subsp. *globosum* (Deflandre, 1936a, p.35, pl.9, fig.1-2) Lentin and Williams, 1973, p.70. Senonian; formerly *Hystriochodinium pulchrum* var. *globosum*.

ramoides Alberti, 1961, p.15-16, pl.8, fig.11-13. Late Barremian.

"?*telaspinosum*" (Fisher and Riley, 1980). NOW *Kleithriasphaeridium*.

voigtii (Alberti, 1961, p.33, pl.8, fig.1-5; emend. Sarjeant, 1966b, p.142-144) Davey, 1974, p.54. Barremian-Early Aptian; formerly *Heliodinium*. O.C.

HYSTRICHOGONYAULAX Sarjeant, 1969, p.13-14.

"*canadensis*" (Pocock, 1972) Stover and Evitt, 1978, p.162. *Jr* syn. of *Hystriochogonyaulax cladophora* (Deflandre) Stover and Evitt; see Fisher and Riley, 1980, p.320. For full citation see *Gonyaulacysta canadensis*.

cladophora (Deflandre, 1938b, p.173-176, pl.7, fig.1-5; text-fig.5-6) Stover and Evitt, 1978, p.162. Early Oxfordian; formerly *Gonyaulax* and *Gonyaulacysta*. We herein reject the transfer of this species to the genus *Rhynchodiniopsis* Deflandre by Below, 1981, p.118.

subsp. *cladophora* (Deflandre, 1938b, p.173-176, pl.7, fig.1-5; text-fig.5-6) Stover and Evitt, 1978, p.162. Early Oxfordian; formerly *Gonyaulax cladophora* subsp. *cladophora* and *Gonyaulacysta cladophora* subsp. *cladophora*. Downie and Sarjeant, 1965, p.114 gave the incorrect citation *Gonyaulax cladophora* Deflandre subsp. *cladophora* Klement. We herein reject the transfer of this subspecies to the genus *Rhynchodiniopsis* Deflandre by Below, 1981, p.118.

HYSTRICHOGONYAULAX (cont'd)

- subsp. *extensa* (Klement, 1960, p.36-37, pl.4, fig.1-4; text-fig. 16) Stover and Evitt, 1978, p.162. Early Kimmeridgian; formerly *Gonyaulax cladophora* subsp. *extensa* and *Gonyaulacysta cladophora* subsp. *extensa*. We herein reject the transfer of this subspecies to the genus *Rhynchodiniopsis* Deflandre by Below, 1981, p.118.
- subsp. *hemipolyedrica* (Klement, 1960, p.36, pl.3, fig.10-12; text-fig.14-15) Stover and Evitt, 1978, p.162. Early Kimmeridgian; formerly *Gonyaulax cladophora* subsp. *hemipolyedrica* and *Gonyaulacysta cladophora* subsp. *hemipolyedrica*. We herein reject the transfer of this subspecies to the genus *Rhynchodiniopsis* Deflandre by Below, 1981, p.118.
- subsp. *isovalvata* (Klement, 1960, p.37-38, pl.4, fig.5-9; text-fig.17) Stover and Evitt, 1978, p.163. Early Kimmeridgian; formerly *Gonyaulax cladophora* subsp. *isovalvata* and *Gonyaulacysta cladophora* subsp. *isovalvata*. We herein reject the transfer of this subspecies to the genus *Rhynchodiniopsis* Deflandre by Below, 1981, p.118.
- "*corioides*" (Benedek, 1972). See *Phthanoperidinium corioides*.
NOTE: Stover and Evitt, 1978, p.118 considered this species to be a *jr syn.* of *Phthanoperidinium comatum*. O.C.
- **cornigera* (Valensi, 1953, p.27, pl.1, fig.4,8,10; pl.2, fig.1-2; pl.13, fig.5; text-fig.2a) Sarjeant, 1969, p.14. Bathonian; formerly *Gonyaulax*.
- crispa* (W. Wetzel, 1967, p.870, pl.15, fig.4a-b) Sarjeant, 1980b, p.119. Middle Jurassic; formerly *Gonyaulax* and *Gonyaulacysta*. See also *Cribooperidinium*. The species was emended by Sarjeant *op.cit.* at the time of the transfer.
- ?*nealei* (Sarjeant, 1962a, p.480, pl.69, fig.1; text-fig.2) Sarjeant, 1969, p.14. Oxfordian; formerly *Gonyaulax*. NOTE: Stover and Evitt, 1978, p.163 considered this to be a "provisionally accepted species".
- pectinigera* (Gocht, 1970b, p.138-139, pl.33, fig.1-4; text-fig.11) Stover and Evitt, 1978, p.163; emend. Fensome, 1979, p.43 (as *Gonyaulacysta pectinigera*). Early Bathonian; formerly *Leptodinium subtile* subsp. *pectinigerum*. Stover and Evitt, 1978, p.163 raised this taxon to the species level.
- pennata* (Riley in Fisher and Riley, 1980) *comb. nov.*
1980 *Gonyaulacysta pennata* Riley in Fisher and Riley, p.321-322, pl.1, fig.10-11. Volgian.
- "*polytrix*" (Benedek, 1972). NOW ?*Phthanoperidinium*.

HYSTRICHOGONYAULAX (cont'd)

regalis (Gocht, 1970b, p.139-140, pl.33, fig.5-7; text-fig.10) Stover and Evitt, 1978, p.163. Early Bathonian; formerly *Leptodinium*.

saepita (Ashraf, 1979) *comb. nov.*
1979 *Leptodinium saepitum* Ashraf, p.128, pl.2, fig.27; pl.3, fig.1-3,5. Late Jurassic (Malm).

serrata (Cookson and Eisenack, 1958, p.34, pl.3, fig.2; text-fig.12-14) Stover and Evitt, 1978, p.163. Late Jurassic-Neocomian; formerly *Gonyaulacysta* and *Gonyaulax*.

"*HYSTRICHOKIBOTIUM*" Klumpp, 1953, p.387. Gocht, 1969, p.32 considered this genus to be a *jr syn.* of "*Hystrihosphaera*". Accordingly, he transferred the type of the genus, *Hystrihokibotium pseudofurcatum*, to *Hystrihosphaera*. Subsequently Sarjeant, 1970, p.76 transferred *Hystrihosphaera pseudofurcata* to *Spiniferites*.

"*trabeculiferum*" (Deflandre and Cookson, 1955). NOW ?*Spiniferites*.

HYSTRICHOKOLPOMA Klumpp, 1953, p.388; emend. Williams and Downie, 1966a, p.176.

"*biformoides*" (Eisenack, 1954) Morgenroth, 1966a, p.28. NOW *Achilleodinium*.

bulbosum (Ehrenberg, 1838, pl.1, fig.17) Morgenroth, 1968, p.546-547. Danian; formerly *Hystrihosphaera*, *Hystrihosphaeridium* and *Baltisphaeridium*. We herein reject the contention by Stover and Evitt, 1978, p.55 that *H. bulbosum* is a *jr syn.* of *Hystrihosphaeridium tubiferum*.

subsp. *turgidum* (Williams and Downie, 1966a) *comb. nov.*
1966a *Hystrihokolpoma eisenackii* var. *turgidum* Williams and Downie, p.178-179, pl.17, fig.5. Early Eocene. Also formerly *Hystrihokolpoma eisenackii* subsp. *turgidum*.

**cinctum* Klumpp, 1953, p.389, pl.17, fig.35. Late Eocene.

"*circumtabulatum*" (Drugg, 1967) Schumacker-Lambry, 1978, p.42. The transfer of this species from the genus *Eisenackia* to the genus *Hystrihokolpoma* is herein rejected and the species is retained in *Alisocysta*.

"*clavigerum*" (Deflandre, 1937b) Williams and Downie, 1969, p.17. NOW *Florentinia*.

denticulatum Matsuoka, 1974, p.330-331, pl.44, fig.3-5. Early-Middle Miocene. O.C.

HYSTRICHOKOLPOMA (cont'd)

"*eisenackii*" Williams and Downie, 1966a, p.176-178, pl.17, fig.1-3; text-fig.46. Early Eocene. O.C. *Jr syn.* of *Hystriochokolpoma cinctum*; see Damassa, 1979a, p.823-824.

subsp. "*turgidum*" (Williams and Downie, 1966a) Lentin and Williams, 1973, p.71. NOW *Hystriochokolpoma cinctum* subsp. *turgidum*; formerly *Hystriochokolpoma eisenackii* var. *turgidum*.

ellipticum Matsuoka, 1974, p.330, pl.44, fig.2. Early-Middle Miocene. O.C.

fenestrecomum May, 1980, p.54-55, pl.3, fig.6-11. Maastrichtian.

"*ferox*" (Deflandre, 1937b) Davey, 1969a, p.159. NOW *Florentinia*.

"*fimbriatum*" (Morgenroth, 1968). NOW *Conneximura*.

granulatum Eaton, 1976, p.269-270, pl.10, fig.11-13; text-fig.15. Early-Middle Eocene. O.C.

indicum Salujha and Kindra, 1981, p.52, pl.3, fig.53-54. Early Paleocene.

mentitum McLean, 1974, p.68-69, pl.8, fig.1-5; text-fig.1B. Late Paleocene. The contention that this species is a *jr syn.* of *Alisocysta circumtabulata* by Schumacker-Lambry, 1978, p.42 is herein rejected because of the distinct morphological differences between the two species.

okinawaium Matsuoka, 1979, p.54,56-57, pl.1, fig.6; pl.2, fig.1-4; text-fig.4-5. Early Pleistocene.

pacificum Matsuoka, 1979, p.51,53-54, pl.1, fig.1-5; text-fig.3,5. Early Pleistocene.

poculum Maier, 1959, p.312-313, pl.31, fig.3. Middle Miocene.

rigaudiae Deflandre and Cookson, 1955, p.279-281, pl.6, fig.6,10; text-fig.42. Eocene-Miocene. O.C.

robustum Salujha and Kindra, 1981, p.52, pl.3, fig.55-56. Early Paleocene.

salacium Eaton, 1976, p.271-272, pl.11, fig.1-3; text-fig.16. Early-Late Eocene. O.C.

"*sequanaportus*" Deflandre and Deflandre-Rigaud, 1958, cards 1352-1353, 4 figs. Late Cretaceous. NOTE: Stover and Evitt, 1978, p.55 considered this name to be a *nomen nudum*.

torquatum Damassa, 1979a, p.825-826, pl.3, fig.1-8; pl.4, fig.9-11; text-fig.7. Early-Middle Eocene.

HYSTRICHOKOLPOMA (cont'd)

tumescens McLean, 1974, p.66,68, pl.8, fig.6-9; text-fig.1A.
Late Paleocene.

unispinum Williams and Downie, 1966a, p.179-180, pl.17, fig.6-7.
Early Eocene.

?*xipheum* (Maier, 1959, p.309, pl.30, fig.5) Davey and Williams,
1969, p.5. Middle Miocene; formerly *Galea* and *Hystriosphae-
ridium*. O.C.

"*HYSTRICHOSPHAERA*" O. Wetzel, 1933b, p.33 ex Deflandre, 1937b, p.61.
Jr syn. of *Spiniferites*. See Sarjeant, 1970, p.75. All species
with the exception of those listed below have been transferred
to *Spiniferites*.

"*biformis*" (Wiesner, 1936). NOW *Hystriosphae-
ridium*.

"*borussica*" (Eisenack, 1954). NOW *Rottnestia*.

"*buccina*" (Davey and Williams, 1966a). *Jr syn.* of *Spiniferites
pseudofurcatus* (Klumpp) Sarjeant. See discussion under
"*Spiniferites buccinus*".

"*bulbosa*" (Ehrenberg, 1838). NOW *Hystriocholpoma*.

"*ceratioides*" (Deflandre, 1937b). NOW *Xenascus*.

"*cingulata*" (O. Wetzel, 1933b). NOW *Pterodinium*.

"*clavigera*" (Deflandre, 1937b). NOW *Florentinia*.

"*crassipellis*" (Deflandre and Cookson, 1955). NOW *Achomosphaera*.

"*cruciata*" (O. Wetzel, 1933b). NOW *Hystriosphae-
ridium*.

"*furcata*" (Ehrenberg, 1938). *Jr syn.* of *Spiniferites ramosus*.
See discussion under "*Spiniferites furcatus*".

var. "*membranacea*" (Rossignol, 1964). NOW *Spiniferites
membranaceus*.

var. "*pachyderma*" (Rossignol, 1964). NOW *Spiniferites
pachydermus*.

"*heterostylis*" (Heisecke, 1970). NOW *Achomosphaera*.

"*hirsuta*" (Ehrenberg, 1838). NOW ?*Operculodinium*.

forma "*minor*" (O. Wetzel, 1933b). NOW ?*Operculodinium
hirsutum* subsp. *minor*.

forma "*varians*" (O. Wetzel, 1933b). NOW ?*Operculodinium
hirsutum* subsp. *varians*.

"HYSTRICHOSPHAERA" (cont'd)

"intermedia" (O. Wetzel, 1933b). NOW *Hystriichosphaeridium*.

"ovum" (Deflandre, 1935). NOW *Hystriichosphaeropsis*.

"paradoxa" (Cookson and Eisenack, 1968). NOW *Spiniferites*.

"penicillata" (Ehrenberg, 1843). NOW *Systematophora*.

forma "coronata" (O. Wetzel, 1933b). NOW *Areoligera coronata*.

forma "medusettiiformis" (O. Wetzel, 1933b). See *Areoligera medusettiiformis*.

forma "rhizopodiphora" (O. Wetzel, 1933b). See *Areoligera rhizopodiphora*.

"pilosa" (Ehrenberg, 1843). NOW *Sentusidinium*.

"pseudofurcata" (Klumpp, 1953) Gocht, 1969, p.32. NOW *Spiniferites*; formerly *Hystriichokibotium*.

"pseudofurcata" (Varma and Dangwal, 1964). NOW *Spiniferites varmae*.

"salpingophora" (Deflandre, 1935). NOW *Hystriichosphaeridium*.

"sergipensis" (Regali *et al.*, 1974). NOW ?*Hystriichosphaeridium*.

"tenuicapillata" (O. Wetzel, 1933b). NOW *Areoligera*.

"tertiaria" (Eisenack and Gocht, 1960). *Jr syn.* of *Spiniferites pseudofurcatus*. For complete citation see *Spiniferites tertiaris*.

var. "obliqua" (Wall, 1967). NOW *Spiniferites pseudofurcatus* subsp. *obliquus*.

"tubifera" (Ehrenberg, 1838). NOW *Hystriichosphaeridium*.

"xanthiopyxides" (O. Wetzel, 1933b). NOW *Tanyosphaeridium*.

HYSTRICHOSPHAERIDIUM Deflandre, 1937b, p.68; emend. Davey and Williams, 1966b, p.55-56.

"aemulum" (Deflandre, 1938b). NOW *Adnatosphaeridium*.

"alagoense" (Regali *et al.*, 1974). NOW ?*Surculosphaeridium*.

"albertense" (Pocock, 1962). NOW *Oligosphaeridium*.

"alcicornu" (Eisenack, 1954). NOW *Achomosphaera*.

"amalthei" (W. Wetzel, 1966). NOW ?*Dapsilidinium*.

HYSTRICHOSPHAERIDIUM (cont'd)

- "*ancoriferum*" (Cookson and Eisenack, 1960a). NOW *Cleistosphaeridium*.
- "*anthophorum*" (Cookson and Eisenack, 1958). NOW *Oligosphaeridium*.
- aquitanicum* Deunff, 1961, p.39-40, pl.2, fig.12-13. Cretaceous.
NOTE: Stover and Evitt, 1978, p.56 considered this to be a "problematical species".
- "*aracajuense*" (Regali et al., 1974). NOW *Spiniferites*.
- arborispinum* Davey and Williams, 1966b, p.61, pl.9, fig.5,10.
Early-Middle Barremian.
- "*armatum*" (Deflandre, 1937b). NOW *Cleistosphaeridium*.
- "*aruncium*" Tasch, 1964, p.193, pl.3, fig.12. Albian. Stover and Evitt, 1978, p.267 considered this species to be a synonym of *Kiokansium unituberculatum*.
- "*arundum*" (Eisenack and Cookson, 1960). NOW *Litosphaeridium*.
- "*ashdodense*" (Rossignol, 1962). Jr syn. of *Lingulodinium machaerophorum*; see Wall, 1967, p.109. For full citation see *Cleistosphaeridium ashdodense*.
- "*asperum*" (Maier, 1959). NOW *Dapsilidinium*.
- assanicum* Sah et al., 1970, p.146-147, pl.2, fig.20-21. Late Cretaceous. NOTE: Stover and Evitt, 1978, p.56 considered this to be a "problematical species".
- "*asterigerum*" (Gocht, 1959). NOW ?*Oligosphaeridium*.
- "*asterium*" (Eaton, 1976). NOW *Melitasphaeridium*.
- "*asymmetricum*" (Deflandre and Courteville, 1939). NOW *Callaiosphaeridium*.
- "*bahiaense*" (Regali et al., 1974). NOW ?*Cleistosphaeridium*.
- biforme* (Wiesner, 1936, p.154, pl.7, fig.9) Deflandre, 1946a, card 881. Late Cretaceous; formerly *Hystriichosphaera*.
NOTE: Stover and Evitt, 1978, p.56 considered this to be a "problematical species".
- "*biformoides*" (Eisenack, 1954). NOW *Achilleodinium*.
- bowerbankii* Davey and Williams, 1966b, p.69-70, pl.8, fig.1,4.
Cenomanian. O.C.

HYSTRICHOSPHAERIDIUM (cont'd)

- ?*breviatum* Morgenroth, 1966a, p.29, pl.7, fig.11-12. Early Eocene. NOTE: Stover and Evitt, 1978, p.56 considered this to be a "provisionally accepted species".
- "*brideauxii*" Lentin and Williams, 1973, p.74 (*nom. subst. pro Hystrichosphaeridium cylindratum* Brideaux, 1971, p.91-92, pl.26, fig.69-70; pl.27, fig.74; text-fig.9c, *non Hystrichosphaeridium cylindratum* Morgenroth, 1966a). Harker and Sarjeant, 1975, p.225-226 considered this species to be a *jr syn.* of *Hystrichosphaeridium cooksoniae* Singh.
- "*bulbosum*" (Ehrenberg, 1838). NOW *Hystrichokolpoma*.
- "*caibense*" (Regali *et al.*, 1974). NOW *Apectodinium*.
- calvum* Tasch, 1964, p.193, pl.1, fig.21. Albian. NOTE: Stover and Evitt, 1978, p.56 considered this to be a "problematical species".
- cambayense* Varma and Dangwal, 1964, p.63, pl.1, fig.1-2. Eocene-Oligocene. NOTE: Stover and Evitt, 1978, p.56 considered this to be a "problematical species".
- "*caminuspinum*" (Wall, 1965a). NOW ?*Polysphaeridium*.
- "*cantharellum*" (Brosius, 1963). NOW *Cordosphaeridium*.
- "*capitatum*" (Cookson and Eisenack, 1960b). NOW *Prolixosphaeridium*.
- "*caulleryi*" (Deflandre, 1938b). NOW *Adnatosphaeridium*.
- "*centrocarpum*" (Deflandre and Cookson, 1955). NOW *Operculodinium*.
- var. "*teokides*" (Srivastava and Banerjee, 1969). NOW *Operculodinium centrocarpum* subsp. *teokides*.
- "*choanophorum*" (Deflandre and Cookson, 1955). NOW *Melitasphaeridium*.
- clavicularum* Deflandre, 1938b, p.191-192, pl.10, fig.4. Oxfordian. NOTE: Stover and Evitt, 1978, p.56 considered this to be a "problematical species".
- "*clavigerum*" (Deflandre, 1937b). NOW *Florentinia*.
- "*coelenteratum*" (Tasch, 1964). See ?*Oligosphaeridium coelenteratum*.
- "*colligerum*" (Deflandre and Cookson, 1955). NOW *Diphyes*.
- collum* Tasch, 1964, p.194, pl.2, fig.7, 16. Albian. NOTE: Stover and Evitt, 1978, p.56 considered this to be a "problematical species".

HYSTRICHOSPHAERIDIUM (cont'd)

- "*complex*" (White, 1842). NOW *Oligosphaeridium*.
- "*cooksoniae*" (Singh, 1971). NOW *Florentinia*.
- "*coronatum*" (O. Wetzel, 1933b). NOW *Areoligera*.
- "*costatum*" (Davey and Williams, 1966b). See *Compositosphaeridium costatum*.
- "*crassipes*" (Reade, 1839). NOW ?*Litosphaeridium*.
- "*cribrotubiferum*" (Sarjeant, 1960a). NOW *Surculosphaeridium*.
- cruciatum* (O. Wetzel, 1933b, p.48, pl.4, fig.30) Deflandre, 1937b, p.79. Late Cretaceous; formerly *Hystriichosphaera*. NOTE: Stover and Evitt, 1978, p.56 considered this to be a "problematical species".
- cylindratum* Morgenroth, 1966a, p.30, pl.8, fig.3-4. Early Eocene.
- "*cylindratum*" Brideaux, 1971, p.91-92, pl.26, fig.69-70; pl.27, fig.74; text-fig.9c. *Jr hom., nom subst. Hystriichosphaeridium "brideauxii"* Lentin and Williams, 1973, p.74. This species is a *jr syn.* of *Hystriichosphaeridium* (now *Florentinia*) *cooksoniae*. See Harker and Sarjeant, 1975, p.225-226.
- "*danicum*" (W. Wetzel, 1952). NOW *Cleistosphaeridium*.
- "*deanei*" (Davey and Williams, 1966b). NOW *Florentinia*.
- "*deflandrei*" (Valensi, 1947). NOW ?*Dapsilidinium*.
- "*dictyophorum*" (Cookson and Eisenack, 1958). NOW *Oligosphaeridium*.
- "*dictyostilum*" Menendez, 1965, p.11-12, pl.2, fig.6; pl.3, fig.18-22. Tertiary. Eaton, 1971, p.359 considered this species to be a *jr syn.* of *Areosphaeridium diktyoplokus* (Klumpp) Eaton.
- difficile* Manum and Cookson, 1964, p.12-14, pl.3, fig.1-3,7. Cenomanian.
- "*diktyoplokus*" (Klumpp, 1953). NOW *Areosphaeridium*.
- "*dispare*" (Tasch, 1964). See ?*Oligosphaeridium dispare*.
- "*divergens*" (Eisenack, 1954). NOW *Operculodinium*.
- dowlingii* Harland, 1973, p.681, pl.85, fig.1; text-fig.10. Late Campanian.

HYSTRICHOSPHAERIDIUM (cont'd)

"*eccentrum*" Tasch, 1964, p.194, pl.1, fig.6; pl.2, fig.9. Albian.
Stover and Evitt, 1978, p.267 considered this species to be a
synonym of *Kiokansium unituberculatum*.

echinatum Menendez, 1965, p.12-13, pl.2, fig.9. Late Cretaceous.
NOTE: Stover and Evitt, 1978, p.56 considered this to be a
"problematical species".

"*echinoides*" (Maier, 1959). NOW *Cleistosphaeridium*.

"*ehrenbergii*" (Deflandre, 1947c). NOW *Cleistosphaeridium*.

"*elegantulum*" Lejeune-Carpentier, 1940, p.22; text-fig.11-12.
Turonian-Senonian. *Jr syn.* of *Oligosphaeridium complex*
(White) Davey and Williams. See Deflandre, 1946b, p.111.

"*ellipticum*" (Cookson, 1965a). NOW *Distatodinium*.

"*entomium*" Tasch, 1964, p.193, pl.3, fig.15. Albian. Stover
and Evitt, 1978, p.267 considered this species to be a synonym
of *Kiokansium unituberculatum*.

"*eoinodes*" (Eisenack, 1958). NOW *Kleithriasphaeridium*.

"*equispinosum*" Tasch, 1963, p.336, pl.1, fig.12. Early Permian.
A specimen of the spore *Raistrickia*; see Stover and Evitt,
1978, p.265.

"*erectum*" (Manum and Cookson, 1964). NOW ?*Cleistosphaeridium*.

"*espiritasantense*" (Regali *et al.*, 1974). NOW *Areoligera*.

"*fabium*" (Tasch, 1964). Stover and Evitt, 1978, p.267 considered
this species to be a synonym of *Kiokansium unituberculatum*.
For full citation see *Polysphaeridium fabium*.

"*ferox*" (Deflandre, 1937b). NOW *Florentinia*.

"*floripes*" (Deflandre and Cookson, 1955). NOW *Homotryblum*.

"*flosculus*" (Deflandre, 1937b). NOW ?*Florentinia*.

"*follium*" (Tasch, 1964). Stover and Evitt, 1978, p.267 considered
this species to be a synonym of *Kiokansium unituberculatum*.
For full citation see *Polysphaeridium follium*.

"*fucosum*" (Valensi, 1955a). NOW ?*Dapsilidinium*.

"*geometricum*" (Pastiels, 1948, p.41, pl.4, fig.1-11, *non* Deflandre,
1942). NOW *Apectodinium homomorphum*.

HYSTRICHOSPHAERIDIUM (cont'd)

gliwicense Macko, 1957, p.113, pl.71, fig.11-15; pl.72, fig.1.
Miocene. NOTE: Stover and Evitt, 1978, p.56 considered this
to be a "problematical species".

"*gallaeforme*" (Brosius, 1963). NOW *Achomosphaera*.

"*granulosum*" (Deflandre, 1937b). NOW *Prolixosphaeridium*.

"*heteracanthum*" (Deflandre and Cookson, 1955). NOW ?*Heterosphaeridium*.

hillii (Merrill, 1895, p.17; text-fig.21) Sarjeant, 1964b, p.175.
Early Cretaceous; formerly *Geodia*. O.C. NOTE: Stover and
Evitt, 1978, p.56 considered this to be a "problematical species".

"*hirsutum*" (Ehrenberg, 1838). NOW ?*Operculodinium*.

"*hirundo*" (Eisenack, 1958). NOW ?*Cordosphaeridium*.

"*horridum*" (Deflandre, 1937b). NOW *Baltisphaeridium*, an acritarch.

"*hugonioti*" (Valensi, 1955a). NOW *Cleistosphaeridium*.

"*inodes*" (Klump, 1953). NOW *Cordosphaeridium*.

var. "*gracile*" (Eisenack, 1954). NOW *Cordosphaeridium*
gracile.

intermedium (O. Wetzel, 1933b, p.46, text-fig.14) Deflandre,
1937b, p.77-78. ?Late Cretaceous; formerly *Hystri-
chosphaera*. NOTE: Stover and Evitt, 1978, p.56 considered this to be a
"problematical species".

"*irregulare*" (Merrill, 1895) Sarjeant, 1964b, p.175. NOW *Hystri-
chosphaeridium speciale*; formerly *Geodia*. NOTE: Stover and
Evitt, 1978, p.56 considered this to be a "problematical species".
When Sarjeant *op.cit.* transferred *Geodia irregularis* to *Hystri-
chosphaeridium*, he created a *jr hom.* of *Hystri-
chosphaeridium irregulare* Pocock, and thus he created an illegitimate combina-
tion. *H. irregulare* (Merrill) Sarjeant is therefore given the
new specific epithet, *H. speciale*, in this paper.

"*irregulare*" (Pocock, 1962). NOW *Oligosphaeridium*.

"*isocalamum*" (Deflandre and Cookson, 1955). NOW *Tanyosphaeridium*.

"*israelianum*" (Rossignol, 1962). NOW *Operculodinium*.

"*kiowanum*" Tasch, 1964, p.193, pl.2, fig.1. Albian. Stover and
Evitt, 1978, p.267 considered this species to be a synonym of
Kiokansium unituberculatum.

HYSTRICHOSPHAERIDIUM (cont'd)

- "*langii*" (Wall, 1965a). NOW ?*Dapsilidinium*.
- lateraliprocessum* Srivastava and Banerjee, 1969, p.102, pl.1, fig.1-3. Eocene. NOTE: Stover and Evitt, 1978, p.56 considered this to be a "problematical species".
- latirictum* Davey and Williams, 1966b, p.66-67, pl.10, fig.8. Early Eocene.
- "*leonardianum*" Tasch, 1963, p.336, pl.1, fig.10-11. Early Permian. A specimen of the spore *Raistrickia*; see Stover and Evitt, 1978, p.265.
- "*leptodermum*" (Maier, 1959). NOW *Spiniferites*.
- "*lobospinosum*" (Gocht, in Weiler, 1956). NOW *Chiropteridium*.
- "*longifilum*" Maier, 1959, p.317, pl.32, fig.7. Middle Oligocene. Downie and Sarjeant, 1965, p.92 considered this species to be an acritarch and transferred it to the genus *Baltisphaeridium*. O.C.
- "*longifurcatum*" (Firtion, 1952). NOW ?*Surculosphaeridium*.
- "*machaerophorum*" (Deflandre and Cookson, 1955). NOW *Lingulodinium*.
- "*macro tubulum*" (Neale and Sarjeant, 1962). See *Oligosphaeridium macro tubulum*.
- "*magdali*" (Drugg, 1967). Jr syn. of *Tanyosphaeridium xanthiopyxides*. For complete citation see *Tanyosphaeridium magdali*.
- "*magnarmatum*" Tasch, 1964, p.192, pl.1, fig.22. Albian. Stover and Evitt, 1978, p.267 considered this species to be a synonym of *Kiokansium unituberculatum*.
- "*major*" (Lejeune-Carpentier, 1940). NOW ?*Dapsilidinium*.
- "*mantellii*" (Davey and Williams, 1966b). NOW *Florentinia*.
- "*maranhense*" (Regali et al., 1974). NOW ?*Spiniferites*.
- "*mariannae*" (Philippot, 1949). NOW *Achomosphaera*.
- "*marsupium*" (Tasch, 1964). Stover and Evitt, 1978, p.267 considered this species to be a synonym of *Kiokansium unituberculatum*. For complete citation see *Polysphaeridium marsupium*.
- "*microtrianum*" (Klump, 1953). NOW *Cordosphaeridium*.

HYSTRICHOSPHAERIDIUM (cont'd)

mineralosum Varma and Dangwal, 1964, p.64-65, pl.1, fig.8-12.

Eocene-Oligocene. NOTE: Stover and Evitt, 1978, p.56 considered this to be a "problematical species".

subsp. *jekhowskyi* Varma and Dangwal, 1964, p.65, pl.1, fig.12; pl.2, fig.1. Eocene-Oligocene.

subsp. *labiatum* Varma and Dangwal, 1964, p.64-65, pl.1, fig.10-11. Eocene-Oligocene.

"*monstruosum*" (Tasch, 1964). NOW *Coronifera*.

multicornutum Kimyai, 1966, p.471, pl.2, fig.20. Cenomanian.

NOTE: Stover and Evitt, 1978, p.56 considered this species to be a "problematical species".

"*multifurcatum*" (Deflandre, 1937b). NOW *Cleistosphaeridium*.

"*oligacanthum*" (W. Wetzell, 1952). NOW *Cleistosphaeridium*.

pachydermum Cookson and Eisenack, 1960b, p.251-252, pl.38, fig.5; text-fig.5. Oxfordian-Tithonian. NOTE: Stover and Evitt, 1978, p.56 considered this to be a "problematical species".

palmatum (White, 1842, p.39, pl.4, fig.12 ex Bronn, 1848, p.1375) Downie and Sarjeant, 1965, p.121. Although Stover and Evitt, 1978, p.57 stated that their citation "recognizes Sarjeant's first use of *palmatum* in *Hystriichosphaeridium*", they are incorrect. Using a generic and specific name together does not constitute a new combination. The actual recombination was effected by Downie and Sarjeant, 1965, p.121 under *H. recurvatum*, when they cited the correct page, plate and fig. number as well as three choices of names for the species; formerly *Xanthidium* and *Cordosphaeridium*.

subsp. *parvum* (Rozen, 1965) *comb. nov.*

1965 *Hystriichosphaeridium recurvatum* var. *parvum* Rozen, 1965, p.303-304, pl.4, fig.6; text-fig.13. Late Eocene. NOTE: Lentin and Williams, 1973, p.79 raised this variety to the subspecies level.

"*palmatum*" (Deflandre and Courteville, 1939). NOW ?*Exochosphaeridium*. This species was transferred from *Hystriichosphaeridium* to the acritarch genus *Baltisphaeridium* by Downie and Sarjeant, 1965, p.94.

paracostatum Cookson and Eisenack, 1974, p.65-66, pl.25, fig.11-13. Albian-Senonian.

"*paradoxum*" (Brosius, 1963). NOW *Bipolaribucina*.

HYSTRICHOSPHAERIDIUM (cont'd)

- "*paraense*" (Regali *et al.*, 1974). NOW *Tuberculodinium*.
- "*parvispinum*" (Deflandre, 1937b). NOW *Prolixosphaeridium*.
- parvum* Davey, 1969b, p.5, pl.1, fig.8; pl.2, fig.1. ?Campanian-Maastrichtian.
- "*pattei*" (Valensi, 1948). NOW ?*Lanterna*.
- patulum* Davey and Williams, 1966b, p.60, pl.10, fig.5. Early Eocene.
- paucifurcatum* Cookson and Eisenack, 1961b, p.44, pl.2, fig. 15. Eocene. NOTE: Stover and Evitt, 1978, p.56 considered this to be a "problematical species".
- "*paulinae*" (Valensi, 1953). NOW ?*Dapsilidinium*.
- "*penicillatum*" (Ehrenberg, 1843) Deflandre, 1937b, p.27. NOW *Systematophora*; formerly *Xanthidium*, *Ovum hispidum* and *Hystri-chosphaera*. NOTE: Stover and Evitt, 1978, p.56 considered this species to be a "problematical species" of *Hystri-chosphaeridium*.
- "*perforatum*" (Gocht, 1959). NOW *Oligosphaeridium*.
- "*perovatum*" (Tasch, 1964). Stover and Evitt, 1978, p.267 considered this species to be a synonym of *Kiokansium unituberculatum*. For complete citation see *Polysphaeridium perovatum*.
- perplexum* Varma and Dangwal, 1964, p.64, pl.1, fig.5-6. Eocene-Oligocene. NOTE: Stover and Evitt, 1978, p.56 considered this to be a "problematical species".
- petilum* Gitmez, 1970, p.289-290, pl.9, fig.1,6; text-fig.24. Early Kimmeridgian.
- "*phoenix*" (Duxbury, 1980). NOW *Sureulosphaeridium*.
- "*pilosum*" (Ehrenberg, 1843). NOW *Sentusidinium*.
- "*placacanthum*" (Deflandre and Cookson, 1955). NOW *Systematophora*.
- "*plicatum*" Maier, 1959, p.318, pl.33, fig.1. Middle Oligocene. Downie and Sarjeant, 1965, p.94 considered this species to be an acritarch and transferred it to the genus *Baltisphaeridium*. This transfer is herein accepted although the illustrated specimen appears to be related to the genera *Achomosphaera* and *Spiniferites*.
- "*polonicum*" (Gorka, 1965). NOW *Compositosphaeridium*.

HYSTRICHOSPHAERIDIUM (cont'd)

polyplarium Maier, 1959, p.322-323, pl.33, fig.7-8. Miocene.
NOTE: Stover and Evitt, 1978, p.56 considered this to be a
"problematical species".

"*polytrichum*" (Valensi, 1947). NOW *Cleistosphaeridium*.

"*protellipticum*" Tasch, 1964, p.194, pl.2, fig.2. Albian.
Stover and Evitt, 1978, p.267 considered this species to
be a synonym of *Kiokansium unituberculatum*.

"*pseudhystrihodinium*" (Deflandre, 1937b). NOW ?*Exochosphaeridium*.

"*pseudorecurvatum*" (Morgenroth, 1966a). NOW *Melitasphaeridium*.

"*pterophorum*" (Deflandre and Courteville, 1939). NOW *Dinoptery-*
gium.

"*pulcherrimum*" (Deflandre and Cookson, 1955). NOW *Oligosphaeridium*.

"*radiculatum*" (Davey and Williams, 1966b). NOW *Florentinia*.

"*ramuliferum*" (Deflandre, 1937b). NOW *Achomosphaera*.

rarityanum Kimyai, 1966, p.471, pl.2, fig.19. Cenomanian.
NOTE: Stover and Evitt, 1978, p.56 considered this to be
a "problematical species".

"*readei*" (Davey and Williams, 1966b). NOW *Kleithriasphaeridium*.

"*recurvatum*" (White, 1842, p.39, pl.4, fig.12) Davey and Williams,
1966b, p.67-68. Senonian; formerly *Xanthidium*. *Jr syn.* of
Hystrichosphaeridium palmatum (White) Downie and Sarjeant; see
Stover and Evitt, 1978, p.57.

subsp. "*parvum*" (Rozen, 1965) Lentin and Williams, 1973, p.79.
NOW *Hystrichosphaeridium palmatum* subsp. *parvum*; formerly
Hystrichosphaeridium recurvatum var. *parvum*.

subsp. "*polypes*" (Cookson and Eisenack, 1962b). NOW
Bacchidium polypes.

"*redonense*" Morzadec-Kerfourn, 1966, p.139, pl.2, fig.1-2.
Holocene. *Jr syn.* of *Lingulodinium machaerophorum*; see
Harland, 1977b, p.94.

"*rehdense*" Maier, 1959, p.317-318, pl.32, fig.3-4. Middle Miocene.
Downie and Sarjeant, 1965, p.95 considered this species to be an
acritarch and transferred it to the genus *Baltisphaeridium*.
This transfer is herein accepted although the illustrated speci-
mens appear to be related to the genus *Achomosphaera*.

HYSTRICHOSPHAERIDIUM (cont'd)

"reniforme" (Tasch, 1964). See *Oligosphaeridium reniforme*.

"replexum" Tasch, 1964, p.193, pl.3, fig.14. Albian. Stover and Evitt, 1978, p.267 considered this species to be a synonym of *Kiokansium unituberculatum*.

"rhabdophorum" (Valensi, 1955b). NOW ?*Dapsilidinium*.

robustum Sah et al., 1970, p.146, pl.2, fig.16-17. Late Cretaceous.

salpingophorum Deflandre, 1935, p.232, pl.9, fig.1; emend. Davey and Williams, 1966b, p.61-62. Senonian; formerly *Hystriosphera*.

"salvadorensis" (Regali et al., 1974). NOW *Thalassiphora*.

"saturnium" Maier, 1959, p.319-320, pl.32, fig.8. Middle Miocene. Downie and Sarjeant, 1965, p.95 considered this species to be an acritarch and transferred it to the genus *Baltisphaeridium*. This transfer is herein accepted although the illustrated specimen appears to be related to the genus *Wetzeliella*.

"scaffoldi" (Baksi, 1962). NOW *Cannosphaeropsis*.

scoriaceum Raynaud, 1978, p.393, pl.1, fig.4-5. Berriasian-Middle Valanginian.

senii Srivastava and Banerjee, 1969, p.104, pl.1, fig.12. Eocene. NOTE: Stover and Evitt, 1978, p.56 considered this to be a "problematical species".

?*sergipense* (Regali et al., 1974) *comb. nov.*
1974 *Hystriosphera sergipensis* Regali et al., p.291, pl.24, fig.1. Early Eocene.

"sheppeyense" Davey and Williams, 1966b, p.68-69, pl.11, fig.3. Early Eocene. *Jr syn.* of *Melitasphaeridium pseudorecurvatum*; see Stover and Evitt, 1978, p.179.

"simplex" (White, 1842). NOW *Dapsilidinium*.

"simplicispinum" (Davey and Williams, 1966b). NOW *Kleithriospheraeridium*.

"siphoniphorum" (Cookson and Eisenack, 1958). NOW *Litosphaeridium*.

speciale *nom. nov.*, *nom. subst. pro* *Hystriospheraeridium irregulare* (Merrill, 1895, p.16, text-fig.4) *non* *Hystriospheraeridium irregulare* Pocock, 1962, p.82, pl.15, fig.228-229. Early Cretaceous. See discussion under "*Hystriospheraeridium irregulare*" (Merrill) Sarjeant.

HYSTRICHOSPHAERIDIUM (cont'd)

- spini-pansatum* (Merrill, 1895, p.17; text-fig.20) Sarjeant, 1964b, p.175. Early Cretaceous; formerly ?*Geodia*. NOTE: Stover and Evitt, 1978, p.56 considered this to be a "problematical species".
- "*spinosum*" (White, 1842). NOW *Exochosphaeridium*.
- "*spiralisetum*" (de Wit, 1943). NOW *Cleistosphaeridium*.
- ?*stellatum* Maier, 1959, p.320-321, pl.33, fig.3-4. Middle Oligocene-Middle Miocene. NOTE: Stover and Evitt, 1978, p.56 considered this to be a "provisionally accepted species".
- ?*stephanophorum* Benedek, 1972, p.30-31, pl.9, fig.6; text-fig.10. Middle and Late Oligocene. NOTE: Stover and Evitt, 1978, p.56 considered this to be a "provisionally accepted species".
- "*striatoconus*" (Deflandre and Cookson, 1955). NOW *Conosphaeridium*.
- "*striolatum*" (Deflandre, 1937b). NOW *Coronifera*.
- sylhetii* Baksi, 1962, p.17, fig.26. Eocene. NOTE: Stover and Evitt, 1978, p.56 considered this to be a "problematical species".
- "*tiara*" (Klumpp, 1953). NOW *Operculodinium*.
- "*torynum*" (Cookson and Eisenack, 1960b). NOW *Egmontodinium*.
- transculentum* Sah *et al.*, 1970, p.147, pl.2, fig.18-19. Late Cretaceous. NOTE: Stover and Evitt, 1978, p.56 considered this to be a "problematical species".
- "*tribrachiosum*" (Tasch, 1964). Stover and Evitt, 1978, p.267 considered this species to be a synonym of *Kiokansium unituberculatum*. For complete citation see *Polysphaeridium tribrachiosum*.
- "*tridactylites*" (Valensi, 1955a). NOW *Florentinia*.
- "*triradicosum*" Tasch, 1964, p.194, pl.2, fig.4,14. Albian. Stover and Evitt, 1978, p.267 considered this species to be a synonym of *Kiokansium unituberculatum*.
- "*truncigerum*" (Deflandre, 1937b). NOW *Cordosphaeridium*.
- **tubiferum* (Ehrenberg, 1838, pl.1, fig.16) Deflandre, 1937b, p. 68; emend. Davey and Williams, 1966b, p.56-58. ?Late Cretaceous; formerly *Xanthidium*, *Ovum hispidum* and *Hystrichosphaera*.
- subsp. *brevispinum* (Davey and Williams, 1966b, p.58, pl.10, fig.10) Lentini and Williams, 1973, p.80. Early Eocene; formerly *Hystrichosphaeridium tubiferum* var. *brevispinum*.

HYSTRICHOSPHAERIDIUM (cont'd)

"*unituberculatum*" (Tasch, 1964). NOW *Kiokansium*.

"*valgum*" Tasch, 1964, p.192-193, pl.2, fig.10. Albian. Stover and Evitt, 1978, p.267 considered this species to be a synonym of *Kiokansium unituberculatum*.

"*vasiformum*" (Neale and Sarjeant, 1962). Duxbury, 1977, p.45 considered this species to be a *jr syn.* of ?*Oligosphaeridium asterigerum*. For complete citation see *Oligosphaeridium vasiformum*.

verbinense Courteville in Deflandre, 1946a, card 945. Late Cretaceous. NOTE: Stover and Evitt, 1978, p.57 considered this species to be a "problematical species".

"*vestitum*" (Deflandre, 1938b). NOW ?*Surculosphaeridium*.

"*whitei*" (Deflandre and Courteville, 1939). NOW ?*Cometodinium*.

"*xanthiopyxides*" (O. Wetzel, 1933b). NOW *Tanyosphaeridium*.

"*xipheum*" (Maier, 1959). NOW ?*Hystriochokolpoma*.

"*zoharyi*" (Rossignol, 1962). NOW *Polysphaeridium*.

HYSTRICHOSPHAERINA Alberti, 1961, p.38. Sarjeant, 1966c, p.209 considered this genus to be a *jr syn.* of *Systematophora* Klement. Accordingly, he transferred the type of the genus, *Hystriochosphaerina schindewolfi*, and the one other species "*Hystriochosphaerina turonica*", to *Systematophora*. Stover and Evitt, 1978, p.57-58 retained *Hystriochosphaerina* as a distinct and separate genus.

"*anthophora*" (Cookson and Eisenack, 1958) Duxbury, 1980, p.126. Species herein retained in *Oligosphaeridium*.

"*calatha*" (Sarjeant, 1961a) Duxbury, 1980, p.126. Species herein retained in *Polystephanephorus*.

orbifera (Klement, 1960, p.66-67, pl.9, fig.9-10; pl.10, fig.7) Stover and Evitt, 1978, p.58. Middle Oxfordian; formerly *Systematophora*.

"*paracalatha*" (Sarjeant, 1960) Duxbury, 1980, p.126. Species herein retained in *Polystephanephorus*.

"*sarjeantii*" (Gitmez, 1970) Duxbury, 1980, p.126. Species herein retained in *Emmetrocyta*.

HYSTRICHOSPHERINA (cont'd)

**schindewolfii* Alberti, 1961, p.38, pl.10, fig.1-3,6-7. Late Barremian-Turonian. See also *Systematophora schindewolfii*. The contention that *H. schindewolfii* is a *jr syn.* of *Oligosphaeridium anthophorum* by Davey, 1979c, p.65 is herein rejected.

turonica Alberti, 1961, p.39, pl.10, fig.4a-b. Turonian. See also *Systematophora turonica*.

varians (May, 1980) *comb. nov.*

1980 *Systematophora varians* May, p.68-69, pl.7, fig.12-16. Campanian.

HYSTRICHOSPHEROPSIS Deflandre, 1935, p.232; emend. Sarjeant, 1966b, p.138; emend. Gocht, 1976, p.331-333.

"*borussica*" (Eisenack, 1954). NOW *Rottnestia*.

complanata Eisenack, 1965, p.153, pl.14, fig.5-7; pl.15, fig.5; text-fig.2-3. Late Eocene-Early Oligocene.

downiei (Pocock, 1972, p.87, pl.22, fig.1-2; text-fig.2) Stover and Evitt, 1978, p.164. Oxfordian-Kimmeridgian. We herein reject the contention of Fisher and Riley, 1980, p.320 that this species is a *jr syn.* of *Hystrihogonyaulax cladophora* (Deflandre) Stover and Evitt; formerly *Gonyaulacysta*.

galeata (Cookson and Eisenack, 1960a, p.3-4, pl.1, fig.16-18) Gocht, 1976, p.332. Albian-Cenomanian; formerly *Scriniodinium* and *Psaligonyaulax*.

irisiae (Kjellström, 1973, p.40-42, fig.34) Gocht, 1976, p.333. Middle-Late Maastrichtian; formerly ?*Scriniodinium*.

obscura Habib, 1972, p.379-380, pl.21, fig.1-3. Late Miocene.

**ovum* Deflandre, 1935, p.232, pl.8, fig.11. Senonian. Lentin and Williams, 1973, p.81 rejected the transfer of this species to "*Hystrichosphaera*" by Deflandre, 1937b, p.67.

pontiana (Baltes, 1969, p.35-36, pl.3, fig.15 ex Lentin and Williams, 1973, p.123) Stover and Evitt, 1978, p.164. Early Pliocene; formerly *Scriniodinium*.

quasicribrata (O. Wetzel, 1961, p.340, pl.2, fig.3) Gocht, 1976, p.322. Erratic, ?Late Cretaceous; formerly *Triblastula*. See also *Amphidiadema rectangularis*, *Triblastula nuda* and *Triblastula tubulata*.

rectangularis Bujak, 1980, p.66, pl.16, fig.10-12; text-fig.15. Late Eocene.

HYSTRICHOSTROGYLON Agelopoulos, 1964, p.673; emend. Stover and Evitt, 1978, p.164. Eaton, 1976, p.237 effectively considered this genus a *jr syn.* of *Achomosphaera* Evitt by transferring the type and single species of the genus, *H. membraniphorum*, to *Achomosphaera*. Stover and Evitt, 1978, p.165 rejected this transfer.

**membraniphorum* Agelopoulos, 1964, p.674, text-fig.1-2. Late Eocene. See also *Achomosphaera membraniphora*.



IMBATODINIUM Vozzhennikova, 1967, p.52-53; emend. Dörhöfer and Davies, 1980, p.36-37. Wiggins, 1975, p.103 considered this genus to be a *jr syn.* of *Pareodinia* Deflandre; emend. Wiggins. He accordingly transferred the type of the genus, *Imbatodinium kondratjevi*, and three other species, *I. antennatum*, *I. verrucosum*, and *I. villosum*, to *Pareodinia*. *Imbatodinium villosum* was renamed *Pareodinia dasyforma* Wiggins non *Pareodinia villosa* Tasch. With the designation of *Imbatodinium villosum* as the type of the genus *Gochteodinia* by Norris, 1978, p.7, the name of the species is now *Gochteodinia villosa*. The remaining species *Imbatodinium imbatodinense* was transferred to *Pareodinia* by Lentin and Williams, 1977b, p.88. The transfer of *Imbatodinium imbatodinense* to "*Necrobroomea*" by Wiggins, 1975, p.111 was rejected by Lentin and Williams, *op.cit.* Dörhöfer and Davies, 1980, p.36-37 retained *Imbatodinium* and recognized it as a *sr syn.* of both *Batioladinium* and *Necrobroomea*.

"*antennatum*" (Gitmez and Sarjeant, 1972). NOW *Pareodinia*.

exiguum (Alberti, 1961, p.26, pl.5, fig.14) Dörhöfer and Davies, 1980, p.37. Early Hauterivian; formerly ?*Batioladinium* and *Broomea*.

gochti (Alberti, 1961, p.27, pl.5, fig.8-10, ?16) Dörhöfer and Davies, 1980, p.37. Valanginian; formerly *Batioladinium* and *Broomea*.

imbatodinense Vozzhennikova, 1967, p.55, pl.12, fig.4a-c. Late Jurassic; see also ?*Pareodinia imbatodinensis*. Dörhöfer and Davies, 1980, p.36-37 emended *Imbatodinium* and retained this species in the genus.

jaegeri (Alberti, 1961, p.26, pl.5, fig.1-7) Dörhöfer and Davies, 1980, p.37. Late Barremian; formerly *Batioladinium* and *Broomea*.

**kondratjevi* Vozzhennikova, 1967, p.55, pl.9, fig.1-9; pl.10, fig.1-6; pl.11, fig.1-3; pl.15, fig.3-4. Late Jurassic; see also *Pareodinia kondratjevi*. Dörhöfer and Davies, 1980, p.36-37 emended *Imbatodinium* and retained this species in the genus.

longicornutum (Alberti, 1961, p.27, pl.5, fig.18-21; pl.6, fig.1-2) Dörhöfer and Davies, 1980, p.37. Late Hauterivian-Barremian; formerly *Batioladinium* and *Broomea*.

micropodum (Eisenack and Cookson, 1960, p.7, pl.2, fig.8-9) Dörhöfer and Davies, 1980, p.37. Albian; formerly *Batioladinium* and *Broomea*.

IMBATODINIUM (cont'd)

pelliferum (Alberti, 1961, p.26, pl.5, fig.11-13) Dörhöfer and Davies, 1980, p.38. Late Barremian-Early Aptian; formerly *Batioladinium* and *Broomea*. Wiggins, 1975, p.111 considered this species to be a *jr syn.* of *Imbatodinium micropodium* (as *Batioladinium*); Dörhöfer and Davies, 1980, p.38 refuted this.

?*tricornoides* (Alberti, 1961) *comb. nov.*

1961 ?*Broomea tricornoides* Alberti, p.28, pl.5, fig.17. Late Hauterivian; also formerly ?*Batioladinium*.

"*verrucosum*" (Vozzhennikova, 1967). NOW *Gochteodinia*.

"*villosum*" (Vozzhennikova, 1967). NOW *Gochteodinia*; see also *Pareodinia dasyforma*.

IMPAGIDINIUM Stover and Evitt, 1978, p.165.

aculeatum (Wall, 1967) *comb. nov.*

1967 *Leptodinium aculeatum* Wall, p.104-105, pl.14, fig.18-19; text-fig.3C-D. Pleistocene-Holocene.

allectrolophum (Sarjeant, 1966b, p.134-135, pl.15, fig.3-6; text-fig.34) Stover and Evitt, 1978, p.165. Middle Barremian; formerly *Leptodinium*.

aspinatum (Cookson and Eisenack, 1974, p.63, pl.23, fig.6) Damassa, 1979a, p.826. Paleocene; formerly *Spiniferites cornutus* subsp. *aspinatus* and *Spiniferites cornutus* var. *aspinatus*.

californiense Damassa, 1979a, p.829-830, pl.5, fig.1-13; text-fig.8. Early-Middle Eocene.

cristatum (May, 1980) *comb. nov.*

1980 *Leptodinium cristatum* May, p.57, pl.5, fig.16-20. Campanian-Maastrichtian.

