MAY, 1902.

A meeting of the Royal Society of Tasmania was held on Monday evening, 12th May. His Excellency the President, Sir Arthur Havelock, G.C.S.I., G.C.M.G., who was to have presided, was prevented attending through indisposition. His Excellency sent a sympathetic letter, expressing his regret and interest in the business of the meeting. In his absence Mr. Thos. Stephens, M.A., senior vice-president, occupied the chair.

The Late Sir James Agnew.

Mr. Stephens said that his unavoidable absence from Hobart at the time of the last meeting of the Society had prevented him from reporting his receipt in February last of a letter from the Royal Colonial Institute in reference to the death of the late Sir James Agnew. The secretary states that the Council "had received with great regret the announcement of the death of Sir James Agnew, for many years a valued and highly respected member of the Institute, and expressed their deep sense of the loss sustained by the Institute, as well as by the community amidst which he had lived so long, and by whom he was so universally and deservedly esteemed."

Tasmania as a Manufacturing Centre.

Mr. G. E. Moore, C.E., opened the discussion on the paper read at the April meeting by Mr. R. E. Macnaghten on Tasmania as a manufacturing centre, especially in relation to water power. He said:—Mr. Macnaghten has drawn a very pleasing picture of Tasmania as a manufacturing centre, based upon its many natural advantages, especially with regard to its superior local conditions for obtaining cheap motive power derived from its lakes and rivers. What I propose to discuss is the reasonableness or otherwise of this foundation, on which he builds his hopes. His authority apparently is a report presented to Parliament by Mr. Rahbek, showing what power could be obtained from the water of the central lakes. Mr. Rahbek estimates that 57,000 h.p. could be delivered at Hobart from this source. A general statement of this kind is of no value to an engineer, and is distinctly misleading to the general public. With just as much accuracy I could state that there is daily 57,000 h.p. of wind power blowing to waste, or 57,000 h.p. steam power in undeveloped coal in Tasmania. To utilise to advantage this water power, two problems must be solved, engineering and commercial. The engineering problem resolves itself into the question whether the local circumstances are such as to enable the necessary works to be carried out to give a certain h.p. at a sufficiently low cost per h.p. to compete with steam. As regards the commercial problem, there is the necessity for constant remunerative employment of the power produced. Taking the engineering problem first, one of the chief necessary factors is a waterfall in proximity to civilisation. Unfortunately Tasmania does not possess a waterfall of any size, and to get a fall of even 10 or 15 feet per mile you must go 40 or 50 miles up the Derwent, and power derived from the central lakes would be double that distance away, so the elements for cheap construction are wanting. No doubt the power obtained would be turned into electric power, capable of being transmitted many miles, but although we hear of electric power being in special cases transmitted 100 miles and more, I think I am correct in saying that for practical purposes the economical limit is not over 20 miles at the present day. Then looking at the commercial side, Mr. Macnaghten mentions four indigenous industries: Woollen goods, beer, timber, and fruit as likely to benefit and increase owing to federation—as no doubt they will, but, unfortunately, they are not trades that require much power, so that if water power is to be largely used, it must be by introducing some new manufactures into the island. The position then is this. There is a large amount of water power undeveloped, but it is doubtful whether it would pay to utilise it at the present time. A practical solution of this question would be the erection of works to create and supply electric power. But Government would hardly be justified in engaging in such a speculation, and there does not appear to be sufficient inducement for any private company to enter the field. The question is entirely one of relative cost, and that you may more easily under-

stand it, I will endeavour to show the approximate capital cost per h.p. of steam and water power. Steam plant may be put down for, say, £30 per h.p., while to put down a water power plant to utilise the power of the Gentle Annie Falls the estimate is not less than £100 per h.p. yet here we have a waterfall 400ft. high. To obtain a fall of 400ft. on any river, falling 40ft. per mile, would require a pipe or race 10 miles long, entailing a very large initial expenditure. For this reason water can only compete with steam when the local conditions are exceptionally favourable, such as the proximity of a waterfall, or when capable of being produced on a large scale. This is the real reason why the water power in this country is still what is popularly called running to waste, and it will continue to do so, until there is sufficient inducement for a company to sink from £50,000 to £100,000 in a large power producing plant. The only suggestion that I can make is that Government should assist private enterprise as far as possible by collecting and publishing useful information with regard to rainfall and river gauging, etc. They might also advertise the fact that they are desirous of developing the latent water power in the State, and with this intent are willing to deal liberally with any person or company formed for this purpose. They will have to give up the idea, which I believe they hold that this water power can be made a direct source of income, and be content with the indirect profit to the State derived from the establishment of new manufactures and new industries.

Mr. A. O. Greene said they were all much indebted to Mr. Macnaghten for again drawing attention to the subject. At Launceston, with the aid of the stream running through the town a very great deal was being done by water power, electric power for lighting, and numerous other purposes was generated, proving a great boon to the city in very many directions. He was much impressed with the water power available in this State to aid in the development of many industries. It was not at all necessary in his opinion that there should first be one great and expensive scheme for developing the power. He agreed that it would do much good to have directed attention to this latent power that was available in several districts.

Mr. R. M. Johnston, F.S.S., thought they must all agree that there was much water power available, but the question was whether it could be utilised with commercial advantage. It appeared that at present in transmitting electrical energy, generated by water power, over a considerable distance, there was a great deal of "leakage." There were engineers now in Tasmania alive to the existence of this water power in various parts of the island, and to some extent it was already being utilised.

