

Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.

Bronze as a non-customary intervention
in the interpretation of insects from the natural world
of Māori

VOLUME ONE

An exhibition report presented in partial fulfilment
of the requirements for the degree of

Doctor of Philosophy
in
Fine Arts

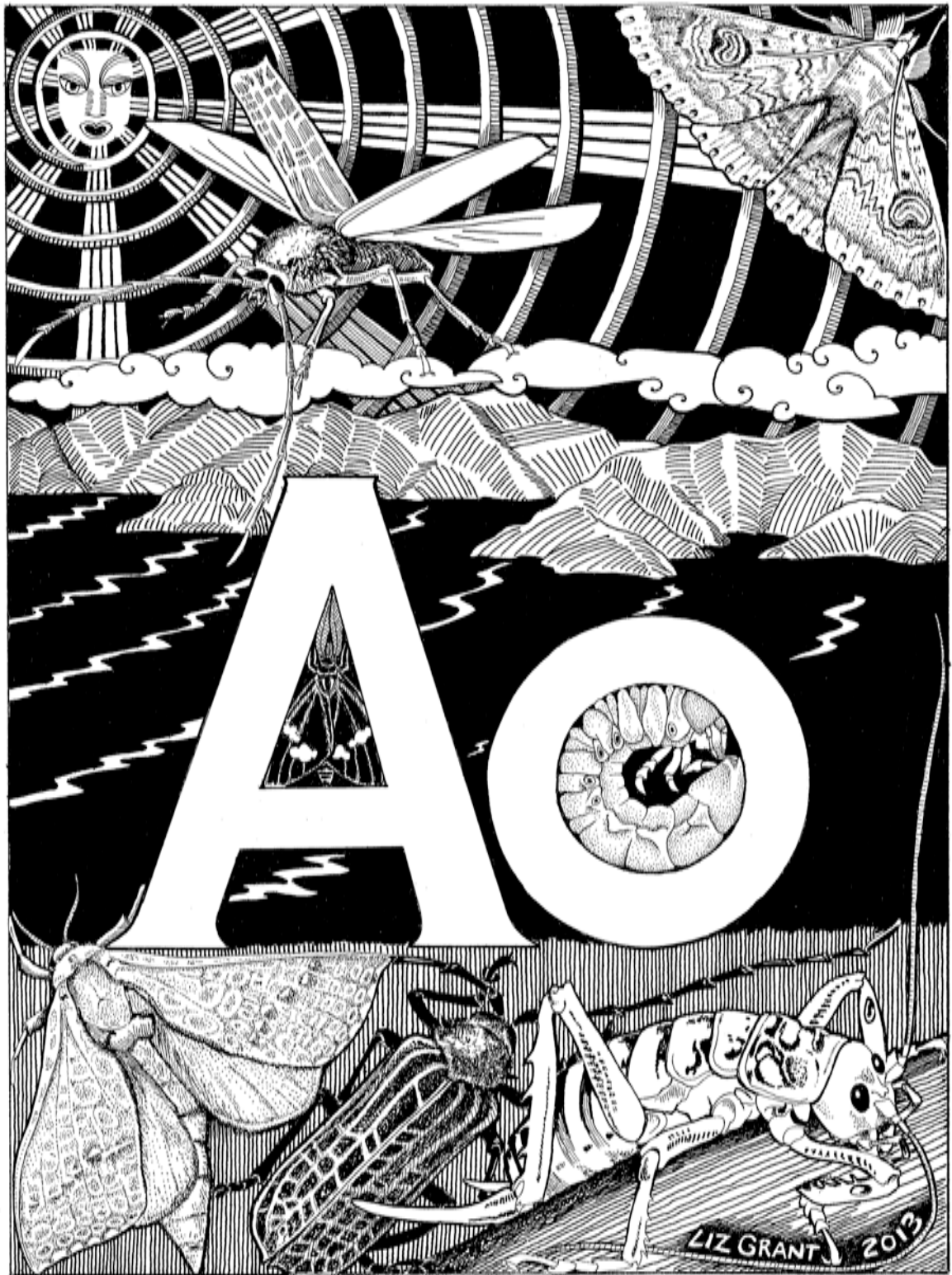
at Massey University, Palmerston North
Aotearoa, New Zealand.

Elizabeth Anne Grant

2014

Art lies in nature

Dürer



Abstract

Without insects the world as we know it would not exist. Insects are essential for life on earth, and yet they invoke from us, a gambit of emotions ranging from fear to fascination. The way in which insects impact on our lives is both surprising and diverse, and yet, in spite of their importance, insects are primarily overlooked as members of our natural world because they are small and inconspicuous.

