

Correlative evidence indicates that the Warburton Range assemblages of acid and basic flows and sills and interbedded sediments, belong to the Nullagine formation.

3.—SUMMARY OF A REPORT ON A SAMPLE OF STINKSTONE (STINKSTEIN) FOUND IN A LIME DEPOSIT ON BOOLARDY STATION, MURCHISON DISTRICT.

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From the inspection carried out in the field and from information otherwise obtained, we have arrived at the following conclusions:—

1. Most of O.P.A. 236H is occupied by granite on which may be shallow surface deposits, but deep basins would be most unlikely.
2. The stinkstone is not confined to the spot where it was first found, but was located in four other places by us, so it is probably fairly common.
3. Where found it was evident that the stinkstone was definitely a variety of travertine limestone, usually the darker variety, occasionally the yellow, but never the really white.
4. The stinkstone does not occur in a regular limestone bed similar to oil-bearing limestones in other countries, but is a surface deposit.
5. Confirming field evidence, analyses of the samples collected show no signs of petroleum.
6. In our opinion, therefore, the occurrence of stinkstone at Boolardy Station has no bearing whatever on the possible occurrence of mineral oil in that area.

4.—FINAL REPORT ON THE CORRELATION OF THE ARTESIAN BORES IN THE METROPOLITAN AREA, PERTH.

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Investigation shows that the information available is insufficient and of too doubtful a character to be used in the production of an accurate sub-surface contour map, indicating the depth below the surface of the various artesian water beds.

The reasons for this conclusion are as follows:—

1. The majority of the bore records available depend on drillers' logs only for a description of the strata passed through. A comparison of the drillers' logs with determination of the strata made by officers of the Geological Survey in the few instances where the cores have been examined by them, shows the drillers' determinations to be often much in error and of very doubtful value.
2. In those cases where sections of the cores have been preserved, there are insufficient samples to allow of these cores being used for accurate correlative purposes.
3. There is great uncertainty in many of the boring records as to the exact depth at which the flows began, in many instances there being in the record simply a note of the amount of flow in gallons per day at a particular depth, the depth at which the flow started being omitted.

4. It has been the custom to record the temperature of the water and its static head only after completion of the bores so that these records for correlative purposes are of doubtful value. The same applies to water analyses.

5. On a study of the bore logs in the Claremont District, it appears that the strata are displaced between the Claremont No. 1 and No. 2 Bores. Lack of information as to the direction and amount of throw of this fault and the possibility of faulting in other parts of the Metropolitan Area make any sub-surface contour plan, drawn without more information than is at present available, of very doubtful value.

The following conclusion have been reached as the result of this investigation:—

The base of the coastal limestone series, consisting of current bedded calcareous sandstones, lies at elevations varying from sea-level to as much as 180 feet below sea-level in different parts of the Metropolitan Area.

Underlying the coastal limestone series there are lacustrine deposits of soft calcareous shales and sandstones passing downwards into a series of marine beds of calcareous shales or mudstones, sandstones and impure limestones. All the beds present are extremely lenticular.

Under the Metropolitan Area there are three distinct artesian water-bearing horizons. These horizons can be distinguished by water analyses, static heads and temperatures of the various flows. The horizons when contoured from bore to bore are found to be unconformable and it is suggested that the water-bearing horizons lie on the surfaces of the unconformities, because of the frequent occurrence of extremely coarse sands and small boulders in the water-bearing zones. These sands are in distinct contrast to the fine-grained nature of the other sediments throughout the series.

Of the three horizons, the upper two have a limited distribution. The upper horizon is met with in the bores in the vicinity of the city and at Osborne Park, and it is thought that the bores of the Guildford District also draw their water from this horizon. The second horizon is met with in the bores in the Leederville District and in the King's Park bores on Mount's Bay Road. The third horizon covers a larger area, having been encountered in all bores of sufficient depth.

In the attached table the various bores in the Metropolitan area have been divided into groups according to which horizon each bore derives its main supplies of water. In the case of those bores which draw by separate casings from two horizons, the separate flows have been listed in their respective groups. Details, where available, of water analyses, temperatures and static heads are also shown.

Three main artesian water horizons can be recognised and these have been named, for purposes of reference, according to the district in which each horizon has been chiefly exploited by boring. As will be seen from the table, these are the Claremont-South Perth, the Leederville and the City horizons, which occur in that order from the lowest upwards. Owing to the relatively isolated positions of the bores at Fremantle, Guildford and Midland Junction from the remainder of the bores in the Metropolitan Area these have not been correlated, as it is considered that too great an uncertainty exists to allow of this being done.