SOME ARANUIAN (POSTGLACIAL) ORGANIC DEPOSITS IN THE SOUTH EASTERN RUAHINE RANGE, NORTH ISLAND, NEW ZEALAND, INVESTIGATED BY PALYNOLOGICAL METHODS.

A thesis presented in partial fulfilment of the requirements for the Degree of Master of Science in Geography at Massey University

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ABSTRACT

Palynological methods have been used to investigate Aranuian organic deposits in the south eastern Ruahine Range. The relevant literature was reviewed. Six profiles from five sites ranging in altitude from 80 to 1050 metres and from 13,300 years B.P. to present were sampled and the pollen analysed. Investigation of the palaeoecology of each site included the geomorphology, stratigraphy, present vegetation and pollen rain where relevant. The pollen data as percentages of several pollen sums was presented in pollen diagrams, statistically analysed and an interpretation suggested.

An investigation of pollen rain in the Kahuterawa Valley in the Tararua Range and on Mount Ruapehu was made to obtain information on present podocarp-broadleaf forests and about *Weinmannia racemosa* in particular. The results indicated a succession of dominants, including *W. racemosa* over a period of up to 1000 years. This information was used in interpreting the pollen spectra of the fossil sites.

All sites were reviewed as part of an Aranuian series. It was concluded that a climatic change from a drier cooler climate to a warmer moister one occurred between 13,300 $\pm$ and 10,650 (provisional date only). A more equable climate than at present possibly occurred between 3200 $\pm$ and 3770 $\pm$ with fewer frosts and droughts. These findings are in general agreement with those of palynologists at sites in other parts of New Zealand. Other aspects of climatic change erosional history, plant-land relationships and species representation have been discussed. The decline of *W. racemosa* at the West Tamaki site was part of a natural stage in the life cycle and not caused by the browsing of the opossum.

PREFACE

This is the first time that an investigation of organic deposits by palynological methods has been undertaken at Massey University. Personally, I am grateful for the opportunity that has been given me to follow an interest I have had for many years and the work has given me much satisfaction and pleasure. The investigation would not have been possible without the help, interest and co-operation of three Departments.

I would like particularly to thank Professor K.W. Thomson for his permission to submit such an investigation as a fit subject for a masterate thesis in Geography. Professor B.P. Springett and Professor R.G. Thomas generously supplied the necessary equipment and chemicals. Professor J.K. Syers kindly allowed the use of laboratory space and facilities during vacations.

For so willingly giving of their time and knowledge in many helpful discussions and advice, I would like to thank my supervisor Dr J.P Skipworth of the Botany and Zoology Department and my assistant supervisor Dr M.J. Shepherd of the Geography Department. During Dr Shepherd's absence overseas Dr J.L. McArthur of the Geography Department arranged essential field trips and gave much appreciated advice and encouragement.

Without the help and enthusiasm of Dr V.E. Neall and Mr M. Marden of the Soil Science Department the investigation would not have been possible, they suggested suitable sites some of which were already dated. The technical staff of all these Departments cheerfully tackled the practical problems of equipment and supplies and I thank them for their assistance. The Curator of the Massey Herbarium Dr M.B. Forde graciously consented to

the removal of pollen samples from the herbarium specimens. The reference slide collection will remain at Massey.

Much support from outside the campus came from D.S.I.R. Dr E.J. Godley, Director of the Botany Division, Lincoln kindly gave permission for a six weeks study period in 1980 in the Palynological Laboratory under the direction of Dr N.T. Moar. All the staff of this laboratory were most helpful and enthusiastic. Two further visits were made during 1981 when valuable advice was received on the handling and presentation of data. The curator of the National Herbarium at Lincoln, Miss B.H. Macmillan kindly identified many specimens and allowed me to collect pollen from the herbarium specimens. Other identifications were made by Dr E. Edgar and Dr D.R. Given. All the identifications of the fossil wood specimens were made by Dr R.N. Patel. I am grateful to all these people for their generous interest and support. Dr E.O. Campbell of Massey gave up valuable time to identify the fossil plant remains found at the Delaware site and shared her knowledge of bog plants, this timely help was much appreciated.

During the last three months two visits have been made to the Geological Survey Department, Lower Hutt. Discussions with Dr J.I. Raine were most useful and he very kindly instructed me in the use of their excellent photographic equipment which enabled the photographs of the modern and fossil pollen to be included in this thesis.

Thanks are also expressed to the staff of the Massey Printery for the production of many diagrams and to the Central Photographic Unit for their continued interest in the production of the

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