

BOOK REVIEW

***Endless Novelties of Extraordinary Interest. The Voyage of H.M.S. Challenger and the Birth of Modern Oceanography.* Doug Macdougall. 2019. Yale University Press, New Haven, London, 257 pp.**

One hundred and fifty years ago, on May 9, 1873, the Royal Navy's corvette H.M.S. *Challenger* steamed into Halifax harbour to begin a ten-day stay for repairs and reprovisioning. Under normal circumstances this would not have been an unusual event – Halifax was, after all, the Royal Navy's pre-eminent base in the western North Atlantic. The comings and goings of R.N. vessels were regular events. But *Challenger* aroused particular interest because of its goals, which were not naval but scientific. While in port it entertained a procession of Halifax citizenry, particularly members of the Nova Scotian Institute of Science, and its personnel went ashore for rest, relaxation, and the pursuit of natural history in a new environment.

The background of *Challenger's* cruise – which took 3-1/2 years and covered 68,890 nautical miles - lay in an expanding interest during the 1860s and '70s in the nature of life and the physical conditions under which it existed in the deep ocean. With the support of the Royal Society and the Royal Navy (particularly of its hydrographer George Richards) two natural scientists brought their plans for a major investigation of the oceans to fruition. The first was Charles Wyville Thomson, then Regius Professor of Natural History in the University of Edinburgh, and W.B. Carpenter, physiologist at the University of London and a vice-president of the Royal Society. They had been collaborating through the 1860s on biological collecting in deeper and deeper water around the British Isles and now saw the opportunity to investigate the organisms and physico-chemical conditions of the deep sea on a global scale. In a remarkably short time a major expedition was put together, no small part of which was re-purposing, renovating and provisioning a superannuated warship, H.M.S. *Challenger*, for scientific work.

Doug Macdougall's interesting, attractively-written book on the expedition is a recent addition to oft-told tales in a new context. Shortly after the return of *Challenger* to England in 1876, some of the participants prepared their accounts of experiences on the expedition,

notably Sub-lieutenant Lord George Campbell's *Log-Letters from "The Challenger"* (1876) and H.N. Moseley's *Notes by a Naturalist on the "Challenger"* (1879). Other participants from among the naval staff of the ship and the group of six scientists aboard eventually did the same, giving views of science at sea and on land plus people and places around the world. The centenary in 1972 of the departure of *Challenger* from England evoked a new outpouring of popular and more academic historical treatises, making the famous cruise extremely well documented, at least from the point of view of the serving officers and the scientists (a series of colour sketches by a cooper, Benjamin Shephard, was discovered in 1968, and there is an account by a steward's assistant, Joseph Matkin, discovered and published in the 1990s, giving views from below decks - we could do with more if they exist). Macdougall relies extensively on Campbell and Moseley for vivid commentary on work at sea and explorations on land - with justification, because Campbell's witty insouciance (as befitted a son of the Duke of Argyll) did not disguise his keen eye for the ridiculous and the interesting, and Moseley was among the most enquiring of the scientists ("naturalists") aboard (his studies ranged from animal functional morphology and behaviour to linguistics and physical anthropology).

Macdougall does not commit the sin of Whig historiography - seeing current knowledge as the result of a logical progress from a more primitive past to an enlightened present - but he does use modern scientific knowledge of the oceans and their inhabitants to provide context for the frequently surprising observations and discoveries made by the *Challenger* scientists. This approach works well, at least to my eyes. Without overburdening the reader with everything that happened on board, he selects several examples of scientific observations or discoveries that were novel in their time, sometimes inexplicable with 19th century knowledge of biology, physics or chemistry, but that presented themselves to a dedicated team of observers with virtually unlimited time and resources on the first great scientific exploration of the oceans. It is hard not to be caught up in debates over the origin of oceanic sediments, the search for the origins of life, beginning the untangling of coral biology, the thrill and extreme danger of being alone - really alone - in the iceberg-filled Southern Ocean, or the difficulty and danger of trying to find birds of paradise in Australia and New Guinea. The examples are varied, vivid and engagingly presented.

One of *Challenger's* scientists, the chemist J.Y. Buchanan, claimed in later years that the science of oceanography began with the ship's first official deep-sea station, made west of the Canary Islands on February 15, 1873. Similar views are found in later years, into our own times, particularly in the prefaces to oceanography texts, in which *Challenger* is invoked as the originator of a new science. The case could be made too that the 50 volumes of the *Challenger* Reports, published between 1880 and 1895, mainly due to the immense energy of the *Challenger* naturalist John Murray, formed the basis of modern oceanography. Others are more sceptical (I have been among them), pointing out that that in many respects the *Challenger* Expedition was the culmination of an older tradition, using outdated techniques and approaching scientific problems in a way that was the epitome of 19th century European science. I now view this as a pointless debate – *Challenger* was what it was, not a precursor nor a last gasp of an old tradition.

Macdougall concludes his book, in a chapter titled “*Challenger's* Enduring Legacy” with a measured assessment of the significance of the great expedition, particularly focussing on the reports and John Murray. Many factors of 19th century science

“...converged to ensure that the *Challenger* project was supported by the government as a standalone enterprise. The expedition and the later work it spawned, especially in the Challenger Office in Edinburgh, fostered a new, more collaborative way of doing science. The participants were loosely organized and independent, but supported by public funds. This was a mode of working that enabled them to accomplish more than had been possible previously, and it ushered in an era in which similar organizational structures sprang up elsewhere” (p. 236)

And as he goes on to say,

“By the time the last volume of the report was published, in 1895, and the Challenger Office closed [it was in Edinburgh, partly housed in Murray's residence in Granton], a small informal but influential worldwide community of marine scientists had come into being. To a considerable extent it owed its existence to the expedition. A few years later, in 1899, the king of Sweden invited many of these marine scientists from around the world to Stockholm to attend the first International Conference on the Exploration of the Sea.

John Murray, who had recently been knighted by Queen Victoria, headed the British delegation. The conference was a signal that oceanography was by now firmly established as a discipline in its own right.” (p. 240)

Macdougall quotes Murray on the significance of the *Challenger* Expedition: as “the greatest advance in the knowledge of our planet since the celebrated discoveries of the fifteenth and sixteenth century.” (p. 241). Perhaps true, but perhaps of more importance was how it was conducted and how its results were produced and disseminated for, quoting Macdougall, “the *Challenger* expedition and its research and publication program indisputably served as a model for a new kind of marine research” (p. 240) – one that involved large (and expensive) enterprises in which governments played a part, research was done and shared collaboratively, and with international collaboration if not in the doing, certainly in its spread. In my opinion, McDougall gets it just right when he concludes that “*Challenger*’s moment in the sun was a turning point in the long history of humankind’s fascination with the sea.” (p. 241). This book is a very useful, well thought-out, and attractive presentation of *Challenger* science, but equally of what made it significant in the long run for marine science from the late 19th century into our own times.

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