Platinum Discovery?:

A Shiny New Result of the Garden Range 2 Excavations on Taungurung Country

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Introduction

We wanted to know where the artefacts from the Garden Range 2 (GR2) site came from (**Figure 1 & Figure 2**). Were these hammerstones and grinding stones locally sourced or did people bring them to the site through exchange networks 700-800BP years ago? How do the excavated artefacts compare to those in the Museums Victoria collection?

Figure 1: Photograph of the Garden Range 2 site while facing south, 20 June 2018 (McNiven et al. 2024).

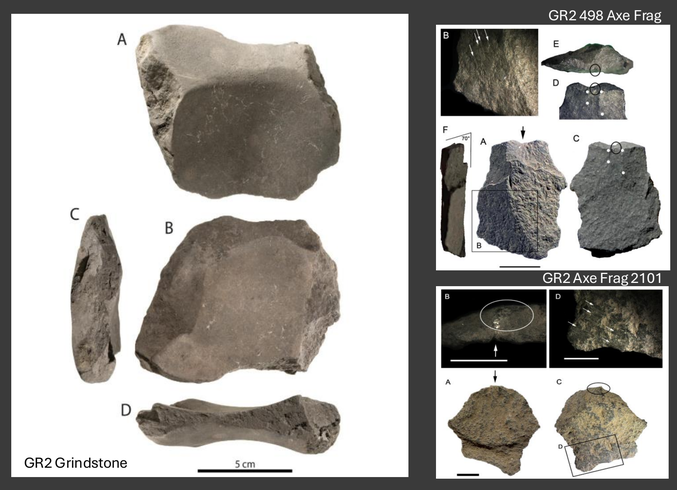

Figure 2: Examples of the GR2 artefacts (McNiven et al. 2024).

Method

We used non-destructive pXRF (Bruker Tracer 5i & Olympus Vanta) to identify if the stone artefacts were felsic (local) or mafic (non-local) to the area around the GR2 site (**Figure 3**). Hammerstones and grinding stones from MV were also included for comparison. We also looked for platinum group minerals (PGM) because, even though they are rare, they had been reported by Birch (2024) and Rodriguez et al. (2017) claimed ruthenium (Ru) could be detected by pXRF in rocks.

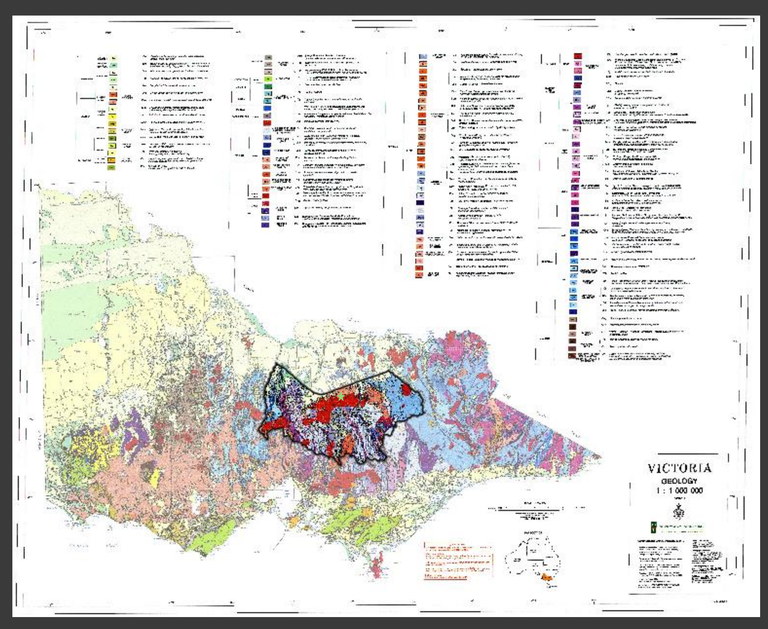

Figure 3: Map of the geological rock types present in the state of Victoria with TLaWC boundary. GR2 shown at green star.

Results

We were able to see on multiple geological bivariate scatter plots (e.g. **Figures 4 – 5**) that the artefacts excavated at GR2 were more mafic than felsic. The geological setting around GR2 is felsic. Therefore, it is mostly likely the artefacts originated from a mafic setting such as the Howqua Valley.

