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REPORT

on the

PHOTOGEOLOGICAL INTERPRETATION

of

L.E.E. Mosaic Sheets T8, T12, T16.

for

Mt. LYELL - ELECTROLYTIC ZINC - EXPLORATIONS

QUEENSTOWN

TASMANIA

Adastra Hunting Geophysics Pty. Ltd.,
3 Queen's Road,
MELBOURNE, S.C.2,
Victoria, Australia.

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Photographs covering the three sheets have been examined stereoscopically, and various geological boundaries, structures and bedding trends have been indicated. Correlation of the various interpreted formations with those already mapped has only been possible to a limited extent. Generally there is a lack of definite continuity from mapped to unmapped areas, and it is felt that no useful purpose would be achieved by pushing possible correlations too far.

The interpretation should however provide sufficient information for future field traverses to be planned in the most economic manner so that the maximum amount of data is obtained.

It will also be noted that the majority of structures shown are classed as linear features of unknown origin, and that there are relatively few definite faults. As evidence of faulting, we have depended on visible dislocation, or discontinuity of formations and these are rare. The most important faults seem to have a general E - W trend and to be more common in the northern part of the area. In much of the country already mapped faults are rather common, but a number of these are barely apparent on the photographs or cannot be confirmed at all.

By contrast there are a vast number of linear features visible, which are revealed by vegetation, drainage or photo-tones. Many of these may be minor faults, but they would also include incipient faults, joints and probably some bedding trends. At least within limited areas they tend to be parallel to one of several main directions.

While generally accepting the given geology as a guide, there are several aspects with which we would disagree to a certain extent and these are indicated under the discussion of each sheet.

MAP 8

On this sheet there is the greatest diversity of formations. In the north-west sector the oldest Pre-Cambrian rocks (Frenchman Quartzites and Joyce Schists) occupy a block trending ESE to WNW. They are probably bounded on the southern side by a major fault. This fault and other sub-parallel ones to the north either die out to the east or stop at a major NE - SW fault (photograph 87; run 6).

In the area already mapped a number of cross-faults has been shown, but for the most part these are not readily apparent on the photographs and we should expect that, at the most, displacement along them was small. If considered important possibly these should be checked again as certainly in some places they seem to be continuous across an indicated fault.

The central part of the map is occupied by a basin of Palaeozoic rocks. In the north the Ordovician already mapped is separated by the NNE - SSW fault from the Frenchman Quartzites. The southern continuation of this fault is lost under the material on the floors of the large valleys (?Quaternary gravels). Further south the Palaeozoic basin is bounded by a strong E - W curved fault which seems to die out to the east.

The boundary between the Palaeozoic and Pre-Cambrian on the eastern side is hard to determine and is evidently mainly hidden under alluvium. Probably the younger rocks lie unconformably on the older. The Pre-Cambrian of the south-west sector has been mapped partly as Scotchfire Schists and partly as Jane Dolomite. The remainder of the western side comprises bare quartzite ranges and tree-covered hills. The latter are evidently continuous with the Scotchfire Schists already mapped. Bedding trends are very difficult to distinguish in these tree-covered hills, but there seems no reason for not considering them all to belong to the Scotchfire Schists as far north as the fault bounding the Frenchman Quartzites. The adjacent quartzites in the lakes area are therefore presumed to be Fincham Quartzites.

Field work has indicated that the northern and southern parts of the central area comprise Palaeozoic sediments. It is probable that the latter occupy the whole of this area. An E - W traverse has evidently been made from the Jane River road and all the beds from Ordovician to Florence Quartzites encountered. Unfortunately no clear cut boundaries between the formations are apparent on the photographs; also they cannot be continued northward with any certainty. This difficulty is increased by the lack of any overlap between runs 8 and 9.

On run 9, of the Ordovician sediments only one hill of probable Owen Conglomerate is at all distinctive, and this only for a short distance. To the north the Gordon Limestone probably forms poor outcrops or disappears completely under the alluvium of the river. Of the Silurian sediments it appears as if the Amber Shales may extend over a wider area than shown and possibly be bounded on the eastern side by a fault. The easternmost quartzites mapped appear to dip to the west on the photographs and this is borne out by two out of three of the measured dips. Unless the Florence Quartzite has a distinctive field appearance so that its identification is undoubted, it would seem just as likely from the photographs that the quartzite on the road is on the east limb of a syncline and may be correlated possibly with the upper part of the Crotty Sandstone.

