the case of transport, we may, by careful observation and experiment, see how far we can make use of this organisation to dispose of our fruit with the best results to ourselves. With this object we have established an agency in London, to reduce expenses, to control sales, to find out so as to prevent or make claims for all damages, and generally to exercise a supervision on behalf of growers.

Discussion on this paper was postponed till next meeting.

The Secretary read a paper contributed by Mr. J. Shirley, B.Sc., of Queensland, a corresponding member, on "A list of the known lichens of Tasmania," and one by Mr. A. T. Urquhart on "Some Tasmanian spiders," from a collection supplied by Mr. A. Morton, curator of the Tasmanian Museum. The other papers on the agenda were held over till next meeting.

The CHAIRMAN proposed a vote of thanks to the gentlemen who had contributed papers, which terminated the proceedings.

MAY, 1892.

The monthly meeting of the Royal Society of Tasmania was held at the Museum on Tuesday, May 11. His Excellency the Governor Sir R. G. C. Hamilton, K.C.B., LL.D., presided. There was a good attendance of Fellows.

His EXCELLENCY expressed his regret at being absent from the last meeting. This was the first time he had been with them since the late Science Congress had met, and he congratulated them upon the success which had attended their labours in this respect. This was, he was sure, largely due to the exertions of Mr. A. Morton, the General Secretary, who had been indefatigable in his efforts to make the affair a success. Mr. Ogilvy had thrown out a very valuable suggestion, to which reference was made in his address at the meeting of the Science Association. The idea was that they should have corresponding members stationed in various places. The country should be mapped out into districts, and each separate district be recognised as being under certain persons' observations, who would undertake to forward anything of any importance which might come under their notice in their particular districts. They might also be communicated with at will upon the subject, and inquiries instituted. He would like the matter to be discussed at the next meeting of the Society. Perhaps they might think the matter over, and make preparations for the discussion in the meantime. He then invited discussion upon the paper of Mr. W. E. Shoobridge.

Mr. A. MORTON said that the suggestion of Mr. Ogilvy was bearing fruit already. He had received a number of specimens from different parts of the island. One was a specimen of a very large crane (*Ardea pacifica*) seldom found in Tasmania, although common in Australia. Another was a white crane (*Herodias alba*) also scarce here. A duck, hitherto unrecorded in Tasmania, called the "blue bill" (*Erismatura australis*) was also sent. The Australian coot was another species of bird rather scarce in Tasmania, and recently found here in some plenitude. He was at a loss to account for the influx of these birds into the island at this period.

His EXCELLENCY stated that he had observed that the crane species were unusually plentiful this year.

THE EXPORT OF APPLES.

Mr. C. H. GRANT, with reference to Mr. Shoobridge's paper upon the export of apples to Europe, said that the author of the paper had dealt with the question in a very able manner, although it was rather deficient in the details relating to the cultivation of fruit, which, however, might possibly relate more to the gardening industry than to the Royal Society. The paper itself could bear a great deal of argument. He was not in a position to criticise it for it carried a great deal of information, and contained matter of interest. From a scientific point of view it was invaluable. In the earlier days of fruit-growing there was a great amount of labour wasted, and money expended in cultivating the wrong kind of fruit. It was always a matter of interest to study the products of the soil, and he was sure the Society was much indebted to him. Mr. Shoobridge had also given some valuable information concerning his meteorological surveys, in which he was a pioneer. They were all, he was sure, greatly pleased with the efforts of Mr. Shoobridge in the researches he had made, and for the valuable information he had furnished.