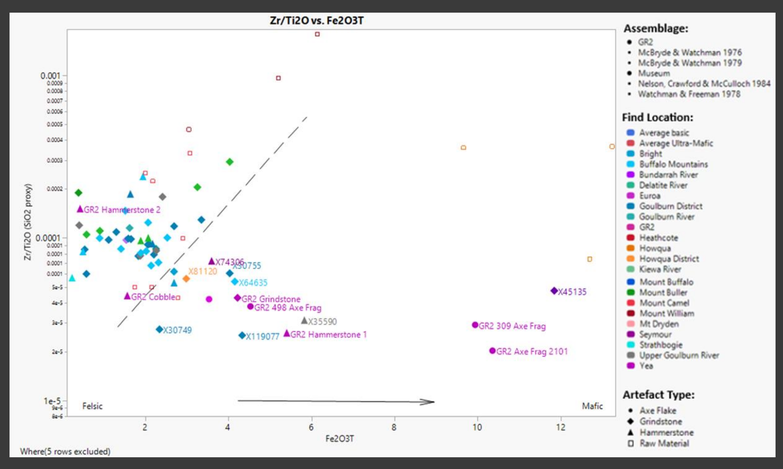

Figure 4: GR2 assemblage (excluding hammerstone 2), X30749, X30755, X35590, X45135, X74306, X81120, X119077 and Howqua raw materials to be more mafic.

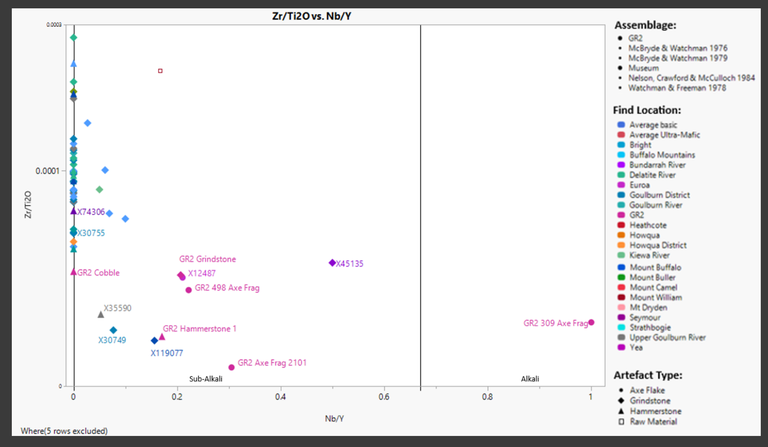

Figure 5: Pearce W-F diagram categorize GR2 artefacts (excluding cobble) as sub-alkali basalt and alkali. The majority of MV artefacts cannot be classified in this range along with the GR2 Cobble. Five of the MV artefacts (X12487, X35590, X30749, X119077 and X45135) plot in the sub-alkali (more mafic) range.

It was not possible to detect any PGM in the artefacts. This is most likely because these minerals are not present in the artefacts. However, we also consider pXRF not suitable for detecting Ru as Rodriguez et al. (2017) claim. **Figure 6** shows the area where the Ru Kα peak is expected is in the Rh Kα Compton scatter. Additionally, the other PGM (Ir, Os, Pt) that are detectable with pXRF were not identified in the artefacts.

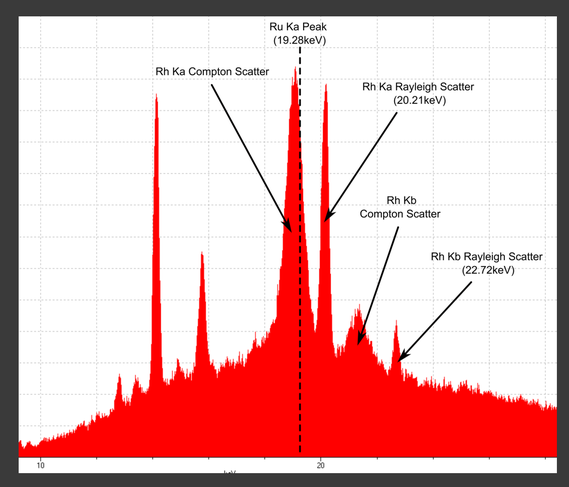

Figure 6: Ru peak hard to see because of Rh Compton scatter in the pXRF spectra.

Conclusion

- Excavated artefacts dated to 700-800BP show the historical exchange networks observed in McBryde's (1970s-1980s) research existed centuries earlier on Taungurung Country.
- Most likely provenance location for the mafic artefacts is the Howqua Valley approximately 75 km away from GR2.

References

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McBryde, I & Watchman, A 1976, 'The distribution of greenstone axes in southeastern Australia: A preliminary report', *Mankind*, vol. 10, no. 3, pp. 163–174.

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