**dispertitum* (Cookson and Eisenack, 1965a, p.122-123, pl.12, fig. 5-7) Stover and Evitt, 1978, p.165. Late Eocene; formerly *Leptodinium*.

elegans (Cookson and Eisenack, 1965a, p.123-124, pl.12, fig.10-13) Stover and Evitt, 1978, p.165. Late Eocene; formerly *Leptodinium*.

maculatum (Cookson and Eisenack, 1961b, p.40, pl.2, fig.5-6) Stover and Evitt, 1978, p.166. Eocene; formerly *Leptodinium*.

margaritifera (Cookson and Eisenack, 1960a, p.5, pl.2, fig.1-2; text-fig.1) Stover and Evitt, 1978, p.166. Campanian; formerly *Gonyaulax* and *Leptodinium*.

IMPAGIDINIUM (cont'd)

- ?*membranigerum* (Gerlach, 1961, p.162-164, pl.26, fig.1-4,7; text-fig.4-5) Stover and Evitt, 1978, p.166. Late Oligocene; formerly *Leptodinium*. NOTE: Stover and Evitt, 1978, p.166 considered this to be a "provisionally accepted species".
- multiplexum* (Wall and Dale, 1968) *comb. nov.*
1968 *Leptodinium multiplexum* Wall and Dale, p.318, pl.1, fig. 1-7. Early Pleistocene.
- ?*ovum* (Sah *et al.*, 1970, p.147-148, pl.2, fig.25) Stover and Evitt, 1978, p.166. Late Cretaceous; formerly *Leptodinium*. NOTE: Stover and Evitt, 1978, p.166 considered this to be a "provisionally accepted species".
- paradoxum* (Wall, 1967, p.106-107, pl.15, fig.5-8; text-fig. 2-3A,B) Stover and Evitt, 1978, p.166. Middle Miocene-Recent; formerly *Leptodinium*.
- patulum* (Wall, 1967, p.105-106, pl.14, fig.20; pl.15, fig.1-4; text-fig.4) Stover and Evitt, 1978, p.166. Middle Miocene-Holocene; formerly *Leptodinium*.
- pentahedrias* Damassa, 1979b, p.202, 204, pl.3, fig.22,24-26, 28-29; pl.4, fig.1-3,6; text-fig.4. Early Paleocene.
- ?*simplicium* (Cookson and Eisenack, 1961b, p.42, pl.2, fig.3-4; text-fig.1e-f) Stover and Evitt, 1978, p.166. Eocene; formerly *Psaliogonyaulax* and *Rottnestia*. NOTE: Stover and Evitt, 1978, p.166 considered this to be a "provisionally accepted species".
- sphaericum* (Wall, 1967) *comb. nov.*
1967 *Leptodinium sphaericum* Wall, p.108, pl.15, fig.11-15; text-fig.2a-c. Pleistocene-Holocene.
- striatum* (Wall, 1967, p.107-108, pl.15, fig.9-10; text-fig.5) Stover and Evitt, 1978, p.166. Middle Miocene-Holocene; formerly *Leptodinium*.
- striatum* (Clarke and Verdier, 1967, p.31, pl.4, fig.11-13; pl.5, fig.15; text-fig.12) Stover and Evitt, 1978, p.166. Santonian; formerly *Gonyaulacysta* and *Leptodinium*.
- verrucosum* (Brideaux and McIntyre, 1975, p.30, pl.9, fig.1-8) Stover and Evitt, 1978, p.166. Middle Albian; formerly *Pterodinium*.
- victorianum* (Cookson and Eisenack, 1965a, p.123, pl.12, fig.8-9) Stover and Evitt, 1978, p.166. Late Eocene; formerly *Leptodinium*.

IMPAGIDINIUM (cont'd)

?*whitei* (Sarjeant, 1966b, p.126-128, pl.14, fig.2; text-fig.32)
Stover and Evitt, 1978, p.166. Cenomanian; formerly *Gonyaula-*
cysta. NOTE: Stover and Evitt, 1978, p.166 considered this
to be a "provisionally accepted species".

IMPLETOSPHAERIDIUM Morgenroth, 1966a, p.32

capillaceum Morgenroth, 1966a, p.33, pl.9, fig.12. Early Eocene.

cingulatum (Grigorovich, 1971, p.94, pl.2, fig.1) Stover and
Evitt, 1978, p.232-233. Paleocene; formerly *Cliosphaeridium*.
O.C.

cracens Eaton, 1976, p.306, pl.21, fig.6; text-fig.25E. Early-
Late Eocene.

?*densicomatum* (Maier, 1959, p.307, pl.29, fig.7-8) Morgenroth,
1966a, p.33. Middle Oligocene-Middle Miocene; formerly *Galea*
and *Baltisphaeridium*.

"*erinaceum*" (Morgenroth, 1966a). NOW *Operculodinium*.

implicatum Morgenroth, 1966a, p.34, pl.9, fig.1-3. Early Eocene.

"*insolitum*" (Eaton, 1976). NOW ?*Cleistosphaeridium*.

kroemmelbeinii Morgenroth, 1966a, p.34-35, pl.9, fig.4-5. Early
Eocene. Orthographic correction used by Eaton, 1976, p.308.

labyrinthus Morgenroth, 1966a, p.35, pl.9, fig.6-7. Early Eocene.

luxurium Eaton, 1976, p.309, pl.21, fig.3-4; text-fig.25F.
Middle-Late Eocene.

multispinosum Benedek, 1972, p.31-32, pl.11, fig.11; pl.12,
fig.15. Middle Oligocene.

"*panniforme*" (Gerlach, 1961) Morgenroth, 1966a, p.35. NOW
Cleistosphaeridium; formerly *Baltisphaeridium*.

"*placacanthum*" (Deflandre and Cookson, 1955) Morgenroth, 1966a,
p.35. NOW *Systematophora*.

"*pycnospinosum*" (Benedek, 1972). NOW ?*Lingulodinium*.

rugosum Morgenroth, 1966a, p.36, pl.10, fig.2-3. Early Eocene.

severinii (Cookson and Cranwell, 1967, p.208, pl.3, fig.1-2)
Liengjarern *et al.*, 1980, p.486. Eocene-Oligocene; formerly
Baltisphaeridium.

IMPLETOSPHAERIDIUM (cont'd)

**transfodum* Morgenroth, 1966a, p.32, pl.10, fig.4-5. Early Eocene.

"*whitei*" (Deflandre and Courteville, 1939) Morgenroth, 1966a, p.37. NOW ?*Cometodinium*; formerly *Hystriosphæridium* and *Baltisphaeridium*.

"INVERSIDINIUM" McLean, 1973b, p.730. Jr syn. of *Palaeotetradinium*; see Stover and Evitt, 1978, p.70.

"*caudatum*" (Benson, 1976). NOW *Palaeotetradinium*.

"*exilimum*" McLean, 1973b, p.730,732, pl.90, fig.1-9. Late Paleocene. Jr syn. of *Palaeotetradinium minusculum* (Alberti) Stover and Evitt; see Stover and Evitt, 1978, p.71.

"ISABELIA" Lentin and Williams, 1976, p.56 non *Isabelia* Barbosa-Rodrigues (an orchid). SEE *Isabelidium*.

ISABELIDIINIUM Lentin and Williams, 1977a, p.167. (nom. subst. pro *Isabelia* Lentin and Williams, 1976, p. 56).

acuminatum (Cookson and Eisenack, 1958, p.27, pl.4, fig.5-8) Stover and Evitt, 1978, p.109. Cenomanian-Early Turonian; formerly *Alterbia* and *Deflandrea*.

?*amphiatum* (McIntyre, 1975, p.65-66, pl.2, fig.5-8) Lentin and Williams, 1977a, p.167. Campanian-Maastrichtian; formerly *Deflandrea*.

bakeri (Deflandre and Cookson, 1955, p.251, pl.4, fig.1-2,4) Lentin and Williams, 1977a, p.167. Paleocene-Early Eocene; formerly *Deflandrea*.

balmei (Cookson and Eisenack, 1962b, p.486 nom. subst. pro *Deflandrea minor* Cookson and Eisenack, 1960a, p.2, pl.1, fig. 1-3) Stover and Evitt, 1978, p.109. Turonian-Middle Senonian; formerly *Alterbia* and *Deflandrea*.

belfastense (Cookson and Eisenack, 1961a, p.71, pl.11, fig.4-6) Lentin and Williams, 1977a, p.167. Senonian; formerly *Deflandrea*.

"*conoratum*" (Stover, 1974) Lentin and Williams, 1977a, p.167. NOW *Eurydinium*; formerly *Deflandrea*. O.C.

cooksoniae (Alberti, 1959b, p.97, pl.9, fig.1-6) Lentin and Williams, 1977a, p.167. Late Senonian; formerly *Deflandrea* and *Australiella*.

cretaceum [(Cookson, 1956, p.184-185, pl.1, fig.1-5 (non 6-7, which are now *Nelsoniella aceras*)] Lentin and Williams, 1977a, p.167. Late Cretaceous; formerly *Deflandrea*.

ISABELIDINIUM (cont'd)

"*dakotaense*" (Stanley, 1965) Lentin and Williams, 1977a, p.167.
NOW ?*Chatangiella*; formerly *Deflandrea*.

delicatum (Baltes, 1969, p.34, pl.1, fig.7 ex Lentin and Williams, 1973, p.40) Lentin and Williams, 1977a, p.167. Early Eocene; formerly *Deflandrea*.

druggii (Stover, 1974, p.171, pl.1, fig.3a-b,4) Lentin and Williams, 1977a, p.167. Early-Middle Paleocene; formerly *Deflandrea*. O.C.

?*extremum* (Cookson and Eisenack, 1974, p.48, pl.20, fig.4) Stover and Evitt, 1978, p.109. Albian-Cenomanian; formerly *Deflandrea* and ?*Spongodinium*. NOTE: Stover and Evitt, 1978, p.109 considered this to be a "provisionally accepted species".

gallium (Davey and Verdier, 1973, p.196-197, pl.3, fig.1-4) Stover and Evitt, 1978, p.109. Late Albian; formerly *Deflandrea* and *Spinidinium*.

"*gambangense*" (Cookson and Eisenack, 1970a) Lentin and Williams, 1977a, p.167. NOW *Eucladinium*; formerly *Deflandrea*.

glabrum (Cookson and Eisenack, 1969, p.3, fig.1a) Lentin and Williams, 1977a, p.167. Albian-Cenomanian; formerly *Deflandrea*.

?*globosum* (Davey, 1970, p.344, pl.2, fig.3) Lentin and Williams, 1977a, p.167. Cenomanian; formerly *Deflandrea*. This species is tentatively placed in *Isabelidinium*, although it may be an endocyst.

"*glomeratum*" (Davey, 1970) Lentin and Williams, 1977a, p.167.
NOW *Eurydinium*; formerly *Deflandrea*.

**korojonense* (Cookson and Eisenack, 1958, p.27-28, pl.4, fig.10-11) Lentin and Williams, 1977a, p.167. Campanian-Early Maastrichtian; formerly *Deflandrea*.

latum (Cookson and Eisenack, 1968, p.110; text-fig.1a-c) Lentin and Williams, 1977a, p.168. ?Santonian-Early Campanian; formerly *Deflandrea*.

"*madureense*" (Cookson and Eisenack, 1970a) Lentin and Williams, 1977a, p.168. NOW *Eucladinium*; formerly *Deflandrea*.

magnum (Davey, 1970, p.342-343, pl.2, fig.6-8) Stover and Evitt, 1978, p.109. Cenomanian; formerly *Chatangiella* and *Deflandrea*.

ISABELIDINIUM (cont'd)

microarmum (McIntyre, 1975, p.65, pl.1, fig.5-8) Lentin and Williams, 1977a, p.168. Campanian-Maastrichtian; formerly *Deflandrea*.

pellucidum (Deflandre and Cookson, 1955, p.251, pl.4, fig.3) Lentin and Williams, 1977a, p.168. Paleocene-Early Eocene; formerly *Deflandrea bakeri* forma *pellucida*. This forma was raised to the species level by Cookson and Eisenack, 1958, p.27.

?*rhombovale* (Cookson and Eisenack, 1970a, p.143, pl.12, fig.10-11) Lentin and Williams, 1977a, p.168. Late Albian-Senonian; formerly *Deflandrea*. NOTE: Stover and Evitt, 1978, p.109 considered this to be a "provisionally accepted species".

seelandicum (Lange, 1969, p.113-114, pl.2, fig.10; pl.3, fig.3) Lentin and Williams, 1977a, p.168. Danian; formerly *Broomea*.

spasicum (Grigorovich, 1969b) *comb. nov.*
1969b *Australiella spastica* Grigorovich, p.67-68, pl.1, fig. 1. Late Cretaceous.

"*spinosissimum*" (Cookson and Eisenack, 1970a) Lentin and Williams, 1977a, p.168. NOW *Eucladinium*; formerly *Deflandrea*.

thomasi (Cookson and Eisenack, 1961a, p.71-72, pl.11, fig.7-10) Lentin and Williams, 1977a, p.168. Senonian; formerly *Deflandrea*. O.C.

ISTHMOCYSTIS Duxbury, 1979a, p.199-200.

**distincta* Duxbury, 1979a, p.201, pl.1, fig.1-6; pl.2, fig.8; text-fig.3-4. Valanginian.



JANSONIA Pocock, 1972, p.97.

**jurassica* Pocock, 1972, p.97-98, pl.29, fig.8-9; text-fig.14-15.
Late Bajocian.

JUSELLA Vozzhennikova, 1963, p.183.

crebraporosa Vozzhennikova, 1967, p.120, pl.53, fig.1-6. Early
Oligocene.

**denticulata* Vozzhennikova, 1963, p.183; text-fig.19a-b. Early
Oligocene. Holotype lost. Lectotype chosen by Vozzhennikova,
1967, p.119-120, pl.52, fig.1-5.

"*rariporosa*" Vozzhennikova, 1967, p.119-120. Invalid. Name
chosen by Vozzhennikova to replace the name *J. denticulata*
as her interpretation of the morphology of *J. denticulata*
was incorrect in 1963. However, under the I.C.B.N. (Article
62) the original specific name cannot be changed in this way.



KAIWARADINIUM Wilson, 1978, p.81-82.

**buccinatum* Wilson, 1978, p.82, fig.2-8. Early Tithonian.

KALLOSPHAERIDIUM De Coninck, 1969, p.44.

?*agglutinatum* McIntyre and Brideaux, 1980, p.25, pl.12, fig.5-12.
Valanginian.

?*bellulum* (Jiabo, 1978) *comb. nov.*

1978 *Tenua bellula* Jiabo, p.51, pl.23, fig.14-16. Early
Tertiary.

biornatum Stover, 1977, p.73-74, pl.1, fig.9-10. Early Oligocene.

"*biornatum*" (Jiabo, 1978). *Jr hom.* of *Kallosphaeridium biornatum*
Stover, 1977. NOW *Kallosphaeridium biparatum nom. nov.*

subsp. "*biornatum*". *Jr hom.* NOW *Kallosphaeridium biparatum*
subsp. *biparatum*.

subsp. "*crassum*" (Jiabo, 1978). *Jr hom.* NOW *Kallosphaeridium*
biparatum subsp. *crassum*.

biparatum comb. nov., nom. nov., nom. subst. pro Kallosphaeridium
biornatum (Jiabo, 1978) non *K. biornatum* Stover, 1977.
1978 *Tenua biornata* (O.C.) Jiabo, p.52, pl.22, fig.21-29; pl.23,
fig.1-4. Early Tertiary.

subsp. *biparatum comb. nov., nom. nov., nom. subst. pro*
Kallosphaeridium biornatum (Jiabo) *biornatum* non *K. biornatum*
Stover *biornatum*.

1978 *Tenua biornata* Jiabo *biornata* (O.C.) Jiabo, p.52,
pl.22, fig.21-29. Early Tertiary.

subsp. *crassum comb. nov., nom. nov., nom. subst. pro Kallo-*
sphaeridium biornatum (Jiabo) *crassum* non *K. biornatum*
Stover

1978 *Tenua biornata* Jiabo *crassa* (O.C.) Jiabo, p.52, pl.23,
fig.1-4. Early Tertiary.

**brevibarbatum* De Coninck, 1969, p.44-45, pl.13, fig.14-15.
Early Eocene.

capulatum Stover, 1977, p.74, pl.1, fig.11-13. Middle-Late
Oligocene.

KALLOSPHAERIDIUM (cont'd)

coninckii (Burger, 1980a, p.74, pl.26, fig.5-6) Burger, 1980b, p.277. Albian; formerly *Membranosphaera*.

granulatum (Norvick in Norvick and Burger, 1976, p.79-80, pl.11, fig.9; pl.12, fig.3) Stover and Evitt, 1978, p.59. Cenomanian; formerly *Membranosphaera*.

?*minor* (Jiabo, 1978) *comb. nov., stat. nov.*

1978 *Tenua hystrix* subsp. *minor* Jiabo, p.52-53, pl.23, fig.5-7. Early Tertiary.

norvickii (Burger, 1980a) *comb. nov.*

1980a *Membranosphaera norvickii* Burger, p.73-74, pl.26, fig. 7-8. Albian.

orchiesense De Coninck, 1975, p.101-102, pl.18, fig.15-17. Early Eocene (Ypresian).

romaense (Burger, 1980a, p.74, pl.27, fig.1-3) Burger, 1980b, p.277. Aptian; formerly *Membranosphaera*.

KALYPTEA Cookson and Eisenack, 1960b, p.256; emend. Wiggins, 1975, p.110. Gocht, 1970b, p.154 considered this genus to be a *jr syn.* of *Pareodinia*. Dörhöfer and Davies, 1980, p.30 considered *Kalyptea* and *Komeuria* to be synonymous. They preferred to retain *Komeuria* and suppress *Kalyptea* because the original description of *Komeuria* better circumscribed pareodiniacean forms with an antapical horn than that of *Kalyptea*. Since *Kalyptea* and *Komeuria* were erected in the same publication (Cookson and Eisenack, 1960b), the author who first designated the two genera as being synonymous (Wiggins, 1975) had the right of name choice and must be followed (I.C.B.N. Art. 57). Therefore the generic epithet *Kalyptea* must be retained and *Komeuria* suppressed (E.H. Davies, pers. comm.).

"*aceras*" (Manum and Cookson, 1964). NOW *Caligodinium*.

**dicerias* Cookson and Eisenack, 1960b, p.256-257, pl.39, fig.1; emend. Fisher and Riley, 1980, p.323. Tithonian. Gocht, 1970b, p.154 considered this species to be a questionable *jr syn.* of *Pareodinia ceratophora* Deflandre. However Wiggins, 1975, p.110 presented an emended diagnosis for *Kalyptea* and retained *K. dicerias* as the type of the genus. The transfer of this species to *Komeuria* by Dörhöfer and Davies, 1980, p.30 is herein rejected.

distincta Jain and Millepied, 1975, p.145-146, pl.4, fig.65. Aptian-Albian. NOTE: Stover and Evitt, 1978, p.110 considered this to be a "problematical species".

KALYPTEA (cont'd)

glabra (Cookson and Eisenack, 1960b, p.257, pl.39, fig.7-8) Wiggins, 1975, p.110. Probably Tithonian. The retention of this species in *Komewuia* by Dörhöfer and Davies, 1980, p.31 is herein rejected.

"*granulata*" (Jiabo, 1978). NOW *Caligodinium*.

"*halosa*" (Filatoff, 1975). NOW *Caddasphaera*. NOTE: Stover and Evitt, 1978, p.110 considered this to be a "problematical species" of *Kalyptea*.

"*jurassica*" Alberti, 1961, p.21, pl.7, fig.8. Wiggins, 1975, p.110 considered this species to be a *jr syn.* of *Kalyptea stegasta* (Sarjeant) Wiggins. Prior to this Gocht, 1970b, p.154 considered *Kalyptea jurassica* to be a questionable *jr syn.* of *Pareodinia ceratophora* Deflandre.

"*monoceras*" Cookson and Eisenack, 1960b, p.275, pl.39, fig.2-3. Gocht, 1970b, p.154 considered this species to be a questionable *jr syn.* of *Pareodinia ceratophora* Deflandre. Wiggins 1975, p.103 also considered "*Kalyptea monoceras*" to be a *jr syn.* of *Pareodinia ceratophora*.

"*stegasta*" (Sarjeant, 1961a) Wiggins, 1975, p.110. NOW and formerly *Netrelytron*. See Sarjeant, 1976c, p.16.

"*trinetron*" (Sarjeant, 1966c) Wiggins, 1975, p.110. NOW and formerly *Netrelytron*. See Sarjeant, 1976c, p.16-17.

KENLEYIA Cookson and Eisenack, 1965b, p.135-136.

?*essentialis* (De Coninck, 1969, p.38, pl.11, fig.7-8) Stover and Evitt, 1978, p.167. Early Eocene; formerly *Lanternosphaeridium*. NOTE: Stover and Evitt, 1978, p.167 considered this to be a "provisionally accepted species".

"*fimbriata*" (Cookson and Eisenack, 1967b). NOW *Muratodinium*.

leptocerata Cookson and Eisenack, 1965b, p.136, pl.17, fig.5-6. Paleocene.

lophophora Cookson and Eisenack, 1965b, p.136-137, pl.17, fig.7-10. Paleocene.

?*nuda* De Coninck, 1969, p.45-46, pl.13, fig.24-25. Early Eocene. NOTE: Stover and Evitt, 1978, p.167 considered this to be a "provisionally accepted species".

**pachycerata* Cookson and Eisenack, 1965b, p.136, pl.17, fig.1-3. Paleocene.

KIOKANSIUM Stover and Evitt, 1978, p.167.

**unituberculatum* (Tasch, 1964, p.194, pl.3, fig.8) Stover and Evitt, 1978, p.167. Albian; formerly *Hystrichosphaeridium*.

"*KISSELEVIA*" Vozzhennikova, 1967, p.103. Presumably an orthographic misrepresentation of *Kisselovia* Vozzhennikova. Lentin and Williams, 1973, p.83 were in error when they stated that *Kisselovia* Vozzhennikova, 1963 was a *nomen nudum*. They based their statement on the fact that a holotype was not designated for the type of the genus, *Kisselovia ornata*. *Kisselovia* was and remains the correct orthography for the valid name under I.C.B.N. Art. 37.

KISSELOVIA Vozzhennikova, 1963, p.183. Lentin and Williams, 1973 p.83 were in error when they stated that *Kisselovia* was a *nomen nudum* because a holotype was not designated for the type of the genus, *K. ornata*. As Stafleu (personal communication) has pointed out, a type cannot be validly published, only a name can (I.C.B.N. Art. 37). *Kisselovia* is therefore valid.

?*clathrata* (Eisenack, 1938, p.187, text-fig.5) Lentin and Williams, 1976, p.136. Late Eocene-Early Oligocene; formerly *Wetzeliella*.

subsp. *angulosa* Châteauneuf and Graus-Cavagnetto, 1978, p.69-70, pl.5, fig.8-9. Early Oligocene (Sannoisian).

subsp. "*fasciata*" (Rozen, 1965) Lentin and Williams, 1976, p. 136. NOW *Kisselovia fasciata*; formerly *Wetzeliella clathrata* var. *fasciata*. Raised to subspecies status by Lentin and Williams, 1973, p.141.

coleothrypta (Williams and Downie, 1966b, p.185-186, pl.18, fig.8-9; text-fig.47) Lentin and Williams, 1976, p.136. Early Eocene; formerly *Wetzeliella*.

subsp. *rotundata* Châteauneuf and Gruas-Cavagnetto, 1978, p. 68-69, pl.3, fig.5. Middle-Late Eocene (Lutetian-Bartonian).

crassiramosa (Williams and Downie, 1966b, p.189-190, pl.19, fig.1,5; text-fig.50) Damassa, 1979a, p.837. Early Eocene; formerly *Wetzeliella tenuivirgula* var. *crassiramosa*, *Wetzeliella tenuivirgula* subsp. *crassiramosa* and *Kisselovia tenuivirgula* subsp. *crassiramosa*. Raised to subspecies status by Lentin and Williams, 1973, p.143. O.C. The elevation of this taxon to species status is not attributable to Costa and Downie, 1979, p.44.

edwardsii (Wilson, 1967c, p.477, fig.8-9) Stover and Evitt, 1978, p.111. Early Eocene; formerly *Wetzeliella*. O.C. The transfer of this species from *Wetzeliella* to *Kisselovia* is not attributable to Costa and Downie, 1979, p.44.

KISSELOVIA (cont'd)

fasciata (Rozen, 1965, p.296-297, pl.2, fig.13; text-fig.4)
Costa and Downie, 1979, p.44. Late Eocene; formerly *Wetzeliella clathrata* var. *fasciata*, *Wetzeliella clathrata*
subsp. *fasciata* and *Kisselovia clathrata* subsp. *fasciata*.

insolens Eaton, 1976, p.292-293, pl.18, fig.1-2. Early Eocene.

"major" Vozzhennikova, 1960, pl.3, fig.1. No diagnosis given.
nom. nud. Vozzhennikova, 1967, p.104-105 designated as
holotype a specimen which has been destroyed.

**ornata* Vozzhennikova, 1967, p.103-104, pl.42, fig.1-3; pl.43,
fig.1-4; pl.44, fig.1-12; pl.45, fig.1-3. Eocene.

subsp. *ornata* (Vozzhennikova, 1967, p.104, pl.42, fig.1-3;
pl.43, fig.1-4; pl.44, fig.4-6,9-12) Lentin and Williams,
1973, p.84. Eocene; formerly *Kisselevia ornata* forma
ornata.

subsp. *reticulata* (Vozzhennikova, 1967, p.104, pl.44, fig.1-3,
7-8; pl.45, fig.1-3) Lentin and Williams, 1973, p.84.
Eocene; formerly *Kisselevia ornata* forma *reticulata*.

reticulata (Williams and Downie, 1966b, p.187-188, pl.19, fig.3,6;
text-fig.48) Lentin and Williams, 1976, p.136. Early Eocene;
formerly *Wetzeliella*.

stellata Damassa, 1979a, p.834,837, pl.7, fig.1-7. Early-Middle
Eocene.

tenuivirgula (Williams and Downie, 1966b, p.188-189, pl.19,
fig.2,4; text-fig.49) Lentin and Williams, 1976, p.136. Early
Eocene; formerly *Wetzeliella*.

subsp. *conopia* (Williams and Downie, 1966b, p.184, pl.18,
fig.5) Costa and Downie, 1979, p.44. Early Eocene; formerly
Wetzeliella articulata var. *conopia* and *Wetzeliella articulata*
subsp. *conopia*.

subsp. "*crassiramosa*" (Williams and Downie, 1966b) Lentin and
Williams, 1976, p.137. NOW *Kisselovia crassiramosa*; formerly
Wetzeliella tenuivirgula var. *crassiramosa*. Raised to sub-
species status by Lentin and Williams, 1973, p.143. O.C.

variabilis Bujak, 1980, p.67, pl.17, fig.1-6; text-fig.16.
Late Eocene.

KLEITHRIASPHAERIDIUM Davey, 1974, p.55-56.

**corrugatum* Davey, 1974, p.56-57, pl.5, fig.1-5; text-fig.3.
Early Barremian.

KLEITHRIASPHERIDIUM (cont'd)

eoinodes (Eisenack, 1958, p.402, pl.27, fig.3-4) Davey, 1974, p.58. Late Aptian; formerly *Hystrichosphaeridium* and *Cordosphaeridium*.

fasciatum (Davey and Williams, 1966b, p.90, pl.7, fig.5-6) Davey, 1974, p.57. Barremian; formerly ?*Cordosphaeridium*.

loffrense Davey and Verdier, 1976, p.310-312, pl.1, fig.1-6. Senonian.

readei (Davey and Williams, 1966b, p.64-65, pl.6, fig.3) Davey and Verdier, 1976, p.314. Cenomanian; formerly *Hystrichosphaeridium*. Davey and Verdier, 1976, p.314 also emended the species diagnosis.

simplicispinum (Davey and Williams, 1966b, p.59-60, pl.9, fig.3) Davey, 1974, p.57. Barremian; formerly *Hystrichosphaeridium*.

telaspinosum (Fisher and Riley, 1980) *comb. nov.*
1980 ?*Hystrihodinium telaspinosum* Fisher and Riley, p.322, pl.1, fig.5. Volgian. The transfer of this species from ?*Hystrihodinium* to *Kleithriasphaeridium* cannot be attributed to Riley, 1979, p.221.

truncatum (Benson, 1976, p.184-185, pl.2, fig.6-9) Stover and Evitt, 1978, p.168. Late Maastrichtian-Early Paleocene; formerly "*Diversispina*".

tubulosum (Cookson and Eisenack, 1969, p.5-6, pl.2, fig.D-F) Stover and Evitt, 1978, p.168. Albian-Cenomanian; formerly *Conosphaeridium*.

"*KOFOIDOPSIS*" Tasch, 1963, p.333. The type species of this "genus" is based on a mineral grain; see Stover and Evitt, 1978, p.265, 294.

"**coronata*" Tasch, 1963, p.333-334, pl.1, fig.7-8. Early Permian. This species is based on a mineral grain; see Stover and Evitt, 1978, p.265.

"*KOMEWUIA*" Cookson and Eisenack, 1960b, p.257; emend. Dörhöfer and Davies, 1980, p.30. Wiggins, 1975, p.110 considered this genus to be a *jr syn.* of *Kalyptea* Cookson and Eisenack; emend. Wiggins. He accordingly transferred the type of the genus *Komewuia*, *K. glabra*, to *Kalyptea*. Dörhöfer and Davies, 1980, p.30 preferred to retain *Komewuia* and suppress *Kalyptea* because the original description of *Komewuia* better circumscribed pareodiniacean forms with an antapical horn than that of *Kalyptea*. Since *Kalyptea* and *Komewuia* were erected in the same publication (Cookson and Eisenack, 1960b), the author who first designated the two genera as being synonymous (Wiggins, 1975) had the right of name choice and must be followed (I.C.B.N. Art. 57). Therefore the generic epithet *Kalyptea* must be retained and *Komewuia* suppressed (E.H. Davies, pers. comm.).

"KOMEWUIA" (cont'd)

"*diceras*" (Cookson and Eisenack, 1960b; emend. Fisher and Riley, 1980, p.323) Dörhöfer and Davies, 1980, p.30. NOW and formerly *Kalyptea*. The transfer of this species to the genus *Komewuia* by Dörhöfer and Davies, *op.cit.* is herein rejected.

"**glabra*" (Cookson and Eisenack, 1960b). NOW *Kalyptea*.

KOROJONIA Cookson and Eisenack, 1958, p.54.

**dubiosa* Cookson and Eisenack, 1958, p.54, pl.12, fig.13.
Cenomanian-Early Maastrichtian.

KYLINDROCYSTA Fenton *et al.*, 1980, p.162.

**spinosa* Fenton *et al.*, 1980, p.162-163, pl.14, fig.10-13; pl.15, fig.2,4-6. Late Bajocian.



LABYRINTHODINIUM Piasecki, 1980, p.67.

**truncatum* Piasecki, 1980, p.67,70, pl.2, fig.9-11; pl.3, fig.2;
pl.6, fig.3-4. Middle Miocene.

LACINIADINIUM McIntyre, 1975, p.70.

arcticum (Manum and Cookson, 1964, p.18-19, pl.6, fig.1-4)
Lentin and Williams, 1980, p.41. Cenomanian; formerly
Diconodinium.

biconiculum McIntyre, 1975, p.71, pl.4, fig.5-9. Campanian.

firmum (Harland, 1973, p.669-670, pl.84, fig.8-9,15; text-fig.6)
Morgan, 1977, p.136. Late Campanian; formerly *Diconodinium*.
This transfer is not attributable to Lentin and Williams, 1980,
p.41.

?*inflatum* (Eisenack and Cookson, 1960, p.4, pl.1, fig.12-13)
Morgan, 1977, p.136. Late Albian-Cenomanian; formerly
Diconodinium.

**orbiculatum* McIntyre, 1975, p.70-71, pl.4, fig.10-13. Campanian.

tenuistriatum (Eisenack and Cookson, 1960, p.4, pl.1, fig.14-16)
Morgan, 1977, p.136. Late Albian-Cenomanian; formerly
Diconodinium.

LAGENORHYTIS Duxbury, 1979b, p.587 (*nom. subst. pro Speetonia*
Duxbury, 1977 *non* Black, 1971).

**delicatula* (Duxbury, 1977, p.49, pl.12, fig.1-2,4-5; text-fig.18)
Duxbury, 1979b, p.587. Valanginian; formerly *Speetonia*.

LANTERNA Dodekova, 1969, p.16.

**bulgarica* Dodekova, 1969, p.16-17, pl.2, fig.3-6; pl.3, fig.1;
text-fig.B,Db. Tithonian.

?*pattei* (Valensi, 1948, p.539, fig.1) Brideaux and Fisher, 1976,
p.25. Bathonian; formerly *Hystriosphæridium* and *Baltisphæ-*
aeridium. NOTE: Stover and Evitt, 1978, p.59 considered this
to be a "provisionally accepted species".

?*saturnalis* Brideaux and Fisher, 1976, p.24-25, pl.6, fig.1-10;
pl.7, fig.1-13. Late Oxfordian-Late Kimmeridgian. NOTE:
Stover and Evitt, 1978, p.59 considered this to be a "pro-
visionally accepted species".

LANTERNA (cont'd)

?*spinosa* Dodekova, 1969, p.17-18, pl.3, fig.2-3,5-6,9,12;
text-fig.C, Da. Tithonian. NOTE: Stover and Evitt, 1978, p.59
considered this to be a "provisionally accepted species".

sportula Dodekova, 1969, p.18-19, pl.3, fig.4,7,10-11; text-
fig.Dc. Tithonian.

LANTERNOSPHAERIDIUM Morgenroth, 1966a, p.37; emend. Stover and
Evitt, 1978, p.168.

"*axiale*" (Eisenack, 1965) Morgenroth, 1966a, p.38-39. NOW
Fibrocyta; formerly *Cordosphaeridium*.

"*bipolare*" (Cookson and Eisenack, 1965b) De Coninck, 1969, p.38.
NOW *Fibrocyta*; formerly *Cordosphaeridium*. The transfer of
this species to *Amphorosphaeridium* by Davey, 1969c, p.35, was
rejected by Lentini and Williams, 1977b, p.95.

"*essentiale*" (De Coninck, 1969). NOW ?*Kenleyia*.

"*hirundo*" (Eisenack, 1958) Corradini, 1973, p.154. NOW ?*Cordo-*
sphaeridium; formerly *Hystriochosphaeridium* and *Achomosphaera*.

**lanosum* Morgenroth, 1966a, p.38, pl.10, fig.10-11. Early Eocene.

"*lappaceum*" (Drugg, 1970b). NOW *Fibrocyta*.

"*licium*" (Jain *et al.*, 1975). NOW *Fibrocyta*.

"*morgenrothii*" (Corradini, 1973). NOW *Fibrocyta*.

"*mutinense*" (Corradini, 1973). NOW ?*Fibrocyta*.

"*ovale*" (Hansen, 1977). NOW *Fibrocyta*.

"*personatum*" (Corradini, 1973). NOW ?*Operculodinium*.

"*radiatum*" (Morgenroth, 1966a). NOW *Fibrocyta*.

"*vectense*" (Eaton, 1976). NOW *Fibrocyta*.

LEBERIDOCYSTA Stover and Evitt, 1978, p.59-60,

**chlamydata* (Cookson and Eisenack, 1962b, p.496, pl.7, fig.1-3,
5-8) Stover and Evitt, 1978, p.60. Albian-Cenomanian; formerly
Hexagonifera.

defloccata (Davey and Verdier, 1973, p.198, pl.3, fig.6,8)
Stover and Evitt, 1978, p.60. Late Albian-Early Cenomanian;
formerly *Hexagonifera* and *Thalassiphora*.

LEBERIDOCYSTA (cont'd)

?*laticaudata* Vozzhennikova, 1967, p.125-126, pl.54, fig.1) Stover and Evitt, 1978, p.60. Santonian; formerly ?*Hexagonifera*.

NOTE: Stover and Evitt, 1978, p.60 considered this to be a "provisionally accepted species".

?*pergamentacea* (Burger, 1980a, p.88, pl.47, fig.2-3) Burger, 1980b, p.272. Aptian; formerly *Palaeostomocystis*.

?*scabrata* (Jain and Taugourdeau-Lantz, 1973, p.64, pl.4, fig.11-12) Stover and Evitt, 1978, p.60. Early Cretaceous; formerly ?*Hexagonifera*. NOTE: Stover and Evitt, 1978, p.60 considered this to be a "provisionally accepted species".

LECANIELLA Cookson and Eisenack, 1962a, p.269.

dictyota Cookson and Eisenack, 1962a, p.270, pl.37, fig.18-20. Aptian-Cenomanian.

foveata Singh, 1971, p.426, pl.79, fig.5-10; pl.80, fig.1. Late Albian.

**margostriata* Cookson and Eisenack, 1962a, p.269-270, pl.37, fig.16-17. Albian-Cenomanian.

LEIPOKATIUM Bradford, 1975, p.3066. This genus was valid when published; it is a cyst form taken from sediments of questionable age and was treated as a fossil. The contention by Harland and Reid, 1980, p.223 that a Latin diagnosis is required, is herein rejected.

**invisitatum* Bradford, 1975, p.3067, fig.8-16. Recent.

LEJEUNECYSTA Artzner and Dörhöfer, 1978, p.1381 (*nom. subst. pro Lejeunia* Gerlach, 1961, p.169); emend. Lentin and Williams, 1976, p.68; emend. Bujak, 1980, p.68; *non* Libert, 1820.

applanata (Bradford, 1977, p.47-49, fig.2:1-8) Artzner and Dörhöfer, 1978, p.1381. Recent; formerly *Lejeunia*.

cinctoria (Bujak, 1980) *comb. nov.*
1980 *Lejeunia cinctoria* Bujak, p.68-69, pl.18, fig.1-4; text-fig.17. Late Eocene.

diversiforma (Bradford, 1977, p.49,52,55-56, fig.4:1-4,6-7; fig.6:1-3) Artzner and Dörhöfer, 1978, p.1381. Recent; formerly *Lejeunia*.

subsp. *muscatensis* (Bradford, 1977, p.55-56, fig.6:1-3) Artzner and Dörhöfer, 1978, p.1381. Recent; formerly *Lejeunia*.

LEJEUNECYSTA (cont'd)

- fallax* (Morgenroth, 1966b, p.2-3, pl.1, fig.6-7) Artzner and Dörhöfer, 1978, p.1381. Middle Oligocene; formerly *Lejeunia*.
- **hyalina* (Gerlach, 1961, p.169, pl.26, fig.10-11; emend. Kjellström, 1972, p.469) Artzner and Dörhöfer, 1978, p.1381. Late Oligocene; formerly *Lejeunia*.
- "*magnifica*" (Stanley, 1965) Artzner and Dörhöfer, 1978, p.1381. NOW and formerly *Phelodinium*; formerly *Deflandrea* and *Lejeunia*. The transfer of this species to *Senegalinium* by Harland, 1977a, p.188 was rejected by Lentin and Williams, 1977b, p.96 because of the nature of the endocyst and archeopyle.
- paratenella* (Benedek, 1972, p.41-42, pl.5, fig.8; text-fig.18) Artzner and Dörhöfer, 1978, p.1381. Late Oligocene; formerly *Lejeunia*.
- "*pentagonalis*" (Corradini, 1973) Artzner and Dörhöfer, 1978, p.1381. NOW and formerly *Phelodinium*; formerly *Deflandrea* and *Lejeunia*. The transfer of this species to *Senegalinium* by Harland, 1977a, p.189 was rejected by Lentin and Williams, 1977b, p.96 because of the nature of the endocyst and archeopyle.
- ?*psilodora* (Benedek, 1972, p.42, pl.6, fig.5) Artzner and Dörhöfer, 1978, p.1381. Middle Oligocene; formerly *Lejeunia*. NOTE: Stover and Evitt, 1978, p.112 considered this (as *Lejeunia psilodora*) to be a "provisionally accepted species".
- spatiosa* (Morgenroth, 1966b) *comb. nov.*
1966b *Lejeunia spatiosa* Morgenroth, p.3-4, pl.1, fig.5. Early Oligocene; formerly *Lejeunia* and *Maduradinium*. NOTE: Stover and Evitt, 1978, p.112 rejected the transfer of this species to *Maduradinium* by Lentin and Williams, 1976, p.73.
- tenella* (Morgenroth, 1966b) *comb. nov.*
1966b *Lejeunia tenella* Morgenroth, p.4-5, pl.1, fig.8-9. Early Oligocene; formerly *Lejeunia* and *Vozzhennikovia*. NOTE: Stover and Evitt, 1978, p.112 rejected the transfer of this species to *Vozzhennikovia* by Lentin and Williams, 1976, p.67.
- "*tricuspis*" (O. Wetzel, 1933a) Artzner and Dörhöfer, 1978, p.1381-1382. NOW and formerly *Phelodinium*; formerly *Astrocysta*, *Lejeunia* and *Peridinium*. The transfer of this species to *Senegalinium* by Harland, 1977a, p.188 was rejected by Lentin and Williams, 1977b, p.96 because of the nature of the endocyst and archeopyle.
- "LEJEUNIA" Gerlach, 1961, p.169; emend. Kjellström, 1972, p.467; emend. Lentin and Williams, 1976, p.68. *Jr hom.* of *Lejeunia* Libert, 1820. Species formerly included within this genus have been transferred to *Lejeunecysta* Artzner and Dörhöfer, with the exception of those species listed below.

"LEJEUNIA" (cont'd)

"aechmophora" (Benedek, 1972). NOW ?*Wilsonidium*.

"ampla" (Harland, 1973). NOW *Palaeoperidinium*.

"cretacea" (Pocock, 1962). NOW *Palaeoperidinium*.

"elongata" (Jiabo, 1978). NOW *Ceratiopsis*.

"fissurata" (Jiabo, 1978). NOW *Ceratiopsis*.

"gaditana" (Riegel, 1974) Lentin and Williams, 1980, p.41.
NOW *Phelodinium*.

"kozlowskii" Gorka, 1963, p.41, pl.5, fig.4. Late Maastrichtian.
This species was transferred to the superfluous genus "*Astrocysta*" by Davey, 1970, p.360. Harker and Sarjeant, 1975, p.223 considered "*Lejeunia kozlowskii*" to be a *jr syn.* of *Lejeunia tricuspis* (O. Wetzel) Gorka
Phelodinium. The transfer of this species to *Senegalinium* by Harland, 1977a, p.189 was rejected by Lentin and Williams, 1977b, p.96, because of the nature of the endocyst and archeopyle.

"laevigata" (Malloy, 1972) Lentin and Williams, 1976, p.71. NOW *Andalusiella*.

"magnifica" (Stanley, 1965) Lentin and Williams, 1976, p.71.
NOW *Phelodinium*; formerly *Deflandrea*.

"parva" (Harland, 1973). NOW *Palaeoperidinium*.

"pentagonalis" (Corradini, 1973) Lentin and Williams, 1976, p.71.
NOW *Phelodinium*; formerly *Deflandrea*.

"spatiosa" (Morgenroth, 1966b). NOW *Lejeunecysta*. The transfer of this species to *Maduradinium* by Lentin and Williams, 1976, p.73 was rejected by Stover and Evitt, 1978, p.233, because of the uncertainty of the status of *Maduradinium*.

"tricuspis" (O. Wetzel, 1933a) Gorka, 1963, p.40. NOW *Phelodinium*; formerly "*Astrocysta*" and *Peridinium*.

LENTINIA Bujak, 1980, p.69.

**serrata* Bujak, 1980, p.71-72, pl.18, fig.7-12; text-fig.18-19.
Late Eocene.

wetzeli (Morgenroth, 1966a, p.9, pl.1, fig.4-5) Bujak, 1980, p.72. Early Eocene; formerly *Deflandrea*. O.C.

LEPTODINIUM Klement, 1960, p.45; emend. Sarjeant, 1969, p.11-12;
emend. Stover and Evitt, 1978, p.169-170.

"*aceras*" (Eisenack, 1958) Gitmez and Sarjeant, 1972, p.215. NOW
Acanthaulax; formerly *Gonyaulax*.

"*aculeatum*" (Wall, 1967). NOW *Impagidinium*.

"*alectrolophum*" (Sarjeant, 1966b). NOW *Impagidinium*.

amabile (Deflandre, 1939, p.143, pl.6, fig.8) Sarjeant, 1969,
p.12. Kimmeridgian; formerly *Gonyaulax*. This species was
transferred to *Gonyaulacysta* by Dodekova, 1971, p.7; this
transfer was rejected by Lentin and Williams, 1973, p.86.
NOTE: Stover and Evitt, 1978, p.171 considered this to be a
"problematical species".

?*antigonium* Ioannides *et al.*, 1977, p.456-457, pl.3, fig.7-8;
text-fig.10. Kimmeridgian. NOTE: Stover and Evitt, 1978,
p.170 considered this to be a "provisionally accepted species".

arcuatum Klement, 1960, p.48, pl.6, fig.5-6; emend. Gitmez, 1970,
p.270. Middle Oxfordian.

"*bacculatum*" (Baltes, 1971). NOW *Millioudodinium*.

cancellatum Brideaux and McIntyre, 1975, p.21-22, pl.5, fig.7-9.
Middle Albian.

"*churchillii*" Harland, 1968, p.548-551, fig.12-13,22-24. Holocene.
Reid, 1974, p.599 stated, "The single specimen on which
Harland (1968) based his new species *Leptodinium churchillii*
was seen on examination to be referable to the 'nodosa' form of
Spiniferites bentori".

clathratum (Cookson and Eisenack, 1960b, p.246-247, pl.37, fig.5;
text-fig.1) Sarjeant, 1969, p.12. Probably Tithonian; formerly
Gonyaulax. This species was transferred to *Gonyaulacysta* by
Dodekova, 1971, p.10; this transfer was rejected by Lentin and
Williams, 1973, p.86.

crassinervum (Deflandre, 1939, p.144, pl.6, fig.5) Sarjeant, 1969,
p.12. Kimmeridgian; formerly *Palaeoperidinium*. NOTE: Stover
and Evitt, 1978, p.170 considered this to be a "problematical
species".

"*cristatum*" (May, 1980). NOW *Impagidinium*.

"*cristatum*" (Riley in Fisher and Riley, 1980). *Jr hom.* of
Leptodinium cristatum May, 1980. NOW *Leptodinium volgense*
nom. nov.

LEPTODINIUM (cont'd)

deflandrei (Riley in Fisher and Riley, 1980) *comb. nov.*

1980 *Gonyaulacysta deflandrei* Riley in Fisher and Riley, p.320-321, pl.1, fig.1-2. Volgian.

?*delicatum* (Davey, 1969a, p.123-124, pl.1, fig.7-8; text-fig. 10A-B) Sarjeant, 1969, p.12. Formerly *Gonyaulacysta*. Sarjeant, 1969, p.12 incorrectly cited the date for the publication of this species as 1968; Davey's paper actually appeared early in 1969. NOTE: Stover and Evitt, 1978, p.170 considered this to be a "provisionally accepted species".

"*dispertitum*" (Cookson and Eisenack, 1965a). NOW *Impagidinium*.

"*egemeni*" (Gitmez, 1970). NOW *Tubotuberella*.

"*elegans*" (Cookson and Eisenack, 1965a). NOW *Impagidinium*.

eumorphum (Cookson and Eisenack, 1960b, p.246, pl.37, fig.1-3; text-fig.3) Sarjeant, 1969, p.12. Late Jurassic; formerly *Gonyaulax*.

freakei (Sarjeant, 1963c, p.85-86, pl.1, fig.1-3) Sarjeant, 1969, p.12. Oxfordian; formerly *Gonyaulax*.

?*gongylos* (Sarjeant, 1966b, p.111-113, pl.13, fig.1-2; text-fig.23) Stover and Evitt, 1978, p.170. Early Oxfordian; formerly *Gonyaulacysta*. NOTE: Stover and Evitt, 1978, p.170 considered this to be a "provisionally accepted species".

?*hyalodermopsis* (Cookson and Eisenack, 1958, p.34, pl.3, fig.11-12; text-fig.5-6) Stover and Evitt, 1978, p.170. Neocomian-Aptian; formerly *Gonyaulax* and *Gonyaulacysta*. NOTE: Stover and Evitt, 1978, p.170 considered this to be a "provisionally accepted species".

"*incompositum*" (Drugg, 1970b) Lentin and Williams, 1973, p.87. NOW *Corrudinium*; formerly *Gonyaulacysta*.

"*maculatum*" (Cookson and Eisenack, 1961b). NOW *Impagidinium*.

"*margaritiferrum*" (Cookson and Eisenack, 1960a) Sarjeant, 1969, p.31. NOW *Impagidinium*; formerly *Gonyaulax*.

"*membranigerum*" (Gerlach, 1961). NOW ?*Impagidinium*.

micropunctatum Jain and Millepied, 1975, p.139, pl.2, fig.32-33. Early-?Late Aptian. NOTE: Stover and Evitt, 1978, p.170 considered this to be a "problematical species". We herein reject the contention by Below, 1981, p.107 that this species is a *jr syn.* of *Oodnadattia tuberculata* Eisenack and Cookson.

LEPTODINIUM (cont'd)

millioudi (Sarjeant, 1963c, p.86-88, pl.1, fig.4-7) Sarjeant, 1969, p.13. Oxfordian; formerly *Gonyaulax*. O.C.

mirabile Klement, 1960, p.48-50, pl.6, fig.7-10; text-fig.25-27. Middle Oxfordian. Transfer of this species to *Gonyaulacysta* by Dodekova, 1967, p.19 was rejected by Lentin and Williams, 1973, p.87.

modicum Brideaux and McIntyre, 1975, p.22, pl.5, fig.10-15. Middle Albian.

subsp. *denticulatum* Brideaux, 1977, p.8, pl.1, fig.10-11. Barremian.

?*mosaicum* (Downie, 1957, p.424, pl.20, fig.7; text-fig.2f) Sarjeant, 1969, p.13; emend. Sarjeant, 1976c, p.6-7. Middle Kimmeridgian; formerly *Palaeoperidinium* and *Gonyaulacysta*. NOTE: Stover and Evitt, 1978, p.170 considered this to be a "provisionally accepted species".

"*multiplexum*" (Wall and Dale, 1968). NOW *Impagidinium*.

"*norrisi*" (Pocock, 1972). NOW *Ctenidodinium*.

"*ovum*" (Sah *et al.*, 1970). NOW ?*Impagidinium*.

"*panneum*" (Norris, 1965). NOW *Ctenidodinium*.

"*paradoxum*" (Wall, 1967). NOW *Impagidinium*.

"*patulum*" (Wall, 1967). NOW *Impagidinium*.

"*pectinigerum*" (Gocht, 1970) Fenton *et al.*, 1980, p.158. NOW *Hystrihogonyaulax pectinigera*; formerly *Leptodinium subtile* subsp. *pectinigerum*. The retention of this taxon in *Leptodinium* is herein rejected and the transfer to *Hystrihogonyaulax* by Stover and Evitt, 1978, p.163 is accepted.

"?*perforans*" (Cookson and Eisenack, 1958) Stover and Evitt, 1978, p.170. NOW *Cribroperidinium*; formerly *Gonyaulacysta* and *Gonyaulax*. NOTE: Stover and Evitt, 1978, p.69 considered this to be a "provisionally accepted species" of *Leptodinium*.

?*pilum* (Gocht, 1959, p.56, pl.6, fig.14; pl.8, fig.8) Sarjeant, 1969, p.13. Valanginian; formerly *Palaeoperidinium* and *Gonyaulacysta*. NOTE: Stover and Evitt, 1978, p.171 considered this to be a "problematical species".

porosum (Lejeune-Carpentier, 1946, p.193, 196; text-fig.6) Sarjeant, 1969, p.13. Senonian; formerly *Gonyaulax*. NOTE: Stover and Evitt, 1978, p.171 considered this to be a "problematical species".

LEPTODINIUM (cont'd)

"*punctatum*" (Baltes, 1971). NOW *Millioudodinium*.

"*regale*" (Gocht, 1970b). NOW *Hystriehogonyaulax*.

reticulatum (Nagy, 1969, p.293, pl.1, fig.7,10) Lentin and Williams, 1973, p.88. Late Pannonian; formerly *Gonyaulax*.
NOTE: Stover and Evitt, 1978, p.171 considered this to be a "problematical species".

"*saepitum*" (Ashraf, 1979). NOW *Hystriehogonyaulax*.

"*schizoblatum*" (Norris, 1965). NOW *Ctenidodinium*.

setcheyense (Sarjeant, 1976c, p.4-6, pl.1, fig.7; text-fig.1) Stover and Evitt, 1978, p.170. Kimmeridgian; formerly *Gonyaulacysta*.

simplex Burger, 1980a, p.84, pl.42, fig.1-5. Aptian.

