

at Lord Howe Island, some 420 miles from Sydney. It is allied to the present strange lizard found at Western Australia, known as *Moloch horridus*. Specimens of both were exhibited on the table.

A fine cob of Indian corn grown on Maria Island was submitted by the Secretary.

A very interesting collection of carved ethnological subjects from the Bouka Island, Solomon Group, from the Australian Museum, were also exhibited.

ENORMOUS EARTHWORMS.

Mr. MORTON exhibited some very large earthworms kindly obtained by Mr. Bernard Shaw, Inspector of Police. Some of these measured from 2ft. to 3ft. in length. Mr. Morton stated that Mr. J. J. Fletcher, Director of the Linnæan Society of New South Wales was busy writing a work on the earthworms of Australia, and on forwarding a few of the Tasmania worms for comparison, Mr. Fletcher writes:—"They are splendid specimens, and about the finest worm I have yet seen, for though one of ours is longer, it is not so robust, nor so altogether magnificent. My third paper is to be read on the 29th inst., but I am not able to include them in it, as I have not quite finished with those already in hand. But I will get to work at them as soon as possible. They are certainly a new species, and very likely a new genus, but I cannot decide this without dissection. Later on I shall be glad to send you for your museum specimens of as many named species of our worms as I can spare." Mr. Morton said he had some alive that he intended sending to Mr. Fletcher.

THANKS.

A vote of thanks was passed to the authors of the papers, and to those who had contributed interesting information.

LICHENS.

Mr. BASTOW at the conclusion of the meeting, submitted some well mounted specimens of Tasmanian lichens, including some of the most interesting species. Other specimens had been arranged for the microscopes which were inspected by the ladies and gentlemen present.

SEPTEMBER, 1887.

The monthly meeting of the Royal Society of Tasmania was held at the Museum on September 12.

His Excellency (the President) Sir Robert Hamilton in the chair, and there was a large attendance of Fellows and Ladies.

The Hon. B. S. Bird and Mr. C. E. Featherstone were admitted Fellows of the society.

List of additions to the library during the month of August:—

Annual Report of the Department of Mines, New South Wales, for the year 1886.—From the Department.

Bollettino dei Musei di Zoologia ed Anatomia comparata, della R. Università di Torino, Nos. 19 to 26, Vol. II.—From the Society.

Bulletin de la Société D'Ethnographie, 2nd ser., No. 7.—From the Society.

Monthly weather reports, U.S. of America, 1886-7.—From the Department.

Norwegian North Atlantic Expedition, 1876-8, XVIII., A and B. "The North Ocean—its Depths, Temperature, and Circulation." By H. Mohn. With 48 plates and 3 woodcuts.—From the Department.

Proceedings of the Linnæan Society of New South Wales, second series, Vol. 2. Part 2.—From the Society.

Results of Meteorological Observations made in New South Wales during 1885.—From the Government Astronomer.

Scientific Transactions of the Royal Dublin Society, Vol. 3. Series 2. XI.—On New Zealand Coleoptera. With descriptions of new genera and species.—By D. Sharp, M.B.

XII.—The Fossil Fishes of the chalk of Mount Lebanon, in Syria.—By James W. Davis, F.G.S.

XIII.—On the cause of Iridescence in Clouds.—By G. Johnstone Stoney, M.A., etc. Vol. 5. N.S. July, 1886. Part 3. October, Part 4. January, 1887. Part 5. April, Part 6.—From the Society.

Statistics of the colony of New Zealand for the year 1886. Results of the Census of the colony of New Zealand, taken for the night of the 23th March, 1886. Sickness and Infirmity, Land, Stock, etc., Industries, Land and Building Societies, Public Libraries, Mechanics Institutes, Places of Worship, Maori Census.—From the Department.

The Times, London, June 22, 1887, containing an account of the jubilee.—From Mr. Justin Browne.

Transactions of the Wagner Free Institute of Science of Philadelphia, Vol. 1.—From the Trustees.

Transactions of the Geological Society of Australasia, Vol. 1. Part 2.—From the Society.

Verhandlungen der Gesellschaft Für Erdkunde Zu Berlin. Band, XIV., No. 5, 6,—From the Society.

PAPERS.

