needing $T > 140$ K for the phase transition between amorphous and cubic ice. This latter theory also requires amorphous ice to have the suspiciously high density of 2.3 g m^{-3}, implying an O–O distance of ~ 2.0 Å compared with the more normal 2.8 Å. None of these can account for the outbursts of P/Schwassmann-Wachmann (1).

Three theories remain—tidal disruption by Jupiter, asteroidal collision and collision with boulders[9] (mass ~ 10^8 g). Pittich[2] has ruled out the first two, leaving only the boulders.

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Changes in the latitude of the climatic zones of the Northern Hemisphere

IN a discussion of the drought in the Sahelian Zone of Africa it has been suggested[1] that the drought is associated with a shift of the climatic zones of the Northern Hemisphere towards the equator. An analysis by Lamb was quoted as evidence for this shift, but Lamb's analysis was mainly related to the subpolar pressure minimum, and the latitude of the subtropical pressure maximum would seem to be more relevant to the Sahelian zone.

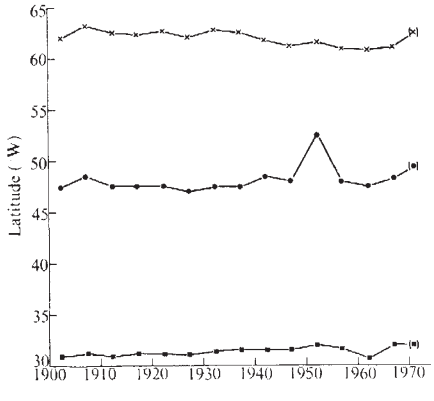

Fig. 1 Average latitudes of climatic zone parameters in the North Atlantic (whole year). Five year means except the last plot which is 1970–1973. ×, Subpolar flow; ●, westerly maximum; ■, subtropical high.

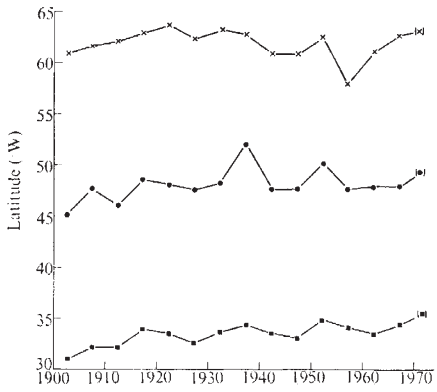

Fig. 2 Average latitudes of climatic zone parameters in the North Atlantic (summer). Five year means except the last plot which is 1970–37. ×, Subpolar flow; ●, westerly maximum; ■, subtropical high.

Using values of sealevel pressure stored on magnetic tape in the form of a grid, the latitudes of the subpolar minimum of pressure, the subtropical maximum of pressure and the latitude of strongest westerly winds were calculated. Non-overlapping periods of 5 yr from 1900 to date were used, both for the northern hemisphere and the North Atlantic region (10°W to 60°W). Figure 1 shows these three parameters for the Atlantic region for the whole year and Fig. 2 for the Atlantic for the summer (June, July and August).

The data for the whole year confirm Lamb's analysis in indicating a slight trend of the subpolar pressure minimum towards the equator but show no trend or even a slight one towards the pole for the maximum of the westerlies and the subtropical pressure maximum. The data for summer lead to broadly the same conclusion, except that the trend of the subtropical pressure maximum towards the pole is stronger. The results for the whole hemisphere are similar. What is particularly notable is the trend of all the parameters towards the pole for the whole year and for the summer over the past three 5 yr periods while the Sahelian rainfall has been decreasing. This makes the hypothesis that the present Sahelian drought is due to a shift of the climatic zones towards the equator scarcely tenable.

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Matters arising

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Role of arginase in the epidermis

THE article by Oka and Perry concerning the role of arginase in the mammary gland[1] suggests an explanation for the high levels of this enzyme in the skin[2,3]. This tissue resembles mammary gland in that the remaining enzymes of the urea cycle seem to be absent.

A large body of work exists regarding the stimulation of epidermal proliferation as a result of wounding. Such stimulation is preceded by the induction of ornithine decarboxylase and the production of putrescine and spermidine under the influence of the epidermal growth factor[4,5]. Thus, it seems possible that the function of arginase, at least in the epidermis, is to provide a reservoir of ornithine for the production of spermidine. This idea is consistent with the observations that cutaneous lesions associated with pathological proliferation of rete cells, such as psoriasis and the common wart[2], or following experimental application of carcinogenic substances[6], show greatly increased arginase activity.

Of course it is possible, as Oka and Perry point out, that arginase may also be involved in the production of proline, although this seems less likely to be of significance in the epidermis than in the dermis.

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