

REPORT - TERMINOLOGY WORKING GROUP MEETING, LONDON APRIL 1992

Jeremy R. Young, Palaeontology, The Natural History Museum London

As announced in the last Newsletter (13/3, p.90) the Terminology Workshop in Prague was considered a success and the meeting voted to establish a working group to revise the discussion document into a publishable set of Guidelines on Coccolith Terminology. So in April this year we had a working group meeting at the Natural History Museum to continue the work begun in Prague.

This meeting was attended by a range of experienced nanno workers covering the stratigraphic spectrum from Jurassic to Recent, complemented by post-grad students from University College London to give the opinion of less entrenched workers. The attendees were, in stratigraphic sequence;

Living: Berit Heimdal, Ric Jordan, Annelies Kleijne.

Cenozoic: Liam Gallagher, Ton Romein, Katharina von Salis, Steve Spencer, Jeremy Young.

Mesozoic: Paul Bown, Jackie Burnett, Andrea Fiorentino, Martin Jakubowski, Brigitta van Niel, Dave Rutledge, Dawn Windley.

In addition apologies for absence and written suggestions were received from Marie-Pierre Aubry and Jim Bergen.

The workshop lasted for two and a half days about equally divided between plenary sessions discussing general aspects and sub-groups considering the application of terminology to individual families.

Inevitably given the number of people the workshop produced some splendid arguments - not least between the living and fossil workers. However, amicable relationships were maintained and sensible compromises worked out. I now need to produce a revised version of the terminology document. This will be circulated to all members of the working group, any other INA members who have strong feelings on the subject are welcome to write to me and I will include them on the mailing. Eventual publication will probably be in the journal *Palaeontology*.

INFORMAL NOTES ON SOME OF THE MORE CONTROVERSIAL TOPICS

Whilst most of the document is a synthesis of existing opinions in places we had to be a bit more creative and since these are likely to be the most controversial parts they are summarised here. Any comments would be very welcome.

N.B. The disjunct/conjunct division is essentially a concept of mine that I talked the others into accepting. The other topics discussed here were all the subject of free ranging debate and the opinions are the product of this.

RIM / CENTRAL AREA

In >90% of coccoliths there is an outer part which is somewhat higher than the inner part of the coccolith. This provides a convenient basis for starting any description of the shape and structure of coccoliths. After significant debate we decided that the terms rim and central area were most appropriate for these two parts.

PLACOLITH / MUROLITH / PLANOLITH

The term placolith is generally agreed to be useful since it describes a common morphotype which has evolved repeatedly, presumably because the interlocking pattern of coccolith arrangement is a good way of making coccospheres. After much debate we decided that two other morphotypes were of similar importance: bowl-shaped coccoliths (which do not overlap or interlock on the coccosphere) - e.g. *Zygodiscus*, *Pontosphaera*; and disc-shaped coccoliths (which overlap but do not interlock) - e.g. *Rhabdosphaera*, *Discoaster*. For these there unfortunately were no adequate and unambiguous terms so we coined two new ones murolith (from Latin *Murus*, a wall) and planolith (from Latin *Planus*, level).

The other -lith words caused much debate but it was agreed that most of them were no longer truly descriptive terms but rather taxo-descriptive terms, i.e. informal taxonomic names for coccoliths produced by particular taxa. As such they do not need independent definitions - examples include helicolith, sphenolith, scapholith and caneolith. The document will include clarification of the meaning of all such terms.

COCCOLITH AND NANNOLITH

We recommend that the term nannolith is used in the sense defined by Perch-Nielsen (1985) Bown (1987), and Aubry (1989). I.e. For calcareous nannofossils of uncertain affinity to coccoliths - e.g. discoasters, sphenoliths, *Micula*, *Ceratolithoides*. By extension it can be applied to a few living taxa where the calcareous structures are not definitely homologous with heterococcoliths or holococcoliths e.g. *Braarudosphaera* (pentaliths), *Florisphaera* (plates), *Ceratolithus* (ceratoliths, not the hoop-shaped coccoliths). The nannolith / coccolith division is convenient for describing assemblages but probably does not reflect any real taxonomic division, and with further research it is quite probable that many nannoliths as currently recognised may be proven to be true coccoliths.

The term nannolith has also sometimes been used as the equivalent to nannofossil but including living specimens (e.g. Haq 1978, Flores 1989). We felt that nannofossil could almost always be used in this sense and that nannolith was better reserved for the non-coccolith nannofossils.

DISJUNCT AND CONJUNCT CENTRAL AREA STRUCTURES

We recommend that the terms conjunct and disjunct be used to describe whether or not central area structures are formed from the rim and so appear in cross-polarised light to be in optical continuity with it. Examples of taxa with conjunct central area structures include *Kamptnerius* (plate), *Watznaueria biporta* (bar), *Gephyrocapsa* (bridge) and *Toweius* (bars). Examples of taxa with disjunct central area structures include *Arkhangelskiella* (plate), *Watznaueria britannica* (bar), *Coccolithus* (bar) and *Chiasmolithus* (cross).

