1882.

NEW ZEALAND.

NEW ZEALAND INSTITUTE, 1881-82

(FOURTEENTH ANNUAL REPORT OF THE)

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

THE Board held meetings on the 28th July, and 11th November, 1881.

The retiring members, in conformity with the Act, were Messrs W. T. L. Travers, T. Mason, and the Hon. G. R. Johnson, all of whom were re-appointed by His Excellency the Governor.

The elected members under clause 7 of the Act are: Mr. Justice Gillies, the Hon. Wm. Rolleston and Mr. James McKerrow.

There are now five vacancies on the roll of honorary members.

The members on the roll of the Institute now number: Honorary Members, 25. Ordinary Members: Auckland Institute, 301; Hawke's Bay Philosophical Society, 107; Wellington Philosophical Society, 277; Westland Institute, 100; Philosophical Institute, Canterbury, 197; Otago Institute, 213; Southland Institute, 65; Total, 1,285. The Nelson Association having withdrawn from incorporation, the number is nominally less than that for last year by fifty members.

The printing of Vol. XIV. was commenced in February and completed early in April, a portion of the edition being ready for issue towards the end of May. The volume contains seventy-eight articles, also Presidents' Addresses and abstracts of papers which appear in the Proceedings and Appendix. There are 610 pages of letter press and 39 plates.

The following is a division of the contents of the volume for comparison with last year's work:—

	1882. Pages.	1881. Pages.
Miscellaneous	200	170
Zoology	144	79
Botany	104	147
Chemistry	16	4
Geology	52	21
Proceedings	54	42
Appendix	40	40
	610	503

The volumes of the Transactions now on hand are—Vol. I., 410; Vol. II., none; Vol. III., none; Vol. IV., none; Vol. V., 50; Vol. VI., 50; Vol. VII., 150; Vol. VIII., 20; Vol. IX., 160; Vol. X., 10; Vol. XI., 70; Vol. XII., 70; Vol. XIII., 70; Vol. XIV., not yet fully distributed.

From the Hon. Treasurer's balance-sheet it will be seen that there is a balance of £5 11s 10d. to the credit of the Board, against which there is the balance due to the publishers of £12 13s 2d; on the other hand there is a considerable balance from the sale of volumes in the hands of the London Agents.

The Annual Reports of the various departments connected with the Institute are appended.

JAMES HECTOR,
Manager.

Approved by the Board, 8th August, 1882.

G. RANDALL JOHNSON,
Chairman.

ACCOUNTS OF NEW ZEALAND INSTITUTE, 1881-82.

Receipts.	£	s.	d.
Balance in hand, 28th July, 1881	49	2	1
Vote for 1881-82	500	0	0
Contributions from Wellington Philosophical Society (one-sixth of annual revenue)	20	19	10
Sale of volumes	19	19	0
	£590	0	11

Expenditure.	£	s.	d.
Printing Vol. XIV.	582	2	0
Purchase of second hand Vols. of Transactions of New Zealand Institute, 5 Vols., &c.	2	5	0
Miscellaneous		2	1
Balance in hand	5	11	10
	£590	0	11

ARTHUR STOCK,
Hon. Treasurer.

8th August, 1882.

MUSEUM.

The number of names entered in the Visitors' Book during the year is 13,000 (week days 10,000; Sundays, 9,000) but, as mentioned in previous reports, this gives no adequate idea of the number of persons visiting the institution, as comparatively few care to sign the Register. The usual average daily attendance is about fifty on week days, and 150 on Sundays.

Natural History Collections.

The additions to this section have been somewhat extensive; but the excessively crowded state of the Museum Department, renders the exhibition of recent acquisitions quite impossible, until further accomodation is provided.

Mammalia.—Amongst the animals recently added to the collection, and specially worthy of notice are: (1) two skins of the Tasmanian devil (*Diabolus ursinus*), presented by Mr. J. B. Poynter, of Poverty, Bay; per Honorable G. Randall Johnson, M.L.C; two hedgehogs (*Erinaceus europœus*), 1 sable *marter sibellina)* 1 Ermine (*Mustela*) 1 beautiful specimen of the platypus (*Platypus anatinus).*

Pisces.—The most noticeable addition to this department is a collection of 161 specimens, illustrative of the Ichthyology of the Pacific Coast of North America, presented by the United States National Museum.

