

rocks. The latter include several Lithothamnion species, *Mesophyllum* sp. and scarce examples attributable to mastophoroids.

Elianella elegans and, in lesser amounts, *Parachaetetes asvapatii* are major components of the reef boundstones. The peyssonneliacean *Polystrata alba* is also very frequent in the intermound deposits.

ARP G., REIMER A., and REITNER J.

Photosynthesis-induced biofilm calcification and Calcium concentrations in Phanerozoic oceans

Photosynthetic carbon assimilation is commonly invoked to cause CaCO_3 precipitation in cyanobacterial biofilms that results in the formation of calcareous stromatolites, which were common in the marine realm from the Archean to the Cretaceous. However, biofilm calcification patterns in recent lakes, and simulation of photosynthetically-induced rise in CaCO_3 supersaturation, demonstrate that this mechanism does only apply in settings low in dissolved inorganic carbon and high in Ca^{2+} . By combining simulation results with paleo- pCO_2 curves, we show that Phanerozoic oceans sustaining calcified cyanobacteria must have had considerably higher Ca^{2+} concentrations than today. Predicted occurrences of marine calcified cyanobacteria correspond to their observed abundances during the Phanerozoic, with the major exception of the Cretaceous that reflects a significant drawdown in Ca^{2+} caused by calcareous plankton. The enigmatic lack of calcified cyanobacteria in stromatolite-bearing Precambrian sequences can now be explained as a result of high dissolved inorganic carbon concentrations.

AUBRECHT R.

Bathonian to Oxfordian stromatactis mud-mounds in Slovakia and their origin

Three occurrences of stromatactis mud-mounds have been found in the Czorsztyn unit, of the Pieniny Klippen Belt (Western Carpathians, Slovakia): Slavnické Podhorie, Štepnická skala and Babiná. Their stratigraphic range is from Bathonian to Oxfordian, i.e. they belong to the latest known true stromatactis mud-mounds. Geometry of the mounds is not always visible as the klippen are tectonic blocks enveloped by younger Cretaceous marls. At Štepnická skala site only, a flat mound shape of the stromatactis beds is visible. The wall rocks are invariably micritic to pelmicritic mudstones, wackestones to packstones with fauna of pelecypods, brachiopods, ammonites, crinoids etc. All the mentioned occurrences contain networks of stromatactis cavities. At Slavnické Podhorie they occur as low as in the underlying Bajocian-Bathonian crinoidal limestones which testifies their biological origin. Any of so far presented inorganic models of stromatactis origin is hardly applicable to the wall rock sediment formed by crinoidal skeletal detritus. The only difference between this site and other occurrences of the Bajocian to Bathonian crinoidal limestones in the Pieniny Klippen Belt is peloidal interparticle matrix probably of microbial origin. This site was then pre-disposed to be a site of mud-mound growth still before the turning from skeletal to mudstone deposition. The stromatactis cavities are invariably filled by radial fibrous calcite (RFC) and then sometimes by internal sediment and, finally, by clear blocky calcite. Some fillings were even incomplete, with empty void in the centres. In two instances, at Babiná and Slavnické Podhorie localities, tests of ostracods *Pokornyopsis* sp. were found, surrounded by the latest stages of the RFC. The mentioned ostracods were cave-dwellers (AUBRECHT and KOZUR, 1995) which indicate that stromatactis cavities for a certain period of time formed an open-space network through which

