

1874.
NEW ZEALAND.

SIXTH ANNUAL REPORT OF THE NEW ZEALAND INSTITUTE.

Presented to both Houses of the General Assembly by command of His Excellency.

GENERAL BUSINESS.

THE Board of Governors met during the past year for the transaction of business on the 29th July, 1873, and 6th of January, 1874.

The retiring members of the Board for the year were reappointed, and the Governors elected by the affiliated Societies were—Mr. Justice Chapman, Mr. Rolleston, M.H.R., and Mr. J. C. Crawford.

The following foreign members were elected for the year, in accordance with Statute IV.:—Sir Charles Lyell, Bart., F.R.S.; Albert Gunther, M.D., F.R.S., &c.; Rev. O. Pickard Cambridge, M.A., C.M.Z.S.

The number of members now on the roll of the Institute is as follows:—

Honorary Members	...	...	...	...	...	...	18
<i>Ordinary Members.</i>							
Auckland Institute	...	...	...	...	...	...	214
Wellington Philosophical Society	...	...	...	...	...	...	146
Otago Institute	...	...	...	...	...	...	128
Philosophical Society of Canterbury	...	...	...	...	...	...	76
Nelson Association	...	...	...	...	...	...	59
Making a total of	...	...	...	...	...	...	641

The Institute has lost one foreign member during the year, by the death of Professor Louis Agassiz.

Each of the members included in the above list receives a copy of the sixth volume of the Transactions and Proceedings of the Institute, free of cost.

The free list, a copy of which is appended, requires seventy-nine volumes; and the remainder of the edition of 900 volumes is reserved for sale at £1 1s. each to private individuals, and at half price to local libraries in the colony.

PUBLICATION OF THE TRANSACTIONS.

The printing of the sixth volume was commenced in January last, but owing to the excessive demand for all kinds of labour during the present season, from the influence of which the printer's business was not exempt, the contract could not be completed so soon as usual, and the book was not issued until the end of June. Some extra delay was also caused through the late date at which the papers were received, and to allow Mr. J. T. Thomson to correct the proof sheets of his ethnographical paper; and lastly, owing to the very large number of illustrations.

The volume contains 560 pages, with thirty-five plates and several woodcuts. Eighty-one articles were selected by the Board, and printed in the volume. These are by forty-two authors, and have been arranged as follows:—

	Papers.	Pages.
Miscellaneous	28	61
Zoology	30	146
Botany	10	44
Chemistry	3	20
Geology	10	95
Proceedings of Societies	...	88

In the Proceedings will be found abstracts of thirty-three communications, which were not considered suitable for printing in the Transactions.

Mr. Thomson's paper was placed in an appendix, in order to avoid as much as possible delaying the rest of the work while the proof sheets were sent to Dunedin for revision.

In the Appendix will also be found two articles not directly connected with New Zealand, and a reprint from the "Annals and Magazine of Natural History," which has been made at the suggestion of the Philosophical Institute of Canterbury.

The illustrations of the papers by Dr. Buller (Plate XXI.), and the Rev. O. P. Cambridge (Plate VI.), were executed in London, and Plate I. on Mr. Thomson's paper in Dunedin. The remainder of the illustrations have been printed, by permission of the Hon. the Colonial Secretary, at the Government Lithographic establishment. The other drawings on stone were made from the original objects by Mr. John Buchanan, of the Geological Department, except in the case of those illustrating Dr. Knight's paper on the Structure of the Saurian Teeth (Plates XXIV.—VI.), which were drawn on the stone by the author himself.

The valuable services afforded by the assistant editor, Mr. A. T. Bothamley, in passing the work through the press, and by Mr. R. B. Gore, in preparing the abstract of the Meteorological Observations which will be found in the Appendix, have to be acknowledged.

The following papers submitted to the Board for approval have been reserved :—

1. Cosmography, by J. Leith.
2. Remarks on Mr. Leith's Paper, by T. Heale.
3. Remarks on Dr. Basstian's work on Beginnings of Life, by T. Heale.
4. Induction and Necessary Truth, by Dr. Kidd.

Dr. Haast's valuable paper on the "Harpagornis" has been entitled "Abstract," but it is necessary to explain that only paragraphs repeated from his previous paper on the same subject (Art. XXVIII., Vol. IV.) have been suppressed, the author having prepared a complete *résumé* of the whole subject, to be printed in quarto form with the illustrations of natural size. The funds at the disposal of the Board will not, however, for the present, allow of the production of the series of quarto monographs that are contemplated, of which Dr. Haast's papers are to be the first.

The reprint of Vol. I. of the Transactions, which was undertaken by Government, has not yet been published, owing to the pressure of work in the Government Printing Office.

The number of volumes now on hand is as follows:—Of Vol. I., 5 copies; Vol. II., 36 copies; Vol. III., 31 copies; Vol. IV., 35 copies; Vol. V., 119 copies.

The statement of accounts of the Institute by the Honorary Treasurer is appended, and shows a balance in hand of £209 9s. 5d.

