

## ABSTRACT OF ANNUAL REPORT.

During the past year the Society has held seven general meetings, at which twenty-eight papers were read.

Eight new members have been added to the roll during the past year, and we have lost by death a most valuable member of the Society, the late Mr. W. Skey.

The balance-sheet shows that the receipts for the year, including the balance carried forward, amount to £164 17s. 6d., and the expenditure to £87 2s. 1d., leaving a balance in hand of £77 15s. 5d.

The Research Fund fixed deposit now amounts to £35 9s. 10d., which increases the credit balance to £113 5s. 3d.

ELECTION OF OFFICERS FOR 1901.—*President*—Mr. G. V. Hudson; *Vice-presidents*—Mr. H. B. Kirk and Sir James Hector; *Council*—Messrs. G. Hogben, R. C. Harding, H. N. McLeod, R. L. Mestayer, E. Tregear, Martin Chapman, and George Denton; *Secretary and Treasurer*—Mr. R. B. Gore; *Auditor*—Mr. T. King.

Sir James Hector congratulated the President on his re-election, and spoke of the very efficient manner in which he had conducted the business of the Society during the past year.

Mr. Hudson briefly thanked the members for the honour conferred upon him.

*Papers*.—1. "Description of a New Ophiurid (*Amphiura aster*)," by Mr. H. Farquhar; communicated by the Secretary. (*Transactions*, p. 250.)

The specimen was found near Timaru by Mr. A. Haylock.

2. "On Seismograms of Distant Earthquakes," by G. Hogben, M.A.

Mr. Hogben said he wished to place on record what he took to be a notable event in the history of seismology in Australasia—that was, the identification of two or three of the tracings of the Milne seismograph in Wellington with those of somewhat similar instruments at European stations. On the recommendation of Sir James Hector, the New Zealand Government ordered two horizontal pendulums for recording one element of the minute or microseismic vibrations that passed round or through the earth. One of these was placed under his (Mr. Hogben's) charge, and it was now installed in a specially constructed room under his private house. Several months were occupied in allowing the masonry column on which the instrument was placed to settle, and in testing and adjusting the instrument. It was not, therefore, until October of last year that it was in full working-order. The instruments at the central Imperial station for Germany, which was also the headquarters of the International Seismological Association, appeared to have been in working-order on the 1st July, 1900. They were somewhat more sensitive than the Milne seismograph, and were of the type known as the Rebeur-Ehlert. The essential principle, however, was the same. He had received from Dr. Gerland, of Strasburg, and from Dr. Schutt, of Hamburg (where Rebeur-Ehlert pendulums were also installed), abstracts of the records of their instruments for the month of October, 1900. Of the fourteen shocks or series of shocks recorded at Strasburg, Mr. Hogben noted clear coincidences with shocks recorded in Wellington in three cases, and more doubtful coincidences in two other cases. One of the earthquakes, from the evidence available so far, seemed to have come from some place in the eastern Pacific, probably from the coast of Peru,

though that was pure conjecture. Another was a very considerable earthquake that took place in the territory of Alaska. It was recorded also at Victoria, British Columbia, and at Toronto, in Canada, by Milne instruments, and at all the more important European stations. It lasted for over three hours altogether. The Wellington record was consistent with the idea that the vibrations travelled hither along great circles of the earth's crust. The third earthquake was probably from a centre nearer to New Zealand than to Strasburg. It also was probably a Pacific earthquake. There was no difficulty in identifying these by means of the particulars as to time, &c., which he had received from Strasburg. Mr. Hogben, who exhibited to the meeting originals and copies of seismograms taken in Wellington, added that it was proposed to issue monthly reports here. Permission had been given to have them printed. They would be distributed to other stations. The weak point of the British Association's system was that it did not print its records for two years. If records were printed and distributed month by month they could be worked out and compared with less labour. To go through them at the end of two years was a very arduous and, in some respects, almost hopeless task. It was hoped that there would be an opportunity of publishing a synopsis of the Wellington records in the "Transactions of the New Zealand Institute." Unfortunately, there was no station in Australia as yet. A promise had been given that an instrument would be set up in Melbourne when funds were available. One was promised for Honolulu without the condition as to funds, and it would probably be erected when the United States authorities had got their scientific affairs in Hawaii into working-order. The nearest station to Wellington was Batavia. It was desirable that there should be one nearer. Two or three of the records which he exhibited agreed with records taken at Batavia. It might be better if the British and International Associations co-operated in regard to the class of instruments used, and in other matters. Probably, however, good, and not harm, would result from comparing observations made by means of two kinds of instruments.

