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PRELIMINARY REPORT ON WHITE CLAY AT BELL MOUNT

by K. L. BURNS

Introduction

The clay deposit of Mr. M. A. Good of Erriba is located on the West Spur of the Bell Mount Goldfield. The latest report on this field was by Broadhurst in 1934, who listed five earlier reports.

Three brief visits have been made on the present occasion, while Mr. G. Fowles has spent two days investigating old workings for outcrops of white clay.

For the most part this report is based on investigations of earlier workers, but several significant re-interpretations are made.

Locality

The turn-off to the goldfield is 35 miles from Devonport on the Cradle Mountain Highway, and about one mile north of the Moina turn-off, where the highway occupies the watershed between the Forth and Wilmot rivers. From the turn-off, half a mile of old formation, negotiable with Land Rover in all weathers, terminates at Adam Smith's old homestead near the junction of Bell and Basalt Creeks.

General Geology

Bell Mount, to the north, is composed of Cambrian greywacke siltstones, with a sheared green pyroclastic rock outcropping on the track to the Washington Mine. The southern edge of the Mount is defined by an east-west linear, interpreted as a fault, although Elliston has mapped this as an unconformity.

South of the linear the bedrock is Owen Conglomerate and Moina Sandstone. The sandstone contains rhynchonellid fossils near Sykes workings on Bell Creek. The general structure of the goldfield appears to be a syncline plunging south, excavated to form a shallow basin.

Bell Mount Goldfield

The topography and geology are described by Broadhurst.

The central portion of the basin is occupied by black pug, the flanks by white clay, both being overlain by alluvial wash. On the top of East and West Spurs outcrops a "ferromanganese gossan" described by Reid. Since the disposition of the associated deposits affects the potential reserves of white clay, it is necessary to discuss their distribution.

(a) **The Ferro-Manganese Gossan.** This outcrops extensively on the East Spur, where it consists of plates and botryoidal masses of limonite cementing quartz sand, embedded in a brown clay more than seven feet deep. Similar plates occur on West Spur, where they overlie a sinuous auriferous lead.

There is no doubt that these "gossans" are iron cemented sub-basaltic deposits of Tertiary age, and are remnants of a capping that originally extended across the area at a general elevation of 1775 feet.

(b) **The Black Pug.** The pug is more than 16 feet deep, and is really a graphitic shale. In Poverty Creek thin seams of bedded chert occur in the pug. In Bell Creek, intraformational siltstone breccias occur in the pug, and rhynchonellid fossils. About 100 yards upstream from the confluence of the east and west branches of Bell Creek, bands of sandstone and white clay are interbedded with the pug, the latter carrying rhynchonellid fossils. Cubes of pyrite are everywhere abundant.

The black pug is a graphitic shale conformably overlying the Moina Sandstone, and represents weathered limestone or transition beds at the base of the limestone.

(c) **The White Clay.** The limits of exposed clay are indicated on the map. The outcrops on West Spur have been pegged by Mr. Good. The clay is exposed in a shallow pit and several trenches, in a water-race further down the hill, and in a sluice-face near Basalt Creek.

The clay is white, with a faint blue tinge, and only occasional brown seams. The greatest depth exposed is three feet.

An amount of clay, not exceeding one ton by the size of the excavation, was shipped by a Mr. Loney to Melbourne about 1925.

The clay is also exposed in a water-race on East Spur.

The amount of clay readily accessible without requiring excessive stripping of the wash overburden amounts to less than 5000 yards, assuming a depth of three feet.

(d) **The Alluvial Wash.** Detailed descriptions of the wash are given in earlier reports. On West Spur the wash overlying the clay is a fat putty sand, ranging from one to three feet deep. The thickness increases to near 12 feet near Bell Creek, where it overlies black pug. The amount and size of boulders increases down the hill, till near Bell Creek boulders up to three feet diameter occur.