For Māori, insects are part of ngā tamariki a Tāne, borne from the union between Tāne Mahuta and Punga. But, the distraction associated with colonisation, has faded much of the mātauranga (knowledge) and oral story telling associated with insects from Te ao Māori.

For this reason, this thesis focuses on insects recognised by Māori and considered significant to Māori around the time of European colonisation as based on written documentation (mostly European) derived from colonial field work observations, dictionaries, missionaries and researchers both Māori and non Māori during the nineteenth, twentieth and twenty first centuries. Set within a scientific framework, the topics covered, range from cosmo-genealogical entomology, through to entomophagy.

Using bronze, the thesis exhibition will visually present the diverse ways in which insects were significant to Māori. Given the inherent fragility of the invertebrate fauna and the strength and durability of bronze, this constitutes an ideal medium to interpret their life histories. Concurrently this work seeks to promote an aesthetic appreciation for insects by displaying their diverse forms and colours.

The intended out come is to be both informative and visually stimulating.

Preface

The perceived value of insects in a modern world is small. For early Māori, who relied heavily on the surrounding world of nature to survive, insects played a great and varied role in sustaining the people both physically and spiritually.

This thesis will consider the importance and significance of insects within the natural world of Maori around the time of European colonisation. It will conclude with an artistic interpretation that processes insects in a colonial New Zealand manner, but will particularly reflect the perspective of a cultural Aotearoa. The work also aims to promote an aesthetic appreciation of insects. This ethno-entomology will necessarily include considerations and discussions of entomophagy (eating insects), academic entomology (scientific entomology) and cultural entomology where insects are associated with musical, cosmo-logical and traditional story telling.

Acknowledgements

Ko Tainui te waka
Ko Hotorua te tangata
Ko Wharepuhunga te maunga
Ko Waikato te awa
Ko Ngāti Raukawa te iwi
Ko Ngāti Huri te hapū
Ko Pikitū rāua ko Poupatate ngā marae
Ko Rauti tōku tupuna
Ko Liz Grant ahau

Firstly, I would like to thank my supervisor, Professor Robert Jahnke, who encouraged me to embark on this PhD, and whose own artwork is inspirational and exemplifies high excellence in production.

I would like to acknowledge the Massey University Doctoral Scholarship that gave me financial peace of mind and helped to make the funding of my particular medium possible. I am also grateful for the financial assistance given through the Purehuroa Award.

Ross Wilson of Marton foundries had the difficult task of casting all my insects. I know I mercilessly pushed his boundaries and gave him many sleepless nights as he endeavoured to negotiate and worry over the technical difficulties of actually casting such small and intricate work. But he did it and always with a smile.

Many thanks go to Jono Williams of Frogparking, who laboriously entered the dimensions for the patterns of the drawer and cabinets onto the computer so that a wooden pattern could be made of each, and to Brett Rangitaawa from Heavy Metal foundries in Petone who sand-cast all the drawers and cabinets from these patterns. Brad Boniface who took the photographs of the completed drawers and cabinets, also took the great image of my painted wētā-punga out in the 'wild' (my garden).

Thanks also go to Hone Morris who kindly provided contemporary translations for many of the karakia and waiata that appear in Chapter Two and the Appendices, and to Wendy Pond for her valuable comments regarding Māori and insects.

I would like to acknowledge my grandfather, Ross Michie, who inspired my love of nature and love of beach combing. Who would also let me, when I was young, sit in front of, and 'pour over' his 'Cabinet of curiosities' that contained his life's collection of nature's treasures, - if I asked politely. Grandpa, I have several 'cabinets of curiosity' of my own now!

I wish to thank my father, Lewis Grant for instilling in me a love of books, particularly reference books, and the desire for having one's own library. I wish you could have been here dad, to see my work – and my library! And my mum Mavis Grant, for giving me her patience and ability to embark on things that are immensely time consuming. You gave me your hands - and have always been there for me.

Thanks also go to friends and family who took an interest in my work.

Finally, and very importantly, I would like to acknowledge the support, encouragement, and love shown me by my husband, Don Sandbrook. Throughout my studies and production of art, you have always been my number one fan, offering many positive words of admiration for my work. You helped enormously with the tedious finishing and braising and have been exceptional when it came to discussing technical issues. You even helped out with the cooking!

