ROYAL SOCIETY.

APRIL. 1888,

The opening meeting of the 1888 session of the Royal Society of Tasmania took place on Monday evening, April 23rd, and was held in the upper room of the new wing recently added to the Museum, which is intended to be ultimately used as a temporary picture gallery, but was made use of last night for the special purpose of permitting some technical subjects to be dealt with by the aid of some large apparatus for illustration. A large number of Fellows, and an unusually large number of visitors were present, including Sir Thomas Brady, the Inspector of Fisheries for Ireland, who accompanied Sir Robert and Lady Hamilton and a party from Government House.

His Excellency the GOVERNOR, who took the chair as President of the Society, said : Ladies and gentlemen, let me first say how pleased I am to see such a large gathering here this evening. The fact of the addition of these two fine rooms to the Museum buildings enabled the Council of the Royal Society on this occasion to depart from the usual programme of opening nights, and instead of having papers read and discussions upon them, to have a meeting more of the character of a conversazione, with the exhibition of certain mechanical processes. But we have also another item on the programme here this evening which I think will interest you all. There was no matter which the Royal Society took up last year which was of greater interest than the introduction of a new supply of salmon ova under the superintendence of Sir Thomas Brady. (Cheers.) As you all know, it was through the liberality of Dr. Agnew that this experiment was enabled to be tried, and I am sure you will all regret, as I do, the absence of that gentleman this evening. (Cheers.) I begged him to come and stay at Government House and meet Sir Thomas Brady, and be present at the unpacking of the ova, but he was most unfortunately prevented. Sir Thomas Brady, as you are no doubt aware, has arrived. The Council has made him an Hon. Member of this Society, and he has been good enough to undertake to make a few remarks upon the work he took in hand for this Society. From the columns of the Press we have heard a good deal about what has happened since the ova arrived here, but a great deal of the work began before the ova arrived here, and we hope to hear from Sir Thomas some account of this work, and I do not think I need ask you to give him, what I am sure you will give him, a very warm reception. (Cheers.) It would be unreasonable to expect Sir Thomas Brady would to-night give us an elaborate paper, for the preparation of which he would have had but very little time, and all that we can expect him is to give us the salient points of his observations, and the steps he took to ensure success. After he has expressed these to us I would ask him to be kind enough to tell us what his opinion is as to the fish we really have here, for I am sure it would be very interesting to have his opinion. I am not going to anticipate anything he will say to you, but there is one point I particularly wish to notice. He will tell you that through the kindness of Mr. Robert Moore, of Londonderry, not only was this ova given gratuitously, but that gentleman's hatcheries and men were placed at the disposal of Sir Thomas Brady so as to allow the ova to be developed into that state most suitable for the voyage. I think the colony owes a great deal of gratitude to Mr. Moore. (Cheers). I will not detain

you longer, as there is a great deal to do this evening, but will now introduce to you Sir Thomas Brady, and, in doing so, I introduce an old and valued friend and colleague. Sir Thomas Brady is not like some of us, a merely *dilettanti* fisherman, nor is he a mere scientist. He has had 40 years of public service, and during the whole of that time has been engaged in regulating the fisheries of Ireland—a most important interest—looking after the public rights in these fisheries, and developing them in the interest of commerce and the improvement of the food supply of the people. I think we are to be congratulated upon the presence of Sir Thomas amongst us. I can only hope that his visit here will be as pleasant to himself as I am sure it will be profitable and pleasant to us.

