age. In Snowdonia, the Pitt's Head Rhyolite forms the base of the Snowdon Volcanic Series (Williams, H. 1927). East of the Glaslyn River it has been demonstrated that the Pitt's Head Rhyolite is Soudleyan in age (Williams, A. & Harper *in* Beavon, 1963). This must mean that the Pitt's Head Rhyolite is missing from the succession in the Dolwyddelan area. According to Williams & Bulman (1931, p. 434) the nearest recorded occurrence of the Pitt's Head Rhyolite is at Cerrig Cochion (Fig. 1) in the extreme west of the Dolwyddelan area but Beavon (1963) showed that the nearest outcrops of the lateral equivalent of the Pitt's Head Rhyolite (the Lower and Middle Lapilli Tuffs) crop out around Yr Arddu, approximately 4 km south-west of Cerrig Cochion.

The question remains as to which formation forms the base of the Snowdon Volcanic Series in the Dolwyddelan syncline. Williams & Bulman suggested that the following succession was present there; Glanrafon Beds, Lower Rhyolite Tuffs, Bedded Pyroclastic Series and Upper Rhyolite Tuffs. Dean (1965) has shown that the Bedded Pyroclastic Series is Longvillian and Harper (*in* Shackleton, 1959) has dated the Lower Rhyolite Tuff of the Moel Hebog area as Lower Longvillian. The Glanrafon Beds discussed in this paper, which lie immediately under the Snowdon Volcanic Series, are also Longvillian in age; hence the authors are of the opinion that, on palaeontological grounds, the Lower Rhyolite Tuff is the most likely formation at the base of the Snowdon Volcanic Series in the Dolwyddelan syncline. This confirms the conclusion reached by Williams & Bulman (1931, p. 440) on petrological grounds.

All the fossil specimens collected are lodged in the Department of Geology, University of Sheffield. The research for the above note has been carried out with the assistance of a University of Sheffield Field Research Fund (M.R.) and a N.E.R.C. research studentship (J.N.D.).

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CORRELATION OF BASE OF MIDDLE HEADON BEDS BETWEEN WHITECLIFF BAY AND COLWELL BAY, ISLE OF WIGHT

SIR,–The best exposures of the Middle Headon Beds (Lower Oligocene) of southern England are at Colwell Bay and Whitecliff Bay, on the western and eastern ends of the Isle of Wight. Away from the coast exposures are very limited and give no hope of

tracing strata continuously across the island. The contact of the Middle Headon Beds with the Lower Headon Beds is a regional disconformity (Curry, 1958). In a classical account of the stratigraphy of the Isle of Wight, White (1921) made the following correlations on the evidence of molluscan fossils:

Biostratigraphic Units	*Formations at Colwell Bay*	*Formations at Whitecliff Bay*
Meretrix incrassata Zone	*Ostrea* Bed	
	Venus Bed	
	Trigonocoelia Bed	*Venus* Beds
	Neritina Bed	
Roydon Zone) Brockenhurst Zone)	(not represented)	Brockenhurst Beds

The Roydon and Brockenhurst Zones are both named after places and not after key fossils but are true biostratigraphic units. White implied that the *Meretrix incrassata* Zone overlaps the Roydon and Brockenhurst Zones towards the west. Curry (1958) recently recognised the possibility that the lower beds at Colwell Bay might be as old as the Brockenhurst Zone or Roydon Zone, but the correlation of the strata between Whitecliff Bay and Colwell Bay remained as uncertain as it was in White's day.

Foraminifera were identified in a sequence of 22 samples through the Middle Headon Beds at Colwell Bay and nearby Hatherwood Point, and in a sequence of 14 samples at Whitecliff Bay. The biofacies of benthonic foraminifera indicate decreasing salinities, and for the lower strata, decreasing depths of deposition from Whitecliff Bay to Colwell Bay. These findings are consistent with but do not confirm the overlap implied by White. Because the biofacies are so different the benthonic foraminifera give no direct evidence of correlation between Whitecliff Bay and Colwell Bay.

The most useful evidence for correlation is a minute planktonic foraminifer tentatively identified as *Globigerina* cf. *angustiumbilicata* Bolli. This is the only species of planktonic foraminifera represented in the Middle Headon Beds, apart from very rare *Chiloguembelina* near the base of the Brockenhurst Beds, and is of no use for inter-regional correlation. It was found only at two horizons in the lower part of the beds at Colwell Bay, and at two horizons at Whitecliff Bay. At Colwell Bay one horizon is near the base of the *Neritina* Bed and the other is near the base of the *Venus* Bed. At Whitecliff Bay one horizon is near the base of the Brockenhurst Zone and the other is near the base of the Roydon Zone. Range charts by Bhatia (1955), showing the stratigraphic distribution of foraminifera at Whitecliff Bay, confirm the occurrence in the Brockenhurst and Roydon Zones and absence from all higher Middle Headon Beds.

The ecological control of the distribution of planktonic foraminifera is less complex and better understood than that of benthonic organisms. In view of the decreasing salinities and decreasing depth of sea towards the west, as indicated by benthonic foraminifera, it is most unlikely that planktonic foraminifera would have been living at Colwell Bay at a time when they were not living at Whitecliff Bay. It is suggested therefore that the two horizons with *Globigerina* at Colwell Bay correspond with those at Whitecliff Bay. Accordingly the base of the *Neritina* Bed at Colwell Bay is here correlated with the base of the Brockenhurst Zone, and the base of the *Venus* Bed at Colwell Bay with the base of the Roydon Zone. It is inferred that there is no significant overlap, and the *Meretrix incrassata* Zone of White is an ecozone transgressing age boundaries.

The work outlined above was carried out at the Sedimentology Research Laboratory, University of Reading, and was supported by a Nuffield Foundation Commonwealth Travelling Fellowship.

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IS THE ZAGROS FAULT LINE OF IRAN A WRENCH FAULT?

SIR,—In the recently published Geophysical Monograph 13 of the American Geophysical Union, The Earth's Crust and Upper Mantle, a short communication by Professor H. W. Wellman has included the Zagros fault line of Iran amongst the "Major Wrench Faults of the World (mostly active)". No evidence is given but reference is made to earlier papers by N. Pavoni (1961), and himself (1965). Pavoni suggested by dashed lines on a small scale map that the Zagros fault line might be a continuation of the Anatolian fault line; the latest tectonic map of the world, based on all available geological maps, disagrees. Wellman's conception comes from a study of small-scale air photo mosaics and his evidence is topographical not geological. In his own words evidence for horizontal movement along this 1200 km fault line was found in three places only. "The best locality shows tailing streams and three small streams that appear to have been displaced about 100 m. At the other localities there are a possibly displaced spur and streams. All displaced features favour dextral displacement, but none is conclusive". More than this is required to establish a world major wrench fault.

The Zagros fault line has been recorded geologically on the reconnaissance scale of 1:250,000. It has been visited by two generations of structurally and stratigraphically minded geologists, some of whom have in recent years viewed it from aircraft including helicopters. Not one of them has suggested that there has been any transcurrent movement, but all have been impressed by the evidence of overthrusting towards the south-west (or under thrusting in the opposite direction) which took place during the latest paroxysm of the Alpine orogeny in the Pliocene. It is possible that horizontal or vertical movement along this very important line took place during earlier phases of the orogeny but this is not subject to proof from air photographs.

The Middle East is attracting much regional tectonic interest at the present time, not least among geophysicists. It would be wrong to accept a late Tertiary major wrench fault along the very important Zagros fault line without any geological evidence of horizontal movement.

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