Aves.—The acquisitions in this section, though not very numerous, are nevertheless of a very interesting character, the chief items are: (1) several specimens of *Rallus affinis* and allied species from Mr. A. Hamilton, of Napier; (2) an Australian roller (*Eurystomus australis*) shot at Akamotu and presented by Mr. A. Reid; (3) A fine peacock presented by Mrs. Borlase; (4) A pure albino peacock, by Mr. Harding of Napier; (5) A magnificent specimen of the Bird of Paradise *(Paradisea raggiana)*, by Dr. Bennet of Sydney; (6) Two Bustards *(Otis tarda)* by Mr. Banbury of London; (7) twenty-six skins, New Zealand and Foreign, purchased by the Director.

New Zealand Birds have been presented to Dr. Finch, of Bremen, Mr. Hague, of London, and Dr. Buller, Wellington. A collection of thirty-two eggs, was sent to Mr. A. Gillies, of Dunedin as an exchange.

Reptilia.—Only a few New Zealand species have been added to this branch, but a collection of the forms indigenous to this colony, has been sent to the Bremen Museum.

Invertebrata.—A collection of coloured corals, presented by Mr. H. E. Liardet; and a very fine collection of New Zealand sponges, presented by Mr. J. A. Smith of Napier, are the chief items under this heading. The sponges however are very important, as the quality leaves but little doubt that New Zealand may yet be able to produce sponges suitable for market.

Ethnological.

Very large collections have been received under this head, amongst the articles more especially worthy of notice are (1) two Japanese shrines, 500 years old, from the Temple of Kamakura, presented by Mr H. S. Tiffen, of Napier; (2) a large collection of weapons, domestic utensils, &c., illustrative of the ethnology of New Guinea and neighbouring islands, received in exchange from Mr H. H. Romilly, Deputy Commissioner of the Pacific; (3) casts of Maori implements, in exchange from the Canterbury Museum; (4) a cast of the celebrated Rorotangi, the figure of a bird carved in serpentine, reported to have been brought by the Maories to New Zealand from Hawaiki, presented by Major Wilson; (5) 2 Maori carved walking-sticks, purchased; (6) twenty samples of pottery from South Sea Islands, presented by His Excellency Sir Arthur Gordon; (7) Hindoo Holy Writings deposited by Miss Woodward.

Miscellaneous.

Amongst the miscellaneous articles lately received are (1) silver seal of the colony of New Zealand, defaced by Her Majesty in Council, presented by the Hon. the Colonial Secretary; (2) seal of the Province of Wellington, presented by the Government Storekeeper; (3) collection of timbers, economic vegetable substances, and casts of 12 famous nuggets, &c., in exchange from Technological Museum, Melbourne; (4) specimens of quartz from Te Aroha, presented by the Hon. the Minister for Mines and Mr J. C. Firth; (5) 8 glass show cases, used at the Crystal Palace Wool Show, presented by the Hon. the Colonial Secretary; (6) Map of Wellington in 1841, deposited by Hon. W. B. D. Mantell; (7) iron pipe, made by Mr P. Birley, of Auckland, deposited by Mr W. Swanson, M.H.R; (8) one gold, two silver, and two bronze medals awarded to the colony at the Crystal Palace Wool Exhibition, presented by the Hon. the Colonial Secretary; (9) portrait in oil, known as the "Molesworth Portrait," deposited by Sir W. Fitzherbert.

Geological Survey.

During the past year Mr. Cox has been engaged for three months, from January to March, in an examination of the Cape Colville peninsula, more especially at the mining centres of the Thames, Coromandel, Waitekauri, Owharoa, Waihi and Te Aroha. The most important result which he has obtained, lie in his determination of the stratification of the rocks at the Thames. He has shown there that the beds of the auriferous series consist of alternations of a moderately hard compact, pyritous, tufacoous, sandstone (tufanite of Dr. Hector), with less pyritous beds, a similar rock, which is, however, much broken up into pieces by joints, and a hard green dioritic rock, which is of true fragmental origin, but which passes at places into crystalline bands which are never continuous for any great distance. It is in the first of these that the reef have proved most highly auriferous, and while gold does occur in them while passing through the second class of country, they are not as a rule payable, and where the reefs traverse the hard rocks, they are absolutely barren. He has shewn that several of these hard belts occur, and that were they are met with in the lower level of the mines, the gold is cut off by them, but that other belts of auriferous country occur below, in which other sets of reefs have been worked. His work generally tends to show that so far from the Thames being worked out, there are yet, in all probability, as rich auriferous belts of country at lower levels as have hitherto been worked near the surface, and that gold will be found to quite as great depths as it is practicable to work. Besides this, he has illustrated the structure and behaviour of the reefs by numerous sections, and has also prepared a plan and section of the Ohinemuri and Te Aroha Districts.