Sir THOMAS BRADY, who was greeted with prolonged applause on rising, said: Your Excellency, ladies and gentlemen,—Before entering into details of the observations made by me in the recent transport of ova to this colony, will you permit me in the first place to express, however inadequately, the great gratification it affords me to stand on the present occasion within the precincts of the Royal Society of Tasmania, and to congratulate its members on the success it has obtained by the magnificent Museum which gave me such pleasure in visiting on Saturday in company with His Excellency. It would be idle for me to speak to you of the generous patriotic conduct of Dr. Agnew, who is so well known to you all, for the desire he has always shown to promote the interests of the colony, or to comment on the munificent contribution he has given towards promoting an industry which I hope, and have every confidence, may become one of the most important products of the island. I trust it may prove to be only the pioneer for other yet undiscovered or undeveloped natural resources of the island, and that the example so nobly given by him may be imitated not only here, but in other places, and may be followed in that country which is my birthplace and has my love, and to which Tasmania is again indebted for another supply of salmon ova. Though perhaps trespassing too far on your indulgence in these preliminary observations, I cannot refrain from mentioning the name of another to whom the colony is indebted for the unprecedented success that has attended our late work, and for the details I will have the honour to give you by and bye, which may probably in future years tend to facilitate fish acclimatisation in this or other colonies, and to dispel some of the mysteries which at present surround it. No doubt money could have procured salmon ova, without my aid, from any country in which that noble fish exists, but, without egotism or claiming to deserve any thanks whatever, I cannot help feeling some doubt as to the wishes of Dr. Agnew or your Society having been so successfully carried out this year as they have been, but for the great interest felt and the prompt action taken by His Excellency the Governor, who has in this matter only given another proof of his anxiety to promote the material interests of any country with which he may be connected, thus confirming the opinion entertained by all who know his public character, that the country over whose councils or welfare he is called on to preside must be benefited if his advice prove of any avail. The colony of Tasmania is to be congratulated in having as Governor an able statesman—one who will spare no exertion to promote its interest as he has done in other places and other climes, where his absence is now deeply deplored by the many, and where he has left behind him a name respected and honoured—"the best to live for and the best to die for." The salmon ova which has been landed and placed in the hatchery was taken from salmon in the celebrated salmon river, in the county of Donegal, the property of Robert L. Moore, Esq., D.L., of Molennan, Londonderry. The intimation I received from the chairman of the Society arrived too late to enable me to obtain ova from

other rivers, of which I tried several without success. Owing to the very mild winter in Ireland salmon were found on the spawning beds much earlier than usual, and in many rivers which were tried only spawned fish were found. I was almost in despair of being able to get a sufficient quantity of ova to export, when Mr. Moore, animated by that kindness and public spirit which have always governed his actions, in the most generous manner placed at my disposal any fish from any of the rivers held by him, and also his very complete hatchery on the banks of the river Erne, so as to enable the ova to be all "eyed" before being sent away. It is to that gentleman, and not to me the colonists are deeply indebted for the present large supply of ova. The fish from which the ova were taken varied very much in size, from 10 to upwards of 20lbs. each in weight. They were stripped in the middle of January and placed in the hatchery where they remained till removed by me on the 28th and 29th February, and 1st March last. The eyes in the ova were first observed on the 23rd February by the superintendent of the fishery, so that before being packed for their ultimate destination, all the ova had been "eyed" for fully a week previously. The mode of packing and transit was that so successfully adopted by Sir James Maitland on a shipment of salmon ova by him to New Zealand in 1886. The trays in which the ova were packed, consist of a light wooden frame, 10in. square by 27in. deep, bottomed with perforated zinc. Into these trays was placed at the bottom on the perforated zinc, a layer of clean well-picked fresh moss (sphagnum). On this moss was placed a layer of ova taken from the hatching rills. Above that, another layer of moss, and on this latter another layer of ova, and finally another layer of moss. Of these cases or trays there were 120, each of which contained about 18,000 ova. The number was ascertained by counting the number of salmon ova in a given space on the rills, and making a calculation accordingly with reference to the size of the trays in which they were placed. It was the most accurate way of computing the number of ova. Six of these cases were placed in what might be called refrigerating packing boxes, consisting of an inner box ⅜in. larger than the frames of the trays or cases; the outer box was 4in. deeper than the inner and 3in. wider for sawdust to be packed between the two boxes, to serve not only as a protection against frost, but to act as a cushion and minimise the effects of rough usage. An air space surrounds the trays to secure an equal temperature to each. These boxes are 2ft. 7in. long by 1ft. 6½in. wide, and 1ft. 8½in. high outside measurement. The inside box is sufficiently smaller to allow a few inches of sawdust between the two boxes. Charred fillets are fitted into the inside box, which is also charred, to hold the trays half an inch clear Each tray has four holes cut in the sides to admit air freely to the moss and to facilitate adjusting. A large ice tray rests on the top of the ova trays, but clear of the moss covering the ova, and is bevelled outwards so as to entirely close the inside of the outer box. This most successful mode of transporting ova was invented by Sir James Maitland, Bart., of European celebrity, for hatching and transporting ova of many species of fish from his great fish hatching at Hawistown, and the description given by me is taken from his book. Having packed these 120 trays or cases into 20 of these transport boxes, I found that I had a large quantity of ova still over—which I brought to London with me in bottles, swung in frames in a particular manner invented by myself, and which I packed in London in 30 boxes, of about 18in. by 12in. by about 4in. deep, in the same manner as I had already packed the cases for the refrigerating transport boxes. The surplus of ova was caused by my having placed only two layers of ova in each tray instead of three, which they were originally designed for, having learned that a good deal of the ova in the wider layer where there were three, sent to New Zealand, had not reached their