Mr. Geo. Kerr looked forward to many manufactures arising in this State with the aid of water power. It would no doubt become a very valuable asset. The new Waverley woollen mills in the city were being worked by water power. He predicted that ere long paper mills would be established in Hobart.

Mr. Target, C.E., referred to the generation of electrical power on a large scale at Niagara Falls,

Mr. Macnaghten replied to the discussion. Mr. Rahbek's reports did not confirm Alderman Moore's view.

Mr. G. E. Moore could not find that Mr. Rahbek had gone into the financial aspect to prove that this water power would be remunerative, commercially.

Mr. Macnaghten: Last session of Parliament, two companies made application for rights to develop the water power. It was to be hoped that such a valuable asset of the State would not be given away. There was too much of the power of throwing cold water on projects existing in Tasmania. Tasmania would become a great manufacturing and industrial country if the people had more faith in their country, and more perseverance. (Applause.) He quoted Mr. Rahbek's report, which showed that 57,000 horse power (electrical) could be generated for use in Hobart, by utilising the available water power, and the place might become a great commercial centre.

Mr. Moore said it all depended on the cost of developing the power.

Mr. Macnaghten was accorded a vote of thanks.

School of Forestry and Agriculture.

Mr. L. Rodway read a further paper by Mr. W. Heyn, who is connected with the Dover (England) harbour works, on

the question of establishing a School of Forestry and Agriculture in Tasmania. The writer offered numerous detailed suggestions with respect to marketing numerous products, from apples to timber. The State could easily grow enormous quantities of those timbers which she was now importing, equal to one-third of her exports of timber, and paid two-thirds more for it.

Discussion on the paper was postponed till the next meeting.

A New Fish.

Mr. R. M. Johnston tabled a description of a new species of Goby, which he named in honour of Mr. Geo. Hinsby, who has presented many specimens to the Museum, "Gobius hinsbyi." Mr. Johnston said: There is no doubt that many more of the smaller types of our marine and fresh water fishes have as yet escaped the notice of ichthyologists, and our amateur sportsmen might do good service in preserving and forwarding to the Tasmanian Museum all forms of fishes which may seem to them to be new or in any way strange in appearance.

The meeting then terminated.

List of books and magazines presented to the Royal Society of Tasmania during the month of May, 1902:—

Transactions of the Royal Dublin Society, Parts VIII. to XIII.

Proceedings of the Royal Dublin Society, Parts II. to IV.

Economic proceedings of the Royal Dublin Society, Vol. I., Part II.

Memoirs and proceedings of the Manchester Philosophical Society. Vol. 46. Parts III. and IV. 1901-2.

Atti della Reale Academia dei Lincei, Roma.

A list of the best books relating to Dutch East India, made up in commemoration of the third centenary of the foundation of the East India Co., March 20, 1602. By Martinius Nijhoff.

From Shanghai to Bhamo. By R. L. Jack, LL.D.

Proceedings of the Royal Society of England. Vol. LXIX. No. 457.

Boletim da Sociedade de Geographia de Lisbon.

Journal of the Society of Arts.

Journal of Agriculture of Victoria.

Proceedings of the Washington Academy of Sciences. (a) Papers from the Hopkins Standford Galapagos Expedition, 1898-9. (b) VII. Entomological results. Arachidua. By N. Banks. (c) Papers from the Harriman, Alaska Expedition. XXVII. Apterygota, by J. W. Folson. (d) Organisation and Membership of the Washington Academy of Science.

The Scottish Geographical Magazines, current numbers.

The Queensland Flora. Vols. I. to V. By F. M. Bailey, F.L.S., Government Botanist of Queensland.

The Periodical. by H. Froude.

Lizury der Mathematisch Naturwissenschaftlichen.

The Victorian Naturalist. Vol. XIX. No. 1. May, 1902.

Annual report of the Colonial Laboratory of New Zealand.

Transactions of the Royal Irish Academy. (a) Vol. XXXI. Part XII. Further developments of the Geometrical Theory of Six Screws; by Sir Robert Ball, F.R.S., LL.D. (b) Notes on the High Crosses of Moone Drumcliff, Termonfechhin, and Kilamery; by the late Miss Margaret Stokes. (c) The Ancient Forts of Ireland, being a contribution towards our knowledge of their types, affinities, and structural features; by T. J. Westropp, M.A. (d) Vol. XXXII. The interpretation of a Quaternion, as a point of symbol. Part II. Quaternion Arrays; by C. J. Joly, M.A., Royal Astronomer of Ireland.

Journal of the Royal Microscopical Society of London. Part II. April. 1902.

Annals of the South African Museum. Vols. II. and III.

Bulletin of the Natural History Society of New Brunswick.

The Royal Geographical Journal, London, April 1902.

Journal of the Scottish Meteorological Society (third series).

Statistics of the Colony of New Zealand for the year 1901. Part III.—Trade and Interchange.

North Queensland Ethnography. Bulletin 4. March, 1902. "Games, Sports, and Amusements." by Dr. W. E. Roth.

The Record of the Mines of South Australia, Tarcoola, and the North-Western district, with plans by H. Y. L. Brown, F.G.S., Government Geologist.

Report of the British Association for the Advancement of Science held at Glasgow, September, 1901. (Bound.)

Proceedings of the Linnæan Society of New South Wales. Part IV. Vol. XXVI. No. 104.

Monthly Notices of the Royal Astronomical Society. Vol. LXII. No. 5, March, 1902.

Boletim Mensal do Observatorio, Rio ty of New Brunswick.

Boletin del Institutio de Geologico. Mexico.