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Dolomite reserves in the vicinity of the Hastings Caves Reserve

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An examination has been made of the area surrounding the Hastings Caves Reserve in order to ascertain if appreciable reserves of dolomite could be located, or what work or expenditure would be necessary in order to prove reserves of at least one million tons.

Geological information on this area is meagre and no analyses of the reported dolomite were available. Two chips of stone from near the cave have been analysed chemically and examined by X-ray diffraction. The X-ray pattern indicated that the rock consists largely of dolomite with a little quartz and this was substantiated by chemical analyses which showed that the chips contained 21% and 20.4% respectively of MgO, which is close to the theoretical composition of pure dolomite.

A geological reconnaissance has been made of the roads and tracks in the area together with several short traverses into other likely areas in the district not covered by access routes. Geologically the results of this work were mostly disappointing. The area is very densely covered with semi-mature eucalypt regrowth and dense rain forest. Apart from a few quarries along the roads, dolomite at Newdegate Cave and the known silica deposits on the Hogs Back ridge, only one other outcrop has been discovered. Elsewhere the ground is covered by Quaternary gravel and matted vegetation and provides no useful geological information. Fieldwork in the area is severely restricted by the dense vegetation and any exploration which is contemplated in the area will be slow, difficult and expensive.

The known rock distribution is shown on Figure 1. This, together with the practical considerations demanded by quarrying in the district, indicate that if dolomite is to be sought in the area, then the exploration should be directed to the area shown as 'A' on Figure 1. The reasons for selecting this area are:

1. The flat area southeast of area A is swampy and carries abundant surface drainage. The resurgence of thermal springs in the vicinity also suggests that locally heavy subsurface water flows may be encountered in this area. This area is also covered by a blanket of Quaternary gravel and clay overlying bedrock. Thus any quarry in this area would have to be an open pit operation liable to sudden and possibly uncontrollable groundwater flows. For suitable quarrying conditions the rising ground northwest of the Hogs Back and to the northeast of the road to the caves present the most promising conditions.
2. The area to the northeast of the road is excluded on geological grounds, as the only dolomite likely to be present would be a very narrow strip adjacent to the northeast side of the present cave reserve.
3. It is considered that any quarrying operation should be situated at least half a mile from the present cave in order to provide a measure of protection to the very delicate stalactites in the existing caves. Even at this distance it is considered that careful testing prior to opening up a quarry and strict control of blasting procedures would be necessary during quarrying operations.
4. Dolomite occurs upstream from the cave reserve, but the area is known to contain caves presently under investigation by caverneering interests. Exploration in that area, besides offering formidable access problems, would bring an immediate confrontation with caverneering and conservation interests.
5. The only outcrop found to date was away from the current cave reserve and within area A. This occurs along the old forestry track running southwest from the end of the caves road. The area traversed by this track is dotted with thick rain forest and the geology, apart from a single exposure, is completely obscured by soil, vegetation, deeply weathered rock and talus. This exposure consists of cavernous dolomitic limestone, with three chip samples from the only outcrop assaying only 5.5%, 3.9% and 2.4% MgO. Whilst this material does not in any way approach a workable grade it does serve to indicate the presence of the rock sequence in the area.

For the reasons outlined the area is not attractive as a potential source of dolomite. The presence of a cave reserve over the best and most accessible deposit, together with the limitations this imposes on possible quarries nearby and the difficulties of the terrain, will make further investigations difficult.

Recommendations

In order to prospect for additional dolomite reserves in the district, in an area where quarrying would be a practical proposition, it will be necessary firstly to open up an access route into area A (fig. 1) and provide some exposures so that further geological, geochemical and geophysical work can be undertaken.

It is recommended that the first step would be to bulldoze out the old forestry track shown on Figure 1, over a distance of about two miles. In addition to providing access, the bulldozing should also be aimed at uncovering as much bedrock exposure as possible along the route.

Estimated cost for this stage of the investigation is approximately $1000.

Following the above, a further geological examination of the area should be made. If the results of this work justify it, geophysical and geochemical surveys could be carried out to indicate areas of most interest.

The final stage of investigation would be a diamond drilling programme to prove up the required quantity and quality of the dolomite.

It is estimated that a drilling programme to prove about one million tonnes of dolomite would cost between $4000 and $5000, but this is subject to modification when the geology of the area is better known.

Finally it is noted that the area is a State Forest and permission would be required from the Forestry Commission before bulldozing and other works could be undertaken.