"*sphaericum*" (Wall, 1967). NOW *Impagidinium*.

"*striatum*" (Wall, 1967). NOW *Impagidinium*.

"*striatum*" (Clarke and Verdier, 1967) Sarjeant, 1969, p.13.
NOW *Impagidinium*; formerly *Gonyaulacysta*.

**subtile* Klement, 1960, p.46-47, pl.6, fig.1-4; text-fig.23-24.
Early Kimmeridgian.

subsp. "*pectinigerum*" (Gocht, 1970b). NOW *Hystriehogonyaulax pectinigera*.

?*tenuicornutum* Cookson and Eisenack, 1962b, p.478, pl.3, fig. 12-13; text-fig.1a-b. Albian. The transfer of this species to *Gonyaulacysta* by Sarjeant, 1969, p.11 was rejected by Stover and Evitt, 1978, p.160 who considered ?*Leptodinium tenuicornutum* to be a "provisionally accepted species".

"*victorianum*" (Cookson and Eisenack, 1965a). NOW *Impagidinium*.

volgense comb. nov., nom. nov., nom. subst. pro *L. cristatum* (Riley in Fisher and Riley, 1980) non *L. cristatum* May, 1980. 1980 *Gonyaulacysta cristata* Riley in Fisher and Riley, p.320, pl.1, fig.8,12. Volgian.

LIASIDIUM Drugg, 1978, p.69

**variabile* Drugg, 1978, p.69-70, pl.4, fig.10, pl.5, fig.1-9.
Sinemurian.

"LINGULASPHAERA" Drugg, 1970b, p.817. *Jr syn.* of *Diphyes*; see Stover and Evitt, 1978, p.38. These authors *op.cit.* (p.39) transferred the type of the genus and single species, *Lingulasphaera spinula*, to *Diphyes*.

LINGULODINIUM Wall, 1967, p.109; emend. Wall and Dale, 1973, p.23-24.

**machaerophorum* (Deflandre and Cookson, 1955, p.274, pl.9, fig. 4,8) Wall, 1967, p.109. Miocene; formerly *Hystrichosphaeridium* and *Baltisphaeridium*.

subsp. *filiforme* (Rossignol, 1964, p.91, pl.2, fig.13) Lentin and Williams, 1973, p.89. Pleistocene; formerly *Baltisphaeridium machaerophorum* var. *filiforme*.

subsp. *megacanthum* (Rossignol, 1964, p.91, pl.2, fig.15) Lentin and Williams, 1973, p.89. Pleistocene; formerly *Baltisphaeridium machaerophorum* var. *megacanthum*.

subsp. *strangulatum* (Rossignol, 1964, p.91, pl.2, fig.16) Lentin and Williams, 1973, p.89. Pleistocene; formerly *Baltisphaeridium machaerophorum* var. *strangulatum*.

pugiatum (Drugg, 1970b, p.819; text-fig.16D-E) Wall and Dale, 1973, p.24. Oligocene; formerly *Operculodinium*.

?*pycnospinosum* (Benedek, 1972, p.32, pl.12, fig.14) Stover and Evitt, 1978, p.172. Middle-Late Oligocene; formerly *Impleto-sphaeridium*. NOTE: Stover and Evitt, 1978, p.172 considered this to be a "provisionally accepted species" and possibly a *jr syn.* of *Lingulodinium machaerophorum*.

siculum (Drugg, 1970b, p.820; text-fig.16F-G) Wall and Dale 1973, p.24. Oligocene; formerly *Trioperculodinium*.

solarum (Drugg, 1970b, p.819; text-fig.16A-C) Wall and Dale 1973, p.24. Oligocene; formerly *Operculodinium*.

LITHODINIA Eisenack, 1935, p.175; emend. Gocht, 1975b, p.353.

"*acanthosphaera*" (Sarjeant, 1961a) Lentin and Williams, 1977, p.100. NOW ?*Meiourogonyaulax*.

"*araneosa*" (Muir and Sarjeant, 1978) Riley, 1979, p.221. The transfer of this species from *Meiourogonyaulax* to *Lithodinia* is herein rejected and the species is retained in *Meiourogonyaulax*.

"*arktikos*" Fenton, 1981, p.251,253, pl.2, fig.1-2; pl.3, fig.1. Late Bathonian. *Jr syn.* of *Meiourogonyaulax borealis*; see Sarjeant, 1980, p.123 for discussion of the latter species.

bathonica Conway, 1978, p.349, pl.2, fig.4-7. Late Bathonian.

LITHODINIA (cont'd)

- "*bulloidea*" (Cookson and Eisenack, 1960b) Gocht, 1976, p.334.
NOW *Meiourogonyaulax*; formerly *Gonyaulax*.
- "*callomonii*" (Sarjeant, 1972) Gocht, 1976, p.334. NOW and
formerly *Meiourogonyaulax*.
- "*cantrellii*" (Sarjeant, 1972) Gocht, 1976, p.334. NOW and
formerly ?*Meiourogonyaulax*.
- "*caytonensis*" (Sarjeant, 1959) Gocht, 1976, p.334. NOW and
formerly *Meiourogonyaulax*.
- "*crystalata*" (Sarjeant, 1959) Gocht, 1976, p.334. NOW and
formerly ?*Meiourogonyaulax*.
- "*decapitata*" (W. Wetzel, 1967) Gocht, 1976, p.334. NOW and
formerly *Meiourogonyaulax*.
- "*deflandrei*" (Sarjeant, 1968) Gocht, 1976, p.334. NOW and
formerly *Meiourogonyaulax*.
- "*dicryptos*" (Gitmez and Sarjeant, 1972) Gocht, 1976, p.334.
NOW *Canningia*; formerly *Meiourogonyaulax*.
- "*ghermanii*" (Beju, 1971) Gocht, 1976, p.334. NOW and formerly
Meiourogonyaulax.
- "*insulofigurata*" (Dodekova, 1975) Gocht, 1976, p.334. NOW and
formerly *Meiourogonyaulax*.
- **jurassica* Eisenack, 1935, p.175-177, pl.4, fig.5-10; text-fig.1-4;
emend. Gocht, 1975b, p.355. Callovian.
- var. "*ornata*" (Eisenack, 1935). NOW *Ctenidodinium ornatum*.
- "*pertusa*" (Duxbury, 1977). NOW *Meiourogonyaulax*.
- "*pila*" (Gitmez and Sarjeant, 1972) Gocht, 1976, p.334. NOW and
formerly *Meiourogonyaulax*.
- "*pocockii*" (Sarjeant, 1968) Davey, 1979d, p.217. NOW
Escharisphaeridia; formerly *Chytroeisphaeridia*.
- "?predae" (Beju, 1971) Gocht, 1976, p.334. NOW *Carpathodinium*;
formerly *Meiourogonyaulax*.
- "*psoros*" (Davey and Verdier, 1974) Gocht, 1976, p.334. NOW and
formerly *Meiourogonyaulax*.
- "*reticulata*" (Dodekova, 1975) Gocht, 1976, p.334. NOW and for-
merly *Meiourogonyaulax*.

LITHODINIA (cont'd)

- "*rioulti*" (Sarjeant, 1968) Gocht, 1976, p.334. NOW and formerly *Meiourogonyaulax*.
- "*sagena*" (Duxbury, 1980). NOW *Meiourogonyaulax*.
- "*staffinensis*" (Gitmez, 1970) Gocht, 1976, p.334. NOW and formerly *Meiourogonyaulax*.
- "*stoveri*" (Millioud, 1969) Gocht, 1976, p.334. NOW and formerly *Meiourogonyaulax*.
- "*strongylos*" (Sarjeant, 1972) Gocht, 1976, p.334. NOW and formerly *Meiourogonyaulax*.
- "*superornata*" (W. Wetzel, 1967) Fenton, 1981, p.253. The transfer of this species from *Meiourogonyaulax* to *Lithodinia* is herein rejected and the species is accordingly retained in *Meiourogonyaulax*.
- "*valensi*" (Sarjeant, 1966b) Gocht, 1976, p.334. NOW and formerly *Meiourogonyaulax*.
- "LITHOPERIDINIUM" Deflandre, 1933, p.272. *Jr syn.* of *Peridinites*. See both Deflandre, 1945, card 806-809 and Norris and Sarjeant, 1965, p.38.
- LITOSPHERIDIUM Davey and Williams, 1966b, p.79-80; emend. Davey and Verdier, 1973, p.193.
- arundum* (Eisenack and Cookson, 1960, p.8, pl.3, fig.7-9) Davey, 1979b, p.557. Albian; formerly *Hystriosphæridium*.
- "*conispinum*" (Davey and Verdier, 1973). NOW ?*Dapsilidinium*.
- ?*crassipes* (Reade, 1839, pl.9, fig.2-5) Davey and Williams, 1969, p.5. Late Cretaceous; formerly *Hystriosphæridium*. NOTE: Stover and Evitt, 1978, p.62 considered this to be a "provisionally accepted species".
- "?*flosculus*" (Deflandre, 1937b) Davey and Williams, 1969, p.5. NOW ?*Florentinia*.
- "?*inversibuccinum*" (Davey and Williams, 1966b). NOW *Paucisphaeridium*.
- ?*mamellatum* De Coninck, 1977, p.42, pl.6, fig.8-13. Eocene.
- **siphoniphorum* (Cookson and Eisenack, 1958, p.44, pl.11, fig.8-10) Davey and Williams, 1966b, p.80-82. Albian-Genomanian; formerly *Hystriosphæridium*.
- "?*striatoconus*" (Deflandre and Cookson, 1955) Sarjeant, 1969, p.14. NOW *Conosphaeridium*.

LITOSPHERIDIUM (cont'd)

"?*truncigerum*" (Deflandre, 1937b) Davey and Williams, 1969, p.6.
NOW *Cordosphaeridium*. Lentin and Williams, 1973, p.80 rejected
the transfer of "*Hystriochosphaeridium truncigerum*" to ?*Lito-*
sphaeridium by Davey and Williams, *op.cit.*, since the species
possesses a precingular archeopyle.

LOPHOCYSTA Manum, 1979, p.238.

**sulcolimbata* Manum, 1979, p.238,240-242, pl.1, fig.1-11; text-
fig.1. Early Miocene.

LOPHODICTYOTIDIUM Pocock, 1972, p.109.

**sarjeanti* Pocock, 1972, p.109, pl.25, fig.5-6. Late Bajocian.

LÜEHNDEA Morgenroth, 1970, p.346-347.

**spinosa* Morgenroth, 1970, p.347, pl.9, fig.1-4. Late Pliens-
bachian.

LUNATADINIUM Brideaux and McIntyre, 1973, p.396.

**dissolutum* Brideaux and McIntyre, 1973, p.396-397,400-401, pl.1,
fig.1-13. Hauterivian-Middle Albian.

LUXADINIUM Brideaux and McIntyre, 1975, p.36.

**primulum* Brideaux and McIntyre, 1975, p.37-38, pl.12, fig.9-12;
pl.13, fig.1-8. Middle Albian.

propatulum Brideaux and McIntyre, 1975, p.37 = *Scriniodinium*
eurypylum auct. non Manum and Cookson 1964 *in* Brideaux, 1971,
p.99, pl.29, fig.97-98 and *in* Singh, 1971, p.364, pl.62, fig.
6-10. Albian.



MADURADINIUM Cookson and Eisenack, 1970a, p.150.

**pentagonum* Cookson and Eisenack, 1970a, p.150, pl.10, fig.13-17.
Senonian.

"*spatiosum*" (Morgenroth, 1966b) Lentin and Williams, 1976, p.73.
NOW *Lejeunecysta*; formerly *Lejeunia*.

MAGHREBINIA Below, 1981, p.22.

chleuh Below, 1981, p.22-23, pl.1, fig.5; pl.12, fig.5; text-fig.
13. Vraconian-Cenomanian.

**perforata* (Clarke and Verdier, 1967, p.36, pl.6, fig.1-3; text-
fig.15) Below, 1981, p.23. Early Cenomanian; formerly *Dino-*
pterygium and *Pterodinium*.

"*MANCODINIUM*" Morgenroth, 1970, p.352. *Jr syn.* of *Dapcodinium*;
see Dörhöfer and Davies, 1980, p.23 who transferred the type
and single species of the genus, *M. semitabulatum*, to *Dap-*
codinium.

MATHUROSPHAERA Varma and Dangwal, 1964, p.70.

**rajivii* Varma and Dangwal, 1964, p.70, pl.2, fig.11-12. Eocene-
Oligocene. O.C.

"*MATURODINIUM*" Morgenroth, 1970, p.353-354. *Jr syn.* of *Dapcodinium*;
see Dörhöfer and Davies, 1980, p.23 who transferred the type and
single species of the genus, *M. inornatum*, to *Dapcodinium*.

MEIOUROGONYAULAX Sarjeant, 1966b, p.144. Gocht, 1975b, p.353
considered this genus to be a *jr syn.* of *Lithodinia* Eisenack;
emend. Gocht. Stover and Evitt, 1978, p.62-63 differentiated
Meiourogonyaulax from *Lithodinia* on the nature of the archeo-
pyle. The contention by Fenton, 1981, p.250-251, that *Meiouro-*
gonyaulax is a *jr syn.* of *Lithodinia* is herein rejected because
of the differences in archeopyle modes between the two genera.

?*acanthosphaera* (Sarjeant, 1961a, p.94-95, pl.13, fig.14; text-
fig.4) Sarjeant, 1976c, p.12. Early Oxfordian; formerly
Gonyaulax, *Acanthaulax* and *Lithodinia*. Stover and Evitt,
1978, p.63 considered this to be a "provisionally accepted
species".

amlasis Below, 1981, p.58, pl.6, fig.14-16. Hauterivian.

MEIOUROGONYAULAX (cont'd)

- araneosa* Muir and Sarjeant, 1978, p.197-198, pl.1, fig.1, text-fig.1. Middle Callovian. The transfer of this species to *Lithodinia* by Riley, 1979, p.221 is herein rejected.
- borealis* Sarjeant, 1980b, p.123-124. Late Bathonian. Holotype figured as *Meiouroganyaulax decapitata* (W. Wetzel) Sarjeant by Sarjeant, 1972, pl.5, fig.3; text-fig.5.
- bulloidea* (Cookson and Eisenack, 1960b, p.247, pl.37, fig.11; text-fig.4) Sarjeant, 1969, p.14. Tithonian; formerly *Gonyaulax* and *Lithodinia*.
- callomonii* Sarjeant, 1972, p.31-33, pl.5, fig.5; text-fig.6. Late Bathonian-Early Callovian. See also *Lithodinia*.
- ?*cantrellii* Sarjeant, 1972, p.37-38, pl.4, fig.3; pl.6, fig.1-2; text-fig.8. Late Bathonian. See also *Lithodinia*. Stover and Evitt, 1978, p.63 considered this to be a "provisionally accepted species".
- caytonensis* (Sarjeant, 1959, p.330, pl.13, fig.1; text-fig.1) Sarjeant, 1969, p.14. Early Callovian; formerly *Gonyaulax*, *Gonyaulacysta* and *Lithodinia*.
- ?*crisulata* (Sarjeant, 1959, p.332, pl.13, fig.2; text-fig.2) Sarjeant, 1969, p.14. Early Callovian; formerly *Gonyaulax* and *Lithodinia*.
- "*decapitata*" (W. Wetzel, 1967, p.869, pl.16, fig.7a-b) Sarjeant, 1972, p.29-31; emend. Sarjeant, 1980b, p.121. Bajocian; formerly *Gonyaulax* and *Lithodinia*. Stover and Evitt, 1978, p.63 considered this to be a "problematical species". Fenton, 1981, p.253 considered this species, as *Lithodinia decapitata*, to be a *jr syn.* of *Meiouroganyaulax valensii*, as *Lithodinia valensii*.
- deflandrei* Sarjeant, 1968, p.228-229, pl.1, fig.20; pl.3, fig.13; text-fig.4. Late Callovian. See also *Lithodinia*.
- "*dicrypta*" (Gitmez and Sarjeant, 1972). NOW *Canningia*. Stover and Evitt, 1978, p.63 considered this to be a "problematical species" of *Meiouroganyaulax*. O.C.
- ghermanii* Beju, 1971, p.287-288, pl.4, fig.1-3; text-fig.4. Callovian-Oxfordian. See also *Lithodinia*.
- insulofigurata* Dodekova, 1975, p.21-22, pl.2, fig.4-5,7-8; text-fig.4. Late Bathonian. See also *Lithodinia*.
- pertusa* (Duxbury, 1977, p.41-43, pl.8, fig.5; text-fig.15) Below, 1981, p.57. Berriasian-Hauterivian; formerly *Lithodinia*.

MEIOUROGONYAULAX pertusa (cont'd)

subsp. *heta* Below, 1981, p.56-57, pl.3, fig.7-8; pl.11, fig.21; pl.14, fig.1-4; text-fig.59-60. Hauterivian.

pila Gitmez and Sarjeant, 1972, p.226-227, pl.4, fig.5; pl.7, fig.3; text-fig.23. Middle-Late Kimmeridgian. See also *Lithodinia*.

"?*predae*" (Beju, 1971). NOW *Carpathodinium*. See also *Lithodinia*.

psoros Davey and Verdier, 1974, p.634-636, pl.92, fig.8-9. Aptian. See also *Lithodinia*.

reticulata Dodekova, 1975, p.22-23, pl.2, fig.11-13; text-fig.4. Late Bathonian. See also *Lithodinia*.

rioultii Sarjeant, 1968, p.229; validation of *Meiourogonyaulax rioultii* Sarjeant, 1965, p.181, pl.1, fig.1; text-fig.1. Early Callovian. See also *Lithodinia*. Stover and Evitt, 1978, p.63 considered this to be a "problematical species".

sagena (Duxbury, 1980) *comb. nov.*
1980 *Lithodinia sagena* Duxbury, p.127, pl.3, fig.6,9,12-13. Barremian.

staffinensis Gitmez, 1970, p.276-278, pl.3, fig.1; text-fig. 20a-b. Early Kimmeridgian. See also *Lithodinia*.

stoveri Millioud, 1969, p.429, pl.3, fig.1-3. Hauterivian-Aptian. See also *Lithodinia*.

strongyla Sarjeant, 1972, p.35-37, pl.4, fig.7; text-fig.7. Late Bathonian-Early Callovian. See also *Lithodinia*. O.C.

superornata (W. Wetzel, 1967, p.869, pl.16, fig.8a-b) Sarjeant, 1969, p.15; emend. Sarjeant, 1980b, p.124-125. Bathonian; formerly *Gonyaulax* and ?*Gonyaulacysta*.

**valensii* Sarjeant, 1966b, p.145-146, pl.15, fig.7; text-fig.37. Bathonian. See also *Lithodinia*.

MELITASPHAERIDIUM Harland and Hill, 1979, p.38-39.

asterium (Eaton, 1976, p.273, pl.11, fig.7-10) Bujak *et al.*, 1980, p.30. Late Eocene; formerly *Hystriosphæridium*.

**choanophorum* (Deflandre and Cookson, 1955, p.271-272; text-fig.23-29) Harland and Hill, 1979, p.39-40. Pliocene; formerly *Hystriosphæridium*. The species was emended by Harland and Hill (*op.cit.*) at the time of the transfer.

pseudorecurvatum (Morgenroth, 1966a, p.30-31, pl.8, fig.5-6) Bujak, 1980, p.30. Early Eocene; formerly *Hystriosphæridium* and *Operculodinium*.

- MEMBRANILARNACIA* Eisenack, 1963a, p.99; emend. Williams and Downie, 1966c, p.219.
- "*amalthei*" (W. Wetzel, 1966). NOW *Endoscrinium*. NOTE: Stover and Evitt, 1978, p.64 considered this to be a "provisionally accepted species" of *MembraniLarnacia*.
- ?*australis* (Pöthe de Baldis, 1966, p.225, pl.1, fig.h) Eisenack and Kjellström, 1971a, p.797. Early Tertiary; formerly *MembraniLarnax*. NOTE: Stover and Evitt, 1978, p.64 considered this to be a "provisionally accepted species".
- "*characta*" (Tasch, 1964, p.192, pl.1, fig.20) Eisenack and Kjellström, 1971a, p.799. Albian; formerly *MembraniLarnax*. Pierce, 1976, p.27 considered this species to be a *jr syn.* of the acritarch *Schizosporis reticulata* Cookson and Dettmann.
- delicata* Kar, 1979, p.35, pl.4, fig.70-71. Oligocene.
- "*densa*" Cookson and Eisenack, 1974, p.71, pl.25, fig.19; pl.29, fig.19. Late Eocene. Stover and Evitt, 1978, p.64 considered this species to be a *jr syn.* of *Valensiella clathroderma* (Deflandre and Cookson) Eisenack.
- "*diktyophora*" Agelopoulos, 1967, p.49-50, pl.12, fig.3-4,6. Late Eocene. Eaton, 1976, p.277 considered this species to be a *jr syn.* of "*Cannosphaeropsis ursulae*" Morgenroth, 1966a, which is now included in *Eatoricysta*.
- fibrosa* Jiabo, 1978, p.91-92, pl.28, fig.1-12. Early Tertiary.
- "*formosa*" (Tasch, 1964, p.192, pl.1, fig.23) Eisenack and Kjellström, 1971a, p.801. Albian; formerly *MembraniLarnax*. Pierce, 1976, p.27 considered this species to be a *jr syn.* of the acritarch *Schizosporis reticulata* Cookson and Dettmann.
- "*gigantea*" (Tasch, 1964, p.192, pl.2, fig.13) Eisenack and Kjellström, 1971a, p.803. Albian; formerly *MembraniLarnax*. Pierce, 1976, p.27 considered this species to be a *jr syn.* of the acritarch *Schizosporis reticulata* Cookson and Dettmann.
- glabra* Agelopoulos, 1967, p.47-49, pl.12, fig.5; pl.13, fig.2,9; text-fig.6. Late Eocene.
- **leptoderma* (Cookson and Eisenack, 1958, p.50, pl.10, fig.7,9) Eisenack, 1963a, p.101. Albian; formerly *MembraniLarnax*.
- liradiscoides* (O. Wetzel, 1933b, p.52, pl.6, fig.3a-b) Downie and Sarjeant, 1965, p.129. Late Cretaceous; formerly *MembraniLarnax*. NOTE: Stover and Evitt, 1978, p.64 considered this to be a "problematical species".
- ?*marina* (Kufferath, 1950, p.34; text-fig.40) Downie and Sarjeant, 1965, p.129. Holocene; formerly *MembraniLarnax*.

MEMBRANILARNACIA (cont'd)

?*minuta* De Coninck, 1969, p.43, pl.12, fig.13-14. Eocene. NOTE: Stover and Evitt, 1978, p.64 considered this to be a "provisionally accepted species".

?*ovalis* Cookson and Eisenack, 1974, p.72, pl.29, fig.21. Senonian. NOTE: Stover and Evitt, 1978, p.64 considered this to be a "provisionally accepted species".

polycladiata Cookson and Eisenack in Eisenack, 1963a, p.100. Holotype: Cookson and Eisenack, 1958, p.51, pl.10, fig.8. Albian.

pterococcoides (O. Wetzel, 1933b, p.53, pl.6, fig.4) Eisenack, 1963a, p.102. Senonian; formerly *MembraniLarnax*. NOTE: Stover and Evitt, 1978, p.64 considered this to be a "problematical species".

subsp. *minuta* (Rozen, 1965, p.312-313, pl.2, fig.4-5; text-fig.23-24) Lentini and Williams, 1973, p.92. Late Eocene; formerly *MembraniLarnacia pterococcoides* var. *minuta*.

"*pterospermoides*" (O. Wetzel, 1933b) Downie and Sarjeant, 1965, p.130. Transfer of this species from *MembraniLarnax* to *MembraniLarnacia* was rejected by Lentini and Williams, 1973, p.92.

"*reticulata*" Williams and Downie, 1966c, p.220-221, pl.24, fig.4-6; text-fig.59. Early Eocene. De Coninck, 1969, p.43 and Gocht, 1969, p.65 considered this species to be a *jr syn.* of *MembraniLarnacia ursulae* (Morgenroth) De Coninck; the latter species is now included in the genus *Eatonicysta*.

"*reticulovata*" (Tasch, 1964, p.192, pl.2, fig.3) Eisenack and Kjellström, 1971a, p.811. Albian; formerly *MembraniLarnax*. Pierce, 1976, p.27 considered this species to be a *jr syn.* of the acritarch *Schizosporis reticulata* Cookson and Dettmann.

scabra Jiabo, 1978, p.92, pl.27, fig.13. Early Tertiary.

?*tenella* Morgenroth, 1968, p.554-555, pl.48, fig.2-4. Danian. NOTE: Stover and Evitt, 1978, p.64 considered this to be a "provisionally accepted species".

?*tenera* De Coninck, 1975, p.93-94, pl.17, fig.2-3. Ypresian. NOTE: Stover and Evitt, 1978, p.64 considered this to be a "provisionally accepted species".

"*ursulae*" (Morgenroth, 1966a) De Coninck, 1969, p.43. NOW *Eatonicysta*.

MEMBRANILARNAX O. Wetzel, 1933b, p.51. Downie and Sarjeant, 1965, p.130 transferred the type of this genus, *M. pterospermoides*, to ?*Membranilarnacia*, which in effect combines the two genera *Membranilarnacia* and *Membranilarnax*. According to the I.C.B.N. rules of priority, the first published name has priority and the genus *Membranilarnacia* becomes a *jr syn.* However, due to the uncertainty regarding the morphology of *M. pterospermoides*, Lentin and Williams, 1973, p.93 proposed that this species be retained in *Membranilarnax*. All other species with the exception of those listed below are now included in *Membranilarnacia*.

"*amandopolitana*" (Valensi, 1955b). NOW ?*Valensiella*.

"*angustivela*" (Deflandre and Cookson, 1955). NOW ?*Samlandia*.

"*clathroderma*" (Deflandre and Cookson, 1955). NOW ?*Valensiella*.

"*ovula*" (Deflandre, 1947c). NOW *Valensiella*.

**pterospermoides* O. Wetzel, 1933b, p.52, pl.6, fig.1-2. Late Cretaceous.

MEMBRANOPHORIDIUM Gerlach, 1961, p.198; emend. Stover and Evitt, 1978, p.64-65.

**aspinatum* Gerlach, 1961, p.199, pl.29, fig.7-8. Middle Oligocene. See also *Chiropteridium*.

"*multispinatum*" Gerlach, 1961, p.203-204, pl.29, fig.5. Late Oligocene-Middle Miocene. *Jr syn.* of *Chiropteridium dispersum*; see Brosius, 1963, p.48 and Gocht, 1969, p.63.

"*partispinatum*" (Gerlach, 1961) Brosius, 1963, p.48. NOW *Chiropteridium*.

?*regulatum* (Jiabo, 1978) *comb. nov.*

1978 *Cyclonephelium regulatum* Jiabo, p.78, pl.27, fig.1-2. Early Tertiary.

variatum (Jiabo, 1978) *comb. nov.*

1978 *Cyclonephelium variatum* Jiabo, p.78-79, pl.27, fig.6-10. Early Tertiary.

MEMBRANOSPHAERA Samoilovich ex Norris and Sarjeant, 1965, p.40; emend. Drugg, 1967, p.29. The name *Membranosphaera* was originally used by Samoilovich, 1961, p.251 as the name of a "groupe" which is not recognized by the I.C.B.N. It was given generic status by Norris and Sarjeant, 1965, p.40. The type of the genus *M. maastrichtica* was at the same time given specific status. Other taxa of the original "groupe" *Membranosphaera* were overlooked. These taxa were given specific status in the genus *Membranosphaera* by Lentin and Williams, 1973, p.94. Stover and Evitt, 1978, p.263 considered this genus to be an acritarch.

MEMBRANOSPHERA (cont'd)

bulluliniiformis Maliavkina ex Lentin and Williams, 1973, p.94.
(Original description, Maliavkina in Samoilovich and Mtchedlishvili, 1961, p.253-254, pl.84, fig.1a-b,2a-b,3-4). Late Jurassic-Late Cretaceous.

subsp. *bulluliniiformis* Maliavkina ex Lentin and Williams, 1973, p.94. (Original description, Maliavkina in Samoilovich and Mtchedlishvili, 1961, p.253-254, pl.84, fig.1a-b,2a-b,3). Late Cretaceous.

subsp. *sphaerica* Maliavkina ex Lentin and Williams, 1973, p.94. (Original description, Maliavkina in Samoilovich and Mtchedlishvili, 1961, p.254-255, pl.84, fig.4). Late Jurassic.

"*coninckii*" (Burger, 1980a). NOW *Kallosphaeridium*.

"*granulata*" (Norvick, 1976). NOW *Kallosphaeridium*.

**maastrichtica* Samoilovich ex Norris and Sarjeant, 1965, p.40. Original description, Samoilovich in Samoilovich and Mtchedlishvili, 1961, p.252, pl.83, fig.1a-d,2a-d. Late Cretaceous.

subsp. *pilata* Samoilovich ex Lentin and Williams, 1973, p.94. (Original description, Samoilovich in Samoilovich and Mtchedlishvili, 1961, p.253, pl.83, fig.3,4a-d). Late Cretaceous.

"*norvickii*" (Burger, 1980a). NOW *Kallosphaeridium*.

"*romaensis*" (Burger, 1980a). NOW *Kallosphaeridium*.

tuberculata Maliavkina ex Lentin and Williams, 1973, p.94. (Original description, Maliavkina in Samoilovich and Mtchedlishvili, 1961, p.255, pl.84, fig.7a-b,8). Late Jurassic.

MENDICODINIUM Morgenroth, 1970, p.347-348.

"*caperatum*" (Brideaux, 1977). NOW *Breedowella*.

groenlandicum (Pocock and Sarjeant, 1972, p.352-354, pl.2, fig.1-9; text-fig.2) Davey, 1979c, p.64. Callovian; formerly *Thuledinium*.

**reticulatum* Morgenroth, 1970, p.348-349, pl.9, fig.5-6; pl.10, fig.1-4. Late Pliensbachian.

woodhamense Drugg, 1978, p.70, pl.5, fig.10-11, pl.6, fig.1-2. Late Callovian.

MICRODINIUM Cookson and Eisenack, 1960a, p.6; emend. Sarjeant, 1966b, p.148-149; emend. Stover and Evitt, 1978, p.65-66.

?*alatum* (Conrad, 1941, p.5, pl.1, fig.C) Lentin and Williams 1976, p.109. Maastrichtian; formerly *Palaeoperidinium*. Sarjeant, 1967b, p.248 recommended the transfer of this species to *Microdinium*. The return of this species to the genus *Palaeoperidinium* by Stover and Evitt, 1978, p.66 is herein rejected.

?*crinitum* Davey, 1969a, p.137, pl.2, fig.7-8. Cenomanian.

"*deflandrei*" (Millioud, 1969). NOW *Druggidium*.

?*dentatum* Vozzhennikova, 1967, p.94-95, pl.38, fig.2a-e. Late Cretaceous. NOTE: Stover and Evitt, 1978, p.66 considered this to be a "provisionally accepted species".

subsp. *dentatum* (Vozzhennikova, 1967, p.95, pl.38, fig.2a-e) Lentin and Williams, 1973, p.95. Late Cretaceous; formerly *Microdinium dentatum* forma *dentatum*.

subsp. *sphaericum* (Vozzhennikova, 1967, p.95-96, pl.36, fig.2a-b; pl.38, fig.1a-b) Lentin and Williams, 1973, p.95. Late Cretaceous; formerly *Microdinium dentatum* forma *sphaericum*.

distinctum Davey, 1969a, p.133-135, pl.2, fig.9-11; text-fig. 13D-E,I. Cenomanian.

"*echinatum*" Clarke and Verdier, 1967, p.64, pl.1, fig.9-10; text-fig.26. Cenomanian. Clarke *et al.*, 1968, p.181 considered this species to be a *jr syn.* of *Microdinium setosum* Sarjeant, 1966b.

?*ellipsoideum* (Deflandre, 1936b, p.178, pl.6, fig.5-7) Lentin and Williams, 1976, p.110. Senonian; formerly *Palaeoperidinium*. Sarjeant, 1967b, p.250 recommended the transfer of this species to *Microdinium*. The retention of this species in the genus *Palaeoperidinium* by Stover and Evitt, 1978, p.218 is herein rejected.

glabrum Cookson and Eisenack, 1974, p.53, pl.20, fig.19. Senonian.

irregulare Clarke and Verdier, 1967, p.65-66, pl.7, fig.5-8; text-fig.27. Cenomanian-Santonian.

?*kustanaicum* Vozzhennikova, 1967, p.96, pl.37, fig.1a-b. ?Maastrichtian. NOTE: Stover and Evitt, 1978, p.66 considered this to be a "provisionally accepted species".

opaecum Brideaux, 1971, p.76-77, pl.21, fig.19-22; text-fig.7d-e. Middle-Late Albian.

MICRODINIUM (cont'd)

- **ornatum* Cookson and Eisenack, 1960a, p.6-7, pl.2, fig.3-8; text-fig.2-4. Albian-Turonian.
- ?*ovatum* Horowitz, 1975, p.24, pl.1, fig.3. Late Triassic.
NOTE: Stover and Evitt, 1978, p.66 considered this to be a "provisionally accepted species".
- ?*punctulatum* Vozzhennikova, 1967, p.96, pl.37, fig.7a-b.
?Maastrichtian. NOTE: Stover and Evitt, 1978, p.66 considered this to be a "provisionally accepted species".
- ?*reticulatum* Vozzhennikova, 1967, p.96-97, pl.37, fig.2-5.
Eocene. NOTE: Stover and Evitt, 1978, p.66 considered this to be a "provisionally accepted species".
- "*robustum*" Davey, 1969b, p.6, pl.1, fig.3; pl.3, fig.2. Stover and Evitt, 1978, p.30 considered this species to be a *jr syn.* of *Cladopyxidium saeptum*.
- "*saeptum*" (Morgenroth, 1968). NOW *Cladopyxidium*.
- setosum* Sarjeant, 1966b, p.151, pl.16, fig.9-10; text-fig.39.
Cenomanian.
- ?*singulare* Vozzhennikova, 1967, p.97, pl.39, fig.2a-3. Eocene. O.C. NOTE: Stover and Evitt, 1978, p.66 considered this to be a "provisionally accepted species".
- smolenskiense* (Vozzhennikova, 1967, p.93, pl.34, fig.1-6; pl.35, fig.6; pl.36, fig.4) Lentini and Williams, 1973, p.95. Late Cretaceous; formerly *Ceratocorys*. NOTE: Stover and Evitt, 1978, p.66 considered this to be a "problematical species".
- spinosum* Brideaux and McIntyre, 1975, p.23-24, pl.6, fig.3-5.
Middle Albian.
- ?*variospinum* Davey, 1969a, p.135, pl.2, fig.5-6; text-fig.13G.
Cenomanian. NOTE: Stover and Evitt, 1978, p.66 considered this to be a "provisionally accepted species".
- veligerum* (Deflandre, 1937b, p.81, pl.12, fig.9) Davey, 1969a, p.136-137. Senonian; formerly *Micrhystridium* and *Ceratocorys*. NOTE: Stover and Evitt, 1978, p.66 considered this to be a "problematical species".
- MICROSPHAERIDIUM* Benedek, 1972, p.46-47.
- **ancistroides* Benedek, 1972, p.47, pl.12, fig.3; text-fig.21.
Late Oligocene.

MIKROCYSTA Bjaerke, 1980, p.71.

**erugata* Bjaerke, 1980, p.71-72, pl.5, fig.10-11. Toarcian.

MIKROPITHON Agelopoulos, 1967, p.51.

**amniophorum* Agelopoulos, 1967, p.51-52, pl.10, fig.6-8. Early-Late Eocene.

MILLIOUDODINIUM Stover and Evitt, 1978, p.173. Duxbury, 1980, p.122 stated that the holotype of the type of the genus *Millioudodinium*, *M. fetchamense*, possesses features (secondary rectilinear markings) which exclude it from the genus. He also proposed that *Cribroperidinium* was a *sr syn.* of *Millioudodinium*.

aichmetes (Sarjeant, 1966b, p.123-124, pl.13, fig.5-6; text-fig. 30) Stover and Evitt, 1978, p.173. Late Barremian; formerly *Gonyaulacysta*.

ambiguum (Deflandre, 1939, p.144, pl.6, fig.2) Stover and Evitt, 1978, p.173. Kimmeridgian; formerly *Gonyaulax* and *Gonyaulacysta*.

apione (Cookson and Eisenack, 1958, p.36, pl.3, fig.7, text-fig. 3-4) Stover and Evitt, 1978, p.173. Albian; formerly *Gonyaulax* and *Gonyaulacysta*.

bacculatum (Baltes, 1971, p.3, pl.1, fig.4-5) Stover and Evitt, 1978, p.173. Early Pliocene; formerly *Leptodinium*.

birkelundii (Fensome, 1979) *comb. nov.*
1979 *Gonyaulacysta birkelundii* Fensome, p.38-40, pl.5, fig.5,8,11; text-fig.14. Portlandian.

?*boreas* (Davey, 1974, p.52-53, pl.4, fig.1-4; pl.7, fig.5) Stover and Evitt, 1978, p.174. Late Barremian; formerly *Gonyaulacysta*.
NOTE: Stover and Evitt, 1978, p.174 considered this to be a "provisionally accepted species".

caudum (Gitmez and Sarjeant, 1972, p.193-194, pl.2, fig.1-2,4-5) Stover and Evitt, 1978, p.173. Kimmeridgian; formerly *Gonyaulacysta*.

?*confusum* (Vozzhennikova, 1967, p.80, pl.17, fig.1a-b; pl.25, fig.4-5; pl.27, fig.3-4) Stover and Evitt, 1978, p.174. Late Jurassic; formerly *Gonyaulax* and *Gonyaulacysta*. NOTE: Stover and Evitt, 1978, p.174 considered this to be a "provisionally accepted species".

"*crispum*" (W. Wetzel, 1967) Stover and Evitt, 1978, p.173. NOW *Hystrihogonyaulax*; formerly *Gonyaulax* and *Gonyaulacysta*.

ehrenbergii (Gitmez, 1970, p.252-254, pl.2, fig.8-9; text-fig.8) Stover and Evitt, 1978, p.173. Early Kimmeridgian; formerly *Gonyaulacysta*.

MILLIQUODINIUM (cont'd)

episomum (Sarjeant, 1966b, p.118-119, pl.13, fig.9-10; text-fig. 27) Stover and Evitt, 1978, p.173. Late Barremian; formerly *Gonyaulacysta*.

**fetchamense* (Sarjeant, 1966b, p.128-130, pl.15, fig.1-2; text-fig. 33) Stover and Evitt, 1978, p.173. Cenomanian; formerly *Gonyaulacysta*.

gigas (Raynaud, 1978) *comb. nov.*
1978 *Gonyaulacysta gigas* Raynaud, p.392-393, pl.2, fig.16.
Late Kimmeridgian-Portlandian.

?*giuseppi* (Morgenroth, 1966a, p.5, pl.2, fig.3-6) Stover and Evitt, 1978, p.174. Early Eocene; formerly *Gonyaulax* and *Gonyaulacysta*. NOTE: Stover and Evitt, 1978, p.174 considered this to be a "provisionally accepted species".

subsp. *major* (Morgenroth, 1966a, p.6, pl.2, fig.5-6) Stover and Evitt, 1978, p.174. Early Eocene; formerly *Gonyaulax giuseppi* subsp. *major* and *Gonyaulacysta giuseppi* subsp. *major*.

globatum (Gitmez and Sarjeant, 1972, p.195-197, pl.3, fig.1-2; text-fig.5A-B) Stover and Evitt, 1978, p.173. Middle-Late Kimmeridgian; formerly *Gonyaulacysta*.

?*globosum* (Brideaux, 1971, p.81, pl.23, fig.37-38; text-fig.7g-h) Stover and Evitt, 1978, p.174. Middle-Late Albian; formerly *Gonyaulacysta*.

?*gottisii* (Dupin, 1968, p.4, pl.1, fig.7-12) Stover and Evitt, 1978, p.174. Late Jurassic; formerly *Gonyaulacysta*. NOTE: Stover and Evitt, 1978, p.174 considered this to be a "provisionally accepted species".

hadrum (Sarjeant, 1966b, p.119-121, pl.14, fig.1; text-fig.28) Stover and Evitt, 1978, p.173. Late Barremian; formerly *Gonyaulacysta*.

?*italicum* (Corradini, 1973, p.132-133, pl.19, fig.8a-b; pl.33, fig.5a-b; text-fig.3) Stover and Evitt, 1978, p.174. Late Cretaceous-Paleocene; formerly *Gonyaulacysta*. NOTE: Stover and Evitt, 1978, p.174 considered this to be a "provisionally accepted species".

?*manilliferum* (Deflandre, 1939, p.143, pl.6, fig.1) Stover and Evitt, 1978, p.174. Kimmeridgian; formerly *Gonyaulax* and ?*Gonyaulacysta*. Stover and Evitt, 1978, p.174 considered this to be a "provisionally accepted species".

?*mecsekense* (Nagy, 1969, p.292, pl.1, fig.6,8) Stover and Evitt, 1978, p.174. Late Pannonian; formerly ?*Gonyaulacysta* and *Palaeoperidinium*. NOTE: Stover and Evitt, 1978, p.174 considered this to be a "provisionally accepted species".

MILLIOUDODINIUM (cont'd)

monacanthum (Deflandre, 1935, p.228, pl.6, fig.1) Stover and Evitt, 1978, p.174. Senonian; formerly *Gonyaulacysta* and *Palaeoperidinium*.

obesum (Brideaux, 1971, p.82, pl.23, fig.39; text-fig.8a-b) Stover and Evitt, 1978, p.174. Late Albian; formerly *Gonyaulacysta*.

pallum (Sarjeant, 1966b, p.113-114, pl.13, fig.3-4; text-fig.24) Stover and Evitt, 1978, p.174. Early Barremian; formerly *Gonyaulacysta*.

?*pannonicum* (Nagy, 1965, p.200-201, pl.1, fig.1-2; pl.2, fig.10; text-fig.1-2) Stover and Evitt, 1978, p.174. Early Pliocene; formerly *Gonyaulax* and *Gonyaulacysta*. NOTE: Stover and Evitt, 1978, p.174 considered this to be a "provisionally accepted species".

parorthoceras (Davey, 1968, p.1) Stover and Evitt, 1978, p.174. Holotype figured by Sarjeant, 1966b as *Gonyaulacysta orthoceras*, pl.14, fig.5-6; text-fig.29. Late Barremian; formerly *Gonyaulacysta*.

punctatum (Baltes, 1971, p.3, pl.1, fig.2-3,6-7) Stover and Evitt, 1978, p.174. Early Pliocene; formerly *Leptodinium*.

saetigerum McIntyre and Brideaux, 1980, p.15, pl.3, fig.2-3,7. Valanginian.

sarjeantii (Vozzhennikova, 1967, p.87-89, pl.25, fig.1-2; pl.28, fig.4; pl.31, fig.1-3; pl.32, fig.1-4) Stover and Evitt, 1978, p.174. Tithonian; formerly *Gonyaulax* and *Gonyaulacysta*.

subsp. *sphaericum* (Vozzhennikova, 1967, p.89, pl.25, fig.1-2; pl.28, fig.4; pl.32, fig.1-4) Stover and Evitt, 1978, p.174. Tithonian; formerly *Gonyaulax sarjeantii* var. *sphaericum* and *Gonyaulacysta sarjeantii* subsp. *sphaerica*.

?*scottii* (Cookson and Eisenack, 1958, p.30, pl.2, fig.5-6) Stover and Evitt, 1978, p.174. Early-Middle Kimmeridgian; formerly *Gonyaulacysta* and *Gonyaulax*. NOTE: Stover and Evitt, 1978, p.174 considered this to be a "provisionally accepted species".

spinoreticulatum McIntyre and Brideaux, 1980, p.15-16, pl.3, fig.4,8-12. Valanginian.

tenuitabulatum (Gerlach, 1961, p.159, pl.25, fig.10-11; text-fig.1-3) Stover and Evitt, 1978, p.174. Middle Oligocene-Middle Miocene; formerly *Gonyaulacysta* and *Gonyaulax*.

MOESIODINIUM Antonescu, 1974, p.62.

**raileanui* Antonescu, 1974, p.62-63, pl.1, fig.1-16. Middle Jurassic.

MONTANAROCYSTA Corradini, 1973, p.183.

**aemiliana* Corradini, 1973, p.183-184, pl.30, fig.2,3a-b. Late Cretaceous-Paleocene.

MORKALLACYSTA Harris, 1974, p.163. Lentin and Williams, 1976, p.160 considered this genus to be a *jr syn.* of *Palaeoperidinium*. The type of the genus and single species "*Morkallacysta pyramidalis*", was accordingly transferred to *Palaeoperidinium*. Stover and Evitt, 1978, p.113-114 retained *Morkallacysta* as a valid genus and rejected the transfer of the type species to *Palaeoperidinium*.

**pyramidalis* Harris, 1973, p.163, pl.1, fig.5-11. Paleocene; see also *Palaeoperidinium*.

MUDERONGIA Cookson and Eisenack, 1958, p.40-41.

asymmetrica Brideaux, 1977, p.40, pl.15, fig.9-10, pl.16, fig.1. Aptian-Albian.

crucis Neale and Sarjeant, 1962, p.449-450, pl.20, fig.2,6; text-fig.6. Late Hauterivian.

extensiva Duxbury, 1977, p.54-55, pl.15, fig.10. Valanginian-Early Hauterivian.

imparilis Duxbury, 1980, p.127-129, pl.5, fig.2,4-5; text-fig.11. Barremian.

**macwhaei* Cookson and Eisenack, 1958, p.41, pl.6, fig.1-5. Aptian. O.C.

pannosa Duxbury, 1980, p.129-130, pl.10, fig.3,6; text-fig.12. Barremian.

perforata Alberti, 1961, p.13, pl.2, fig.8-9. Turonian.

simplex Alberti, 1961, p.12, pl.2, fig.1-2, 4-6; pl.12, fig.1-2. Valanginian-Early Barremian.

staurota Sarjeant, 1966c, p.203-204, pl.21, fig.6-7; pl.23, fig.4; text-fig.53. Early Barremian.

testudinaria Burger, 1980b, p.274-275, fig.9B,10A-E. ?Hauterivian.

tetracantha (Gocht, 1957, p.168, pl.18, fig.7-9; text-fig.5) Alberti, 1961, p.14. Late Hauterivian; formerly ?*Pseudocera-tium*.

tomaszowensis Alberti, 1961, p.12-13, pl.2, fig.12-13. Valanginian.

MUIRADINIUM Harland and Sarjeant, 1970, p.225.

**dorsispirale* (Churchill and Sarjeant, 1963, p.33, pl.1, fig.18; text-fig.2) Harland and Sarjeant, 1970, p.225. Holocene; formerly *Gymmodinium*.

MUIRIELLA Churchill and Sarjeant, 1963, p.36; emend. Harland and Sarjeant, 1970, p.226-227.

**plioplax* Churchill and Sarjeant, 1963, p.37, pl.1, fig.20-21; text-fig.4; emend. Harland and Sarjeant, 1970, p.227-228. Holocene.

MULTISPINULA Bradford, 1975, p.3067. We herein reject the contention of Harland and Reid in Harland *et al.*, 1980, p.216 that this genus was illegitimate when created because it lacked a Latin diagnosis. As no living forms were observed, we agree with Bradford (*op.cit.*) who clearly stated that he considered cysts of unknown origin in unconsolidated sediments to be fossils.

minuta Harland and Reid in Harland *et al.*, 1980, p.216-217, fig. 2M-0. Recent. Because this species was recovered from unconsolidated sediments in the Beaufort Sea does not necessarily imply that it is Recent. The type locality is unconsolidated down to 8000' below the surface and reworking is extensive.

**quanta* Bradford, 1975, p.3067,3069, fig.5-7. Recent.

MURATODINIUM Drugg, 1970b, p.818.

**fimbriatum* (Cookson and Eisenack, 1967b, p.252, pl.40, fig.1-7) Drugg, 1970b, p.818-819. Paleocene; formerly *Kenleyia*.



"*NANNOCERATOPSIELLA*" Tasch, 1963, p.333. The type species of this "genus" is based on a mineral grain; see Stover and Evitt, 1978, p.265,295.

"**permiana*" Tasch, 1963, p.333, pl.1, fig.4-6. Early Permian. This "species" is based on a mineral grain; see Stover and Evitt, 1978, p.265.

"*wellingtoniana*" (Tasch, 1963, p.336, pl.1, fig.9) Lentin and Williams, 1976, p.45. Early Permian; formerly *Deflandrea*. This "species" is based on a mineral grain; see Stover and Evitt, 1978, p.265.

NANNOCERATOPSIS Deflandre, 1938b, p.183; emend. Evitt, 1961b, p.306; emend. Piel and Evitt, 1980, p.102.

ambonis Drugg, 1978, p.70-71, pl.6, fig.3-7. Aalenian.

"*deflandrei*" Evitt, 1961b, p.308-312, pl.1, fig.1-14; pl.2, fig.1-29; text-fig.5,9-17. Evitt, 1962, p.1129-1130 considered this species to be a *jr syn.* of *Nannoceratopsis gracilis* Alberti.

gracilis Alberti, 1961, p.30, pl.7, fig.6; emend. Evitt, 1962, p.1129-1130. Bajocian.

**pellucida* Deflandre, 1938a, p.183, pl.8, fig.8-12; emend. Evitt, 1961b, p.312. Oxfordian.

plegas Drugg, 1978, p.71, pl.6, fig.8-9, pl.7, fig.3. Aalenian.

senex van Helden, 1977, p.165, pl.33.1, fig.1-9; text-fig.33.4. ?Late Pliensbachian-Early Bajocian.

spiculata Stover, 1966, p.42-43, pl.8, fig.1a-5e. Bajocian-Bathonian.

tricerias Drugg, 1978, p.71, pl.6, fig.10-12, pl.7, fig.1-2. Aalenian-Calloviaian.

tricornuta Wille and Gocht, 1979 p.241-242,244, fig.18-23. Toarcian.

"NECROBROOMEA" Wiggins, 1975, p.111. *Jr syn.* of *Imbatodinium* Vozzhennikova and *Batioladinium* Brideaux. Wiggins (*op.cit.*) designated *Necrobroomea longicornuta* (Alberti, 1961) as the type of the genus. All species, with the exception of "*Necrobroomea simplex*" and "*N. imbatodinensis*" are now included in *Imbatodinium*. "*Necrobroomea simplex*" was retained in the genus *Broomea* by Lentin and Williams, 1976, p.144. "*Necrobroomea imbatodinensis*" (as *Imbatodinium imbatodinense*) was transferred to *Pareodinia* by Lentin and Williams, 1977b, p.125.

"NELCHINOPSIS" Wiggins, 1972, p.299. *Jr syn.* of *Gonyaulacysta*; see Duxbury, 1977, p.37.

"**kostromiensis*" (Vozzhennikova, 1967) Wiggins, 1972, p.301-302. NOW and formerly *Gonyaulacysta*; formerly *Gonyaulax*. The transfer of this species to *Nelchinopsis* was rejected by Duxbury, 1977, p.37.

NELSONIELLA Cookson and Eisenack, 1960a, p.4.

**aceras* Cookson and Eisenack, 1960a, p.4, pl.1, fig.12-13.
Santonian-Campanian.

semireticulata Cookson and Eisenack, 1960a, p.4-5, pl.1, fig.15.
Santonian-Campanian.

tuberculata Cookson and Eisenack, 1960a, p.4, pl.1, fig.14.
Santonian-Campanian.

NEMATOSPHEROPSIS Deflandre and Cookson, 1955, p.268; emend.
Williams and Downie, 1966c, p.222.

aquaeducta Piasecki, 1980, p.70, pl.1, fig.1-3; pl.5, fig.1-2.
Middle Miocene.

**balcombiana* Deflandre and Cookson, 1955, p.268-269, pl.8, fig.5.
Middle Miocene.

densiradiata (Cookson and Eisenack, 1962b, p.493, pl.4, fig.5-7)
Stover and Evitt, 1978, p.176. Genomanian; formerly *Carnosphaeropsis*.

grandis Davey, 1975, p.153-154, pl.1, fig.9. Senonian (probably Campanian).

labyrinthea (Ostenfeld, 1903, p.578, fig.12) Reid, 1974, p.592.
Recent; formerly assigned to the modern motile genus *Pterosperma* Pouchet.

?*philippotii* (Deflandre, 1947a, p.1574; text-fig.2-3) De Coninck, 1969, p.29. Senonian; formerly *Carnosphaeropsis*. O.C. NOTE: Stover and Evitt, 1978, p.176 considered this to be a "provisionally accepted species".

