A NOTE ON *GEPHYROCAPSA CARIBBEANICA* AND AMPHORA-SHAPED *SCYPHOSPHAERA*.

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In INA Newsletter 13/1 Young presented a Quatertnary nannofossil range chart. A couple of points seem in order so that errors contained in the chart need not be perpetuated. These errors involove 1. the range - indeed the identity - of *Gephyrocapsa caribbeanica,* and 2. the stratigraphic range of *Scyphosphaera* spp., more specifically amphora-shaped *Scyphosphaera* spp. (e.g. *Scyphosphaera amphora, Scyphosphaera pulcherrima*).

1. Young indicates an early Pleistocene age for *Gephyrocapsa caribbeanica* (*G.* sp. A-B), the youngest occurrence of the species being at about 1.1 million years. Young follows previous workers, all the way back to Hay et al (1967), who first described the species and designated it the zonal marker for the early Pleistocene, stating that its range extended from ".. the last occurence of *Gephyrocapsa oceanica* ...". Unfortunately the problem surrounding the true identity of *Gephyrocapsa caribbeanica* starts right there. The stratigraphic range of *Gephyrocapsa caribbeanica* is based on drilled cores - the submarex cores from Nicaragua rise, but the holotype and paratypes are from eleswhere. Hay and Boudreaux, in Hay et al (1967), illustrated four specimens and designated the stereo pair Plate 12 & 13, Figure 4 the holotype. The holotype and paratype illustrated on Plates 12 & 13, Figure 3, are from the 540cm level of a piston core, A240 M1. That core was published previously by Rosholt et al. (1961) and the data in that publication indicate a Pleistocene age for the type level of *Gephyrocapsa caribbeanica.* More precisely the 540cm level in core A240 M1 is in oxygen isotope stage 8 of Emiliani's numbering system (the same system commonly in use today), and which is also the level of first occurrence of *Emiliania huxleyi.* (Gartner & Emiliani 1976).

[Rosholt et al (1961) had derived an age of 150ka for this level; then, by matching the classical glacial stage succession with the generalized (but very limited) Pleistocene palaeotemperature curve known at that time from the planktonic foaminifer record, interpreted stage 8 to be the middle of the Mindel/Riss (in North America the Yarmouth) stage, i.e. early Pleistocene. From there originates the incorrect early Pleistocene age for *Gephyrocapsa caribbeanica.*]

The problem, then, is this: Based on objective criteria erelating to the holotype, the earlty Pleistocene "marker" cannot reasonably be *Gephyrocapsa caribbeanica*; nor can *Gephyrocapsa caribbeanica* be used as a marker for the early Pleistocene. The two additional paratypes of *G. caribbeanica* (Plates 12 & 13, Figures 1 & 2) only confirm the problem. These two specimens are from the top of core CG-9, which also yielded the two specimens (Plates 12 & 13, Figures 5 & 6) identified as *Gephyrocapsa oceanica* and the two specimens of *Emiliania huxleyi* (Plates 10 & 11, Figures 1 & 2). The species Hey et al (1967) designated *Gephyrocapsa caribbeanica* clearly co-occurs with *Gephyrocapsa oceanica* and with *Emiliania huxleyi* and must be late Pleistocene or, at the very least, extend into the late Pleistocene.

An alternative interpretatioin is that both the holotype and the paratypes of *Gephyrocapsa caribbeanica* are redeposited specimens. This interpretation perpetuates instability in nomenclature and in biostratigraphy and is, therefore, not desirable. Perhaps INA could sponsor a further analysis and resolution of this problem.

2. The second point can be made more briefly. it is my experience that the distinctive amphora-shaped *Scyphosphaera* (I identify them as *Scyphosphaera pulcherrima*) are no longer extant. The youngest occurence seems to be within or near the top of the small *Gephyrocapsa* interval. Further documentation should render this species a useful event marker, even though it is often rare. Representative illustrations include Perch-Nielsen (1985) Figure 52(11) and Figure 53(2).

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ORIGINAL AUTHORS REPLY

I am grateful to Gartner for these comments, one of my hopes in publishing the range chart was to stimulate discussion of this type. Both his points seem entirely valid to me, specifically:

1. This exposition of the true age of the *Gephyrocapsa caribbeanica* holotype resolves a long standing uncertainty (Gartner 1977). Manifestly the name *G. caribbeanica* cannot be applied to the Early Pleistocene form. Given this *G. lumina* Bukry 1973 is almost certainly the correct valid alternative. Sorting out the late Pleistocene taxonomy is a more complex problem - which I skipped over by simply including everything in *G. oceanica*. *G. caribbeanica* has of course priority over *G.margereli* Bréhéret (1978) and *G. mullerae* Bréhéret (1978). A co-operative effort here might be worthwhile.

2. My use of *Scyphosphaera pulcherrima* to illustrate the genus *Scyphosphaera* on the range chart was obviously unfortunate. Rechecking I find that Gartner's observation of restricted occurrence for this species is in agreement with my data and that of for example Samtleben (1979) and Bergen (1984). I doubt this will ever constitute a useful "marker event" but the occurrence of *S. pulcherrima* plainly can provide a useful additional criterion for distinguishing assemblages from above and below the small *Gephyrocapsa* event.

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