Mr. W. E. SHOOBRIDGE said that there were two points which were very necessary to discuss on the subject; one was the question of irrigation, and the other the effects of the atmosphere upon the growth of fruit. The finest fruit he had ever seen was grown in a dry atmosphere, where the trees had been well irrigated. The reason for this was that the trees required as much light and air as possible. The water acted as a carrier of soluble salts, necessary to the life of the trees. The more sunlight and air that was received by the trees the greater and more active were the chemical changes, and the higher products of the plant. The gums, resins, and sugars were more abundant. It was impossible to get this in a moist atmosphere. The French crabs usually grown in a moist atmosphere were, when grown in a dry, airy locality, completely changed in colour. This was very apparent in trees which were grown within a short distance of each other. They also had adopted a new system of pruning. In this climate the full benefit of the sun without too much strength was received, which was of the greatest value. The damage to the fruit in keeping was the result of a fungoid growth produced by the fruit being stored in places where the air was foul. To keep this under it was necessary that the fruit should have a clear current of air. In an atmosphere of 40deg. to 50deg., which was about the proper temperature to keep fruit in, with a clean dry atmosphere, the fruit would keep well. In some of the fruit which had been packed to London a blue mould appeared about the specimens, and on tasting it its flavour was found to be entirely gone. This fungi, which began usually about the region of a bruise, caused immense harm to the fruit, and completely spoiled its flavour. This was never found in the packed fruit near the outlet, because there was a complete current of air. In the places where the fruit was affected the air was very foul, so foul in fact, that in some cases a candle would not burn. It was therefore apparent that the fungi was nourished in stagnant air, and, if information could be gained with regard to this matter, a great step towards the knowledge of the proper course to be dopted for the preservation of fruit would be gained.

His EXCELLENCY thought that if information was sent in from various districts respecting the question of irrigation, and how it was applied, it would be of great value. He asked if there were many districts where irrigation was carried on?

Mr. SHOOBRIDGE replied that there were not very many, although the question was receiving more attention lately than formerly. There were a great many districts where irrigation was not required.

His EXCELLENCY thought that it was a pity if the subject should stop at that place. If Mr. Shoobridge would confer with Mr. Morton a series of papers on the subject might be prepared, and if communication were established with different fruit growing districts information might be obtained of much value.

The meeting adopted the suggestion as a favourable one.

Mr. GRANT said that in his researches he had noticed that in places where fruit had grown to extraordinary proportions, like the district of Nova Scotia where the climate was not of the particular conditions described by Mr. Shoobridge as most favourable, the great depth of soil was perhaps the real cause. He noticed that in the valleys of Nova Scotia the English grasses and clover grew to such a height as to resemble a dense scrub. He did not think that the winter of Tasmania was severe enough to kill the insect pests.

His EXCELLENCY thought that Messrs. Shoobridge, Grant, Abbott, and Morton, if willing to act, might constitute themselves a body to obtain all information possible upon the subject with a view of reducing it to a practical form.

PAPERS.

"The Climate of Eastern Tasmania, indicated by its Lichen Flora:" by Rev. F. R. M. Wilson, Kew, Victoria, Corresponding Member Royal Society, Tasmania:—

During a visit of five weeks to Tasmania, in February and March, 1891, while exploring for lichens in the neighbourhoods of Launceston, Mount Arthur, Ulverstone, Hobart, Mount Wellington, the Huon River, and St. Mary's Pass, I was struck with the general and unexpected poverty of the lichen flora. And, on looking about for the cause of this, I noted the evident frequency of bush fires, which are the most destructive enemies of lichen growth. This, however, did not wholly explain the matter, for, even where the plants might be expected to recover from the action of the fire, their vitality seemed to be checked by the dryness of the climate. This was a discovery surprising to a Victorian, who had been accustomed to consider the climate of Tasmania a humid one. An examination of meteorological authorities, however, showed that in the eastern portion of the island the rainfall is not only less than it is in the western, but less than it is in Victoria. In the west and the highlands of Tasmania 75in. of rain have been registered in one year, and the average of the whole island is said to be 35in.; but the annual rainfall at Hobart is only 21·52in. These adverse influences of fire and drought doubtless re-act on one another; the fires thinning the forests and undergrowth and thus lessening the rainfall, and the lack of rain exposing the country to the ravages of fire. These influences, however, are considerably modified in the eastern part of Tasmania by the altitude of the mountains and by the ocean currents along the coast; both of which have a great effect upon the geographical distribution of lichens. When I visited Tasmania I was anxious to test a theory which I entertained with regard to the distribution of lichens in Australia. This theory was that the warm current from the tropical Pacific Ocean, passing down the east coast of Australia, carries southward the spores of tropical lichens and the conditions favourable to their growth, until it is met by the cold south-west seas and winds which greet the traveller when doubling Wilson's Promontory from the east. Nautical observations have determined the trend of this coastal current, and traced it from the tropics southward beyond Australia and along the eastern coast of Tasmania. Nylander tells us (Syn. Meth., p. 69) that the tropical zone is specially characterised by its epiphyllous lichens, notably by the genus *Strigula*, and, among