destination in as good order as the other two layers where there was less pressure. I determined, therefore, that it was better to have a less quantity with only two layers in better condition, or at least with less risk, than a larger quantity with more risk of loss. I called the ova packed in these 30 boxes my surplus ova, and they could not have been less in number than 60,000 at the very lowest calculation. I need hardly describe the journey, which was only a short mile from the fishery to the railway station, with the precious loads each time, and the care that they should get no concussion, against which a plentiful supply of straw was provided. Straw mattresses were placed on the floor of the railway waggon on which the boxes were put, and firmly wedged with plenty of straw so that they could not collide or move. I left by train on the evening of 2nd March and remained at Enniskillen all that night. At 6 o'clock next morning we left for Dublin, when all the boxes had to be shifted on board the steamer from Holyhead, and on arrival there we had a special waggon ready in waiting, into which the boxes were removed and packed in the same manner as at first start. On arrival in London on Sunday morning, I had all the boxes examined and replenished with ice, of which I carried a good supply with me, and on Monday morning, March 5, they were carted to the docks, where they were put on board the s.s. Kaikoura. The chamber constructed for their reception on board the vessel was between decks in the forward part of the vessel, and contained a space of 1,953 cubic feet. It was thoroughly insulated and lined out with lead fitted for cold air blast from ship's refrigerating chamber to regulate temperature. It had ice racks for store ice, and inside were formed one double refrigerating case, and two single ones for holding the transport boxes already described. The 20 boxes were placed in these refrigerating chambers, the doors of which were regularly supplied with ice from the ship during the voyage, and ice packed round the boxes. The 30 boxes containing the surplus ova were placed on the top and outside of these refrigerating cases, there being no room for them in the inside. As I had not much confidence in their keeping alive under the conditions under which they had been packed in London by water supplied at the London docks, and the position in which I was obliged to place them in the chamber, I would not waste any of the Wenham Lake ice on them, and they were during the whole voyage consequently only supplied with ice made on board ship from condensed steam. On arrival here and being opened I expected to have found them all dead, but to my surprise the ova in them was found to be in almost as good condition as those which had received such extra care and constant attention.

