Colonial Museum and Geological Survey Department.

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# CATALOGUE

OF THE

# TERTIARY MOLLUSCA AND ECHINODERMATA

OF

# NEW ZEALAND,

IN THE COLLECTION OF THE COLONIAL MUSEUM.

BY

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Published by Command.

WELLINGTON.
BY AUTHORITY: G. DIDSBURY, GOVERNMENT PRINTER.

1873.

# PREFACE.

The Tertiary Fossils enumerated in the following Catalogue are all represented in the Colonial Museum, and, with a few exceptions, have been collected during the Geological Survey of the Colony. About eighty distinct localities for Tertiary Fossils have been examined, but the relative value of the collections from these places as palæontological evidence is very unequal, owing to the circumstances under which the collections were made. Thus in many cases the fossils are only a few chance specimens obtained during the exploration of remote and uninhabited districts; and in only a very few instances have the collections been sufficiently exhaustive to afford reliable materials useful in the stratigraphical comparison of widely separated fossiliferous deposits.

Additional uncertainty must also arise from the fact that in certain localities two or more distinct formations occur, which could not be discriminated at the time when some of the earliest collections were formed.

The classification of the Formations adopted by Captain Hutton from the numerical proportions of the species is therefore only to be considered as a provisional attempt, but this does not detract from the value which it is hoped the Catalogue will have for the collector. Hitherto, in the absence of all artificial excavation of the rock masses, the opportunities for obtaining fossils have been few in comparison with those available in more

fully settled countries; but the rapid extension of railway lines and roads throughout the Islands will display in future better sections of the strata for the inspection of the geologist, and open up many new localities rich in fossil remains.

A series of lithographed plates is being prepared of the most characteristic fossils mentioned in this Catalogue, including all the newly described species, and will be issued shortly.

JAMES HECTOR.

Colonial Museum, Wellington, 18th June, 1873.

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## *ERRATA.*

Page 4. *Pleurotoma sulcata.* For "Broken River (L)" read "Broken River (U)."

„ 6. *Purpura excursa.* This species must be expunged, as it is identical with *Struthiolaria senex.*

„ 7. *Voluta pacifica.* For "*Var. V.*" read "*Var. C.*"

„ 7. *Mitro enysi.* For "Broken River (U)" read "Broken River (L)."

„ 8. Insert "Marginella" before "51. M. albescens."

„ 14. *Crypta profunda* is found recent at Auckland.

„ 18. *Mactra inflata* is found recent at Wellington.

„ 24. *Lucina divaricata:* add "Broken River (L)."

# INTRODUCTION.

SINCE the Synopsis of the younger formations of New Zealand was published in the Geological Reports for last year (Geological Reports, 1871–72, p. 182), I have visited the eastern parts of the Provinces of Marlborough and Nelson, and the north-east part of Canterbury, which districts include most of the more important localities for tertiary fossils; and this, together with further additions to the collection in the Museum, has enabled me to make several important corrections in the classification there proposed. In the first place, the additional fossils from Broken River, as well as the stratigraphical rearrangement by Dr. Hector of those from the same locality previously in the collection, and a personal examination of the Waipara and Weka Pass districts, have shown me that my Waitemata group must be broken up, and the larger part of it transferred to the upper portion of the Ototara group, while the remainder must go to the Hawke Bay group, or the Ahuriri formation, as I now propose to call it, in order to assimilate the name with those of the other formations.

An examination in the field of the Culverden beds, showed me that these also must be transferred to the Ototara group, and the Weka Pass building stone to the lower part of the same formation. This necessitated the transference of the Cobden limestone also into this formation; thus eliminating from the Waipara formation most of its tertiary looking fossils.* I have, therefore, grouped all these beds together under the name of the Oamaru formation, which I have divided into an upper or Trelissick group, and a lower or Ototara group. According to my present views, therefore, our tertiary rocks may be divided as follows:—

| Probable Age. | Formation. | Group. |
|---|---|---|
| Newer Pliocene ... | Wanganui formation, 76 per cent. recent. | |
| Upper Miocene ... | Pareora formation, 34 per cent. recent ... | Awatere group. / Kanieri group. |
| Lower Miocene ... | Ahuriri formation, 23 per cent. recent. | |
| Upper Eocene ... | Oamaru formation, 9 per cent. recent. ... | Trelissick group. / Ototara group. |

The following are the localities in which they are found:—

*Wanganui formation.*—North Island: Shakespeare Cliff, Wanganui; Patea.