NEMATOSPHAEROPSIS (cont'd)

pusulosa (Morgenroth, 1966b, p.8, pl.2, fig.6) Stover and Evitt, 1978, p.176. Early Oligocene; formerly *Carnosphaeropsis*.

scala Duxbury, 1977, p.43, pl.9, fig.2. Valanginian-Hauterivian.

singularis Davey, 1979b, p.557, pl.5, fig.6,10,14. Aptian-Albian.

"*velata*" (Clarke and Verdier, 1967). NOW ?*Spiniferites*.

NEODIACRODIUM Theodorova-Shakhmundes, 1976, p.94.

breviprocessatum Theodorova-Shakhmundes, 1976, p.97-98, pl.1, fig.5-6a. Late Barremian.

corniculatum Theodorova-Shakhmundes, 1976, p.96-97, pl.1, fig.4. Barremian.

hystrichoforme Theodorova-Shakhmundes, 1976, p.99, pl.1, fig.11. Late Barremian.

**longiprocessatum* Theodorova-Shakhmundes, 1976, p.94-95, pl.1, fig.7-8. Early Valanginian.

proprium Theodorova-Shakhmundes, 1976, p.98-99, pl.1, fig.9-10. Late Barremian.

timofeevii Theodorova-Shakhmundes, 1976, p.95-96, pl.1, fig.2-3. Early Albian.

NETRELYTRON Sarjeant, 1961a, p.113; emend. Sarjeant, 1966c, p.199. Wiggins, 1975, p.110 and Stover and Evitt, 1978, p.110 considered this genus to be a *jr syn.* of *Kalyptea* Cookson and Eisenack; emend. Wiggins. Wiggins *op.cit.* accordingly transferred the type of the genus, *Netrelytron stegastum*, and *N. trinetron* to *Kalyptea*. Wiggins considered the remaining species *Netrelytron parum* Gitmez, to be a *jr syn.* of "*Kalyptea trinetron*" (Sarjeant) Gitmez. Sarjeant, 1976c, p.15-17 retained *Netrelytron* and the species therein.

"*jurassicum*" (Alberti, 1961). Invalidly transferred from *Kalyptea* by Sarjeant, 1966c, p.201.

parum Gitmez, 1970, p.314-315, pl.5, fig.4; pl.9, fig.4. Early Kimmeridgian. Wiggins, 1975, p.110 considered this species to be a *jr syn.* of "*Kalyptea trinetron*" (Sarjeant) Wiggins. Sarjeant, 1976c, p.16-17, however, refuted Wiggins's conclusions. Stover and Evitt, 1978, p.110 agreed with Wiggins.

**stegastum* Sarjeant, 1961a, p.114-115, pl.15, fig.15; text-fig.14. Early Oxfordian. Wiggins, 1975, p.110 transferred this species to *Kalyptea* Cookson and Eisenack; emend. Wiggins. Sarjeant, 1976c, p.16, however, retained *Netrelytron* and the species therein, including *N. stegastum*. Stover and Evitt, 1978, p.110 agreed with Wiggins.

NETRELYTRON (cont'd)

trinetron Sarjeant, 1966c, p.199-200, pl.22, fig.3; text-fig.51. Middle Barremian. Wiggins, 1975, p.110 transferred this species to *Kalyptea* Cookson and Eisenack; emend. Wiggins. Sarjeant, 1976c, p.16-17, however, retained *Netrelytron* and the species therein, including *N. trinetron*. Stover and Evitt, 1978, p.110 agreed with Wiggins.

NEXOSISPINUM Davey, 1979b, p.557-558.

**hesperum* Davey, 1979b, p.558, pl.6, fig.1-5. Aptian-Albian.

vetusculum (Davey, 1974, p.45, pl.1, fig.1-2) Davey, 1979b, p.558. Barremian; formerly *Adnatosphaeridium* and *Systematophora*.

NORICYSTA Bujak and Fisher, 1976, p.58; emend. Dörhöfer and Davies, 1980, p.23-24.

**fimbriata* Bujak and Fisher, 1976, p.60,62, pl.9, fig.1-5; text-fig.5A-B; emend. Dörhöfer and Davies, 1980, p.24. Norian.

pannucea Bujak and Fisher, 1976, p.62, pl.9, fig.6-10; text-fig.5D. Norian.

varivallata Bujak and Fisher, 1976, p.62, pl.9, fig.16-17; text-fig.5C. Norian.

NUMMUS Morgan, 1975, p.163.

**monoculatus* Morgan, 1975, p.163, pl.3, fig.1a-d,4a-c. Late Neocomian-Aptian.

similis (Cookson and Eisenack, 1960b, p.254, pl.38, fig.14) Burger, 1980b, p.275. Tithonian; formerly *Leiosphaeridia*.



OCCISUCYSTA Gitmez, 1970, p.267.

"*aculeata*" (Klement, 1960) Below, 1981, p.60. We herein reject this transfer and retain the species in *Acanthaulax*.

**balia* Gitmez, 1970, p.267-268, pl.5, fig.1-2; text-fig.16.
Early Kimmeridgian. O.C.

"*cornuta*" (Davey, 1974) Below, 1981, p.60. We herein reject this transfer and retain the species in *Cribroperidinium*.

coummia Below, 1981, p.61, pl.8, fig.6-7; pl.13, fig.10-11.
Albian.

crestata Jain, 1977, p.175, pl.5, fig.63-65. Early Albian.

evittii (Dodekova, 1969, p.14, pl.1, fig.1-2) Gitmez, 1970, p.269.
Tithonian; formerly *Gonyaulacysta*. O.C.

"*hollisteri*" (Habib, 1972) Below, 1981, p.60. We herein reject this transfer and retain the species in *Diacanthum*.

monoheuriska Gitmez and Sarjeant, 1972, p.221-223, pl.7, fig.10-11;
text-fig.21. Early Kimmeridgian. O.C.

"*paucispina*" (Eisenack and Cookson, 1960) Below, 1981, p.60. We herein reject this transfer and retain the species in *Trichodinium*.

sousensis Below, 1981, p.61-62, pl.8, fig.1-2. Aptian.

"*speetonensis*" (Davey, 1974) Below, 1981, p.60. We herein reject this transfer and retain the species in *Trichodinium*.

tentoria Duxbury, 1977, p.44-45, pl.3, fig.8-9; text-fig.16.
Berriasian-Barremian.

"*tenuiceras*" (Eisenack, 1958) Below, 1981, p.63. We herein reject this transfer and retain the species in *Diacanthum*.

OCHETODINIUM Damassa, 1979a, p.830-833.

**romanum* Damassa, 1979a, p.833-834, pl.6, fig.1-2. Early-Middle Eocene.

ODONTOCHITINA Deflandre, 1935, p.234; emend. Davey, 1970, p.354.

athabaskensis Pocock, 1962, p.78, pl.14, fig.209-210. Barremian.

ODONTOCHITINA (cont'd)

"*blastema*" Davey, 1970, p.356, pl.5, fig.4-5. Davey and Verdier, 1971, p.27 considered this species to be a *jr syn.* of *Xenascus ceratioides* (Deflandre) Lentin and Williams.

costata Alberti, 1961, p.31, pl.6, fig.10-13; emend. Clarke and Verdier, 1967, p.58-59. Cenomanian-Turonian.

cribropoda Deflandre and Cookson, 1955, p.292, pl.3, fig.7-11; text-fig.58. Senonian.

nuda (Gocht, 1957, p.168, pl.18, fig.3-4,6) Dörhöfer and Davies, 1980, p.39. Late Hauterivian; formerly ?*Pseudoceratium*.

**operculata* (O. Wetzel, 1933a, p.170, pl.2, fig.21-22; text-fig.3) Deflandre and Cookson, 1955, p.291-292. Senonian.

porifera Cookson, 1956, p.188, pl.1, fig.17. Senonian.

"*silicora*" Deflandre, 1935, p.234, pl.9, fig.8-10. Late Cretaceous. Deflandre and Cookson, 1955, p.292 considered this species to be a *jr syn.* of *Odontochitina operculata* (O. Wetzel) Deflandre and Cookson.

"*striatoperforata*" Cookson and Eisenack, 1962b, p.490, pl.3, fig.14-19. Albian-Cenomanian. Clarke and Verdier, 1967, p.58 considered this species to be a *jr syn.* of *Odontochitina costata* Alberti.

"*subbaramana*" Jain and Taugourdeau-Lantz, 1973, p.64-65, pl.4, fig.3. Early Cretaceous. *Jr syn.* of *Odontochitina cribropoda*; see Jain, 1977, p.186.

ODONTOCHITINOPSIS Eisenack, 1961, p.298-299, 308.

incerta (Deflandre-Rigaud, 1954, p.59; text-fig.3) Eisenack, 1964, p.563. Late Cretaceous; formerly *Ceratocystidiopsis*. According to Article 33, para 4 of the I.C.B.N. the transfer of *Ceratocystidiopsis incerta* to *Odontochitinaopsis* by Eisenack, 1961, p.299 is invalid. We reject the retention of the species in *Ceratocystidiopsis* as proposed by Stover and Evitt, 1978, p.234.

**molesta* (Deflandre, 1937b, p.90, pl.17, fig.1-2) Eisenack, 1961, p.299. Senonian; formerly *Ceratocystidiopsis*.

OLIGOSPHAERIDIUM Davey and Williams, 1966b, p.70-71.

abaculum Davey, 1979a, p.428, 430, 432-433, pl.48, fig.1-6; pl.49, fig.1-7, pl.50, fig.1, 4, 10-11; text-fig.1-2. Barremian.

albertense (Pocock, 1962, p.82, pl.15, fig.226-227) Davey and Williams, 1969, p.5. Barremian; formerly *Hystriichosphaeridium*.

OLIGOSPHAERIDIUM (cont'd)

- anthophorum* (Cookson and Eisenack, 1958, p.43, pl.11, fig.12-13; text-fig.16-18) Davey, 1969a, p.147. Late Jurassic-Early Cretaceous; formerly *Hystri-chosphaeridium*. The transfer of this species to *Polystephanephorus* by Davey, 1979c, p.65 is herein rejected. Also the transfer of this species to *Hystri-chosphaerina* by Duxbury, 1980, p.126 is herein rejected.
- ?*asterigerum* (Gocht, 1959, p.67, pl.3, fig.1; pl.7, fig.1-4) Davey and Williams, 1969, p.5. Hauterivian; formerly *Hystri-chosphaeridium*. NOTE: Stover and Evitt, 1978, p.68 considered this to be a "provisionally accepted species".
- bucini-ferum* Corradini, 1973, p.142-143, pl.21, fig.2a-b; text-fig.5. Senonian.
- cephalum* Sah et al., 1970, p.147, pl.2, fig.22-23. Late Cretaceous.
- "?*coelenteratum*" (Tasch, 1964, p.195, pl.2, fig.11) Davey and Williams, 1969, p.5. Albian; formerly *Hystri-chosphaeridium*. Stover and Evitt, 1978, p.69 considered this species to be a *jr syn.* of *Oligosphaeridium irregulare*.
- **complex* (White, 1842, p.39, pl.4, div.3, fig.11) Davey and Williams, 1966b, p.71-74. Senonian; formerly *Hystri-chosphaeridium*.
- subsp. *brevispinum* Jain, 1977, p.182, pl.1, fig.4. Albian.
- "*diastema*" Singh, 1971, p.337, pl.55, fig.4-5; pl.56, fig.1-2. Harker and Sarjeant, 1975, p.226 and Brideaux and McIntyre, 1975, p.29 considered this species to be a *jr syn.* of *Oligosphaeridium totum* Brideaux.
- dictyophorum* (Cookson and Eisenack, 1958, p.44, pl.11, fig.14) Davey and Williams, 1969, p.5. Late Jurassic; formerly *Hystri-chosphaeridium*.
- "?*dictyostilum*" (Menendez, 1965, p.11, pl.2, fig.6; pl.3, fig.18-22) Eisenack and Kjellström, 1971a, p.845. Eaton, 1971, p.359 considered this species to be a *jr syn.* of *Areosphaeridium diktyoplokus* (Klumpp) Eaton.
- "?*dispare*" (Tasch, 1964, p.195, pl.2, fig.8) Davey and Williams, 1969, p.5. Albian; formerly *Hystri-chosphaeridium*. Stover and Evitt, 1978, p.69 considered this species to be a *jr syn.* of *Oligosphaeridium irregulare*.
- dividuum* Williams, 1978, p.797, pl.5, fig.8. Valanginian-Barremian.
- fenestratum* Duxbury, 1980, p.130-131, pl.9, fig.8-9. Barremian.

OLIGOSPHAERIDIUM (cont'd)

intermedium Corradini, 1973, p.143-144, pl.21, fig.7; text-fig.6.
Late Cretaceous-?Paleocene.

irregulare (Pocock, 1962, p.82, pl.15, fig.228-229 *non* Merrill, 1895) Davey and Williams, 1969, p.5. Barremian; formerly *Hystriosphæridium*.

"*macrotubulum*" (Neale and Sarjeant, 1962, p.452, pl.20, fig.7; text-fig.8a) Davey and Williams, 1966b, p.75. Hauterivian; formerly *Hystriosphæridium*. NOTE: Stover and Evitt, 1978, p.68-69 considered this to be a "provisionally accepted species". *Syn.* of *Oligosphaeridium vasiformum*; see McIntyre and Brideaux, 1980, p.21. Also *jr syn.*, by implication, of *Oligosphaeridium asterigerum*; see Duxbury, 1977, p.45.

membranaceum Jiabo, 1978, p.71-72, pl.26, fig.12. Early Tertiary.

minor Jiabo, 1978, p.72, pl.26, fig.5-6. Early Tertiary.

"*nanrum*" (Davey, 1974). NOW *Discorsia*.

"*paradoxum*" (Brosius, 1963) Davey and Williams, 1969, p.5. NOW *Bipolaribucina*.

perforatum (Gocht, 1959, p.68, pl.3, fig.7; pl.7, fig.13-16) Davey and Williams, 1969, p.5. Hauterivian-Barremian; formerly *Hystriosphæridium*.

"*perforatum*" (Jain, 1977). *Jr hom.* of *Oligosphaeridium perforatum* (Gocht, 1959) Davey and Williams, 1969. NOW *Oligosphaeridium porosum*.

poculum Jain, 1977, p.181, pl.1, fig.1-3. Early Albian.

porosum *nom. nov.*, *nom. subst. pro Oligosphaeridium perforatum* Jain, 1977 (p.181, pl.1, fig.5-7) *non* *O. perforatum* (Gocht, 1959, p.68, pl.3, fig.7; pl.7, fig.13-16) Davey and Williams, 1969, p.5. Early Albian.

prolixispinosum Davey and Williams, 1966b, p.76-77, pl.8, fig.2-3. Cenomanian. The transfer of this species to *Tanyosphaeridium* by Duxbury, 1980, p.132 is herein rejected because of the number and nature of the processes.

pulcherrimum (Deflandre and Cookson, 1955, p.270, pl.1, fig.8; text-fig.21-22) Davey and Williams, 1966b, p.75-76. Albian; formerly *Hystriosphæridium*.

"*reniforme*" (Tasch, 1964, p.193, pl.2, fig.6) Davey, 1969a, p.148. Albian; formerly *Hystriosphæridium*. Stover and Evitt, 1978, p.69 considered this species to be a *jr syn.* of *Oligosphaeridium irregulare*.

OLIGOSPHAERIDIUM (cont'd)

reticulatum Davey and Williams, 1966b, p.74, pl.7, fig.10.
Cenomanian.

totum Brideaux, 1971, p.88-89, pl.25, fig.53-55,57. Late Albian.

subsp. *minor* (Brideaux, 1971, p.88-89, pl.25, fig.54,57)
Lentin and Williams, 1973, p.100. Late Albian; formerly
Oligosphaeridium totum var. *minor*.

subsp. *totum* (Brideaux, 1971, p.88, pl.25, fig.53,55) Lentin and
Williams, 1973, p.100. Late Albian; formerly *Oligosphaeridium*
totum var. *totum*.

"*vasiformum*" (Neale and Sarjeant, 1962, p.452, pl.20, fig.1;
text-fig.8b) Davey and Williams, 1966b, p.74-75. Middle
Hauterivian-Early Barremian; formerly *Hystriosphaeeridium*.
Jr syn. of ?*Oligosphaeridium asterigerum*; see Duxbury, 1977,
p.45.

verrucosum Davey, 1979b, p.558, pl.5, fig.1-3. Aptian.

OLLULA Goczan, 1962, p.194,200.

**goczani* Loeblich and Loeblich, 1966, p.442, *nom. subst. pro*
tautonym *O. ollula* Goczan, 1962, p.195,201, pl.3, fig.11-16.
See Loeblich and Loeblich, 1971, p.312. Cretaceous.

OMANODINIUM Bradford, 1975, p.3070. We herein reject the conten-
tion of Harland and Reid in Harland *et al.*, 1980, p.223 that
this genus and the two included species, *O. alticinctum* and *O.*
tholus, were illegitimate because they lacked Latin diagnoses.
As no living forms were observed, we agree with Bradford (*op.*
cit.) who clearly stated that he considered cysts of unknown
origin in unconsolidated sediments to be fossils.

**alticinctum* Bradford, 1975, p.3070,3072, fig.23-28. Recent.
Also see discussion under genus.

tholus Bradford, 1975, p.3072,3074, fig.17-22. Recent. Also
see discussion under genus.

OMATIA Cookson and Eisenack, 1958, p.60; emend. Wiggins, 1969,
p.150.

alaskaensis Stover and Evitt, 1978, p.178 = *Herendeenia pisci-*
formis of Wiggins, 1969, p.146,148, pl.1, fig.1-7; holotype:
pl.1, fig.1-3, not *Omatia pisciformis* of Cookson and Eisenack,
1958, p.61, pl.8, fig.6. Neocomian, probably Late Hauterivian-
Barremian.

"*butticula*" (Wiggins, 1969). NOW *Boreocysta*.

OMATIA (cont'd)

**montgomeryi* Cookson and Eisenack, 1958, p.60, pl.8, fig.7-9.
Late Jurassic.

pisciiformis Cookson and Eisenack, 1958, p.61, pl.8, fig.6.
Late Jurassic. The transfer of this species to *Herendeenia*
by Wiggins, 1969, p.146-148 was rejected by Stover and
Evitt, 1978, p.280-281.

OMATIDIUM Courtinat and Gaillard, 1980, p.40.

**amphiacanthum* (Cookson and Eisenack, 1958, p.37, pl.5, fig.9)
Courtinat and Gaillard, 1980, p.40. Late Jurassic or Neo-
comian.

"OODNADATTIA" Eisenack and Cookson, 1960, p.6. *Jr syn.* of *Dino-*
pterygium; see Norris and Sarjeant, 1965, p.44. Clarke and
Verdier, 1967, p.36 considered the type of the genus, *O.*
tuberculata, to be a *jr syn.* of *Dinopterygium cladoides*.
Stover and Evitt, 1978, p.205 considered *Oodnadattia* to be a
jr syn. of *Dinopterygium*, but retained *Dinopterygium tuber-*
culatum as a distinct and separate species. We herein reject
the retention of the genus *Oodnadattia* by Below, 1981, p.64
who stated that this genus has an apical archeopyle.

"*alata*" (Cookson and Eisenack, 1962b) Below, 1981, p.107. We
herein reject this transfer and retain the species in
Xiphophoridium.

"*pterophora*" (Deflandre and Courteville, 1939, p.102) Below, 1981,
p.107. We herein reject the transfer of this species from
Hystriichosphaeridium to *Oodnadattia*, and have herein trans-
ferred it to the genus *Dinopterygium* Deflandre.

OPAEOPSOMUS Pocock, 1972, p.96. (*non Opaeopsomus* Evitt in Pocock,
1972). Pocock used the name *Opaeopsomus* which appeared ori-
ginally in an unpublished company report by Evitt. See I.C.B.N.
Article 46D. Pending examination of the holotype of *O. wapel-*
lensis, we reject the contention of Stover and Evitt, 1978,
p.69 that *Opaeopsomus* is probably congeneric with *Ellipsoi-*
dictyum. For the same reasons we reject the opinion of Dörhöfer
and Davies, 1980, p.23 that *Opaeopsomus* is a *jr syn.* of *Dap-*
codinium.

**wapellensis* Pocock, 1972, p.97, pl.24, fig.14. Callovian.

OPERCULITES Newman, 1965, p.18.

**carbonis* Newman, 1965, p.18-20, pl.1, fig.14-16. Campanian.

OPERCULODINIUM Wall, 1967, p.110-111.

bergmanni (Archangelsky, 1969a, p.414, pl.2, fig.8,11) Stover
and Evitt, 1978, p.178. Eocene; formerly *Cleistosphaeridium*.

OPERCULODINIUM (cont'd)

**centrocarpum* (Deflandre and Cookson, 1955, p.272, pl.8, fig.3-4) Wall, 1967, p.111. Miocene; formerly *Baltisphaeridium*, *Hystriichosphaeridium* and *Cordosphaeridium*. Morgenroth, 1966a, p.26 included this species as a subspecies of *Cordosphaeridium tiara*. De Coninck, 1969, p.32 questionably included this species as a subspecies of *Cordosphaeridium microtriainum*. This interpretation was rejected by Lentin and Williams, 1973, p.102.

subsp. *teokides* (Srivastava and Banerjee, 1969) *comb. nov.*, *stat. nov.*

1969 *Hystriichosphaeridium centrocarpum* var. *teokides*
Srivastava and Banerjee, p.103, pl.1, fig.6-8. Eocene.

crassum Harland, 1979b, p.536, pl.2, fig.12-14. Late Miocene-Pleistocene.

divergens (Eisenack, 1954, p.67, pl.9, fig.13-16) Stover and Evitt, 1978, p.178. Early Oligocene; formerly *Baltisphaeridium*, *Cordosphaeridium* and *Hystriichosphaeridium*.

erinaceum (Morgenroth, 1966a, p.33-34, pl.8, fig.10-12) Stover and Evitt, 1978, p.178. Early Eocene; formerly *Impleto-sphaeridium*.

flucturum Davey, 1969b, p.8, pl.2, fig.3,7-8. Maastrichtian-?Danian.

giganteum Wall, 1967, p.112, pl.16, fig.9-10. Pleistocene-Holocene.

?*hirsutum* (Ehrenberg, 1838, p.109-135, pl.1, fig.13) Lentin and Williams, 1973, p.102. Cretaceous; formerly *Xanthidium*, *Ovrum hispidum*, *Hystriichosphaeridium*, *Hystriichosphaera* and *Baltisphaeridium*. NOTE: Stover and Evitt, 1978, p.179 considered this to be a "provisionally accepted species".

subsp. *ampulum* (W. Wetzel, 1955, p.38; text-fig.11) Lentin and Williams, 1973, p.102. Danian; formerly *Hystriichosphaeridium hirsutum* subsp. *ampulum*.

subsp. *minor* (O. Wetzel, 1933b, p.45-46, pl.4, fig.26) Lentin and Williams, 1973, p.102. Late Cretaceous; formerly *Hystriichosphaera hirsuta* forma *minor*.

subsp. *varians* (O. Wetzel, 1933b, p.47-48, pl.4, fig.27-29) Lentin and Williams, 1973, p.102. Late Cretaceous; formerly *Hystriichosphaera hirsuta* forma *varians*.

israelianum (Rossignol, 1962, p.132, pl.2, fig.3) Wall, 1967, p.111. Pleistocene; formerly *Hystriichosphaeridium* and *Baltisphaeridium*.

OPERCULODINIUM (cont'd)

multispinosum Ashraf, 1979, p.144, pl.9, fig.9,11. Early Cretaceous.

?*personatum* (Corradini, 1973, p.157, pl.23, fig.5-6) Stover and Evitt, 1978, p.179. Senonian; formerly *Lanternosphaeridium*. NOTE: Stover and Evitt, 1978, p.179 considered this to be a "provisionally accepted species".

placitum Drugg and Loeblich, 1967, p.186, pl.1, fig.9-11b; text-fig.4. Oligocene. NOTE: Stover and Evitt, 1978, p.179 considered this to be a "problematical species".

"*pseudorecurvatum*" (Morgenroth, 1966a) Stover and Evitt, 1978, p.179. Early Eocene. NOW *Melitasphaeridium*; formerly *Hystriichosphaeridium*.

psilatatum Wall, 1967, p.111-112, pl.16, fig.6-8. Holocene.

"*pugiatum*" (Drugg, 1970b). NOW *Lingulodinium*.

?*punctatum* Cookson and Eisenack, 1971, p.220, pl.9, fig.6. Albian-Cenomanian. NOTE: Stover and Evitt, 1978, p.179 considered this to be a "problematical species".

?*rarispinosum* Cookson and Eisenack, 1971, p.220-221, pl.9, fig.7-8. Albian-Cenomanian.

"*solarum*" (Drugg, 1970b). NOW *Lingulodinium*.

"*spinigerum*" (Brideaux, 1977). NOW *Protqellipsodinium*.

tiara (Klumpp, 1953, p.390, pl.17, fig.8-10) Stover and Evitt, 1978, p.179. Eocene; formerly *Baltisphaeridium*, *Cleistosphaeridium*, *Cordosphaeridium* and *Hystriichosphaeridium*.

xanthium (Benedek, 1972, p.27-28, pl.9, fig.8; text-fig.9) Stover and Evitt, 1978, p.179. Middle-Late Oligocene; formerly *Cordosphaeridium*.

OVALICYSTA Bjaerke, 1980, p.71.

**hiata* Bjaerke, 1980, p.71, pl.2, fig.7-12. Toarcian.

OVOIDINIUM Davey, 1970, p.351; emend. Lentin and Williams, 1976, p.103-104.

cinctum (Cookson and Eisenack, 1958, p.26, pl.4, fig.1-3) Davey, 1970, p.354. Late Neocomian or Early Aptian; formerly *Deflandrea*, *Evittia* and *Pocockia*. This species was chosen by Pocock (1972) as the type of the genus *Evittia* (non Brito, 1967). The name *Pocockia* was designated by Lentin and Williams (1973, p.114) as a *nomen subst.* for *Evittia* Pocock, 1972. Lentin and Williams 1976, p.104, however, considered *Pocockia nom. subst. pro Evittia* Pocock 1972 (non Brito, 1967) to be a *jr syn.* of *Ovoidinium*.

OVOIDINIUM (cont'd)

- diversum* Davey, 1979b, p.558, pl.6, fig.6-16. Aptian-Albian.
- ?*fragile* Norvick, 1976, p.88, pl.13, fig.1,8; pl.17, fig.7.
Cenomanian.
- implanum* Davey, 1979b, p.558-559, pl.5, fig.7-9,11-12. Albian.
- ?*indicum* Jain and Taugourdeau-Lantz, 1973, p.64, pl.4, fig.1-2.
Early Cretaceous. NOTE: Stover and Evitt, 1978, p.217 considered this to be a "provisionally accepted species".
- "?*indistinctum*" (Cookson and Eisenack, 1974) Lentin and Williams, 1976, p.105. NOW and formerly *Craspedodinium*.
- ?*kansanum* (Tasch, 1964, p.196, pl.1, fig.1) Lentin and Williams, 1976, p.105. Albian; formerly *Peridinium* and ?*Deflandrea*. Lentin and Williams, 1976, p.105 questionably included this species in *Ovoidinium* because of the uncertainty as to its archeopyle. We adhere to the generic concept of Lentin and Williams, 1976 and reject the retention of this species in *Deflandrea* by Stover and Evitt, 1978, p.101.
- "*ostium*" (Davey, 1970). NOW *Ovoidinium verrucosum* subsp. *ostium*.
- ovale* (Cookson and Eisenack, 1970a, p.145, pl.13, fig.8) Lentin and Williams, 1976, p.105. Albian-Cenomanian; formerly *Ascodinium*. We adhere to the generic concept of Lentin and Williams, 1976 and reject the retention of this species in *Ascodinium* by Stover and Evitt, 1978, p.201.
- scabrosum* (Cookson and Hughes, 1964, p.40, pl.5, fig.1-3) Davey, 1970, p.352. Albian-Early Cenomanian; formerly *Ascodinium*.
- **verrucosum* (Cookson and Hughes, 1964, p.41, pl.5, fig.4-7) Davey, 1970, p.351-352. Cenomanian; formerly *Ascodinium*.
- subsp. *ostium* (Davey, 1970, p.353, pl.4, fig.5-6; text-fig.18) Lentin and Williams, 1975, p.2153. Albian-Early Cenomanian; formerly *Ovoidinium ostium*. Transfer of the species as a variety of *Ovoidinium verrucosum* was effected by Davey and Verdier, 1973, p.198.
- waltonii* (Pocock, 1972, p.93, pl.22, fig.13-14) Lentin and Williams, 1976, p.105. Early Jurassic; formerly *Evittia* and *Pocockia*.
O.C.



PALAEOCYSTODINIUM Alberti, 1961, p.20.

australinum (Cookson, 1965b, p.140, pl.25, fig.1-4; emend. Malloy, 1972, p.63) Lentin and Williams, 1976, p.89. Paleocene; formerly *Svalbardella*.

benjamini Drugg, 1967, p.31, pl.3, fig.1; pl.9, fig.3. Maastrichtian-Danian.

?*deflandrei* Gruas-Cavagnetto, 1968, p.92-93, pl.13, fig.15-19. Late Paleocene.

?*denticulatum* Alberti, 1961, p.20-21, pl.7, fig.9. Turonian.

gabonense Stover and Evitt, 1978, p.155 = *Svalbardella australina* Cookson and Eisenack, 1965b, of Malloy 1972, p.63, pl.1, fig.17,20; holotype pl.1, fig.17. Maastrichtian.

**golzowense* Alberti, 1961, p.20, pl.7, fig.10-12; pl.12, fig.16. Late Eocene-Late Oligocene.

granulatum (Wilson, 1967b, p.226-227, fig.7-9) Lentin and Williams, 1976, p.89. Paleocene; formerly *Svalbardella*.

?*hyperxanthum* (Vozzhennikova, 1963, p.185, fig.20) Vozzhennikova, 1967, p.152-153. Paleocene; formerly *Cystodiniopsis*. O.C. NOTE: Stover and Evitt, 1978, p.115 considered this to be a "provisionally accepted species".

lidiae (Gorka, 1963, p.37, pl.5, fig.6) Davey, 1969b, p.12-13. Maastrichtian; formerly *Leiofusa*.

"*microgranulatum*" Jain and Millepied, 1973, p.29, pl.2, fig.23; pl.3, fig.30. Maastrichtian. Lentin and Williams, 1976, p.89 considered this species to be a *jr syn.* of *Andalusiella polymorpha* (Malloy).

"*punctatum*" Jain and Millepied, 1973, p.29, pl.2, fig.24; pl.3, fig.26-28. Maastrichtian. Lentin and Williams, 1976, p.89 considered this species to be a *jr syn.* of *Andalusiella polymorpha* (Malloy).

reductum May, 1980, p.84-85, pl.21, fig.20. Campanian-Maastrichtian.

PALAEOCYSTODINIUM (cont'd)

?*rhomboides* (O. Wetzel, 1933a, p.168, pl.2, fig.17) Lentin and Williams, 1973, p.103. Senonian; formerly *Ceratium* cf. *fuscus* forma *rhomboides*. Lentin and Williams, 1973 elevated *Ceratium* cf. *fuscus* forma *rhomboides* to the species level in order to remove fossil forms from *Ceratium fuscus*. The assignment of these forms to *C. fuscus* had previously been questioned by Eisenack, 1961, p.300-301 and Evitt, 1961c, p.402. As the figured forms most nearly compare with *Palaeocystodinium*, Lentin and Williams, 1973, p.103-104 questionably transferred the forms to this genus.

subsp. *filosum* (O. Wetzel, 1933a, p.169, pl.2, fig.20) Lentin and Williams, 1973, p.103. Senonian; formerly *Ceratium* cf. *fuscus* forma *filosum*.

subsp. *incertum* (Deflandre, 1936a, p.29, pl.10, fig.8-9) Lentin and Williams, 1973, p.103. Senonian; formerly *Ceratium* cf. *fuscus* forma *incertum*. O.C.

subsp. *nodosum* (O. Wetzel, 1933a, p.169, pl.2, fig.19) Lentin and Williams, 1973, p.104. Senonian; formerly *Ceratium* cf. *fuscus* forma *nodosum*.

subsp. *ovatum* (O. Wetzel, 1933a, p.168-169, pl.2, fig.18) Lentin and Williams, 1973, p.104. Senonian; formerly *Ceratium* cf. *fuscus* forma *ovatum*.

scabratum Jain et al., 1975, p.12-13, pl.6, fig.63. Danian.

stockmansii Boltenhagen, 1977, p.114-115, pl.23, fig.1-4. Campanian-Maastrichtian.

PALAEOGLENODINIUM Deflandre, 1935, p.227.

**cretaceum* Deflandre, 1935, p.227, pl.7, fig.2-3. ?Senonian.

PALAEOHYSTRICHOPHORA Deflandre, 1935, p.230; emend. Deflandre and Cookson, 1955, p.257.

"*brevispinosa*" (Pocock, 1962). NOW *Cyclonephelium*.

"*dispersa*" (Cookson and Eisenack, 1958). NOW *Diconodinium*.

**infusorioides* Deflandre, 1935, p.230-231, pl.8, fig.4. ?Senonian.

"*isodiametrica*" (Cookson and Eisenack, 1958). NOW *Hystriochodinium*.

"*minuta*" (Deflandre and Cookson, 1955). Transferred to the genus *Diconodinium* by Deflandre and Deflandre-Rigaud, 1966. Morgan, 1977, p.130 considered this species to be a *jr syn.* of *Alterbia balmei*.

PALAEOHYSTRICHOPHORA (cont'd)

"*multispina*" (Deflandre and Cookson, 1955). NOW *Diconodinium*.

?*muriciiformis* (Conrad, 1941, p.7, pl.1, fig.k) Lentin and Williams, 1976, p.110. Maastrichtian; formerly *Palaeoperidinium*.
Sarjeant, 1967b, p.253 recommended transfer of this species to *Palaeohystrichophora*.

"*myalupensis*" (Churchill and Sarjeant, 1963). NOW *Aquadulcum*.

oblongata Jiabo, 1978, p.89-90, pl.20, fig.7-8. Early Tertiary.

panshanensis Jiabo, 1978, p.89, pl.20, fig.1-6; text-fig.15.
Early Tertiary.

paucisetosa Deflandre, 1943, p.507-508; text-fig.26. ?Senonian.
Stover and Evitt, 1978, p.235 suggested that this species falls within the range of variability for *Palaeohystrichophora infusorioides*.

"*paucispina*" (Alberti, 1961). NOW *Rhombodella*.

"*pellifera*" (Cookson and Eisenack, 1958). NOW *Diconodinium*.

"*pikeae*" (Churchill and Sarjeant, 1963). NOW *Aquadulcum*.

"*spinosissima*" (Deflandre, 1938b). NOW ?*Pareodinia*.

PALAEOPERIDINIUM Deflandre, 1935, p.227; emend. Sarjeant, 1967b, p.246.

"*alatum*" (Conrad, 1941). NOW *Microdinium*. See also comments by Stover and Evitt, 1978, p.218.

ampulum (Harland, 1973, p.673-674, pl.84, fig.1,7; text-fig.8)
Lentin and Williams, 1976, p.109. Late Campanian; formerly *Lejeunia* and *Astrocyta*.

"*basilium*" (Drugg, 1967, p.13, pl.1, fig.9-11; pl.9, fig.1a-b)
Drugg, 1970b, p.810. ?Maastrichtian-Danian; formerly *Peridinium*. Jr syn. of *Palaeoperidinium pyrophorum*; see Stover and Evitt, 1978, p.218.

"*bicuneatum*" (Deflandre, 1938b). NOW *Dinopterygium*.

"*castaneum*" (Deflandre, 1935). NOW *Trichodinium*.

"*caulleryi*" (Deflandre, 1935). NOW ?*Diconodinium*.

"*cayeuxi*" (Deflandre, 1935). NOW *Phanerodinium*.

"*cornutum*" Vozzhennikova, 1963, text-fig.14, nom. nud. No description given.

PALAEOPERIDINIUM (cont'd)

"*crassinervum*" (Deflandre, 1939). NOW *Leptodinium*.

cretaceum Pocock, 1962, p.80, pl.14, fig.219-221; emend. Davey, 1970, p.359. This species was the type of the genus "*Astrocysta*" Davey, 1970, p.359, which Lentin and Williams, 1976, p.110 considered to be a *jr syn.* of *Palaeoperidinium* Deflandre; emend. Sarjeant. Also formerly *Lejeunia* and *Subtilisphaera*.

damasii (Lejeune-Carpentier, 1942, p.185-186, fig. 10) Lentin and Williams, 1976, p.110. Senonian; formerly *Peridinium* and ?*Cooksoniella*.

"*deflandrei*" Lentin and Williams, 1973, p.105. Lentin and Williams erected this species to accommodate fossil specimens formerly attributed to the modern taxon *Peridinium conicum*. For a description of such forms please refer to Deflandre, 1939b, p.174; holotype pl.4, fig.4. *Jr syn.* of *Palaeoperidinium pyrophorum*; see Stover and Evitt, 1978, p.218.

subsp. "*larjakiense*" (Vozzhennikova, 1967) Lentin and Williams, 1973, p.105. NOW *Palaeoperidinium larjakiense*; formerly *Peridinium conicum* var. *larjakiense* and *Cooksoniella larjakiensis*.

"*dictyophorum*" (Deflandre, 1938b). NOW *Aldorfia*.

"*ellipsoideum*" (Deflandre, 1936b). NOW ?*Microdinium*. See also comments by Stover and Evitt, 1978, p.218.

"*eurypylum*" (Manum and Cookson, 1964) Evitt, 1975, p.81. NOW *Saeptodinium*; formerly *Scriniodinium*.

"*granulatum*" (Oleinik, 1976b) *comb. nov.*
1976b *Pentagonum granulatum* Oleinik, p.225-226, pl.1, fig.3-5.
Jr hom. of *P. granulatum* Singh, 1964. NOW *P. oleiniki* *nom. nov.*

"*granulatum*" (Singh, 1964). NOW ?*Apteodinium indicosum*; formerly *Gonyaulacysta indicosa* *nom. subst.* Brideaux, 1971.

"*hansoniarum*" (Traverse, 1955) Lentin and Williams, 1973, p.105; emend. Evitt, 1974, p.2-3. NOW *Saeptodinium*; formerly *Peridinium*.

huanghuaense (Jiabo, 1978) *comb. nov.*
1978 *Pentagonum huanghuaense* Jiabo, p.56, pl.1, fig.1-3. Early Tertiary.

"*hyalodermum*" (Deflandre, 1939). NOW *Gonyaulacysta*.

larjakiense (Vozzhennikova, 1967) *comb. nov., stat. nov.*
1967 *Peridinium conicum* var. *larjakiense* Vozzhennikova, p. 71-72, pl.16, fig.1-2. Paleocene; also formerly *Cooksoniella larjakiensis* and *Palaeoperidinium deflandrei* subsp. *larjakiense*.

PALAEOPERIDINIUM (cont'd)

- "*manumcooksoni*" (Corradini, 1973, p.176-177, pl.28, fig.4,6)
Lentin and Williams, 1976, p.110. Late Cretaceous-Paleocene;
formerly *Astrocysta*. Lentin and Williams, 1976, p.110 con-
sidered this species to be a *jr syn.* of *Palaeoperidinium*
cretaceum Pocock ex. Davey.
- marginatum* (Vozzhennikova, 1967, p.107, pl.46, fig.1,3-4,6)
Lentin and Williams, 1976, p.110. Paleocene; formerly
Pentagonum.
- "*mecsekense*" (Nagy, 1969). NOW ?*Millioudodinium*.
- "*monacanthum*" (Deflandre, 1935). NOW *Millioudodinium*.
- "*mosaicum*" (Downie, 1957). NOW ?*Leptodinium*.
- "*muriciforme*" (Conrad, 1941). NOW ?*Palaeohystrichophora*.
- "*nuciforme*" (Deflandre, 1938b). NOW *Apteodinium*.
- "*nuciformoides*" Gorka, 1965, p.324-325, pl.2, fig.1-2. Sarjeant,
1968, p.227 considered this species to be a *jr syn.* of
Gonyaulacysta nuciformis (Deflandre) Sarjeant.
- "*nudum*" (Downie, 1957). See *Pareodinia nuda*.
- "*nudum*" (Nagy, 1969). NOW ?*Tectatodinium*. See discussion
under "*Palaeoperidinium pannonium*" Lentin and Williams.
- oleinikii* *nom. nov.*, *nom. subst. pro Palaeoperidinium granulatum*
(Oleinik, 1976b) Lentin and Williams, herein, *non Palaeoperidin-*
ium granulatum Singh, 1964.
1976b *Pentagonum granulatum* Oleinik, p.225-226, pl.1, fig.3-5.
Late Eocene.
- "*paleocenicum*" (Cookson and Eisenack, 1965c) Lentin and Williams,
1976, p.110. NOW *Gingiodinium*; formerly *Peridinium* and ?*Cook-*
soniella.
- "*pannonium*" Lentin and Williams, 1973, p.106, *nom. subst. pro*
Palaeoperidinium nudum Nagy, 1969 (*non Palaeoperidinium nudum*
Downie, 1957), p.291, pl.1, fig.1. NOW ?*Tectatodinium pannon-*
ium. This species is, according to Nagy, 1969, p.291, most
closely comparable to "*Palaeoperidinium nuciforme*" (Deflandre,
1938b) which was transferred to *Gonyaulacysta* by Sarjeant,
1968, p.227 and is now included in *Apteodinium*. Harker and
Sarjeant, 1975, p.224 transferred "*Palaeoperidinium pannonium*"
to *Phthanoperidinium*. Lentin and Williams, 1976, p.110 pro-
posed that "*Palaeoperidinium pannonium*" be transferred to
Gonyaulacysta as ?*Gonyaulacysta nuda* (Nagy, 1969). After
further study of the diagnosis and single illustration "*Palae-*
operidinium pannonium" was questionably transferred to *Tecta-*
todinium, as ?*Tectatodinium nudum* (Nagy, 1969) *comb. nov.* by

PALAEOPERIDINIUM (cont'd)

Lentin and Williams, 1977b, p.121. However, the correct name of the taxon is ?*Tectatodinium pannonium* Lentin and Williams, because the epithet "*nudum*" is illegitimate.

parvum (Harland, 1973, p.672-673, pl.84, fig.3,12-14; text-fig.7) Lentin and Williams, 1976, p.111. Late Campanian; formerly *Lejeunia*.

"*pilum*" (Gocht, 1959). NOW ?*Leptodinium*.

"*piriforme*" (Conrad, 1941). NOW *Gonyaulacysta*. See also comments by Stover and Evitt, 1978, p.218.

"*pyramidale*" (Harris, 1973) Lentin and Williams, 1976, p.111. Paleocene. NOW and formerly *Morkallacysta*.

**pyrophorum* (Ehrenberg, 1838, pl.1, fig.1,4) Sarjeant, 1967b, p.246-247. Late Cretaceous; formerly *Peridinium*.

"*reticulatum*" (Valensi, 1953). NOW *Ellipsoidictyum*.

"*rhomboidale*" (Gorka, 1965). NOW ?*Trichodinium*.

sibiricum (Vozzhennikova, 1963, p.183; text-fig.17a-b) Lentin and Williams, 1976, p.111. Paleocene; formerly *Pentagonum*.

"*spinosissimum*" (Deflandre, 1938b). NOW ?*Pareodinia*.

"*spinosum*" (Cookson and Hughes, 1964). NOW *Epelidosphaeridia*.

?*subconicoides* (Lejeune-Carpentier, 1942, p.183-185; text-fig.1-8) Lentin and Williams, 1973, p.106. Senonian; formerly *Peridinium*.

"*tabulatum*" (Cookson and Eisenack, 1965c) Lentin and Williams, 1976, p.111. NOW and formerly *Gingiodinium*. This transfer was rejected by Stover and Evitt, 1978, p.218.

tenuis Schumacker-Lambry, 1978, p.46-47, pl.4, fig.11-13. Paleocene (Landenian).

"*velatum*" (Conrad, 1941). NOW ?*Seriodinium*. See also comments by Stover and Evitt, 1978, p.218.

"*ventriosum*" (O. Wetzel, 1933a) Deflandre, 1935. NOW *Cribroperidinium*.

PALAEOSPHAERIUM Gorka, 1965, p.308.

**infrequens* Gorka, 1965, p.308, pl.2, fig.7. Early Kimmeridgian.

PALAEOSTOMOCYSTIS Deflandre, 1937b, p.52.

"*apiculata*" (Cookson and Eisenack, 1960a). NOW ?*Fromea*.

"*bakonyensis*" (Goczan, 1962). NOW *Pyxidinospis*.

"*chytra*" (Drugg, 1967). NOW *Fromea*.

"*cretacea*" (O. Wetzel, 1933a, p.175, pl.2, fig.28-29) Deflandre, 1937b, p.54. Late Cretaceous; formerly ?*Trachelomonas cretacea*. *Trachelomonas* is a genus of the class Euglenineae. Stover and Evitt, 1978, p.70 considered this species to be an acritarch.

"*cylindrica*" (Cookson and Eisenack, 1960b). NOW ?*Fromea*.

decora Deflandre, 1945, card 850, fig.436a. Late Cretaceous.

"*echinulata*" (Deflandre, 1937b). NOW *Diacrocanthidium*.

"*expolita*" (Brideaux, 1977). NOW *Fromea*.

"*fragilis*" (Cookson and Eisenack, 1962b). NOW *Fromea*.

"*glabella*" (Singh, 1971). NOW *Fromea*.

"*granulosa*" (Cookson and Eisenack, 1974). NOW *Fromea*.

"*laevigata*" (Drugg, 1967). NOW ?*Fromea*.

"*laevigatus*" (Jiabo, 1978). NOW *Fromea psilata*.

"*minor*" (Jiabo, 1978). NOW *Fromea*.

"*oblonga*" (Deflandre, 1945). NOW *Fromea*.

"*pergamentaceus*" (Burger, 1980a). NOW *Leberidocysta*.

"*pulchella*" Conrad, 1941, p.10; text-fig.3. Stover and Evitt, 1978, p.70 considered this species to be an acritarch.

"*punctulosa*" Deflandre, 1941, p.22-23, pl.6, fig.11. Stover and Evitt, 1978, p.70 considered this species to be an acritarch.

**reticulata* Deflandre, 1937b, p.53-54. Late Cretaceous. Originally figured in Deflandre, 1935, pl.9, fig.13, *nom. nud.*

"*scabrata*" (Jiabo, 1978). NOW *Fromea*.

"*scrobiculata*" (Deflandre and Cookson, 1955) Cookson and Eisenack, 1974, p.79. NOW *Batiacasphaera*; formerly *Leiosphaera*.

"*senilis*" (McIntyre and Brideaux, 1980). NOW *Fromea*.

PALAEOSTOMOCYSTIS (cont'd)

"*sinuosa*" Cookson and Eisenack, 1960b, p.258, pl.38, fig.16-17.
Stover and Evitt, 1978, p.70 considered this species to be an acritarch.

"*sphaerica*" Deflandre, 1937b, p.54. Originally figured in Deflandre, 1935, pl.9, fig.14, *nom. nud.* Stover and Evitt, 1978, p.70 considered this species to be an acritarch.

"*tornatilis*" (Drugg, 1978). NOW *Fromea*.

"*triquetra*" (Brideaux, 1977). NOW *Fromea*.

PALAEOTETRADINIUM Deflandre, 1936b, p.189; emend. Deflandre and Sarjeant, 1970, p.4; emend. Stover and Evitt, 1978, p.70.

NOTE: The inclusion of *Rhombodella* as a *jr syn.* of *Palaeotetradinium* is herein rejected. Accordingly we do not fully accept the emendation of Stover and Evitt *op.cit.*

caudatum (Benson, 1976, p.218,220, pl.13, fig.4-6) Stover and Evitt, 1978, p.71. Late Maastrichtian-Early Paleocene; formerly *Inversidinium*.

"*hermesinoides*" (O. Wetzel, 1940, p.138-140, pl.5, fig.7). Late Cretaceous. NOW *Veryhachium*. See Harker and Sarjeant, 1975, p.225.

"*hyalodermum*" (Cookson, 1956, p.188, pl.1, fig.12-16). Albian-Cenomanian. Downie and Sarjeant, 1963, p.94 transferred this species to the acritarch genus *Veryhachium* Deunff.

minusculum (Alberti, 1961, p.10-11, pl.1, fig.10; pl.12, fig.4) Stover and Evitt, 1978, p.71. Early Eocene; formerly ?*Rhombodinium minusculum* and *Wetzeliiella (Rhombodinium) minuscula*. This species is a *sr syn.* of *Inversidinium exilimum* McLean.

"*paucispina*" (Alberti, 1961) Stover and Evitt, 1978, p.71. This transfer is herein rejected and the taxon is included in *Rhombodella*.

**silicorum* Deflandre, 1936b, p.189, pl.9, fig.11. ?Senonian.
P. silicorum Deflandre, 1934, p.967, text-fig.6, *nom. nud.* since the genus *Palaeotetradinium* was not validly published until 1936.

PALHISTIODINIA Deflandre, 1938b, p.185.

**arcana* Deflandre, 1938b, p.185, pl.5, fig.10. Oxfordian.

"PALMNICKIA" Eisenack, 1954, p.69. Morgenroth, 1966a, p.40 stated that *Palmnickia* falls within the range of variation found in *Samlandia chlamydophora* Eisenack, 1954. Both Morgenroth, 1966a, p.39 and Benedek, 1972, p.36 considered the type of the genus *Palmnickia*, *P. lobifera*, to be a synonym of *Samlandia chlamydophora* Eisenack, 1954. The remaining species "*Palmnickia californica*" was transferred to *Samlandia* by Lentin and Williams, 1977b, p.123 and to *Danea* by Stover and Evitt, 1978, p.152. The last named transfer is accepted herein. The transfer of "*Palmnickia californica*" to *Danea* is not attributable to Damassa, 1979a, p.818.

PALYNODINIUM Gocht, 1970a, p.135,137-138,140. According to Loeblich and Loeblich, 1971, p.312, the genus *Palynodinium* Gocht, 1970a is invalid as no description or diagnosis is given; see I.C.B.N. Art. 42, par. 1. However, this particular requirement of Art. 42 has been removed, retroactively, in the latest edition of the I.C.B.N. Thus *Palynodinium* Gocht, 1970a is valid.

**grallator* Gocht, 1970a, p.135,137-138,140; text-fig.2; text-fig.4, no.1-8; text-fig.5, no.1-2. Late Cretaceous.

PARABOHAIDINA Jiabo, 1978, p.43.

granulata Jiabo, 1978, p.44, pl.17, fig.4-6. Early Tertiary.

**laevigata* Jiabo, 1978, p.43, pl.15, fig.4; pl.16, fig.1-11; pl.17, fig.1-3. Early Tertiary.

subsp. *laevigata* Jiabo, 1978, p.44, pl.16, fig.7-11. Early Tertiary.

subsp. *minor* Jiabo, 1978, p.44, pl.16, fig.1-6; pl.17, fig.1-3. Early Tertiary.

subsp. *ovata* Jiabo, 1978, p.44, pl.15, fig.4. Early Tertiary.

retirugosa Jiabo, 1978, p.44-45, pl.17, fig.7-9. Early Tertiary.

verrucosa Jiabo, 1978, p.45, pl.17, fig.11. Early Tertiary.

verrurugosa Jiabo, 1978, p.45, pl.17, fig.10. Early Tertiary.

PARAGONYAULACYSTA Johnson and Hills, 1973, p.207; emend. Dörhöfer and Davies, 1980. p.31.

borealis (Brideaux and Fisher, 1976, p.21-22, pl.3, fig.3-4,6-9; pl.4, fig.1-8) Stover and Evitt, 1978, p.116. Late Oxfordian-Berriasian; formerly *Pareodinia*.

**calloviensis* Johnson and Hills, 1973, p.207, pl.2, fig.9,15-16; text-fig.9A-C; emend. Dörhöfer and Davies, 1980, p.31. Early Callovian.

PARAGONYAULACYSTA (cont'd)

capillosa (Brideaux and Fisher, 1976, p.20-21, pl.2, fig.3-10; pl.3, fig.1-2,5) Stover and Evitt, 1978, p.116. Late Oxfordian-Berriasian; formerly *Pareodinia*.

retiphragmata Dörhöfer and Davies, 1980, p.31-32, fig.14; 29D-F. Callovian.

PARALECANIELLA Cookson and Eisenack, 1970b, p.322; emend. Elsik, 1977, p.96.

**indentata* (Deflandre and Cookson, 1955, p.292, pl.9, fig.5-7; text-fig.56) Cookson and Eisenack, 1970b, p.323; emend. Elsik, 1977, p.96. Paleocene-Miocene; formerly *Epicephalopyxis*.

"PARANETRELYTRON" Sarjeant, 1966c, p.201. Wiggins, 1975, p.102 considered this genus to be a *jr syn.* of *Pareodinia* Deflandre; emend. Wiggins.