I have drawn out a table showing the temperature of the air on deck —the sea water inside the chamber, but outside the refrigerating cases in which the ova boxes were placed—and that inside the double refrigerating cases, which I have called Nos. 1, 2, and 3, No. 1 being nearest the door entering into the chamber, and which might be more or less affected by the opening of the door—No. 2, the one further from the door, and No. 3, the one furthest from the door. In considering these tables and the positions of the allotment of ova in the chamber it will be seen that on some days the temperature in the chamber in which these boxes with the surplus ova were placed ran up as high as 47 degrees, while the highest temperature inside the refrigerating cases only reached 35½deg. Though the inference to be drawn from this is that ova may be safely carried when the air is at so high a temperature as 47 and the outer air at same time up to 78 and 79, yet I would not think of trusting a shipment of ova to the dangers attendant on such a high temperature, but I think it solves this problem at any rate that all the elaborate arrangements of perfectly

insulated cases are not necessary, and that, with ordinary care and watchfulness in keeping up a proper supply of ice, and not allowing the ova to get frozen, are all that are required in the case of eyed ova. The great thing to be observed is the proper impregnation of the ova and careful hatching till it has arrived to the eyed state. The tables of temperature may, and I hope will, lead, after careful scrutiny, to important results in a scientific point of view. A large quantity of ship's ice was used during the voyage, but only for the purpose of packing and filling in doors, casements of chamber, etc., but all from the water of which the ova was to be fed was Wenham Lake ice, of which I brought with me from London four tons. I also used one ton in Ireland and between that and London. On the 10th April, finding the ova in such a forward state of development, I determined to try the experiment of hatching a few on board. The commander kindly gave me the use of a spare cabin, and in this I erected a temporary hatchery. My appliances were not of a first-class order. My hatching box consisted of a portion of an old tobacco box, which I had emptied, and got cut in two by the engineer, and a lip soldered on it. My water holder consisted of a common oil can inverted with a pipe and a tap in the neck to allow the water to run into the tobacco box. The water was obtained from a breaker lying in one of the ships boats on deck, and which had been brought on board at Plymouth exactly one month previously, and was thick with sediment, and lastly I got a foot bath to receive the water as it flowed from the hatchery. These were my materials for making a most important experiment. I never had much of a faint heart, but I could not help feeling I was working under great difficulties, but I remembered the expression of our immortal poet—"Never say fail," and to work I went. I lifted with a teaspoon from one of the trays out of the refrigerating case, which then stood at 34 degrees, 43 ova, and placed them in my new hatchery in the cabin, which then stood at 55½deg. Next morning the water was up to 60deg., and on the 13th at 1 o'clock I had the gratification of seeing one fish swimming about and another just coming out of the shell. The temperature of the air and water in the cabin then stood at 60deg. The fish were actually hatched out under all the difficulties I have mentioned, and in addition a great rolling of the vessel, in 74 hours. On the 15th we had a stiff breeze and a high sea, which caused the vessel to roll very much, disturbing the ova, tossing them about from end to end of the vessel in which they were in such a manner that I felt assured all would be killed, but the only effect it had was that several of the young fish partly out of the shell had been apparently strangulated. Whether this was caused by the rolling of the ship or the great sediment in the water I could not tell, but before I left the ship every ovum of the 43 promiscuously taken from the trays had hatched out either fully or in part, and I left the living fish with the commander to be carried to New Zealand, and thence, if possible, again to London. I look upon this experiment as valuable to show that there is little or no danger in removing ova when hatched for a certain time from a low to a very high temperature. One more experiment I made with living salmon fry, and I will not detain you longer. I brought 12 fry of a year old from the River Foyle, in the county of Londonderry, to try how far I could carry them safely. I had two glass jars fitted into a case and placed in the cool chamber. In the one jar I had water in which I had kept the fish in London, and in the other water supplied to me from the ship. In the latter I placed five of the fry, and next morning to my horror all were dead. The rest continued alive and well, and fed daily on flour and water rubbed in my hand into little strips resembling worms until the 18th inst., when we were in latitude 17deg. N., when six out of the seven died. I had been