[22 October 1971]

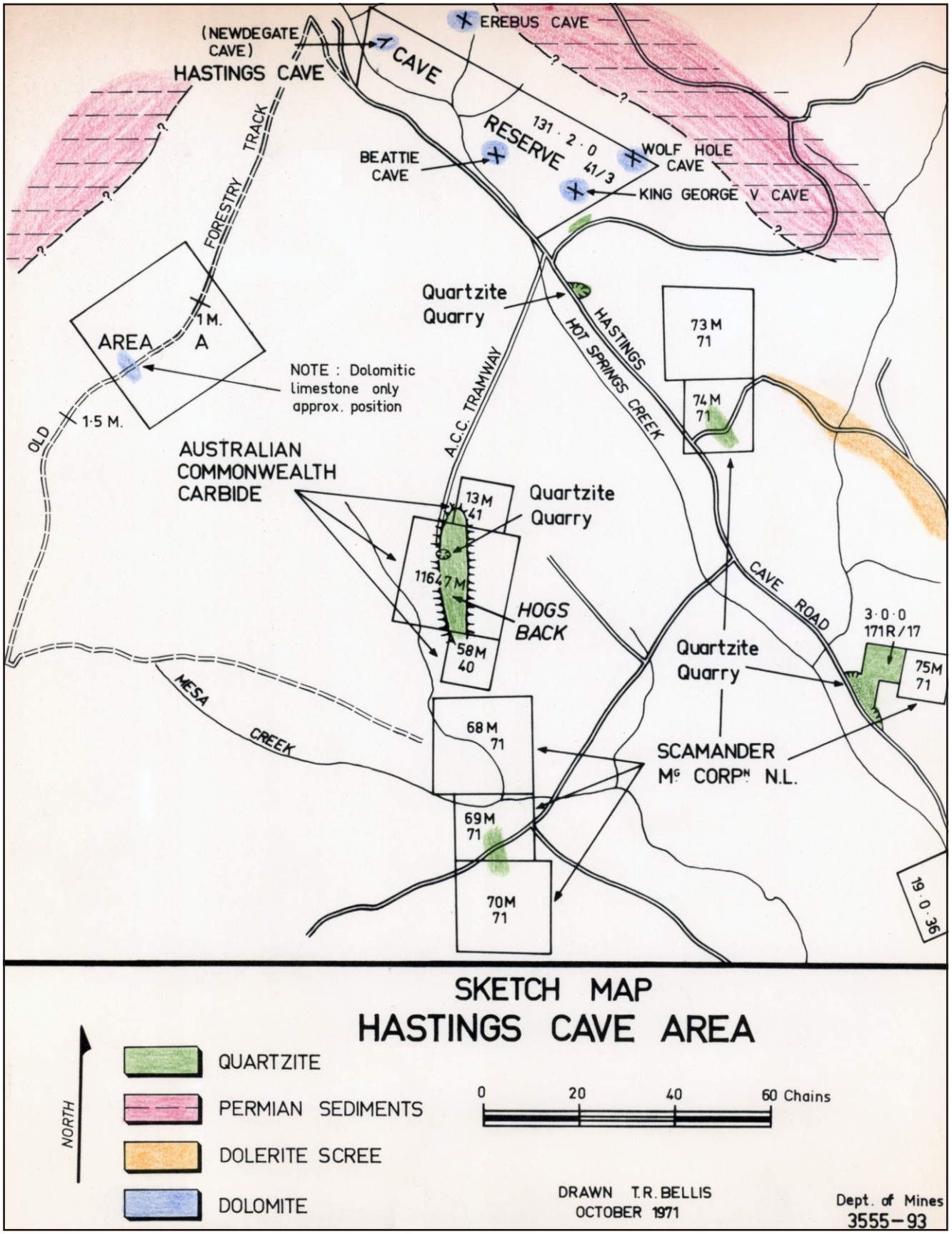
(NEWDEGATE CAVE)
HASTINGS CAVE
CAVE
EREBUS CAVE
RESERVE
131 . 2 . 0
41/3
BEATTIE CAVE
WOLF HOLE CAVE
KING GEORGE V CAVE
FORESTRY TRACK
AREA A
1 M.
1·5 M.
OLD
NOTE : Dolomitic limestone only approx. position
Quartzite Quarry
A.C.C. TRAMWAY
HASTINGS HOT SPRINGS CREEK
73 M 71
74 M 71
AUSTRALIAN COMMONWEALTH CARBIDE
13 M 41
Quartzite Quarry
116 47 M
HOGS BACK
58 M 40
CAVE ROAD
3·0·0 171R/17
75M 71
Quartzite Quarry
MESA CREEK
68 M 71
SCAMANDER Mg CORPn N.L.
69 M 71
70M 71
19·0·36
SKETCH MAP
HASTINGS CAVE AREA
NORTH
QUARTZITE
PERMIAN SEDIMENTS
DOLERITE SCREE
DOLOMITE
0 20 40 60 Chains
DRAWN T.R. BELLIS
OCTOBER 1971
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Figure 1