Table of Contents

| | |
|--|--------------|
| Dedication | |
| Abstract | ii |
| Preface | iii |
| Acknowledgements | iv |
| Table of Contents | vi - ix |
| List of Appendices | x - xii |
| List of Figures | xiii - xvi |
| List of Tables | xvii - xviii |
| | |
| Chapter One: Thesis preview | 1 |
| 1.1 Volume and chapter summary | 1 |
| 1.2 Text conventions | 3 |
| 1.3 Photographic images and illustrations | 3 |
| | |
| Bronze as a non-customary intervention in the interpretation of insects from the natural world of Māori | |
| 1.4 Introduction | 4 |
| 1.4.1 Background: The science | 4 |
| 1.4.2 Background: The cultural canon | 6 |
| 1.4.3 European colonisation | 7 |
| 1.5 From Europe to New Zealand: Collecting insect images and specimens | 8 |
| 1.6 PhD study | 22 |
| 1.6.1 Investigatory questions and aims | 23 |
| 1.7 Objectives of the investigation | 25 |
| | |
| Chapter Two: Entomological practices; The insects; Historical and cultural evidence | 26 |
| 2.1 Introduction | 26 |
| 2.2 Entomology – The study of insects | 26 |

| | |
|--|------------|
| 2.2.1 Entomology terms and conventions | 27 |
| 2.3 General Māori names for insects and insect origins | 28 |
| 2.4 Te aitanga pepeke – The insect family | 33 |
| 2.4.1 Order Lepidoptera – Moths and butterflies | 33 |
| 2.4.2 Order Coleoptera – Beetles | 59 |
| 2.4.3 Order Odonata – Dragonflies and damselflies | 72 |
| 2.4.4 Order Megaloptera – Dobsonflies | 75 |
| 2.4.5 Order Plecoptera – Stoneflies | 76 |
| 2.4.6 Order Orthoptera – Wētā, crickets and grasshoppers | 77 |
| 2.4.7 Order Hemiptera – Bugs | 89 |
| 2.4.8 Order Phasmatodea – Stick insects | 96 |
| 2.4.9 Order Mantodea – Praying mantids | 98 |
| 2.4.10 Order Blattodea – Cockroaches | 99 |
| 2.4.11 Order Dermaptera – Earwigs | 100 |
| 2.4.12 Order Diptera – Flies | 101 |
| 2.4.13 Order Hymenoptera – Ants and wasps | 123 |
| 2.4.14 Order Phthiraptera – Lice | 129 |
| 2.4.15 Order Siphonaptera – Fleas | 131 |
| 2.5 Conclusions | 134 |
| Chapter Three: Artistic practices | 135 |
| 3.1 Introduction | 135 |
| 3.2 Bronze in the Māori world | 135 |
| 3.2.1 Māori artists using bronze | 136 |
| 3.3 Painted bronze | 138 |
| 3.3.1 Bronze insects and painted bronze | 142 |
| 3.4 Bronze distortion | 144 |
| 3.5 Insect collecting and painting | 145 |
| 3.6 Conclusion | 147 |
| Chapter Four: Methods and methodology | 148 |
| 4.1 Introduction | 148 |
| 4.2 Wax insects | 148 |
| 4.2.1 Insect pins | 149 |
| 4.3 The drawers and cabinets: The lost wax process versus sand casting | 150 |

| | | |
|--|---|------------|
| 4.3.1 | The attachment mechanism for the artworks to the wall | 157 |
| 4.3.2 | The knobs | 158 |
| 4.4 | Painting | 161 |
| 4.5 | Combining the insects with the drawers | 165 |
| 4.6 | The three cabinets and nine drawers of insects | 166 |
| 4.6.1 | Cabinet One, drawer one | 167 |
| 4.6.2 | Cabinet One, drawer two | 170 |
| 4.6.3 | Cabinet One, drawer three | 172 |
| 4.6.4 | Cabinet Two, drawer one | 173 |
| 4.6.5 | Cabinet Two, drawer two | 175 |
| 4.6.6 | Cabinet Two, drawer three | 177 |
| 4.6.7 | Cabinet Three, drawer one | 179 |
| 4.6.8 | Cabinet Three, drawer two | 181 |
| 4.6.9 | Cabinet Three, drawer three | 183 |
| 4.6.10 | Beyond the drawers | 187 |
| 4.7 | Conclusion | 192 |
| Chapter Five: Discussion and analysis | | 193 |
| 5.1 | Introduction | 193 |
| 5.2 | Historical records | 193 |
| 5.2.1 | Whakataukī and waiata | 196 |
| 5.2.2 | Dictionaries | 198 |
| 5.2.3 | The importance of insects over time | 201 |
| 5.2.4 | Terminology | 202 |
| 5.3 | The outcome and overall artistic analysis | 206 |
| 5.3.1 | The insects | 206 |
| 5.3.2 | The drawers and cabinets | 207 |
| 5.3.3 | Painting the bronze | 208 |
| 5.4 | Science versus art debate | 210 |
| 5.5 | Preliminary response to the work | 212 |
| 5.6 | The exhibition | 213 |
| 5.6.1 | Negotiating the exhibition and audience reaction | 216 |
| 5.7 | Implications of the artworks | 217 |
| 5.7.1 | Implications of some of the insects documented | 219 |

| | |
|---|------------|
| 5.8 Past and present uses of insects | 221 |
| 5.8.1 Possible applications of the investigation | 221 |
| 5.8.1.1 Entomophagy | 221 |
| 5.10 Conclusions | 223 |
| Chapter Six: Summary and conclusions | 225 |
| 6.1 Thesis summary | 225 |
| 6.2 Visual summary and outcomes | 227 |
| 6.3 The artwork | 229 |
| 6.4 Conclusion | 230 |
| References | 233 |
| Appendices | 247 |
| Karakia and waiata | 308 |
| Key Māori terms and names | 330 |
| Common names and terms | 340 |
| Exhibition - Te Manawa, 18 July - 5 October 2014 | 344 |