cortical lichens, by the numerous species of *Thelotrema*, *Graphis*, *Chiodecton*, *Glyphis*, *Trypethelium*, and *Porina*. These genera, which are allied to the *Ascomycetes* among the fungi, are largely represented in Queensland, on the eastern or seaward side of the coastal ranges. All of these, except the *Porinæ*, appear along the coast of New South Wales, but are less numerous there both specifically and individually. In Victoria neither *Strigulæ* nor *Porinæ* have been found, unless in a very undeveloped state, and the other genera have far fewer representatives than in the more northern colonies. They are most frequent in the eastern part of Victoria. I discovered many species of *Graphis* and *Thelotrema*, and several *Chiodecta*, on the seaward slope of the dividing range to the east of Melbourne, and especially on the Gippsland coast, and one *Glyphis* and one *Trypethelium* at the lakes entrance in Gippsland. It remained to be seen whether or not my theory would be supported by lichenological explorations in eastern and north-eastern Tasmania. I had opportunity to test it on Mount Arthur and in St. Mary's Pass; and I found some of the same *Graphides* and *Chiodecta* and even a *Trypethelium*, which I had collected near Sydney and at the lake entrance in Victoria. Two or three species of *Chiodecta* I found, not only on Mount Arthur, but even as far south as Mount Wellington. The genus *Trypethelium* is especially tropical or sub-tropical, and the presence of one of this genus in St. Mary's Pass testifies to the geniality of the climate in eastern Tasmania. As in Victoria, so in the more southern colony, the warm current down the east coast of Australia brings southward conditions favourable to the growth of sub-tropical lichens. These facts, I think, suggest to the medical faculty what probably their experince has already proved, that the climate of east Gippsland and the eastern coast of Tasmania must be pre-eminently beneficial to invalids. Lichenological observations indicate that both of these places are favoured by a much milder winter, as well as a cooler summer, than the other parts of their respective colonies.

Mr. GRANT thought that the subject was a most interesting one from a botanist's point of view, and from the specimens laid upon the table it would seem that they were beautiful in form, and extremely interesting in every way. The collection of mosses were well worth looking at. They were done up in a most convenient form for examinations. There was no difficulty in getting at them, and the names were put upon them clearly and legibly. The Society was, he was sure, deeply indebted to the donors, from whom he hoped to have more shortly.

CORRESPONDENCE.

Cullenswood House, St. Mary's, May 2, 1892.—The Secretary of the Royal Society of Tasmania. Sir,—Having received a communication from Mr. E. D. Atkinson, of Wynyard, relative to the terrible destruction of the young of Puffinus brevicanda, or "mutton bird," at the Straits Islands, for the boiling down of their fat, I beg to bring the matter strongly before the Council of the Royal Society, with a request that a deputation of its members may wait upon the Government, and suggest the passing of an Act during the coming session of Parliament, which shall put a stop to the destruction of this species for the purpose complained of. I cannot do better than transcribe from Mr. Atkinson's letter what he says in reference to the slaughter of the birds :—"When I was there, and for some time previous, the young birds were being taken for the purpose of 'fatting,' that is, boiled down for their fat. On Green Island alone, five men were obtaining 2,500 birds a day, and this would be going on for several weeks. On Chapel and Babel Islands, which are much larger, the same thing was going on, but on a much larger scale. Some hundreds of thousands will be destroyed in this

manner, and when I tell you the fat is 9d. per gallon, and it takes 120 birds to make one, you will see what rightful destruction is done for a miserable return. It is perfectly legitimate to take the birds for curing and keeping for food, but as there are too many for this they must destroy them in a wholesale way for fat; and this is done by one or two men only, the majority of the folks there and all the half-castes are against the fatting process. I was requested when there to see if anything could be done to have a stop put to it." This extract speaks for itself, and the points to be urged on the Government are:—The enormous destruction for a disproportionate, and as Mr. Atkinson says, a very miserable return, and the undoubted fact that the mutton birds will in a few years be driven way from these breeding haunts altogether, and the means of getting a living resorted to by the islanders entirely cut from under their feet.—I have the honour to be, sir, your obedient servant, W. V. Legge, Tasmania, Member of Committee for Preservation of Plants and Animals.