Reports showing the progress of the works in the various departments under the Manager's direction are appended.

7th August, 1874.

JAMES HECTOR,
Manager.

No. FREE LIST FOR ISSUE OF THE "TRANSACTIONS."
Copies.

- 12 Governors of the Institute. (See printed list in Transactions.)
- 18 Honorary members. (See printed list in Transactions.)
- 1 The Prime Minister.
- 1 The Colonial Treasurer.
- 1 The Native Minister.
- 1 The Under Colonial Secretary.

Foreign Societies, Libraries, &c.

- 1 The Colonial Office, London.
- 1 The Agent-General, London.
- 1 Trübner and Co. (Agents), London.
- 1 The British Museum, London.
- 1 The Royal Society, London. (Ex.)
- 1 The Royal Geographical Society, London. (Ex.)
- 1 Ethnological Society, London. (Ex.)
- 1 Geological Society, London. (Ex.)
- 1 Zoological Society, London. (Ex.)
- 1 Geological Survey of the United Kingdom, London. (Ex.)
- 1 Geological Magazine. (For Review.)
- 1 Literary Institute, Norwich, England. (Ex.)
- 1 The University Library, Edinburgh. (Ex.)
- 1 The Royal Society, Dublin. (Ex.)
- 1 The Philosophical Society of Leeds, England. (Ex.)
- 1 Smithsonian Institute, Washington. (Ex.)
- 1 Geological Survey of India. (Ex.)
- 1 Royal Society of Tasmania Library. (Ex.)
- 1 The Public Library of Melbourne.
- 1 South Australian Institute Library. (Ex.)
- 1 Royal Society of Victoria, Melbourne. (Ex.)
- 1 University Library, Sydney.
- 1 Public Library of Tasmania.
- 1 Legislative Library, Adelaide.
- 1 Public Library, Sydney.
- 1 Royal Society, New South Wales. (Ex.)
- 1 Academy of Natural Science Library, Philadelphia, U.S. (Ex.)
- 1 Academy of Natural Science, San Francisco. (Ex.)
- 1 Oxford University Library, England.
- 1 Imperial German Academy of Naturalists, Dresden. (Ex.)
- 1 Cambridge University Library, England.

Contributions and Exchanges.

- 1 His Excellency Governor Weld, Western Australia.
- 1 Professor Balfour, Edinburgh.
- 1 Professor McCoy, Melbourne.
- 1 Chairman of School Library Committee, Eton, Bucks, England.
- 1 Chairman of School Library Committee, Harrow, England.
- 1 Chairman of School Library Committee, Rugby, Warwickshire, England.
- 1 President of Natural History Society, Marlborough College, Marlborough, Wilts.
- 1 Colonel Jewett, New York.
- 1 Dr. Wojeikof, of St. Petersburg.
- 1 Hon. Mr. Casey, Victorian Government.

Libraries and Societies in New Zealand.

- 1 Secretary, Auckland Institute.
- 1 Secretary, Wellington Philosophical Society.
- 1 Secretary, Philosophical Institute of Canterbury.
- 1 Secretary, Nelson Association.
- 1 Secretary, Otago Institute.
- 1 General Assembly Library.
- 9 Provincial Council Libraries.

Publishing Branch.

- 1 Editor.
- 1 Assistant Editor.
- 2 Draftsman.
- 1 Lithographer.
- 1 Government Printer.

Total, 97 copies.

MUSEUM.

No additions or alterations have been made to the Museum building during the past year, and the only expenditure has been for a few cases and drawers to enable the collections of fossils made during the season to be sorted and examined.

The accommodation for this and all other departments of the Museum is still quite insufficient, and the state of the building itself is such as to cause serious deterioration of the valuable collection which has been accumulated. Nothing short of the completion of the building according to the original plan will afford the accommodation that is now required for the arrangement of a type museum; and even then, to obtain sufficient space to enable the collections to be thoroughly comprehensible and easy of reference, a number of the larger specimens will have to be disposed of by exchange or gift. An expansion of the department of the Museum devoted to the Vegetable Kingdom is urgently required, to meet the applications that are very frequently made for information respecting vegetable products.

The number of specimens added to the Museum during the year has been over 20,000, of which 18,000 are fossils collected by the Geological Survey Department. About 600 specimens have been distributed as exchanges, and 205 bird skins have been presented to the Otago Museum.

Mammalia.—Several additions to the Cetacean collections have been secured, among which is a complete skeleton of the Sulphur Bottom Whale, 70 feet in length, obtained in Port Underwood; and also one of the Fin Back, procured for the Museum by Mr. Charles Traill in Stewart Island. The comparison of these skeletons, when they arrive at the Museum, will help to settle some important points in the natural history of this species. The skull of a calf of *Neobalæna marginata*, and several other interesting cetaceans have also been lent by the Auckland Museum, for the purpose of being described. Among the *foreign mammalia* the most important additions have been a fine collection of eighty specimens of the Rodents of North America, presented by the Smithsonian Institute, and twenty-four specimens of Reptiles from South Australia, sent by Mr. Waterhouse.