these ostracods and their larvae could migrate. Except stromatactis cavities, at all the examined sites there are numerous examples of seeming recrystallization as was discussed by BLACK, 1952 and ROSS *et alii*, 1975 versus BATHURST (1977). The radiaxial fibrous calcite enclose patches of matrix and isolated allochems. The RFC crystals are invariably oriented perpendicular to the substrate whether it is a cavity wall or an enclosed allochem. Therefore, they could not grow from the centre of the cavity outward, for later they would not be able to re-orient themselves perpendicular to the allochems they meet on their way. This observation was introduced already by BATHURST (1977). However, he did not provide a satisfactory explanation of this phenomenon. His answer, that the "floating" allochems are in fact interconnected in three dimensions which is not visible in a single thin-section, seem to be very unlikely in the samples we have studied. There were numerous cases when the "floating" allochem was much smaller than the RFC crystals that surrounded it and the average distances between the allochems too. In the portions of rocks where the sparry calcite prevailed, the same picture was observed in both directions of perpendicular-made thin-sections. There was a very little possibility of any allochems to be supported by being attached to other allochems. Moreover, such construction would be so friable that any water-current would destroy it. In such a case, numerous allochems would be fallen on the bottoms of the cavities forming an internal sediment which is quite rarely observed. Therefore, examining the Slavnické Podhorie and Babiná mud-mounds one meets a conflict between apparently empty cavities that had to exist in the rock (internal sediment, cave-dwelling ostracods *Pokornyopsis* sp. etc.) and seeming "recrystallization" evidently related to the same RFC which also forms the initial void filling. There are, however, some alternative explanations of the "recrystallization". The RFC crystals did not necessarily have to start their growth in the cavity and growing outward as proposed by BLACK (1952) and ROSS *et alii* (1975). Instead, the allochems might serve as nucleation sites on which the crystals started their growth. But what about the patches of micritic host-rocks enveloped by the RFC? How could the RFC crystals know which portion of the micrite is to be taken as a nucleation site and which one to be recrystallized? Apparently, not only allochems but also the micritic patches had to be different from the matter that surrounded them and supported them. The most likely origin of "recrystallization", which was also adopted by us, was proposed already by ROSS *et alii* (1975) as one of their alternative explanations. They stated that "...the radiaxial fibrous calcite must have replaced some other substance which may have been mineral, or vegetable, or partly both..." and "...some modern blue-green algae have the consistency of tough rubber. Layers of such a rubbery organic material might have supported layers of calcilutite and later been replaced by sparry aragonite..." A good old theory of an unknown soft-bodied organism is then apt to explain not only origin of the stromatactis cavities themselves but also the cases of seeming "recrystallization". By our opinion, the RFC crystals (either short- or long-bladed) of our "recrystallization" spar grew at the expense of decaying microbial mucilages, similar to those described by REITNER *et alii* (1995) from the modern reef sediments of Lizard Island. The mucus might enclose peloids, allochems or whole mudstone patches which, in this sense, really "floated" in the cavity space and served as nucleation sites for RFC. The entire mud-mound represented most probably a microbially bound autochthonous micrite; the stromatactis and stromatactoid cavities originated where clearer mucilage patches occurred, relatively free of inessential elements. Common morphological variability of stromatactis, penetration of the sparry calcite to narrow spaces, enclosing of the "floating" allochems and mudstone matrix patches by sparry calcite are the facts that are in favour of presence of mucus, as disorganized assemblage of various protozoans, as proposed by TSIEN (1985a) or KAUFMANN (1997, p.947-948), rather than of sponges and other well organized metazoan organisms which would by filtering prevent the allochems from entering their growth cavities.

Moreover, sponge spicules and skeletons represent just subordinate elements in the examined mud-mounds. The proposed microbial colonies had to be specialized for living in mud-mounds and thus represent a soft-bodied reef-forming organism. These specialized colonial microbes extincted during Late Jurassic-Cretaceous time as there were no true younger stromatolite fabrics revealed.

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BARATTOLO F.

Fossil algae (mainly Dasycladaleans) at the K/T boundary and Palaeocene

The Upper Cretaceous is to be considered a period of crisis for dasycladaleans. According to stratigraphical evidence the minimal occurrence of dasycladaleans seems restricted to the Cenomanian - Senonian interval. In respect to the Senonian, the Maastrichtian can be considered as a moment of moderate increase for dasyclads. In the Palaeocene we see a full and important flourishing of new genera and species.

Margin and open platform facies

Dasycladaleans possibly flourishing in these environments are *Broeckella belgica* L. Morellet et J. Morellet, *Orioporella malaviae* Pia, *Sandalia multipora* Dieni, Massari et Radoičić, *Oroseina solaris* Dieni, Massari et Radoičić, *Cymopolia edwardsi* L. Morellet et J. Morellet, *Cymopolia frugifera* Segonzac, *Jodotella veslensis* L. Morellet et J. Morellet, *Jodotella sloveniaensis* Deloffre et Radoičić, *Triploporella apenninica* Baretta as well as most bornetellids (*Zittelina*, *Dactylopora*), uteriids (*Uteria*) and thyrso-porellids (*Thyrso-porella*, *Trinocladus*). Thyrso-porellids preferentially occupied open environment (J.P. Beckmann and R.