"**strongylum*" Sarjeant, 1966c, p.201-202, pl.21, fig.5; pl.23, fig.5; text-fig.52. Wiggins, 1975, p.103 considered this species to be a *jr syn.* of *Pareodinia ceratophora* Deflandre.

PAREODINIA Deflandre, 1947c, p.4; emend. Wiggins, 1975, p.103; emend. Stover and Evitt, 1978, p.116.

"*aceras*" (Manum and Cookson, 1964) Davey and Verdier, 1974, p.645. Lentini and Williams, 1975, p.2153 rejected the transfer of this species to *Pareodinia* by Davey and Verdier, *op.cit.* The species has therefore been retained in *Caligodinium* Drugg.

alaskensis Wiggins, 1975, p.104, pl.2, fig.7-8. ?Callovian-Middle Kimmeridgian.

antennata (Gitmez and Sarjeant, 1972, p.232-233, pl.11, fig.2-3) Wiggins, 1975, p.107. Kimmeridgian; formerly *Imbatodinium*.

"*aphelia*" Cookson and Eisenack, 1958, p.60, pl.12, fig.3-4,9. Middle Jurassic-Early Cretaceous. Wiggins, 1975, p.103 considered this species to be a *jr syn.* of *Pareodinia ceratophora* Deflandre.

?*apotomocerastes* Sarjeant, 1972, p.27-28, pl.3, fig.4. Late Bathonian-Early Callovian. NOTE: Stover and Evitt, 1978, p.117 considered this to be a "provisionally accepted species".

arctica Wiggins, 1975, p.103, pl.2, fig.1-5. Late Jurassic, probably Tithonian.

asperata Riley in Fisher and Riley, 1980, p.324, pl.3, fig.6,10. Volgian.

"*borealis*" (Brideaux and Fisher, 1976). NOW *Paragonyaulacysta*.

PAREODINIA (cont'd)

brachythelisis Fensome, 1979, p.29-31, pl.4, fig.3,5-7; text-fig.11.
Bajocian-Callovian.

"*capillosa*" (Brideaux and Fisher, 1976). NOW *Paragonyaulacysta*.

**ceratophora* Deflandre, 1947c, p.4, text-fig.1-3; emend. Gocht, 1970b, p.153-156. Late Callovian.

subsp. *pachyceras* (Sarjeant, 1959, p.337, pl.13, fig.10; text-fig.5a) Lentin and Williams, 1973, p.108. Early Callovian; formerly *Pareodinia ceratophora* var. *pachyceras*. Sarjeant, 1976c, p.10 retained *Pareodinia ceratophora* var. *pachyceras*. His arguments for so doing, however, are inconclusive.

subsp. *scopaea* (Sarjeant, 1972, p.26, pl.2, fig.4) Lentin and Williams, 1973, p.108. Late Bathonian-Early Callovian; formerly *Pareodinia ceratophora* var. *scopaeus*.

curvocervicata Tasch, 1964, p.196, pl.3, fig.1. Albian. NOTE: Stover and Evitt, 1978, p.117 considered this to be a "problematical species".

"*dasyforma*" Wiggins, 1975, p.107 *nom. subst. pro Imbatodinium villosum* Vozzhennikova, 1967, p.56, pl.12, fig.1-3; pl.13, fig.1-3; pl.14, fig.1-2; pl.15, fig.1-2 (*non Pareodinia villosa* Tasch, 1964). Wiggins, *op.cit.*, incorrectly cited the species as *Pareodinia villosa* Vozzhennikova. *Imbatodinium villosum* Vozzhennikova was never validly transferred to *Pareodinia*. NOW *Gochteodinia villosa*.

evittii (Pocock, 1972, p.94-95, pl.24, fig.6,8; text-fig.11) Wiggins, 1975, p.105. Late Bajocian-Callovian; formerly *Tenua*.

gibberosa Jiabo, 1978, p.48-49, pl.6, fig.14. Early Tertiary.

groenlandica Sarjeant, 1972, p.27, pl.2, fig.2; pl.5, fig.1. Late Bathonian-Early Callovian.

"*imbatodinensis*" (Vozzhennikova, 1967) Lentin and Williams, 1977b, p.125. NOW and formerly *Imbatodinium*. The transfer of this species from *Imbatodinium* to "*Necrobroomea*" by Wiggins, 1975, p.111 was rejected by Lentin and Williams, 1977b, p.125 because of the nature of the archeopyle and of the antapex in this species. NOTE: Stover and Evitt, 1978, p.117 considered this to be a "provisionally accepted species" of *Pareodinia*.

"*kondratjevi*" (Vozzhennikova, 1967) Wiggins, 1975, p.104. NOW and formerly *Imbatodinium*. O.C.

minuta Wiggins, 1975, p.104, pl.2, fig.9-10. Late Jurassic.

moderna Kufferath, 1950, p.37-38; text-fig.34. Holocene.

PAREODINIA (cont'd)

mutabilis Riley in Fisher and Riley, 1980, p.324-325, pl.3, fig. 1-3. Volgian.

"*nuda*" (Downie, 1957, p.424, pl.20, fig.11; text-fig.2e) Sarjeant, 1967b, p.254. Late Kimmeridgian; formerly *Palaeoperidinium*. Wiggins, 1975, p.103 considered this species to be a *jr syn.* of *Pareodinia ceratophora* Deflandre. Sarjeant, 1976c, p.11 preferred to retain *Pareodinia nuda*, which is characterized by a longer apical horn with separation of the wall layers at the tip. Stover and Evitt, 1978, p.125 agreed with Wiggins *op.cit.*

"*osmingtonensis*" (Sarjeant, 1962b) Wiggins, 1975, p.105. NOW and formerly *Pluriarvalium*.

subsp. "*rostrata*" (Wiggins, 1975). NOW *Pluriarvalium osmingtonense* subsp. *rostratum*.

prolongata Sarjeant, 1959, p.335-336, pl.13, fig.8; text-fig.4. Early Callovian.

psilata Jain and Millepied, 1975, p.143-144, pl.3, fig.51. Aptian-Albian.

"*ramosa*" (Cookson and Eisenack, 1958) Wiggins, 1975, p.107. The transfer of this species from *Broomea* to *Pareodinia* by Wiggins (*op.cit.*) was rejected by Lentin and Williams, 1976, p.144.

reticulopilosa (Dodekova, 1975, p.26-27, pl.5, fig.1-6) Stover and Evitt, 1978, p.117. Late Bathonian; formerly "*Glomodinium*".

robusta Wiggins, 1975, p.105, pl.3, fig.1-4. Late Jurassic.

"*spinosa*" (Alberti, 1961). NOW ?*Apteodinium albertense* *nom. subst.* herein.

?*spinosissima* (Deflandre, 1938b, p.179, pl.9, fig.11) Wiggins, 1975, p.107. Late Jurassic; formerly *Palaeoperidinium*, *Palaeohystrichophora* and ?*Acanthaulax*. NOTE: Stover and Evitt, 1978, p.117 considered this to be a "provisionally accepted species".

"*tripartita*" Johnson and Hills, 1973, p.208, pl.2, fig.12-14, 17-18; pl.3, fig.1-2; text-fig.11A-C. Late Bathonian. Wiggins, 1975, p.105 considered this species to be a *jr syn.* of *Pareodinia evittii* (Pocock) Wiggins.

var. "*acuta*" Johnson and Hills, 1973, pl.2, fig.12; *nom. nud.* No description; name appears only in explanation of plates.

var. "*obtusa*" Johnson and Hills, 1973, p.208. Incorrect name for "*Pareodinia tripartita* subsp. *tripartita*". See discussion under "*P. tripartita* subsp. *tripartita*". Wiggins, 1975, p.105 considered this subspecies to be a *jr syn.* of *Pareodinia evittii* (Pocock) Wiggins.

PAREODINIA "tripartita" (cont'd)

subsp. "*rotunda*" (Johnson and Hills, 1973, p.209, pl.3, fig.1-2; text-fig.11C) Lentin and Williams, 1975, p.2153. Late Bathonian; formerly *Pareodinia tripartita* var. *rotunda*. Wiggins, 1975, p.105 considered this subspecies to be a *jr syn.* of *Pareodinia evitti* (Pocock) Wiggins.

subsp. "*tripartita*" (Johnson and Hills, 1973, p.208, pl.2, fig.12,13,17-18; text-fig.11B) Lentin and Williams, 1975, p.2153. Late Bathonian; formerly *Pareodinia tripartitus* var. *obtusus*. Johnson and Hills cite the same holotype for *Pareodinia tripartitus* and *Pareodinia tripartitus* var. *obtusus*; therefore *Pareodinia tripartitus* var. *obtusus* is an incorrect name for *P. tripartitus* var. *tripartitus* (I.C.B.N., Art. 26). Wiggins, 1975, p.105 considered *Pareodinia tripartita* to be a *jr syn.* of *Pareodinia evitti* (Pocock) Wiggins.

"*verrucosa*" (Vozzhennikova, 1967) Wiggins, 1975, p.105. NOW *Gochteodinia*; formerly *Imbatodinium*.

villosa Tasch, 1964, p.195-196, pl.1, fig.9. Albian. NOTE: Stover and Evitt, 1978, p.117 considered this to be a "problematical species".

"*PARVOCAVATUS*" Gitmez, 1970, p.306. *Jr syn.* of *Dingodinium*; see Fisher and Riley, 1980, p.319-320 who transferred the two species, *P. spinosus* and *P. tuberosus*, the type of the genus, to *Dingodinium*. These authors did not give the full citation for the transfer of *Parvocavatus spinosus* to *Dingodinium* and it was therefore invalid. However, Davey, 1979c, p.60 had previously, and correctly, transferred *P. spinosus* to *Dingodinium*.

PARVOCYSTA Bjaerke, 1980, p.59-60,62.

barbata Bjaerke, 1980, p.65, pl.1, fig.10,14-15,18; text-fig.3F. Toarcian.

**bullula* Bjaerke, 1980, p.62,64, pl.1, fig.2-6, text-fig.3C. Toarcian.

contracta Bjaerke, 1980, p.64-65, pl.1, fig.7-8; text-fig.3B. Toarcian.

cracens Bjaerke, 1980, p.66, pl.4, fig.16; text-fig.3D. Toarcian.

nasuta Bjaerke, 1980, p.65-66, pl.1, fig.11-12; text-fig.3A. Toarcian.

PARVULODINIUM Dodekova, 1975, p.29.

**clavatum* Dodekova, 1975, p.30, pl.6, fig.4-9; text-fig.8. Late Bathonian.

PAUCIBUCINA Jiabo, 1978, p.73-74.

**dongyingensis* Jiabo, 1978, p.74, pl.24, fig.1,14. Early Tertiary.

liaoningensis Jiabo, 1978, p.74, pl.24, fig.2. Early Tertiary.

simplex Jiabo, 1978, p.74, pl.24, fig.3-4. Early Tertiary.

PAUCISPHAERIDIUM Bujak *et al.*, 1980, p.30,32.

**inversibuccinum* (Davey and Williams, 1966b, p.82, pl.12, fig.3) Bujak *et al.*, 1980, p.32. Early Eocene; formerly ?*Iritosphaeridium*. The species was emended by Bujak *et al.* (*op.cit.*) at the time of the transfer.

PENTADINIUM Gerlach, 1961, p.164-165.

?*circumsutum* (Morgenroth, 1966b, p.5, pl.1, fig.3-4) Stover and Evitt, 1978, p.180. Early Oligocene; formerly *Pterodinium*. NOTE: Stover and Evitt, 1978, p.180 considered this to be a "provisionally accepted species".

**laticinctum* Gerlach, 1961, p.165-166, pl.26, fig.5-6; text-fig. 6-7. Middle Oligocene-Middle Miocene.

subsp. *granulatum* Gocht, 1969, p.29-30, pl.9, fig.17-18; text-fig.20. Middle Oligocene.

subsp. *imaginatum* Benedek, 1972, p.43-44, pl.2, fig.11; pl.6, fig.9. Late Oligocene.

subsp. *lophophorum* Benedek, 1972, p.44, pl.6, fig.8; text-fig.19. Middle Oligocene.

membranaceum (Eisenack, 1965, p.151, pl.14, fig.4; pl.15, fig.6; text-fig.1) Stover and Evitt, 1978, p.180. Late Eocene-Early Oligocene; formerly *Planinosphaeridium*.

taeniagerum Gerlach, 1961, p.167-168, pl.26, fig.8-9,12,15; text-fig.8. Middle Oligocene-Middle Miocene.

subsp. *imaginatum* Benedek, 1972, p.45-46, pl.6, fig.12. Late Oligocene.

subsp. *lophophorum* Benedek, 1972, p.45, pl.6, fig.13. Middle Oligocene.

"PENTAGONUM" Vozzhennikova, 1963, p.183. Lentini and Williams, 1976, p.161 considered this genus to be a *jr syn.* of *Palaeoperidinium*. They accordingly transferred the two validly published species, "*Pentagonum sibiricum*" the type of the genus and "*P. marginatum*", to *Palaeoperidinium*. See below for details of other species.

"PENTAGONUM" (cont'd)

"*conicooides*" Vozzhennikova, 1963, *nom. nud.* No description. The name appears only in the description for text-fig.17 where it is erroneously used for *P. sibiricum*.

"*granulatum*" (Oleinik, 1976b). NOW *Palaeoperidinium*.

"*huanghuaense*" (Jiabo, 1978). NOW ?*Palaeoperidinium*.

PERIDICTYOCYSTA Cookson and Eisenack, 1974, p.70.

**mirabilis* (Cookson and Eisenack, 1958, p.48, pl.8, fig.3-5)
Cookson and Eisenack, 1974, p.70. Late Jurassic; formerly
Cannosphaeropsis.

PERIDINITES Lefèvre, 1933a, p.418. (Type of the genus was selected by Deflandre, 1945, card 800).

barbadensis Lefèvre, 1933a, p.416. (Figured in Lefèvre, 1933b, text-fig.9-12). Early Tertiary.

diodon Lefèvre, 1933a, p.417-418. (Figured in Lefèvre, 1933b; text-fig.23). Early Tertiary.

globosus Lefèvre, 1933a, p.416. (Figured in Lefèvre, 1933b, text-fig.15-16). Early Tertiary.

maculatus (Vozzhennikova, 1967, p.117-118, pl.49, fig.1-12; pl.50, fig.1-8) Lentini and Williams, 1973, p.110. Early Oligocene; formerly *Lithoperidinium*.

oamaruensis (Deflandre, 1933, p.265; text-fig.1-7) Deflandre, 1945, card 806-809. Tertiary; formerly *Lithoperidinium*.

ovalis Lefèvre, 1933a, p.417. (Figured in Lefèvre, 1933b, text-fig.21-22). Early Tertiary.

**parvulus* Lefèvre, 1933a, p.416. (Figured in Lefèvre, 1933b; text-fig.6-8). Early Tertiary. Designated as nomenclatural type by Deflandre, 1945, Fiche #800.

perforatus Lefèvre, 1933a, p.418. (Figured in Lefèvre, 1933b, text-fig.25-30). Early Tertiary.

piriformis Lefèvre, 1933a, p.417. (Figured in Lefèvre, 1933b, text-fig.17-18). Early Tertiary.

subsp. *compactus* (Lefèvre, 1933a, p.417; figured in Lefèvre, 1933b, text-fig.19-20) Lentini and Williams, 1973, p.110. Early Tertiary; formerly *Peridinites piriformis* var. *compactus*. O.C.

rossicus (Deflandre, 1940, p.266; text-fig.1-4) Deflandre, 1945, card 817-818. Eocene; formerly *Lithoperidinium*.

PERIDINITES (cont'd)

sphaericus Lefèvre, 1933a, p.416-417. (Figured in Lefèvre, 1933b, text-fig.13-14). Early Tertiary.

subsp. *minor* (Lefèvre, 1933b, p.224; text-fig.24) Lentin and Williams, 1973, p.111. Early Tertiary; formerly *Peridinites sphaericus* var. *minor*.

PERIDINIUM Ehrenberg, 1832, p.38. Modern genus defined from the motile stage. The current generic assignment of fossil dinoflagellate cysts formerly included in *Peridinium* is given below.

"*basilium*" (Drugg, 1967). See *Palaeoperidinium basilium*.

"*comatum*" (Morgenroth, 1966b). NOW *Phthanoperidinium*.

conicum (Gran) Ostenfeld and Schmidt. Modern species defined from the motile stage. Fossil cysts assigned to this species by Deflandre, 1939b were included in *Palaeoperidinium deflandrei* by Lentin and Williams, 1973, p.105. Stover and Evitt, 1978, p.218 considered *Palaeoperidinium deflandrei* to be a *jr syn.* of *Palaeoperidinium pyrophorum*.

var. "*larjakiense*" (Vozzhennikova, 1967). NOW *Palaeoperidinium larjakiense*.

"*crenulatum*" (De Coninck, 1975). NOW *Phthanoperidinium*.

"*damasii*" (Lejeune-Carpentier, 1942). NOW *Palaeoperidinium*.

"*delitiense*" (Ehrenberg, 1838). NOW *Spongodinium*.

"*diamantum*" (Churchill and Sarjeant, 1963). NOW *Gonyaulacysta*.

"*eocenicum*" (Cookson and Eisenack, 1965a). NOW ?*Phthanoperidinium*.

"*galeatum*" (Lejeune-Carpentier, 1942). NOW *Deflandrea*.

"*hansonianum*" (Traverse, 1955). NOW *Saeptodinium*.

"*illustrans*" (O. Wetzel, 1933a). NOW ?*Phthanoperidinium*.

"*kansanum*" (Tasch, 1964). NOW ?*Ovoidinium*.

"*lambdoideum*" (Nagy, 1966). NOW *Phthanoperidinium*.

"*paleocenicum*" (Cookson and Eisenack, 1965c). NOW *Gingiodinium*; see also *Palaeoperidinium*.

"*pleum*" (Tasch, 1964). NOW *Deflandrea*.

"*pyrophorum*" (Ehrenberg, 1838). NOW *Palaeoperidinium*.

PERIDINIUM (cont'd)

- "*resistente*" (Morgenroth, 1966a). NOW *Phthanoperidinium*.
"*schizokeras*" (De Coninck, 1975). NOW ?*Phthanoperidinium*.
"*stellatum*" (Wall and Dale, 1968). NOW. *Stelladinium*.
"*stockmansii*" (De Coninck, 1975). NOW *Phthanoperidinium*.
"*subconicoides*" (Lejeune-Carpentier, 1942). NOW ?*Palaeoperidinium*.
"*tricuspis*" (O. Wetzel, 1933a). NOW *Phelodinium*.
"*ventriosum*" (O. Wetzel, 1933a). NOW *Cribroperidinium*.

PERISSEIASPHAERIDIUM Davey and Williams, 1966b, p.78.

"*eisenackii*" Davey and Williams, 1969, p.6, = *Hystrichosphaeridium anthophorum sensu* Eisenack, 1958, p.402, pl.26, fig.1-2 non Cookson and Eisenack, 1958. Late Aptian. Davey and Verdier, 1974, p.640 and Duxbury, 1980, p.126 considered this species to be a *jr syn.* of *Hystrichosphaerina schindewolfii* Alberti, 1961.

**pannosum* Davey and Williams, 1966b, p.78-79, pl.3, fig.5; pl.11, fig.8; text-fig.15. Early Eocene.

PHALLOCYSTA Dörhöfer and Davies, 1980, p.26-27.

**eumekes* Dörhöfer and Davies, 1980, p.27, fig.12; 24D-E,G; 26H, J-K; 27A-I. Toarcian-Bajocian/Bathonian.

PHANERODINIUM Deflandre, 1937a, p.110.

**cayeuxii* (Deflandre, 1935, p.229, pl.6, fig.2-3) Deflandre, 1937a, p.110. Senonian; formerly *Palaeoperidinium*.

subsp. *laeve* (Lejeune-Carpentier, 1951, p.310-322; text-fig.6) Lentin and Williams, 1973, p.112. Senonian; formerly *Phanerodinium cayeuxii* var. *laeve*.

fourmarieri Lejeune-Carpentier, 1951, p.311; text-fig.7. Senonian.

setiferum Deflandre, 1937a, p.112-114; text-fig.5. Senonian.

PHELODINIUM Stover and Evitt, 1978, p.117-118.

gaditanum (Riegel, 1974) *comb. nov.*
1974 *Deflandrea gaditana* Riegel, p.356-357, pl.2, fig.8-9; pl.3, fig.1-2. ?Senonian; also formerly *Lejeunia*.

PHELODINIUM (cont'd)

magnificum (Stanley, 1965, p.218-219, pl.20, fig.1-6) Stover and Evitt, 1978, p.118. Paleocene; formerly *Deflandrea*, *Lejeunia* and *Senegalinium*. See also *Lejeunecysta*.

pachyceras Liengjarern *et al.*, 1980, p.486-487, pl.54, fig.4. Late Eocene-Early Oligocene.

**pentagonale* (Corradini, 1973, p.175, pl.28, fig.3) Stover and Evitt, 1978, p.118. Senonian; formerly *Deflandrea* and *Lejeunia*. See also *Lejeunecysta*.

pumilum Liengjarern *et al.*, 1980, p.487, pl.54, fig.2. Late Eocene.

tricuspis (O. Wetzel, 1933a, p.166, pl.2, fig.14) Stover and Evitt, 1978, p.118. Senonian; formerly *Astrocysta*, *Lejeunia*, *Peridinium* and *Senegalinium*. See also *Lejeunecysta*.

PHOBEROCYSTA Millioud, 1969, p.431-432. See also *Xenascus*.

"*ceratioides*" (Deflandre, 1937b). NOW *Xenascus*.

?*dubia* Corradini, 1973, p.182, pl.29, fig.6a-b. Senonian.

"*gochti*" (Corradini, 1973). NOW *Xenascus*.

**neocomica* (Gocht, 1957, p.172-178, pl.19, fig.1-5; pl.20, fig.1-7; text-fig.7-16) Millioud, 1969, p.432. Hauterivian; formerly ?*Wetzeliella*.

subsp. *circulata* (Gocht, 1957, p.178; text-fig.14) Lentin and Williams, 1973, p.112. Hauterivian; formerly ?*Wetzeliella neocomica* forma *circulata*.

subsp. *convexa* (Gocht, 1957, p.178, pl.20, fig.1-2) Lentin and Williams, 1973, p.112. Hauterivian; formerly ?*Wetzeliella neocomica* forma *convexa*.

subsp. *cruciformis* (Gocht, 1957, p.176-177, pl.19, fig.5; pl.20, fig.3; text-fig.9-10) Lentin and Williams, 1973, p.112. Hauterivian; formerly ?*Wetzeliella neocomica* forma *cruciformis*.

subsp. *dedecosa* (Gocht, 1957, p.177, text-fig.11) Lentin and Williams, 1973, p.112. Hauterivian; formerly ?*Wetzeliella neocomica* forma *dedecosa*.

subsp. *pteridia* (Gocht, 1957, p.178; text-fig.14) Lentin and Williams, 1973, p.112. Hauterivian; formerly ?*Wetzeliella neocomica* forma *pteridia*.

subsp. *subovalis* (Gocht, 1957, p.177, text-fig.12-13) Lentin and Williams, 1973, p.113. Hauterivian; formerly ?*Wetzeliella neocomica* forma *subovalis*.

PHOBEROCYSTA (cont'd)

"*sarjeantii*" (Corradini, 1973). NOW *Xenascus*.

"*serpaglii*" (Corradini, 1973). NOW *Xenascus*.

tabulata Raynaud, 1978, p.393-394, pl.1, fig.1-2. Berriasian-Valanginian.

PTHANOPERIDINIUM Drugg and Loeblich, 1967, p.182.

alectrolophum Eaton, 1976, p.295,298, pl.17, fig.10-11; text-fig. 23A. Late Eocene.

amiculum Liengjarern *et al.*, 1980, p.487-488, pl.53, fig.4. Late Eocene.

**amoenum* Drugg and Loeblich, 1967, p.182, pl.1, fig.1-5; text-fig.1. Oligocene.

?*campoense* Caro, 1973, p.359-360, pl.4, fig.7. Early Eocene.
NOTE: Stover and Evitt, 1978, p.119 considered this to be a "provisionally accepted species".

comatum (Morgenroth, 1966b, p.1, pl.1, fig.1-2) Eisenack and Kjellström, 1971a, p.907. Early Oligocene; formerly *Peridinium*. The transfer of this species from *Peridinium* to *Phthanoperidinium* is not attributable to Eaton, 1976, p.294.

"*corioides*" (Benedek, 1972, p.20, pl.9, fig.4) Lentin and Williams, 1976, p.76. Middle Oligocene; formerly *Hystriochogonyaulax*. *Jr syn.* of *Phthanoperidinium comatum*; see Stover and Evitt, 1978, p.118. O.C.

crenulatum (De Coninck, 1975, p.96, pl.17, fig.5-7) Lentin and Williams, 1977b, p.131. Ypresian; formerly *Peridinium*.

"*diamantum*" (Churchill and Sarjeant, 1963) Lentin and Williams, 1973, p.113. NOW *Gonyaulacysta*; formerly *Peridinium*.

echinatum Eaton, 1976, p.298-299, pl.17, fig.8-9,12; text-fig.23B. Early-Late Eocene.

?*eocenicum* (Cookson and Eisenack, 1965a, p.119-120, pl.11, fig.1-5) Lentin and Williams, 1973, p.113. Late Eocene; formerly *Peridinium*. The transfer of this species from *Peridinium* to ?*Phthanoperidinium* is not attributable to Eaton, 1976, p.294.

flebile Liengjarern *et al.*, 1980, p.488-489, pl.54, fig.6. Early Oligocene.

geminatum Bujak, 1980, p.72,74, pl.19, fig.8-12; text-fig.20D, 22A. Late Eocene.

PHTHANOPERIDINIUM (cont'd)

- ?*illustrans* (O. Wetzel, 1933a, p.167, pl.2, fig.15) Lentin and Williams, 1973, p.113. Senonian; formerly *Peridinium*. NOTE: Stover and Evitt, 1978, p.119 considered this to be a "problematical species".
- lambdoideum* (Nagy, 1966, p.39, pl.1, fig.1-3; text-fig.1a-b) Eisenack and Kjellström, 1971a, p.909. Early Pliocene; formerly *Peridinium*. NOTE: Stover and Evitt, 1978, p.119 considered this to be a "problematical species".
- levinurum* Bujak, 1980, p.74, pl.19, fig.13-16; text-fig.20E,22B. Late Eocene.
- multispinum* Bujak, 1980, p.74, pl.19, fig.17-19; text-fig.20F. Late Eocene.
- obscurum* Harland and Sharp, 1980, p.291,293-295, pl.1-2; text-fig. 2-3. Late Eocene.
- "*pannonium*" (Lentin and Williams, 1973) Harker and Sarjeant, 1975, p.224. NOW ?*Tectatodinium nudum*; also formerly *Palaeoperidinium* and *Gonyaulacysta* (as ?*G. nuda*). The transfer of this species to *Phthanoperidinium* Drugg and Loeblich by Harker and Sarjeant, 1975, p.224 was rejected by Lentin and Williams, 1977b, p.131. See discussion under "*Palaeoperidinium pannonium*".
- ?*polytrix* (Benedek, 1972, p.20, pl.6, fig.1) Lentin and Williams, 1976, p.76. Middle Oligocene; formerly *Hystriochogonyaulax*.
- ?*pseudoechinatum* Bujak, 1980, p.75-76, pl.19, fig.20; text-fig.20C. Late Eocene.
- resistente* (Morgenroth, 1966a, p.5, pl.2, fig.1-2) Eisenack and Kjellström, 1971a, p.911. Early Eocene; formerly *Peridinium*. The transfer of this species from *Peridinium* to *Phthanoperidinium* is not attributable to Eaton, 1976, p.294. Stover and Evitt, 1978, p.119 suggested that this species is a *jr syn.* of *Phthanoperidinium eocenicum*.
- ?*schizokeras* (De Coninck, 1975, p.97, pl.17, fig.16-17) Lentin and Williams, 1977b, p.131. Ypresian; formerly *Peridinium*. NOTE: Stover and Evitt, 1978, p.119 considered this to be a "provisionally accepted species".
- stockmansii* (De Coninck, 1975, p.97-98, pl.17, fig.18-37) Lentin and Williams, 1977b, p.131. Ypresian; formerly *Peridinium*. Stover and Evitt, 1978, p.119 suggested that this species is conspecific with *Phthanoperidinium eocenicum*. According to De Coninck, 1977, p.40 the specimens illustrated in De Coninck, 1975, pl.17, fig.18-36 are referable to *Phthanoperidinium echinatum*.

PTHANOPERIDINIUM (cont'd)

"*tritonium*" Eaton, 1976, p.299-300, pl.17, fig.2-3,6-7; text-fig.23C,24. Early-Late Eocene. *Jr syn.* of *Phthanoperidinium comatum*; see Bujak, 1980, p.72.

PITHONELLA Lorenz, 1901. Modern genus. Bolli, 1974 and later workers have included fossil species in *Pithonella*.

antaretica Rögl, 1976, p.702, pl.3, fig.1-6; pl.4, fig.1-12. Early Paleocene (Danian).

atlantica Olsson and Youssefnia, 1979, p.1090, pl.2, fig.7-12. Early Campanian.

bassriverensis Olsson and Youssefnia, 1979, p.1090, pl.1, fig.13-16. Cenomanian.

"*bollii*" Rögl, 1976, p.701, pl.1, fig.1-4; pl.2, fig.1-4. Early Paleocene (Danian). *Jr syn.* of *Pithonella helentappanae*; see Keupp, 1979a, p.23.

carteri Bolli, 1974, p.852, pl.1, fig.1-4; pl.8, fig.1-3; pl.21, fig.1. Tithonian.

cookii Bolli, 1974, p.856, pl.6, fig.9-12; pl.18, fig.3-9; pl.23, fig.6. Coniacian-Santonian.

edgari Bolli, 1974, p.854, pl.4, fig.1-4; pl.13, fig.3-7; pl.22, fig.4. Albian.

excentrica Keupp, 1979c, p.660, pl.6, fig.6-12. Late Hauterivian.

francadecimae Bolli, 1974, p.855, pl.5, fig.1-4; pl.14, fig.10-12; pl.15, fig.1-6; pl.23, fig.1. Albian.

fusiformis Rögl, 1976, p.702, pl.1, fig.12-14; pl.2, fig.9-12. Early Paleocene (Danian).

gustafsonii Bolli, 1974, p.854, pl.3, fig.9-12; pl.12, fig.7-12; pl.13, fig.1-2; pl.22, fig.3. ?Late Aptian-Middle Albian.

hannoverana Keupp, 1979a, p.27-29, pl.5, fig.1-9. Early Barremian.

heirtzleri Bolli, 1974, p.855, pl.5, fig.5-8; pl.15, fig.7-12; pl.16, fig.1-4; pl.23, fig.2. Albian.

helentappanae Bolli, 1974, p.853, pl.2, fig.1-4; pl.10, fig.1-8; pl.21, fig.4. Barremian-Albian.

johnstonei Bolli, 1974, p.856, pl.6, fig.5-8; pl.18, fig.1-2; pl.23, fig.5. Coniacian-Santonian.

PITHONELLA (cont'd)

- krasheninnikovii* Bolli, 1974, p.856, pl.7, fig.1-5; pl.18, fig.10-12; pl.19, fig.1-12; pl.20, fig.1-4; pl.24, fig.1-2. Coniacian-Santonian.
- "loeblichii"* Bolli, 1974, p.853-854, pl.3, fig.1-4; pl.11, fig.9-12; pl.12, fig.1-3; pl.22, fig.1. ?Late Aptian-Middle Albian. *Jr* syn. of *Pithonella helentappanae*; see Keupp, 1979a, p.23.
- menightii* Bolli, 1974, p.852-853, pl.1, fig.5-8; pl.8, fig.4-8; pl.21, fig.2. Tithonian.
- megalithica* Keupp, 1979a, p.25-26, pl.4, fig.1-2,4; text-fig.2. Early Barremian.
- nonarenzae* Bolli, 1974, p.853, pl.2, fig.5-8; pl.10, fig.9-12; pl.21, fig.5. Barremian-Albian.
- oviformis* Keupp, 1979a, p.32-33, pl.8, fig.1-5. Early Barremian.
- paratabulata* Keupp, 1980, p.242-244, pl.30-31. Late Aptian.
- patriciagreeleyae* Bolli, 1974, p.853, pl.2, fig.9-12; pl.11, fig.1-8; pl.21, fig.5. Barremian-Albian.
- subsp. *ovata* Keupp, 1979a, p.32, pl.6, fig.10; pl.7, fig.1-3. Early Barremian.
- pycnothecata* Keupp, 1978, p.94, fig.11-12. Tithonian.
- quiltyi* Bolli, 1974, p.855-856, pl.6, fig.1-4; pl.17, fig.1-12; pl.23, fig.4. Albian.
- robinsonii* Bolli, 1974, p.854, pl.4, fig.5-8; pl.13, fig.8-12; pl.14, fig.1-3; pl.22, fig.5. Albian.
- subsp. *coalita* Keupp, 1979a, p.27, pl.4, fig.9-10. Early Barremian.
- rockeri* Bolli, 1974, p.854, pl.3, fig.5-8; pl.12, fig.4-6; pl.22, fig.2. ?Late Aptian-Middle Albian.
- sheilasantawae* Bolli, 1974, p.854-855, pl.4, fig.9-12; pl.14, fig.4-9; pl.22, fig.6. Albian.
- tanyphloia* Keupp, 1979a, p.29-30, pl.6, fig.1-8. Early Barremian.
- thayeri* Bolli, 1974, p.853, pl.1, fig.9-12; pl.8, fig.9-12; pl.9, fig.1-12; pl.21, fig.3. Oxfordian-Tithonian.
- titanoplax* Rögl, 1976, p.701-702, pl.1, fig.5-9; pl.2, fig.5-8. Early Paleocene (Danian).
- tithonica* Keupp, 1978, p.90,92, fig.7-10. Tithonian.

PITHONELLA (cont'd)

veeversi Bolli, 1974, p.855, pl.5, fig.9-12; pl.16, fig.5-12; pl.23, fig.3. Albian.

woodburyensis Olsson and Youssefnia, 1979, p.1091, pl.1, fig.11; pl.2, fig.1-6. Santonian-Campanian.

"*PLANINOSPHERIDIUM*" Eisenack, 1965, p.151. *Jr syn.* of *Pentadinium*; see Stover and Evitt, 1978, p.179-180. These authors transferred the type and single species of the genus, *Planinosphaeridium membranaceum*, to *Pentadinium*.

PLATYCYSTIDIA Cookson and Eisenack, 1960a, p.12.

**diptera* Cookson and Eisenack, 1960a, p.14, pl.3, fig.22. ?Late Albian-Genomanian.

PLURIARVALIUM Sarjeant, 1962b, p.260. Wiggins, 1975, p.102 considered this genus to be a *jr syn.* of *Pareodinia* Deflandre; emend. Wiggins. He accordingly transferred the type of the genus, "*Pluriarvalium osmingtonense*" to *Pareodinia*. Stover and Evitt, 1978, p.113-114 retained *Pluriarvalium* as a valid genus and rejected the transfer of the type species to *Pareodinia*. Dörhöfer and Davies, 1980, p.32 considered *Pluriarvalium* to be a *jr syn.* of *Pareodinia*.

**osmingtonense* Sarjeant, 1962b, p.262, pl.1, fig.5; text-fig.6. Late Oxfordian; see also *Pareodinia*.

subsp. *rostratum* (Wiggins, 1975, p.106-107, pl.5, fig.1-2) Stover and Evitt, 1978, p.119. Late Jurassic; formerly *Pareodinia osmingtonensis* subsp. *rostrata*.

"*POCOCKIA*" Lentin and Williams, 1973, p.114, *nom. subst. pro* *Evittia* Pocock, 1972, p.93 (*non Evittia* Brito, 1967). Type of genus *P. cincta* (Cookson and Eisenack, 1958) Lentin and Williams, 1973, p.114. Lentin and Williams, 1976, p.162 considered the genus *Pocockia* to be a *jr syn.* of *Ovoidinium*. Accordingly they transferred the two species "*Pocockia cincta*" and "*Pocockia waltonii*" to *Ovoidinium*.

POLYGONIFERA Habib, 1972, p.376.

**evittii* Habib, 1972, p.376, pl.5, fig.1-2. Oxfordian-Kimmeridgian.

POLYKRIKOS Bütschli, 1873, p.673. Modern genus defined from the motile stage. The single fossil cyst species included in this genus, *P. tentaculatum* O. Wetzel, 1933a, has been transferred to *Wetzelodinium* Deflandre.

POLYSPHAERIDIUM Davey and Williams, 1966b, p.91-92; emend. Bujak *et al.*, 1980, p.32,34.

POLYSPHAERIDIUM (cont'd)

- "*amalthei*" (W. Wetzel, 1966) Riley and Sarjeant, 1972, p.2. NOW ?*Dapsilidinium*; formerly *Hystrichosphaeridium*. NOTE: Stover and Evitt, 1978, p.76 considered this to be a "provisionally accepted species" of *Polysphaeridium*.
- "*asperum*" (Maier, 1959) Davey and Williams, 1969, p.6. NOW *Dapsilidinium*; formerly *Hystrichosphaeridium*.
- "*belgicum*" (Sarjeant, 1969, p.15 = *Hystrichosphaeridium fluctuans sensu* Pastiels, 1948, p.40, pl.3, fig.16 non Eisenack, 1938, p.230-231, pl.16, fig.1). NOW ?*Dapsilidinium*. NOTE: Stover and Evitt, 1978, p.76 considered this to be a "provisionally accepted species" of *Polysphaeridium*.
- "*caminuspinum*" (Wall, 1965a) Riley and Sarjeant, 1972, p.3. NOW ?*Dapsilidinium*; formerly *Hystrichosphaeridium*. Stover and Evitt, 1978, p.76 considered this to be an acritarch.
- "*cephalum*" (Kar, 1979). NOW ?*Batiacasphaera*.
- congregatum* (Stover, 1977, p.79, pl.3, fig.39-44) Bujak *et al.*, 1980, p.34. Middle Oligocene; formerly *Hemicystodinium*.
- "*conispinum*" (Davey and Verdier, 1973) Stover and Evitt, 1978, p.76. NOW ?*Dapsilidinium*; formerly *Litosphaeridium*. NOTE: Stover and Evitt, 1978, p.76 considered this to be a "problematical species" of *Polysphaeridium*.
- "*daveyi*" (Boltenhagen, 1977). NOW *Dapsilidinium*.
- "*deflandrei*" (Valensi, 1947) Davey and Williams, 1969, p.6. NOW ?*Dapsilidinium*; formerly *Hystrichosphaeridium*.
- "*elongatum*" (Jain and Millepied, 1975). NOW ?*Dapsilidinium*. NOTE: Stover and Evitt, 1978, p.76 considered this to be a "provisionally accepted species" of *Polysphaeridium*.
- "*fabium*" (Tasch, 1964, p.195, pl.2, fig.5) Davey and Williams, 1969, p.6. Albian; formerly *Hystrichosphaeridium*. Stover and Evitt, 1978, p.76 considered this species to be a synonym of *Kiokansium unituberculatum* (Tasch) Stover and Evitt.
- "*follium*" (Tasch, 1964, p.195, pl.1, fig.8) Davey and Williams, 1969, p.6. Albian; formerly *Hystrichosphaeridium*. Stover and Evitt, 1978, p.76 considered this species to be a synonym of *Kiokansium unituberculatum* (Tasch) Stover and Evitt.
- "*fucosum*" (Valensi, 1955a) Davey and Williams, 1969, p.6. NOW ?*Dapsilidinium*; formerly *Micrhystridium* and *Hystrichosphaeridium*.
- "*giganteum*" (Caro, 1973). NOW *Cleistosphaeridium*.

POLYSPHAERIDIUM (cont'd)

- "*granulosum*" (Jain and Millepied, 1975). NOW *Dapsilidinium*.
- "*laminaspinosum*" (Davey and Williams, 1966b). NOW *Dapsilidinium*.
- "*langii*" (Wall, 1965a) Riley and Sarjeant, 1972, p.3; emend. Morbey, 1975, p.41-42. NOW ?*Dapsilidinium*; formerly *Hystri-chosphaeridium*. O.C.
- "*major*" (Lejeune-Carpentier, 1940) Davey and Williams, 1969, p.6. NOW ?*Dapsilidinium*; formerly *Hystri-chosphaeridium* and *Cordosphaeridium*. NOTE: Stover and Evitt, 1978, p.76 considered this to be a "provisionally accepted species" of *Polysphaeridium*.
- "*marsupium*" (Tasch, 1964, p.193, pl.3, fig.16) Davey and Williams, 1969, p.6. Albian; formerly *Hystri-chosphaeridium*. Stover and Evitt, 1978, p.76 considered this species to be a synonym of *Kiokansium unituberculatum* (Tasch) Stover and Evitt.
- "*microtriainum*" (Klump, 1953) Kar, 1979, p.33. The transfer of this species to *Polysphaeridium* by Kar, *op.cit.*, is herein rejected and it is retained in *Cordosphaeridium*.
- "*multispinosum*" (Davey, 1974). NOW *Dapsilidinium*.
- "*pastielsii*" (Davey and Williams, 1966b). NOW *Dapsilidinium*.
- "*paulinae*" (Valensi, 1953) Davey and Williams, 1969, p.6. NOW ?*Dapsilidinium*; formerly *Hystri-chosphaeridium*. NOTE: Stover and Evitt; 1978, p.76 considered this to be a "problematical species" of *Polysphaeridium*.
- "*perovatum*" (Tasch, 1964, p.194, pl.3, fig.13) Davey and Williams, 1969, p.6. Albian; formerly *Hystri-chosphaeridium*. Stover and Evitt, 1978, p.76 considered this species to be a synonym of *Kiokansium unituberculatum* (Tasch) Stover and Evitt.
- "*pseudocolligerum*" (Stover, 1977). NOW *Dapsilidinium*.
- "*pumilum*" (Davey and Williams, 1966b). NOW ?*Dapsilidinium*. NOTE: Stover and Evitt, 1978, p.76 considered this to be a "provisionally accepted species" of *Polysphaeridium*.
- "*punctatum*" (Jain and Millepied, 1975). NOW ?*Dapsilidinium*. NOTE: Stover and Evitt, 1978, p.76 considered this to be a "provisionally accepted species" of *Polysphaeridium*.
- "*rhabdophorum*" (Valensi, 1955b) Davey and Williams, 1969, p.7. NOW ?*Dapsilidinium*; formerly *Hystri-chosphaeridium*.
- "*simplex*" (White, 1842) Davey and Williams, 1969, p.7. NOW *Dapsilidinium*; formerly *Xanthidium* and *Hystri-chosphaeridium*. NOTE: Stover and Evitt, 1978, p.76 considered this to be a "problematical species".

POLYSPHAERIDIUM(cont'd)

**subtile* Davey and Williams, 1966b, p.92, pl.11, fig.1; emend. Bujak *et al.*, 1980, p.34. Early Eocene.

"?*tribrachiosum*" (Tasch, 1964, p.195, pl.1, fig.3) Davey and Williams, 1969, p.7. Albian; formerly *Hystriichosphaeridium*. Stover and Evitt, 1978, p.76 considered this species to be a synonym of *Kiokansium unituberculatum* (Tasch) Stover and Evitt.

"*warreni*" (Habib, 1976). NOW *Dapsilidinium*.

"*williamsi*" (Boltenhagen, 1977). NOW ?*Cleistosphaeridium*.

"*williereae*" (Boltenhagen, 1977). NOW ?*Apectodinium*.

zoharyi (Rossignol, 1962, p.132, pl.2, fig.10) Bujak *et al.*, 1980, p.34. Pleistocene; formerly *Hemicystodinium* and *Hystriichosphaeridium*.

subsp. *ktana* (Rossignol, 1964) *comb. nov.*

1964 *Hystriichosphaeridium zoharyi* var. *ktana* Rossignol, p.88, pl.2, fig.6-7,10; pl.3, fig.11. Pleistocene; also formerly *Hemicystodinium zoharyi* subsp. *ktana*.

POLYSTEPHANEPHORUS Sarjeant, 1961b, p.1096. Although Sarjeant created this genus in 1961, none of the species were correctly transferred until Downie and Sarjeant, 1965, p.141 complied with all the rules for combinations in listing species within *Polystephanephorus*. Sarjeant, 1976c, p.18 is incorrect in his interpretation of I.C.B.N. Art. 33. The contention that *Polystephanephorus* is a *jr syn.* of *Hystriichosphaerina* by Duxbury, 1980, p.125-126 is herein rejected.

"*anthophorum*" (Cookson and Eisenack, 1958, p.43) Davey, 1979c, p.65. The transfer of this species from *Oligosphaeridium* to *Polystephanephorus* by Davey, *op.cit.*, is herein rejected.

**calathus* (Sarjeant, 1961a, p.104, pl.14, fig.7; text-fig.7) Downie and Sarjeant, 1965, p.141. Early Oxfordian; formerly *Polystephanosphaera*. The transfer of this species to *Hystriichosphaerina* by Duxbury, 1980, p.126 is herein rejected.

evryanthus Cookson and Eisenack, 1974, p.70-71, pl.24, fig.14. ?Neocomian-Albian.

paracalathus (Sarjeant, 1960a, p.143-144, pl.6, fig.4; text-fig.3b) Downie and Sarjeant, 1965, p.141. Middle Callovian; formerly *Polystephanosphaera*. The transfer of this species to *Hystriichosphaerina* by Duxbury, 1980, p.126 is herein rejected.

"*sarjeanti*" (Gitmez, 1970). NOW *Emmetrocyta*.

"?*sarrisii*" (Archangelsky, 1969a). NOW *Senoniasphaera*.

POLYSTEPHANEPHORUS (cont'd)

"*speciosus*" (Alberti, 1961) Riley and Sarjeant, 1972, p.3. The transfer of this species to *Polystephanephorus* was rejected by Stover and Evitt, 1978, p.144; NOW and formerly *Cannosphaeropsis*.

"*urnaformis*" (Cookson, 1953). NOW *Emmetrocyta*.

"POLYSTEPHANOSPHAERA" Sarjeant, 1960a, p.140-142. This genus was rejected by Sarjeant, 1961b, p.1095-1096 and the type species *Polystephanosphaera valensii* was invalidly transferred to *Systematophora*. The transfer was correctly carried out by Downie and Sarjeant, 1965, p.146. Other species formerly included in "*Polystephanosphaera*" have been assigned to *Polystephanephorus* Sarjeant.

PONTIADINIUM Stover and Evitt, 1978, p.180.

**inequicornutum* Baltes, 1971, p.5, pl.1, fig.8-12; pl.2, fig.1-3 ex Stover and Evitt, 1978, p.180. Early Pliocene. Baltes, 1971, included this species in the genus *Diconodinium* but failed to designate a type; therefore, according to I.C.B.N. Art. 37, the name was invalid. Stover and Evitt, 1978, p.180, by designating a lectotype, validated the species and designated it the type and only species of the genus *Pontiadinium*.

PRIONODINIUM Leffingwell and Morgan, 1977, p.293-294.

**alaskense* Leffingwell and Morgan, 1977, p.194-195, pl.1, fig.1-3; pl.2, fig.1-5; pl.3, fig.4; text-fig.4. Late Neocomian.

alveolatum Leffingwell and Morgan, 1977, p.295-297, pl.1, fig.4-6; pl.2, fig.6-8; text-fig.5. Late Neocomian.

PRISMATOCYSTIS Habib, 1969, p.98.

cylindrica Habib, 1970, p.374, pl.10, fig.2. Albian-Cenomanian.

**ewingii* Habib, 1969, p.98, pl.3, fig.11. Albian-Early Cenomanian.

PROLIXOSPHAERIDIUM Davey *et al.*, 1966, p.171.

anasillum Erkmen and Sarjeant, 1980, p.64-65, pl.4, fig.2,9; pl.5, fig.3. Late Callovian-Late Kimmeridgian.

basifurcatum Dodekova, 1969, p.21-22, pl.5, fig.1-6; text-fig.G. Tithonian.

capitatum (Cookson and Eisenack, 1960b, p.252, pl.39, fig.9) Singh, 1971, p.342. Oxfordian-Kimmeridgian; formerly *Hystriosphæridium*. See also *Tenua*.

conulum Davey, 1969a, p.160-161, pl.8, fig.5-6. Cenomanian.

PROLIXOSPHAERIDIUM (cont'd)

"*deirense*" Davey *et al.*, 1966, p.171-172, pl.3, fig.2; text-fig.45. Middle Barremian. This species, the type of the genus, is considered to be a *jr syn.* of *Prolixosphaeridium parvispinum* (Deflandre, 1937b) Davey *et al.*, 1969, by Davey and Verdier, 1974, p.636-637. *P. parvispinum* therefore becomes the correct name of the type of the genus.

elongatum Jain, 1977, p.185, pl.4, fig.48-49. Early Albian.

granulosum (Deflandre, 1937b, p.77, pl.16, fig.4 as *Hystri-
sphaeridium xanthiopyxides* var. *granulosum*) Davey *et al.*,
1966, p.172. Senonian. Elevated to specific rank as *Balti-
sphaeridium granulosum* by Sarjeant, 1962b, p.264; formerly
Baltisphaeridium and *Hystrichosphaeridium*.

mixtispinosum (Klement, 1960, p.58, pl.6, fig.17-19) Davey *et
al.*, 1969, p.17. Early Kimmeridgian; formerly *Baltisphaeri-
dium*.

**parvispinum* (Deflandre, 1937b, p.77, pl.16, fig.5, as *Hystri-
sphaeridium xanthiopyxides* var. *parvispinum*) Davey *et al.*,
1969, p.17. Late Aptian. Elevated to specific rank as *Hystri-
chosphaeridium parvispinum* by Cookson and Eisenack, 1958, p.45;
formerly *Baltisphaeridium* and *Hystrichosphaeridium*. The type
of the genus *Prolixosphaeridium*, *P. deirense*, is considered to
be a *jr syn.* of *P. parvispinum* by Davey and Verdier, 1974,
p.636-637; the latter species therefore becomes the type of
the genus.

?*spissum* (McIntyre and Brideaux, 1980) *comb. nov.*
1980 *Cleistosphaeridium spissum* McIntyre and Brideaux, p.20,
pl.7, fig.1-9. Valanginian.

"?*torynum*" (Cookson and Eisenack, 1960b) Eisenack and Kjellström,
1971a, p.951. NOW *Egmontodinium*; formerly *Hystrichosphaeridium*.

"?*xanthiopyxides*" (O. Wetzel, 1933b) Davey *et al.*, 1969, p.17.
NOW *Taryosphaeridium*; formerly *Hystrichosphaera*, *Hystri-
sphaeridium* and *Baltisphaeridium*.

PROMINANGULARIA Jiabo, 1978, p.47.

dongyingensis Jiabo, 1978, p.48, pl.19, fig.13-17. Early Tertiary.

**granulata* Jiabo, 1978, p.47-48, pl.19, fig.7-12; text-fig.8.
Early Tertiary.

laevigata Jiabo, 1978, p.48, pl.19, fig.5-6. Early Tertiary.

PROTOELLIPSODINIUM Davey and Verdier, 1971, p.28.

clavulum Davey and Verdier, 1974, p.637-638, pl.93, fig.7.
Aptian.

seghire Below, 1981, p.110-111, pl.11, fig.9-11,13-15; pl.15,
fig.17-19; text-fig.71. Hauterivian.

subsp. *medaure* Below, 1981, p.110-111, pl.11, fig.9,13-15;
pl.15, fig.17-18; text-fig.71. Hauterivian.

spinigerum (Brideaux, 1977) *comb. nov.*

1977 *Operculodinium spinigerum* Brideaux, p.30, pl.12, fig.8-9;
pl.13, fig.1-11. Barremian.

**spinocristatum* Davey and Verdier, 1971, p.28-29, pl.5, fig.2,5,11.
Albian.

spinosum Davey and Verdier, 1971, p.29-30, pl.5, fig.10. Albian.

touile Below, 1981, p.111-112, pl.11, fig.8,16-17; pl.15, fig.15-16;
text-fig.71. Aptian.

subsp. *mugatae* Below, 1981, p.112, pl.11, fig.8,17; pl.15, fig.
15-16; text-fig.71.

PSALIGONYAULAX Sarjeant, 1966b, p.136. We herein reject the contention
of Below, 1981, p.52 that this genus is a *jr syn.* of *Gonyaulacysta*
Deflandre.

"*apatela*" (Cookson and Eisenack, 1960b) Sarjeant, 1969, p.15. NOW
Glabridinium.

cypraea Ioannides, *et al.*, 1977, p.460, pl.4, fig.5-8; text-
fig.12. Kimmeridgian. NOTE: Stover and Evitt, 1978, p.182
considered this to be a "provisionally accepted species".

