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Book Review

Lighthouses – The Race to Illuminate The World by Toby Chance and Peter Williams. Pub. New Holland Publishers (UK) Ltd. 2008. Hardback, illustrated, 272pp. ISBN 978-1-84773-174-6. £17.99

All lighthouses show a bright flashing light. That's obvious, surely? Everyone knows that, it's what we were taught at school: lighthouses have always flashed.

Well, no, actually, that popular belief is very far from the truth, in fact so unbelievably far from the truth it is almost out of sight, just like early lighthouses that were so far out of sight as to be virtually useless to the hapless mariner. Yet within the relatively short period of one hundred and fifty years those dim, flickering, unreliable spots of dull light that storm-tossed seamen strained their eyes to pick out from the gloom transformed into brilliant beams of blinding light sweeping the black horizon with a degree of pinpoint accuracy, efficiency and unflinching reliability those earlier mariners would find difficult, if not impossible, to comprehend. The terms "bright", "flashing" and "light" took a painfully long time to come to be spoken in the same breath.

Credit for this unprecedented evolution in visual (and audible) aids to navigation – worldwide - may be laid at the feet of just a handful of brilliant, gifted, far-sighted men within a variety of countries, each having personal, political, academic, scientific and prejudicial administrative wars to fight to have their revolutionary ideas accepted. It is a long and convoluted story. Yet in recording its fundamental complexities and contextual scientific theories, this book records far more than a mere story, just as Stevenson's and Hague's seminal works on lighthouse history and architecture are scarcely simple books on lighthouses.

Many of the leading characters we meet as the tale unfolds ring out the clear bell of familiarity: Augustin Fresnel, Ami Argand, Michael Faraday, Sir David Brewster, Sir James Douglass, Robert Stevenson, Gustaf Dalen and, principally, the great James Chance, whose great-great grandson, author Toby Chance, brings an intimate association to this book. These were a new breed of experimental scientists and engineers, fully in tune with the emerging needs of the Industrial Revolution and the resultant flourishing of world commerce. They individually recognized the need for applying the latest scientific theories to safe navigation, but fought constant battles with reactionary, hide-bound lighthouse authorities – and sometimes even fellow scientists – to put their advanced principles into effect.

Two central factors were at the very core of the immense improvement in lighthouse optics, the principle of reflective and refractive dioptric lenses and the extraordinarily precise manufacture of glass of sufficient quality and quantity to allow those principles to be practically realized, latterly on a truly industrial scale. The company of Chance Brothers, based in the West Midland's industrial heartland, already had an enviable reputation for the superior quality of their glass before they became involved in lighthouse optics. A significant coming together of the two skills was amply demonstrated at the Great Exhibition of 1851, when his uncle, Lucas Chance, not only accomplished the Herculean task of supplying all the glass for what was to be known as the Crystal Palace, but within that monumental building the young James Chance displayed to an admiring public the first dioptric lighthouse lenses to emerge from their expanding Birmingham factory. It was a triumph. James Chance had succeeded where others had failed. Seemingly insuperable technical difficulties in the manufacture of large sections of optical grade glass were finally overcome. The monopoly in lens manufacture for so long proclaimed by the French was about to drastically change.

Yet the effort to promote dioptric lenses as the natural successor to polished parabolic reflectors and large, crude disc lenses in the face of staunch resistance by lighthouse authorities would drag on for decades. Eventually, however, with parallel improvements in the design and efficiency of illuminants taking place, between France and England some of the most magnificent and extraordinary lighthouse optics were to emerge as the mature offspring of a truly symbiotic marriage between the glass-maker's and engineer's art.

Because the race to illuminate the world involved so many distinguished historic figures and notable events, the balance between the narrative and the technical in any account must be far removed from a linear progression, yet all the pieces of this picture do eventually come together as a satisfactory whole. This is not a novel, yet has many recognizable elements of a novel, so entwined are the acting participants' relationships, the Chance family naturally acting as the root. Neither is it a light read, but more of a happy coupling between an academic treatise and social documentary. The text admits little breathing space, either physical or mental.

Toby Chance and Peter Williams have concluded a remarkable project. One can only wonder at the huge volume of material that had to be sifted through, riddled, read, analyzed and deliberated upon for inclusion in the work. Hercules may have baulked at that task too. The result is a new, long-awaited book devoted to the story of dioptric lighthouse optics and the role the exceptional talents of one man, James Chance, together with his family, had to play in their development and production.

By the way, who did actually invent the "Fresnel" lens? Buy this book and find out!

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