*Awatere group.*—South Island: Awatere; Motanau (L); Awamoa; Hampden; Port Hills, Nelson; Mount Caverhill.

*Kanieri group.*—South Island: Kanieri; Callaghan's Creek, Westland; Lyndon; Waikari; Lower Gorge of the Waipara; Pomahaka, Otago.

* I am, however, still of opinion that the Waipara formation belongs to the Upper Cretaceous period.

In addition to the above, the following belong to the Pareora formation, but it is uncertain in which group they should be placed:—

North Island: Upper Wanganui River; Hautapu Falls, Upper Rangitikei; Manawatu Gorge (upper end); White Cliffs, Taranaki.

South Island: Conway River; Kokohu; Pareora; Waitaki; Weka Pass (U).

*Ahuriri formation.*—North Island: Napier; Castle Point; Taipo, on the East Coast of Wellington; Kawau; Cape Rodney; Orakei Bay, Auckland (?); Waitotara. South Island: Broken River* (U); Hurunui Mound; Te Anau Lake (?).

*Trelissick group.*—South Island: Broken River* (L); Weka Pass (M); Mount Brown; Deans, Waipara; Kaipuki Cliffs; Point Elizabeth; Tata Island.

*Ototara group.*—North Island: Poverty Bay (L); Raglan; Port Waikato; Aotea; Wangape Lake; Wangarei; Cape Kidnappers. South Island: Cobden; Weka Pass (L); Waipara (L); Oamaru; Caversham; Curiosity Shop; Brighton; Waihola Gorge.

In addition to the above, the following also belong to the Oamaru formation, but the evidence is not yet sufficient to say in which group they should be placed:—

South Island: Culverden; Black-birch Creek; Pahau; Cape Farewell; Takaka; Lake Wakatipu†; Cave Creek, Mount Somers; Tokomairiro; Winton.

In addition to the above, beds of Pleistocene (Post-pliocene) age are found at Wanganui, Motanau, and Cape Kidnappers.

The fossils from the Chatham Islands appear to be mixed, as shells characteristic of the Kanieri group, the Ahuriri formation, and the Trelissick group are all in the collection. I think it probable that two formations occur there, one belonging to the Pareora formation, and the other intermediate between the Ahuriri and Oamaru formations. If, however, there should be only one formation present, I should be inclined to refer it to the Ahuriri period.

In the following pages, when more than one *tertiary* formation occurs in a locality, I have marked the upper, middle, and lower formations by the letters (U), (M), and (L) respectively, immediately after the name of the locality. I have also included in the Catalogue descriptions of a few species taken to Europe by Dr. Hochstetter, but not represented in the collection of the Colonial Museum; these species will be found pointed out in the text.

Wellington, May, 1873. F. W. HUTTON.

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* Same locality as Trelissick of previous lists.—J.H.

† The limestones of Lake Wakatipu may perhaps belong to the Upper Cretaceous period (Waipara formation), as the fossils are not very characteristic, and considerably distorted.

