

1873.

NEW ZEALAND.

FIFTH ANNUAL REPORT OF THE NEW ZEALAND INSTITUTE.

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

FIVE years have now elapsed since the foundation of the New Zealand Institute, and this being the first occasion of a change of its official President, it affords an opportunity for a brief retrospect of the results which have been achieved through its instrumentality.

The chief object of the Act under which the Institute was incorporated was to promote the formation of societies in different parts of the Colony for the collection and discussion of original observations concerning its natural history and resources. It was obvious that the geographical circumstances of the Colony prevented the formation of any strong central society capable of stimulating and directing such investigations by frequent meetings of its members, as in other colonies that possess a chief centre of population, in which all social institutions become naturally concentrated. The constitution of the New Zealand Institute furnishes, therefore, a means of combining the efforts of Provincial societies, at the same time relieving them of the great expense which they would have to incur in publishing their Transactions in an independent form. Experience elsewhere has shown that, in new countries especially, the funds of such societies are inadequate for the proper production of their Transactions, from the fact that the number of their members is few and the field for original observation is large, so that in a few years such societies are liable to decay, after accumulating much material that would be, if published, of great assistance in advancing our knowledge of the country.

Each scientific society in New Zealand that becomes affiliated to the Institute receives a share of an annual parliamentary grant, in proportion to the amount of work which is performed by its members, and the result is the production of a volume of Transactions and Proceedings that carries more authority, and does more credit to the Colony, than could be derived from the publication of a number of detached pamphlets.

The form of constitution thus indicated has already evoked favourable expressions of opinion in some of the leading scientific journals of the old country, and it has even been seriously proposed that a similar institution should be established for consolidating the work of the different scientific societies scattered throughout Great Britain.

Although there is still much room for improvement, a comparison of the five volumes which have now been issued shows that there is an increasing interest manifested in scientific pursuits, which must be attributed in a great measure to the influence which has been exerted by the publications of the Institute. Not only has the standard of the communications made to the societies greatly improved, but the demand which is everywhere expressed for elementary instruction in science evinces a desire on the part of the public to obtain as a branch of education the qualifications necessary for the comprehension and utilization of scientific literature which is so characteristic a feature of the present age.

During the last five years, 445 communications have been read before the different societies incorporated with the Institute, and of these 286 have been printed at length in the Transactions. With few exceptions, all these papers relate directly to the Colony, and place on record matters of fact and observations that otherwise would probably not have been published for many years to come. They comprise in round numbers about 120 papers on miscellaneous subjects, chiefly relating to ethnological considerations of the aboriginal race or connected with the industrial resources of the Colony, 120 on Zoological subjects, 70 on Botanical, 53 on Chemistry and Metallurgy, and 60 on subjects relating to Geology and Physical Geography.

The information contained in these volumes is widely diffused beyond the limits of the Colony, the chief libraries in all parts of the world being supplied with copies.

The number of members of the Institute has now increased from 256 to 563, the following being the numbers enrolled in the different incorporated Societies:—

Auckland Institute	...	...	...	...	...	174
Wellington Philosophical Society	...	...	...	...	...	135
Otago Institute	...	...	...	...	...	113
Philosophical Institute of Canterbury	...	...	...	...	...	77
Nelson Association	...	...	...	...	...	64

During the past year four meetings of the Board of Governors have been held for the transaction of business, on 19th September and 13th November, 1872, and 21st February and 29th July, 1873.

Sir David Monro and Mr. W. T. L. Travers, F.L.S., were re-nominated Governors, and the Hon. Mr. Waterhouse and the Hon. Mr. Stafford were appointed on the retirement of Mr. Fitzgerald, C.M.G., and Dr. Knight, F.R.C.S.

The Governors elected by the incorporated Societies for the present year were Mr. Justice Chapman, Mr. Rolleston, M.H.R., Captain Hutton, F.G.S.

In February, 1873, Mr. Ludlam resumed the office of Honorary Treasurer, which had been held during his absence from the Colony by the Hon. Mr. Mantell.

The Foreign Members elected, in accordance with Statute IV., during the past year, are—Sir George Grey, K.C.B., Professor Huxley, LL.D, F.R.S., Admiral Stokes.

A diploma of honorary membership was also conferred by the Board upon His Excellency Sir G. F. Bowen, G.C.M.G., accompanied by an address, placing on record an acknowledgment of his services for the advancement of scientific pursuits in the Colony.