induced the previous evening to give them vermicelli for food, but whether that killed them or not I could not say. I have, however, brought a little of it with me to have it analysed. It was certainly not the temperature, for it stood on that day at 40. I removed the only living one into Plymouth water, but it took no food, and on the 20th, when we were in the 6th deg. of latitude, it died while I was looking at it. The temperature of the water was then only 35. I have by this experiment proved that there cannot be the slightest doubt about carrying living fry safely if any proper precautions about the water being supplied with the necessary quantity of oxygen are taken, and that there can be no difficulty in doing this. I will now conclude these too lengthy and perhaps somewhat tedious observations by asking your indulgence, and saying that having examined the fish lately taken by the Governor I had no hesitation in pronouncing it a true salmon, and I am quite convinced that no practical man who would see the fish would ever think of calling it anything but a salmon. Whether it be the true *salmo salar* or not, it is, at any rate, a fish which would be considered and treated as a salmon in salmon countries ; would be sold and purchased as such, and if the colonists of Tasmania seek for more than Ireland, which now exports salmon to the amount of over £600,000 worth annually, I cannot help saying that I think they are hard to be pleased, and ought to go without them.

The paper was listened to with marked attention and frequently applauded, and at its conclusion Sir Thomas said no scientist would consider or talk of the fish we have in Tasmania in any other way but as a salmon. He remembered three or four years ago Mr. Seager sent him three fish which after writing his own opinion of, he submitted to an eminent member of the Royal Society of Dublin, an icthyologist and a well-known scientist, who was not aware of his opinion and wrote one that exactly coincided with it. It was that one fish was a true salmon, one was not, and there was a doubt about the third. He took this fish before one of the most celebrated scientists and icthyologists, a man with a European reputation, but this gentleman would not give an opinion until he knew where it came from. After some demur the information that it came from Tasmania was given, and the authority then said it was not a salmon. (Laughter.) As he went away this gentleman said, "You are going to take it to somebody else. You may take it to the six best scientists in England, and you will get six different opinions." Sir Thomas concluded by apologising for taking up so much time, but as he had heard it whispered that the Royal Society had conferred the honour of electing him an honorary member, he desired to take the opportunity of saying that he felt deeply indebted to the gentlemen composing this Royal Society for the very kind manner in which they had appreciated any little exertion of his in trying to benefit the colony. He had only to assure them, to assure all present, and to assure every colony that wherever it was possible for him to assist them, either by advice or work, it would afford him the greatest pleasure to do so. (Cheers.)

The Hon. P. O. Fysh regretted the absence of the Hon. Dr. Agnew, whose name would ever be mentioned with great respect for his professional and private worth, and for his munificence to this Institution. He would desire, as he was sure all present would do, to tender to our distinguished visitor, Sir Thomas Brady, this public and hearty welcome, accompanied with congratulations upon the successful fruition of the important work which he has travelled so far to accomplish. We welcome him as a scientist eminent in his speciality, and have much gratification in learning his opinion that the fish before us, caught by His Excellency, is a true *Salmo salar*, and, therefore, about its character their existed no longer any dubility. It was his duty to regard Sir Thomas' mission, from a utilitarian point

of view, as adding to the food of the people and increasing the commercial value of the Fisheries of Tasmanian waters. In these waters, the nurseries of fish, the harvests of the future are to be gathered for Australasia, and remembering that the Board of Trade returns of England show a value of £10,000,000 per annum as the product of the Fisheries of Great Britain, that gave some indication of the commercial importance of Fisheries here. This experiment has demonstrated the kinship between the philosophical, practical, and profitable. Ova brought from rivers 13,000 miles away, under circumstances of suspended animation, passing through the Torrid Zone, and reaching a Southern sphere to be revitalised, with the result that the living fish are exhibited upon the table as examples of the teeming life now existing at the Salmon Hatchery, thus gaining practical evidence of the commercial value of science to this community. Apart from that aspect, however, the occasional advent of scientific men at this Institute gave a new inspiration to the work of the Fellows, and leave behind not only pleasing memories, but incentives to renewed efforts. The archives of this Institute will hand down as public benefactors the names of Dr. Agnew, Sir Thomas Brady, and Mr. Moore, and in years to come, when future generations shall enjoy the sports of our rivers and partake as food of the king of fish, the record of this work, in which Dr. Agnew, Sir Thomas and Mr. Moore have been engaged, will be reviewed and the great value of their services re-acknowledged, and not the least that assistance afforded by Mr. Moore's lavish gift. That Irish gentleman has learnt from his associations with Nature's bounties himself to be bountiful. Nothing could be more so than his gifts of ova to this community. This, the second important donation, this time of half-a-million ova, without fee or reward, no, not without reward, for the scientist finds his high reward in the success of his experiments, and in that respect Mr. Moore reaps a great reward, and he is rewarded also by the fact that he has ministered to the commercial success of a people akin with himself—British Colonists.

