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Quaternary Vegetational, Environmental and Climatic
History of the Lower Taieri Plain,
East Otago,
New Zealand.

Regan William O'Brien

2000

A thesis presented in partial fulfilment of the requirements for the Degree of
Master of Science in Quaternary Science
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Quaternary Vegetational, Environmental and Climatic History of the Lower Taieri Plain,
East Otago, New Zealand

by Regan O'Brien

ERRATUM SHEET

References made to McGlone and Wilmshurst (1999) on the following pages refer to McGlone and Wilmshurst (1999a)

Page 57, 2nd paragraph, 15th line
Page 60, 2nd paragraph, 11th line
Page 138, 1st paragraph, 11th line
Page 140, 1st paragraph, 11th line
Page 148, 2nd paragraph, 12th and 21st lines
Page 149, 2nd paragraph, 16th line

Page 72, 2nd paragraph, 11th line - the text reference should read Macphail and McQueen (1983) not Macphail and Mckellar (1983).

Page 102, 3rd paragraph, 9th line - text reference should read Flenley and Velasco (1996) not Flenley *et. al.* (1996).

Page 55, 2nd paragraph, 11th line - text reference should read McGlone *et. al.* (1997b) not McGlone *et. al.* (1997).

Page 21 - Figure 2.4 - text reference should read after Tauber, 1965, not Tauber, 1968.

Page 33 - Figure 3.3 - text reference should read Pillans, 1991, not Pillans, 1999.

MISSING REFERENCES

The following references were inadvertently left off the reference list:

Assarson, G., and Granlund, E. (1924). En metod for pollenanalys av minerogena jordarter. *Geol. foren. Stockh. forh.* **46**, 76-82.

Ehrenberg, C. G. (1838). Beobachtungen uber neue Lagen fossiler Infusorien und das Vorkommen von Fichtenbeluten neben deutlichem Fichtenholz, Haifischzahen, Echinoiden und Ifusorien in Vohynischen Feuersteine der Kreide. - *Monatsber. Berliner Akad* **1838**, 104.

Erdtman, G. (1966). Sporoderm morphology and morphogenesis - A collection of data and suppostioins. *Grana Palynology* **6**, 318-323.

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Hughes, J. (1999). A diatom based paleoenvironmental history of the Taieri basin, Otago. Victoria University of Wellington, BSc Hons.

Imbrie, J., Hays, J.D. Martinson, D.G., McIntyre, A., Mix, A.C., Morely, J.J., Pisias, N.G., Prell, W.L. and Shakleton, N.J. (1984). The orbital theory of Pleistocene climate: support from a revised chronology on the maritime O18 record. In: Berger, A.L. *et al.* (eds) *Milankovitch and Climate Part 1*.

Libby, W.F. (1955). Radiocarbon Dating (2nd Ed.). Chicago Publ. Phoenix Science Series.

ADDITIONAL COMMENTS

Page 16, 1st paragraph, 8th line - *Callitriche* is actually tricolpoid or tetracolpoid. Another example of an inaperturate grain from the New Zealand flora is *Beilschmiedia tawa*.

Page 31, 1st paragraph, 5th line - Asteraceae is now known to have been in New Zealand since the Oligocene.

Page 75 - the diagram depicting the core stratigraphy shows a silt/clay band extending from 61.76m to approx. 50m. This is incorrect, the silt/clay band should extend to 54.48m.

ABSTRACT

This project presents the palynology of the 154m Waipori 99-1 long core taken from the Lower Taieri Plain, east Otago, New Zealand. The current vegetation and climate are reviewed along with the geological and geomorphological setting of the Taieri Basin. Reviews are given on the history of New Zealand's vegetation since the Late Cretaceous and on the late Pleistocene and Holocene vegetation and climate of southern New Zealand. The field and lab techniques used in the course of this project are detailed.

The Waipori 99-1 long core contained a number of extensive glacial aggradational gravel sequences. These are separated in places by interbedded fine sediments which were found, for the most part, to have been deposited during warm climate periods. Subsidence within the basin has determined which sediments survive in the record. Periodic subsidence and fluvial erosion have resulted in a discontinuous sedimentary sequence. Polliniferous sediments were found only above -103m. Pollen analysis suggests that the sediments may date back as far as the mid Quaternary. Dating on the core poorly constrains sediments which pre-date the Holocene. The pollen evidence presented in this project is used to create a number of possible chronological lines along which to interpret environmental information derived from the core. No particular line is fully endorsed by the project however.

As many as four, and possibly five, warm climate pollen assemblages are recognised. Pollen analysis suggests that during these warm periods, podocarp-broadleaf forests occupied the basin. *Prumnopitys taxifolia* was the most consistently common podocarp in the region. *Fuscospora* beeches appear to have once been more common in the area in contrast to the present day. *Dacrydium cupressinum* was apparently absent from the area during the mid to late Quaternary, expanding into the basin only in the mid Holocene. The Holocene vegetational, climatic and environmental record is in agreement with others published from southern New Zealand.