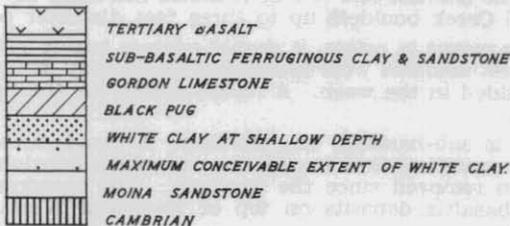
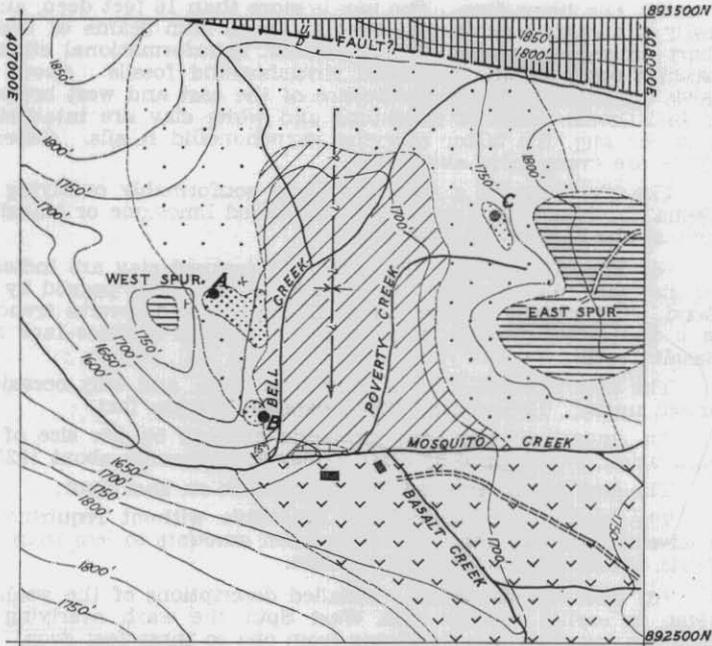
If the wash is recent in origin, it should contain basalt boulders. Although two basalt boulders were found in a spoil dump, none have been found embedded in the wash. A recent source for the wash is difficult to locate.

If the wash is sub-basaltic, i.e., Tertiary, it could have been derived from the summit of Bell Mount, the rest of the conglomerate cover having been removed since the Tertiary. The occurrence of gold in the sub-basaltic deposits on top of East and West Spurs supports this view.

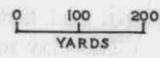
Origin and Extent of the White Clay

The clay may represent remnants of a sub-basaltic layer which blanketed the black pug, and was overlain by the ferruginous

GEOLOGICAL SKETCH MAP OF BELL MOUNT GOLDFIELD



GEOLOGICAL BOUNDARIES -----
 CONTOURS (50ft. intervals.) ~~~~~



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Plate 22

deposit. This would require the wash to be of Recent origin. Under this view, the clay is probably confined to the East and West Spurs, and potential reserves amount to 25,000 yards assuming a depth of three feet.

However, it seems probable that the clay represents a weathered claystone occurring near the top of the Moina Sandstone, because of the occurrence in Bell Creek of similar clays which are interbedded with the black pug and carry fossils. In this case the clay will flank the basin on three sides, and potential reserves are 150,000 yards assuming a depth of three feet. The chances of finding areas of clay with only a thin wash cover are considerably improved under this second alternative.

Conclusions

Exposures are completely inadequate to enable a reliable estimate to be made of the tonnages economically available. However it appears that several thousand yards are available with only two to three feet of overburden.

Depending on the origin of the clay, potential reserves may be 25,000 yards or even as much as 150,000 yards, assuming a uniform thickness of three feet. However much of this may be covered with wash exceeding five feet deep.

It is unlikely that sufficient gold could be recovered to pay the cost of removing the wash. A relatively cheap access road could be constructed from the highway to the summit of the East Spur, a distance of 30 chains. The estimated cost of carriage of clay to Devonport is £2 per yard.

Recommendations

If the clay is of desirable quality, the first requirement is a shaft to bedrock to enable a geologist to inspect structures in the clay at depth. Depending on the results of this, a boring campaign will be necessary before any definite calculations can be made.