

**AXE-MAKING AND AXE DISTRIBUTION FROM  
TWO QUARRIES IN EAST AUSTRALIA**

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A thesis submitted for the degree of Doctor of Philosophy  
of the University of New England

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I certify that the substance of this thesis has not already been submitted for any degree and is not currently being submitted for any other degree or qualification.

I certify that any help received in preparing this thesis, and all sources used, have been acknowledged in this thesis



Roderick. S. Cliff

## **ABSTRACT**

### **Axe-making and axe distribution from two quarries in east Australia**

This study is about axe making at two quarries. I have derived a model based on formal economic theory for explaining the transfer of axes into a distribution system. There are three major kinds of axe output from quarries:

- (1) Axes for local use.
- (2) Axes for non-local exchange.
- (3) Axes traded for gain.

I argue that these outputs can be differentiated by their distribution, together with:

- (1) The exchange potential of a good, which is established by symmetry in the shape of an axe and enables the axe to be recognised and accepted by others in an exchange transaction.
- (2) Value-adding economic decisions in axe making, which can be established by measuring efficiency in the control of production. This gives an advantage to axe producers at some quarries.

Axe trade for gain would incorporate symmetrical axes, efficient production and a non-local distribution pattern.

My predictions for the two quarries, one at Gulong and one at Warren are initially derived from distribution patterns. The output at Gulgong was predicted to be trade-driven in that the axes would be symmetrically shaped for exchange, and axe making would be a value-adding economic activity within which efficient knapping actions controlled axe making. In contrast, output at Warren (Little Mount quarry) was predicted not to be based on trade for gain. The axes would not be symmetrical in shape and would not be manufactured by efficient means.

The potential of the quarries to supply axes for exchange and trade for gain is evaluated by, the selection and extraction of raw material, the process of shaping preforms, and the toolkits used in manufacture at the quarries.

From the results of testing symmetry and efficiency I conclude that axe making at Gulgong was not based on trade for gain. There was no efficient behaviour in axe

making, but output had exchange potential through the symmetrical shape and the axes were transferred over long distances. At Warren symmetry in shape was a weak feature of the axe making process and efficient actions did not control knapping, which suggested a regime of direct procurement and local distribution supported by the restricted dispersal of the axes in the region.

A decision process based on value-adding economic principles operates throughout the stages of the reduction sequence for axes in the production trajectory. Outputs from the production trajectory at the quarries are used for other purposes than as axes of symmetrical shape for exchange and trade into a distribution system, or as axes used locally. Some preforms abandoned from symmetrical shaping as axes become part of the toolkits at the quarries where they are used as hammerstones. The expansion of study material from axes to include manufacturing debris and toolkits emphasises the value of quarries as the point of manufacture, by which the nature of production in relation to the dispersal of axes can be evaluated. It also suggests ways of testing these propositions at other sites.

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