**deflandrei* Sarjeant, 1966b, p.137-138, pl.14, fig.7-8; text-fig.35.
Cenomanian. The transfer of this species to *Gonyaulacysta* by
Below, 1981, p.53 is herein rejected.

"*dualis*" (Brideaux and Fisher, 1976). NOW *Gonyaulacysta*.

"*galeata*" (Cookson and Eisenack, 1960a) Davey and Verdier, 1973,
p.195. NOW *Hystriochosphaeropsis*; formerly *Scriniodinium*.

"*simplicia*" (Cookson and Eisenack, 1961b) Sarjeant, 1969, p.15.
NOW ?*Impagidinium*; formerly *Rottnestia*.

PSEUDOCERATIUM Gocht, 1957, p.166; emend. Dörhöfer and Davies, 1980,
p.39.

"*ceratioides*" (Deflandre, 1937b). NOW *Xenascus*.

PSEUDOCERATIUM (cont'd)

"*dettmanniae*" (Cookson and Hughes, 1964). NOW *Endoceratium*.

expositum Brideaux, 1971, p.102-103, pl.30, fig.105-106,108.
Middle-Late Albian.

"*gochti*" (Neale and Sarjeant, 1962). NOW *Eopseudoceratium*. The retention of this species in *Pseudoceratium* by Stover and Evitt, 1978, p.78 is herein rejected.

"*gochti*" (Pocock, 1962). Jr hom. of *Pseudoceratium gochti* Neale and Sarjeant, 1962. NOW *Pseudoceratium hansgochti*.

"*hansgochti*" nom. nov., nom. subst. pro *Pseudoceratium gochti* Pocock, 1962, p.79, pl.14, fig.213-214. Late Albian-Early Cenomanian. Singh, 1971, p.320 considered this species (as *Pseudoceratium gochti*) to be a jr syn. of *Broomea* (now *Imbatodinium*) *jaegeri* Alberti.

"*ludbrookii*" (Cookson and Eisenack, 1958). NOW *Endoceratium*.

"*?nudum*" (Gocht, 1957). NOW *Odontochitina*.

parvum Michael, 1964, p.28, pl.2, fig.1. Early Barremian.

**pelliferum* Gocht, 1957, p.166-168, pl.18, fig.1-2; text-fig.1-3; emend. Dörhöfer and Davies, 1980, p.39. Valanginian-Hauterivian.

subsp. *solocispinum* (Davey, 1974, p.68, pl.9, fig.6) Lentin and Williams, 1975, p.2154. Middle-Late Barremian; formerly *Pseudoceratium pelliferum* var. *solocispinum*.

"*regium*" Singh, 1971, p.375-376, pl.66, fig.2-4; pl.67, fig.1-2. Harker and Sarjeant, 1975, p.226 considered this species to be a jr syn. of *Pseudoceratium expositum* Brideaux.

retusum Brideaux, 1977, p.14-15, pl.4, fig.10-12; pl.5, fig.1-2, 5-10. Barremian-Aptian.

robustum Michael, 1964, p.29, pl.2, fig.2. Early Barremian.

"*?tetracanthum*" (Gocht, 1957). NOW *Muderongia*.

"*turneri*" (Cookson and Eisenack, 1958). NOW *Endoceratium*.

PSEUDODEFLANDREA Alberti, 1959a, p.91-92. Lentin and Williams 1976, p.125 stated that this monospecific genus is based on a single complete specimen of *Pseudodeflandrea gigantea*. Alberti also recorded the hypocyst of another specimen. Lentin and Williams, *op.cit.* suggested that *Pseudodeflandrea* may represent an aberrant form, or be a species of *Odontochitinoopsis* Eisenack or *Xenascus* Cookson and Eisenack.

**gigantea* Alberti, 1959a, p.92; text-fig.1. Middle Oligocene.

PSEUDOFROMEA Burger, 1980b, p.276. NOTE: there is some uncertainty as to whether this fossil is a dinoflagellate.

**collaris* Burger, 1980b, p.276-277, fig.12A-C,13. Barremian.

PSEUDOKOMEWUIA He, 1980, p.1-2.

PSEUDOKOMEWUIA subgen. *CONDOCORPIDIA* He, 1980, p.4.

retirugosa He, 1980, p.5-6, pl.1, fig.15-16. Oligocene.

unicornis He, 1980, p.5, pl.1, fig.13-14; text-fig.4. Oligocene.
He, *op.cit.* designated this species as the type of the subgenus.

PSEUDOKOMEWUIA subgen. *PSEUDOKOMEWUIA* He, 1980, p.2.

cerciata He, 1980, p.3-4, pl.1, fig.7-8. Oligocene.

granulata He, 1980, p.4, pl.1, fig.9-12. Oligocene.

**laevigata* He, 1980, p.2-3, pl.1, fig.1-6; text-fig.1-3. Oligocene.

PTEROCYSTIDIOPSIS Deflandre, 1937b, p.90.

?*angulosa* Deflandre, 1941, p.23-24, pl.6, fig.6-10. Late Jurassic.

"*halosa*" (Filatoff, 1975) Courtinat and Gaillard, 1980, p.80. The transfer of this species to *Pterocystidiopsis* is herein rejected and it is retained in the genus *Caddasphaera*.

ornata Deflandre, 1937b, p.91-92, pl.18, fig.1-3. Late Cretaceous.

**stephaniana* Deflandre, 1937b, p.91, pl.17, fig.7-9. Cenomanian.

treptensis Courtinat and Gaillard, 1980, p.81-82, pl.6, fig.4,6.
Late Oxfordian.

"*velata*" (Deflandre and Cookson, 1955). NOW *Thalassiphora*.

PTERODINIUM Eisenack, 1958, p.395.

agadirensis Below, 1981, p.112-113, pl.3, fig.9. Gargasian.

**aliferum* Eisenack, 1958, p.395-396, pl.24, fig.6; text-fig.6.
Late Aptian.

bab Below, 1981, p.113, pl.7, fig.10-11; pl.14, fig.9,12-13;
text-fig.72-73. Hauterivian.

cingulatum (O. Wetzel, 1933b, p.28, pl.4, fig.10) Below, 1981, p.114. Senonian; formerly *Cymatiosphaera*, *Hystriosphera* and *Spiniferites*.

subsp. *cingulatum* (O. Wetzel, 1933b, p.28, pl.4, fig.10) Below, 1981, p.114. Senonian; formerly *Hystriosphera cingulata* var. *cingulata* and *Spiniferites cingulatus* subsp. *cingulatus*.

PTERODINIUM cingulatum (cont'd)

subsp. *granulatum* (Clarke and Verdier, 1967) *comb. nov.*

1967 *Hystriichosphaera cingulata* var. *granulata* Clarke and Verdier, p.45-46, pl.9, fig.5-6. Cenomanian; also formerly *Spiniferites cingulatus* subsp. *granulatus*.

subsp. *intermedium* (Cookson and Eisenack, 1974) *comb. nov.*

1974 *Spiniferites cingulatus* var. *intermedius* Cookson and Eisenack; p.64, pl.23, fig.8-9,11. Senonian; also formerly *Spiniferites cingulatus* subsp. *intermedius*.

subsp. *ovale* (Cookson and Eisenack, 1974) *comb. nov.*

1974 *Spiniferites cingulatus* var. *ovalis* Cookson and Eisenack, p.64, pl.23, fig.12. Paleocene; also formerly *Spiniferites cingulatus* subsp. *ovalis*.

subsp. *reticulatum* (Davey and Williams, 1966a) *comb. nov.*

1966a *Hystriichosphaera cingulata* var. *reticulata* Davey and Williams, p.39, pl.1, fig.10; pl.2, fig.4. Cenomanian; also formerly *Spiniferites cingulatus* subsp. *reticulatus*.

"*circumsutum*" (Morgenroth, 1966b). NOW ?*Pentadinium*.

?*cornutum* Cookson and Eisenack, 1962b, p.490, pl.3, fig.1-6.

Aptian-?Albian. NOTE: Stover and Evitt, 1978, p.183 considered this to be a "provisionally accepted species".

eisenackii Jain, 1977, p.178, pl.6, fig.73. Early Albian.

"*magnoserratum*" (Cookson and Eisenack, 1962b). NOW *Spiniferites*.

mamounium Below, 1981, p.116-117, pl.7, fig.9; pl.15, fig.14; text-fig.77. Gargasian.

"?*perforatum*" (Clarke and Verdier, 1967) Davey and Verdier, 1971,

p.30-31. NOW *Maghrebinia*; formerly *Dinopterygium*. NOTE: Stover and Evitt, 1978, p.183 considered this to be a "provisionally accepted species" of *Pterodinium*.

premos Duxbury, 1980, p.131, pl.3, fig.1-2. Barremian.

?*reticulatum* Singh, 1971, p.358-359, pl.60, fig.6-7. Middle

Albian. NOTE: Stover and Evitt, 1978, p.183 considered this to be a "provisionally accepted species".

"*verrucosum*" (Brideaux and McIntyre, 1975). NOW *Impagidinium*.

"*PYRAMIDIUM*" Clarke and Verdier, 1967, p.39. Clarke *et al.*, 1968, p.182 considered this genus to be a *jr syn.* of *Xiphophoridium* Sarjeant. The type and single species of the genus, *Pyramidium alatum*, is now the type of the genus *Xiphophoridium*. We reject the contention of Below, 1981, p.64 that this genus is a *jr syn.* of "*Oodnadattia*" Eisenack and Cookson.

PYXIDIELLA Cookson and Eisenack, 1958, p.51.

**pandora* Cookson and Eisenack, 1958, p.52, pl.6, fig.10-11.
Late Jurassic.

"?*scrobiculata*" (Deflandre and Cookson, 1955) Cookson and Eisenack, 1958, p.52. NOW *Batiacasphaera*; formerly *Leiosphaera* and *Leiosphaeridia*. NOTE: Stover and Evitt, 1978, p.120 considered this to be a "provisionally accepted species" of *Pyxidiella*.

simplex Harland, 1979b, p.537-538, pl.3, fig.12-15. Late Miocene.

PYXIDINOPSIS Habib, 1976, p.382.

bakonyensis (Goczan, 1962, p.193-194,200, pl.3, fig.4-10) Stover and Evitt, 1978, p.184. Maastrichtian; formerly *Palaeostomocystis*.

**challengerensis* Habib, 1976, p.382, pl.1, fig.1; pl.3, fig.1-2.
Berriasian-Hauterivian.

2

QUADRINA Bujak, 1980, p.90.

**pallida* Bujak, 1980, p.90-91, pl.22, fig.9-11. Late Eocene.

QUINQUECUSPIS Harland, 1977b, p.106.

**concretum* (Reid, 1977, p.438-439, pl.1, fig.9-11) Harland, 1977b, p.107. Recent; formerly *Trinovantedinium*.

P

RAPHIDODINIUM Deflandre, 1936b, p.184-185.

**fucatum* Deflandre, 1936b, p.185-186, pl.10, fig.1-7. ?Senonian.

RENIDINIUM Morgenroth, 1968, p.551-552.

**membraniferum* Morgenroth, 1968, p.552-553, pl.46, fig.9; pl.47, fig.1-3. Danian.

vitalare (Cookson, 1965b, p.138-139, pl.24, fig.1-7) Stover and Evitt, 1978, p.79. Paleocene; formerly *Cyclonephelium*.

REUTLINGIA Drugg, 1978, p.72.

**gochti* Drugg, 1978, p.72-73, pl.7, fig.7-10. Callovian.

RHAETOGONYAULAX Sarjeant, 1966b, p.152-153; emend. Harland *et al.*, 1975, p.860; emend. Fisher and van Helden, 1979, p.270.

arctica (Wiggins, 1973, p.4, pl.1, fig.1-4; pl.2, fig.1-9; text-fig.2a-d) Stover and Evitt, 1978, p.219. Late Triassic; formerly *Shublikodinium*.

subsp. *maculata* (Wiggins, 1973, p.4-5, pl.2, fig.10-12) Stover and Evitt, 1978, p.219. Late Triassic; formerly *Shublikodinium arcticum* subsp. *maculatum* and *Shublikodinium arcticum* var. *maculatum*.

"*chaloneri*" (Sarjeant, 1963b, p.354; textfig.2(right);3) Sarjeant, 1969, p.15. NOW *Rhaetogonyaulax rhaetica* subsp. *chaloneri*; formerly *Gonyaulax*. Harland *et al.*, 1975, p.863 considered this species to be a var. of *Rhaetogonyaulax rhaetica*.

dilatata (Wiggins, 1973, p.6, pl.5, fig.3-4) Stover and Evitt, 1978, p.219. Late Triassic; formerly *Shublikodinium*.

**rhaetica* (Sarjeant, 1963b, p.353; text-fig.1-2(left)) Loeblich and Loeblich, 1968, p.212; emend. Harland *et al.*, 1975, p.862. Late Triassic; formerly *Gonyaulax*.

subsp. *chaloneri* (Sarjeant, 1963b, p.354, text-fig.2(right);3) Lentin and Williams, 1977b, p.138. Late Triassic; formerly *Gonyaulax chaloneri*. This taxon was transferred to *Rhaetogonyaulax* by Sarjeant, 1969, p.15. Subsequently Harland *et al.*, 1975, p.863 redesignated it as a variety of *Rhaetogonyaulax rhaetica*. Lentin and Williams, 1977b, p.138 raised it to the subspecies level.

RHAETOGONYAULAX (cont'd)

testacea Fisher and van Helden, 1979, p.272, pl.1, fig.1-6;
text-fig.1E. Middle Norian-Rhaetian.

tortuosa Fisher and van Helden, 1979, p.274,276, pl.2, fig.7;
pl.3, fig.2,6-7; pl.4, fig.1-8. Karnian-Rhaetian.

uncinata Fisher and van Helden, 1979, p.274, pl.2, fig.3-8;
pl.3, fig.1,3-5. Middle Norian-Rhaetian.

RHOMBODELLA Cookson and Eisenack, 1962b, p.496; emend. Jiabo, 1978,
p.49. Stover and Evitt, 1978, p.70-71 considered this genus to
be a *jr syn.* of *Palaeotetradinium*; accordingly they transferred
the type of the genus, *R. natans*, to *Palaeotetradinium* as a *jr
syn.* of *Palaeohystrichophora paucispina* Alberti, 1961, which
they also transferred to *Palaeotetradinium*. Although we agree
that *R. natans* and *P. paucispina* are conspecific, the inclusion
of these distinctive Aptian-Albian forms in *Palaeotetradinium*
is herein rejected and the genus *Rhombodella* is retained.
Duxbury, 1980, p.134-135 also believed that *Rhombodella* was a
separate and distinctive genus which is characterized by having
four groups of processes at the "corners".

baculata Jiabo, 1978, p.49, pl.24, fig.14-15. Early Tertiary.

bifurcata Jiabo, 1978, p.50, pl.24, fig.16-17. Early Tertiary.

"*kendelbachia*" (Morbey, 1975). NOW *Heibergella*.

"*natans*" Cookson and Eisenack, 1962b, p.496, pl.7, fig.12-13.
Aptian-Albian. *Jr syn.* of *R. paucispina*; see Stover and
Evitt, 1978, p.71.

**paucispina* (Alberti, 1961, p.19-20, pl.3, fig.25) Duxbury, 1980,
p.136. Albian; formerly *Palaeohystrichophora*. The transfer of
this species to *Palaeotetradinium* by Stover and Evitt, 1978,
p.71 is herein rejected. The original type of the genus
Rhombodella, *R. natans* Cookson and Eisenack, 1962b, is consid-
ered to be a *jr syn.* of *R. paucispina* by Stover and Evitt,
1978, p.71.

tubiforma Jiabo, 1978, p.50, pl.24, fig.12-13. Early Tertiary.

variabilis Jiabo, 1978, p.50, pl.24, fig.7-11. Early Tertiary.

vesca Duxbury, 1980, p.135-136, pl.5, fig.7,10; text-fig.16.
Barremian.

RHOMBODINIUM Gocht, 1955, p.85; emend. Bujak, 1979, p.313. This genus was lowered to the subgeneric rank within the genus *Wetzeliella* by Alberti, 1961, p.9. Vozzhennikova, 1967, p.167-168 maintained it at the genus level. Harker and Sarjeant, 1975, p.225 again designated *Rhombodinium* as a subgenus of *Wetzeliella* Eisenack. *Rhombodinium* was retained at the generic level by Lentin and Williams, 1977b, p.139.

"*condylos*" (Williams and Downie) Lentin and Williams, 1976, p.128.
NOW *Dracodinium*; formerly *Wetzeliella*.

"*coronatum*" (Vozzhennikova, 1967). Was *Wetzeliella coronata*. Costa and Downie, 1979, p.43 considered this species to be a *jr syn.* of *Wetzeliella articulata*. For full citation see *Wetzeliella coronata*.

**draco* Gocht, 1955, p.86, text-fig.1. Middle Oligocene.

subsp. "*freienwaldense*" (Gocht, 1955) Lentin and Williams, 1973, p.120. NOW *Rhombodinium freienwaldense*; formerly *Rhombodinium draco* forma *freienwaldensis*.

freienwaldense (Gocht, 1955, p.87; text-fig.2) Costa and Downie, 1979, p.44. Middle Oligocene; formerly *Rhombodinium draco* forma *freienwaldensis* and *Rhombodinium draco* subsp. *freienwaldense*.

glabrum (Cookson, 1956, p.186, pl.2, fig.1-5) Vozzhennikova, 1967, p.169. Eocene; formerly *Wetzeliella*. The transfer of this species to *Wilsonidium* by Costa and Downie, 1979, p.45 is herein rejected.

subsp. *crassithecum* (Vozzhennikova, 1967, p.170, pl.91, fig.1-2, 4-6) Lentin and Williams, 1973, p.120. Late Eocene-Early Oligocene; formerly *Rhombodinium glabrum* forma *crassithecum*.

subsp. "*granulatum*" (Wilson, 1967c) Lentin and Williams, 1973, p.120. NOW *Dracodinium granulatum*; formerly *Wetzeliella (Rhombodinium) glabra* var. *granulata*.

"*intermedium*" (Cookson and Eisenack, 1961b) Lentin and Williams, 1973, p.120. NOW *Wilsonidium*; formerly *Wetzeliella*.

longimanum Vozzhennikova, 1967, p.171, pl.92, fig.1-3; pl.93, fig.1-6; pl.94, fig.1-3. Late Eocene.

"*minusculum*" (Alberti, 1961) Lentin and Williams, 1973, p.120. NOW *Palaeotetradinium*; formerly *Wetzeliella (Rhombodinium) minuscula*. McLean, 1973b, p.732 hypothesized that this species may belong to the genus *Inversidinium* McLean. The transfer of this species to *Inversidinium* by Costa and Downie, 1979, p.44 is herein rejected.

oravense Grigorovich, 1971, p.94, pl.2, fig.6. Eocene.

RHOMBODINIUM (cont'd)

"*?ornatum*" (Wilson, 1967c) Stover and Evitt, 1978, p.121. The transfer of this species from *Wilsonidium* to *Rhombodinium* is herein rejected.

pentagonum Vozzhennikova, 1967, p.171-172, pl.89, fig.4; pl.95, fig.1-5; pl.96, fig.1-6. Late Eocene-Early Oligocene. The transfer of this species to the genus *Wetzeliella* was rejected by Stover and Evitt, 1978, p.121. In view of the nature of the archeopyle and ornamentation, we do not agree with Costa and Downie, 1979, p.40 that *R. pentagonum* is a *jr syn.* of *Wetzeliella articulata*.

perforatum (Jan du Chêne and Chateauneuf, 1975, p.30-31, pl.1, fig.8-14; pl.3, fig.7-10) Lentin and Williams, 1977b, p.139. Middle Eocene (Lutetian); formerly *Wetzeliella (Rhombodinium) perforata*.

porosum Bujak, 1979, p.314-315, pl.1, fig.3,5-8; pl.2, fig.11; text-fig.8C. Late Eocene.

pustulosum Châteauneuf, 1980, p.150, pl.29, fig.5-7,10. Late Eocene (Auversian).

"*rhomboidum*" (Alberti, 1961) Lentin and Williams, 1973, p.121. NOW *Dracodinium*; formerly *Wetzeliella (Rhombodinium)*.

"*rotundatum*" Baltes, 1969, p.35, pl.5, fig.10 ex Lentin and Williams, 1973, p.121. Oligocene; formerly *Wetzeliella rotundata* (provisional designation). *Jr syn.* of *Rhombodinium freienwaldense*; see Costa and Downie, 1979, p.44.

vialovi Oleinik, 1976a, p.85-86, pl.1, fig.7-9. Late Eocene.

"*waipawaense*" (Wilson, 1967c) Lentin and Williams, 1973, p.121. NOW *Dracodinium*; formerly *Wetzeliella (Rhombodinium)*.

RHYNCHODINIOPSIS Deflandre, 1935, p.231. We herein reject the emendation of this genus by Below, 1981, p.117.

**aptiana* Deflandre, 1935, p.231, pl.5, fig.10; pl.8, fig.7-10. Senonian.

"*cladophora*" (Deflandre, 1938b) Below, 1981, p.118. We herein reject this transfer and retain the species and all its subspecies in *Hystrihogonyaulax*.

"*crassicornuta*" (Klement, 1960) Below, 1981, p.118. We herein reject this transfer and retain the species in *?Gonyaulacysta*.

fimbriata (Duxbury, 1980, p.123, pl.1, fig.1-3) Below, 1981, p.118. Barremian; formerly *Gonyaulacysta*.

RICULACYSTA Stover, 1977, p.76-77.

**perforata* Stover, 1977, p.77-78, pl.2, fig.22-31. Middle-Late Oligocene.

ROMANODINIUM Baltes, 1971, p.8-9.

**areolatum* Baltes, 1971, p.9, pl.3, fig.1-2. Early Pliocene.

ROTTNESTIA Cookson and Eisenack, 1961b, p.40,42.

amphicavata Dobell and Norris in Harland *et al.*, 1980, p.218-220, text-fig.4A-N,5-7. Sub-Recent.

**borussica* (Eisenack, 1954, p.62, pl.9, fig.5-7) Cookson and Eisenack, 1961b, p.42. Early Oligocene; formerly *Hystriosphæra* and *Hystriosphæropsis*. The transfer to *Triblastula* by Morgenroth, 1966a, p.15-16 was rejected by Eisenack, 1969, p.105-108.

"*simplicia*" (Cookson and Eisenack, 1961b). NOW ?*Impagidinium*; also formerly *Psaligonyaulax*.



SAEPTODINIUM Harris, 1974, p.162.

eurypylum (Manum and Cookson, 1964, p.20-21, pl.4, fig.7-13)
Stover and Evitt, 1978, p.220. Late Cretaceous; formerly
Palaeoperidinium and *Scriniodinium*.

**gravattense* Harris, 1974, p.162-163, pl.1, fig.1-4. Paleocene.

hansonianum (Traverse, 1955, p.77-79, pl.13, fig.147; emend.
Evitt, 1974, p.2-3) Stover and Evitt, 1978, p.220. Late
Oligocene; formerly *Palaeoperidinium* and *Peridinium*. Accord-
ing to Article 33, paragraph 4 of the I.C.B.N., transfer of
"*Palaeoperidinium hansonianum*" (Traverse) Lentin and Williams,
1973, to *Saeptodinium* by Harris, 1974 was invalid.

tasmaniense Harris, 1974, p.163, pl.1, fig.12; pl.2, fig.1-6.
Late Oligocene-Early Miocene.

SAMLANDIA Eisenack, 1954, p.76.

?*angustivela* (Deflandre and Cookson, 1955, p.290, pl.7, fig.4-5)
Eisenack, 1963a, p.102. Eocene; formerly *Membranilarnax*.
NOTE: Stover and Evitt, 1978, p.186 considered this to be a
"provisionally accepted species".

"*californica*" (Drugg, 1967) Lentin and Williams, 1977b, p.141.
NOW *Danea*.

**chlamydophora* Eisenack, 1954, p.76, pl.11, fig.12-15. Early
Oligocene.

reticulifera Cookson and Eisenack, 1965a, p.126-127, pl.15,
fig.10-15. Late Eocene.

SARJEANTIA Horowitz, 1975, p.25.

**triassica* Horowitz, 1975, p.25, pl.1, fig.7. Late Triassic.

SCHEMATOPHORA Deflandre and Cookson, 1955, p.262.

**speciosa* Deflandre and Cookson, 1955, p.262-263, pl.6, fig.11-13;
pl.7, fig.11; emend. Stover, 1975, p.39. Eocene-Miocene.

SCHIZOCYSTIA Cookson and Eisenack, 1962a, p.270.

laevigata Cookson and Eisenack, 1962a, p.270-271, pl.37, fig.13-
14. ?Late Albian-Cenomanian.

SCHIZOCYSTIA (cont'd)

**rugosa* Cookson and Eisenack, 1962a, p.270, pl.37, fig.11-12.
?Late Albian-Cenomanian.

SCRINIOCASSIS Gocht, 1964, p.121.

dictyotus (Cookson and Eisenack, 1960b, p.248-249, pl.37,
fig.8-9) Beju, 1971, p.299. Oxfordian-Tithonian; formerly
Scriniodinium. O.C.

subsp. *dictyotus* (Cookson and Eisenack, 1960b, p.248-249,
pl.37, fig.8-9) Beju, 1971, p.299. Oxfordian-Tithonian;
formerly *Scriniodinium dictyotum* subsp. *dictyotum*. O.C.

subsp. *osmingtonensis* (Gitmez, 1970, p.310-311, pl.1, fig.3;
pl.8, fig.12) Lentin and Williams, 1975, p.2154. Early
Kimmeridgian; formerly *Scriniodinium dictyotum* subsp.
osmingtonense. O.C.

subsp. *papillatus* (Gitmez, 1970, p.311, pl.9, fig.11) Lentin
and Williams, 1975, p.2154. Early Kimmeridgian; formerly
Scriniodinium dictyotum subsp. *papillatum*. O.C.

subsp. *pirum* (Gitmez, 1970, p.311,313, pl.10, fig.1; pl.13,
fig.1-2; text-fig.33a-b) Lentin and Williams, 1975, p.2154.
Early Kimmeridgian; formerly *Scriniodinium dictyotum* subsp.
pirum. O.C.

**weberi* Gocht, 1964, p.121, pl.17, fig.1-4; text-fig.39. Late
Lias (Late Toarcian)-Early Bajocian.

SCRINIODINIUM Klement, 1957, p.409-410.

"*amalthei*" (W. Wetzel, 1966) Sarjeant, 1980b, p.117. The species
was emended by Sarjeant *op.cit.* at the time of the transfer.
NOW *Endoscrinium*; formerly ?*Membranilarnacia*.

"*apatelum*" (Cookson and Eisenack, 1960b). NOW *Glabridinium*.

attadalense (Cookson and Eisenack, 1958, p.25, pl.1, fig.7)
Eisenack, 1967, p.193 (748a). Aptian; formerly *Gymnodinium*.

"*australiense*" (Deflandre and Cookson, 1955) Eisenack, 1967, p.195
(748b). NOW *Apteodinium*; formerly *Gymnodinium*. Invalidly
transferred to *Emslandia* by Nagy, 1965, p.202.

"*bicuneatum*" (Deflandre, 1938b) Gitmez, 1970, p.308. NOW
Dinopterygium.

"*campanulum*" (Gocht, 1959). NOW *Endoscrinium*. The retention of
this species in ?*Scriniodinium* by Stover and Evitt, 1978, p.187
is herein rejected.

SCRINIODINIUM (cont'd)

- ?*ceratophorum* Cookson and Eisenack, 1960b, p.249, pl.37, fig.7. Oxfordian-Early Kimmeridgian. NOTE: Stover and Evitt, 1978, p.187 considered this to be a "provisionally accepted species".
- "*cooksoniae*" Anderson, 1960, p.30, pl.9, fig.1-3. *Jr syn.* of *Subtilisphaera* (as *Deflandrea*) *pirnaensis*; see Sarjeant and Anderson, 1969, p.232-233.
- **crystallinum* (Deflandre, 1938b, p.165, pl.5, fig.1-3) Klement, 1960, p.18. Oxfordian; formerly *Gymnodinium*.
- "*dictyotum*" (Cookson and Eisenack, 1960b). NOW *Scriniocassis*.
- "*eurypylum*" (Manum and Cookson, 1964). NOW *Saeptodinium*.
- "*galeatum*" (Cookson and Eisenack, 1960a). NOW *Hystrichosphaeropsis*.
- "*galeritum*" (Deflandre, 1938b). NOW *Endoscrinium*. The retention of this species in *Scriniodinium* by Stover and Evitt, 1978, p.187 is herein rejected.
- "*gochtii*" (Pocock, 1972). NOW *Endoscrinium*. NOTE: Stover and Evitt, 1978, p.187 considered this to be a "provisionally accepted species" of *Scriniodinium*.
- heusseri* Habib, 1970, p.366-368, pl.8, fig.4. Albian-Cenomanian.
- inritibilum* Riley in Fisher and Riley, 1980, p.322-323, pl.2, fig.7,9.
- "*iridis*" (Kjellström, 1973). NOW *Hystrichosphaeropsis*.
- ?*irregulare* (Cookson and Eisenack, 1958, p.28-29, pl.10, fig.1-2) Stover and Evitt, 1978, p.188. Late Jurassic; formerly *Wetzeliella*. NOTE: Stover and Evitt, 1978, p.188 considered this to be a "provisionally accepted species".
- "*klementii*" (Pocock, 1972). NOW *Endoscrinium*. NOTE: Stover and Evitt, 1978, p.188 considered this to be a "provisionally accepted species" of *Scriniodinium*.
- "*luridum*" (Deflandre, 1938b). NOW *Endoscrinium*. The retention of this species in *Scriniodinium* by Stover and Evitt, 1978, p.187 is herein rejected.
- ?*nilsii* Kjellström, 1973, p.42, fig.35. Middle-Late Maastrichtian. Stover and Evitt, 1978, p.188 considered this to be a "problematical species", suggesting it may be *Paralecaniella indentata*.

SCRINIODINIUM (cont'd)

- ?*novissimum* Morgenroth, 1968, p.540-541, pl.43, fig.3-4. Danian.
NOTE: Stover and Evitt, 1978, p.188 considered this to be a "provisionally accepted species".
- ?*obscurum* Manum and Cookson, 1964, p.21-22, pl.4, fig.5-6. Late Cretaceous. NOTE: Stover and Evitt, 1978, p.188 considered this to be a "provisionally accepted species".
- "*oxfordianum*" (Sarjeant, 1962a). NOW *Sirmiodinium*.
- parvimarginatum* (Cookson and Eisenack, 1958, p.24, pl.1, fig.6) Eisenack, 1967, p.201 (770a). Late Jurassic; formerly *Gymnodinium*.
- playfordii* Cookson and Eisenack, 1960b, p.248, pl.37, fig.6. Oxfordian-Tithonian. O.C.
- "*pontianum*" Baltes, 1969 ex Lentin and Williams, 1973. NOW *Hystriochosphaeropsis*; formerly *Scriniodinium pontianum* (provisional designation).
- pseudocrystallinum* Beju, 1971, p.295-297, pl.7, fig.1-3; text-fig.7. Oxfordian-Kimmeridgian.
- ?*reticulatum* Pocock, 1972, p.91-92, pl.23, fig.3. Callovian.
NOTE: Stover and Evitt, 1978, p.188 considered this to be a "provisionally accepted species".
- "*rostratum*" (Brideaux and McIntyre, 1975). NOW *Endoscrinium*.
- scutellum* Eisenack, 1958, p.385, pl.24, fig.3. Late Aptian.
- "*subvallare*" (Sarjeant, 1962b). NOW *Endoscrinium*. The retention of this species in *Scriniodinium* by Stover and Evitt, 1978, p.187 is herein rejected.
- ?*torulosum* (Deflandre, 1943, p.504, pl.17, fig.7-8; text-fig.17-25) Lentin and Williams, 1973, p.124. Senonian; formerly *Gymnodinium*. Lentin and Williams, *op.cit.* questionably assigned this species to *Scriniodinium* since, according to Evitt (personal communication), it does not have a precingular arch-eopyle. NOTE: Stover and Evitt, 1978, p.188 considered this to be a "problematical species", suggesting that it is an acritarch.
- "*trabeculosum*" (Gocht, 1959). NOW *Gardodinium*.
- ?*velatum* (Conrad, 1941, p.8-9, pl.1, fig.A) Lentin and Williams, 1976, p.111. Maastrichtian; formerly *Palaeoperidinium*. The retention of this species in *Palaeoperidinium* by Stover and Evitt, 1978, p.218 is herein rejected.

SCRINIODINIUM (cont'd)

?*verrucosum* Heisecke, 1970, p.232-234, pl.9, fig.2-3; pl.10, fig.3. Danian. NOTE: Stover and Evitt, 1978, p.188 considered this to be a "provisionally accepted species".

SELENOPEMPHIX Benedek, 1972, p.47; emend. Bujak, 1980, p.82.

armata Bujak, 1980, p.83-84, pl.21, fig.1-3; text-fig.23D,24.
Late Eocene.

coronata Bujak, 1980, p.84, pl.21, fig.4-5; text-fig.17B,23C.
Late Eocene.

elegantula (Williams, 1978, p.797-798, pl.7, fig.7,9) Bujak, 1980, p.84. Middle Eocene; formerly ?*Vozzhennikovia*.

**nephroides* Benedek, 1972, p.47-48, pl.11, fig.13; pl.16, fig.1-4; emend. Bujak, 1980, p.84. Middle-Late Oligocene.

selenoides Benedek, 1972, p.48, pl.11, fig.15; pl.16, fig.5-8; text-fig.22; emend. Bujak, 1980, p.86. Middle-Late Oligocene.

SENEGALINIUM Jain and Millepied, 1973, p.22; emend. Stover and Evitt, 1978, p.122-123. Lentin and Williams, 1976, p.163 incorrectly concluded that *Senegalinium* is synonymous with *Alterbia*. The type of the genus *Senegalinium*, *S. bicavatum*, appears to have a standard hexa 2a archeopyle and equal antapical horns. Herngreen, 1975, p.60-61 considered *Senegalinium* to be a *jr syn.* of *Deflandrea* Eisenack; emend. Lentin and Williams, 1977b, p.144 since *Deflandrea* has a broad hexa 2a archeopyle. The views of Harland, 1977a, p.188 regarding the morphology of this genus were also rejected by Lentin and Williams, *op.cit.* Loeblich and Tappan, 1977, p.368 were incorrect in assuming the genera *Alterbia*, *Senegalinium* and *Andalusiella* are synonymous.

"*acuminatum*" (Cookson and Eisenack, 1958) Loeblich and Tappan, 1977, p.368. NOW *Isabelidinium*. The transfer of this species from *Alterbia* to *Senegalinium* is herein rejected.

aenigmaticum (Boltenhagen, 1977) *comb. nov.*
1977 *Deflandrea aenigmatica* Boltenhagen, p.86-88, pl.14, fig.5-10. Albian-Turonian.

?*asymmetricum* (Wilson, 1967a, p.62-63, fig.17-21) Stover and Evitt, 1978, p.123. Erratic, probably Eocene; formerly *Alterbia* and *Deflandrea*. NOTE: Stover and Evitt, 1978, p.123 considered this to be a "provisionally accepted species".

SENEGALINIUM (cont'd)

- **bicavatum* Jain and Millepied, 1973, p.23, pl.1, fig.1-4; text-fig.1B. Campanian-Maastrichtian. This species was erroneously transferred to *Alterbia* by Lentin and Williams, 1976, p.49. Herngreen, 1975, p.61 transferred *Senegalinium bicavatum* to *Deflandrea* Eisenack; emend. Lentin and Williams. Since *Deflandrea* is characterized by a broad hexa 2a archeopyle, this transfer was rejected by Lentin and Williams, 1977b, p.144.
- cwillieri* (Boltenhagen, 1977, p.99-100, pl.17, fig.3-6) Lentin and Williams, 1980, p.41. Campanian; formerly *Deflandrea*.
- ?*dilwynense* (Cookson and Eisenack, 1965c, p.141, pl.18, fig.6-9) Stover and Evitt, 1978, p.123. Paleocene; formerly *Alterbia* and *Deflandrea*. NOTE: Stover and Evitt, 1978, p.123 considered this to be a "provisionally accepted species".
- "*dubium*" (Jain and Millepied, 1973). NOW ?*Andalusiella*.
- ectorugosum* (Archangelsky, 1969b, p.192, pl.1, fig.5-7) Stover and Evitt, 1978, p.123. Late Eocene; formerly *Alterbia* and *Deflandrea*.
- "*gaditanum*" (Riegel, 1974) Harland, 1977a, p.189. NOW *Phelodinium*; formerly *Deflandrea*.
- "*granulostriatum*" (Jain and Millepied, 1973). NOW *Ceratiopsis*.
- "*ingrami*" (Cookson and Eisenack, 1970a) Loeblich and Tappan, 1977, p.368. NOW *Eurydinium*. The transfer of this species from *Alterbia* to *Senegalinium* is herein rejected.
- "*kozlowskii*" (Gorka, 1963) Harland, 1977a, p.189. See "*Lejeunia kozlowskii*".
- macrocystum* (Cookson and Eisenack, 1960a, p.3, pl.1, fig.7-8) Stover and Evitt, 1978, p.123. Campanian; formerly *Alterbia* and *Deflandrea*.
- "*magnificum*" (Stanley, 1965) Harland, 1977a, p.188. NOW *Phelodinium*.
- microgranulatum* (Stanley, 1965, p.219, pl.19, fig.4-6) Stover and Evitt, 1978, p.123. Paleocene; formerly *Alterbia* and *Deflandrea*.
- microspinosum* (Boltenhagen, 1977, p.98-99, pl.17, fig.1-2) Lentin and Williams, 1980, p.41. Campanian-Maastrichtian; formerly *Deflandrea*.
- obscurum* (Drugg, 1967, p.17, pl.2, fig.8-9; pl.9, fig.5) Stover and Evitt, 1978, p.123. Maastrichtian-Danian; formerly *Alterbia* and *Deflandrea*.

SENEGALINIUM (cont'd)

"*pentagonale*" (Corradini, 1973) Harland, 1977a, p.189. NOW *Phelodinium*.

"*psilatum*" Jain and Millepied, 1973, p.23-24, pl.1, fig.5-6; text-fig.1A. Herngreen, 1975, p.61 considered this species to be a *jr syn.* of *Deflandrea laevigata* Malloy, which is now included in *Andalusiella* Riegel.

sergipense (Herngreen, 1975, p.61, pl.3, fig.13-15) Lentin and Williams, 1980, p.41. Late Senonian; formerly *Deflandrea*.

"*tricuspis*" (O. Wetzel, 1933a) Harland, 1977a, p.188. Now *Phelodinium*.

"*trisinum*" Jain and Millepied, 1973, p.25, pl.2, fig.16. Lentin and Williams, 1976, p.164 considered this species to be a *jr syn.* of "*Alterbia polymorpha*" (Malloy) Lentin and Williams. This last named species is now included in *Andalusiella*.

SENONIASPHAERA Clarke and Verdier, 1967, p.61.

"*?frisica*" (Raynaud, 1978). NOW *Sirmiodiniopsis*.

inornata (Drugg, 1970b, p.811-812, fig.3C-F) Stover and Evitt, 1978, p.80. Danian; formerly *Chiropteridium*.

jurassica (Gitmez and Sarjeant, 1972, p.240-241, pl.14, fig.5,8) Lentin and Williams, 1976, p.85. Kimmeridgian; formerly *Hexagonifera*. The transfer of this species to *Ambonosphaera* by Fensome, 1979, p.51 is herein rejected. Riley, 1979, p.221 suggested that this species may be a *jr syn.* of *Meiourogonyaulax staffinensis*.

lordii (Cookson and Eisenack, 1968, p.112, fig.1,I-K) Lentin and Williams, 1976, p.102. Santonian-Early Campanian; formerly *Ascodinium*. O.C.

microreticulata Brideaux and McIntyre, 1975, p.35, pl.11, fig.7-12; pl.12, fig.1-8. Middle Albian. We herein reject the transfer of this species to *Canningia* by Below, 1981, p.31.

**protrusa* Clarke and Verdier, 1967, p.61-62, pl.14, fig.7-9; text-fig.24. Santonian.

rotundata Clarke and Verdier, 1967, p.62-63, pl.14, fig.1-3; text-fig.25. Santonian-Campanian.

?*sarrisii* (Archangelsky, 1969a, p.411, pl.2, fig.5-7) Stover and Evitt, 1978, p.80. Eocene; formerly *Polystephanephorus*. NOTE: Stover and Evitt, 1980, p.80 considered this to be a "provisionally accepted species".

SENTUSIDINIUM Sarjeant and Stover, 1978, p.49-50.

aptiense (Burger, 1980a, p.76, pl.23, fig.1,5; pl.24, fig.1)
Burger, 1980b, p.277. Aptian; formerly *Tenua*.

asymmetrum (Fenton *et al.*, 1980) *comb. nov.*
1980 *Tenua asymmetra* Fenton *et al.*, p.160,162, pl.16, fig.1,
3,5. Late Bajocian.

?*atlanticum* (Habib, 1972, p.375, pl.4, fig.2,5) Sarjeant and
Stover, 1978, p.50. Callovian-Oxfordian; formerly *Tenua*.

baculatum (Dodekova, 1975, p.28-29, pl.6, fig.1-3; text-fig.7)
Sarjeant and Stover, 1978, p.50. Late Bathonian; formerly
Tenua.

brevispinosum Courtinat and Gaillard, 1980, p.60, pl.9, fig.4,7;
text-fig.10e. Late Oxfordian.

capillatum (Davey, 1975) *comb. nov.*
1975 *Tenua capillata* Davey, p.155-156, pl.2, fig.4,7.
Senonian (probably Campanian).

creberbarbatum Erkmen and Sarjeant, 1980, p.52-54, text-fig.2.
Oxfordian-Kimmeridgian.

echinatum (Gitmez and Sarjeant, 1972, p.190, pl.1, fig.1,9)
Sarjeant and Stover, 1978, p.50. Kimmeridgian; formerly
Tenua. See also *Batiacasphaera*.

eisenackii (Boltenhagen, 1977) *comb. nov.*
1977 *Tenua eisenackii* Boltenhagen, p.56-58, pl.5, fig.5-8.
Cenomanian-Turonian.

subsp. *vermiculatum* (Boltenhagen, 1977) *comb. nov., stat. nov.*
1977 *Tenua eisenackii* var. *vermiculata* Boltenhagen, p.57-58,
pl.5, fig.7-8. Cenomanian-Turonian.

erythrocomum Erkmen and Sarjeant, 1980, p.56,58, pl.2, fig.11;
pl.3, fig.1-6,8-11; pl.4, fig.5; text-fig.5. Late Callovian.

myriatrichum Fensome, 1979, p.12-13, pl.2, fig.7; text-fig.5A.
Late Oxfordian-Middle Kimmeridgian.

?*neophytensum* (Ioannides *et al.*, 1977, p.463, pl.5, fig.5,8-9)
Sarjeant and Stover, 1978, p.50. Kimmeridgian; formerly
Tenua.

ornatum Courtinat and Gaillard, 1980, p.61-62, pl.9, fig.2-3,5;
text-fig.10a. Late Oxfordian.

pelionense Fensome, 1979, p.13-15, pl.1, fig.5-9; text-fig.5B.
Bajocian-Bathonian.

SENTUSIDINIUM (cont'd)

- pilosum* (Ehrenberg, 1843, p.61) Sarjeant and Stover, 1978, p.50; emend. Erkmen and Sarjeant, 1980, p.51. Oxfordian; formerly *Xanthidium*, *Ovum hispidum*, *Hystrichosphaera*, *Hystrichosphaeridium*, *Baltisphaeridium*, *Cleistosphaeridium* and *Tenua*. See also *Batiacasphaera*.
- *rioultii* (Sarjeant, 1968, p.231, pl.1, fig.12,22; pl.2, fig.1-2,4) Sarjeant and Stover, 1978, p.50. Late Callovian; formerly *Tenua*. O.C. See also *Batiacasphaera*.
- separatum* (McIntyre and Brideaux, 1980) *comb. nov.*
1980 *Cleistosphaeridium separatum* McIntyre and Brideaux, p.19-20, pl.6, fig.4-8. Valanginian.
- sparsibarbatum* Erkmen and Sarjeant, 1980, p.54-56, pl.2, fig.2-8; pl.6, fig.9; text-fig.4. Callovian.
- ?varispinosum* (Sarjeant, 1959, p.338, pl.13, fig.7; text-fig.6) Sarjeant and Stover, 1978, p.50. Early Callovian; formerly *Baltisphaeridium* and *Tenua*. NOTE: Stover and Evitt, 1978, p.81 considered this to be a "provisionally accepted species".
- verrucosum* (Sarjeant, 1968, p.232, pl.1, fig.17; pl.2, fig.3,6) Sarjeant and Stover, 1978, p.50. Late Callovian; formerly *Tenua*. O.C. See also *Batiacasphaera*.
- villersense* (Sarjeant, 1968, p.231-232, pl.1, fig.16; pl.2, fig.5-10) Sarjeant and Stover, 1978, p.50. Early Callovian-Early Oxfordian; formerly *Tenua*. O.C. See also *Batiacasphaera*.
- "*SHUBLIKODINIUM*" Wiggins, 1973, p.2-4. *Jr syn.* of *Rhaetogonyaulax*; see Stover and Evitt, 1978, p.218. Individual species synonyms and transfers are listed below.
- "*acanthocomum*" Wiggins, 1973, p.5, pl.4, fig.5-6. Late Triassic. Stover and Evitt, 1978, p.219 considered this species to be conspecific with *Rhaetogonyaulax arctica* (Wiggins) Stover and Evitt.
- "**arcticum*" (Wiggins, 1973). NOW *Rhaetogonyaulax*.
- subsp. "*maculatum*" (Wiggins, 1973) Lentin and Williams, 1973, p.125. NOW *Rhaetogonyaulax arctica* subsp. *maculata* (Wiggins) Stover and Evitt; formerly *Shublikodinium arcticum* var. *maculatum*.
- "*armatum*" Wiggins, 1973, p.6, pl.5, fig.1. Late Triassic. Stover and Evitt, 1978, p.219 considered this species to be conspecific with *Rhaetogonyaulax arctica* (Wiggins) Stover and Evitt.
- "*dilatatum*" (Wiggins, 1973). NOW *Rhaetogonyaulax*.

"SHUBLIKODINIUM" (cont'd)

"*echinoverrucatum*" Wiggins, 1973, p.6-7, pl.5, fig.5-6. Late Triassic. Stover and Evitt, 1978, p.219 considered this species to be conspecific with *Rhaetogonyaulax dilatata* (Wiggins) Stover and Evitt.

"*granulatum*" Wiggins, 1973, p.6, pl.5, fig.2. Late Triassic. Stover and Evitt, 1978, p.219 considered this species to be conspecific with *Rhaetogonyaulax dilatata* (Wiggins) Stover and Evitt.

"*scaberrimum*" Wiggins, 1973, p.7, pl.5, fig.6. Late Triassic. Stover and Evitt, 1978, p.219 considered this species to be conspecific with *Rhaetogonyaulax dilatata* (Wiggins) Stover and Evitt.

"*setigerum*" Wiggins, 1973, p.5-6, pl.4, fig.10-11. Late Triassic. Stover and Evitt, 1978, p.219 considered this species to be conspecific with *Rhaetogonyaulax arctica* (Wiggins) Stover and Evitt.

"*spinulosum*" Wiggins, 1973, p.5, pl.4, fig.7-9. Late Triassic. Stover and Evitt, 1978, p.219 considered this species to be conspecific with *Rhaetogonyaulax arctica* (Wiggins) Stover and Evitt.

"*verrucosum*" Wiggins, 1973, p.5, pl.3, fig.1-11; pl.4, fig.1-3. Late Triassic. Stover and Evitt, 1978, p.219 considered this species to be conspecific with *Rhaetogonyaulax arctica* (Wiggins) Stover and Evitt.

subsp. "*exsculptum*" (Wiggins, 1973, p.5, pl.4, fig.4) Lentin and Williams, 1973, p.125. Late Triassic; formerly *Shublikodinium verrucosum* var. *exsculptum*. Stover and Evitt, 1978, p.219 considered this subspecies to be conspecific with *Rhaetogonyaulax arctica* (Wiggins) Stover and Evitt.

SICYOIDIUM He, 1980, p.8.

**ansatum* He, 1980, p.8, pl.1, fig.21-22. Oligocene.

"SILICISPHAERA" Davey and Verdier, 1976, p.320-321. Jr syn. of *Florentinia*; see Duxbury, 1980, p.119.

"*buspina*" (Davey and Verdier, 1976). NOW *Florentinia*.

"**ferox*" (Deflandre, 1937b) Davey and Verdier, 1976, p.322. NOW *Florentinia*; formerly *Hystrichosphaeridium*, *Baltisphaeridium* and *Hystrichokolpoma*.

"?*flosculus*" (Deflandre, 1937b) Davey and Verdier, 1976, p.330. NOW ?*Florentinia*; formerly *Hystrichosphaeridium* and ?*Litosphaeridium*. O.C.

"*SILICISPHAERA*" (cont'd)

"*ramulus*" (May, 1980). NOW *Florentinia*.

"*tenera*" (Davey and Verdier, 1976). NOW ?*Florentinia*.

"?*torulosa*" (Davey and Verdier, 1976). NOW ?*Florentinia*.

"*tridactylites*" (Valensi, 1955a) Davey and Verdier, 1976, p.330.
NOW *Florentinia*; formerly *Hystrichosphaeridium*, *Baltisphaeridium* and *Achomosphaera*.

SIRMIODINIOPSIS Drugg, 1978, p.73.

frisica (Raynaud, 1978) *comb. nov.*

1978 *Senoniasphaera frisica* Raynaud, p.394, pl.1, fig.11.
Oxfordian-Middle Valanginian.

**orbis* Drugg, 1978, p.73-74, pl.7, fig.11; pl.8, fig.1-4.
Callovian.

triapertus (Beju, 1979) *comb. nov.*

1979 *Arkellidinium triapertum* Beju, p.4-5, fig.1-2. Late
Callovian.

SIRMIODINIUM Alberti, 1961, p.22; emend. Warren, 1973, p.104.

**grossii* Alberti, 1961, p.22, pl.7, fig.5-7; pl.12, fig.5;
emend. Warren, 1973, p.104-105. Late Hauterivian-Late
Barremian. O.C.

oxfordianum (Sarjeant, 1962a, p.485, pl.69, fig.13-14) Courtinat
and Gaillard, 1980, p.52. Oxfordian; formerly *Endoscrinium*
and *Scriniodinium*.

SMOLENSKIELLA Vozzhennikova, 1967, p.181-182.

**crassithea* Vozzhennikova, 1967, p.182-183, pl.105, fig.1-4,6;
pl.106, fig.1-4. Late Cretaceous.

"*SOANIELLA*" Vozzhennikova, 1967, p.108. Lentin and Williams, 1976,
p.165 designated the type of the genus and single species,
Soaniella granulata, as a *nomen ambiguum*. They rejected the
species in accordance with Article 69 of the I.C.B.N., thus
making *Soaniella* a superfluous genus.

"*SPEETONIA*" Duxbury, 1977, p.48-49. *Jr hom.* of *Speetonia* Black,
1971. See *Lagenorhysis*.

**delicatula*" (Duxbury, 1977). NOW *Lagenorhysis*.

SPINIDINIUM Cookson and Eisenack, 1962b, p.489; emend. Lentin and Williams, 1976, p.62-63.

"*aperturum*" (Wilson, 1967a). NOW *Vozzhennikovia*.

boydii Morgan, 1975, p.159-160, pl.1, fig.3a-d. Late Aptian-Albian..

?*clavus* Harland, 1973, p.674-675, pl.84, fig.5-6,10; text-fig.9. Late Campanian. NOTE: Stover and Evitt, 1978, p.125 considered this to be a "provisionally accepted species". O.C.

densispinatum Stanley, 1965, p.226-227, pl.21, fig.1-5. Paleocene.

echinoideum (Cookson and Eisenack, 1960a, p.2, pl.1, fig.5-6) Lentin and Williams, 1976, p.64. Santonian-Campanian; formerly *Deflandrea*. The transfer of this species to *Vozzhennikovia* by Stover and Evitt, 1978, p.130 is herein rejected.

subsp. *rhombicum* (Cookson and Eisenack, 1974, p.49-50, pl.20, fig.5-9) Lentin and Williams, 1976, p.64. Albian-Cenomanian; formerly *Deflandrea rhombica*. Lentin and Williams, 1976, p.64 lowered this taxon to the subspecies level because it is distinguished from *Spinidinium echinoideum* only by having a reduced number of spines. The elevation of this taxon to the species level by Stover and Evitt, 1978, p.124 is herein rejected.

essoii Cookson and Eisenack, 1967a, p.135, pl.19, fig.1-8. Paleocene.

