world around this time should not be dated or correlated with the earlier Swedish results".

Finally, Noël incorrectly discusses our three minimum requirements as though they were absolute criteria. We reiterate that our criteria are to be regarded as minimum practical criteria for recognising geomagnetic excursions in recent sediments and that they represent only the first of several hurdles which a geomagnetic excursion must pass before gaining recognition as a global phenomenon.

Fairbridge[4] has recently suggested the Late Weichselian geomagnetic 'reversal' is correlated with a short sharp cold fluctuation in climate. He discusses a mechanism by which climate could be controlled by geomagnetic changes. We would explain such a correlation by an opposite mechanism, namely that sudden climatic changes produce variable sediments which increase the probability of spurious palaeomagnetic data and hence apparent geomagnetic changes.

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Liquid nitrogen enhancement of partially annealed fission tracks in glass

PILIONE and Gold[1] described a means of revealing partially annealed fission tracks in glass by immersing the glass (NBS SRM 962)[2] into liquid nitrogen. According to their discussion it was possible to increase the total number of etchable tracks by increasing the immersion time of the glass in liquid nitrogen. Using this information we attempted to duplicate this work using the same NBS SRM 962 glass.

In a preliminary experiment, we immersed a piece of SRM 962 glass wafer into liquid nitrogen for approximately 8 h. Before the immersion the glass had been heated to 230 °C for 1 h such that 57% of the tracks were annealed and then the glass was polished. This piece of glass and an unannealed piece, which had previously been broken from the same SRM 962 wafer, was etched in 16% HF at 23 °C for 75 s. Then the fission tracks in both pieces were counted and the track densities compared. The track counting statistics, however, were such that a definitive conclusion could not be drawn.

The experiment was repeated using several pieces of the SRM 962 glass and different continuous liquid nitrogen immersion times. At the end of each given immersion time, pieces of the glass were removed, allowed to reach room temperature, polished, and etched in HF as before. The results of this experiment are summarised in Table 1. We found no significant change with respect to the increased number of etchable tracks in the glass after its immersion in liquid nitrogen.

From our results we conclude that liquid nitrogen has no effect on the annealed tracks in glass. Subsequent discussions with Pilione and Gold have indicated that this effect was only observed when the glass had been polished before exposure to nitrogen. Therefore our conclusion is that the enhancement of partially annealed tracks is perhaps a surface phenomenon and has no effect on the interior matrix of the glass.

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PILIONE AND GOLD REPLY—It is apparent from discussions between Pilione and Carpenter that different criteria are used for the identification of fission tracks in glass. But any 'track identification' difference should not affect the results if the density of 'artefacts' remained constant with immersion in liquid nitrogen, because the values reported were nomalised in ratio form. We are investigating the effects of chemical etchants on fission tracks and 'artefacts' in glass, in order to resolve this dilemma. We intend to report in the near future on recent experiments indicating the enhancement effect we noted earlier[1] is probably a surface rather than a volume phenomenon[2].

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Table 1 Effect of liquid nitrogen immersion on partially annealed fission tracks in glass

Glass condition		Track density* (tracks mm^{-2})	Track retention
Not annealed		402.3	100%
Annealed, 230 °C for 1 h	No N_2 treatment	231.4	57.5%
	1 d in N_2	231.0	57.4%
	7 d in N_2	228.2	56.7%
	30 d in N_2	223.7	55.6%

*Counting statistics (1σ) is ±3%.

Lack of correlation between tight junction morphology and permeability properties in developing choroid plexus

MOLLGARD *et al.*[1] report on morphological study of the sheep choroid plexus during foetal development. Excellent freeze–fracture replicas clearly show no difference in the ultrastructural features of the tight junctions in the choroid epithelium between 40- and 125-d foetuses. The authors reasonably agree that changes in tight junction strand number cannot account for alterations in permeability properties during development, since changes in strand number do not occur.

The reader unfamiliar with the blood–brain–cerebrospinal fluid system is likely to be left with the impression that these results disprove the existence of a correlation between tight junction morphology and permeability in the choroid epithelium itself and therefore in epithelia in general. This is not so. All the permeability studies[2–4] referred to were made in intact animals or foetuses, in which transport of a solute between blood and cerebrospinal fluid can occur indirectly through the walls of the cerebral vessels and the interstitial fluid of brain as well as directly across the choroid epithelium. The observed developmental alterations in permeability with respect to cerebrospinal fluid are probably partly, and perhaps wholly, due to maturation of the cerebral vessels, that is, of the blood–brain barrier[2,3]. Unless the authors or others can as clearly show for the cerebral endothelial cells of the sheep what has been so well demonstrated for the choroid epithelium, namely that there is no morphological change in the tight junctions of the blood–brain barrier from 40 d gesta-