

PERTEMUAN PERSATUAN (MEETINGS OF THE SOCIETY)

TECHNICAL TALKS

J.V. WATSON: A deeply eroded collision orogen: the Caledonides of Britain

Prof. J.V. Watson, who is in Malaysia as External Examiner in Geology to the Department of Geology, University of Malaya, gave the above talk to an interested audience at the University on 21 March 1984.

Professor Watson started off her talk by mentioning that the Caledonian cycle ended in a collision orogeny involving the large continental plates of Europe and North America. The suture marking the former site of the Iapetus Ocean crosses Britain near the Scottish border and continues into Ireland via the Solway Firth.

After reviewing the geology of the European part south of the suture, Professor Watson then concentrated most of her talk on the "North American" part, in particular the Caledonian foldbelts of Scotland. The Southern Uplands of Scotland has been documented as an accretionary wedge deposited and deformed along the North American continental margin from 490 to 420 Ma ago. The Highland region was initially separated from the continental margin, firstly by a more stable block of continental crust analogous to that now underlying the Midland Valley, and secondly by the Southern Uplands accretionary prism. Caledonian deformation began in the weak Dalvadian Basin and extended northwestwards into the Moine. The Iapetus Ocean closed 420 Ma ago, causing an onset of sinistral transcurrent motions on NE-SW lines. Regional uplift of the thickened Dalvadian sedimentary pile led erosion and removal of 20 to 30 km thickness of overburden from the Highlands in Ordovician and Silurian times, as deduced from the uplifted metamorphic isograds.

Caledonian magmatism began with the development of the strike-slip faults. The positions of the granites were strongly influenced by transverse NW-SE dislocations in the lower crust as shown by the gravity anomalies. The deep seated dislocations acted as conduits for the melts over periods up to 25 Ma. The granites are of sub-crustal origin and magmatism was triggered by vertical and horizontal block movements.

C.S. HUTCHISON