He called upon the assembled company to welcome Sir Thomas with the heartiness with which Tasmanians knew so well how to greet their friends.

The audience rose and expressed their response to the invitation by loud applause.

Mr. Robert Henry then gave a short explanation of submarine mining, illustrated by apparatus and illustrations of the working of electro-contact mines as used for the protection of our harbour. Mr. W. F. Ward, the Government analysist, followed with some simple but interesting and rapidly performed experiments with the air pump, to illustrate the elasticity of gases and modern theories deduced from such phenomena.

In the lower room there was a display of exhibits, a collection of photographs, a lithographic press, and an oxy-hydrogen microscope.

Great interest was manifested in Mr. Perrin's exhibits, especially in the proposed design for the timber trophy in the Melbourne Exhibition. The photographs represent the work of an eight months old association—The Tasmanian Photographic and Art Association—and are worthy specimens of this beautiful Art. Mr. Echlin, secretary to the association, gave practical demonstration of platinotype printing—this process is the invention of and patented by Mr. Willis (a relative of our worthy citizen, Mr. Clemes), and consists of sensitising the paper with platinum-chloride, printing as in silver, but in about an eighth of the time, and developing in an aqueous solution of neutral oxalate of potash, at a temperature of 150deg. to 170deg. Fahr.—then fixing in an 8 per cent. bath of hydrochloric acid, the result being a picture bearing a resemblance to fine steel engraving, and having the inestimable advantage of being permanent; the

subject chosen by the demonstrator was a copy of an engraving, the property of the Royal Society, of Sir John Franklin; upwards of 200 prints were developed and distributed to the visitors.

Mr. E. Scott presided at a small lithographic press, by Waterlow, London, and printed some excellent work from a very fine drawing of a portion of Mr. R. M. Johnston's work (about to be published), the delicay of the lines proved the efficacy of the machine under Mr. Scott's able manipulation.

The oxy-hydrogen microscope was also demonstrated by Mr. Echlin, assisted by Mr. A. L. Butler. This instrument is probably the only one of its kind in the colonies, patented by Newton, London. It will project the smallest microscopic object on the screen eight feet in diameter or at will the image can be deflected on the table, rendering it applicable either for copying the object with pencil or photograph; with the latter an exposure of a fraction of a second will suffice.

The photograph of His Excellency, party, and members of the Council was taken by a charge of gun-cotton and magnesium powder discharged by electricity by Mr. Henry, the management being under the direction of Mr. R. McGuffie.

At the conclusion of the meeting a formal vote of thanks was passed to Messrs. R. Henry, Lieut. Mathieson, W. F. Ward, S. Clemes, F. Echlin, A. Butler, and W. F. Scott for lending apparatus and explaining their use.

SALMON OVA TO TASMANIA, PER S.S. "KAIKOURA."

March and April, 1888.

Observations as to Temperature made on Voyage.