"*gallium*" (Davey and Verdier, 1973) Lentin and Williams, 1976, p.64. NOW *Isabelidinium*; formerly *Deflandrea*.

?*irmoechinatum* (Heisecke, 1970, p.230, pl.1, fig.3; pl.2, fig.2-3) Stover and Evitt, 1978, p.125. Early Paleocene; formerly *Deflandrea* and *Gonyaulacysta*. NOTE: Stover and Evitt, 1978, p.125 considered this to be a "provisionally accepted species".

lanternum Cookson and Eisenack, 1970a, p.144-145, pl.12, fig.1-3. Senonian.

macmurdoense (Wilson, 1967a, p.60-62, fig.11-16,22; text-fig.2a) Lentin and Williams, 1976, p.64. Early Tertiary; formerly *Deflandrea*.

"*microceratum*" Stanley, 1965, p.227-228, pl.22, fig.5-6. Stone, 1973, p.53-54 considered this species to be a *jr syn.* of *Spinidinium densispinatum* Stanley.

"*montanaense*" (Harland, 1977a) Lentin and Williams, 1977b, p.147. NOW *Alterbia*; formerly *Deflandrea*.

SPINIDINIUM (cont'd)

ornatum (May, 1980) *comb. nov.*

1980 *Deflandrea ornata* May, p.77-78, pl.9, fig.3-5. Campanian-basal Maastrichtian.

?*ovale* (Vozzhennikova, 1967, p.99, pl.40, fig.1a-b,2a-b) Lentin and Williams, 1977b, p.147. Paleocene-Eocene; formerly *Canninginopsis*. This species clearly possesses peridiniacean paratabulation and a hexa 2a paraplate (Vozzhennikova, 1967, pl.40, fig.2b). Although the nature of the archeopyle is unknown, the species was questionably placed in *Spinidinium* by Lentin and Williams, 1977b, p.147 because of the peridiniacean paratabulation and denticulate parasutures.

?*pilatium* (Stanley, 1965, p.222, pl.21, fig.12-16) Costa and Downie, 1979, p.43. Paleocene; formerly ?*Wetzeliella*.

pulchrum (Benson, 1976, p.194, pl.9, fig.4-9) Lentin and Williams, 1977b, p.147. Early Paleocene; formerly *Deflandrea*.

rallum Heisecke, 1970, p.226-228, pl.1, fig.1-2; pl.2, fig.1. Danian.

"*rhombicum*" (Cookson and Eisenack, 1974) Stover and Evitt, 1978, p.124. See *Spinidinium echinoideum* subsp. *rhombicum*.

"*rotundum*" (Wilson, 1967a). NOW *Vozzhennikovia*.

sagittulum (Drugg, 1970b, p.809-810, fig.1a-c) Lentin and Williams, 1976, p.64. Early Eocene; formerly *Deflandrea*.

**styloniferum* Cookson and Eisenack, 1962b, p.489, pl.1, fig.1-5. Aptian-?Albian.

sverdrupianum (Manum, 1963, p.59-60, pl.2, fig.6-15; text-fig.3) Lentin and Williams, 1973, p.64. Cenomanian; formerly *Deflandrea*; see also *Subtilisphaera*.

uncinatum May, 1980, p.85-86, pl.10, fig.5-7; pl.13, fig.9-10. Campanian-Maastrichtian.

?*vestitum* Brideaux, 1971, p.99-101, pl.29, fig.99-103; text-fig.10a,d. Late Albian-Early Cenomanian. The transfer of this species to *Deflandrea* by Sverdrlove and Habib, 1974, p.59-60 was rejected by Lentin and Williams, 1977b, p.148. NOTE: Stover and Evitt, 1978, p.125 considered this to be a "provisionally accepted species".

SPINIFERITES Mantell, 1850, p.191; emend. Sarjeant, 1970, p.75.

alatus Duxbury, 1977, p.49, pl.5, fig.4. Berriasian-Valanginian.

SPINIFERITES (cont'd)

ancoriferus Cookson and Eisenack, 1974, p.58, pl.21, fig.4-5.
Middle-Late Cretaceous.

aracajuensis (Regali et al., 1974) comb. nov.

1974 *Hystriosphæridium aracajuense* Regali et al., p.291, pl. 24, fig.6. Paleocene-Early Eocene.

?*assamicus* (Kar et al., 1972, p.147, pl.1, fig.6-7) Lentin and Williams, 1973, p.126. Tertiary; formerly *Hystriosphæra*.

NOTE: Stover and Evitt, 1978, p.190 considered this to be a "provisionally accepted species".

belerius Reid, 1974, p.596-598, pl.2, fig.12-13. Recent.

bentorii (Rossignol, 1964, p.84-85, pl.1, fig.3,3bis,7-8; pl.3, fig.2-3; text-fig.A-F) Wall and Dale, 1970, p.47-48. Pleistocene-Holocene. *Spiniferites bentorii* was figured but not described in Rossignol, 1961, pl.1, fig.7-8, and described but not illustrated or adequate reference made to the above illustrations in Rossignol, 1962, p.132. O.C.

subsp. *truncatus* (Rossignol, 1964, p.85, pl.1, fig.5-6; pl.3, fig.1) Lentin and Williams, 1973, p.126. Quaternary; formerly *Hystriosphæra bentorii* var. *truncata*. O.C.

"*buccinus*" (Davey and Williams, 1966a, p.42-43, pl.4, fig.1; text-fig.10-11) Sarjeant, 1970, p.75. Lentin and Williams, 1973, p.126 considered this species to be a *jr syn.* of *Spiniferites pseudofurcatus* (Klumpp) Sarjeant.

bulloideus (Deflandre and Cookson, 1955, p.264, pl.5, fig.3-4) Sarjeant, 1970, p.75. Eocene-Miocene; formerly *Hystriosphæra*. Harland, 1977b, p.101-102 considered this species to be a *jr syn.* of *Spiniferites ramosus*, but stated that *S. bulloideus sensu* Wall, 1965, was a distinct and different morphotype from *S. bulloideus*.

cambrus (Sah et al., 1970, p.144, pl.1, fig.3) Stover and Evitt, 1978, p.190. Late Cretaceous; formerly *Achomosphaera*.

"*ceratioides*" (Deflandre, 1937b). NOW *Xenascus ceratioides*. The transfer of this species to *Spiniferites* by Sarjeant, 1970, p.76 was rejected by Lentin and Williams, 1973, p.127.

SPINIFERITES (cont'd)

"?*cingulatus*" (O. Wetzel, 1933b) Sarjeant, 1970, p.76. NOW *Pterodinium*; formerly *Cymatiosphaera* and *Hystriichosphaera*.
NOTE: Stover and Evitt, 1978, p.190 considered this to be a "provisionally accepted species" of *Spiniferites*.

subsp. "*cingulatus*" (O. Wetzel, 1933b) Lentin and Williams, 1973, p.127. NOW *Pterodinium cingulatum* subsp. *cingulatum*; formerly *Hystriichosphaera cingulata* var. *cingulata*. Transfer of the variety to *Spiniferites* was effected by Davey and Verdier, 1971, p.32.

subsp. "*granulatus*" (Clarke and Verdier, 1967) Lentin and Williams, 1973, p.127. NOW *Pterodinium cingulatum* subsp. *granulatum*; formerly *Hystriichosphaera cingulata* var. *granulata*.

subsp. "*intermedius*" (Cookson and Eisenack, 1974) Lentin and Williams, 1977b, p.149. NOW *Pterodinium cingulatum* subsp. *intermedium*; formerly *Spiniferites cingulatus* var. *intermedius*.

subsp. "*ovalis*" (Cookson and Eisenack, 1974) Lentin and Williams, 1977b, p.149. NOW *Pterodinium cingulatum* subsp. *ovale*; formerly *Spiniferites cingulatus* var. *ovalis*.

subsp. "*perforatus*" (Clarke and Verdier, 1967, p.46-47, pl.9, fig.2-4; text-fig.19). Clarke *et al.*, 1968, p.181 considered this taxon to be a *jr syn.* of *Hystriichosphaera cingulata* var. *reticulata* Davey and Williams, which is now *Pterodinium cingulatum* subsp. *reticulatum*.

subsp. "*polygonalis*" (Clarke and Verdier, 1967, p.47, pl.8, fig.7-8; text-fig.20). Clarke *et al.*, 1968, p.181 considered this taxon to be a *jr syn.* of *Hystriichosphaera crassimurata* Davey and Williams, which is now included in *Spiniferites*.

subsp. "*reticulatus*" (Davey and Williams, 1966a) Lentin and Williams, 1973, p.127. NOW *Pterodinium cingulatum* subsp. *reticulatum*; formerly *Hystriichosphaera cingulata* var. *reticulata*. Transfer of this taxon to *Spiniferites* effected by Davey and Verdier, 1971, p.33.

compactus Cookson and Eisenack, 1974, p.59, pl.21, fig.11.
?Aptian-Albian.

confossus Davey, 1979b, p.559, pl.8, fig.1-4. Aptian.

cooksoniae Lentin and Williams, 1977b, p.149, *nom. subst. pro S. granulatus* (Cookson and Eisenack, 1974, p.59, pl.27, fig.7)
non S. granulatus Davey, 1969b. ?Aptian-Albian. O.C.

SPINIFERITES (cont'd)

?*cornigerus* (O. Wetzel, 1933b, p.39, pl.5, fig.6) Sarjeant, 1970, p.76. Late Cretaceous; formerly *Hystrichosphaera*. NOTE: Stover and Evitt, 1978, p.191 considered this to be a "provisionally accepted species".

cornutus (Gerlach, 1961, p.180, pl.27, fig.10-12) Sarjeant, 1970, p.76. Middle Oligocene-Middle Miocene; formerly *Hystrichosphaera*.

subsp. "*aspinatus*" (Cookson and Eisenack, 1974) Lentin and Williams, 1977b, p.149. NOW *Impagidinium aspinatum*; formerly *Spiniferites cornutus* var. *aspinatus*.

subsp. *cornutus* (Gerlach, 1961, p.180, pl.27, fig.10-12) Sarjeant, 1970, p.76. Middle Oligocene-Middle Miocene; formerly *Hystrichosphaera*. Cookson and Eisenack, 1974, p.62 are incorrect in their citation *Spiniferites cornutus* (Gerlach, 1961) subsp. *cornutus* subsp. nov. When Sarjeant 1970, p.76 transferred the species "*Hystrichosphaera cornutus*" to *Spiniferites* he also in effect transferred the subspecies.

subsp. *crassifurcatus* (Cookson and Eisenack, 1974, p.63, pl.22, fig.9) Lentin and Williams, 1977b, p.150. Albian-Cenomanian; formerly *Spiniferites cornutus* var. *crassifurcatus*.

subsp. "*laevimurus*" (Davey and Williams, 1966a, p.44-45, pl.4, fig.5) Lentin and Williams, 1973, p.127. Early Eocene; formerly *Hystrichosphaera cornuta* var. *laevimura*. Cookson and Eisenack, 1974, p.62 considered this subspecies to be a *jr syn.* of *Spiniferites cornutus* subsp. *cornutus* (Gerlach) Sarjeant.

subsp. *normalis* (Cookson and Eisenack, 1974, p.62, pl.23, fig.5) Lentin and Williams, 1977b, p.150. Paleocene; formerly *Spiniferites cornutus* var. *normalis*.

subsp. *opisthophorus* (Cookson and Eisenack, 1974, p.62, pl.23, fig.1-4) Lentin and Williams, 1977b, p.150. Paleocene; formerly *Spiniferites cornutus* var. *opisthophorus*.

subsp. *sinefurcatus* (Cookson and Eisenack, 1974, p.63, pl.22, fig.8) Lentin and Williams, 1977b, p.150. Albian-Cenomanian; formerly *Spiniferites cornutus* var. *sinefurcatus*.

"*crassimuratus*" (Davey and Williams, 1966a, p.39, pl.1, fig.11) Sarjeant, 1970, p.76. Cenomanian; formerly *Hystrichosphaera*. Kjellström, 1973, p.44 considered this species to be a *jr syn.* of *Spiniferites pterotus* (Cookson and Eisenack) Sarjeant.

"*crassipellis*" (Deflandre and Cookson, 1955) Sarjeant, 1970, p.76. NOW *Achomosphaera*; formerly *Hystrichosphaera*.

SPINIFERITES (cont'd)

- cristatus* (Conrad, 1941, p.4-5, pl.1, fig.D; text-fig.2D) Lentin and Williams, 1973, p.128. Maastrichtian; formerly *Hystrichosphaera*. NOTE: Stover and Evitt, 1978, p.191 considered this to be a "problematical species".
- cruciformis* Wall and Dale, 1973, p.21-22, pl.1, fig.1-6; pl.2, fig.1-4. Early Holocene.
- delicatus* Reid, 1974, p.601-602, pl.2, fig.20-22. Recent.
- ?*dentatus* (Gocht, 1959, p.75-76, pl.4, fig.11; pl.7, fig.19) Lentin and Williams, 1973, p.128; emend. Duxbury, 1977, p.49-50. Late Hauterivian; formerly ?*Hystrichosphaera*.
- elongatus* Reid, 1974, p.602-603, pl.3, fig.23-24. Recent.
- frigidus* Harland and Reid in Harland *et al.*, 1980, p.213-216, fig.2A-J; text-fig.3. Recent. Because the species was recovered from unconsolidated sediments in the Beaufort Sea does not necessarily imply that it is Recent. The type locality is unconsolidated down to 8000' below the surface and reworking is extensive.
- "*furcatus*" (Ehrenberg, 1838, pl.1, fig.12,14). Davey and Williams, 1966a, p.29-33 considered "*Hystrichosphaera furcata*" to be a synonym of "*Hystrichosphaera ramosa*", which is now the type of the genus *Spiniferites*. Since the original specimens of "*Spiniferites furcatus*" have been lost, while the specimens of *Spiniferites ramosus* are preserved, it appears that *S. ramosus* should have priority.
- granulatus* (Davey, 1969b, p.4-5, pl.1, fig.4-7) Lentin and Williams, 1973, p.128. Maastrichtian-?Danian. Formerly *Hystrichosphaera*.
- "*granulatus*" (Cookson and Eisenack, 1974). NOW *Spiniferites cooksoniae* Lentin and Williams, 1977b, non *S. granulatus* Davey, 1969b.
- "*heterostylis*" (Heisecke, 1970) Lentin and Williams, 1973, p.128. NOW *Achomosphaera*; formerly *Hystrichosphaera*.
- hyperacanthus* (Deflandre and Cookson, 1955, p.264-265, pl.6, fig.7) Cookson and Eisenack, 1974, p.59. Miocene; formerly *Hystrichosphaera* and *Achomosphaera*. Reid, 1974, p.603 also transferred this species to *Spiniferites*.
- inaequalis* Wall and Dale, 1973, p.22, pl.1, fig.7-8. Holocene.
- katatonos* Corradini, 1973, p.169, pl.25, fig.3a-c,6a-b; pl.37, fig.1-2. Late Cretaceous-Paleocene; formerly *Hystrichosphaera*.

SPINIFERITES (cont'd)

lazus Reid, 1974, p.604-605, pl.3, fig.25-27. Recent.

leptodermus (Maier, 1959, p.321, pl.33, fig.5-6) Sarjeant, 1970, p.76. Middle Oligocene-Late Miocene; formerly *Hystrichosphaeridium*.

?*magnoserratus* (Cookson and Eisenack, 1962b, p.490, pl.3, fig.7-8) Stover and Evitt, 1978, p.191. Aptian-?Albian; formerly *Pterodinium*. NOTE: Stover and Evitt, 1978, p.191 considered this to be a "provisionally accepted species".

?*maranhensis* (Regali et al., 1974) comb. nov.

1974 *Hystrichosphaeridium maranhensis* Regali et al., p.291, pl.23, fig.3. Albian-Cenomanian.

membranaceus (Rossignol, 1964, p.86, pl.1, fig.4,9-10; pl.3, fig.7,12) Sarjeant, 1970, p.76. Pleistocene-Recent; formerly *Hystrichosphaera furcata* var. *membranacea*. This taxon was elevated to specific rank as *Hystrichosphaera membranacea* by Wall, 1967, p.102.

membranosus (Archangelsky, 1969b, p.197-199, pl.3, fig.1-4) Lentin and Williams, 1973, p.128. Late Eocene; formerly *Hystrichosphaera*.

microceras Cookson and Eisenack, 1974, p.60-61, pl.22, fig.10-12; pl.24, fig.1-2. Paleocene.

subsp. *laticornutus* (Cookson and Eisenack, 1974, p.61, pl.22, fig.11) Lentin and Williams, 1977b, p.151. Paleocene; formerly *Spiniferites microceras* var. *laticornutus*.

subsp. *microceras* (Cookson and Eisenack, 1974, p.60-61, pl.22, fig.10; pl.24, fig.1-2) Lentin and Williams, 1977b, p.151. Paleocene; formerly *Spiniferites microceras* var. *microceras*.

subsp. *opisthophorus* (Cookson and Eisenack, 1974, p.61, pl.22, fig.12) Lentin and Williams, 1977b, p.152. Paleocene; formerly *Spiniferites microceras* var. *opisthophorus*.

mirabilis (Rossignol, 1963, pl.2, fig.16-21, described but not figured in Rossignol, 1962, p.132) Sarjeant, 1970, p.76. Pleistocene; formerly *Hystrichosphaera*.

monilis (Davey and Williams, 1966a, p.45, pl.5, fig.2) Sarjeant, 1970, p.76; emend. Eaton, 1976, p.282. Early Eocene; formerly *Hystrichosphaera*.

nanus Matsuoka, 1976, p.111, pl.28, fig.1-3. Pleistocene.

SPINIFERITES (cont'd)

- nodosus* (Wall, 1967, p.101, pl.14, fig.7-9; text-fig.2) Sarjeant, 1970, p.76. Quaternary; formerly *Hystri-chosphaera*. Reid, 1974, p.598 considered this species to be a *jr syn.* of *Spiniferites bentorii* (Rossignol) Sarjeant. This view is herein rejected.
- pachydermus* (Rossignol, 1964, p.86, pl.1, fig.1-2; pl.3, fig.6) Reid, 1974, p.607. Pleistocene-Holocene; formerly *Hystri-chosphaera furcata* var. *pachyderma* and *Spiniferites ramosus* subsp. *pachydermus*.
- paradoxus* (Cookson and Eisenack, 1968, p.114; text-fig.2G,3) Sarjeant, 1970, p.76. Senonian; formerly *Hystri-chosphaera*.
- ?*pedatus* (O. Wetzel, 1933b, p.55-56, pl.4, fig.35) Lentin and Williams, 1973, p.129. Late Cretaceous; formerly ?*Hystri-chosphaera*.
- perforatus* (Davey and Williams, 1966a, p.41, pl.5, fig.7) Sarjeant, 1970, p.76. Early Eocene; formerly *Hystri-chosphaera*.
- porosus* (Manum and Cookson, 1964, p.11-12, pl.2, fig.1-5; text-fig.2) Harland, 1973, p.690. Late Cretaceous; formerly *Hystri-chosphaera*.
- pseudofurcatus* (Klumpp, 1953, p.388, pl.16, fig.12-14) Sarjeant, 1970, p.76. Late Eocene; formerly *Hystri-chokibotium* and *Hystri-chosphaera*. For present taxonomic position of *Hystri-chosphaera pseudofurcata* Varma and Dangwal, see *Spiniferites varmae* Lentin and Williams, 1973, p.129.
- subsp. *obliquus* (Wall, 1967, p.103, pl.14, fig.16; text-fig.2) Lentin and Williams, 1973, p.129. Late Pleistocene-Recent; formerly *Hystri-chosphaera tertiaria* var. *obliqua*.
- "?*pterotus*" (Cookson and Eisenack, 1958, p.50, pl.11, fig.7) Sarjeant, 1970, p.76. Albian-Maastrichtian; formerly *Cyma-tiosphaera*. *Jr syn.* of *Pterodinium cingulatum* (O. Wetzel) Below; see Below, 1981, p.114. NOTE: Stover and Evitt, 1978, p.191 considered this to be a "provisionally accepted species" of *Spiniferites*.
- **ramosus* (Ehrenberg, 1838, pl.1, fig.1-2,5) Loeblich and Loeblich, 1966, p.56-57. Late Cretaceous; formerly *Xanthidium*, *Ovum hispidum* and *Hystri-chosphaera*. Davey and Williams, 1966a, p.29-33 considered "*Hystri-chosphaera furcata*" to be a synonym of *Spiniferites ramosus*. Accordingly all subspecies of "*Hys-trichosphaera furcata*" are included below as subspecies of *Spiniferites ramosus*.
- ?subsp. *angustus* (W. Wetzel, 1952, p.394, pl.A, fig.2; text-fig.2) Lentin and Williams, 1973, p.129. Danian; formerly *Hystri-chosphaera furcata* subsp. *angusta*.

SPINIFERITES ramosus (cont'd)

- subsp. ?*aulosphaeropsis* (O. Wetzel, 1933b, p.35, pl.5, fig.5)
Lentin and Williams, 1973, p.129. Late Cretaceous; formerly
Hystriichosphaera furcata forma *aulosphaeropsis*.
- subsp. *brevifurcatus* (Cookson and Eisenack, 1974, p.57, pl.21,
fig.6,9) Lentin and Williams, 1977b, p.153. Turonian-Senonian;
formerly *Spiniferites ramosus* var. *brevifurcatus*.
- subsp. *cavispinosus* Hansen, 1977, p.13, fig.21D-E. Maastrichtian.
- subsp. *endoperforatus* (Corradini, 1973, p.168, pl.26, fig.9-10)
Lentin and Williams, 1975, p.2155. Senonian; formerly
Spiniferites ramosus var. *endoperforatus*.
- subsp. *gracilis* (Davey and Williams, 1966a, p.34-35, pl.1, fig.5;
pl.5, fig.6) Lentin and Williams, 1973, p.130. Cenomanian-
Eocene; formerly *Hystriichosphaera ramosa* var. *gracilis*.
Transfer of the variety to *Spiniferites* was effected by
Corradini, 1973, p.165.
- subsp. *granomembranaceus* (Davey and Williams, 1966a, p.37-38,
pl.4, fig.4) Lentin and Williams, 1973, p. 130. Early Eocene;
formerly *Hystriichosphaera ramosa* var. *granomembranacea*.
Transfer of the variety to *Spiniferites* was effected by
Corradini, 1973, p.166.
- subsp. *granosus* (Davey and Williams, 1966a, p.35, pl.4, fig.9)
Lentin and Williams, 1973, p.130. Early Eocene; formerly
Hystriichosphaera ramosa var. *granosa*. Transfer of the variety
to *Spiniferites* was effected by Corradini, 1973, p.167.
- subsp. *meandriiformis* (Corradini, 1973, p.168-169, pl.26, fig.11-
12) Lentin and Williams, 1975, p.2155. Senonian; formerly
Spiniferites ramosus var. *meandriiformis*.
- subsp. *multibrachiatus* (deWit, 1943, p.376; text-fig.3f) Lentin
and Williams, 1973, p.130. Late Cretaceous; formerly
Hystriichosphaera furcata forma *multibrachiata*.
- subsp. *multibrevis* (Davey and Williams, 1966a, p.35-36, pl.1,
fig.4; pl.4, fig.6; text-fig.9) Lentin and Williams, 1973,
p.130. Hauterivian-Early Eocene; formerly *Hystriichosphaera*
ramosa var. *multibrevis*. Transfer of the variety to
Spiniferites effected by Davey and Verdier, 1971, p.33.
- subsp. *multiplicatus* (Rossignol, 1964, p.86, pl.1, fig.14; pl.3,
fig.16) Lentin and Williams, 1973, p.130. Pleistocene-Holocene;
formerly *Hystriichosphaera furcata* var. *multiplicata*.
- subsp. "*pachydermus*" (Rossignol, 1964) Lentin and Williams, 1973,
p.130. NOW *Spiniferites pachydermus*; formerly *Hystriichosphaera*
furcata var. *pachyderma*.

SPINIFERITES ramosus (cont'd)

- subsp. *primaevus* Duxbury, 1977, p.50-51, pl.4, fig.2-3.
Valanginian.
- subsp. *ramosus* (Ehrenberg, 1838, pl.1, fig.1-2,5) Loeblich and
Loeblich, 1966, p.56-57. Late Cretaceous; formerly *Xanthidium*,
Ovum hispidum and *Hystriichosphaera*.
- subsp. *reticulatus* (Davey and Williams, 1966a, p.38, pl.1,
fig.2-3) Lentin and Williams, 1973, p.130. Cenomanian;
formerly *Hystriichosphaera ramosa* var. *reticulata*. Transfer
of the variety to *Spiniferites* was effected by Davey and
Verdier, 1971, p.34.
- subsp. *spinosus* Jain, 1978, p.149, pl.1, fig.3. Maastrichtian.
- "*ramuliferus*" (Deflandre, 1937b) Reid, 1974, p.608. The transfer
of this species from *Achomosphaera* to *Spiniferites* by Reid,
1974, p.608-609 was rejected by Lentin and Williams, 1977b,
p.153.
- reginaldi* (Mantell, 1844, p.240; text-fig.53, no.5) Sarjeant,
1970, p.76. Late Cretaceous; formerly *Xanthidium*, *Hystriicho-*
sphaera and *Baltisphaeridium*. NOTE: Stover and Evitt, 1978,
p.191 considered this to be a "problematical species".
- rubinus* (Rossignol, 1964, p.87, pl.1, fig.12-13; pl.3, fig.22-23)
Sarjeant, 1970, p.76. Quaternary; formerly *Hystriichosphaera*.
- scabratus* (Wall, 1967, p.102, pl.14, fig.10-13; text-fig.2)
Sarjeant, 1970, p.76. Pleistocene-Recent; formerly *Hystriicho-*
sphaera.
- scabrosus* (Clarke and Verdier, 1967, p.49-50, pl.9, fig.7-10;
text-fig.21) Lentin and Williams, 1975, p.2155. Cenomanian-
Santonian; formerly *Hystriichosphaera*. The transfer of this
species from *Hystriichosphaera* to *Spiniferites* is not attri-
butable to Harker and Sarjeant, 1975, p.225.
- "*septatus*" (Cookson and Eisenack, 1967b) McLean, 1971, p.730. NOW
Hafniasphaera; formerly *Baltisphaeridium* and *Achomosphaera*.
- septentrionalis* Harland, 1977b, p.103-104, pl.1, fig.12-18;
text-fig.4. Late Quaternary.
- setosus* (Philipot, 1949, p.56; text-fig.1) Sarjeant, 1970,
p.76-77. Senonian; formerly *Hystriichosphaera*. NOTE: Stover
and Evitt, 1978, p.191 considered this to be a "problematical
species".
- ?*speciosus* (Deflandre, 1937b, p.65, pl.11, fig.2) Sarjeant, 1970,
p.77. Late Cretaceous; formerly *Hystriichosphaera*. NOTE: Stover
and Evitt, 1978, p.191 considered this to be a "provisionally
accepted species".

SPINIFERITES (cont'd)

- speetonensis* Duxbury, 1980, p.131-132, pl.11, fig.1-2,4. Barremian.
- splendidus* Harland, 1979b, p.537, pl.3, fig.1-2. Late Miocene-
Early Pliocene.
- supparus* (Drugg, 1967, p.24, pl.4, fig.5-6) Sarjeant, 1970, p.77.
Maastrichtian-Danian; formerly *Hystri-chosphaera*.
- "*tertiarius*" (Eisenack and Gocht, 1960, p.515; text-fig.4). *Jr*
syn. of *Spiniferites pseudofurcatus*; see Gocht, 1969, p.32 and
Sarjeant, 1970, p.76; formerly "*Hystri-chosphaera tertiaria*".
- ?*trabeculiferum* (Deflandre and Cookson, 1955, p.269, pl.8, fig.6)
Lentin and Williams, 1973, p.131. Middle Miocene; formerly
Hystri-chokibotium. NOTE: Stover and Evitt, 1978, p.191 con-
sidered this to be a "provisionally accepted species".
- ?*tripodes* (Morzadec-Kerfourn, 1966, p.140-141, pl.3, fig.3-4)
Lentin and Williams, 1973, p.131. Holocene; formerly *Balti-*
sphaeridium.
- varmae* Lentin and Williams, 1973, p.131 (*nom. subst. pro Hystri-*
chosphaera pseudofurcata Varma and Dangwal, 1964, p.66, pl.2,
fig.7-8; *non Spiniferites pseudofurcatus* (Klumpp) Sarjeant,
1970). Eocene-Oligocene. NOTE: Stover and Evitt, 1978, p.191
considered this to be a "problematical species".
- ?*velatus* (Clarke and Verdier, 1967, p.51-52, pl.10, fig.1-2;
text-fig.22) Stover and Evitt, 1978, p.191. Santonian; for-
merly *Nematosphaeropsis*. NOTE: Stover and Evitt, 1978, p.191
considered this to be a "provisionally accepted species".
- wetzeli* (Deflandre, 1937b, p.65, pl.11, fig.6,8) Sarjeant,
1970, p.77. Senonian; formerly *Hystri-chosphaera*.
- SPONGODINIUM* Deflandre, 1936b, p.169-170; emend. Stover and Evitt,
1978, p.191-192.
- **delitiense* (Ehrenberg, 1838, p.110, pl.1, fig.1-6) Deflandre,
1936b, p.170-171. Late Cretaceous; formerly *Peridinium*.
- "?*extremum*" (Cookson and Eisenack, 1974) Lentin and Williams, 1976,
p.40. NOW *Isabelidinium*; formerly *Deflandrea*.
- solidum* Alberti, 1961, p.31-32, pl.3, fig.17-18. Late Barremian-
Aptian.

STELLADINIUM Bradford, 1975, p.3065.

**reidii* Bradford, 1975, p.3065-3066, fig.2-4. Recent.

stellatum (Wall and Dale, 1968, p.275, pl.2, fig.15) Reid, 1977, p.443. Recent; formerly *Peridinium*.

STENOXYINIUM Deflandre, 1968, p.424.

**grassei* Deflandre, 1968, p.425-426, fig.1-6. Senonian.

STEPHANELYTRON Sarjeant, 1961a, p.109; emend. Stover *et al.*, 1977, p.331.

caytonense Sarjeant, 1961a, p.110, pl.15, fig.16; text-fig.11; emend. Stover *et al.*, 1977, p.332. Early Oxfordian.

**redcliffense* Sarjeant, 1961a, p.109-110, pl.15, fig.11; text-fig. 10; emend. Stover *et al.*, 1977, p.331-332. Early Oxfordian.

scarburghense Sarjeant, 1961a, p.111, pl.15, fig.12-13; emend. Stover *et al.*, 1977, p.333. Early Oxfordian.

tabulophorum Stover *et al.*, 1977, p.333, pl.1, fig.12-13. Callovian.

STEPHODINIUM Deflandre, 1936a, p.58; emend. Davey, 1970, p.347.

"*australicum*" Cookson and Eisenack, 1962b, p.491, pl.2, fig.5-10. Clarke and Verdier, 1967, p.67 considered this species to be a *jr syn.* of *Stephodinium coronatum* Deflandre.

**coronatum* Deflandre, 1936a, p.58; text-fig.103. Senonian.

"*europaeicum*" Cookson and Hughes, 1964, p.50, pl.8, fig.9-17. Clarke and Verdier, 1967, p.67 considered this species to be a *jr syn.* of *Stephodinium coronatum* Deflandre.

?*pellucidum* Deflandre, 1943, p.505,507; text-fig.12-16. ?Senonian. NOTE: Stover and Evitt, 1978, p.193 considered this to be a "provisionally accepted species".

"*spiniiferum*" (Cookson and Eisenack, 1965a). NOW ?*Thalassiphora*.

SUBATHUA Khanna and Singh, 1980, p.307-308.

"*balcanica*" (Baltes, 1971). This species, considered to be a *jr syn.* of *Thalassiphora pelagica* by Stover and Evitt, 1978, p.194, was incorrectly transferred to *Subathua* by Khanna and Singh, 1980, p.308 (see I.C.B.N. Art.33, para.4).

**sahni* Khanna and Singh, 1980, p.308-309, pl.1, fig.1-3,5-9; text-fig.1-2. Eocene.

SUBATHUA (cont'd)

spinosa Khanna and Singh, 1980, p.309, pl.1, fig.10-12; text-fig.3.
Eocene.

SUBTILIDINIUM Morgenroth, 1968, p.539.

**minutum* Morgenroth, 1968, p.539-540, pl.42, fig.8-9; pl.43,
fig.1-2; text-fig.3-4. Danian.

SUBTILISPHAERA Jain and Millepied, 1973, p.26-27; emend. Lentin and
Williams, 1976, p.117-118.

"*asymmetrica*" (Davey and Verdier, 1971, p.39-40, pl.2, fig.4,6)
Lentin and Williams, 1976, p.119. NOW *Subtilisphaera deformans*;
formerly *Deflandrea asymmetrica* and *Deflandrea deformans*
Davey and Verdier.

balcattensis (Cookson and Eisenack, 1969, p.3,5, fig.1B-F) Lentin
and Williams, 1976, p.119. Albian-Cenomanian; formerly
Deflandrea.

cheit Below, 1981, p.126-127, pl.9, fig.23-24; text-fig.85. Aptian-
Vraconian.

crassigranulosa Jain and Millepied, 1973, p.28, pl.2, fig.25.
Aptian.

"*cretacea*" (Pocock, 1962) Jain and Millepied, 1973, p.27. NOW
Palaeoperidinium. Lentin and Williams, 1975, p.2155 rejected
the transfer of this species to *Subtilisphaera* by Jain and
Millepied, 1973, p.27.

deformans (Davey and Verdier, 1973, p.197, *nom. nov. pro Deflandrea*
asymmetrica Davey and Verdier, 1971, p.39-40, pl.2, fig.4,6
non D. asymmetrica Wilson, 1967a, p.62-63) Stover and Evitt,
1978, p.238. Middle Albian; formerly *Deflandrea asymmetrica*,
D. deformans and *Subtilisphaera asymmetrica*. See also *Deflandrea*
daveyi.

"*euthema*" (Davey and Verdier) Lentin and Williams, 1976, p.119.
NOW *Eurydinium*; formerly *Deflandrea*.

foliacea (Eisenack and Cookson, 1960, p.2, pl.1, fig.3) Stover
and Evitt, 1978, p.239. Turonian-Middle Senonian; formerly
Alterbia and *Deflandrea*.

perlucida (Alberti, 1959b, p.102, pl.9, fig.16-17) Jain and
Millepied, 1973, p.27. Late Barremian; formerly *Deflandrea*.

pirnaensis (Alberti, 1959b, p.100, pl.8, fig.1,5) Jain and
Millepied, 1973, p.27. Middle Turonian; formerly *Deflandrea*.

SUBTILISPHAERA (cont'd)

pontis-mariae (Deflandre, 1936b, p.167, pl.2, fig.7-9) Lentin and Williams, 1976, p.119. ?Senonian; formerly *Gymmodinium*, *Deflandrea* and *Ascodinium*.

rotundata (Eisenack and Cookson, 1960, p.2, pl.1, fig.1-2) Jain and Millepied, 1973, p.27. Albian; formerly *Deflandrea*. Lentin and Williams, 1976, p.119 did not agree with Davey, 1974, p.65 that *S. rotundata* is a *jr syn.* of *Subtilisphaera perlucida* (Alberti) Jain and Millepied. In Davey (*op.cit.*) the species are included in *Deflandrea*.

scabrata Jain and Millepied, 1973, p.28, pl.3, fig.36-39. Aptian.

**senegalensis* Jain and Millepied, 1973, p.27-28, pl.3, fig.31-33. Aptian.

"*sverdrupiana*" (Manum, 1963). NOW *Spinidinium*. The transfer of this species to *Subtilisphaera* by Jain and Millepied, 1973, p.27 was rejected by Lentin and Williams, 1977b, p.157.

?*terrula* (Davey, 1974, p.65, pl.8, fig.4-5) Lentin and Williams, 1976, p.119. Middle Barremian; formerly *Deflandrea*.

?*trendallii* (Cookson and Eisenack, 1970a, p.145-146, pl.12, fig.5-6) Lentin and Williams, 1976, p.120. Albian-Cenomanian; formerly *Ascodinium*. O.C.

ventriosa (Alberti, 1959b, p.101, pl.9, fig.14-15) Jain and Millepied, 1973, p.27. Early Aptian; formerly *Deflandrea*.

zavia Below, 1981, p.128-129, pl.9, fig.21-22; text-fig.82. Albian.

SUESSIA Morbey, 1975, p.38.

**swabiana* Morbey, 1975, p.39-40, pl.14, fig.5-11; pl.17, fig.4-9; text-fig.12-15. Rhaetian.

SUMATRADINIUM Lentin and Williams, 1976, p.77-78.

**hispidum* (Drugg, 1970a, p.120-121, fig.12-15) Lentin and Williams, 1976, p.77. Middle Miocene-Pliocene; formerly *Xenicodinium*.

SURCULOSPHAERIDIUM Davey *et al.*, 1966, p.160-161.

?*alagoense* (Regali *et al.*, 1974) *comb. nov.*
1974 *Hystriosphæridium alagoensis* Regali *et al.*, p.290, p.124, fig.2. Middle Eocene-Miocene.

**cribrotubiferum* (Sarjeant, 1960a, p.137, pl.6, fig.2-3; text-fig.1) Davey *et al.*, 1966, p.161. Early Oxfordian; formerly *Hystriosphæridium*.

subsp. *granulosum* Jain, 1977, p.183, pl.6, fig.76. Early Albian.

SURCULOSPHERIDIUM (cont'd)

divarispinosum Jain, 1977, p.183, pl.6, fig.77. Early Albian.

granulosum Jain, 1977, p.182-183, pl.2, fig.17. Early Albian.

?*longifurcatum* (Firtion, 1952, p.157, pl.9, fig.1; text-fig.1H-M)
Davey *et al.*, 1966, p.163. Cenomanian; formerly *Hystri-
sphaeridium* and *Baltisphaeridium*. NOTE: Stover and Evitt,
1978, p.83 considered this to be a "provisionally accepted
species".

phoenix (Duxbury, 1980) *comb. nov.*
1980 *Hystriosphæridium phoenix* Duxbury, p.124-125, pl.13,
fig.5-6; text-fig.9. Barremian.

trunculum Davey, 1979b, p.559-560, pl.8, fig.6-9. Aptian-
Albian.

?*vestitum* (Deflandre, 1938b, p.189, pl.11, fig.4-6) Davey *et al.*,
1966, p.162. Oxfordian; formerly *Hystriosphæridium* and
Baltisphaeridium. NOTE: Stover and Evitt, 1978, p.83 consid-
ered this to be a "provisionally accepted species".

SUSADINIUM Dörhöfer and Davies, 1980, p.28.

**scrofoides* Dörhöfer and Davies, 1980, p.28-29, fig.13; 24F,H-I,K;
25A-D. Toarcian-Bathonian.

SVALBARDELLA Manum, 1960, p.21.

"*australina*" (Cookson, 1965b). NOW *Palaeocystodinium*.

**cooksoniae* Manum, 1960, p.21-22, pl.1, fig.1-3; text-fig.2.
Late Paleocene-Eocene.

"*granulata*" (Wilson, 1967b). NOW *Palaeocystodinium*.

hampdenensis Wilson, 1977, p.564-566, fig.1-8. Middle Eocene.

"*polymorpha*" (Malloy, 1972). NOW *Andalusiella*.

"*rhomboides*" (Boltenhagen, 1977). NOW *Andalusiella*.

"?*vozzhennikovae*" (Boltenhagen, 1977). NOW *Andalusiella*.

SVERDRUPIELLA Bujak and Fisher, 1976, p.45-48.

baccata Bujak and Fisher, 1976, p.48-49, pl.1, fig.5-7; text-fig.
2B. Norian.

cristata Bujak and Fisher, 1976, p.51, pl.6, fig.4-7; text-fig.2F.
?Carnian-Norian.

SVERDRUPIELLA (cont'd)

downiei Bujak and Fisher, 1976, p.51, pl.7, fig.1-6; text-fig.2I.
?Carnian-Norian.

manicata Bujak and Fisher, 1976, p.50, pl.3, fig.8-11; text-fig.2G.
Norian.

mutabilis Bujak and Fisher, 1976, p.50, pl.4, fig.1-12; pl.5,
fig.1-10; pl.6, fig.1-3; text-fig.2J. ?Carnian-Norian.

ornaticingulata Bujak and Fisher, 1976, p.49, pl.1, fig.8-10;
text-fig.2K. ?Carnian-Norian.

raiaformis Bujak and Fisher, 1976, p.50, pl.3, fig.4-7; text-fig.2D.
?Carnian-Norian.

sabinensis Bujak and Fisher, 1976, p.49, pl.3, fig.1-3; text-fig.2E.
?Carnian-Norian.

**septentrionalis* Bujak and Fisher, 1976, p.48, pl.1, fig.1-4;
text-fig.2A. ?Carnian-Norian.

spinosa Bujak and Fisher, 1976, p.51, pl.6, fig.8-10; text-fig.2C.
?Carnian-Norian.

usitata Bujak and Fisher, 1976, p.49, pl.2, fig.1-12; text-fig.2H.
?Carnian-Norian.

SYSTEMATOPHORA Klement, 1960, p.61-62.

ancyrea Cookson and Eisenack, 1965a, p.126, pl.14, fig.1-3.
Late Eocene. We herein reject the contention of Stover and
Evitt, 1978, p.84 that this species is a *jr syn.* of *Systemato-*
phora placacantha.

**areolata* Klement, 1960, p.62-65, pl.9, fig.1-8; text-fig.32-35.
Early Kimmeridgian.

?*austini* (Merrill, 1895, p.16, fig.11) Sarjeant, 1964b, p.175.
Early Cretaceous; formerly ?*Geodia*. NOTE: Stover and Evitt,
1978, p.85 considered this to be a "problematical species"

"?*capricorna*" (Cookson and Eisenack, 1965) Eisenack, 1969, p.113.
NOW *Areosphaeridium*; formerly *Cordosphaeridium*.

complicata Neale and Sarjeant, 1962, p.455-456, pl.19, fig.6-7.
Late Hauterivian-Middle Barremian.

cretacea Davey, 1979b, p.560, pl.8, fig.10,13-15. Albian.

"*fasciculigera*" Klement, 1960, p.65, pl.9, fig.11-12. Middle
Oxfordian-Early Kimmeridgian. *Jr syn.* of *Systematophora*
penicillata; see Sarjeant, 1980a, p.282.

SYSTEMATOPHORA (cont'd)

iunctispina (Klement, 1960, p.68-69, pl.10, fig.1-6) Stover and Evitt, 1978, p.84. Middle Oxfordian; formerly *Taeniophora*.

subsp. *filamentosa* (Klement, 1960, p.70, pl.10, fig.5-6) Stover and Evitt, 1978, p.84. Middle Oxfordian; formerly *Taeniophora iunctispina* subsp. *filamentosa*.

subsp. *iunctispina* (Klement, 1960, p.69, pl.10, fig.1-4) Stover and Evitt, 1978, p.84. Middle Oxfordian; formerly *Taeniophora iunctispina* subsp. *iunctispina*.

"*orbifera*" (Klement, 1960). NOW *Hystriichosphaerina*.

"*ovata*" (Gitmez and Sarjeant, 1972). NOW *Egmontodinium*. NOTE: Stover and Evitt, 1978, p.84 considered this to be a "provisionally accepted species" of *Systematophora*.

penicillata (Ehrenberg, 1843, p.61) Sarjeant, 1980a, p.282. Late Oxfordian; formerly *Xanthidium*, *Ovum hispidum*, *Hystriichosphaera* and *Hystriichosphaeridium*.

placacantha (Deflandre and Cookson, 1955, p.276, pl.9, fig.1-3) Davey *et al.*, 1969, p.17; emend. May, 1980, p.68. Miocene; formerly *Hystriichosphaeridium*, *Baltisphaeridium* and *Impletosphaeridium*.

"*schindewolfii*" (Alberti, 1961) Downie and Sarjeant, 1965, p.146. NOW and formerly *Hystriichosphaerina*.

silyba Davey, 1979a, p.433-434, 436, pl.48, fig.7-8; pl.50, fig.2-3, 5-6, 7-9. Barremian.

"*turonica*" (Alberti, 1961) Downie and Sarjeant, 1965, p.146. NOW and formerly *Hystriichosphaerina*.

valensi (Sarjeant, 1960a, p.142-143, pl.6, fig.5-7; text-fig. 3c) Downie and Sarjeant, 1965, p.146. Late Oxfordian; formerly *Polystephanosphaera*.

?*variabilis* (Cookson and Eisenack, 1967a, p.134-135, pl.19, fig.9-11) Stover and Evitt, 1978, p.84. Paleocene; formerly *Cyclonephelium*. NOTE: Stover and Evitt, *op.cit.*, considered this to be a "provisionally accepted species".

"*varians*" (May, 1980). NOW *Hystriichosphaerina*.

"*vetuscula*" (Davey, 1974) Duxbury, 1977, p.51. NOW *Nexosispinum*; formerly *Adnatosphaeridium*.



"*TAENIOPHORA*" Klement, 1960, p.67-68. Stover and Evitt, 1978, p.84 considered this genus to be a *jr syn.* of *Systematophora* Klement. They accordingly transferred the type of the genus *Taeniophora*, *T. iunctispina*, to *Systematophora*. The remaining species *Taeniophora linifera*, was transferred to the genus *Achomosphaera* by Stover and Evitt, 1978, p.138-139.

"**iunctispina*" (Klement, 1960). NOW *Systematophora*.

subsp. "*filamentosa*" (Klement, 1960). NOW *Systematophora iunctispina* subsp. *filamentosa*.

subsp. "*iunctispina*" (Klement, 1960). NOW *Systematophora iunctispina* subsp. *iunctispina*.

"*linifera*" (Cookson and Eisenack, 1967b) Eisenack and Kjellström, 1971a, p.1019. Late Paleocene. NOW *Achomosphaera*; formerly *Baltisphaeridium*.

TALEISPHAERA Duxbury, 1979a, p.201.

**hydra* Duxbury, 1979a, p.201, pl.2, fig.1,4,6-7. Barremian.

TANYOSPHAERIDIUM Davey and Williams, 1966b, p.98.

boletum Davey, 1974, p.61-62, pl.6, fig.7. Barremian.

"*ellipticum*" (Cookson, 1965a) Davey and Williams, 1969, p.7. NOW *Distatodinium*; also formerly *Hystrichosphaeridium*.

fusiform Matsuoka, 1974, p.332-333, pl.46, fig.4,9-10. Early-Middle Miocene. O.C.

isocalamum (Deflandre and Cookson, 1955, p.272, pl.2, fig.7-8; text-fig.30-35) Davey and Williams, 1969, p.7. Early Cretaceous; formerly *Hystrichosphaeridium*.

"*magdali*" (Drugg, 1967, p.26, pl.4, fig.8-10; pl.9, fig.7) Heisecke, 1970, p.244. Danian; formerly *Hystrichosphaeridium*. Stover and Evitt, 1978, p.85 considered this species to be a *jr syn.* of *Tanyosphaeridium xanthiopyxides*.

"*paradoxum*" (Brosius, 1963) Gocht, 1969, p.54. NOW *Bipolaribucina*; also formerly *Hystrichosphaeridium* and ?*Oligosphaeridium*.

"*prolixispinosum*" (Davey and Williams, 1966b) Duxbury, 1980, p.132. Species herein retained in *Oligosphaeridium*.

TANYOSPHERIDIUM (cont'd)

regulare Davey and Williams, 1966b, p.99-100, pl.3, fig.4.
Early Eocene.

salpinx Norvick, 1976, p.63-64, pl.9, fig.10. Cenomanian.

"*tenerum*" (Benedek, 1972). NOW *Distatodinium*.

"*torynum*" (Cookson and Eisenack, 1960b) Stover and Evitt, 1978,
p.85. NOW *Egmontodinium*; formerly *Hystriosphæridium* and
?Prolixosphæridium.

**variecalamum* Davey and Williams, 1966b, p.98-99, pl.6, fig.7;
text-fig.20. Cenomanian.

xanthiopyxides (O. Wetzel, 1933b, p.44, pl.4, fig.25) Stover and
Evitt, 1978, p.85. Senonian; formerly *Hystriosphæra*, *Hys-*
trichosphæridium, *Baltisphaeridium* and *?Prolixosphæridium*.

"TAPEINOSPHERIDIUM" Ioannides *et al.*, 1977, p.461-462. *Jr syn.* of
Chytroeisphaeridia; see Davey, 1979d, p.211.

"*granulatum*" (Ioannides *et al.*, 1977). NOW *?Tectatodinium*.

"*hyalinum*" (Raynaud, 1978). NOW *Chytroeisphaeridia*.

"**pericompsum*" (Ioannides *et al.*, 1977). NOW *Chytroeisphaeridia*.

TECTATODINIUM Wall, 1967, p.112-113.

"*gochti*" (Dodekova, 1975). NOW *Dodekovia*.

?granulatum (Ioannides *et al.*, 1977, p.462, pl.4, fig.18-19) Davey,
1979d, p.217. Kimmeridgian; formerly *Tapeinosphaeridium*.

"*nudum*" (Nagy, 1969) Lentin and Williams, 1977b, p.121. Invalid
transfer since this species is a *jr hom.* of *Palaeoperidinium*
nudum Downie, 1957. NOW *Tectatodinium pannonium*; formerly
Palaeoperidinium and *?Gonyaulacysta*. See discussion under
"*Palaeoperidinium pannonium*".

pannonium (Lentin and Williams, 1973) *comb. nov.*

1973 *Palaeoperidinium pannonium* Lentin and Williams, p.106
nom. subst. pro Palaeoperidinium nudum Nagy, 1969 (*non*
Palaeoperidinium nudum Downie, 1957) p.291, pl.1, fig.1.
Pannonian; also formerly *Phthanoperidinium pannonium*, *?Gony-*
aulacysta nuda and *?Tectatodinium nudum*.

**pellitum* Wall, 1967, p.113, pl.16, fig.11-12. Miocene-Holocene.

psilatum Wall and Dale, 1973, p.22-23, pl.1, fig.9-15; pl.3,
fig.1-6. Holocene.

TENERIDINIUM Krutzsch, 1962, p.41.

**magnoides* Krutzsch, 1962, p.42, pl.10, fig.1-7; text-fig.1a.
Eocene.

"*TENUA*" Eisenack, 1958, p.410; emend. Sarjeant, 1968, p.230-231.
Lentin and Williams, 1973, p.135 rejected the emendation of this genus by Pocock, 1972, p.94 since the inclusion of smooth forms within *Tenua* would create a *jr syn.* of *Cunningia* Cookson and Eisenack, 1960b. The emended circumscription of Pocock was otherwise similar to that of Sarjeant, 1968. Sarjeant and Stover, 1978, p.49 considered *Tenua* to be a *jr syn.* of the genus *Cyclonephelium*. The retention of *Tenua* by Davey, 1978, p.894, with *T. rioultii* as type species, is herein rejected and the treatment of Sarjeant and Stover, 1978 is accepted. The present generic assignments of the species of "*Tenua*" are given below.

"*anaphrissa*" (Sarjeant, 1966c) Benedek, 1972, p.9-10. Harker and Sarjeant, 1975, p.224 rejected the transfer of this species to *Tenua* and retained it in the genus *Doidyx* Sarjeant. Sarjeant and Stover, 1978, p.51 transferred this species from *Doidyx* to *Aptea*.

"*aptiensis*" (Burger, 1980a). NOW *Sentusidinium*.

"*asymmetra*" (Fenton *et al.*, 1980). NOW *Sentusidinium*.

"*atlantica*" (Habib, 1972). NOW *Sentusidinium*.

"*baculata*" (Dodekova, 1975). NOW *Sentusidinium*.

"*bellula*" (Jiabo, 1978). NOW ?*Kallosphaeridium*.

"*bifidis*" (Jiabo, 1978). NOW ?*Cleistosphaeridium*.

"*biornata*" (Jiabo, 1978). NOW *Kallosphaeridium biparatum*.

subsp. "*biornata*" (Jiabo, 1978). NOW *Kallosphaeridium biparatum* subsp. *biparatum*.

subsp. "*crassa*" (Jiabo, 1978). NOW *Kallosphaeridium biparatum* subsp. *crassum*.

"*brevispinosa*" (Pocock, 1962) Brideaux, 1977, p.15. NOW *Cyclonephelium*; formerly *Palaeohystrichophora*; see also ?*Cunningia*. The transfer of this species to *Tenua* by Brideaux, 1977, p.15 necessitated the transfer to *Cyclonephelium* effected herein.

"*capillata*" (Davey, 1975). NOW *Sentusidinium*.

"*capitata*" (Cookson and Eisenack, 1960b) Gitmez and Sarjeant, 1972, p.189. NOW *Prolixosphaeridium*; formerly *Hystrichosphaeridium*.

