GEOLOGICAL SEQUENCE IN RECENT DRILLING NEAR THE GOLIATH CEMENT COMPANY'S WORKS—RAILTON

by I. B. Jennings.

Bearing in mind the difficulty in establishing a rigid sequence in this area from drilling (see attached plan), it seems reasonably clear that the following sequence is present where fully developed. Exposures around the present quarry faces also support this sequence generally.

(1) Surface soil, pebbles and organic material.
(2) Tertiary (?) clays and pebbles.
(3) Lateritic (?) limonite horizon (occasionally).
(4) Weathered limestone.
(5) Fresh limestone.

The following remarks are offered concerning these horizons from a study of the cores of the recent drilling. The general sequence was discussed more fully in my earlier report (1959) on the conditions generally in this area.

(1) *The Soil Horizon.*—This is very thin, varying from almost nothing to, at the most, 10 feet. However, the surface of the ground is covered by a thin layer of pebbles many of which are magnetic. There may be sufficient accumulation of these in places to affect magnetometer work. I doubt if either the layer of pebbles or the magnetic fraction is constant over any distance.

(2) *The Tertiary (?) Clays.*—These consist of a variable thickness of clays containing quartz, quartzite and limonite fragments, many of them rounded. The pink quartzites closely resemble rocks of the Moina Sandstone sequence which directly underlie the limestone. No dolerite or basalt pebbles have been encountered in the drilling so that the possibility of these clays representing a very deeply weathered Permian section cannot be disproved. However, it is considered that this is extremely unlikely on the following grounds:—

(1) The horizon would be quite dissimilar both lithologically and structurally to the basal Permian sequence as exposed in this general area.

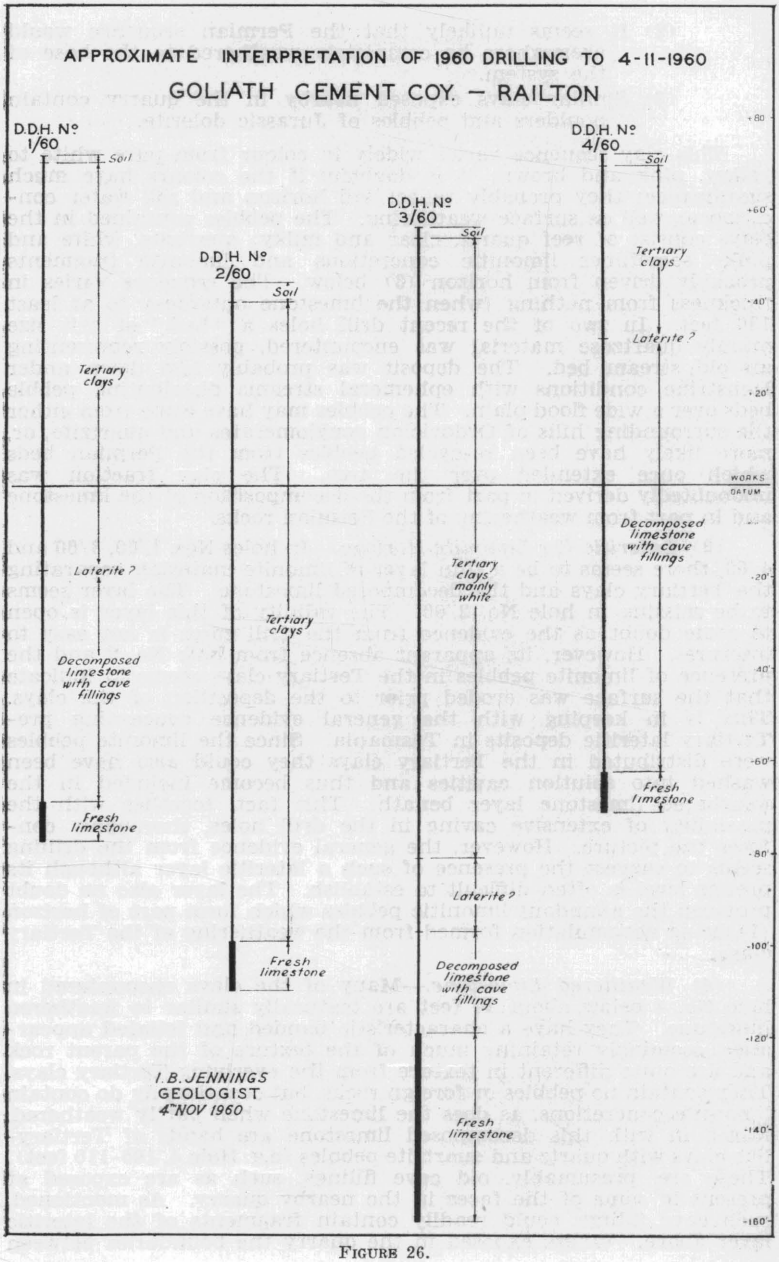
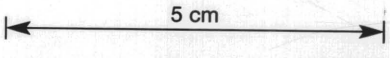