The attached statement of account shows the manner in which the funds at the disposal of the Board of Governors have been expended, leaving a balance of £181 13s. 3d. in hand at the close of the financial year.

The fifth volume of Transactions and Proceedings was issued in the month of May last. It contains 541 pages and 21 plates. 101 original communications were selected by the Board and printed in this volume; these are by 48 different authors, and consist of 33 on Zoology, 15 on Botany, 5 on Chemistry, 5 on Geology, and 43 papers on Miscellaneous subjects.

An arrangement has been made for the republication of the first volume of the Transactions, which is now out of print, only a small edition having been published; so that members who have joined the Institute since its first year may be able to obtain copies.

MUSEUM.

The number of specimens added to the collections in the Museum during the past year is 646, and the various sources from which they have been derived is acknowledged in the attached Schedule.*

Additional accommodation having been provided, a portion of the Museum hitherto occupied by offices has been applied to its proper use, and has afforded space for the exhibition of the large series of fossil Reptilian remains, which is now one of the most interesting and valuable collections in the Museum.

These fossil remains represent portions of forty-three individuals belonging to the genus *Plesiosaurus*, *Mauisaurus*, *Liodon*, and *Taniwasaurus*, and are from the upper mesozoic formation at the Amuri Bluff, and Waipara. They have been worked out from an exceedingly hard matrix, and will all be described and figured during the ensuing year.

Seals and Cetacea.—The collections in this branch have received many important additions, and the whole of the representatives of the latter group in New Zealand have been described in Vol. V. of the "Transactions of the New Zealand Institute," illustrated with figures of the most interesting specimens.

The skull of the elephant seal (*Morunga elephantina*), found among sand-hills on the West Coast, is a most interesting addition; and also the skull of a large seal, probably *Arctocephalus lobatus*, from the Campbell Islands, presented by the Rev. R. Taylor. A fine skull of *Orca pacifica*, or the whale-killer, captured on the coast of Otago, has also been deposited, for the purpose of being described, by the Hon. Captain Fraser.

Birds.—A considerable addition to the collection of New Zealand birds was made during the examination of the S.W. coast in January last, and during the exploration of the Te Anau district, which was made for this Department.

The collection of foreign birds has received a valuable addition of sixty-nine species from Dr. Finsch, in exchange for collections sent to him from this country. Professor Newton, of Cambridge, has presented a fine series of the bones of the Dodo and Solitaire, the extinct birds from the Mauritius and Rodriguez Islands. A fine series of birds from the Christiania Museum, in Norway, was procured by Mr. Friberg, during a visit to that country in connection with the Immigration Department.

To Mr. Bills, the energetic and successful acclimatizer of so many European forms to the Colony, the Museum is indebted for a series of specimens of English birds; and lastly, Mr. Howard Saunders has presented, through Mr. Buller, a very fine collection of thirty-four specimens of British birds, that are especially useful for comparison with allied forms indigenous to this country.

The collection of foreign birds' eggs has been again added to by a donation from Mr. Potts, of six specimens. Among the mounted additions to this section of the Museum must be mentioned the recently completed skeleton of *Cnemiornis calcitrans*, an extinct form of goose that co-existed with the Moa, which has been deposited for study and exhibition by the Hon. Captain Fraser.

Reptilia.—A collection of mounted reptiles, received from the Trustees of the British Museum, including the principal species of crocodiles, lizards, and snakes, forms a very imposing addition, and the series was rendered more complete by a fine specimen of the American alligator, presented by Mr. Buller. It is worthy of note that several specimens of the large turtle have lately been found to reach as far south as Cook Strait, one specimen having been cast up on Cape Farewell sandspit, and another near Wanganui, of which latter the skull and some other bones have been presented by the Rev. Richard Taylor.

Fishes.—Several important additions have been made to this section of the fauna during the past year, and the collection of duplicates has enabled a tolerably complete series of our fish to be sent to the British Museum, so that Dr. Gunther may have an opportunity of critically examining the new species described in the Catalogue of New Zealand Fishes. The new species discovered during the year have been described by Captain Hutton in a supplementary paper to the catalogue, and printed in Vol. V. of the "Transactions of the New Zealand Institute." Mention has also to be made of a fine collection of fish preparations received from the Trustees of the British Museum.