The best known examples of conjunct and disjunct structures are the bars in the central area of *Helicosphaera* species. These may be either disjunct or conjunct. To explain our choice of terms it is useful to review past usage, as summarised in the table below.

AUTHOR	Term for conjunct bar	Term for disjunct bar
Bramlette & Wilcoxon (1967)	Bar in optical continuity	Bar not in optical continuity
Haq (1971, 1973)	Bridge in optical continuity	Bridge not in optical continuity
Perch-Nielsen (1985)	Continuous bridge	Distinct bridge
Theodoridis (1984)	Bar	Bridge
Aubry (1988, 1990)	Bridge	Bar
Our recommendation	Conjunct bar	Disjunct bar
Examples	<i>H. carteri</i>	<i>H. intermedia</i>

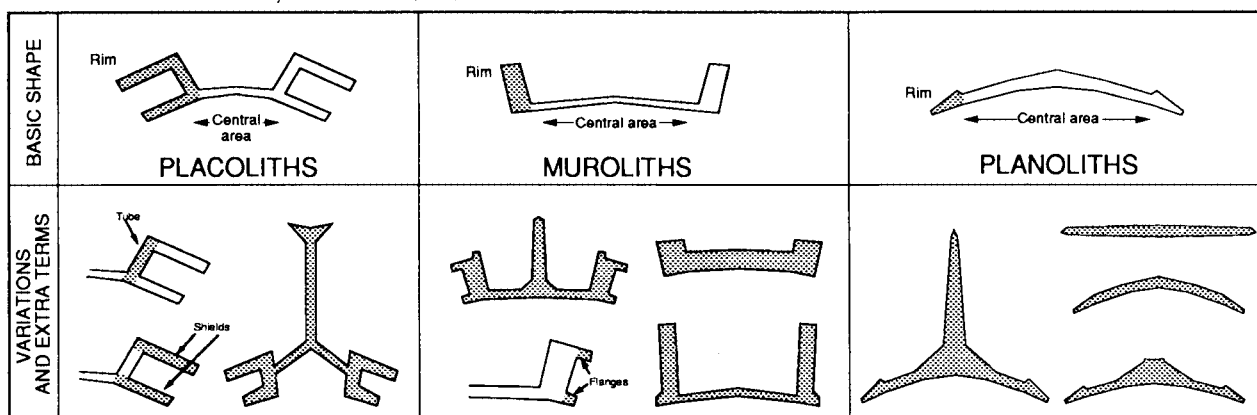
The phrases "in optical continuity" and "not in optical continuity" are viable but unwieldy. Also they place undue emphasis on the optical properties which are in fact a consequence of the structures being respectively formed from the rim crystal units or from separate crystal units confined to the central area. The bar/bridge divisions of Aubry and Theodoridis avoid these problems but introduce the new one that the special meaning ascribed to the terms bar and bridge has no logical relation to their normal meaning. This is highlighted by the fact that Aubry and Theodoridis used the terms with opposite senses. Also we prefer to use the terms bar and bridge to describe structures that are respectively flat (as in *Helicosphaera*) or arched (as in *Gephyrocapsa*).

Perch-Nielsen's continuous/distinct division is perhaps better but these two terms are not logical opposites and neither is very satisfactory since all *Helicosphaera* bars are arguably both continuous and distinct.

The recommended terms conjunct and disjunct are short, easily learned (we hope), and do not have distracting connotations.

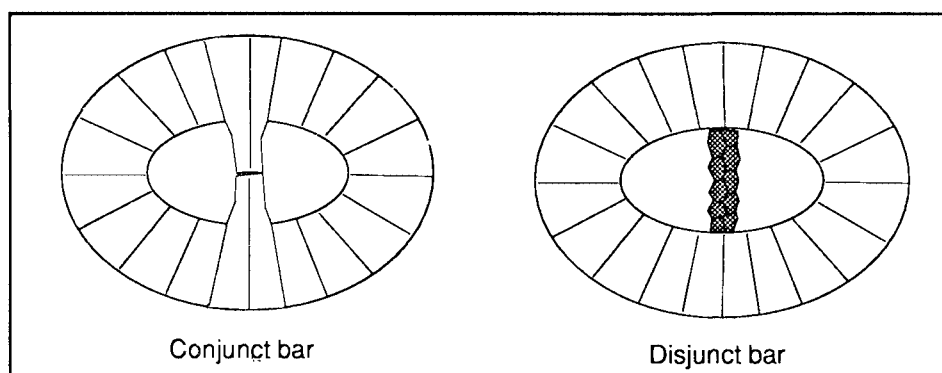
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Placoliths, muroliths, and planoliths.

Three basic types of coccoliths based on shape in cross-section. Intermediates between these types occur and also coccoliths not assignable to any of these types. Our objective is solely to give names to commonly recurring morphotypes, not to create a para-classification.



Conjunct and disjunct central area bars.

Conjunct central area structures are defined as those formed from the rim elements. Disjunct central area structures are formed from elements separate from the rim.