# SUMMARY.

| | Recent. | Pleistocene. | Wanganui Formation. | Pareora Formation. | | Ahuriri Formation. | Oamaru Formation. | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Awatere Group. | Kanieri Group. | | Trelissick Group. | Ototara Group. | |
| Dentalium pacificum ... ... | * | * | | | | | | | |
| „ conicum ... ... | ... | ... | * | ... | ... | * | | | |
| „ nanum ... ... | ... | ... | * | | | | | | |
| „ tenuis ... ... | ... | ... | ... | ... | ... | ... | ... | * | |
| „ mantelli ... ... | ... | ... | ... | * | | | | | |
| „ irregularis... ... | ... | ... | ... | * | * | | | | |
| „ lævis ... ... | ... | ... | ... | * | * | ... | ... | ... | Chatham Islands. |
| „ giganteum ... | ... | ... | ... | ... | * | ... | * | * | Fossil in Chile. |
| „ solidum ... ... | ... | ... | ... | ... | * | | | | |
| Murex octogonus ... ... | * | * | * | | | | | | |
| „ zealandicus ... ... | * | ... | * | | | | | | |
| „ lyratus ... ... | * | ... | * | | | | | | |
| Typhis zealandica ... ... | ... | ... | * | | | | | | |
| Fusus pensum ... ... | * | ... | * | | | | | | |
| „ australis ... ... | * | ... | * | * | | | | | |
| „ zealandicus ... ... | * | * | * | ... | ... | ... | ... | ... | Chatham Islands.(?) |
| „ „ var. B. ... | ... | ... | ... | ... | * | | | | |
| „ mandarinus ... ... | * | ... | * | * | * | | | | |
| „ dilatatus ... ... | * | ... | * | * | ... | * | | | |
| „ crawfordi ... ... | ... | ... | ... | ... | ... | * | | | |
| „ plicatilis ... ... | ... | ... | ... | ... | * | | | | |
| „ corticatus ... ... | * | * | * | | | | | | |
| „ plebeius ... ... | * | ... | * | | | | | | |
| „ linea ... ... ... | * | * | * | | | | | | |
| „ littorinoides ... ... | * | ... | * | | | | | | |
| „ triton ... ... ... | * | * | * | | | | | | |
| „ nodosus ... ... | * | * | * | | | | | | |
| „ „ var. B. ... | * | * | * | * | * | | | | |
| „ „ „ C. ... | ... | ... | * | * | | | | | |
| „ „ „ D. ... | ... | ... | ... | * | * | | | | |
| Pleurotoma novæ zealandiæ ... | * | ... | * | | | | | | |
| „ lævis ... ... | * | ... | * | | | | | | |
| „ buchanani ... | ... | ... | * | * | | | | | |
| „ trailli ... ... | ... | ... | ... | * | | | | | |
| „ awamoaensis ... | ... | ... | ... | * | | | | | |

SUMMARY—*continued.*

| —— | Recent. | Pleistocene. | Wanganui Formation. | Pareora Formation. | | Ahuriri Formation. | Oamaru Formation. | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Awatere Group. | Kanieri Group. | | Trelissick Group. | Ototara Group. | |
| Conus ornatus ... ... | ... | ... | ... | * | | | | | |
| „ trailli ... ... ... | ... | ... | ... | * | | | | | |
| Struthiolaria nodulosa ... | * | * | * | | | | | | |
| „ „ var. C | ... | * | * | | | | | | |
| „ vermis ... ... | * | * | | | | | | | |
| „ scutulata ... | * | ... | ... | * | | | | | |
| „ sulcata ... ... | ... | ... | ... | * | ... | * | | | |
| „ cingulata ... | ... | ... | ... | * | | | | | |
| „ „ var. B | ... | ... | ... | * | | | | | |
| „ cincta ... ... | ... | ... | ... | * | * | | | | |
| „ „ var. B | ... | ... | ... | ... | * | | | | |
| „ „ „ C | ... | ... | ... | ? | | | | | |
| „ tuberculata ... | ... | ... | ... | ... | ... | * | | | |
| „ „ var. B | ... | ... | ... | ... | * | | | | |
| „ senex ... ... | ... | ... | ... | ... | ... | ... | ... | * | |
| Trichotropis inornata ... ... | * | ... | * | | | | | | |
| Cerithium rugatum ... ... | ... | ... | ... | ... | * | | | | |
| „ cancellatum ... | ... | ... | * | * | | | | | |
| „ nodulosum ... | ... | ... | ... | ... | ... | * | | | |
| Rissoa vana ... ... | ... | ... | ... | * | | | | | |
| Turritella rosea ... ... | * | * | * | * | * | * | | | |
| „ gigantea ... ... | ... | ... | ... | ... | * | * | ... | * | |
| „ vittata ... ... | * | * | * | * | ... | * | | | |
| „ pagoda ... ... | * | * | * | * | | | | | |
| „ ambulacrum ... | ... | ... | ... | * | ... | ... | ... | ... | Chatham Islan fossil in Patago |
| „ tricincta ... ... | ... | ... | * | * | * | | | | |
| „ „ var. B | ... | ... | ... | ... | * | | | | |
| „ fulminata, var. B ... | ... | * | * | | | | | | |
| „ bicincta ... ... | ... | ... | ... | ... | * | | | | |
| „ ornata ... ... | ... | ... | ... | ... | * | | | | |
| Cladopoda zealandica ... | * | ... | * | | | | | | |
| „ monilifera ... | ... | ... | * | ... | ... | * | | | |
| Phorus onustus ... ... | ... | ... | ... | * | | | | | |
| Calyptræa maculata ... ... | * | * | * | * | ... | * | * | | |
| Trochita tenuis ... ... | * | * | * | | | | | | |
| „ dilatata ... ... | ... | ... | ... | * | * | | | | |
| Crypta costata ... ... | * | ... | * | ... | * | | | | |
| „ contorta ... ... | * | * | ... | * | ... | * | | | |
| „ incurva ... ... | ... | ... | ... | * | * | | | | |
| „ striata ... ... ... | ... | ... | ... | * | ... | ... | * | * | |
| „ profunda ... ... | * | ... | * | * | ... | * | | | |
| Pilæopsis uncinatus ... ... | ... | * | | | | | | | |
| „ radiatus ... ... | ... | ... | ... | * | | | | | |
| Neritella niitda ... ... | ... | ... | ... | ... | * | | | | |
| Turbo granosus ... ... | * | * | ... | ... | * | | | | |
| „ rubicundus ... ... | * | * | | | | | | | |
| „ superbus ... ... | ... | ... | ... | ... | ... | * | | | |
| Imperator imperialis ... | * | * | * | | | | | | |