List of Appendices

| | |
|---|-----|
| Appendix 1a: Green and white colouration of the male pūriri moth, <i>Aenetus virescens</i> | 247 |
| Appendix 1b: Moss green and brown colouration of the female pūriri moth, <i>Aenetus virescens</i> | 247 |
| Appendix 2a: Split houhere branch showing pūriri caterpillar chamber and operculum | 248 |
| Appendix 2b: Puta-puta-wētā tree showing entrance to two evacuated chambers | 248 |
| Appendix 3a: Vegetable caterpillar, <i>Cordyceps robertsii</i> showing fruiting body. Length, 260mm ... | 249 |
| Appendix 3b: Close up of mummified caterpillar. Caterpillar length, 65mm | 249 |
| Appendix 4a: Bag moth cocoon, <i>Liothula omnivorus</i> on manuka branch | 250 |
| Appendix 4b: Cocoon of the moth, which the goddess of music, Raukataura, first used as her flute and later as her dwelling place. This narrative also inspired the form of the uniquely Māori bugle flute, the pūtōrino. At times the empty cocoon shows holes that may be the result of parasitic damage. Such holes may have inspired the locality of the mangai (Central hole) in the pūtōrino ... | 250 |
| Appendix 5a: Greasy cutworm moth, <i>Agrotis ipsilon aneituma</i> | 251 |
| Appendix 5b: Greasy cutworm caterpillar, <i>Agrotis ipsilon aneituma</i> | 251 |
| Appendix 6: Resting position of the wattle moth, <i>Dasypodia cymatodes</i> | 252 |
| Appendix 7: The eating behaviour of the flax notcher caterpillar, <i>Tmetolophota steropastis</i> results in the appearance of triangular notches along the edge of the leaf blade | 253 |
| Appendix 8a: The eating behaviour of the flax looper caterpillar, <i>Orthoclydon praefectata</i> results in the appearance of 'windows' along the leaf blade | 254 |
| Appendix 8b: The flax looper caterpillar revealed when a dead curled leaf blade is unrolled | 254 |
| Appendix 9a: The moth of the cabbage tree looper, <i>Epiphryne verriculata</i> . Length, 38mm | 255 |
| Appendix 9b: Cabbage tree looper caterpillar resting head down at leaf base | 255 |
| Appendix 10a: The eating pattern of the kawakawa looper caterpillar, <i>Cleora scriptaria</i> | 256 |
| Appendix 10b: The kawakawa looper caterpillar on underside of leaf | 256 |
| Appendix 11a: The red admiral butterfly, <i>Vanessa gonerilla</i> on Sedum plant | 257 |
| Appendix 11b: Dorsal view of the wing | 257 |
| Appendix 12a: The forest ringlet butterfly, <i>Dodonidia helmsii</i> . Dorsal surface | 258 |
| Appendix 12b: The forest ringlet butterfly, <i>Dodonidia helmsii</i> . Ventral surface | 258 |
| Appendix 13a: Kanuka longhorn beetle, <i>Ochrocydus huttoni</i> | 259 |
| Appendix 13b: Fine frass or excretal sawdust at the base of a kanuka or manuka is evidence of the presence of kanuka longhorn larvae | 259 |
| Appendix 14: The manuka beetle, <i>Pyronota festiva</i> | 260 |
| Appendix 15: The grass grub larva, <i>Costelytra zealandica</i> in the classic 'C' pose. Diameter, approximately 12mm | 261 |
| Appendix 16: Mūmū chafer, <i>Stethaspis longicornis</i> | 262 |