Date.	Hour.	Air inside Cool Chamber.	Inside Refrigerating Cases.			Air on Deck.	Sea Water.
			In No. 1, nearest Door.	In No. 2, further from Door.	In No. 3, furthest from Door.		
March 8	4 p.m.	42	35	34	34		
„ 9	8 a.m.	40	34	33	33		
	noon	40	34	33	33		
	4 p.m.	40	34	33	33		
„ 10	8 a.m.	38	34	33	33		
	noon	39	34	33	33	52	54
	4 p.m.	40	34	33	32½	50	54
„ 11	8 a.m.	40	35	34	34	52	54
	noon	40	35	34	34	50	54
	4 p.m.	38	33	32	31	50	54
„ 12	8 a.m.	39	33	32	32	54	55
	noon	39	33	32	32	54	55
	4 p.m.	39	33	32	32	54	55
„ 13	8 a.m.	39	34	34	33	58	57
	noon	39	34	34	34	60	59
	4 p.m.	38	33	33	33	60	59
„ 14	8 a.m.	40	34	33	33	62	60
	noon	38	34	34	34	62	62
	4 p.m.	38	34	34	34	61	63
„ 15	8 a.m.	40	34	34	34	63	64
	10½ a.m.	40	34	33	33	65	67
	11 a.m.	40	34	33	33	67	67
	2 p.m.	41	35	35	35		
	3½ p.m.	40	35	35	35		
	6 p.m.	38	34	33	33		
„ 16	8 a.m.	38	33½	33	32¼	66	67
	noon	40	35	34	34	68	67
	2½ p.m.	41	35	35	35		
	4 p.m.	41	35	35	35	70	68
„ 17	8 a.m.	40	35	34	34	69	68
	noon	38	34	34	34	70	68
	4 p.m.	38	34	34	34	69	68
	5¾ p.m.	38	34	34	34		
„ 18	8 a.m.	40½	35	34	33	70	69
	noon	42	35	34	34	74	70
	4 p.m.	41	35	34	35	74	70
„ 19	8 a.m.	44	35	34	34	74	73
	noon	41	35	34	34	77	75
	2 p.m.	40	34	33	33		
	4 p.m.	38	34	33	33	80	75
	5¾ p.m.	38	34	33	33		

Date.	Hour.	Air inside Cool Chamber.	Inside Refrigerating Cases.			Air on Deck.	Sea Water.
			In No. 1, nearest Door.	In No. 2, further from Door.	In No. 3, furthest from Door.		
March 20	8 a.m.	38	35	35	35	80	80
	10 a.m.	38	35	35	35		
	noon	40	35	35	34	83	84
	4 p.m.	40	35	34	33½	84	83
„ 21	8 a.m	45	35	34	34	82	82
	noon	42	34	33½	33	82	82
	1½ p.m.	44	35	34	33½		
	4 p.m.	44	35	34	33½	82	83
„ 22	8 a.m.	45	35	34	34	80	80
	noon	45	34	34	33	82	80
	4 p.m.	45	35	35	34½	82	80
„ 23	8 a.m.	45	35	34	34½	80	80
	10½ a.m.	42	35	34	33½		
	noon	42	35	35	35	81	80
	4 p.m.	44	35	34	34	82	80
, 24	8 a.m.	47	35	35	34	78	78
„ 24	noon	47	35	35	34	79	78
	4 p.m.	47	35	35	34	77	76
„ 25	8 a.m.	45	35	34	34	75	75
	noon	42	35	34	33	77	74
	2½ p.m.	42	35	34	33		
	4 p.m.	42	35	34	33	77	75
	7 p.m.	42	35	34	33½		
„ 26	8 a.m.	42	35	35	34	72	72
	noon	43½	35	35	35	74	71
	4 p.m.	42	35	34	34	74	72
„ 27	8 a.m.	44	35	34	34	70	69
	noon	42	35	34	33½	73	71
	4 p.m.	42	35	34	34	75	71
, 28	8 a.m.	42	35	34	34	69	69
	noon	42	35	34	33½	72	69
	3 p.m.	42	35	34	34		
	4 p.m.	42	35	34	34	74	70
29	8 a.m.	44	35	34	33	67	68
	noon	42	35	34	33	70	67
	4 p.m.	42	35	34	33	71	69
	5½ p.m.	42	35	34	33		
30	8 a.m.	42	35	35	34	65	67
	noon	42	35½	35	34½	71	67
	4 p.m.	42	35½	35	34½	71	67
„ 31	8 a.m.	42½	35½	35	35	64	66

