

**GEOLOGY OF PORTION
OF THE GRAND UNCONFORMITY
NORTH OF BROKEN HILL, N.S.W.**

BY

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INTRODUCTION.

Location. The area is situated 26 miles due north of Broken Hill in the Northern Barrier Ranges. It comprises some fifteen square miles adjacent to the unconformity of the Younger Torrowangee Series and the older rocks of the Willyama Complex. From the Brewery Creek Pluton it extends eastwards to a point just west of the Paps, while the northern boundary is about 2 miles south of Poolamacca homestead.

Physiography. The topography is one of low hills which are usually covered by a typically semi-arid vegetation consisting predominantly of mulga (*Acacia Aneura*), Dead Finish (*Acacia Tetragonaphylla*) and Beefwood (*Grevillea Striata*) together with the everpresent saltbush.

The hills of the area fall naturally into three well defined groups. Jagged, craggy ridges in the schist area stand up in marked contrast to the rounded, boulder strewn hills of the tillites, and the pale, tor covered hills of granite.

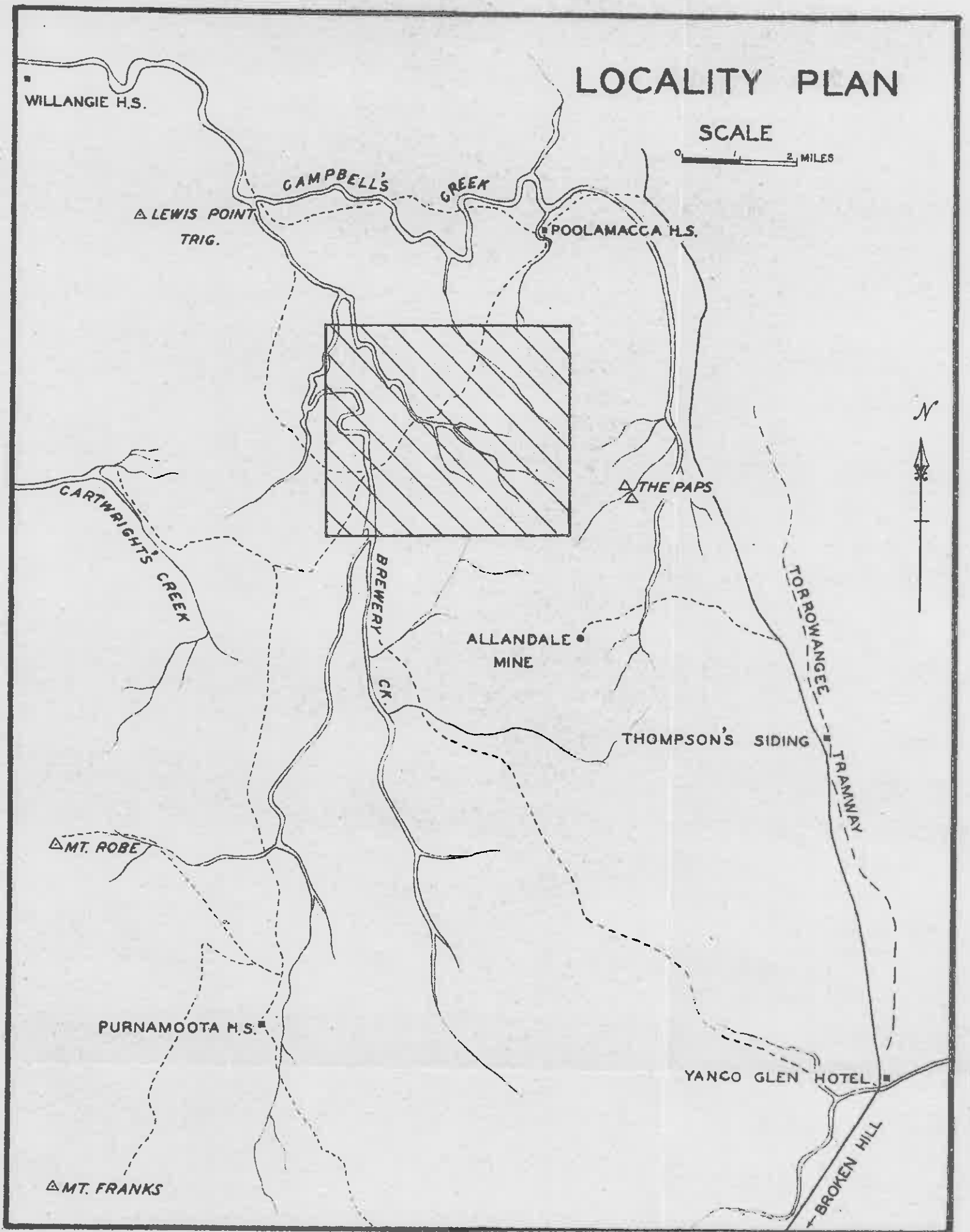
Because of the paucity of vegetation and general lack of soil cover the rock outcrops are usually particularly good.