APPROXIMATE INTERPRETATION OF 1960 DRILLING TO 4-11-1960
GOLIATH CEMENT COY. — RAILTON
D.D.H. Nº 1/60
Soil
Tertiary clays
Laterite?
Decomposed limestone with cave fillings
Fresh limestone
D.D.H. Nº 2/60
Soil
Tertiary clays
Fresh limestone
D.D.H. Nº 3/60
Soil
Tertiary clays mainly white
Laterite?
Decomposed limestone with cave fillings
Fresh limestone
D.D.H. Nº 4/60
Soil
Tertiary clays
Laterite?
Decomposed limestone with cave fillings
Fresh limestone
WORKS DATUM
+80'
+60'
+40'
+20'
-20'
-40'
-60'
-80'
-100'
-120'
-140'
-160'
I. B. JENNINGS
GEOLOGIST
4th NOV 1960

FIGURE 26.


5 cm

(2) It seems unlikely that the Permian sequence would everywhere be completely weathered to the base of the system.

(3) Similar clays exposed nearby in the quarry contain boulders and pebbles of Jurassic dolerite.

This clay sequence varies widely in colour from pure white to yellow, pink and brown; it is doubtful if the colours have much significance; they probably reflect soil horizon and soil water condition as well as surface weathering. The pebbles contained in the clays consist of reef quartz, clear and milky; quartzite, white and pink; sometimes limonitic concretions and limonite fragments probably driven from horizon (3) below. The sequence varies in thickness from nothing (when the limestone outcrops) to at least 130 feet. In two of the recent drill holes a "bed" of grit size mainly quartzose material was encountered, possibly representing an old stream bed. The deposit was probably laid down under lacustrine conditions with ephemeral streams distributing pebble beds over a wide flood plain. The pebbles may have come from either the surrounding hills of Ordovician conglomerates and quartzite, or, more likely have been re-cycled pebbles from the Permian beds which once extended over the area. The clay fraction was undoubtedly derived in part from the decomposition of the limestone and in part from weathering of the Permian rocks.

(3) *Lateritic (?) Limonite Horizon.*—In holes Nos. 1/60, 3/60 and 4/60, there seems to be a thin layer of limonite materials separating the Tertiary clays and the decomposed limestone. The layer seems to be missing in hole No. 2/60. The validity of this layer is open to some doubt as the evidence from the drill cores is not easy to interpret. However, its apparent absence from hole No. 2 and the presence of limonite pebbles in the Tertiary clays seems to indicate that the surface was eroded prior to the deposition of the clays. This is in keeping with the general evidence concerning pre-Tertiary lateritic deposits in Tasmania. Since the limonite pebbles were distributed in the Tertiary clays they could also have been washed into solution cavities and thus become included in the weathered limestone layer benath. This fact, together with the possibility of extensive caving in the drill holes, thoroughly confuses the picture. However, the general evidence from the drilling seems to suggest the presence of such a lateritic layer although its precise level is often difficult to establish. The layer also no doubt provided the abundant limonitic pebbles which form part of horizon (1) being accumulation formed from the weathering of the Tertiary clays.

(4) *Weathered Limestone.*—Many of the clays encountered in hole No. 4 below about 40 feet are texturally similar to weathered limestone. They have a characteristic banded and foliated appearance, seemingly retaining much of the texture of the parent rock and are quite different in texture from the overlying Tertiary clays. They contain no pebbles or foreign rocks, but occasionally do contain limonitic concretions, as does the limestone when partly weathered. Mixed in with this decomposed limestone are bands of Tertiary-like clays with quartz and quartzite pebbles (e.g. Hole 4, 105-110 feet). These are, presumably, old cave fillings, such as are exposed at present in some of the faces in the nearby quarry. As mentioned, such cave fillings could readily contain fragments of the lateritic layer above. Where exposed in the quarry the boundaries between

the decomposed limestone and old cave fillings are clear and sharp. Due to poor core recovery and caving in drill holes it is not possible to define such boundaries from the drill core.

(5) *Fresh Limestone.*—The limestone recovered in the drilling was the typical blue-grey styolitic limestone found in this vicinity. There is ample evidence of solution cavities and irregular weathering of the top of the limestone. None of the limestone encountered was highly sheared and the dips of the limestone appear to be constant within about 10°. Sub-surface levels of the limestone vary from about —60 feet to —120 feet (below datum) in 120 feet lateral distance. If we take the earlier drilling into account the sub-surface discrepancy in level between the top of the fresh limestone in Hole 3/60 and the hole drilled last year on C traverse, would be even greater than this. Clearly the limestone surface is sharply pinnacled with individual pinnacles rising almost with vertical walls for as much as 100 feet.