| | |
|---|-----|
| Appendix 17a: Adult male sand scarab, <i>Pericoptus truncatus</i> . Length approximately, 30mm | 263 |
| Appendix 17b: Sand scarab grub in sand cavity beneath rotting log | 263 |
| Appendix 18a: The male giraffe weevil, <i>Lasiornychus barbicornis</i> showing antennae arising from the tip of the rostrum | 264 |
| Appendix 18b: The smaller female giraffe weevil, showing antennae arising from midway along the rostrum | 264 |
| Appendix 19: The ground beetle, <i>Megadromus capito</i> . Total length approximately 40mm | 265 |
| Appendix 20: The orange spotted ladybird, <i>Coccinella leonine</i> on the right and an immature praying mantid to the left | 266 |
| Appendix 21: Giant dragonfly, <i>Uropetala carovei</i> . Note the wings out stretched when at rest | 267 |
| Appendix 22a: Blue damselfly, <i>Austrolestes colenisonis</i> . Note the wings held together when at rest | 268 |
| Appendix 22b: Red damselfly, <i>Xanthocnemis zealandica</i> | 268 |
| Appendix 23a: The dobsonfly larva, <i>Archicauliodes diversus</i> revealed beneath a large stone above the water line | 269 |
| Appendix 23b: The dobsonfly larva showing gill filaments | 269 |
| Appendix 24a: Male wētā, <i>Hemideina thoracica</i> displaying his large head and extended mandibles | 270 |
| Appendix 24b: Male wētā displaying aggressive stance with hind legs over his head, ready to strike | 270 |
| Appendix 25a: The male small black field cricket, <i>Bobilla</i> sp. | 271 |
| Appendix 25b: The female small black field cricket, <i>Bobilla</i> sp. Note the short wings | 271 |
| Appendix 26: The common small grasshopper, <i>Phaulacridium marginale</i> | 272 |
| Appendix 27: The katydid, <i>Caedicia simplex</i> feeding on totara | 273 |
| Appendix 28a: The male chorus cicada, <i>Amphisalta zealandica</i> . The pale orange circular vibratory tympanal flaps can be seen on the ventral surface | 274 |
| Appendix 28b: The empty shells of many chorus cicadas on fence posts and surrounding foliage | 274 |
| Appendix 29: The little grass cicada, <i>Kihia muta</i> | 275 |
| Appendix 30: The black-spined stick insect, <i>Acanthoxyla prasina inermis</i> feeding on feijoa foliage | 276 |
| Appendix 31a: The green praying mantid, <i>Orthodera novaezealandiae</i> | 277 |
| Appendix 31b: The green praying mantid, showing its mobile triangular head and folded raptorial forelegs | 277 |
| Appendix 32: The female seashore earwig, <i>Anisolabis littorea</i> displaying protective behaviour over her eggs | 278 |
| Appendix 33: Fly maggots | 279 |

| | |
|---|-----|
| Appendix 34: The metallic blue-black blowfly, <i>Calliphora quadrimaculata</i> | 280 |
| Appendix 35: The yellow-brown blowfly, <i>Calliphora stygia</i> | 281 |
| Appendix 36: The parasitic tachinid bristle fly, <i>Protohisticia alcis</i> | 282 |
| Appendix 37: The metallic blue hoverfly, <i>Helophilus hochstetteri</i> | 283 |
| Appendix 38: The rat-tail hoverfly maggot, revealed when stagnant water was tipped out of container. Note the terminal breathing siphon | 284 |
| Appendix 39a: Adult female striped mosquito, <i>Aedes notoscriptus</i> showing her white-spotted legs | 285 |
| Appendix 39b: Mosquito larvae and two pupae. Commonly called wrigglers and tumblers | 285 |
| Appendix 40: The green crane fly, <i>Leptotarsus viridus</i> | 286 |
| Appendix 41: The cascading threads produced by the glow-worm, <i>Arachnocampa luminosa</i> | 287 |
| Appendix 43: Technical drawing of the drawer base, showing mitre angles | 288 |
| Appendix 44: Technical drawing of the drawer sides showing mitre angles | 289 |
| Appendix 45: Technical drawing of the front face, Cabinet One | 290 |
| Appendix 46: Technical drawing of the top, Cabinet One | 291 |
| Appendix 47: Technical drawing of the flat element, Cabinet One | 292 |
| Appendix 48: Technical drawing if the left hand side, Cabinet One | 293 |
| Appendix 49: Technical drawing if the right hand side, Cabinet One | 294 |
| Appendix 50: Technical drawing of the front face, Cabinet Two | 295 |
| Appendix 51: Technical drawing of the top, Cabinet Two | 296 |
| Appendix 52: Technical drawing of the flat element, Cabinet Two | 297 |
| Appendix 53: Technical drawing if the left hand side, Cabinet Two | 298 |
| Appendix 54: Technical drawing if the right hand side, Cabinet Two | 299 |
| Appendix 55: Technical drawing of the front face, Cabinet Three | 300 |
| Appendix 56: Technical drawing of the top, Cabinet Three..... | 301 |
| Appendix 57: Technical drawing of the flat element, Cabinet Three..... | 302 |
| Appendix 58: Technical drawing if the left hand side, Cabinet Three..... | 303 |
| Appendix 59: Technical drawing if the right hand side, Cabinet Three..... | 304 |
| Appendix 60: List of insects deemed to have had significance for early Māori | 305 |

