

FOURTH ANNUAL REPORT

OF THE

NEW ZEALAND INSTITUTE.

PRESENTED TO BOTH HOUSES OF THE GENERAL ASSEMBLY, BY COMMAND OF
HIS EXCELLENCY.

WELLINGTON.

—
1872.

FOURTH ANNUAL REPORT OF THE NEW ZEALAND INSTITUTE.

MEETINGS of the Board of Governors were held during the past year on the 24th August, 12th September, 1st November, 1871; and 28th February, and 11th April, 1872.

The following gentlemen were re-nominated to be Governors:—W. T. L. Travers, F.L.S., and Charles Knight, F.R.C.S.; and a vacancy occasioned by the retirement of J. E. FitzGerald, C.M.G., has not yet been filled up.

The Governors elected by the affiliated Societies for the present year are—His Honor William Rolleston, the Hon. W. B. D. Mantell, His Honor Mr. Justice Chapman.

On the 11th April, 1872, Alfred Ludlam, Esq., resigned the honorary Treasurership, and the Hon. W. B. Mantell, M.L.C., accepted the office.

In accordance with the provisions of Statute IV., three foreign members were elected, namely, J. E. Gray, Ph. D., F.R.S., Charles Darwin, M.A., F.R.S., William Lauder Lindsay, M.D., F.R.S.E.

The Institute now includes five affiliated Societies; the total number of members being 577, showing an increase of 24 on last year.

	Members.
Wellington Philosophical Society	132
Auckland Institute	157
Philosophical Institute of Canterbury	81
Otago Institute	136
Nelson Association	71

The appended statement of accounts shows the manner in which the endowment of the Institute has been applied.

The fourth volume of the Transactions and Proceedings was issued in May last. It consists of 472 pages, and contains sixty-four original communications by forty-five authors, illustrated by nineteen lithograph plates. Of these papers, nineteen are on zoology, twelve on botany, nine on chemistry, three on geology, and nineteen on miscellaneous subjects.

The Board of Governors having decided that, in publication, preference is to be given to those papers which add to the knowledge of observed facts relative to New Zealand, several papers of a general character have been held back, or only published in an abridged form.

The supply of volumes now in store is as follows:—Of Volume I., none; Volume II., 58; Volume III., 53; Volume IV., 74 copies.

The report of the Manager on the condition of the Museum and other establishments placed under his direction, is appended. It shows that valuable additions have been made to the collections in the Museum during the past year, but that the want of sufficient exhibiting space has rendered it necessary to remove a large portion of those additions from exhibition to the public. On this point the Governors feel it to be their duty to point out that the collections in the Museum cannot be properly exhibited, so that the public may derive full advantage from them, without the completion of the building as originally designed.

The Governors also call attention to the expediency of increasing the staff of the Colonial Museum, especially as regards the preparation of articles of natural history, so that collections of such objects may be distributed to the various Educational Institutions of the Colony in a form calculated to aid in the work of instruction in Natural History.

G. F. BOWEN,
President.

Wellington, September 19, 1872.

ACCOUNTS OF NEW ZEALAND INSTITUTE for 1871–72, from 11th August, 1871, to August, 1872.

RECEIPTS.	EXPENDITURE.																		
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17th September, 1872.

WALTER MANTELL, Honorary Treasurer.

MUSEUM.

THE collections in the Museum have been increased, during the past year, by the addition of 2,169 specimens, as detailed in the attached Schedule*, but owing to the crowded state of the building it has been found necessary to remove a large part of the collections from public exhibition. This has been

chiefly effected by the construction of two large cabinets, each of which accommodates as many specimens as twenty floor cases. One of these has been devoted to the rock specimens, illustrative of the geology of different parts of the Colony, reference to which is only occasionally required. A small gallery has also been erected at one end of the main hall of the building, on which moa skeletons and other conspicuous objects have been placed, by which arrangement a considerable saving of floor space has been effected.

A temporary arrangement for warming and airing the building has been effected, as it was found that the collections suffered injury from damp.

Birds.—The collection of New Zealand birds is now tolerably complete, and has been arranged in a suitable cabinet for reference, there being only a few of the specimens set up for exhibition.

Very extensive collections of birds from various parts of the world have now accumulated, which it has been found necessary to place in drawers and packing cases, so that at the present time they are inaccessible to the public, and inconveniently difficult of access for reference.

The most extensive recent addition to the collections in this department has been that purchased from Mr. H. Travers, which consists of thirty-seven species and 192 specimens from the Chatham Islands, some of which are new to science or extremely rare.

A collection of seventy birds of California has also been presented by the Academy of Natural Science in San Francisco; 114 bird skins from Norway, presented by Mr. J. Graff; forty-one European bird skins, forwarded by Dr. Buller; and fifty-seven specimens of birds are on their way from Germany, having been sent in exchange by Dr. O. Finsch.

The New Zealand birds' eggs have been mounted for exhibition, and the collection has been enriched by the donation of fifty-six specimens of the eggs of British birds, by Mr. T. H. Potts.

