CORRESPONDENCE

Pseudofossils from the Precambrian, including 'Buschmannia' and 'Praesolenopora'

SIR – The recent note by Debrenne & Lafuste (1979) is a welcome warning that an occurrence of crystal aggregates which have been mistaken for fossils can have unwarranted consequences for stratigraphy. The authors were apparently unaware of wider implications of their observations. When the paper on *Buschmannia* (Kaever & Richter, 1976) appeared, I informed the senior author that his fossils were not Archaeocyatha but that similar objects had been described as red algae (*Praesolenopora*, etc.) from the Late Precambrian of China by Tsao & Liang (1974). Professors Kaever and Oekentorp (University of Münster) kindly lent me the original material of *Buschmannia* and this was later supplemented by further specimens collected by Dr W. Hegenberger (Geological Survey of Southwest Africa) at Farm Grünental 151, Windhoek District, from the Grünental Member, Kuibis Subgroup, Nama Group. Lian & Tsao (1976) discussed additional 'red algae' from the Sinian of China, extending their stratigraphic range downward to the Kunming 'Series'. Tsao & Zhao (1978) described further 'Coralliniaceae' from Sichuan and adjoining areas. In 1978 Dr M. R. Walter and Dr M. J. Muir (Bureau of Mineral Resources, Canberra) brought to my notice a paper (Walker *et al.* 1977) where carbonate pseudomorphs after gypsum and anhydrite were described from the Middle Proterozoic of Australia. Drs Walter and Muir, having studied the literature on '*Buschmannia*' and '*Praesolenopora*', '*Manicosiphonia*', etc., concluded that they were not organic remains but crystal pseudomorphs. In the meantime my attempts to verify the algal morphology of the supposed fossils had failed. Having ascertained the same facts as Walter and Muir (and, as we now know, at the same time independently Debrenne), I informed (August 1978) Professor Kaever and Dr Hegenberger that *Buschmannia* is a pseudofossil. Dr Hegenberger replied that he had originally in the field considered his finds as crystal aggregates. He stressed the significance of the occurrence of evaporite minerals for the interpretation of the conditions of sedimentation of the Buschmannsklippe Formation. From a palaeoecological viewpoint it is interesting that in the Upper and Middle Proterozoic of China (Tengying and Kunyang Groups of the Sinian) they occur in close association with stromatolites, indicating that their environment was locally hypersaline.

The relations of the Buschmannsklippe Formation to the Nama Group are no more 'difficult to establish' (Debrenne & Lafuste, 1979) than other Precambrian correlations but on the contrary seem well established (see Martin, 1965, pp. 29, 106, 114–15, 117, 119–20; Hartnady, 1978, Table 13). The identification of the Nama fossils described by Haughton as Archaeocyatha was shown many years ago (Glaessner, 1963, p. 113) to be based on a misinterpretation and this was confirmed recently (Glaessner, 1978). Neither are the Cribricyatha, which are represented in the Nama Group by *Cloudina* Germs, Archaeocyatha. Hill (1972) listed them under 'Phylum uncertain, probably not Archaeocyatha' while my re-investigation of *Cloudina* confirmed the view which was first considered by Germs (1972) that they are polychaete worm tubes. The affinities of *Cloudina* with the Cribricyathacea which are admitted by Debrenne & Lafuste (1979, p. 144) do not indicate a Cambrian age of the basal Nama as some authors have claimed. The survival of *some* groups of animals on *some* taxonomic level from Precambrian to Early Cambrian is to be expected by those who do not accept catastrophist views (Glaessner, 1976, p. 270). The top of the Nama Group is probably Lower Cambrian but that is still being investigated. The latest published statement on the age of the basal part (Kröner, 1978, p. 209), 'is that the Kuibis Formation appears to be very late Precambrian in age' (see also Hartnady, 1978, p. 151–4). As Debrenne & Lafuste have stated, this is in agreement with palaeontological evidence, after the exclusion of pseudofossils and other erroneous conclusions.

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SIR – The letter from Professor Glaessner on *Buschmannia* shows that he now agrees with the Debrenne & Lafuste interpretation. The first time we discussed this problem in Paris in the spring of 1977, Professor Glaessner was inclined to the organic interpretation both of *Buschmannia* and *Praesolenopora*. I think it is very important that the attention of geologists who work with such ancient rocks should be drawn to the risk of serious stratigraphic errors which can be committed by such erroneous interpretations.

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