Mr. SAVILLE-KENT, F.L.S., F.Z.S., read a paper on the acclimatisation of the true salmon (*Salmo salar*) in Tasmanian waters, and upon the reported salmon disease affecting the fish under cultivation at the breeding establishment on the river Plenty. He pointed out that the disease was more or less prevalent amongst the fish at every breeding season, and was caused by the growth upon some wounded or abraded surface of the fishes skin of a species of aquatic fungus, known technically by the name of *Saprolegnia ferax*. Continuing, he said—"The spores or germs of this fungus are almost constantly present in pond or river water and naturally germinate and flourish luxuriantly upon any submerged dead or putrifying animal matter. The mildew-like growth that develops upon dead flies immersed in water represents one phase of this fungus, and I exhibit this evening samples of it growing on pieces of dead fish and mussel that have been purposely cultivated for the occasion. Also fragments of the felt or paper like masses characteristic of the growth of this *Saprolegnia* upon diseased fish, and which have been detached from one of the salmon that recently died at the Salmon Ponds. Mounted specimens, illustrating the more minute structure of this fungus, are exhibited in the adjacent microscopes. This more minute structure as there shown, and which I have also delineated on the accompanying diagram, consists of an interlacing network of branching threads or hyphæ, commonly called the "mycelium" of the fungus, and from which arise erect sub-cylindrical or club-shaped seed capsules or "sporangia." Within each such sporangium may be developed several hundred microscopic seeds or zoospores, every one of which, should it alight upon congenial soil, such as a sore on a fish's back or any dead animal matter, is capable of developing into an extensive fungus colony. Millions of these minute seeds or zoospores may be developed from a single tuft of

fungus not more than one quarter of an inch in diameter, and as these are provided with locomotive organs or cilia, wherewith they can traverse the water in every direction, it may be anticipated that in those waters where the fungus is abundant, a wounded fish has little or no chance of escape. There is yet another seed or spore known as the "oospore" by which this fungus may be developed, but which is of much rarer occurrence, and provides for the latent or resting phases of the species. As will be familiar to many present, a very destructive outbreak of this fungoid disease attacked the salmon in the English and Scotch rivers in the year 1878, and has been more or less prevalent in later years. Thus, in the annual report of the local Board of Conservators of the Tweed district for the year 1881, it is recorded that no less than 14,600 salmon had succumbed in that river to this disease, making with the two preceding years a total of 22,000. While up to the present time nothing is known absolutely or accurately concerning the immediate origin of these epidemic outbreaks, there is, I think, much evidence to show, in the case more especially of apparently healthy fish being attacked, that the absence of sufficient oxygen in the water for the healthy maintenance of the fish, either through overcrowding, abnormal temperature, or by direct pollution, represents a very if not the most important factor. Notwithstanding, however, the apparently exhaustive onslaughts of this formidable epidemic it is satisfactory to know that the returns of the fish captured in these previously affected rivers within later years has been in no way diminished, but even increased. It is indeed advocated by some authorities on fisheries matters that good is accomplished through the visitations of this epidemic, since it operates as a check by which the old male fish or kelts, which systematically lay in wait for and prey upon the young salmon smolts when descending to the sea, are periodically eliminated. . . . With the true salmon, *Salmo salar*, however, the case is different. The only breeding stock of these species that has been available this past winter for artificial propagation has been a series of 30 fish developed from the salmon ova brought out by the s.s. Abingdon in 1884, hatched out that same year, and since retained in the Ponds. These fish, or rather what remain of them up to the present time, not having migrated to salt water, are in a relative dwarfed or undeveloped condition. The largest of them scarcely exceeds a foot in length, and they still retain their immature or parr markings. The majority of them have nevertheless manifested a tendency to propagate, and from the entire series a number of ova little short of 4,000 have been artificially expressed and fertilised. I should rejoice to be able to congratulate the colony upon having in this most auspicious anniversary of Her Majesty's reign, and after many years of indefatigable and self-denying perseverance on the part of that very worthy body of gentlemen, the late Salmon Commissioners, succeeded in establishing in Tasmania a race of this noble fish that would propagate and grow to maturity in its lakes and rivers without requiring to migrate to salt water, and which race might be most appropriately distinguished by the title *par excellence* of the "jubilee salmon." I fear, however, that the prospects of the achievement are not altogether encouraging. With the view of assisting, as far as possible, towards the successful conduct of the experiments that might be continued, he submitted the following suggestions:—In the first place, it is desirable that more than ordinary care should be exercised in the manipulation of these valuable fish for artificial propagation. During the Conferences at the International Fisheries Exhibition, London, 1883, at which I had the privilege of being present, one of the most important papers contributed was that by Professor Huxley on "Fish Diseases." In this paper the fatal malady caused by, or associated with the fungus, *Saprolegnia ferax*, was specially dealt with, and in the discussion that followed many new

and valuable data were elicited. In this direction, Mr. Wilmot, the Chief Commissioner of the Canadian Fisheries, bore testimony to the fact that at the hatching stations in Canada they formerly lost a very large number of the salmon manipulated through the fungus. "Round the tail, where the men had caught the fish, this fungoid growth appeared and spread until the fish was killed." Also, in handling the salmon "three or four finger marks might be left across the fish's back; a few days after they invariably found three or four stripes of fungoid growth, and the fish invariably died." In order to combat the mortality from this cause, india-rubber gloves were supplied to the hatcheries for the manipulation of the fish and have been used ever since with gratifying results, it being found that the salmon were much less liable to injury and to the attacks of the fungus when so treated. Similar simple mechanical appliances might undoubtedly be profitably introduced at the hatchery on the River Plenty for the future handling of the surviving fish. Mr. Saville-Kent proceeded to explain that, in his opinion, the failure to acclimatise the true salmon in Tasmanian waters was chiefly due to the considerably higher temperature of the sea on this coast as compared with that of the British seas. In conclusion, he remarked that every resource at the command of human skill had apparently been brought to bear upon the naturalisation of the salmon in Tasmania, and no more fitting opportunity than the present could be selected for placing on record the indebtedness of the colony to that body of gentlemen, the late Salmon Commissioners who have so perseveringly devoted their time and best energies for many years to these acclimatisation operations. And if, owing to an inflexible law of nature, this one species has proved intractable, they will have the satisfaction of knowing that through their accomplished establishment in Tasmania of many varieties of the allied and more plastic forms of *Salmo trutta* and *Salmo fario*, they have conferred on the community at large, if not an equal, yet a very substantial benefit.