Invertebrata.—The Marine Mollusca have all been remounted and correctly named, with printed labels in uniformity with the catalogue prepared by Captain Hutton, which has been issued by the

* See "Eighth Museum and Laboratory Report."

Department. The foreign collections have also received additions, the chief of which are sixty species of Tasmanian shells, presented by Mr. W. Legrand, a general collection of forty specimens from Mr. Damon, of Weymouth, and a fine series of the shells of Queensland, presented by Mr. Charles Coxen, of Brisbane, through the Hon. W. H. Reynolds.

In addition to the catalogue of the Marine Mollusca of New Zealand above referred to, a valuable list by Dr. von Martens, of Berlin, giving the synonyms and reference to all species described as having been received in Europe from New Zealand, and also a list and descriptions of all New Zealand shells, furnished by Dr. Cox, of Sydney, are in the printer's hands, and these catalogues will together form a most useful guide to the student of New Zealand conchology.

The New Zealand Echinodermata have been arranged and named, and the catalogue prepared by Captain Hutton has been published by the Department.

Captain Hutton has also published a list of the Sertularians in Vol. V. of the "Transactions of the New Zealand Institute;" and the attention of students should also be directed to the same author's recent valuable essay on the Geographical Relations of the New Zealand Fauna, which is also published in the same volume.

The first portion of the Rev. O. P. Cambridge's work on the Spiders of New Zealand has been received, and probably the whole of it will be published during the next year. Several new species have been described by Dr. Powell, of Christchurch; and the valuable papers of Mr. R. M. Fereday on the Lepidoptera, and Mr. C. M. Wakefield on the Coleoptera (Vol. V., Transactions of the New Zealand Institute), and of Mr. R. McLachlan in the "Annals and Magazine of Natural History," Vol. XII., No. 67, though not issued in connection with the Museum, may be mentioned as of interest and importance to New Zealand naturalists.

The foregoing is sufficient to show that material is rapidly accumulating which will enable a systematic handbook to the Fauna of this interesting country to be prepared as a companion to Dr. Hooker's valuable and convenient handbook of the Flora.

Palæontological.—Very important and extensive additions have been made to the collection of fossils, both of New Zealand and foreign countries. Chief among the former is a large series of upper mesozoic fossils found associated with the reptilian remains at the Amuri Bluff. It is proposed to place these in the hands of an experienced palæontologist in England for publication; and they will no doubt assist in determining the relative geological position of the most important formations that occur in New Zealand.

The fossils of the tertiary strata have been described in a catalogue by Captain Hutton, published as a companion to the catalogue of the recent Mollusca. This is a most important work, and will prove of great assistance in advancing the geological survey of the country on a more accurate basis of classification than has hitherto been possible.

The collections of foreign rocks and minerals have been added to by presentations from Professor Parlatore, of Florence, Professor B. Smyth, of Melbourne, and a collection from Norway by Mr. Friberg.

HERBARIUM.

The plant collections have received no important additions during the year, but gatherings in the south-west district of Otago and on the highest ranges in the North Island have added a few new species to the Flora. The Herbarium has been removed to a situation better adapted for its preservation, and is undergoing thorough rearrangement.

LABORATORY.

The number of analyses which have been made in the Laboratory for the public during the year is 272, making a total of 1,505 different entries in the Laboratory books. The schedule, which has been prepared for reference in the usual form, shows the nature and contributors of the various substances, which comprise 39 coals, 47 rocks and minerals, 39 metallic ores, 14 mineral and potable waters, 37 gold assays, 41 appeals from the Secretary of Customs, and 28 of miscellaneous articles. The attention of the analyst has been directed principally to the preparation of cements from the various materials available in the Colony, and to the classifying and careful valuation of the various kinds of iron ores found in the Colony, and the results obtained will be found in separate reports on the subject.

GEOLOGICAL SURVEY.

Certain parts of Canterbury Province, the Amuri and Marlborough districts, and the western part of the Province of Nelson, have been the chief districts geologically surveyed; but many special examinations relative to the development of coal mines have been made in other parts of the Colony, all of which will be found in reports now in the course of publication. A geological map of the Colony, on the scale of 12 miles to 1 inch, was prepared specially for the Vienna Exhibition, and sent to England in March last; it contains all the additional information obtained up to last year.

All the fossil plants found in New Zealand have been accurately drawn and printed by photolithography, 50 plates being now ready to illustrate a work on the Fossil Flora that is in progress. In addition, most of the other fossils, and especially those which are to be sent to England for description, have been figured, so that they may not be altogether lost in case of accident. Nearly 100 lithograph plates, plans, and drawings of natural history objects, have also been prepared during the year.