List of Figures

| | |
|--|----|
| Fig. 1.1 Stag beetle. Three-dimensional rendition of Durer’s painting | 9 |
| Fig. 1.2 Plate I, from Rev. Richard Taylor’s Te ika a Maui, 1855 | 20 |
| Fig. 1.3 Plate II, from Rev. Richard Taylor’s Te ika a Maui, 1855 | 21 |
| Fig. 2.1 An example of taxonomic ranking | 28 |
| Fig. 2.2 Pepe tuna, <i>Aenetus virescens</i> | 34 |
| Fig. 2.3 Pepe and pū a Raukatauri, <i>Liothula omnivorus</i> | 38 |
| Fig. 2.4 Moka | 40 |
| Fig. 2.5 Anuhe, hōtete, <i>Agrius convolvuli</i> | 41 |
| Fig. 2.6 Hīhue, <i>Agrius convolvuli</i> | 47 |
| Fig. 2.7 Pepe, <i>Agrotis ipsilon aneituma</i> | 48 |
| Fig. 2.8 Pepe kehua, <i>Dasypodia cymatodes</i> | 50 |
| Fig. 2.9 Pepe tāwhanawhana, <i>Epiphryne verriculata</i> | 53 |
| Fig. 2.10 Pepe, <i>Cleora scriptaria</i> | 54 |
| Fig. 2.11 Mokarakara and makokōrori, <i>Nyctemera annulata</i> | 54 |
| Fig. 2.12 Kahukura, <i>Vanessa gonerilla gonerilla</i> | 57 |
| Fig. 2.13 Huhu, tunga-rakau, and pepe-te-muimui, <i>Prionoplus reticularis</i> | 60 |
| Fig. 2.14 Mūmū, <i>Stethaspis longicornis</i> | 65 |
| Fig. 2.15 Large fleshy larva of mumutaua, <i>Pericoptus truncatus</i> | 66 |
| Fig. 2.16 Tuwhaipapa, <i>Lasiorrhyncus barbicornis</i> | 67 |
| Fig. 2.17 Pāpapa and moeone, <i>Cicindella tuberculata</i> | 68 |
| Fig. 2.18 Kurikuri, <i>Megadromus capito</i> | 70 |
| Fig. 2.19 Takituri, <i>Hadrobregmus magnus</i> | 71 |
| Fig. 2.20 Kapokapowai, <i>Uropetala carovei</i> | 72 |
| Fig. 2.21 Kēkēwai, tīemiemi, <i>Austrolestes colenisonis</i> | 74 |
| Fig. 2.22 Kihitara, <i>Xanthocnemis zealandica</i> | 74 |
| Fig. 2.23 Pepe, <i>Archichaulodes diversus</i> | 75 |
| Fig. 2.24 Puene, <i>Archichaulodes diversus</i> | 75 |
| Fig. 2.25 Pūtangatanga (female), <i>Hemideina crassidens</i> | 79 |
| Fig. 2.26 Tokoriro, <i>Gymnoplectron waitomoensis</i> | 81 |
| Fig. 2.27 Pihareinga, <i>Teleogryllus commodus</i> | 82 |
| Fig. 2.28 Honi, <i>Triamescaptor aotea</i> | 83 |
| Fig. 2.29 Kapakapa, <i>Locusta migratoria</i> | 85 |