Mr. Bernard Shaw said that perhaps Colonel Legge probably was not aware that there was a law to prevent the destruction of young mutton birds. This prohibited the taking of birds until they were fit for human food, and was instituted especially to prevent their wholesale destruction. This was the first season that the regulation had been in force, and he hoped that it would have a salutary effect. The constable who had charge of the islands was only recently appointed, and it would be his duty to see that the Act was carried out.

Mr. Thomas Stephens hoped that the Act would be carried out efficiently. It was a subject which could scarcely be discussed without preparation. The birds formed the staple food of a half-caste population of the Straits, and they should be either compelled to restrain themselves in the wanton destruction of the mutton birds, or else be removed to another place. The natives could not be made farmers all at once, but their condition was being greatly improved. He regretted the absence of Bishop Montgomery, who had made himself acquainted with the condition of the half-castes in the Straits thoroughly. At certain seasons of the year the natives of the islands assembled to snare the birds. This had been going on for at least 50 years, and there did not appear to be any appreciable diminution in their numbers. He thought that if the law was a good one it might be very strictly enforced, as there were too many laws on the Statute Book of Tasmania already which were allowed to rest dormant.

Mr. Shaw said that there were four matters to be dealt with. The first was the destruction of the young birds, the next the taking of the eggs, the next the destruction of the birds by fire, and lastly, the injury done to the birds by the presence of cattle and sheep. He read the regulations in force upon the subject, which provided against the destruction of the birds as stated in the paper of Colonel Legge. These regulations were issued on the 12th December last.

PRESENTATIONS.

The Secretary called attention to a number of donations which had been sent to the Museum. Mr. W. A. Weymouth forwarded 85 specimens of mosses comprising 68 species. The Rev. F. R. M. Wilson sent in a number of specimens of lichens, which were like the mosses, mounted and classified. Mr. Omant presented samples of rocks from the West Coast, consisting of calcite and limestone, and which were said to be valuable for flux, analysis of which has already been published. A specimen of stone found near the Russell Falls was submitted by the Secretary to Mr. A. Montgomery, the Government Geologist, who said that on examination of it he found that it was not kaolin but pretty

nearly pure silica, probably tripoli or infusorial earth. He stated that the infusorial earth had a considerable commercial value if of good quality, and he quoted the U.S. mineral statistics, it was shown that the production of 2,532 tons of 2,000lb., valued at 50,640dol., or about £4 a ton. This stone was found in connection with the lithographic stone recently referred to in a previous issue of *The Mercury*.

PAPER BY PROFESSOR TATE.

A paper was handed in by the Secretary, contributed by Professor Ralph Tate, F.L.S., of Adelaide, on the "Classificatory portion and synonyms of *Eaetoniella Rufilabris*."

After the usual votes of thanks the meeting terminated.

JUNE.

The monthly meeting of the Royal Society of Tasmania was held in the Society's room at the Museum on Tuesday evening, June 14. His Excellency the Governor Sir R. G. C. Hamilton, K.C.B., LL.D., presided, and there was a good attendance of ladies and gentlemen.

A NEW MEMBER.

Mr. Charles Holdsworth was duly elected a Fellow of the Society.

AUSTRALASIAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE JOURNAL.

The SECRETARY (Mr. Alex. Morton) laid on the table Volume III. of the journal of the New Zealand meeting, which had just arrived. He also said the journal of the Hobart meeting was well in hand.

His EXCELLENCY expressed himself as highly pleased that the publication of the Hobart journal was being done so expeditiously.

CORRESPONDING MEMBERS.

The SECRETARY stated that the Council had under consideration Mr. Ogilvy's suggestions with regard to corresponding members throughout the country, and hoped to be able to report on it by next meeting.

PAPERS.

Notes on the Natural Limits to Occupation on the Land, by Mr. R. M. JOHNSTON, F.L.S.

Notes on the Square-set System of Timbering in Mining at Zeehan and Dundas, illustrated by a Model Square-set. By ALFRED J. TAYLOR, F.L.S.

His EXCELLENCY moved a vote of thanks to the gentlemen who had contributed. As regarded Mr. Taylor's paper, he was sure they had all listened to it with great interest. The explanation he had given was very clear, and he had no doubt his object would be fulfilled if the general attention of the mining public was directed both to the advantages and drawbacks of this description of timbering. (Applause.)

The proceedings then terminated.

JULY.

The usual monthly meeting of the Royal Society was held at the Museum on Tuesday evening, July 12. His Excellency the Governor