Further eastward other ridges suggest westerly-dipping sediments which are evidently of the lower part of the Silurian and Ordovician. In the middle part of the runs 7 and 8 where trends are mostly easily interpreted there appears to be a series of synclines and anticlines, probably belonging to the Silurian with Ordovician appearing on the flanks. Definite interpretation of individual formations is not possible but a single NE - SW traverse should give a good cross-section of the succession and enable all the formations to be identified.

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The Palaeozoic rocks are intersected by several ENE - WSW faults along which displacements are small.

To the east of the Palaeozoic basin are further areas of Pre-Cambrian rocks overlain in part by dolomite hills and probably flat-lying Permian sediments. It is assumed that the Permian comprises the flat-lying benches appearing beneath the Jurassic of the western outlier, but the boundary between the two is not easily picked out in the north and is covered by scree in parts.

Bedding trends and structures in the Pre-Cambrian on the eastern side are generally obscure. For the most part the country is covered with heavy forest except above the tree line where small patches of quartzites may be seen. Probably schists comprise most of the country. The main trends seem to be N-S, possibly swinging to the north-west in the north.

It is a striking feature that the streams draining the Palaeozoic sediments usually have relatively wide (?) alluvium-filled valleys and were possibly dammed up by the block of Frenchman Quartzites at some stage.

MAPS 12 & 16

We are in general agreement with the mapping of the northern sector, although it appears that the positioning of some of the features may not be quite correct. From this mapping we infer that the Scotchfire Schists, Jane Dolomite and Fincham Quartzite respectively appear on the photographs usually as forest-covered hills, flat comparatively bare areas with poor outcrops, and bare white more rugged hills. Assuming these distinctions apply elsewhere in adjacent areas, then it appears that much of the country to the east and south of the mapped area comprises Scotchfire Schists, being tree-covered hills. Particularly in the east bedding trends are vague.

Structurally the area mapped is in contrast to most of the remainder of sheets 12 and 16. Over sheet 16 the general strike direction is NNE - SSW, swinging around to the north-east across the middle of sheet 12. Faulting does not seem important in the southern area. In the mapped area of runs 9 and 10 however bedding trends are variable and faulting more common. As on sheet 8, the most important fault direction is ESE - WNW.

The dominant topographical feature of this whole area is the high quartzite range which trends NNE - SSW across the middle of the sheet. This has a steep dip to the east and is continuous across sheet 16 except for one E - W fault which has small displacement. In the north the range swings round more to the east and eventually the quartzite largely disappears in a thickly timbered area. This appears to be due to the

effect of strong E - W faulting coupled probably with a general plunge to the north. Parallel to and east of the big range there is a series of synclines and anticlines. The rocks appear to comprise mainly schists and quartzites. Outcrops are scarce in the wide Denison River valley east of the range, but it is probably occupied by schists with possibly dolomite in the centre. The quartzite seems to thin out in the south and disappear into a tree-covered area. This may indicate a change of facies.

Further to the east again beyond a probable anticline quartzites predominate. The position of fold axes in the steeply-dipping quartzites is not certain but it seems as if the latter quartzites dip off the schists of the hills east of Denison Valley. This suggests that these quartzites may be higher in the succession than those of the range.

The picture west of the high range is rather obscure. There appears to be rather broader folding than in the east, but bedding trends are less easily seen. The rocks are probably mainly schists in the tree-covered areas with one zone, largely bare of vegetation which may comprise dolomites.

The western flanks of the main range appear to be largely covered with outwash with a few hard rock outcrops.

The relationship of the quartzite of the main range to the beds immediately to the west is uncertain. Towards the northern end of the range some of the poorly outcropping beds to the west seem to run into the quartzite at an angle suggesting either an unconformable relationship or that rocks of the range have been thrust over the other beds.

In the far south some of the narrower ranges with better defined dip slopes are somewhat reminiscent of the palaeozoic rocks to the north.

The full succession of rocks occurring on Sheet 16 should be encountered by a single E - W traverse across the middle of the sheet, with perhaps a check along the southern margins.