Sir LAMEERT DOESON said he had never seen anything at all approaching a salmon since he had come from the Old Country. He had heard Sir Frederick Weld say that he caught an 1lb. salmon, but the question was whether it was a true salmon. There was no doubt that the ova sent out from Home was sent by gentlemen who were good judges, and it was genuine salmon ova. Therefore they should assume beyond all possibility of doubt that the ova was really salmon ova. These had failed. There was something yet to be learned, and he did not think they should lose sight of the fact that the English herring, crab, and lobster might be introduced.

His EXCELLENCY said he had listened with very great pleasure indeed to this paper and discussion. This was a subject in which he took a very great interest, merely as a fisherman. He had often before he came here heard of the efforts made by Tasmania to acclimatise salmon. He thought it stood to reason that the ova sent out here must have been proper ova, but it was a pity that so few specimens were afloat. There appeared to have been only one real salmon ever caught, and if they were really sure that there was one 10lb. salmon caught, why should they not catch more? He thought it would be a great pity and misfortune if it was to be considered now that after the great many years they had tried this should turn out a failure. He expressed satisfaction at seeing so many ladies present, taking an interest in the proceedings of the Society, which was very gratifying. (Hear, hear).

In the absence of the author the SECRETARY (Mr. A. Morton) read a paper entitled "A First List of the Birds of Maria Island," by Col. W. V. Legge. In his paper the author pointed out that of late years much has been added to our knowledge of the local distribution of birds in Europe and Asia, by the publication of "Lists of Birds" in such

journals as the "Ibis," "Stray Feathers," and the "Proceedings of the Geological Society," and the information afforded by such papers had proved of the greatest advantage to authors in the publication of recent works.

The paper dealt with some 64 species, and should prove of the most importance to ornithologists. Accompanying the paper was several interesting specimens of Terns and other sea birds.

NATURAL GRAFTING.

Note on a specimen of natural grafting, or inarching of the branches of the weeping ash (*Fraxinus excelsior pendula*), by F. Abbott, Superintendent Botanical Gardens. Mr. Abbott said the specimen laid on the table was one of natural grafting or inarching; similar examples are occasionally met with, and it is most probable that the art of grafting itself originated with the ancients by cases of a like nature coming under notice. Several things are necessary to lead up to a union of this kind—1st. The branches must naturally be in the right position 2nd. A certain amount of friction is necessary to rub off the outer bark, and then some amount of quietude and repose is essential to allow the union to take place. As it is only occasionally that all these conditions can be fulfilled at the proper time good examples like the one under notice are not common, and on that account it may be of interest to those present.

The SECRETARY drew attention to a very valuable cast of a skull of an Australian herbivorous marsupial (*Nototherium Mitchellii*) an extinct animal, rather smaller in size than the *Diprotodon*. The fossil remains of this remarkable animal are found in New South Wales and the Darling Downs, Queensland. The secretary stated that this very valuable specimen had been presented by their very generous friends, the trustees of the Sydney Museum. Dr. Ramsay, the curator of the Sydney Museum, Mr. Morton stated, was always most willing to assist the Tasmanian Museum in making the Museum as complete as possible in their collections.

MAGNIFICENT SHELLS.

On the table were two magnificent specimens of *Pinna nobilis*, presented by Lieut. Beddome to the Museum.

VOTE OF THANKS.

The President proposed a vote of thanks to the authors of papers read, which was carried by acclamation.

OCTOBER, 1887.

The usual monthly meeting of the Royal Society of Tasmania was held on Monday evening, October 10th, 1887. The President, His Excellency Sir Robert Hamilton, occupied the chair at opening, and there was a moderate attendance of Fellows, and lady visitors.

List of additions to the library during the month of September:—

Bollettino della Società Geografica Italiana, Ser. II., Vol. XII., Fasc. 6, 7, 8, 1887. From the Society

Bulletin de la Société Royale de Botanique de Belgique, Fondée Le 1er Juin, 1867. Tome Vingt, sixième, Anner, 1887. From the Society.

Journal of the Royal Microscopical Society, Part 4, August, 1887. From the Society.

Leeds Philosophical and Literary Society's annual report for 1886-7. From the Society.