The apparatus and lantern are very similar to those already described, but the diagonal arrangement of the sash bars or astragals of the lantern (which is made on the "Scotch" system) is more fully carried out, and the increased rigidity thereby gained permits the use of thinner and lighter plate glass panes, thus obstructing less light and facilitating repairs. The arrangements for cleaning the outside of the lantern panes are also much more perfect. The apparatus is also made with inclined frames, so as to equalize more perfectly the distribution of the light—an improvement introduced many years ago by Mr. Alan Stevenson, engineer to the Scotch Lighthouse Board, but, strangely, scarcely yet adopted in England, though so obviously beneficial. The apparatus is of the third order, but the lamps, which are on the fountain principle, have three wick burners like those at Mana, &c. The light which at this station would naturally be wasted on the landward side, is reflected back again by a "Dioptric Spherical Mirror," an entirely new invention, by which the physical properties of glass are so skilfully taken advantage of as to cause it to reflect the light back to the point from which it emanated (and thence, of course, forward seaward) as perfectly as if it were an opaque substance; so that this combination of prisms, though apparently perfectly transparent, does not allow a single ray of light to pass through it which could be beneficially reflected, and actually casts a shadow on the wall behind. This kind of mirror was invented by Mr. Thomas Stevenson, C.E., Edinburgh, some years ago, and a small one exhibited in London in 1862 attracted great notice, but this and a larger one intended for Cape Saunders are the first which have ever been made for actual lighthouse work, and they were found on trial to give highly satisfactory results. I examined the whole apparatus optically after it was fixed in its place, and the result was very satisfactory, every prism being of good form and properly placed so as to contribute its due portion of light to the mariner. As Tairoa light will be of comparatively minor importance after the completion of that on Cape Saunders, it has been made of a blood red color by the use of ruby-colored lamp glasses, thus precludiug all risk of mistaking the one for the other. The power of the light is of course much diminished by this arrangement, but I believe it to be quite sufficient for the position—a subdued light at the entrance to a harbour being, in most cases, preferable, as not tending to dazzle the eyes and render other objects invisible. The lantern and apparatus cost £995 2s. 11d.; freight, buildings, road, &c., £3939 1s. 8d., making the total cost when complete (so far as the accounts passed through my hands) £4937 4s. 7d. This light is erected on Tairoa's Head at the seaward side of the entrance to Otago Harbour, at an elevation of 196 feet above the sea, and should be seen, in clear weather, at a distance of 20 miles, though from its color absorbing so much of the light (a *red* glass merely stops or absorbs the *yellow* rays, which form both the largest and brightest portion of the spectrum) it will probably be very seldom seen so far. It shows over about 13 points of the compass to seaward, the land light being reflected as above described, and has been regularly exhibited since January, 1st, 1865.

Dog Island in Foveaux Strait being very low and quite in the track of shipping—especially of the Inter-colonial mail steamers—the establishment of a lighthouse there is obviously of much importance. It was necessary to make the tower 100 feet high in order to give the light sufficient range, and this, combined with the unworkable nature of the stone on the Island, and the great depth of foundation required for the dwellings, has made the undertaking comparatively a costly one; but I have, notwithstanding, been able to keep the cost within the average price of similar works in equally inaccessible situations at home. The tower is 21½ feet diameter at the base, 16½ feet diameter below the balcony, 100 feet high to the lantern, and 118 feet high over all. It is plain to a degree, economy having been looked upon as a paramount consideration, but its simple massiveness renders it a not unpleasing object. The external walls of the dwellings are also of stone, the interior partitions being of wood, and the whole has been satisfactorily completed by the contractor, Mr. Garside, in the face of very considerable difficulties. The lantern is of the first class, 12 feet internal diameter and 10 feet high in the clear of glazing, and the astragals are of gun metal, thus combining in the highest degree strength, lightness, and durability. The apparatus is catadioptric revolving of the first order on the independent burner system, there being sixteen small apparatus or Holophotes, each with a separate argand lamp and reflector behind, arranged on a large four sided frame of malleable iron, four on each side; the frame makes a complete revolution every two minutes, being driven by a clock work machine of the most massive kind, so that a distant observer will get the very powerful combined flash of the four holophotes on each face of the frame at intervals of 30 seconds. This arrangement, designed by Messrs. Stephenson, C.E., of Edinburgh, is peculiarly applicable to inaccesssible localities like Dog Island, from the simplicity and durability of the argand lamps, and from the ease with which they can be repaired, as well as from the fact that even should one or more of the lamps be temporarily disabled the light, though weakened, will not be totally extinguished; whereas the failure of the one lamp used in the central burner system would involve—temporarily at least—the total disappearance of the mariner's guide. The works should ere this have been entirely completed had they not been delayed by the remarkable inclemency of the winter in the Strait, and other causes over which I had no control, but the worst has now been got over, and there appears to be no doubt that the light will be ready for permanent exhibition not later than the first of August next. The lantern and apparatus cost £2483 6s. 1d., and freight, buildings, road, &c., &c., £6992 18s.; making the whole cost (so far as the accounts have passed through my hands) £9476 4s. or say £9600. The lighthouse is erected on a small island off the entrance to Bluff Harbor, Foveaux Strait, at an elevation of 150 feet above the sea, thus insuring a range in ordinary weather of at least 18 miles, and will shew a flash every half minute.

Cape Saunders next to Dog Island is certainly one of the most important sites for a lighthouse on the East Coast of the Middle Island, and it is to be regretted that that important work was not undertaken before Tairoa's Head, as being "par excellence" a *sea light*, while the other is more properly a harbor light. The optical apparatus for a first class dioptric fixed white light, including a glass spherical mirror, is now in Dunedin, and it is to hoped that the necessary funds for the completion of the work will be appropriated at the proximate meeting of the General Assembly. Were the site more