Date.	Hour.	Air inside Cool Chamber.	Inside Refrigerating Cases.			Air on Deck.	Sea Water.
			In No. 1, nearest Door.	In No. 2, further from Door.	In No. 3, furthest from Door.		
April 1	8 a.m.	42	35½	35	34	66	64
	noon	39	35½	34	34	63	72
	4 p.m.	42	35	34	34	66	68
,, 2	8 a.m.	40	35	34	34	64	64
	noon	40	35	34	34	63	65
,, 2	4 p.m.	40	35	34	34	64	65
,, 3	8 a.m.	39	35	34	34	58	58
	noon	40	35	35	35	60	62
	1½ p.m.	39	35	34½	34		
	4 p.m.	38	35	34	34	56	59
,, 4	8 a.m.	38	35	34	34	49	55
	11 a.m.	35	34	34	34		
	noon	35	34	34	34	53	52
	4 p.m.	35	34	34	34	49	48
,, 5	8 a.m.	35	34	34	34	45	43
	noon	35	34	34	34	47	46
	4 p.m.	35	34	34	34	44	43
,, 6	8½ a.m.	25	34	34	34	45	45
	11 a.m.	30	34	34	34		
	noon	32	34	34	33½	47	45
	4 p.m.	35	34	34	33	49	49
,, 7	8 a.m.	33	34	34	34	51	49
	noon	34	34	34	33½	52	48
	1 p.m.	34	34	34	33½		
	4 p.m.	35	34	34	34	53	48
,, 8	8 a.m.	40	34	34	33	46	43
	noon	38	34	33	33	47	43
	4 p.m.	38	34	33	33	51	43
,, 9	8 a.m.	38	34	34	33½	47	46
	11 a.m.	38½	35	34	33½		
	noon	38	35	34	34	49	46
	4 p.m.	38	35	34	33½	47	44
,, 10	8 a.m.	36	35	34	33½	48	49
	11 a.m.	35	34	34	33½		
	noon	35	34	34	33½	48	47
,, 10	4 p.m.	38	34½	34½	34	47	47
,, 11	8 a.m.	38	35	34	34	48	47
	noon	40	35	34	34	50	46
	4 p.m.	40	35	34½	34	50	44
,, 12	8 a.m.	38	35	34	34	50	49
	noon	40	35	34	34	51	47
	4 p.m.	40	35	34	34	50	44

Date.		Hour.	Air inside Cool Chamber	Inside Refrigerating Cases.			Air on Deck.	Sea Water.
				In No. 1, nearest door.	In No. 2, further from Door.	In No. 3, furthest from Door.		
April	13	8 a.m.	38	35	34	34	51	47
		noon	38	35	34	34	49	46
		2 p.m.	38	35	35	34		
		4 p.m.	38	34	34	33½	49	45
,,	14	8 a.m.	38	35	34	34	50	47
		11 a.m.	38	35	34	34		
		noon	37	35	34	33	50	48
		4 p.m.	38	35	34	33½	50	48
,,	15	8 a.m.					54	51
		noon					54	52
		4 p.m.					53	50
,,	16	8 a.m.	38	35	34	34	52	50
		noon	38	35	34	33½	53	49
		1½ p.m.	40	35	34	34		
		4 p.m.	38	35	34	33½	52	49
,,	17	8 a.m.	37	35	34	34	56	52
		10 a.m.	37	35	34	33½		
		noon	40	35	34	34	56	52
		4 p.m.	38	35	34	34	57	52
,,	18	8 a.m.	38	35	34½	34	56	54
		noon	35	35	34	33½	56	56