1873.

NEW ZEALAND.

LIGHTHOUSES ON THE COASTS OF NEW ZEALAND,

(REPORT ON THE).

Presented to both Houses of the General Assembly by command of His Excellency.

No. 1.

MEMORANDUM by the Hon. Mr. REYNOLDS.

MR. SEED will please request Captain Johnson and Captain Edwin to take into consideration the whole question of Lights on the Coast, and to prepare a comprehensive Plan and Report, showing where they would recommend the erection of additional lights, and the transposition of those already existing; the class of each proposed light, and the probable cost of the same in detail. Without desiring to influence their judgment, I may state that my idea is,—

1. That there should be an alteration in the position and class of the present lights in Cook Strait.
2. That the Cape Saunders Lighthouse should be completed; and it would be a question for consideration whether the light now at Otago Heads could not with advantage be removed there, and a simple harbour light substituted instead.
3. That a light should be placed somewhere in Favorite or Foveaux Strait, western entrance; also one on or near the Snares (Stewart's Island).
4. That a light be placed on one of the islands near Auckland, on the route from San Francisco.

I would like to have the report ready on my return to Wellington.

Melbourne, 2nd January, 1873. WILLIAM H. REYNOLDS.

No. 2.

MEMORANDUM for SECRETARY of CUSTOMS.

MR. SEED,—As directed in your Minute of 16th January, 1873, we forward herewith the Report on the Lighting of the New Zealand Coast (accompanied by a chart), required by the Hon. the Commissioner of Customs in his Memorandum dated 2nd January, 1873.

3rd March, 1873.

R. JOHNSON,
R. A. EDWIN,
Commander, R.N.

Enclosure in No. 2.

REPORT on the LIGHTING of the NEW ZEALAND COAST.

IN drafting the following scheme of lighting the seaboard of the Colony, we have endeavoured to make it as comprehensive as possible; and, while it treats existing lights generally as a part of the proposed system, will also admit the placing such future lights as it may be deemed necessary to erect, and at the same time insure that each newly placed light shall be part of one continuous system.

In devising such a scheme as we now propose, it is necessary to consider the direction from which the principal foreign trade of the Colony arrives, as by this our opinion as to the position of the more powerful lights should be guided.

With the exception of vessels bound to Auckland from North America and the South Sea Islands, the whole of the over-sea vessels arrive from the westward; for it will be found that ships from England bound to Otago and Canterbury, and possibly also to Napier, first make the Snares Islands, upon which we recommend the erection of a First-order light, revolving once a minute. This light will also be of great benefit to homeward-bound Australian vessels; and we believe that the desirability of placing a good light on these islands has been already noticed in Australian newspapers. Vessels from Australia and Tasmania bound to Otago and Canterbury pass through Foveaux Strait. As the weather in this locality is often thick and winter nights are long, we propose the erection of a First-order light, revolving once in every two minutes, to distinguish it from the Snares (revolving every minute), and from Dog

Island light, which revolves every half-minute; probably either Rugged or Centre Island will be found the most suitable position.

As the whole of the English and Australian vessels that trade to Wellington and Nelson, and sometimes those from Newcastle, N.S.W., bound to Canterbury, pass through Cook Strait and make the land about Cape Farewell, it follows that this Cape is an important site for a light. We therefore propose that a First-order light, revolving every two minutes, be erected hereabouts. This period of revolution will distinguish it from the light proposed for Cape Foulwind, and also from the one already placed on Cape Farewell Spit, where a less powerful light would be sufficient guide.

English and Australian ships bound to Auckland first make the land about Cape Maria Van Dieman; and as an extensive traffic exists and strong currents are experienced in the vicinity of this Cape, we have no hesitation in recommending that a First-order light, flashing every ten seconds, be placed in this important position.

Vessels from North America and the South Seas bound to Auckland make the land about the Great Barrier, and as there is an increasing trade between Auckland, Fiji, and other South Sea Islands, we propose that a First-order light, revolving once every minute, showing alternately red and white, be placed on the Moko Hinou Islands. This light will also be of great value to the coasting trade, as it commands the whole entrance of the Hauraki Gulf from the northward.

The land about Cape Egmont being low, vessels from off sea voyages seldom first make it; but as the position is valuable as a guide to the coasting-trade of the Colony, we consider that a Second-order light will be sufficient.

Careful consideration of the various descriptions of illuminating apparatus shows that the Holophotal Revolving Lights have greater optical range than Fixed Lights. A revolving light of that description and of the Second order has an optical range of twenty-five miles, and costs about £2,200; whilst a fixed light of the First order has a range of twenty miles, and costs about £2,960. By adopting the revolving light a large saving will be effected in first cost; and as the consumption of oil in Second-order lights is about 490 gallons annually, whilst that of First-order lights (fixed) is 736, a considerable saving will be obtained in the cost of annual maintenance. Besides these advantages, revolving lights are less liable to be mistaken for either bush fires or a vessel's light; and for these reasons we do not hesitate in recommending the adoption of the Holophotal Revolving Light as the coastal light of the Colony.

