

Bass is essentially a Cenozoic basin, although it may contain Permian, Triassic, Jurassic and Lower - mid Cretaceous rocks between the relatively undisturbed Tertiary above, and complexly folded and intruded pre-Permian rocks below. Permian "tillites" are known from small outcrops along the northern Tasmanian coastline. These may extend northward for some distance into the Bass Basin. The Triassic is represented by sandstone and shale with minor conglomerate and coal in Tasmania, and by minor glacial beds in Victoria. The Jurassic - Lower Cretaceous, generally non-marine, Otway Group occurs in the Gippsland and Otway Basins and may be present in the Bass Basin.

During the Paleocene and Eocene time, gentle regional downwarping occurred in the Gippsland and Otway Basins and similar downwarp occurred in the Bass Basin. Tasmania remained a positive area. Volcanism and lava flows were abundant from the western part of the Gippsland Basin to the eastern part of the Otway. Similarly, a few small flows occurred in Tasmania. No volcanic rocks of this age are known in the axial portion of the Bass Basin. During this time in Bass there were widespread swamp conditions under which peat, clay, sand, silt and gravel were deposited. During Lower and Middle Eocene occasional thin marine sediments may have intercalated with these non-marine rocks. Upper Eocene time saw a change in sedimentary conditions from non-marine to restricted marine.

Uplift and slight deformation took place in Gippsland after deposition of the Eocene coal measures. Deposition apparently was continuous during this time in the Otway basin. In the Bass Basin there is seismic evidence of an unconformity near the top of the Eocene.

During the Oligocene and Miocene time marine conditions prevailed in the Bass Basin with deposition of fossiliferous limestone, calcareous mudstone, marl, and minor siltstone beds. Local angularity beneath the Oligocene-Miocene contact on seismic sections indicates a regressive pulse at the beginning of Miocene time. At and near the present edges of the Bass Basin in Tasmania and Victoria are outcrops of mainly Miocene skeletal limestones and some marine, fossiliferous siltstone.

In the southwest part of the Bass Basin in the vicinity of Three Hummock Island, and in the northern half of the basin, tuffite cones of Upper Oligocene and Lower Miocene age indicate tectonic activity during this period.

During Pliocene time the marine transgression reached the end of its full cycle in Gippsland and Otway. During Middle Pliocene time these areas, and also the entire Bass Straits region, were subjected to uplift, probably accompanied by some gentle deformation and faulting. Volcanism and outpouring of lava was widespread in Tasmania and west - central Victoria.

The sea in general regressed to its present limits during late Pliocene and Pleistocene time.

(3)

Generalized Stratigraphy of the Bass Basin

Paleozoic Rocks

Paleozoic sediments (marine to non-marine) metasediments, metamorphics, and igneous intrusive and extrusive rocks are believed to comprise "economic" basement in the greater Bass Straits region.

In the Mesozoic - Tertiary Otway Basin, two wells reached the Paleozoics (Fergusons Hill-1 and Pretty Hill-1), as did the Arco S.W. Bairnsdale-1, Duck Bay-1 and others in the Gippsland Basin. Hence, it is reasonable to expect that the Paleozoics