

TERTIARY REGIONAL LITHOLOGIES(i) Conara-Cleveland (Sections B, C, D) (Fig. Nos. 8, 9, 10)

Little information is available on lower Tertiary sediments of this area due to inability to penetrate basalt. However, at B/6, there is 225 ft. of sub-basaltic sediments; at C/2, 185 ft. and at D/3, 297 ft., which is close to the maximum. This sub-basin is constricted downstream by narrowing dolerite banks. The sediments are fine and carbonaceous at B/6, with thick clay sections down to basement, incorporating much partly carbonized wood, indicating settled lacustrine or swampy conditions. At C/1-C/2 and D/3-W3C, there is abundant sand and silt with gravel sections, indicating more fluvial conditions. The sands are predominantly of colourless quartz and are grey overall, except for surface oxidised sections. Minor pyritic cement is present at the base of the sediments in C/1.

The basalt which rests on a fairly level surface at 600-650 ft. above sea level, possibly averaged 100 ft. thick originally and has been very deeply leached, leaving a kaolinitic, and in places bauxitic residuum. It has been largely stripped (C/1, C/10, C/12) and entirely removed elsewhere (W3C, W2B) where the Tertiary sediments were reburied under Pleistocene sediments.

(ii) Epping-Nile (Sections F, H, J) (Fig. Nos. 11, 12, 13)

A wide range of sediments occur at section F representing deltaic conditions where the paleo drainage course of the South Esk entered the main part of the basin. Only shallow silts rest on the deeply weathered undulating dolerite basement and above this is an alternating sequence of sands, silts and gravels. A marker bed of carbonized wood fragments occurs between F/2 and F/5 at about 200 ft. depth while a gravel marker extends across the whole section at an average of 100 ft. depth, forming a thick sequence at F/1-F/2. The sands and gravels contain a fair amount of white felspar, often quite coarse, partly kaolinized, which may be largely derived from Permo-Triassic rocks, or else locally from rapidly stripped dolerite.

The maximum thickness observed is at F/4, at about 300 ft. This is probably all Tertiary, as its collar is below the level of basalt. A lateritic capping between F/2-F/3 would indicate a pre-Pleistocene surface.

Across section H more settled conditions are indicated by thick silt-clay sequences in the lower parts. Shallow gravels here may in part be recent as the South Esk meanders over a wide present day flood plain after emerging from a dolerite entrenched tract, east of section F. This course was probably assumed after diversion, caused by basalt to the south.

The carbonaceous silty sands from H/4-H/6 have a grey-green appearance with much fine lithic material, probably derived from dolerite.

In H/4, dolerite basement is at about 200 ft. above sea level, under 370 ft. of sediments, of which about 320 ft. is probably Tertiary.

Similar settled conditions are indicated by sandy-silt-clay sequences at Section J.