With the exception of places already mentioned as being the first land made by vessels from long sea voyages, the erection of the expensive First-order light will not be required; while for marking the prominent points on the coast the Second or Third-order lights will be found amply sufficient.

At entrances to harbours and roadsteads we propose, with few exceptions, the erection of Fixed Lights, as by their uniform character they enable the steamer to take bearings at any moment; whilst in narrow waters, which is a matter of great importance, these lights may be the more readily adopted in these positions, as the range of light in such situations is generally less than that of open-sea lights.

From the great loss of power attendant upon the use of coloured lights, they should only be used in positions where distinction would be otherwise difficult.

Part I. of the accompanying list shows the localities at which we have proposed the erection of First-order lights; and we propose that Second or Third-order lights be placed at the several prominent coastal positions shown in Part II. Examination of this list will show that the total number of coastal lights proposed in this scheme is twenty-seven, including those already erected.

The Three Kings Islands have been frequently mentioned as a good position for a light, but we have given the preference to Cape Maria Van Dieman, on account of its being the point most in the direct course of English and Colonial vessels bound round the north end of the Island.

The southern end of Stewart's Island would also appear to be a good position, but a light placed there would cause vessels to pass within dangerous proximity to the Trap Rocks; we have therefore decided to recommend the Snares Islands, as a light placed on them will have the effect of drawing vessels away from the above-mentioned dangers, and, as already stated, will be of great use to homeward-bound vessels from Australia.

In the annexed list will be found the positions at which we recommend the erection of Harbour and Coast Lights, *i.e.* those that show seaward as well as denote the entrances to ports and roadsteads, and are thus of considerable, though but secondary, assistance to the general navigation of the coast. Additional lights may be added from time to time, due attention being paid to character, colour, and power.

The lights proposed for Hokianga, Kaipara, and Manukau are of power sufficient to illuminate that part of the coast, without the erection of special coastal lights of higher order.

With reference to the transposition of lights, mentioned in the Memorandum of the Hon. the Commissioner of Customs, we are of opinion that, after the erection of the proposed First-order light on Cape Farewell, the illuminating apparatus of the light now on the Sandspit end, which would suit better at a higher elevation, could be removed elsewhere, and one of the Fourth order, that would be visible the same distance of seventeen miles, and cost less in maintenance, could be placed in its stead.

As we believe that Mana Island Light is, from its great elevation, frequently obscured, and as the optical range of this light is only eighteen miles in a mean state of the atmosphere, although, from its elevated situation, it can now be seen twenty-nine miles in clear weather, we consider that, if a suitable position can be found, the light might be shifted lower down with advantage.

After the erection of the proposed First-order light at the western entrance to Foveaux Strait, the light on Dog Island will become a subsidiary light, as already remarked in the case of Farewell Spit; with this difference, that a Third-order light, with an optical range of twenty-one miles, will be found sufficient, instead of the powerful apparatus now in use, which, though it has a great optical range, yet, from its low elevation, can only be seen eighteen miles, and thus would be evidently of greater efficiency in a more prominent position.

When the proposed light for Cape Saunders is erected, a Sixth-order white light will be sufficient to mark the entrance of Otago Harbour; and the present illuminating apparatus of the Third-order

(red) could be removed to Tory Channel entrance, where a light of this order and description is much required, and will complete the lighting of this portion of Cook Strait.

If a light be placed on Cape Kidnappers, the light lately ordered for Napier Bluff will be unnecessarily powerful for that site.

We may here remark that the necessity for these alterations seems to us to have arisen from the want of following some such general system as is now proposed.

We recommend that in all future lights, lamps to burn Petroleum oil in lieu of Colza be supplied to the illuminating apparatus: this will result in a great saving in the annual cost of each light, without any diminution of power; and at ports where only small lights are necessary, the harbour master could attend to them without assistance.

We are unable to give more than the cost of the lantern and apparatus delivered in New Zealand, as the total cost of erection will depend upon the accessibility of the sites proposed, the whole of which we recommend should be carefully surveyed before any further steps be taken, as it may be found upon examination that in some instances an adjacent locality may be found more suitable than the site now proposed, accessibility of position greatly affecting both the cost of erection and that of maintenance.

It is of importance that, where it is practicable, lights should be placed seaward of a danger; that they should show all round seaward; that their elevation should not exceed 200 feet unless unavoidable; and that lighthouses should always be coloured so as to present the greatest contrast with the background.

Accompanying this report, we beg to forward a chart, shewing in colours the various lights proposed, and their situation, as well as the position of those already erected.

In considering this question of Lighting the Coast and Harbours of the Colony, we have been guided in our decisions by the information derived from careful perusal of Mr. Alan Stephenson's "Rudimentary Treatise on Lighthouses, &c.;" Messrs. Chance Brothers and Co.'s Tariff of Dioptric Apparatus; and the Report of the Royal Commission appointed to inquire into the Management of Light Buoys and Beacons, 1861.

R. Johnson.
R. A. Edwin,
Commander, R.N.

3rd April, 1873.

List of Proposed Coastal Lights.

Part I.