COLONIAL INDUSTRIES.

Various subjects referred to this Department in accordance with the recommendation of the Colonial Industries Committee have been dealt with, and will be found fully described in the special Parliamentary report. The arrangements for having the Colony represented at the Vienna Exhibition also devolved on this Department; and this opportunity must be taken of acknowledging the valuable assistance received from the following gentlemen, to whom the Colony is much indebted for their efforts, viz.,—Mr. W. M. Maskell, Mr. T. Kirk, Mr. H. S. Severn, and Mr. J. Ross.

METEOROLOGY.

The observations still continue to be taken and published as heretofore, the only new stations being the establishments at Cape Farewell and Cape Campbell Lighthouses. The biennial report and discussion of the whole meteorological data acquired in the Colony is in the press, and will contain, in addition, an abstract of a valuable analysis of the meteorology of New Zealand, by Dr. Hann, of Vienna.

The re-organization of the Meteorological Staff is at present under consideration, with the view of establishing a few first-class stations where more complete observations than at present taken will be part of the regular routine, and of simplifying those taken at many of the present stations, but at the same time greatly increasing the number of such second-class stations.

TIME OBSERVATORY.

The transit observations are still conducted with regularity, the Observatory being under the immediate charge of the Venerable Archdeacon Stock, assisted by Mr. J. Kebbell.

The mean New Zealand time is given to the Telegraph Department, and forwarded throughout the Colony, and the Observatory Clock also drops the Wellington Time-ball at noon each day.

20th September, 1873.

JAMES HECTOR,
Manager.

Enclosure A.

ACCOUNTS of the NEW ZEALAND INSTITUTE, 1872-73.

RECEIPTS.				EXPENDITURE.			
		£	s. d.			£	s. d.
Balance in hand, August 1872	...	195	13 5	Expense of Volume V.	...	509	16 8
Vote for 1872-73	...	500	0 0	Miscellaneous—Translating, Binding, &c.	...	25	3 6
Sale of Volumes of Transactions	...	21	0 0	Balance in hand	...	181	13 3
		£716	13 5			£716	13 5

29th July, 1873.

ALFRED LUDLAM, Hon. Treasurer.

Enclosure B.

ADDRESS to His Excellency Sir GEORGE BOWEN, G.C.M.G.

WE, the Governors of the New Zealand Institute, feel it to be our duty as well as pleasure, on the eve of your Excellency's departure from New Zealand, to convey to your Excellency our sincere acknowledgment of the interest which you have at all times taken in the advancement of scientific pursuits in the Colony.

Especially we conceive it due to your Excellency to record the fact that your connection with the Institute has not been confined merely to the support and countenance afforded by your Excellency's high official position, but that, in your capacity as its President, your Excellency not only contributed valuable addresses, which appear in its Transactions, but has at all times taken an active and zealous share in the direction and management of its affairs, and in the promotion of its successful career.

We feel justified in assuring your Excellency that the assistance which you have thus rendered will always be remembered with gratitude, not merely by those who feel a personal interest in scientific researches, but also by the colonists generally.

Enclosure C.

REPLY from His Excellency Sir GEORGE F. BOWEN to the Address presented to him by the Governors of the Institute.

GENTLEMEN,—

I am very much gratified by the farewell address presented to me by you, and by the mark of distinction which you have conferred upon me in electing me to be an honorary member of the New Zealand Institute.

Any services which I may have been able to render are thus abundantly rewarded, and they were indeed a labour of love, for it is only simple justice to ascribe to me the most active and enduring interest in the welfare of the association of which I have had the honor of being the first President. Among the many agreeable recollections of this country which I shall always cherish, not the least satisfactory will be the memory of my connection with the Institute, and with the gentlemen who have formed with me its governing Board.

The chief aim of the Colonial Parliament in founding and endowing the Institute was not so much to make provision for the study and cultivation of art, science, and literature in general, but rather to supply guidance and aid for the people of New Zealand in the practical work of colonization. The yearly volumes of the Transactions and Proceedings show that this primary and essential object has been kept in constant view.

Rest assured, gentlemen, that I shall always remember you with respect and gratitude, and that I shall continue, although absent, to watch with lively interest the progress of the New Zealand Institute.