

The "residual oil" extracts of cuttings (2169-2178 and 2961-2970 metres) also have an aromatic-intermediate to aromatic-asphaltic composition (Table 9).

The gasoline-range (C_5 - C_7) composition of the condensate (Tables 6, 7) displays no evidence of *in situ* alteration by water washing or biodegradation (Fig. 9).

5.2 Source Affinity

Condensate (RFT 3, 2788.2 metres)

The alkane composition (Fig. 8) and high aromatics content (9.2%: Table 6) of the C_5 - C_7 hydrocarbon fraction of the Pelican-5 condensate reflect its derivation from land-plant organic matter.

Likewise, aspects of the C_{12+} composition of the condensate attest to its terrestrial source affinity. These include the dominance of C_{29} homologues in its C_{27} - C_{29} sterane and diasterane distributions (parameters 1-3, Table 10; Fig. 20). High pristane/phytane and pristane/ n -heptadecane ratios ($pr/ph = 7.7$; $pr/n-C_{17} = 1.4$: Fig. 11) indicate that the primary terrigenous organic matter was exposed to oxic conditions en route to its final site of accumulation in a peat swamp environment (Fig. 21) where it was reworked by anaerobic acidophilic bacteria.

Bacteria were the precursors of the C_{15} and C_{16} drimanes (m/z 123), C_{27} - C_{35} hopanes (m/z 191) and (in lesser concentration) methylhopanes (m/z 205) found in the condensate (Fig. 15, Appendix 4).

Regular (head-to-tail) acyclic isoprenoids up to C_{40} have been tentatively identified in the Pelican-5 condensate (m/z 183, Fig. 15). This isoprenoid distribution differs in detail from those found in oils generated from source rocks deposited under stable anoxic conditions, and therefore attributed to methanogenic archaeobacteria (McKirdy *et al.*, 1984, 1986). The higher isoprenoids (C_{21+}) in this crude are more likely to be derived from long-chain oligoterpenyl alcohols which occur in higher plants (Philp and Gilbert, 1986).

The m/z 123 and 259 mass fragmentograms of the Pelican-5 condensate (retention time 25-30 mins.: Fig. 14) confirm the presence of the tetracyclic diterpanes, phyllocladane, beyerane and kaurane. These particular C_{20} hydrocarbons are biological markers of conifer leaf resins (Noble *et al.*, 1985). Other conifer resin biomarkers present in the condensate are the C_{19} and C_{20} isopimaranes (Table 11, Fig. 14) which are particularly abundant in Mesozoic oils from the Gippsland Basin. It is noteworthy that resinite is a volumetrically significant component of coals in the Eastern View organic facies of both the Bass and Gippsland Basins (Smith and Cook, 1984; Shanmugam, 1985; Watson, 1986).

Bitumen (2790-2799 and 2961-2970 metres)

The compositions of the two bitumens and the gilsonite sample are nearly identical. This is evident from their respective C_{12+} alkane chromatograms (Figs. 12, 13) and biomarker distributions (Figs. 17-19). Although likewise of land plant/bacterial origin (Fig. 21), the bitumens and gilsonite differ in detail from the heavy ends of the condensate (see in particular biomarker parameters 1-3, 9, 14, 16, 18 and 21: Tables 10, 11; Fig. 20).