No.	Name of Place.	Description of Light.	Cost of Apparatus and Lantern landed in New Zealand.	Remarks.
			£	
1	Cape Maria Van Dieman	Flashing: white, every ten seconds ...	3,550	An important position.
2	Moko Hinou Islands, Hauraki Gulf	Revolving: red and white, every minute	3,450	
3	Cape Farewell	Revolving: white, every two minutes ...	3,450	
4	Rugged Island, Foveaux Strait	Revolving: white, every two minutes ...	3,450	
5	Snares Islands	Revolving: white, every minute	3,450	
6	Nugget Point	Fixed: white	...	Already erected.
7	Dog Island	Revolving: white, every half-minute ...	...	Already erected.

Part II.

8	Cape Saunders	Revolving: white, every minute	2,350	
9	Banks Peninsula, Flat Point	Revolving: white, every minute	2,350	
10	Cape Campbell	Revolving: white, every minute	...	Already erected.
11	Cape Palliser	Revolving: white, every two and a half minutes	2,350	
12	Cape Kidnappers ...	Revolving: white, every half-minute ...	1,550	Third order.
13	Portland Island	Revolving: white, every two minutes ...	2,350	Probably with red sector showing over the Bull Rock.
14	East Cape Island ...	Revolving: white, every minute	2,350	
15	Motiti Island, Bay of Plenty	Flashing: white, every ten seconds ...	1,550	Third order.
16	Cuvier Island	Revolving: white, every half minute ...	2,350	
17	Tiri Tiri	Fixed: white	...	Already erected.
18	Sandspit, Firth of Thames	Fixed: red and white	...	Sixth order: erected by Provincial Government, Auckland.
19	Cape Brett	Revolving: white, every two minutes ...	2,350	
20	North Cape	Revolving: white, every minute	2,350	
21	Gannet Island	Revolving: white, every minute	1,550	Third order.
22	Cape Egmont	Revolving: white, every half-minute ...	2,350	
23	Mana Island	Fixed: white	...	Already erected.
24	Cape Farewell Sandspit ...	Revolving: white, every minute	...	Already erected: red sector over Sandspit end.
25	Cape Foulwind	Revolving: white, every minute	2,350	
26	Cascade Point	Revolving: white, every two minutes ...	2,350	
27	Chalky Island, Dusky Bay	Revolving: white, every half-minute ...	2,350	

List of Harbour and Coast Lights Proposed.

No.	Name of Place.	Description of Light.	Order.	Cost of Apparatus and Lantern, landed in New Zealand.	Remarks.
				£	
1	Tairoa Head, Otago entrance	Fixed: white ...	6th	400	After the erection of the Cape Saunders Light it is proposed to substitute this for the present Third-order red light.
2	Moeraki	Flashing: white, every ten seconds	5th	550	To distinguish it from railway lights, and also from Timaru Lights. Will also be useful as a coast light.
3	Oamaru ...	Fixed: red ...	Signal	50	
4	Timaru ...	Fixed: red ...	...	...	Already erected.
5	Akaroa ...	Fixed: white ...	Signal	50	
6	Godley Head ...	Fixed: white ...	2nd	...	Already erected.
7	Kaikoura ..	Fixed: white ...	Signal	50	
8	Pencarrow Head, Wellington Harbour	Fixed: white ...	2nd	...	Already erected.
9	Castle Point ...	Flashing: white, every ten seconds	5th	550	A very useful coastal light.
10	Napier ...	Fixed: white ...	4th	...	Already erected.
11	Poverty Bay ...	Fixed: white ...	Signal	50	
12	Tauranga ...	Fixed: white ...	Signal	50	
13	Grahamstown ...	Fixed: white ...	...	...	Already erected.
14	Wangarei ...	Fixed: white ...	Signal	50	
15	Russell, Bay of Islands	Fixed: white ...	Signal	70	May require a red sector.
16	Wangaroa, Stephen's Island	Fixed: white ...	6th	400	At present not much required, but will show the entrance of a most secure harbour.
17	Mongonui ...	Fixed: red ...	Signal	50	
18	Hokianga ...	Fixed: white ...	3rd	1,250	Also serviceable as a coast light.
19	Kaipara	Revolving: white, every two minutes	3rd	1,550	Also serviceable as a coast light.
20	Manukau (on Paratutai)	Fixed: white ...	3rd	1,250	Ordered.
21	Waikato ...	Fixed: red ...	6th	400	
22	Taranaki ...	Fixed: white ...	Signal	50	
23	Wanganui ...	Fixed: white ...	...	...	Already erected.
24	Tory Channel ...	Fixed: red	3rd	...	From Tairoa Head. Will be a useful coast light.
25	Nelson ...	Fixed: white and red ...	4th	...	Already erected. Has red sector over entrance.
26	Westport ...	Fixed ...	...	...	
27	Greymouth ...	Fixed ...	...	...	Already erected.
28	Hokitika ...	Fixed ...	...	...	Already erected.
29	Bluff Harbour ...	Fixed ...	...	...	Already erected.

By Authority: George Didsbury, Government Printer, Wellington.—1873.

Price 3d.]