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CORRESPONDENCE

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SIR,

Microparticles in "Byrd" station ice core: comments on the paper by L. G. Thompson, W. L. Hamilton and C. Bull

In a recent paper in the *Journal* (Thompson and others, 1975) a new time scale along the "Byrd" station ice core is suggested. It is based on the interpretation of varying microparticle concentration in terms of seasonal variations, which leads to the conclusion that the age of the bottom ice is only 27 000 years.

We agree with several of the viewpoints put forward in the paper, for example that identification of annual layers by microparticle variations may push the limit for absolute dating of polar ice cores much farther back in time than that set by diffusive obliteration of seasonal stable-isotope cycles.

However, it is extremely difficult to accept the interpretation and the consequent conclusion of Thompson and others (1975), mainly for the following reasons:

1. Accepting the variations as seasonal implies a vertical strain-rate close to zero over the lower 90% of the ice core (cf. fig. 5 and the essentially linear relationships between depth and age claimed in fig. 6). This is hardly consistent with any realistic ice-flow model.
2. In principle, it is impossible to identify a short series of cycles of varying "wavelength" from less than two (in practice three or four) measuring points per cycle. In at least 11 out of the 13 core increments referred to by the authors the sample length was 2 cm or more (Thompson, 1973). Therefore, the minimum layer thickness detectable by their technique is 6 cm, and the fact that no shorter cycles were found is no proof that they do not exist, neither does it disprove the time scale of Johnsen and others (1972), according to which the layer thickness is smaller than 6 cm in the lower 50% of the core (smaller than 2 cm in the lower 14%). The variations in dust concentration measured at great depths are instead due to long-term changes, maybe connected to climatic variations.

The time scale suggested by Johnsen and others (1972) may be shown to be wrong when better field data become available from the complicated "Byrd" station area, and indeed it is encumbered with considerable uncertainty, particularly at great depths. But so far it seems more realistic than that suggested by Thompson and others (1975).

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