

II. DISCUSSION OF THE BATHYMETRIC AND PHYSIOGRAPHIC MAPS (Encl. 1-6)

Southern Australia is characterised by physiographic provinces belonging to Atlantic-type continental margins. In their simplest form they comprise a shelf, slope and continental rise. Marginal plateaux, dividing the slope into upper and lower parts, are present in several areas : they probably formed as the result of subsidence of shelf areas and seem to be composed of downfaulted and downwarped areas of both relatively shallow basement (e.g. Naturaliste Plateau) and subsided sedimentary depocentres (e.g. Ceduna Plateau).

The shelf follows the coastal trend rather closely. It is generally characterised by very shallow basement and corresponds to a drowned peneplain surface of early Tertiary age.

The slope is usually steep, plunging from the shelf to bathyal depths within 50-75 kms. It seems to be defined by faults or fault systems parallel to the continental margin in most cases, but in the area of the Otway basin, where structural trends transect the slope at an angle, it is divided into spurs and re-entrants (Encl. 5). Generally speaking, the slope physiography is rugged, due to erosion and slumping. It is traversed throughout much of its length by erosion channels or submarine canyons. The latter are rather straight and are directed radially away from the coast. Although few have a sedimentary fill they probably form the channels by which sediment from rivers and the shelf reaches the continental rise and abyssal plains. Most are of small dimensions although the largest, the Murray Canyon, has a vertical relief of 2000 m (Conolly and v.d. Borch, 1967).

The continental rise, which lies at depths of 4000 to 5000 m, forms a gentle seaward-dipping province bordering the base of the continental slope. In general the topography is smooth but rather undulating.

A number of isolated abyssal plains are concentrated at the oceanward limit of the continental rise adjacent to the larger submarine canyons e.g. Perth, Gippsland. An abyssal hills province, which resembles the abyssal plains, but which contains areas of exposed basement and hills may also be recognised. Swales, in which topographic relief is subdued by a thin sediment cover, border the abyssal plains and the continental rise.

South of the Naturaliste Plateau lies an area of irregular ridges and valleys, with a strong W-E linearity, that forms the Diamantina fracture zone. This is a feature that stretches from the Ninety East ridge in the west as far east as the Great Australian Bight. It seems to merge with the Australian continental margin in the area of the Beachport Plateau.