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CONTENTS

CHAPTER ONE:

<u>INTRODUCTION</u>	1
Purpose of the study.....	1
Thesis aims.....	1
Location.....	1
Climate.....	3
Geological setting.....	4
Geomorphology and soils.....	5
Vegetation.....	5
Review chapters and their purpose.....	10

CHAPTER TWO:

<u>PRINCIPLES OF PALYNOLOGY</u>	12
Palynology and palaeopalynology - an overview.....	12
The history of palaeopalynology.....	13
The pollen grain and the spore - structure, morphology and purpose.....	14
The exine.....	14
Apertures.....	16
Sexine sculpturing.....	17
Size and shape.....	19
Pollen production, dispersal, sedimentation and preservation.....	19
Pollen production and dispersal.....	20
Pollen dispersal dynamics.....	21
Pollen sedimentation and preservation.....	23

CHAPTER THREE:

THE HISTORY OF NEW ZEALAND'S

<u>VEGETATION</u>	26
The Mesozoic.....	27
The Late Cretaceous.....	27
The Tertiary.....	28
The Paleocene.....	28
The Eocene.....	29

The Oligocene.....	30
The Miocene.....	30
The Pliocene.....	31
The Quaternary.....	32
The early to mid-Pleistocene.....	32
The late Pleistocene.....	36
The last glacial maximum.....	38
The late glacial.....	41
The Holocene.....	42
The early Holocene.....	42
The mid Holocene.....	45
The late Holocene.....	47
Maori clearance.....	48
European clearance.....	50

CHAPTER FOUR:

**THE VEGETATION AND CLIMATE OF SOUTHERN
NEW ZEALAND DURING THE LATE PLEISTOCENE AND
HOLOCENE.....**

The late glacial.....	53
The early Holocene.....	55
The late Holocene.....	57
The human disturbance period.....	61
Summary.....	62

CHAPTER FIVE:

**THE MODERN POLLEN RAIN OF THE NEW ZEALAND'S
VEGETATION.....**

Pollination vectors.....	68
Determining vegetation associations using pollen spectra.....	68
Qualification of the New Zealand pollen rain.....	71
Trees.....	71
Small trees and shrubs.....	72
Herbs.....	72
Ferns and fern allies.....	73

Aquatics.....	73
Conclusion.....	73

CHAPTER SIX:

WAIPORI 99-1 CORE STRATIGRAPHY AND THE SEDIMENTARY ENVIRONMENTS OF THE LOWER TAIERI

<u>PLAIN</u>	74
Core stratigraphy.....	74
Core dating and sedimentation rates.....	77
Quaternary sedimentary history of the Lower Taieri Plain.....	77
Holocene.....	82
Otiran glacial.....	82
Kaihinuan interglacial.....	82

CHAPTER SEVEN:

<u>TECHNIQUES</u>	86
Field techniques.....	86
Drilling procedure and core recovery.....	86
Core handling.....	86
Core depth recording.....	87
Magnetic susceptibility measurement.....	88
Core splitting.....	89
Core description.....	89
Core sealing and boxing.....	91
Laboratory techniques.....	91
Subsampling.....	91
Sample preparation - pollen concentration.....	93
Centrifugation.....	95
Water washes.....	95
Agitation.....	95
Carbonate removal.....	95
Humic acid removal and deflocculation.....	95
Coarse particle sieving.....	96
Silica removal.....	96

Sand fraction removal.....	96
Cellulose removal.....	97
Lignin removal.....	97
Removal of fine particles.....	98
Alcohol dehydration.....	98
Mounting.....	99
Microscopy.....	99
Equipment.....	100
Identification.....	100
Counting procedure.....	101
Charcoal identification and counting.....	102
Dinoflagellate cyst identification and counting.....	103
Computational data analysis and compilation.....	103
Tilia.....	104
Pollen diagrams.....	104
Relative pollen diagrams.....	104
Absolute pollen diagrams.....	105
Zonation and Coniss.....	105
Dating techniques.....	106
Radiocarbon dating.....	106
Uranium-thorium dating.....	108
Thermoluminescence dating.....	108

CHAPTER EIGHT:

<u>RESULTS</u>	109
Waipori 99-1 lower alluvium.....	109
Pollen bearing layer (103m).....	109
Pollen bearing layer (72m).....	110
Waipori 99-1 lacustrine unit.....	110
Waipori lignite section.....	110
Waipori lacustrine section.....	112
Waipori 99-1 upper alluvial unit.....	113
Spot samples(54.50 - 45.19m).....	114
Pollen bearing bed (40.80 - 37.42m).....	114

Spot samples (37.42m - 22.25m).....	114
Waihola silt/sand unit (late glacial and Holocene).....	116

CHAPTER NINE:

<u>DISCUSSION:</u>	119
Waipori 99-1 lower alluvium.....	119
Waipori 99-1 lignite section.....	124
Waipori 99-1 lacustrine section.....	130
Waipori upper alluvium.....	136
Waihola silt/sand unit (late glacial and Holocene).....	138
Core chronology.....	152

CHAPTER TEN:

<u>CONCLUSION</u>	157
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<u>BIBLIOGRAPHY</u>	159
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APPENDICES

APPENDIX ONE:

Sample depths, lithology and preparation steps.....	172
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APPENDIX TWO:

Pollen counts.....	176
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LIST OF FIGURES

1.1	Location map of the Waipori 99-1 drill site.....	2
1.2	Geological cross-section of the Taieri basin.....	4
1.3	Surface geology and geomorphology of the Taieri Basin.....	6
1.4	Remnant vegetation of the Dunedin and Maungatua areas.....	8
2.1	Pollen wall structure.....	15
2.2	Aperture arrangements on pollen grains.....	16
2.3	Sculpted elements of the exine.....	18
2.4	Potential pollen source components (after Tauber).....	21
2.5	Pollen catchment area to site size relationship.....	23

3.1	Gondwana land configuration during the Late Cretaceous.....	27
3.2	Cenozoic ocean sea surface temperatures.....	29
3.3	Oxygen Isotope stages.....	33
3.4	Arboreal fossil pollen sequence from DSPD site 594.....	35
3.5	New Zealand wide pollen spectra during the last glacial maximum.....	39
3.6	New Zealand vegetation and outline at the last glacial maximum.....	40
3.7	Dates for the initiation of major increases in arboreal pollen.....	43
3.8	The Holocene spread of <i>Nothofagus</i>	46
3.9	Example of Maori clearance as represented a fossil sequence.....	49
3.10	Pre- and post-Maori vegetation distributions.....	51
4.1	Composite Holocene vegetation change in southern New Zealand.....	63.
6.1	Summary log of the Waipori 99-1 core.....	75
6.2	Age-depth (sedimentation) curve for the Waipori 99-1 core.....	78
6.3	Combined stratigraphy of selected boreholes across the Taieri basin.....	80

The pollen diagrams are held in a separate booklet:

8.1a	Relative pollen diagram - Lower Waipori 99-1 Alluvium - 103m Silt Unit
8.1b	Absolute pollen diagram - Lower Waipori 99-1 Alluvium - 103m Silt Unit
8.2a	Relative pollen diagram - Lower Waipori 99-1 Alluvium - 72m Silt Unit
8.2b	Absolute pollen diagram - Lower Waipori 99-1 Alluvium - 72m Silt Unit
8.3a	Relative pollen diagram - Waipori 99-1 Lignite Section
8.3b	Absolute pollen diagram - Waipori 99-1 Lignite Section
8.4a	Relative pollen diagram - Waipori 99-1 Lacustrine Unit
8.4b	Absolute pollen diagram - Waipori 99-1 Lacustrine Unit
8.5a	Relative pollen diagram - Upper Waipori 99-1 Alluvium - Spot Samples
8.5b	Absolute pollen diagram - Upper Waipori 99-1 Alluvium - Spot Samples
8.6a	Relative pollen diagram - Upper Waipori 99-1 Alluvium - 40 - 37m Clay Unit
8.6b	Absolute pollen diagram - Upper Waipori 99-1 Alluvium - 40 - 37m Clay Unit
8.7a	Relative pollen diagram - Waipori 99-1 Late Glacial and Holocene Section

8.7b	Absolute pollen diagram - Waipori 99-1 Late Glacial and Holocene Section	
9.1	Proposed chronologies for the Waipori 99-1 long core.....	120
9.2	New Zealand Holocene eustatic sea-level curve.....	131
9.3	Waipori 99-1 phytolith record.....	139
9.4	Waipori 99-1 Holocene diatom record.....	141
9.5	Extent of the Holocene marine transgression into the Taieri Basin.....	142
9.6	Isohyetal map for the Taieri catchment.....	147
9.7	Composite Holocene vegetation change in southern New Zealand including the Waipori 99-1 data.....	151

LIST OF TABLES

6.1	Summary of the Waipori 99-1 long core lithology.....	76
6.2	Summary of dates.....	77

LIST OF PLATES

1.1	Lakes Waihola and Waipori and the Lower Taieri Plain.....	3
7.1	Drilling rig in operation.....	87
7.2	Magnetic susceptibility measurements.....	88
7.3	Core description and logging.....	90
9.1	<i>Brassospora</i>	123
9.2	<i>Casuarina</i>	124
9.3	<i>Ascarina lucida</i>	127
9.4	<i>Quintinia</i>	128
9.5	<i>Lycopodium deuterodensum</i>	144

Photographic plates of the pollen grains and spores shown in plates 9.1 – 9.5 have been magnified x1000.