

Book review

Southern Lights: the Scottish Contribution to New Zealand's Lighthouses

Guinevere Nalder, Whittles Publishing, Caithness, UK, 2017, ISBN 978-1-8499-5156-2, £19.99, 200 pp.

Lighthouses proliferated all over the world after the success of Augustin Fresnel's brilliant invention in 1819 of the refracting (dioptric) glass lens. New Zealand was late to build lighthouses but made up for this with an impressive and remarkably speedy programme of construction. Although the country became a British colony in 1841, development was initially hampered by the problems of navigating its long and difficult coastline. However, what might be called a frenzy of lighthouse building was initiated in 1859. Thirty-three towers were constructed up to 1913; in 1876–1884 alone, 14 were built. While the towers were generally built with local materials by local designers, the design and manufacture of the optics were a highly complex business requiring mathematical prowess and precision engineering of a high order. It was thus confined to a small number of British and French firms that had developed such specialist skills and supplied all the lighting apparatus to New Zealand, as well as the rest of the world. They included the Stevenson family of Scottish lighthouse engineers, the glass-manufacturing firm of Chance Brothers of Birmingham and a number of French firms such as Barbier et Fenestre and Sautter & Cie.

From 1862, the firm of D. & T. Stevenson came to dominate the New Zealand lighthouse scene for nearly a century, procuring tenders, overseeing the supply of apparatus and stores and acting as consulting engineers. The position of the Stevensons was consolidated by the appointment of James Melville Balfour, a member of the family, who was recommended by them to the authorities as a marine engineer. He arrived in New Zealand in 1863.

This book gives an excellent account of the political background from the period of provincial governments through the establishment of the Marine Department and the appointment to it of Balfour, a Stevenson relative, and the role played by those who succeeded him, including another Stevenson relative, L. H. B. Wilson. Overall, it also paints a vivid picture of the logistical problems of shipping delicate and expensive equipment across the globe as well as demonstrating the efficiency of the Stevenson firm. The complete history of each lighthouse, including those built after 1913, is described in exhaustive detail down to the twentieth century.

Alas, despite these virtues, there are some drawbacks, notably the lack of context. While it is true that the Stevensons made a major contribution to lighthouse optics, they were building on Augustin Fresnel's invention of the

reflecting lens. This must be the only lighthouse book in which Fresnel is completely ignored, although all the optical apparatus described springs from his remarkable concept, which completely transformed the effectiveness of coastal lighting. The book is short on context in other ways. For instance, Young's Paraffin Oil Company of Glasgow, which supplied paraffin for the Manukau Heads lighthouse, was the firm of James Young of Glasgow. In 1850, Young patented the distillation of paraffin from shale oil, launching a worldwide, not only Scottish, industry. In the context of this book, Young might reasonably be thought to be part of the Scottish contribution to New Zealand's lighthouses. The book is crammed with facts and with transcriptions of letters and specifications, but although it is stated that lighthouses were furnished with a 'second-order revolving light' or 'first-order dioptric fixed lights' and so on, no reason is given for any of these decisions.

This problem of context is the result of using only the New Zealand government archive and the Stevenson archive, with virtually no reference to anything else. Furthermore, reading manuscript material can cause errors if not checked against other sources. An example of this is the misspelling throughout of the distinguished French firm of Sautter & Cie, which results in its curious placing in the index between Sautter Haile (actually Harlé) & Cie and Sautier, Lemnier (actually Sautter-Lemonnier) & Cie. In fact, these are all the same firm, and the name changes reflect modifications to its partnerships.

Above all, what this book desperately needs is a glossary of terms; otherwise, much of it will be difficult for a general audience to follow. For instance, the phrases 'first order' and so on indicate focal length and range. Thus, a first-order lens has a focal length of 920 mm and a range of 20–30 nautical miles (37.0–55.6 km) suitable for major lights, while the sixth-order lens is used for small harbour lights. Moreover, there is no definition of any of the technical terms. 'Dioptric', scattered throughout the text, refers specifically to the refracting glass prismatic lens invented by Fresnel and was used to distinguish it from the earlier 'catoptric' system using metallic reflectors. 'Catadioptric' refers to the prism invented by Fresnel to parallelise escaping rays, reflecting them back through the main lens; they enabled the development, by Leonor Fresnel (Augustin's brother) and the Stevensons, of the all-glass optics used throughout New Zealand. These and other terms should all have been defined.

This book has copious references, and the numerous transcriptions of archival material are useful for a lighthouse historian. Also, it has some excellent illustrations.

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