CORRESPONDENCE

Drift thickness maps of Scotland

SIR,—The first of a new series of transparent overlays showing variations in thickness of drift and, in some cases, in rock-head level is available from the Edinburgh Office of the Institute of Geological Sciences. The overlays, on the scale of 6 inches to 1 mile, are designed to be used with the appropriate geological or O.S. National Grid quarter-sheet. They show National Grid 1 km intersections and drift isopachytes at levels of 1, 5, 10, 15, 20, 25, 30, 35 and 40 metres, or rock-head contours at 5-metre intervals.

The programme is at present confined to the Edinburgh district and the Irvine–Kilmarnock area. Drift thickness overlays will shortly be available for 6-inch quarter-sheets NT 27 NW, 27 SW, and 27 SE, and both drift thickness and rock-head contour overlays will be available for NS 33 NW, 33 NE, 34 SW, and 34 SE. The drift thickness overlay for NT 27 NE (north-eastern Edinburgh) is available now. The intention is that the programme will be extended to cover, initially, adjacent sheets in both areas. Copies will be supplied to order at a cost each of £1.35 (Permatrace) or £2.00 (Ozalid Ozatype Clear Film); orders may be submitted for any of the 12 overlays listed above.

Although much of the information given by the overlays is dependent on the judgement and interpretative skill of the compiling geologist, and some of it is inevitably largely conjectural, it is based on a consideration of all the data available from surface observation, from boreholes, and from excavations. One of the reasons for the selection of these two areas for this project was the generally high density of relevant data there. The Edinburgh overlays are based on computer-produced maps which incorporate the findings of all the boreholes in the area, and these maps have been modified only where additional information and geological interpretation show them to be in error or highly unlikely to be correct.

Orders and requests for further information should be sent to

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12th September 1973

SIR KINGSLEY DUNHAM
Director

A Mediterranean catastrophe?

SIR,—Professor Sylvester-Bradley (1973) raised the question of the presence of a deep-water Atlantic fauna in Pliocene beds immediately above the Upper Miocene Gessosa-Solfifera formation of Sicily, as being the possible indicator of a catastrophe. The answer is really quite simple in terms of palaeo-oceanography.

The Mediterranean Sea has not always had a water deficit as it has today. In glacial times the Mediterranean Sea had a water surplus that translated itself into a surface current of lower-density waters flowing out through the Straits of Gibraltar and a bottom current flowing in. Huang *et al.* (1972) found sedimentological evidence in the Alboran Sea that some 9000–11000 years B.P., at the end of Würm glaciation, a current reversal took place. This reversal occurred in a geologically brief period without catastrophic consequences.

Geol. Mag. **111** (1), 1974, pp. 79–86. Printed in Great Britain.

The water surplus of the Black Sea in earlier interglacials allowed Mediterranean faunas to migrate to Caucasian shores (Fedorov, 1967).

Because of the water deficit, a strong surface current flows through the Straits of Gibraltar; a bottom current of higher density flows out. The outflowing undercurrent forms a tongue into deeper Atlantic waters of equal density (Lacombe, 1961). This tongue prevents those waters from entering the Straits which are upwelling in the Canary current along the coast of Morocco and in summer time along the coast of Portugal (Krümmel, 1911).

The Pliocene is noted for a gradual decrease in temperatures. If the Mediterranean Sea at some time attained a positive water balance as other seas maintain in temperate climates, then the undertow would start to flow E and would be sucking in deep waters upwelling along the Atlantic coast line. A geostrophic current akin to the one extant today would then sweep faunas as far as Sicily. Again, such an event would occur in a geologically brief period without catastrophic consequences.

A cold-water fauna in a cool Mediterranean Sea faithfully reflects ancient ocean currents and ancient water budgets and says very little about water depths which may still have been very shallow and only slowly subsiding at the time of the Pliocene transgression.

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PETER SONNENFELD

Tertiary beach deposits east of Reading associated with the London Clay transgression

SIR,—The trace fossil *Ophiomorpha* was described by Kennedy & Sellwood (1970) from a sand-body believed to be of Sparnacian age, outcropping in a small pit at Knowl Hill to the E of Reading (SU 819798). In this paper the authors relied upon published sedimentological and palaeogeographic evidence in interpreting the depositional environments represented by the Reading Beds.

The Reading Beds in the W of the London Basin have been conventionally interpreted as a fresh-water sequence being represented by a series of mottled red sandy clays. At their base there is a glauconitic sand facies containing *Ostrea* which is usually interpreted as an early Sparnacian marine transgressive deposit (Sherlock, 1962). To the W, towards London, lagoonal and fully marine sequences are developed (Wooldridge, 1926; Hester, 1965; Curry, 1965).