

**Symposium on ophiolite genesis and evolution of oceanic lithosphere, 7-18 Jan. 1990. UNESCO - Sultan Qaboos Univ., Muscat, Oman. Ministry of Petroleum and Minerals, Sultanate of Oman. Symposium G6**

**MODEL FOR THE INITIAL SUPRACRUSTAL EMPLACEMENT OF HOT-SOLED OPHIOLITES DURING PLATE SEPARATION, AND SOME PLATE KINEMATIC APPLICATIONS**

Miles F. OSMASTON, The White Cottage, Sendmarsh, Ripley, Woking, Surrey GU23 6JT, UK.

Hot-soled ophiolites need to be seen as a distinct breed (e.g. Semail (Sem), Bay of Islands (BOI), Ballantrae (Bal)). Their genesis and immediate supracrustal emplacement seem to follow substantially earlier oceanic basin-forming events at the site (Sem, BOI). Fresh splitting of a well-sedimented, deep-floored basin would produce an igneous ridge (embryo MOR) standing far above the adjacent floor.

It is proposed that, due to the topographic contrast, this edifice bursts its side (or its end, at a transform fault), liberating the subcrustal column of hot diapiric mantle and causing a huge quasi-solid lateral discharge, often carrying part of the already-formed ridge superstructure upon its back. In metamorphosing the basin floor sediments, their H<sub>2</sub>O would penetrate the hot mass, successively lowering its solidus and inducing the H<sub>2</sub>O-dominated magmatic sequences and metasomatism hitherto regarded as evocative of island arc environments. Thermal upwarping of the supporting floor would initiate further sliding and successive decollements within the overridden, overpressured sediments.

The model (1) avoids the severe decollement problem in hot plastic mantle and (2) provides inherently the short genesis-emplacement interval. It also explains:

- (3) the rather small actual ophiolite structural thickness, above the sole (Sem.);
- (4) fabric-bearing dunite 'dykes' in mantle tectonite that suggest shear-induced melt segregations in equilibrium with harzburgite at >50km depth (Sem, BOI);
- (5) metamorphic sole pressures (in mafic protolith) that are several times the ophiolite thickness pressure (melt that segregated from the tectonite during its final upwelling)(BOI, Bal);
- (6) major mechanical disruption of lower crust by mantle tectonite and their compositional mutual disequilibrium (Sem, BOI);
- (7) initial transport directions that vary greatly along the ophiolite (Sem, BOI);
- (8) progressive magma source depletion along the sequence Geotimes-Lasail-Alley-CpxΦ (Sem).

Some fertile plate kinematic consequences will be outlined.