The country is well dissected by numerous streams, the largest of these being the Brewery and the Wookookaroo Creeks which are typical of the Barrier Ranges. These normally flow only after heavy rains, but deposits of water bearing sands along their seemingly dry beds support large red gums which give welcome relief from the scant vegetation of the hills.

LOCALITY PLAN

SCALE

0 1 2 MILES



A WHITE

The larger streams appear to be independent of the geological structure while the smaller tributaries tend to follow some structural feature. This is particularly evident in the trellis type drainage pattern in the more gently folded Torrowangee beds.

It is interesting to note that the whole drainage scheme is essentially to the West - even those streams which flow to the East on the Eastern margin of the area eventually link up with west flowing streams which cut through the ranges to the Lake Frome plains beyond. This, together with the meandering nature of the larger creeks, is suggestive of antecedent origin.

Previous Investigation and scope of present work.

The unconformity between the Torrowangee series and the Willyama complex was first recognised by Mawson and described by him in his memoir of 1912. This was followed by Andrews comprehensive report on the geology of the Barrier Ranges which was published ten years later. No further attempt was made to remap or reinterpret the regional geology of the area until 1950 when Zinc Corporation geologists made a broad study on a regional basis.

An important outcome of this recent work was that a post Torrowangee age was proposed for the Paps granite "dyke" which outcrops parallel to the unconformity from Yanco Glen to the Paps and then swings westward, still parallel to the unconformity

towards Brewery Creek. A post Torrowangee age was likewise proposed for the Brewery Creek Pluton and other similar granite masses in the area.

These granites are a phase of the newer or Proterogine granites of Mawson (1912) and the Mundi Mundi granites of Andrews and Brown (1922) and have previously been regarded as pre-Torrowangee in age.

Zinc Corporation geologists have also reported that the pegmatites which are so abundant in the older Willyama rocks have been intruded into the base of the Torrowangee series in certain localities.

The post Torrowangee age of the granites raised an important problem, in that the tillites, which occur near the base of the Torrowangee series, contain abundant large granite boulders, seemingly identical with the supposedly younger granite.

The exact nature of the unconformity itself has also been much debated in recent years. Some have gone so far as to suggest that this structure has been entirely obliterated by Post Torrowangee thrusting and metamorphism.

Another problem was the occurrence, in the Brewery Creek area, of quite a considerable thickness of highly folded glaciogene sediments stratigraphically below the basal quartzite horizon which occurs along the Yanco Glen-Paps line.

These problems together with the possibility of some post Torrowangee pegmatization prompted the present investigation.

The area was mapped in considerable detail with the aid of aerial photographs kindly supplied by the Zinc Corporation—some five weeks being spent in the field.

The accompanying map was produced by the slotted-template method from the aerial photographs.

A representative cross section of the rock types occurring within the area was collected and some 60 of these were sectioned and examined microscopically.