During part of April he was engaged in an examination of the Blue Mountains, on the Northern side of the Shag Valley, with the special object of determining the position of the Blue Mountain limestone. These he has shewn are interstratified with slate and sandstone of lower carboniferous age, which form the first range north of the Shag River, and are separated from the Te Anau series of Upper Devonian age, which form the next range by a large fault which traverses the country in a N. 65° W. magnetic direction, and has a downthrow to the S.E.

He has also made special reports on the Woodstock Goldfield and the Ross and Humphrey's Gully mining claims on the West Coast, and has examined the lignite deposits at Norsewood, which he reports to be of an inferior character.

During the latter part of November, and part of December, Mr McKay was engaged in collecting moa bones at Motanau, and examining the country between Motanau and the Cheviot Hills. During this work the principal result arrived at, from an economic point of view, was the discovery of an outcrop of hematite, about 6 feet wide, associated with the Triassic rocks of the coast range near Motanau. An analysis shows that this ore is specially adapted for the manufacture of hematite paint. After this he was engaged in Museum work during the month of January, and during February and the early part of March, he examined the antimony deposits of the Carrick Ranges in Otago, and collected fossils from the coal strata of the Bannockburn. He reports that there are three lodes which are apparently convergent, the thickest of these being two feet at its widest part, and outcrop of antimony can be traced at places on the surface from Alexandra at the Manuherikia Junction, to the hills west of the Nevis Bluff on Kawarau River, a distance of over 12 miles. During April and May he was engaged at the request of the Hon. the Minister of Mines in making a typical collection of the rocks of the Reefton District in duplicate. One of these collections being deposited at Reefton as the nucleus of a museum. While thus engaged he made a detailed examination of the relations of the various beds, and confirmed the views previously held concerning them. He also gained important information concerning the extent of the coal-bearing areas, proving their probable continuance, as a basin, across the Inangahua Vally, comparatively near the surface about Reefton, but at much deeper levels towards the junction of the Inangahua, and Buller Rivers. He also made a special report on an antimony lode at Reefton, showing that an outcrop had been found which was about 18 inches thick, and the reef had been driven on for 150 feet from that point without antimony being found. Heavy lodes of antimony are, however, found in several of the auriferous claims from Rainy Creek to Boatman's which, in all cases containing gold, are treated in the ordinary way for the extraction of this alone, all the antimony and probably much of the gold being thus sluiced away. An examination of the auriferous cements at the head of Lankey's Gulley, showed that tinstone undoubtedly occurred associated with these in small quantities, but bad weather prevented any attempt being made to trace this back to its parent rock. He visited Langdon's Reef near Greymouth, and reports that the thickness of the reef at present being worked, is about 2 feet 9 inches, which being less than it was at the outcrop, shows the lode to be of a bunchy character.

The outcrops of coal in Coal Creek, Greymouth, were also examined, and he reports that two seams of coal 6 feet and 10 feet in thickness respectively, occur in the lease, in which a considerable quantity can be worked level free. In the month of June Mr. McKay paid a visit to the Terawhiti Reefs, and reports that the Albion claim possesses a reef of an average thickness of from 18 inches to 2 feet, which has been followed along its strike for a distance of 6 chains, and for a depth of 130 feet. Some assays of quartz from this claim have yielded over 3 oz. gold per ton, but the specimen brought by Mr. McKay gave nothing but traces of the precious metal.

Publications.