| | |
|---|-----|
| Fig. 2.30 Mawhitiwhiti, <i>Phaulacridium marginale</i> | 87 |
| Fig. 2.31 Kikipounamu, <i>Caedica simplex</i> | 88 |
| Fig. 2.32 Kihikihi wawā, <i>Amphisalta zelandica</i> | 89 |
| Fig. 2.33 Kiriwhenua | 96 |
| Fig. 2.34 Rō, whe, <i>Orthodera novaezeelandiae</i> | 98 |
| Fig. 2.35 Kēkerengū, <i>Platyzosteria novaeseelandiae</i> | 99 |
| Fig. 2.36 Matā, <i>Anisolabis littorea</i> | 100 |
| Fig. 2.37 The 'carved' pattern produced by beetle larvae beneath the bark of a dead Eucalyptus branch | 106 |
| Fig. 2.38 The carved pattern 'He whakaironui,' from Phillipps <i>Maori carving</i> (1941, Fig. 9, p. 28) | 107 |
| Fig. 2.39 Ngaro, <i>Calliphora stygia</i> | 109 |
| Fig. 2.40 Ngaro tara, <i>Protohisticia alcis</i> | 110 |
| Fig. 2.41 Ngaro tara, <i>Helophilus trilineatus</i> | 112 |
| Fig. 2.42 Namu, <i>Austrosimulium australense</i> | 113 |
| Fig. 2.43 Waeroa, <i>Aedes notoscriptus</i> | 115 |
| Fig. 2.44 Pongarongaro, naonao, <i>Chironomus zealandicus</i> | 118 |
| Fig. 2.45 Pekepeke-haratua, <i>Leptotarsus viridus</i> | 119 |
| Fig. 2.46 Purātokes, <i>Arachnocampa luminosa</i> | 120 |
| Fig. 2.47 Pokorua, <i>Pachycondyla castanea</i> | 123 |
| Fig. 2.48 Namu katipō, katipō, <i>Priocnemis monachus</i> | 126 |
| Fig. 2.49 Wīwī, <i>Sphictostethus nitidus</i> | 128 |
| Fig. 2.50 Keha, tuiāu, <i>Ctenocephalides felis</i> (cat flea) | 131 |
| Fig. 3.1 <i>Chapman's homer</i> , bronze, 2011, Venice biennale (Regan Balzer) | 137 |
| Fig. 3.2 <i>Personaggio</i> , 1974, Bronze, 3740 x 900 x 900mm | 139 |
| Fig. 3.3 <i>Painted bronze</i> , 1960, oil on bronze, 140 x 203 x 120mm | 140 |
| Fig. 3.4 <i>Painted bronze</i> , 1960, oil on bronze, 343 x 203 diameter | 141 |
| Fig. 3.5 Detail of <i>Batocera longhorns and Goliath</i> , bronze, 1996. Te Manawa | 142 |
| Fig. 3.6 Detail of stick insect on <i>Pacific Monarch (Papaioia)</i> , bronze, 1992, 4040mm, Te Manawa | 144 |
| Fig. 3.7 Plate XIII from G.V. Hudson's <i>New Zealand moths and butterflies</i> , 1898 | 146 |
| Fig. 4.1 The completed wētā-punga | 148 |
| Fig. 4.2 Cast wētā-punga showing sprues | 149 |
| Fig. 4.3 Wax Maquette of drawer and cabinet | 151 |

| | |
|--|-----|
| Fig. 4.4 ‘Fourth drawer’ and cabinet combination | 151 |
| Fig. 4.5 The completed wax combination | 152 |
| Fig. 4.6 ‘Fourth drawer’ and cabinet coated in ceramic shell | 153 |
| Fig. 4.7 Catastrophic failure in the pouring of the cabinet, using the lost wax process | 153 |
| Fig. 4.8 Forklift and angle grinder used to cut the mitres | 154 |
| Fig. 4.9 All the faces of the drawer | 155 |
| Fig. 4.10 Section of cabinet before ‘cleaning’ | 156 |
| Fig. 4.11 The same section of cabinet after grinding and fettling | 156 |
| Fig. 4.12 The stainless steel clamp attached to the back of the drawer..... | 157 |
| Fig. 4.13 The drawer/cabinet suspended off a forklift using the stainless steel clamp | 157 |
| Fig. 4.14 The first series of knobs for the drawers and cabinet..... | 158 |
| Fig. 4.15 The second series of knobs with the additional basal disc | 158 |
| Fig. 4.16 The suspended cabinet/drawer showing wax knobs | 159 |
| Fig. 4.17 The knob is positioned centrally over a hole and against a stopper | 160 |
| Fig. 4.18 A brace is placed over the head of the knob and clamped in place | 160 |
| Fig. 4.19 The clamp is turned over to expose the hole and position for drilling | 160 |
| Fig. 4.20 Pūriri moth coated in primer | 161 |
| Fig. 4.21 A male pūriri moth freshly pinned and set | 162 |
| Fig. 4.22 The same moth showing shrinkage and fading after two months | 162 |
| Fig. 4.23 The bronze pūriri moth, painted | 162 |
| Fig. 4.24 Engraving a drawer using guide runners | 163 |
| Fig. 4.25 Mahogany faux bois airbrushed and varnished | 164 |
| Fig. 4.26 Pen and paint rendition of Hudson’s drawer of pūriri moths | 167 |
| Fig. 4.27 Cabinet one, drawer one | 168 |
| Fig. 4.28 Cabinet one, drawer two | 171 |
| Fig. 4.29 Cabinet one, drawer three | 172 |
| Fig. 4.30 Cabinet two, drawer one | 174 |
| Fig. 4.31 Cabinet two, drawer two | 176 |
| Fig. 4.32 Cabinet two, drawer three | 178 |
| Fig. 4.33 Cabinet three, drawer one | 180 |
| Fig. 4.34 Cabinet three, drawer two | 182 |
| Fig. 4.35 Cabinet three, drawer three | 186 |

