Atlantic Ocean and on the eventual movements of the continents^{8,9}.

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Palaeocurrents in the Upper Cambrian of North Wales

In a recent communication, Crimes and Sly¹ comment on the variation of current patterns in the Cambrian of North Wales. As a contribution to a better knowledge of these current directions this communication records some results obtained by us at different times from work on the Maentwrog and Ffestiniog Beds (Upper Cambrian) of North Wales.

The hard siliceous siltstones and greywackes from these beds show many turbidite structures; for example, sharp lower junctions, diffuse upper junctions, graded and convolute bedding, cross-stratification, sub-aqueous slumping, bioturbation, and a variety of sole markings, including

trace fossils, flute, groove, striation, prod and brush casts. Ball-and-pillow structure, load casts and flame structures are present. Fig. 1 summarizes the measurements on the directional structures and shows clearly that currents came generally from the south-south-west. The four different arrow symbols represent the four commonest directional structures, namely, flute casts, tool marks (prod casts showing polarity and striation casts without polarity) and the dip direction of small-scale foreset beds. The directions in which the arrows point represent the original azimuths after elimination of bedding dip and, where possible, plunge.

The tops of some of the thick, coarse-grained Ffestiniog greywackes in the northern half of the area show well-developed asymmetrical ripple marks, like the spectacular bedding surface in Cwm Graianog described by Williams²; but their trend is not at right angles to the current directions as indicated by sole markings and cross-stratification. Anomalous current directions for the tops of a number of British turbidites have been discussed by Kelling³. He invokes surge-waves, set up by the nose of a turbidity current, which are reflected back from the marginal slopes of the trough and deposit material showing current ripple marks at an oblique angle to the flow direction of the turbidity current. Similar anomalous directions are noted by Whitaker⁴ from the Llandovery calcareous siltstones in South Norway, and the same process may account for the Upper Cambrian occurrences in North Wales.

In the St. David's area of South Wales, Farshori⁵ has measured a number of directional structures in the equivalents of the Maentwrog and Ffestiniog Beds and deduced currents moving from between west-south-west and south-south-west comparable with those in North Wales recorded here.

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CRYSTALLOGRAPHY

Structures of 5-Bromodeoxyuridine and 5-Bromouridine

HALOGENATED deoxyuridines can be incorporated into DNA in place of the normal thymidine component, and this affects the physical properties of the DNA and has important biological consequences. For example, it makes DNA more sensitive to ultra-violet radiation¹ and it produces mutagenic changes².

By means of X-ray crystal analysis we have investigated the structure of 5-bromodeoxyuridine (BUDR) and that of the closely related 5-bromouridine (BUR). These molecules differ by only one oxygen atom (Fig. 1), and it is of interest to see what differences exist between their conformations. BUDR can exist in more than one crystal form, and that studied by us is different from the one mentioned by Camerman and Trotter³, who determined the structure of 5-iododeoxyuridine. They obtained triclinic crystals with unit cell dimensions of $a = 4.87 \text{ \AA}$, $b = 6.72 \text{ \AA}$, $c = 9.56 \text{ \AA}$, $\alpha = 100^\circ 10'$, $\beta = 107^\circ 24'$, $\gamma = 98^\circ 31'$.

Crystals of BUDR and BUR were obtained from aqueous solutions by slow evaporation. The unit cells are monoclinic with the following dimensions:

BUDR $a = 9.150 \text{ \AA}$, $b = 5.142 \text{ \AA}$, $c = 12.108 \text{ \AA}$, $\beta = 108.2^\circ$

BUR $a = 7.725 \text{ \AA}$, $b = 5.813 \text{ \AA}$, $c = 13.264 \text{ \AA}$, $\beta = 101.2^\circ$

Fig. 1. Palaeocurrent directions for Maentwrog and Ffestiniog Beds, North Wales. (Dashed line marks the limit of Cambrian exposures. The arrow south-east of Bethesda is displaced for greater clarity)