The illustrated work on New Zealand birds, by Dr. Buller, referred to in last year's report is advancing through the press, the first two out of the five parts of which it consists, having reached the Colony, and the remainder of the work is, I am informed by the author, already in the printer's hands.*

The catalogue of the birds with the diagnoses of the species, by Captain Hutton, also referred to in last report, was issued in October last.†

Fishes.—A collection of forty-six stuffed specimens, and forty-one skeletons of the fishes of New Zealand, and ninety-two species preserved in spirits, has been prepared and arranged for exhibition, to illustrate this important branch of the Natural History of the country.

The number of fishes now known to belong to New Zealand is 147 species, of which only about fifteen are not represented in the above collection.

The distinctive characters of the species have been given by Captain Hutton, together with notes on the edible species by myself, in a work issued from this department in May last.‡

I should also mention the valuable Osteological preparations which have been made for the Museum by Dr. Knox, among which the following are the most important:—Skeletons of a Moriori (female), the sea leopard, (*Stenorhynchus leptonyx*;) thirty birds, fifty fishes, twenty reptiles, &c., constituting a most interesting feature in the Museum.

Shells.—The collections of New Zealand shells, both recent and fossil, have been thoroughly investigated by Captain Hutton, the greater part of whose time during the past year has been devoted to this important work, and he has prepared a descriptive catalogue, which only awaits the receipt of a list of the New Zealand shells in the European collections, which is being prepared by Dr. Von Martens, of Berlin, to be completed for the press.

The total number of existing species of the class Mollusca, represented in the Museum, and described in this catalogue, will be 560, to which must be added 200 species of fossil shells that are now extinct.

Captain Hutton has also prepared a descriptive catalogue of the New Zealand Echinodermata in the Museum, in which he enumerates thirty-six species.

The collection of foreign shells has been added to during the past year by 170 American species, presented by Colonel Jewett, of New York, and other collections of minor importance.

Insects.—An arrangement has been made for the publication in England of descriptive and illustrated catalogues of the different classes of insects which are found in New Zealand, as their classification cannot be satisfactorily effected without reference to extensive Museums and Libraries containing works of reference in Natural History. The foreign collections in the Museum have received a valuable addition in a named collection of 332 specimens of the Lepidoptera and Coleoptera of Queensland, from W. H. Miskin, Esq.

Palæontology.—The descriptive and illustrated catalogue of the New Zealand fossils in the Museum is also in an advanced state of preparation; but further examination of certain localities will be necessary before it can be sent to press. The collection of minerals, rocks, and fossils has been largely extended during the past year, in the course of the Geological Survey; the chief additions being the collections made in Canterbury by Dr. Haast, and Mr. H. Travers in the Chatham Islands and at the Amuri, where he obtained a large number of Saurian bones, in blocks that weigh several cwt., but unfortunately in a very hard matrix, so that it is doubtful if they can be extracted in a perfect state.

HERBARIUM.

The collection of dried plants, which is kept for reference and exchange, is now very extensive, but from the want of proper accommodation it is constantly liable to injury from insects and mice, being thus a constant source of anxiety and extra labour, which could be avoided if a sufficient number of properly constructed cabinets were provided.

* Birds of New Zealand by W. L. Buller, Sc.D., 4to., with coloured plates of all the species peculiar to the Islands.—Van Vorst, London.

† Catalogue of the Birds of New Zealand, by Captain F. W. Hutton, F.G.S., Assistant Geologist, 8vo., 85 pp.

‡ Fishes of New Zealand, catalogue by Captain F. W. Hutton, F.G.S., Assistant Geologist, and notes on the edible fishes, by Dr. Hector, Director, with 12 plates, 8vo., 135 pp.

The chief special collections which have been added during the past year, besides the plants of the neighborhood, which are constantly being collected by Mr. Buchanan, are specimens illustrating the botany of the Hot Lake and North Taupo Districts, which have been reported on for the Department by Mr. Kirk.

An almost exhaustive collection of the botany of the Chatham Islands has been obtained by Mr. H. Travers; ten sets of which will be available for exchange as soon as they have been reported on by Baron Von Mueller, to whom a complete series has been sent in duplicate for this purpose. The only foreign collections of dried plants received during the past year have been of Sandwich Island plants, from Dr. Hillebrand, and a collection of British Algæ, prepared and presented by Mrs. J. E. Gray.

The Herbarium now contains an addition to the Colonial flora—a very complete set of British flowering plants and ferns, also ferns of new Hebrides, Sandwich Islands, and Fijis.

The chief desiderata necessary to make the Herbarium sufficiently complete for the New Zealand student, are the plants of Eastern Australia and Tasmania.

For convenience of reference, a complete set of New Zealand and British plants is being mounted in books and placed in the library.

LABORATORY.

The attached Schedule shows in the usual form the analyses which have been performed during the year by Mr. Skey, to the number of 285, making a total of 1,233 analyses entered in the Laboratory books.

The publication of these in a complete form, as promised in last report, has been delayed longer than was anticipated, owing to the amount of fresh material that had to be incorporated, but the work is now in an advanced state, and will, it is hoped, form a useful guide to the mineral wealth of the Colony.