"TENUA" (cont'd)

"*dubia*" (Jain and Millepied, 1975). NOW *Cyclonephelium*.

"*echinata*" (Gitmez and Sarjeant, 1972). NOW *Sentusidinium*.

"*eisenackii*" (Boltenhagen, 1977). NOW *Sentusidinium*.

var. "*vermiculata*" (Boltenhagen, 1977). NOW *Sentusidinium eisenackii* subsp. *vermiculatum*.

"*evittii*" (Pocock, 1972). NOW *Pareodinia*.

"*hystricella*" Eisenack, 1958, p.411, pl.23, fig.5-7. Eisenack and Kjellström, 1971a, p.1039 and Brideaux and McIntyre, 1975, p.24 considered this species to be a *jr syn.* of *Tenua hystrix* Eisenack.

"**hystrix*" (Eisenack, 1958). NOW *Cyclonephelium*.

subsp. "*minor*" (Jiabo, 1978). NOW ?*Kallosphaeridium minor*.

"*microcysta*" (Bujak, 1980). NOW *Cleistosphaeridium*.

"*neophytensa*" (Ioannides *et al.*, 1977). NOW ?*Sentusidinium*.

"*pilosa*" (Ehrenberg, 1843) Sarjeant, 1968, p.231. NOW *Sentusidinium*; formerly *Xanthidium*, *Ovum hispidum*, *Hystrichosphaera*, *Hystrichosphaeridium*, *Baltisphaeridium* and *Cleistosphaeridium*.

subsp. "*longispinosa*" (Sarjeant, 1961a, p.102, pl.14, fig.8) Lentin and Williams, 1973, p.136; formerly *Baltisphaeridium pilosum* var. *longispinosum*. Sarjeant, 1976c, p.19 considered this taxon to be a *jr syn.* of the species *Prolixosphaeridium granulatum* (Deflandre) Davey *et al.* Erkmen and Sarjeant, 1980, p.64-65 considered this taxon to be synonymous with *Prolixosphaeridium anasillum*.

"*rioultii*" (Sarjeant, 1968). NOW *Sentusidinium*.

"*taugourdeawi*" (Varma and Dangwal, 1964). See ?*Hemicystodinium taugourdeawi*.

"*varispinosa*" (Sarjeant, 1959) Sarjeant, 1972, p.43. NOW ?*Sentusidinium*.

"*verrucosa*" (Sarjeant, 1968). NOW *Sentusidinium*.

"*villersensis*" (Sarjeant, 1968). NOW *Sentusidinium*.

"TETRASPHERA" Gorka, 1965 non *Tetrasphaera* Popofsky, 1912. NOW *Gorkadinium*.

"**rara*" (Gorka, 1965). NOW *Gorkadinium*.

THALASSIPHORA Eisenack and Gocht, 1960, p.513; emend. Gocht, 1968, p.153.

"*balcanica*" Baltés, 1971, p.6, pl.3, fig.3-7. Early Pliocene.
Jr syn. of *Thalassiphora pelagica*; see Stover and Evitt, 1978, p.194. Transfer of this species to *Disphaeria* by Norvick, 1976, p.99 was rejected by Lentin and Williams, 1977b, p.162 because of the uncertainty of the archeopyle type in that genus.

bononiensis Corradini, 1973, p.185-186, pl.30, fig.5,6a-b,8a-b; pl.37, fig.5a-b; pl.38, fig.1; pl.39, fig.1. Late Cretaceous-Paleocene.

"*defloccata*" (Davey and Verdier) Lentin and Williams, 1976, p.85.
NOW *Leberidocysta*; formerly *Hexagonifera*.

delicata Williams and Downie, 1966c, p.235, pl.26, fig.8; emend. Eaton, 1976, p.287. Early Eocene.

dynamica (Morgenroth, 1966a, p.27-28, pl.6, fig.7-8) Stover and Evitt, 1978, p.195. Early Eocene; formerly *Erikania*.

fenestrata Liengjarern *et al.*, 1980, p.489, pl.54, fig.1. Late Eocene-Early Oligocene.

flammea Cookson and Eisenack, 1967b, p.252-253, pl.42, fig.1-5. Late Paleocene.

?*maxima* Jain and Millepied, 1975, p.146, pl.4, fig.53-54.
Campanian-Maastrichtian. NOTE: Stover and Evitt, 1978, p.195 considered this to be a "provisionally accepted species".

"*munda*" (Davey and Verdier, 1973). NOW *Disphaeria*. The retention of this species in *Thalassiphora* by Stover and Evitt, 1978, p.195 is herein rejected.

?*pansa* Stover, 1977, p.78-79, pl.2, fig.32-38. Middle-Late Oligocene.

patula (Williams and Downie, 1966c, p.217, pl.24, fig.2; text-fig.58) Stover and Evitt, 1978, p.195. Early Eocene; formerly ?*Adnatosphaeridium*. The transfer of this species from ?*Adnatosphaeridium* to *Thalassiphora* is not attributable to Bujak *et al.*, 1980, p.36.

**pelagica* (Eisenack, 1954, p.71, pl.12, fig.17-18) Eisenack and Gocht, 1960, p.513-514. Late Eocene-Early Oligocene; formerly *Pterospermopsis*.

?*petila* Corradini, 1973, p.186, pl.31, fig.1-2. Senonian.

reticulata Morgenroth, 1966b, p.6-7, pl.2, fig.1-2. Early Oligocene.

THALASSIPHORA (cont'd)

salvadorensis (Regali et al., 1974) comb. nov.

1974 *Hystrichosphaeridium salvadorensis* Regali et al., p.290, pl.23, fig.1. Eocene.

?*spiniifera* (Cookson and Eisenack, 1965a, p.124-125, pl.14, fig.10)

Stover and Evitt, 1978, p.195. Late Eocene; formerly *Stephodinium*. NOTE: Stover and Evitt, 1978, p.195 considered this to be a "provisionally accepted species".

succincta Morgenroth, 1966b, p.7-8, pl.2, fig.7-9. Early Oligocene.

"*sueroi*" Pöthe de Baldis, 1966, p.224-225, pl.2, fig.d. Early Tertiary. *Jr syn.* of *Thalassiphora pelagica*; see Stover and Evitt, 1978, p.194.

velata (Deflandre and Cookson, 1955, p.291, pl.8, fig.8)

Eisenack and Gocht, 1960, p.514-515. Early Tertiary; formerly *Pterocystidiopsis*.

THORACOSPHAERA Kamptner, 1927, p.180-184.

albatrosiana Kamptner, 1963, p.177, fig.30. Modern.

"*candora*" Kamptner, 1967, p.157, fig.100,102,105-106. *Jr syn.* of *Thoracosphaera tuberosa*; see Fütterer, 1978, p.716.

"*corsena*" Kamptner, 1967, p.157, fig.82-85. *Jr syn.* of *Thoracosphaera heimi*; see Fütterer, 1978, p.714.

deflandrei Kamptner, 1956, p.448-455, fig.1-4. Eocene.

eichstaettensis Keupp, 1978, p.88-89, fig.1-2. Tithonian.

granulifera Fütterer, 1978, p.715, pl.2, fig.1-12. Late Pliocene-Pleistocene.

"*granulosa*" Kamptner, 1963, p.178, fig.28. *Jr syn.* of *Thoracosphaera heimi*; see Fütterer, 1978, p.714.

**heimi* (Lohmann, 1920, p.117, fig.29) Kamptner, 1944, p.145. Modern; formerly *Syracosphaera*.

"*imperforata*" Kamptner, 1955, p.37,66-71, pl.8, fig.98. *Jr syn.* of *Thoracosphaera heimi*; see Fütterer, 1978, p.714.

"*narena*" Kamptner, 1967, p.158, fig.96-99,101,103. *Jr syn.* of *Thoracosphaera tuberosa*; see Fütterer, 1978, p.716.

"*pelagica*" Kamptner, 1927, p.180-184, text-fig.6. Modern. This species, the original type of the genus, was considered to be a *jr syn.* of *Thoracosphaera heimi* (Lohmann) Kamptner, by Kamptner, 1944, p.145. *Thoracosphaera heimi* therefore becomes the type of the genus.

THORACOSPHERA (cont'd)

"*ricoseta*" Kamptner, 1967, p.159, fig.87. *Jr syn.* of *Thoracosphaera albatrosiana*; see Fütterer, 1978, p.716.

saxea Stradner, 1961, p.84, fig.71. Early Paleocene (Danian).

spinosa Keupp, 1979a, p.17-18, pl.1, fig.6-7. Early Barremian.

strobila Keupp, 1979a, p.18, pl.2, fig.1-3. Early Barremian.

tesserula Fütterer, 1978, p.715, pl.3, fig.1-8,10-11. Paleocene-Late Oligocene.

thoracata Keupp, 1979a, p.19, pl.2, fig.8-11. Early Barremian.

tuberosa Kamptner, 1963, p.179, fig.26. Modern.

"**THULEDINIUM**" Pocock and Sarjeant, 1972, p.352. Pocock and Sarjeant, *op.cit.*, considered this genus to be an acritarch. Davey, 1979c, p.64 stated that *Thuledinium* was a *jr syn.* of *Mendicodinium*. He accordingly transferred the type of the genus and single species, *Thuledinium groenlandicum*, to *Mendicodinium*.

"**TOOLONGIA**" Cookson and Eisenack, 1960a, p.14. *Jr syn.* of *Dinopterygium*; see Stover and Evitt, 1978, p.205. These authors transferred the type and single species of the genus, *Toolongia medusoides*, to *Dinopterygium*.

TRABECULIDIUM Duxbury, 1980, p.132-133.

**quinquetrum* Duxbury, 1980, p.133-134, pl.9, fig.1-2,5. Barremian.

TRIBLASTULA O. Wetzel, 1933b, p.54; emend. Morgenroth, 1966a, p.15.

"*borussica*" (Eisenack, 1954) Morgenroth, 1966a, p.15-16. NOW *Rottnestia*. The above transfer was rejected by Eisenack, 1969, p.105-108, but upheld by May, 1980, p.70.

nuda O. Wetzel, 1961, p.340, pl.2, fig.2. Erratic, ?Late Cretaceous. Gocht, 1976, p.322 questionably considered this species to be a synonym of *Hystriosphæeropsis quasicribrata* (O. Wetzel) Gocht. Stover and Evitt, 1978, p.196 obviously concurred with Gocht's opinion.

"*quasicribrata*" (O. Wetzel, 1961). NOW *Hystriosphæeropsis*.

tubulata O. Wetzel, 1961, p.340, pl.2, fig.4. Erratic, ?Late Cretaceous. Gocht, 1976, p.322 questionably considered this species to be a synonym of *Hystriosphæeropsis quasicribrata* (O. Wetzel) Gocht. Stover and Evitt, 1978, p.196 obviously concurred with Gocht's opinion.

**utinensis* O. Wetzel, 1933b, p.54, pl.6, fig.5-6. Erratic, Cretaceous.

- TRICHODINIUM* Eisenack and Cookson, 1960, p.5; emend. Clarke and Verdier, 1967, p.18-19.
- bifurcatum* Jain and Millepied, 1975, p.140-141, pl.1, fig.14-16. Maastrichtian.
- castaneum* (Deflandre, 1935, p.229, pl.6, fig.8) Clarke and Verdier, 1967, p.19-20. Erratic, ?Senonian; formerly *Palaeoperidinium*.
- "*ciliatum*" (Gocht, 1959, p.65, pl.8, fig.5-6) Eisenack, 1964, p.811. Late Hauterivian; formerly *Apteodinium*. Clarke and Verdier, 1967, p.19 considered this species to be a *jr syn.* of *Trichodinium castaneum* (Deflandre) Clarke and Verdier.
- delicatum* Davey, 1975, p.156-157, pl.2, fig.8-9,11-12. Senonian (probably Campanian).
- eisenackii* Burger, 1980a, p.81, pl.37, fig.1,4. Aptian.
- hirsutum* Cookson, 1965b, p.139, pl.25, fig.5-13. Paleocene.
- "*intermedium*" Eisenack and Cookson, 1960, p.6, pl.2, fig.5-6. Clarke and Verdier, 1967, p.19 considered this species to be a *jr syn.* of *Trichodinium castaneum* (Deflandre) Clarke and Verdier.
- magnum* Jain, 1977, p.175-176, pl.4, fig.40-42. Early Albian.
- paucispinum* Eisenack and Cookson, 1960, p.5-6, pl.2, fig.7. Albian. We herein reject the transfer of this species to the genus *Occisucysta* Gitmez by Below, 1981, p.60.
- **pellitum* Eisenack and Cookson, 1960, p.5, pl.2, fig.4. Aptian.
- ?*rhomboidale* (Gorka, 1965, p.301-302, pl.1, fig.6) Lentin and Williams, 1976, p.111. Early Kimmeridgian; formerly *Palaeoperidinium*. Sarjeant, 1967, p.256 recommended transfer of this species to *Trichodinium*. NOTE: Stover and Evitt, 1978, p.196-197 considered this to be a "provisionally accepted species".
- speetonense* Davey, 1974, p.63, pl.7, fig.2-3. Barremian. We herein reject the transfer of this species to the genus *Occisucysta* Gitmez by Below, 1981, p.60.
- spinosum* Singh, 1971, p.316-317, pl.48, fig.8-9. Late Albian.
- TRIGONOPYXIDIA* Cookson and Eisenack, 1961a, p.75 (*nom. subst. pro Trigonopyxis* Cookson and Eisenack, 1960a, p.11, *non* Penard, 1912.)
- **ginella* (Cookson and Eisenack, 1960a, p.11, pl.3, fig.18-20) Downie and Sarjeant, 1965, p.149. ?Late Albian-Cenomanian.
- microreticulata* Jiabo, 1978, p.124-125, pl.43, fig.1. Early Tertiary.

"*TRIGONOPYXIS*" Cookson and Eisenack, 1960a *non* Penard, 1912. NOW *Trigonopysidia*.

TRINOVANTEDINIUM Reid, 1977, p.436-437; emend. Harland, 1977b, p.108.

**capitatum* Reid, 1977, p.437-438, pl.1, fig.6-8. Recent.

"*concretum*" (Reid, 1977). NOW *Quinquecuspis*.

"*olivum*" Reid, 1977, p.439-440, pl.1, fig.12-14; pl.2, fig.18. Recent. *Jr syn.* of *Lejeunecysta paratenella*; see Harland, 1977b, p.105.

sabrinum Reid, 1977, p.441-442, pl.2, fig.15-17. Recent.

"*TRIOPERCULODINIUM*" Drugg, 1970b, p.820. Wall and Dale, 1973, p.24 considered this genus to be a *jr syn.* of *Lingulodinium* Wall. The type and single species of the genus, "*Trioperculodinium siculum*", is accordingly included in *Lingulodinium*.

TRITHYRODINIUM Drugg, 1967, p.20; emend. Lentin and Williams, 1976, p.98.

druggii Stone, 1973, p.54-55, pl.5, fig.18-19a. Late Campanian.

**evittii* Drugg, 1967, p.20, pl.3, fig.2-3; pl.9, fig.2. Danian.

fragile Davey, 1969b, p.11, pl.3, fig.6,9. Maastrichtian-?Danian.

"*ornatum*" (Felix and Burbridge, 1973). NOW *Ginginodinium*.

pentagonum May, 1980, p.87-88, pl.10, fig.13-14. Maastrichtian.

"*robustum*" (Benson, 1976). NOW ?*Chatangiella*.

striatum Benson, 1976, p.197-198, pl.11, fig.4-8. Late Maastrichtian.

suspectum (Manum and Cookson, 1964, p.9-10, pl.1, fig.9-13) Davey, 1969b, p.12. Cenomanian; formerly *Hexagonifera*.

unicorniculum Davey, 1975, p.158-159, pl.3, fig.6-7. Senonian (probably Campanian).

vermiculatum (Cookson and Eisenack, 1961a, p.74, pl.12, fig.6-8) Lentin and Williams, 1976, p.100. Senonian; formerly *Hexagonifera*.

TUBERCULODINIUM Wall, 1967, p.114.

paraense (Regali *et al.*, 1974) *comb. nov.*

1974 *Hystrichosphaeridium paraensis* Regali *et al.*, p.289, pl.23, fig.6. Early Miocene.

TUBERCULODINIUM (cont'd)

rossignoliae Drugg, 1970a, p.116-118, fig.3,10-11. Early Miocene. O.C.

**vancampoae* (Rossignol, 1962, p.134, pl.2, fig.1) Wall, 1967, p.114-115. Pleistocene; formerly *?Pterospermopsis*. Lentin and Williams, 1973, p.139 rejected the transfer of this species to the modern genus *Pyrophacus* by Wall and Dale, 1971, p.234-235, because the thecal equivalent of the type material is unknown.

wallii Drugg, 1970a, p.115-116, fig.1,4-6. Post Miocene.

TUBIDERMODINIUM Morgenroth, 1966a, p.16.

**sulcatum* Morgenroth, 1966a, p.16-17, pl.3, fig.46. Early Eocene.

TUBOTUBERELLA Vozzhennikova, 1967, p.179-180; emend. Brideaux, 1977, p.36.

"*apatela*" (Cookson and Eisenack, 1960b) Ioannides *et al.*, 1977, p.464. NOW *Glabridinium*; formerly *Seriniodinium* and *Psali-gonyaulax*.

"*dangeardii*" (Sarjeant, 1968) Stover and Evitt, 1978, p.197. NOW *Dimidiadinium*; formerly *Gonyaulacysta*.

dentata Raynaud, 1978, p.395, pl.2, fig.13. Callovian.

egemenii (Gitmez, 1970, p.272-274, pl.10, fig.5-6; text-fig.18) Stover and Evitt, 1978, p.197. Early Kimmeridgian; formerly *Leptodinium*.

eisenackii (Deflandre, 1938b, p.171, pl.6, fig.7-10; text-fig. 3-4) Stover and Evitt, 1978, p.197. Oxfordian; formerly *Endoscrinium*, *Gonyaulacysta* and *Gonyaulax*.

subsp. *oligodentata* (Cookson and Eisenack, 1958, p.30, pl.2, fig.11) Stover and Evitt, 1978, p.198. Late Jurassic; formerly *Endoscrinium eisenackii* subsp. *oligodentatum*.

**rhombiformus* Vozzhennikova, 1967, p.180, pl.101, fig.1-2; pl.102, fig.1-3; pl.104, fig.1-3. Late Jurassic. O.C.

"*sphaerocephalis*" (Vozzhennikova, 1967). NOW *Dimidiadinium*.

whatleyi (Sarjeant, 1972, p.19-21, pl.7, fig.1; text-fig.4) Stover and Evitt, 1978, p.198. Bathonian-Middle Callovian; formerly *Gonyaulacysta*.

TUBULIFERA Schumacker-Lambry, 1978, p.52-53.

**heterosolenia* Schumacker-Lambry, 1978, p.53, pl.8, fig.4-7. Paleocene (Landenian).

TURBIOSPHERA Archangelsky, 1969a, p.408.

**filosa* (Wilson, 1967a, p.66, fig.2,31-32,34) Archangelsky, 1969a, p.408-411. Paleocene-Oligocene; formerly *Cordosphaeridium*.

galatea Eaton, 1976, p.289, pl.15, fig.4-6. Early Eocene.

magnifica Eaton, 1976, p.290, pl.15, fig.7-9. Middle Eocene.

symmetrica Bujak, 1980, p.90, pl.22, fig.6-8. Late Eocene.

U

UVATODINIUM Vozzhennikova, 1963, p.182.

marginatum Vozzhennikova, 1967, p.51-52, pl.8, fig.1-2. Paleocene.

**nasutum* Vozzhennikova, 1963, p.182; text-fig.13a-b. Paleocene.



VALENSIELLA Eisenack, 1963a, p.100-101.

?*amandopolitana* (Valensi, 1955b, p.590, pl.2, fig.7; pl.5, fig.2) Eisenack, 1963a, p.102. Middle Jurassic; formerly *Membranilarnax* and *Favilarnax*. NOTE: Stover and Evitt, 1978, p.86 considered this to be a "provisionally accepted species".

ampulla Gocht, 1970b, p.149-150, pl.34, fig.7-9; text-fig.19a. Early Bathonian.

?*clathroderma* (Deflandre and Cookson, 1955, p.290, pl.7, fig.6; text-fig.51) Eisenack, 1963a, p.101. ?Early Eocene; formerly *Membranilarnax*. NOTE: Stover and Evitt, 1978, p.86 considered this to be a "provisionally accepted species".

griphus Norvick, 1976, p.75-76, pl.8, fig.6-7; pl.10, fig.7-9. Cenomanian.

**ovula* (Deflandre, 1947c, p.9, text-fig.22-23) Eisenack, 1963a, p.101. Bajocian; formerly *Membranilarnax* and *Favilarnax*.

punctata Jain, 1977, p.180, pl.4, fig.44. Early Albian.

undulata Jiabo, 1978, p.92, pl.27, fig.11-12. Early Tertiary.

vermiculata Gocht, 1970b, p.150, pl.34, fig.10-11; text-fig.19d. Early Bathonian.

VALVAEODINIUM Morgenroth, 1970, p.350.

**armatum* Morgenroth, 1970, p.350-351, pl.11, fig.1-5. Lias (Late Pliensbachian).

VECTIDINIUM Liengjarern *et al.*, 1980, p.490.

**stoveri* Liengjarern *et al.*, 1980, p.490-491, pl.54, fig.7. Late Eocene-Early Oligocene.

VOTADINIUM Reid, 1977, p.444.

**calvum* Reid, 1977, p.444-445, pl.2, fig.21-23. Recent.

spinorum Reid, 1977, p.445-446, pl.2, fig.24-26. Recent.

VOZZHENNIKOVIA Lentin and Williams, 1976, p.65-66. We reject the conclusions of Morgan, 1977, p.131 that *Vozzhennikovia* is a *jr syn.* of *Dioxya* Cookson and Eisenack; the two species of the latter genus are morphologically distinctive Albian taxa.

**apertura* (Wilson, 1967a, p.64-65, fig.3-5,8) Lentin and Williams, 1976, p.65. Paleocene-Oligocene; formerly *Spinidinium*. The transfer of this species to *Dioxya* by Morgan, 1977, p.131 is herein rejected.

"*elegantula*" (Williams, 1978). NOW *Selenopemphix*.

?*extensa* (Stover, 1973, p.178-179, pl.5, fig.4a-c,5a-d,6) Lentin and Williams, 1976, p.67. Middle-Late Eocene; formerly *Deflandrea*. Lentin and Williams, 1976, p.67 questionably included this species in *Vozzhennikovia* because it possesses a broad hexa 2a archeopyle. Stover 1973, p.178 stated that the processes are fairly evenly spaced. He later observed (p.179) that the paratabulation is commonly obscure although the outlines of some precingular and postcingular paraplates can be identified by the alignment of the processes, particularly on the dorsal surface of the epicyst. This is confirmed by the accompanying illustrations (pl.5, fig.4a and 5a). Although ?*Vozzhennikovia extensa* therefore appears to represent a distinct morphotype, Lentin and Williams, 1976, p.67 preferred to questionably include it in *Vozzhennikovia*. The transfer of this species to *Dioxya* by Morgan, 1977, p.131 is herein rejected.

?*filigrana* (Benedek, 1972, p.12-13, pl.4, fig.3) Lentin and Williams, 1976, p.67. Middle Oligocene; formerly *Deflandrea*. This species, because of its broad hexa 2a archeopyle, is questionably included in *Vozzhennikovia*. The transfer of this species to *Dioxya* by Morgan, 1977, p.131 is herein rejected.

rotunda (Wilson, 1967a, p.65-66, fig.6-7) Lentin and Williams, 1976, p.67. Eocene; formerly *Spinidinium*. The transfer of this species to *Dioxya* by Morgan, 1977, p.131 is herein rejected.

"*tenella*" (Morgenroth, 1966b) Lentin and Williams, 1976, p.67. NOW *Lejeunecysta*; formerly *Lejeunia*. The transfer of this species to *Dioxya* by Morgan, 1977, p.131 is herein rejected.

"*tenera*" (Kruttsch, 1962) Lentin and Williams, 1976, p.67. NOW *Geiselodinium*; formerly ?*Deflandrea*. The transfer of this species to *Dioxya* by Morgan, 1977, p.131 is herein rejected.

"*villosa*" (Eisenack and Cookson, 1960) Stover and Evitt, 1978, p.130. The transfer of this species from *Dioxya* to *Vozzhennikovia* is herein rejected. Burger, 1980a, p.85 also effected the same transfer.



WALLODINIUM Loeblich and Loeblich, 1968, p.212. (*nom. subst. pro*
Diplotesta Cookson and Eisenack, 1960, *non* Brongniart, 1874.)

anglicum (Cookson and Hughes, 1964, p.56-57, pl.11, fig.1-5)
Lentin and Williams, 1973, p.140. Late Albian-Early Cenomanian;
formerly *Diplotesta*.

bidigitatum (Manum and Cookson, 1964, p.25-26, pl.5, fig.4-6)
Lentin and Williams, 1973, p.140. Late Cretaceous; formerly
Diplotesta.

elongatum (Beju, 1971, p.289-290, pl.3, fig.7-10; text-fig.6A-E)
Duxbury, 1980, p.136. Bajocian-Oxfordian; formerly ?*Fromea*.

**glaessneri* (Cookson and Eisenack, 1960b, p.256, pl.39, fig.4-6)
Loeblich and Loeblich, 1968, p.212. Oxfordian-?Aptian; for-
merly *Diplotesta*.

inflatum (Habib, 1969, p.98, pl.3, fig.14-15; pl.4, fig.2) Habib,
1970, p.274. Albian-Cenomanian; formerly *Diplotesta*.

krutzschii (Alberti, 1961, p.21, pl.7, fig.19-21; pl.12, fig.6-7)
Habib, 1972, p.378. Hauterivian-Barremian; formerly *Diplotesta*.
O.C.

lunum (Cookson and Eisenack, 1960a, p.10-11, pl.3, fig.21)
Lentin and Williams, 1973, p.140. ?Late Albian-Cenomanian;
formerly *Diplotesta*.

WANAEA Cookson and Eisenack, 1958, p.57; emend. Fensome, 1981, p.51.

"*acollaris*" (Dodekova, 1975). NOW *Energlynia*.

elathrata Cookson and Eisenack, 1958, p.58, pl.9, fig.6-8.
Late Jurassic.

digitata Cookson and Eisenack, 1958, p.58, pl.9, fig.2-5. Late
Jurassic.

fimbriata Sarjeant, 1961a, p.112-113, pl.15, fig.14; text-fig.13.
Early Oxfordian.

"*indotata*" (Drugg, 1978). NOW *Energlynia*.

**spectabilis* (Deflandre and Cookson, 1955, p.293, pl.3, fig.12-14)
Cookson and Eisenack, 1958, p.57. Oxfordian; formerly
Epicephalopyxis.

"*zoharensis*" Conway, 1978, p.347, pl.1, fig.6-7,9. Late Bathonian.
Jr syn. of *Energlynia acollaris*; see Fensome, 1981, p.50.

WETZELIELLA Eisenack, 1938, p.187; emend. Williams and Downie, 1966b, p.182; emend. Lentin and Williams, 1976, p.129-130.

subgen. "*Apectodinium*" Costa and Downie, 1976, p.608. Raised to generic rank by Lentin and Williams, 1977b, p.8.

**articulata* Eisenack, 1938, p.186; text-fig.4. Late Eocene-Early Oligocene.

subsp. "*conopia*" (Williams and Downie, 1966b) Lentin and Williams, 1973, p.141. NOW *Kisselovia tenuivirgula* subsp. *conopia*; formerly *Wetzeliella articulata* var. *conopia*.

astra Costa et al., 1978, p.263, text-fig.2. Early Eocene.

"*clathrata*" (Eisenack, 1938). NOW ?*Kisselovia*.

subsp. "*fasciata*" (Rozen, 1965). NOW *Kisselovia fasciata*.

"*coleothrypta*" (Williams and Downie, 1966b). NOW *Kisselovia*.

"*condylos*" (Williams and Downie, 1966b). NOW *Dracodinium*.

"*coronata*" (Vozzhennikova, 1967, p.170-171, pl.89, fig.1-3,5; pl.90, fig.1-5) Lentin and Williams, 1976, p.131. Late Eocene; formerly *Rhombodinium*. Costa and Downie, 1979, p.43 considered this species to be a *jr syn.* of *Wetzeliella articulata* Eisenack.

crispa Agelopoulos, 1967, p.21-22, pl.3, fig.8; pl.4, fig.5a-b. Late Eocene.

"*draco*" (Alberti, 1961). As *Wetzeliella (Rhombodinium)*. NOW and formerly *Rhombodinium*.

"*echinosuturata*" (Wilson, 1967c). NOW *Wilsonidium*.

"*echinulata*" Vozzhennikova, 1967, p.164-165. Figured in Vozzhennikova, 1960, pl.3, fig.3; description not published until 1967. Eocene. Costa and Downie, 1979, p.40 considered this species to be a *jr syn.* of *Wetzeliella articulata* Eisenack.

"*edwardsii*" (Wilson, 1967c). NOW *Kisselovia*.

eocaenica Agelopoulos, 1967, p.16-17, pl.2, fig.6-7; pl.3, fig.1-7. Early-Late Eocene. The contention by Stover and Evitt, 1978, p.132 that this species is invalidly published is herein rejected.

"*glabra*" (Cookson, 1956). NOW *Rhombodinium*.

subsp. *granulata* (Wilson, 1967c). NOW *Dracodinium granulatum*.

WETZELIELLA (cont'd)

gochti Costa and Downie, 1976, p.609-610, pl.92, fig.2-3.
Middle Oligocene. O.C.

hampdenensis Wilson, 1967c, p.480-481, fig.17,19. Middle Eocene.
We herein reject the contention of Costa and Downie, 1979, p.40
that this species is a *jr syn.* of *Wetzeliella articulata*
Eisenack.

"*homomorpha*" (Deflandre and Cookson, 1955). NOW *Apectodinium*.

subsp. "*quinquelata*" (Williams and Downie, 1966b) Lentin and
Williams, 1973, p.141. NOW *Apectodinium quinquelatum*; for-
merly *Wetzeliella homomorpha* var. *quinquelata*.

"*horrida*" Jan du Chêne and Châteauneuf, 1975, p.28,30, pl.1, fig.
1-7; pl.3, fig.1-6. Early Eocene (Cuisian). *Jr syn.* of
Wetzeliella articulata; see Stover and Evitt, 1978, p.131.

"*hyperacantha*" (Cookson and Eisenack, 1965b). NOW *Apectodinium*.

"*intermedia*" (Cookson and Eisenack, 1961b). NOW *Wilsonidium*.

"*irregularis*" (Cookson and Eisenack, 1958). NOW ?*Scriniodium*.
We do not agree with Costa and Downie, 1979, p.43 that this
species is synonymous with *Wetzeliella meckelfeldensis*.

irtyschensis Alberti, 1961, p.8, pl.1, fig.11-12; pl.12, fig.8.
Early Oligocene.

"*lineidentata*" (Deflandre and Cookson, 1955). NOW *Wilsonidium*.

longispinosa (Wilson, 1968, p.59-60, fig.1-10) Lentin and Williams,
1976, p.132. Early Eocene; formerly *Deflandrea*.

lunaris Gocht, 1969, p.13-15, pl.10, fig.1-3; text-fig.6.
Early Eocene.

meckelfeldensis Gocht, 1969, p.15-16, pl.10, fig.12-15. Early
Eocene.

subsp. *lobisca* (Williams and Downie, 1966b, p.196, pl.20,
fig.3) Costa and Downie, 1979, p.43. Early Eocene; formerly
Wetzeliella symmetrica subsp. *lobisca* and *Wetzeliella symmet-*
rica var. *lobisca*.

"*minuscula*" (Alberti, 1961, as *Wetzeliella* (?*Rhombodinium*) *minus-*
cula). NOW *Palaeotetradinium*.

"?*neocomica*" (Gocht, 1957). NOW *Phoberocysta*.

"*ornata*" (Wilson, 1967c). NOW *Wilsonidium*. The transfer of this
species to *Rhombodinium* by Stover and Evitt, 1978, p.121 is
herein rejected.

WETZELIELLA (cont'd)

ovalis Eisenack, 1954, p.59, pl.8, fig.17. Early Oligocene.

"*pachyderma*" (Caro, 1973). NOW *Dracodinium*.

"*paniculata*" (Costa and Downie, 1976). NOW *Apectodinium*.

"*parva*" (Alberti, 1961). NOW *Apectodinium*.

"*pentagona*" (Vozzhennikova, 1967) Lentin and Williams, 1976, p.132. NOW and formerly *Rhombodinium*. In view of the nature of the archeopyle and ornamentation, we do not agree with Costa and Downie, 1979, p.40 that this taxon is a *jr syn.* of *Wetzeliella articulata* Eisenack.

"*perforata*" (Jan du Chêne and Châteauneuf, 1975). NOW *Rhombodinium*.

"*?pilata*" (Stanley, 1965). NOW *?Spinidinium*.

"*reticulata*" (Williams and Downie, 1966b). NOW *Kisselovia*.

"*rhomboidea*" (Alberti, 1961, as *Wetzeliella (Rhombodinium) rhomboidea*). NOW *Dracodinium*.

"*rugosa*" (Stanley, 1965). NOW *?Wilsonidium*. The retention of this species in *?Wetzeliella* by Stover and Evitt, 1978, p.132 is herein rejected.

"*samlandica*" (Eisenack, 1954). NOW *Dracodinium*.

"*similis*" (Eisenack, 1954). NOW *Dracodinium*.

"*solida*" (Gocht, 1955) Williams and Downie, 1966b, p.195. NOW and formerly *Dracodinium*.

symmetrica Weiler, 1956, p.132-135, pl.11, fig.1-3; text-fig.2-5. Middle Oligocene.

subsp. *incisa* Gerlach, 1961, p.156-158, pl.25, fig.9. Middle-Late Oligocene.

subsp. "*lobisca*" (Williams and Downie, 1966b) Lentin and Williams, 1973, p.143. NOW *Wetzeliella meckelfeldensis* subsp. *lobisca*; formerly *Wetzeliella symmetrica* var. *lobisca*.

subsp. *symmetrica* Weiler, 1956, p.132-135, pl.11, fig.1-3; text-fig.2-5. Middle Oligocene.

"*tabulata*" (Wilson, 1967c). NOW *Wilsonidium*.

WETZELIELLA (cont'd)

"*tenuivirgula*" (Williams and Downie, 1966b). NOW *Kisselovia*.

subsp. "*crassiramosa*" (Williams and Downie, 1966b) Lentin and Williams, 1973, p.143. NOW *Kisselovia crassiramosa*; formerly *Wetzeliella tenuivirgula* var. *crassiramosa*.

unicaudalis Caro, 1973, p.366,368, pl.5, fig.1,9. Early Eocene.

"*varielongituda*" (Williams and Downie, 1966b). NOW *Dracodinium*.

"*waipawaensis*" (Wilson, 1967c, as *Wetzeliella (Rhombodinium) waipawaensis*). NOW *Dracodinium*.

wetzeli Agelopoulos, 1967, p.17-18, pl.2, fig.4-5b. Late Eocene. O.C. The contention by Stover and Evitt, 1978, p.132 that this species is invalidly published is herein rejected.

WETZELODINIUM Deflandre, 1936b, p.168.

**tentaculatum* (O. Wetzell, 1933a, p.171, pl.2, fig.23; text-fig.4) Deflandre, 1936b, p.168-169. ?Senonian; formerly *Polykrikos*.

WILSONIDIUM Lentin and Williams, 1976, p.138-139.

?*aechmophorum* (Benedek, 1972, p.41, pl.5, fig.7,11; text-fig.17) Lentin and Williams, 1976, p.139. Middle-Late Oligocene; formerly *Lejeunia*. The archeopyle in this species may be hexa 2a intercalary. The retention of this species in "*Lejeunia*" by Stover and Evitt, 1978, p.112 is herein rejected.

echinosuturatum (Wilson, 1967c, p.477-479, fig.3,22-25) Lentin and Williams, 1976, p.139. Middle Eocene; formerly *Wetzeliella*.

intermedium (Cookson and Eisenack, 1961b, p.40, pl.1, fig.5-6) Costa and Downie, 1979, p.45. Eocene; formerly *Wetzeliella* and *Rhombodinium*.

lineidentatum (Deflandre and Cookson, 1955, p.253-254, pl.5, fig.5; text-fig.17-18) Lentin and Williams, 1976, p.139. Eocene; formerly *Wetzeliella*.

ornatum (Wilson, 1967c, p.481-482, fig.33-34) Lentin and Williams, 1976, p.139. Early Eocene; formerly *Wetzeliella*. The transfer of this species to *Rhombodinium* by Stover and Evitt, 1978, p.121 is herein rejected.

?*rugosum* (Stanley, 1965, p.222-223, pl.21, fig.6-11) Lentin and Williams, 1976, p.140. Paleocene; formerly *Wetzeliella*. The retention of this species in ?*Wetzeliella* by Stover and Evitt, 1978, p.132 is herein rejected. The transfer of this species to *Spinidinium* by Costa and Downie, 1979, p.45 is also rejected.

**tabulatum* (Wilson, 1967c, p.473-474, fig.2,4-7,10-11) Lentin and Williams, 1976, p.140. Late Eocene; formerly *Wetzeliella*.

XZ

XANDARODINIUM Reid, 1977, p.446-447.

**xanthum* Reid, 1977, p.447-448, pl.3, fig.27-29. Recent.

XENASCUS Cookson and Eisenack, 1969, p.7. Davey and Verdier, 1971, p.27 listed the type of this genus *X. australensis* as a *jr syn.* of *Phoberocysta ceratioides* (Deflandre, 1937b) Davey and Verdier, 1971, p.26. Lentin and Williams, 1973, p.143 concurred with this interpretation. However, they retained *Xenascus* (type species: *X. ceratioides* = *sr syn.* of *X. australensis*, = *Phoberocysta ceratioides*, = *Hystriichosphaera ceratioides*) as a genus separate from *Phoberocysta* (type species: *P. neocomica*, = *Wetzeliella neocomica*) on the grounds that they are morphologically distinct. *Xenascus* is characterized by a single lateral (postcingular) horn, whereas *Phoberocysta* is characterized by two similar lateral (postcingular) horns.

"*australensis*" Cookson and Eisenack, 1969, p.7, fig.1, I-K. Davey and Verdier, 1971, p.26 considered this species to be a *jr syn.* of *Xenascus ceratioides* (Deflandre) Lentin and Williams. O.C.

**ceratioides* (Deflandre, 1937b, p.66-67, pl.12, fig.7-8) Lentin and Williams, 1973, p.144. Senonian; formerly *Hystriichosphaera*, *Phoberocysta* and *Pseudoceratium*.

gochti (Corradini, 1973, p.179-181, pl.29, fig.1a-b, 3; text-fig.9) Stover and Evitt, 1978, p.88. Senonian; formerly *Phoberocysta*.

plotei Below, 1981, p.21-22, pl.2, fig.8-9; pl.8, fig.20-21; pl.14, fig.15; text-fig.10. Aptian-Cenomanian.

sarjeantii (Corradini, 1973, p.181, pl.29, fig.2a-b, 4a-b; pl.37, fig.3) Stover and Evitt, 1978, p.88. Senonian; formerly *Phoberocysta*.

serpaglii (Corradini, 1973, p.181-182, pl.29, fig.5, 7a-b; pl.37, fig.4) Stover and Evitt, 1978, p.88. Senonian; formerly *Phoberocysta*.

XENICODINIUM Klement, 1960, p.53-54.

**densispinosum* Klement, 1960, p.54, pl.5, fig.14-15. Early Kimmeridgian.

"*hispidum*" (Drugg, 1970a). NOW *Sumatradinium*.

lubricum Morgenroth, 1968, p.554, pl.47, fig.9; pl.48, fig.1. Danian.

XENICODINIUM (cont'd)

reticulatum Hansen, 1977, p.12, fig.20D-G. Early Paleocene (Danian).

rugulatum Hansen, 1977, p.12-13, fig.20H-J. Early Paleocene (Danian).

XENIKOON Cookson and Eisenack, 1960a, p.14-16.

"*americanus*" (Habib, 1970). NOW *Craspedodinium*.

**australis* Cookson and Eisenack, 1960a, p.16, pl.3, fig.16-17. Turonian-Campanian.

XIPHOPHORIDIUM Sarjeant, 1966b, p.146-147. We reject the contention of Below, 1981, p.64 that this genus is a *jr syn.* of "*Oodnadattia*" Eisenack and Cookson.

**alatum* (Cookson and Eisenack, 1962b, p.487, pl.2, fig.1-4). Sarjeant, 1966b, p.147-148. Albian-Cenomanian; formerly *Hystriochodinium*. We herein reject the transfer of this species to the genus *Oodnadattia* Eisenack and Cookson by Below, 1981, p.107.

XYLOCHOARION Erkmen and Sarjeant, 1978, p.401,403-404.

**hacknessense* Erkmen and Sarjeant, 1978, p.404,406-407, text-fig. 1-11. Callovian.

APPENDIX

Included in the following list of non dinoflagellate genera (primarily acritarchs) are species which subsequently have been referred to the dinoflagellates.

BALTISPHAERIDIUM Eisenack, 1958, p.398.

"*armatum*" (Deflandre, 1937b) Downie and Sarjeant, 1965, p.87. NOW *Cleistosphaeridium*; formerly *Hystrichosphaeridium*.

"*ashdodense*" (Rossignol, 1962) Downie and Sarjeant, 1965, p.87; formerly *Hystrichosphaeridium*. Jr syn. of *Lingulodinium machaerophorum*.

"*bifidum*" (Clarke and Verdier, 1967). NOW *Exochosphaeridium*.

"*biformoides*" (Eisenack, 1954). NOW *Achilleodinium*.

"*bulbosum*" (Ehrenberg, 1838). NOW *Hystrichokolpoma*.

"*centrocarpum*" (Deflandre and Cookson, 1955) Gerlach, 1961, p.192-193. NOW *Operculodinium*; formerly *Hystrichosphaeridium*.

"*clavigerum*" (Deflandre, 1937b). NOW *Florentinia*.

"*colligerum*" (Deflandre and Cookson, 1955) Downie and Sarjeant, 1965, p.88. NOW *Diphyes*; formerly *Hystrichosphaeridium*.

"*danicum*" (W. Wetzel, 1952) Downie and Sarjeant, 1965, p.89. NOW *Cleistosphaeridium*; formerly *Areoligera*.

"*densicomatum*" (Maier, 1959) Gerlach, 1961, p.193. NOW *Impletosphaeridium*; formerly *Galea*.

"*divergens*" (Eisenack, 1954). NOW *Operculodinium*.

"*downiei*" (Sarjeant, 1960a). NOW *Acanthaulax*.

"*echinoides*" (Maier, 1959) Downie and Sarjeant, 1965, p.90. NOW *Cleistosphaeridium*; formerly *Hystrichosphaeridium*.

"*ehrenbergii*" (Deflandre, 1947c) Sarjeant, 1961a, p.103. NOW *Cleistosphaeridium*; formerly *Hystrichosphaeridium*.

"*ferox*" (Deflandre, 1937b) Downie and Sarjeant, 1965, p.90. NOW *Florentinia*; formerly *Hystrichosphaeridium*.

"*granulosum*" (Deflandre, 1937b) Sarjeant, 1962b, p.264. NOW *Prolixosphaeridium*; formerly *Hystrichosphaeridium xanthiopyxides* var. *granulosum*.

BALTISPHAERIDIUM (cont'd)

- "*heteracanthum*" (Deflandre and Cookson, 1955) Downie and Sarjeant, 1965, p.91. NOW *Heterosphaeridium*; formerly *Hystrichosphaeridium*.
- "*hirsutum*" (Ehrenberg, 1838). NOW *Operculodinium*.
- "*hugoniotii*" (Valensi, 1955a) Downie and Sarjeant, 1965, p.91. NOW *Cleistosphaeridium*; formerly *Hystrichosphaeridium*.
- "*israelianum*" (Rossignol, 1962) Downie and Sarjeant, 1965, p.91. NOW *Operculodinium*; formerly *Hystrichosphaeridium*.
- "*leve*" (Maier, 1959) Sarjeant, 1964b, p.176. NOW *Cleistosphaeridium*; formerly *Galea*.
- "*linifera*" (Cookson and Eisenack, 1967b). NOW *Achomosphaera*.
- "*lobospinosum*" (Gocht in Weiler, 1956). NOW *Chiropteridium*.
- "*longifurcatum*" (Firtion, 1952) Downie and Sarjeant, 1965, p.92. NOW *Surculosphaeridium*; formerly *Hystrichosphaeridium*.
- "*lumectum*" (Sarjeant, 1960a). NOW *Cleistosphaeridium*.
- "*machaerophorum*" (Deflandre and Cookson, 1955) Gerlach, 1961, p.191. NOW *Lingulodinium*; formerly *Hystrichosphaeridium*.
- "*mariannae*" (Philippot, 1949) Downie and Sarjeant, 1965, p.92. NOW *Achomosphaera*; formerly *Hystrichosphaeridium*.
- "*mixtispinosum*" (Klement, 1960). NOW *Prolixosphaeridium*.
- "*multifurcatum*" (Deflandre, 1937b) Klement, 1960, p.59. NOW ?*Cleistosphaeridium*; formerly *Hystrichosphaeridium*.
- "*multispinosum*" (Singh, 1964). NOW ?*Cleistosphaeridium*.
- "*neptuni*" (Eisenack, 1958). NOW *Achomosphaera*.
- "*oligacanthum*" (W. Wetzel, 1952) Downie and Sarjeant, 1965, p.93. NOW ?*Cleistosphaeridium*; formerly *Hystrichosphaeridium*.
- "*palmatum*" (Deflandre and Courteville, 1939) Downie and Sarjeant, 1965, p.94. NOW *Exochosphaeridium*; formerly *Hystrichosphaeridium*.
- "*panniforme*" (Gerlach, 1961). NOW *Cleistosphaeridium*.
- "*parvispinum*" (Deflandre, 1937b) Downie and Sarjeant, 1965, p.94. NOW *Prolixosphaeridium*; formerly *Hystrichosphaeridium*.
- "*pattei*" (Valensi, 1948) Downie and Sarjeant, 1965, p.94. NOW *Lanterna*; formerly *Hystrichosphaeridium*.

BALTISPHAERIDIUM (cont'd)

- "pectiniforme" (Gerlach, 1961). NOW ?*Areosphaeridium*; also formerly *Cleistosphaeridium*.
- "pilosum" (Ehrenberg, 1843) Sarjeant, 1961a, p.101. NOW *Sentusidinium*; formerly *Xanthidium*, *Ovum hispidum* and *Hystrichosphaeridium*.
- "placacanthum" (Deflandre and Cookson, 1955) Downie and Sarjeant, 1965, p.94. NOW *Systematophora*; formerly *Hystrichosphaeridium*.
- "polyozon" (Brosius, 1963). NOW ?*Cleistosphaeridium*.
- "polytrichum" (Valensi, 1947) Downie and Sarjeant, 1965, p.95. NOW *Cleistosphaeridium*; formerly *Hystrichosphaeridium*.
- "pseudhystriochodinium" (Deflandre, 1937b) Downie and Sarjeant, 1965, p.95. NOW ?*Exochosphaeridium*; formerly *Hystrichosphaeridium*.
- "ramuliferum" (Deflandre, 1937b). NOW *Achomosphaera*.
- "reginaldii" (Mantell, 1844) Downie and Sarjeant, 1965, p.95. NOW *Spiniferites*; formerly *Xanthidium*.
- "septatum" (Cookson and Eisenack, 1967b). NOW *Hafniasphaera*.
- "severinii" (Cookson and Cranwell, 1967). NOW *Impletosphaeridium*.
- "spinosum" (White, 1842) Downie and Sarjeant, 1965, p.96. NOW ?*Exochosphaeridium*; formerly *Xanthidium* and *Hystrichosphaeridium*.
- "spiralisetum" (de Wit, 1943) Downie and Sarjeant, 1965, p.97. NOW *Cleistosphaeridium*; formerly *Hystrichosphaeridium*.
- "striatoconus" (Deflandre and Cookson, 1955) Downie and Sarjeant, 1965, p.97. NOW *Conosphaeridium*; formerly *Hystrichosphaeridium*.
- "striolatum" (Deflandre, 1937b) Downie and Sarjeant, 1965, p.97. NOW *Coronifera*; formerly *Hystrichosphaeridium*.
- "tiara" (Klump, 1953) Downie and Sarjeant, 1965, p.97. NOW *Operculodinium*; formerly *Hystrichosphaeridium*.
- "triangulatum" (Gerlach, 1961). NOW *Achomosphaera*.
- "tribuliferum" (Sarjeant, 1962a). NOW ?*Cleistosphaeridium*.
- "tridactylites" (Valensi, 1955a) Downie and Sarjeant, 1965, p.97. NOW *Florentinia*; formerly *Hystrichosphaeridium*.
- "tripodes" (Morzadec-Kerfourn, 1966). NOW *Spiniferites*.

BALTISPHAERIDIUM (cont'd)

"*twistringense*" (Maier, 1959) Sarjeant, 1964b, p.176. NOW *Areoligera*;
formerly *Galea*.

"*varispinosum*" (Sarjeant, 1959). NOW ?*Sentusidinium*.

"*vestitum*" (Deflandre, 1938b) Sarjeant, 1960b, p.397. NOW *Surculo-*
sphaeridium; formerly *Hystrichosphaeridium*.

"*whitei*" (Deflandre and Courteville, 1939) Downie and Sarjeant, 1965,
p.98. NOW ?*Cometodinium*; formerly *Hystrichosphaeridium*.

"*xanthiopyxides*" (O. Wetzel, 1933b) Downie and Sarjeant, 1965, p.98.
NOW *Tanyosphaeridium*; formerly *Hystrichosphaeridium*.

CYMATIOSPHAERA O. Wetzel, 1933b, p.27; emend. Deflandre, 1954, p.257.

"*cingulata*" (O. Wetzel, 1933b). NOW *Pterodinium*.

"*pterota*" (Cookson and Eisenack, 1958). NOW *Spiniferites*.

"*striata*" (Cookson and Eisenack, 1960a). NOW *Heslertonia*.

"*teichophera*" (Sarjeant, 1961a). NOW *Heslertonia*.

DOMASIA Downie, 1960, p.199.

"*discophora*" (Cookson and Eisenack, 1962b). NOW *Domasiella*.

GALEA Maier, 1959, p.305, *jr* homonym of *Galea* Meuschen, 1787.

"*densicomata*" (Maier, 1959). NOW *Impletosphaeridium*.

"*galea*" (Maier, 1959). NOW *Areoligera*.

"*koryka*" (Maier, 1959). NOW ?*Chiropteridium*.

"*levis*" (Maier, 1959). NOW *Cleistosphaeridium*.

"*lychnea*" (Maier, 1959). NOW *Areoligera*.

"*mespilana*" (Maier, 1959). NOW *Chiropteridium*.

"*twistringensis*" (Maier, 1959). NOW *Areoligera*.

"*xiphea*" (Maier, 1959). NOW *Hystrichokolpoma*.

GEODIA Lamarck, 1815.

This is a genus of sponge spicules to which Merrill, 1895 referred
the following dinoflagellate species.

"*austini*" (Merrill, 1895). NOW ?*Systematophora*.

GEODIA (cont'd)

"hillii" (Merrill, 1895). NOW *Hystrichosphaeridium*.

"irregularis" (Merrill, 1895). NOW *Hystrichosphaeridium*.

"spini-pansata" (Merrill, 1895). NOW *Hystrichosphaeridium*.

"tripunctata" (Merrill, 1895). *Jr syn.* of *Hystrichosphaera furcata*; see Sarjeant, 1964b, p.175, and therefore now considered to be a *jr syn.* of *Spiniferites ramosus*. See comments under *Hystrichosphaera* and *Spiniferites*.

LEIOFUSA Eisenack 1938a, p.28.

"lidiae" (Gorka, 1963). NOW *Palaeocystodinium*.

LEIOSPHAERIDIA Eisenack, 1958, p.2; emend. Downie and Sarjeant, 1963, p.94.

"scrobiculata" (Deflandre and Cookson, 1955). NOW ?*Pyxidiella*.

"trematophora" (Cookson and Eisenack, 1967a). NOW *Cyclopsiella*.

MICRHYSTRIDIUM Deflandre, 1937b, p.79; emend. Lister, 1970, p.77.

"fucosum" (Valensi, 1955a). NOW ?*Dapsilidinium*.

"paulinae" (Valensi, 1953). NOW ?*Dapsilidinium*.

"veligerum" (Deflandre, 1937b). NOW *Microdinium*.

PTEROSPERMOPSIS W. Wetzel, 1952, p.411.

"pelagica" (Eisenack, 1954). NOW *Thalassiphora*.

"vancampoae" (Rossignol, 1962). NOW *Tuberculodinium*.

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