The following publications have been issued during the year: (1.) Sixteenth Annual Report of the Colonial Museum and Laboratory, together with list of additions, &c., and an Abstract of the Results of Analyses. 64 pp. 8vo. (2.) Manual of the Birds of New Zealand, illustrated with 39 lithographs and 22 woodcuts. 106 pp. 8vo. The Fifteenth Progress Report of the Geological Survey of New Zealand for 1880–81. By Dr. Hector. With maps and sections. Including Special Reports on the Chrome Deposits of New Zealand (Hector; Cox); on the Aniseed Valley Copper Mine (Cox); on the Richmond Hill Silver Mine (Cox); on the Wallsend Colliery, Collingwood (Cox); on the North Auckland District, including Thames and Coromandel Gold Fields, Island of Kawau, and Drury Coal Field (Cox); on the Aorere and Takaka Districts, Nelson (Cox); on the Waitaki Valley, Lindis, and Wanaka Lake District (McKay); on the Coal-bearing Deposits near Shakespeare Bay, Picton (McKay); on the Caswell Sound Marble (McKay); Index to the Localities where Fossils have been collected in New Zealand, with their Stratigraphical Position, is in course of publication, and will shortly be followed by the Sixteenth Progress Report.

The Handbook of New Zealand, prepared by Dr. Hector for the Melbourne Exhibition, is now out of print, so that a third edition is in preparation.

Progress is being made with the preparation of several important works bearing on the Natural History, Mineralogy and Geology of the Colony.

Libraries.

The Libraries in connection with the Museum have increased rapidly during the past year, and it was thought necessary that a Librarian should be appointed. Mr. T. W. Kirk has been placed in charge of the Patent and Public Libraries, the work being performed out of official hours.

New Zealand Institute Library.—The additions to this Library comprise about 255 volumes received in exchange for the transactions from the various Societies and Institutions whose names appear in List III.

Patent Library.—This collection remains as hitherto in the Lecture Room, and appears to be greatly appreciated, especially by those engaged in mechanical pursuits. Thirty two volumes have been added during the year.

Public Library.—It was stated in last Report that very many of the works belonging to this Library were missing when it was removed to the Museum. Private enquiry by the Librarian resulted in the recovery of sixteen volumes, and it has now been decided to advertise in the local newspapers and the

Government Gazette requesting persons having in their possession books belonging to this Library, to return the same to the Museum as soon as possible; it is hoped that by this means a large proportion of the missing works may be recovered.

Meteorology.

Meteorogical statistics are collected at four second-class stations in New Zealand, at Auckland, Wellington, Christchurch and Dunedin, and observations of rain-fall, temperature and wind direction are received from thirty third-class stations. The results are published monthly, and will be collected as usual into a biennial report. There is no first-class meteorological station in New Zealand having the equipment required by the Intercolonial Conference.

The system of intercolonial telegraphic weather exchange has now been in operation for twelve months, and the results obtained and the proposals for securing earlier publication, in an easily comprehensible form, of the weather changes, will form the subject of a special report.

The New Zealand weather for each day is now published the same afternoon in Sydney, Melbourne and Adelaide, and there is no reason why, with a few changes in the organisation of the system, that the Australian weather phase for each day should not be published in all the principal towns in New Zealand on the following morning, By this means from twenty-four to sixty hours' notice would be given of all the most important weather changes.

Observatory.

The time ball service for Wellington is at present suspended, as the ball was dismounted when the old Custom House was removed. Arrangements are being made, however, for its re-erection in a prominent position. In the mean time the Telegraph Department continues to be supplied with mean time, and time signals are furnished to Lyttelton and to various private persons by galvanometers.

In reply to an application from the Home Government, arrangements are being made for organising a corps of local observers for the forthcoming Transit of Venus in December, to assist the party of observers that are to be sent out from Greenwich Observatory.

Laboratory.

The number of analyses performed in the Colonial Laboratory for ordinary purposes during the past year is 265, so that the Laboratory number now arrived at is 3,285.

These analyses are subdivided as follows: Coals, 13; minerals and rocks, 58; metals and ores, 40; examination for silver and gold, 89; waters, 21; miscellaneous, 40. Total 265.

Besides the above, a large number of examinations have been made under the Adulteration Act of 1880, and about the month of August time was occupied in visiting the Rotorua District, at which place he collected samples of and analysed specimens of water from the various springs. The Analyst has also been occupied at various times in verifying certain sets of weights and measures, in compliance with the Act.

The results of the analyses, which are of general interest, are noted in full in the Annual Report which is appended.

James Hector.

By Authority: George Didsbury, Government Printer, Wellington —1882.