In addition to the analysis of minerals and ores of various kinds, it is necessary to point out that a very large portion of the Analyst's time is occupied with examinations of samples submitted by the Secretary of Customs under the Distillation and Gold Duty Acts; and I may also add that the responsible duty of verification of standards, required under the Weights and Measures Act, is also performed for the Colony in connection with this department.

GEOLOGICAL SURVEY FIELD WORK.

Attention has been chiefly directed during the past season to the development of the coal deposits, in accordance with the Public Works Act; the examination of the coal fields on the West Coast of Nelson having been undertaken by myself; those in the Southland District and in the North of Auckland by Captain Hutton; while the coal deposits on the eastern side of the South Island, in Canterbury and Otago, have been examined by Dr. Haast. The chief practical results of the surveys have been published through the Public Works Department, but the extensive additions they have made to the general geological survey of the Colony will be found in the various reports issued from the department for the current year.

DRAFTSMAN'S WORK.

During the past year sixty lithographic plates have been prepared to illustrate the various publications issued by the department; and about thirty-three original drawings made of objects of natural history and fossils, with a view to future publication.

A general geological map of the Colony, on a scale of twelve miles to the inch, is also in progress.

The small-scale geological map, referred to in last year's report, has now been printed off and distributed, 150 copies having been sent to Professor Owen, at his request, for incorporation with a work which he is publishing on the Extinct Struthious Birds of New Zealand.

COLONIAL INDUSTRIES.

A large amount of correspondence under this head falls to the department, the letters received, and despatched relative to the *Phormium tenax* alone amounting to 460. The information collected regarding that and other industries which are being established in the Colony, will be found in official reports, and in a pamphlet specially devoted to the *Phormium*.

METEOROLOGICAL DEPARTMENT.

During last year there have been two new stations established, namely, at Wanganui, in the Wellington Province, and at Queenstown, in Otago, making thirteen stations in all.

There has been no alteration in the other stations, except at Mongonui, where the observer, Mr. Grover, having gone to England on leave for a year, his place has been temporarily filled by Mr. Patieson.

The statistics for 1871, in the form required by the Registrar-General, were furnished from this department on 19th April, and published on 5th July last.

The monthly abstracts of the thirteen stations are all checked and corrected at this office, and continue to be published in the *Gazette*, but owing to the late date at which some of the returns are received, they do not appear as early after the expiration of each month as is desirable.

A return of the daily observations taken in Wellington and most other stations is also published regularly each month in the local newspapers.

All the published returns are sent to the following Observatories, in exchange for their published results, which are filed for reference in the Museum:—The Meteorological Department, London; Observatories at Kew, Greenwich, Melbourne, Sydney, Adelaide, Queensland, Tasmania; Scottish Meteorological Society; *Meteorological Journal*; Smithsonian Institute, U.S.; Meteorological Society, St. Petersburg; and the Meteorological Department, Bengal.

The usual Meteorological Report, in pamphlet form, including the returns from amateur as well as Government observers, is in course of preparation.

It should be mentioned also that the exchange of the daily meteorological records by the different telegraph officers in the Colony, is still continued as previously, and exhibits, in a useful form, especially for persons interested in shipping, the state of the weather each day at 9 a.m., at 27 different stations throughout the Colony.

ASTRONOMICAL OBSERVATORY.

The transit observations for regulating the telegraph time are still made by the the Ven. Archdeacon Stock, assisted by Mr. John Kebbell, who has also given valuable assistance during the past year in repairing and cleaning the mechanism of the astronomical clock and other instruments.

Excepting an interval of a few weeks, when it was found necessary to change the mercury in the pendulum bob, the astronomical clock has now gone continuously for two and a half years, with most satisfactory results on the whole.

The duty of setting the starting clock, which communicates the time each hour to the Telegraph Office, and also drops the time ball at noon, is performed by the Meteorological Observer every morning; the rates and errors of the clocks being duly entered in the Observatory books, which are kept for the purpose.

Mr. Kebbell suggests the desirability of adding to the mechanism of the astronomical clock an adjustment for altering the rate without requiring the pendulum to be stopped, in which recommendation I concur.

The work done at the Observatory hitherto has only been that connected with the regulation of the mean time of the Colony; but I have to report that Mr. Ellery, the Astronomer to the Victorian Government, has again represented the desirability of exchanging chronometers, for the purpose of determining the difference of longitude of New Zealand from Melbourne, with a view of preparing for the observation of the transit of Venus in 1874.

The observations for determining an independent meridian, made by Mr. Jackson, Chief Surveyor, are no doubt valuable*; but I consider that the former report, by Mr. Ellery on the subject,† indicates the desirability of checking Mr. Jackson's meridian, by reference to one that has been established by instruments of superior power and longer conducted observations.

Mr. Ellery states, in a letter dated 6th instant, "I shall be glad to do all I can to assist in the matter of the exchange of chronometers, and could lend one or two for the purpose. All that is necessary is to arrange with some of the captains of the Melbourne steamers, in whom you will meet with every desire to help."

30th August, 1872.

JAMES HECTOR.

* *New Zealand Gazette*, No. 12, 1871.

† Report in the longitude of Wellington, Appendix Journals, House of Representatives, 1870, D. 27.