Birds.—The chief addition to the New Zealand birds has been the acquisition of a large number of skins of huia, kiwis, kakapos, and other specimens that, from their rarity, are useful for exchange. The only species added to the type collection is a specimen of *Procellaria lessoni*, obtained from the Chatham Islands.

Of foreign birds, the Museum has received from Mr. R. L. Holmes a fine series of those indigenous to the Fiji Islands; also a collection, from the Northern Territory of Australia, from the South Australian Museum; and a selection of North American species from the Smithsonian Institute.

A mounted collection of the New Zealand Raptores was sent by Dr. Buller from London, including a specimen of the great eagle, which is stated to have been shot off the East Coast of Wellington.

Reptilia.—In this section the chief additions are the snakes of Fiji and South Australia, but the collections in this class are still very incomplete.

Fishes.—Thirteen fishes have been added to the Fauna of New Zealand during the past year, the most interesting being those obtained in deep water off the coast by the "Challenger Expedition." A fine specimen of the Ceratodus, the fresh-water ganoid fish of Queensland, has also been presented to the Museum by Professor Wyville Thomson. Descriptions of some of these species will be found in the Transactions of the New Zealand Institute.

Invertebrata.—Besides many additions to the New Zealand collection in this class, an interesting series of Crustacea and Annelida, from Spitzbergen and the Coast of Scandinavia, has been presented by Professor Loven. Valuable additions to our Australian and Tasmanian shells have also been received from Dr. Cox, Mr. Gritton, and Mr. Gordon Saxby.

The Critical List of the New Zealand Mollusca by Dr. Von Marten, and also the Descriptive Catalogue of the Land Shells by Dr. Cox, have been published. Attention has also to be directed to the valuable lists of all the New Zealand Insects described up to 1870, prepared by Captain Hutton and Mr. R. W. Fereday, which have been published in the Transactions of the New Zealand Institute, Vol. VI., which also contains the Rev. O. P. Cambridge's introduction to the study of the Spiders of this country, and a Descriptive List of the Neuropterous Insects of New Zealand by Mr. R. McLachlan.

Palæontology.—Very large additions have been made to the collection of Fossils, both from sections formerly examined and from new localities and formations. Chief among these are the richly fossiliferous limestones and quartzites of lower Devonian or upper Silurian age, which underlie unconformably the auriferous rocks of Reefton, and from which over 2,000 specimens have been obtained. As this formation enters largely into the structure of the highly mineralized N.W. district of the South Island, the establishment of an easily recognized zone is most advantageous to the geology of the colony.

The interesting character of the small collection of fossils formerly obtained from the south-east district of Otago, indicating the probable existence of a passage group from lower mesozoic to palæozoic, suggested the importance of having further collections made from the sections afforded in the vicinity of Nugget Point and Catlin's River. For this work Mr. McKay, who conducted the excavations for saurian remains at Amuri Bluff so successfully, was selected; and in the course of three months he obtained nearly 3,000 fossils, which are as yet only partially worked out, but they serve to prove the existence in that district of a range of formations from lower jurassic to upper carboniferous.

A comparison of the upper coal formations on the east side of the South Island with those on the West Coast, and of more ample collections of fossils from the overlying formations, has shown that the bituminous coal seams on the West occur in a lower part of the formation that carries the brown or hydrous coal seams on both sides of the Island, and that the whole, together with an immense thickness of overlying marine formation, must be referred to the cretaceous period. This view has been further established by a survey of the East Cape District of the North Island, and the general results obtained will also require a revision of the present classification of the lower tertiary strata, as the evidence and re-establishment of a cretaceo-tertiary formation having for its upper member a representative of the nummulite limestone.

A special geological survey of the East Cape District of the North Island was made, to investigate the source of the petroleum which springs from the surface of the ground in many localities. This survey is not yet complete, but the information obtained indicates that the mineral oil is derived from bituminous shales of upper jurassic age.

The particulars of the various geological operations in the field will appear in a volume of Report of the Geological Survey; and it may be mentioned that the general geological map of the colony that was sent to the Vienna Exhibition is now in course of publication in Europe.

LABORATORY.

The number of analyses made during the past year was 356, viz.,—35 coals, 77 minerals, 37 ores, 10 waters, 31 gold assays, and 166 miscellaneous.

The particulars of these analyses will be found in the usual Annual Report by the Analyst.

JAMES HECTOR.

ACCOUNTS OF THE NEW ZEALAND INSTITUTE for 1873-74.

RECEIPTS.				EXPENDITURE.			
		£	s. d.			£	s. d.
Balance in hand, August, 1873	...	181	13 3	Expense of Printing Volume VI.	...	520	11 0
Vote for 1873-74	...	500	0 0	Miscellaneous—Binding, Advertising, &c.	...	2	1 6
Contribution from Wellington Philosophical Society	...	24	9 8	Balance	...	209	9 5
Sale of Transactions	...	25	19 0				
		£732	1 11			£732	1 11

A. LUDLAM, Treasurer.

Wellington, 10th August, 1874.

Price 3d.]

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