*Localities.*—Kaipuki; Oamaru; Weka Pass (M); Waikato South Head; Curiosity Shop; Kawau; Aotea (Hochstetter).

66. **S. intermedia,** *sp. nov.* Varices about twelve in a whorl, thin; whorls spirally ribbed, with intermediate striæ between the ribs; last whorl keeled. Axis, 1·25; breadth, ·45; angle of spire, 18°.

*Localities.*—Shakespeare Cliff.

This species has the thin varices of *S. zelebori* with the intermediate striæ of *S. lyrata.*

67. **S. rotunda,** *sp. nov.* Varices about twelve in a whorl, rather thin; whorls finely spirally striated throughout; last whorl rounded; mouth round; imperforate. Axis(?); breadth, 1·25; angle of spire, 20°.

*Localities.*—Weka Pass (L); Brighton.

FAMILY—PYRAMIDELLIDÆ.

## ODOSTOMIA.

68. **O. lactea,** *Angas; Cat. Marine Moll., p.* 22.

*Localities.*—Shakespeare Cliff.

FAMILY—CONIDÆ.

## CONUS.

69. **C. ornatus,** *sp. nov.* Whorls smooth, with a row of small nodules on the keel, crossed by two or three spiral lines; a few spiral striæ at the anterior end of the body whorl. Axis, ·8; breadth, ·3.

*Localities.*—Awamoa.

70. **C. trailli,** *sp. nov.* Spire whorls smooth, angled; body whorl faintly distantly irregularly spirally striated. Axis, ·9; breadth, ·43.

*Localities.*—Awamoa.

FAMILY—STROMBIDÆ.

## STRUTHIOLARIA.

71. **S. nodulosa,** *Lamark; Cat. Marine Moll., p.* 24.

*Localities.*—Wanganui (U); Shakespeare Cliff.

*Var. C.*—Large; whorls slightly angled, sub-nodular.

*Localities.*—Wanganui (U); Shakespeare Cliff.

This variety is intermediate between *S. nodulosa* and *S. gigas.*

72. **S. vermis,** *Martyn; Cat. Marine Moll., p.* 24.

*Localities.*—Wanganui (U).

73. **S. scutulata,** *Deshayes; Cat. Marine Moll., p.* 24.

*Localities.*—Awatere; Motanau (L); Awamoa.

74. **S. sulcata.** *S. canaliculata, Zittel, Voy. Novara, Palæ., p.* 34 *(not of Spengl).* Ovato-oblong, ventricose, thick, turreted; whorls six, suture broad and deeply excavated; with thick quadrangular spiral ribs, which are equal in breadth to the grooves; nine ribs in the