| | |
|--|-----|
| Fig. 4.36 Kihikihi, cicada nymphs and adult kihikihi wawā | 187 |
| Fig. 4.37 Mokarakara, <i>Nyctemera annulata</i> , magpie moths | 188 |
| Fig. 4.38 Pepe kehua, pari kori taua, <i>Dasypodia cymatodes</i> , owl moth | 188 |
| Fig. 4.39 Namu katipō, <i>Priocnemis monachus</i> and the tunnelweb spider, <i>Porrhothele antipodiana</i> | 189 |
| Fig. 4.40 Pihareinga, <i>Teleogryllus commodus</i> in singing positions | 190 |
| Fig. 4.41 Pepe tuna, <i>Aenetus virescens</i> , pūriri moths | 191 |
| Fig. 4.42 Painted wētā-punga in 'habitat' | 192 |
| Fig. 6.1 The DNA of art as it pertains to this thesis | 232 |
| Fig. 6.2 The three-dimensional DNA helix when rotated forms a koru | 232 |

List of Tables

| | |
|---|----|
| Table 1.1 The ‘true’ insects collected on Cook’s first voyage to New Zealand that were described and ascribed the Linnaeus format of binomial nomenclature by Johan Christian Fabricius and published in <i>Systema Entomologiae</i> , 1775 | 16 |
| Table 2.1 Non specific names attributed to insects and insect groups | 28 |
| Table 2.2 Moths or butterflies | 33 |
| Table 2.3 Pūriri moth and caterpillar | 35 |
| Table 2.4 Vegetable caterpillar | 36 |
| Table 2.5 Bag moth cocoon | 38 |
| Table 2.6 Leaf rollers | 40 |
| Table 2.7 Sphinx moth caterpillar | 42 |
| Table 2.8 Whakataukī (proverbs) that reference the sphinx moth caterpillar | 43 |
| Table 2.9 Sphinx moth chrysalis | 46 |
| Table 2.10 Sphinx moth | 47 |
| Table 2.11 Greasy cutworm caterpillar | 49 |
| Table 2.12 Owl moth | 51 |
| Table 2.13 Looper caterpillars and moths | 52 |
| Table 2.14 Magpie moth and caterpillar | 55 |
| Table 2.15 Butterflies and chrysalis | 56 |
| Table 2.16 Red admiral butterfly and caterpillar..... | 57 |
| Table 2.17 Huhu grub, pupa and beetle | 60 |
| Table 2.18 Mānuka beetle | 64 |
| Table 2.19 Grass grub | 65 |
| Table 2.20 Mūmū chafer | 65 |
| Table 2.21 Tanguru chafer | 66 |
| Table 2.22 Sand scarab | 66 |
| Table 2.23 Tiger beetle and larva | 68 |
| Table 2.24 Ground beetle | 70 |
| Table 2.25 Borer beetles | 71 |
| Table 2.26 Dragonflies | 73 |
| Table 2.27 Blue damselfly | 74 |
| Table 2.28 Red damselfly | 74 |
| Table 2.29 Dobsonfly and mayflies | 75 |
| Table 2.30 Wētā | 77 |

| | |
|---|-----|
| Table 2.31 Black crickets | 82 |
| Table 2.32 Whakataukī that reference crickets | 83 |
| Table 2.33 Mole cricket | 84 |
| Table 2.34 Short-horned grasshoppers | 84 |
| Table 2.35 Locust | 85 |
| Table 2.36 Large short-horned grasshopper | 86 |
| Table 2.37 Common small short-horned grasshopper | 87 |
| Table 2.38 Katydid | 88 |
| Table 2.39 Cicada adult | 89 |
| Table 2.40 Whakataukī that reference cicada | 94 |
| Table 2.41 Cicada nymph | 95 |
| Table 2.42 Stick insects and praying mantids | 97 |
| Table 2.43 Black cockroach | 99 |
| Table 2.44 Flies (stout or round bodied flies – Brachycera) | 101 |
| Table 2.45 Maggots | 104 |
| Table 2.46 Bluebottle fly and maggots | 108 |
| Table 2.47 Golden brown blowfly | 109 |
| Table 2.48 Sandflies | 113 |
| Table 2.49 Biting midges..... | 115 |
| Table 2.50 Mosquitoes | 116 |
| Table 2.51 Midges, gnats | 118 |
| Table 2.52 Crane flies | 119 |
| Table 2.53 Glow-worms | 121 |
| Table 2.54 Ants | 123 |
| Table 2.55 Whakataukī that reference ants | 125 |
| Table 2.56 Lice | 129 |
| Table 2.57 Lice eggs | 130 |
| Table 2.58 Fleas | 132 |
| Table 5.1 Insect creators | 202 |

Chapter One

Bronze as a non-customary intervention in
the interpretation of insects from the
natural world of Māori

