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THE  
IDENTIFICATION  
OF  
NEW ZEALAND OBSIDIANS

A Thesis  
presented in partial fulfilment of the  
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GAYE COILA ARMITAGE

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ABSTRACT

Obsidian has proved to be a very valuable aid to archaeological investigations, especially in the area of prehistory. Its geological and archaeological occurrence is worldwide.

The aim of this investigation was to establish a satisfactory method of separating the eight known New Zealand sources of flake quality obsidian. Emission spectrography had been used with partial success but the maximum precision of this analytical method is  $\pm 5\%$ . A more precise analytical method would enable the sources to be separated more readily.

A satisfactory method of sample preparation was developed which gave solutions in which iron, manganese and zinc could be analysed by atomic absorption spectrophotometry, and sodium and potassium by flame photometry.

Replicates of a representative sample from each source were analysed to establish the variation due to the method. This was found to be less than 2%, except when the zinc concentration was below 60 ppm. Analysis of a number of samples from six of the eight sources (Arid Island and Maraetai excluded), established that for these sources the variation in the concentration of at least one of the five elements, was greater between sources than within a source.

All sources, with the possible exception of Taupo and Arid Island, could be distinguished on the basis of the five named elements. Manganese was found to be the most useful element for characterization.

Only one Arid Island sample was available. In all properties it

was very similar to the Taupo pieces analysed, but it may not have been representative. The Maraetai samples available were not flake quality, therefore only one sample was analysed.

The densities of a number of samples from each source were determined by two methods, the hydrostatic weighing method and temperature variation free flotation method. The flotation liquid for the latter was a mixture of bromoform and 1-pentanol.

Successful separation by densities was limited because of extensive overlap between sources. Mayor Island and Kaeo samples were more dense and could be separated from the other six sources, but not from each other. The density method was useful, however, for pieces too small to be analysed chemically. It also had the advantages of being non-destructive and being more readily adaptable to the field.

The two methods of characterization, chemical analysis and density determination, were applied to obsidians from eight archaeological sites located in the following areas, Coromandel, Waikato, Kaipara, Auckland (3), Bluff and Manawatu. More than two hundred and fifty pieces were analysed and more than 95% were positively identified.

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