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Report on Possibilities of Obtaining Underground Water on the Properties of Mr. Kirwood at Howden and Margate.

Howden

The property examined was a 222 acre block charted in the name of P.D. Kirwood. It has a frontage along the shore of North West Bay and extends inland for 1¼ miles towards the elevated central portion of the peninsula. The property is occupied entirely by sandstones and shales. The sandstones are generally of medium grain but all varieties are found down to those fine-grained ones which pass by insensible gradations into coarse grained shales. This series of rock is at least 200 feet in thickness and probably belongs to the Trias-Jura system, although there is no evidence to distinguish them from corresponding members of the Permo-Carboniferous System. The medium grained sandstones should be sufficiently porous to contain supplies of underground water. They form a narrow belt along the north-eastern shore of North-West Bay and so do not have a large watershed. Numerous gullies intersect this belt and cause the surface to be much broken. Though the conditions are not ideal for the occurrence of underground water, it is probable that the sandstones would yield small quantities of water.

The present supply is obtained from a water-hole and shallow well in the small creek below the house. This supply could be improved by sinking the well down to the bedrock of sandstones and a short distance into the latter. A windmill and pump could be installed to pump the water to the vicinity of the house to be used for watering stock. There might be a surplus of water during dry periods which could be used for irrigation, but this surplus would not be sufficient to irrigate any large area.

Several hundred yards to the south of the house and on the opposite side of the ridge, supplies of water have been obtained in very shallow wells and trenches. In an attempt to reach this level a shaft has been sunk on the ridge between these supplies and the house. The shaft is 12 feet deep and passed through soft, weathered, sandstones and shales. The shaft would have to be sunk to a depth of 30 to 40 feet to reach the level of the shallow wells. If the rocks continued to be as soft as those in the shaft the additional 18 to 28 feet would be easily drilled by a hand plant. It is problematical, however, as to whether this soft condition will persist downwards. It would be more convenient, have the same chance of success, and the rocks might be better to bore through, if boring operations were carried out near the pig pens instead of from the bottom of the shaft.

In addition to the above, it must be pointed out that if the sandstones were bored to a depth of approximately 100 feet by a power plant, supplies of water would probably be obtained. As the water is required for irrigation, the quality, which is the most important factor, would probably not be suitable for this purpose.

Margate

The property of Mr. A.W. Kirwood, adjacent to the jetty at Margate was also examined. This property consists of a very flat plain ending along the shore in cliffs

10 to 20 feet in height. The upper portion of this plain is occupied by heavy gravels containing numerous pebbles and boulders of diabase in a clayey matrix. These overlie several feet of loosely-compacted sandstones which, in turn, overlie clays, both the latter deposits being of Tertiary age.

The superficial gravels and the sandstones are porous and small supplies of water might be obtained by sinking to the bed of clay. The resulting supplies would contain dissolved mineral salts (largely bicarbonates of calcium and magnesium and perhaps sodium chloride) which might interfere with spraying solutions for which the water is required.

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