Sir James Hector thanked Mr. Hogben for giving so clear and early an account of such important observations. A semi-annual movement of the earth's crust recorded by the instrument in Wellington was, Sir James thought, very easy of explanation. Mr. Hogben's house in Tinakori Road was situated right on a major geological fault that traversed New Zealand. The movement referred to by Mr. Hogben had been noticed in connection with transit observations in Wellington since 1867. It was to be hoped that the other instrument, now lying in the Museum, would be put in a place not so liable to be affected by geological faults. In conclusion, Sir James said he was extremely glad that a first effort had been made in this matter, and that it was so well advanced under Mr. Hogben's care as to promise that in future they would get something like accurate information about earthquakes occurring here and elsewhere.

Mr. R. C. Harding expressed the opinion that there should be no difficulty in improving the method of duplicating records of earthquakes by electricity.

Mr. Coleman Phillips referred to the character of the numerous earthquakes in the Pacific, and said they would have to be carefully studied before any deductions could be drawn from their movements.

Mr. Hogben, in reply, said that fortunately the position of these instruments was not dependent upon such movements as fault movements, as observers could, after a little time, distinguish one kind of movement from another to a very considerable extent. The same remark held true in regard to certain earthquakes in the Pacific. A point which observers wished to settle was whether the first intimation of an earthquake came along the arc or along the chord. In the case of

the Alaska record there were overlapping records. An electric system of obtaining numerous seismograms simultaneously had been tried, but it was pronounced a failure, as the lower seismograms were not accurate.

The President (Mr. G. V. Hudson) thanked Mr. Hogben for his address, and the thanks were emphasized by the meeting.

3. "Survey: Practical and Precise," by the Hon. G. F. Richardson. (*Transactions*, p. 492.)

4. "Researches into the Action of Fusible Cutouts," by E. G. Brown, A.I.E.E. (*Transactions*, p. 356.)

5. "Note on Vapour-density of Mercury," by Douglas Hector, student in Victoria College; communicated by Professor Easterfield. (*Transactions*, p. 382.)

6. "Embryological Structure of New Zealand *Lepidoptera*," by A. Quail, F.E.S. (*Transactions*, p. 159.)

The following exhibits were laid on the table by Sir J. Hector:—

A great eel, as big as a conger—5 ft. 6 in. in length, and weighing probably over 20 lb.

The big fish, which, as Sir James Hector remarked, would no doubt account for the disappearance of a good many trout, was caught in the Hutt River near Silverstream. It is rare in the scientific sense, though Sir James had no doubt that numerous examples lurked in dark places in the Hutt River. It is known to science as a New Zealand fish, under the name of *Anguilla latirostris*; but, though the British Museum possesses a specimen, this is the only one in any collection in the colony. Four or five species of New Zealand eels required careful study and description, and could give plenty of work to some of our young naturalists.

Sir James Hector gave interesting details of the habits of eels. Their method of reproduction had, he said, long been a mystery, careful examination always failing to detect eggs in the body of the female. It was now known that they retired to the ocean for the breeding-season, and at great depths—under the enormous pressure of some thousand fathoms of water—deposited their eggs. A small, thin, translucent fish, the *Leptocephalus*, had now been proved to be the fry of the conger, and a flood of light had been thrown on the subject. Large eels like this were rarely seen except when streams or ponds were drained. This one got into a backwater, and was killed in somewhat unsportsmanlike fashion with a pitchfork. There was another great fresh-water eel in New Zealand, found in the Waikato, the Buller, and in Lake Wakatipu, but differing from this one in important respects. In that species the jaws were equal, while in this one the lower jaw projected considerably beyond the upper; the Waikato eel was steel-blue, and this one was a brownish-olive above and below.

A pair of skulls, male and female, of a leopard-seal (genus *Stenorhynchus*, species doubtful), from Macquarie Island.

One of the animals, Sir James Hector explained, had suffered the agonies of toothache, one of the tusks showing signs of extensive caries. A curious habit of this species, who dived with difficulty on account of their fat, was to swallow rounded stones for ballast. On dissection their stomachs were usually found loaded with stones.

A supposed true specimen of *Salmo salar* in the smolt stage, taken in the entrance of the Motueka River, Nelson.