

*Report on the Deposits of Auriferous Cement at the "25-Mile" workings, Coolgardie Goldfield, by S. Göczel, Field Geologist.*

*To the Secretary for Mines.*

SIR,

Coolgardie, August 5th, 1895.

In addition to my telegraphic report on the so-called cement deposits, I beg to state as follows:—

The auriferous deposits in question are situated about seven miles in a Northerly direction from the "25-Mile" (Coonahion). They appear as banks and cappings, and, although partly covered by more recent surface formations, they must be regarded as surface deposits.

Lithologically considered, the rock of which those deposits consist is sandstone, with more or less frequent transits into conglomerates.

The auriferous sandstone banks overlay immediately the country formation. The latter is gneissic-granite rotted or decomposed to a considerable depth.

The principal component elements in the auriferous deposits are:—

1. Sharp-edged quartz grains derived from the decomposed country formation;
2. Quartz-brecciac, derived probably from secretion veins which were contained in the decomposed country formation; and occasionally
3. Small, rounded, and smoothened quartz pebbles.

The matrix cementing those rock elements consists chiefly of crypto-crystalline silica, which frequently becomes more or less ferruginous, imparting to the rock variegated colouring.

In some portions the auriferous rock presents porphyritic habitus, and in such places the cementing matrix assumes felsitic character.

The transit from the silicious into the felsitic matrix is in some instances abrupt, in others gradual.

The gold occurs embedded in the matrix, and the gold particles are frequently visible to the naked eye.

Partial crystalline development on some of the observed gold particles, and the absolute absence of a waterworn character, admit only primary deposition from a solution.

In some of the ferruginous portions pseudomorphs of brown hematite, after pyrites, can be observed.

In such portions some of the gold was associated originally with pyrites, and became liberated during the decomposition of the latter.

Considering the above observations, it follows that the cementing matrix, and the gold contained in the same, are a contemporaneous precipitate from one and the same thermal solution.

Genetically identical auriferous surface deposits occur in many places within the interior auriferous region. Lithological differences find full explanation in the difference of the country formation in which the thermal vents were situated, and also in local conditions.

Such gold deposits within the interior auriferous region, wherever they have proved to be payable, have been worked by the digger.

The surface gold deposits within the interior auriferous region are sometimes of primary, sometimes of secondary origin; but it would be a difficult matter to draw a practical line of distinction between the two.

Joint occurrences and gradual transits produce that difficulty. An attempt to draw such a line of distinction between surface gold deposits would only widen the field for litigation and paralyse part of an energy which has proved of great value to the advancement of our gold-mining industry.

I have, &c.,

S. GÖCZEL,

Government Field Geologist.