In deep waters

THE SILENT LANDSCAPE: In the Wake of HMS Challenger 1872-1876 by Richard Corfield
J Murray £20 pp303

PHILIP MARSDEN

MARY EVANS, BRIDGEMAN

Ice work: the Challenger expedition, led by Wyville Thomson, far left, ranks alongside that of the Beagle

In 1872, the steam corvette HMS Challenger set out from Portsmouth on an ambitious quest to explore the oceans. Three and a half years later, full of samples and specimens and data, she returned. Such has been the importance of her work that the Challenger expedition is now mentioned in the same breath as those of Vasco da Gama, Columbus, Magellan and Cook. In its legacy to science, a better comparison is perhaps with the Beagle, on which Darwin set sail for the south 41 years earlier.

Until the Challenger, the depths of the sea were as remote as space. They were believed to be azoic, devoid of any life; others thought the water was so cold that it turned to ice at a certain depth, or so dense that nothing could penetrate it, leaving sunken ships and their passengers in a state of perpetual suspension. But the Challenger's on-board scientists, analysing the contents of the trawls and dredges, revealed an environment so rich in life that even now, a century and a quarter later, its range of known species is frequently being revised.

Anyone feeling world-weary or afflicted by the state of our shrinking, trampled planet could do a lot worse than to flick through the pictures of diatomas and radiolaria and dinoflagellates dragged up by the Challenger. The diversity, beauty and eccentricity of these tiny lifeforms is thrilling, their sheer numbers dizzying. A single cup of sea water can contain up to 50,000 of them. There is now nothing on land to compare with the entire north Atlantic glowing in springtime with their chlorophyll (an effect revealed only recently by satellite photographs).

The Silent Landscape is the latest in a long line of books about the voyage of HMS Challenger. Charles Wyville Thomson, director of the scientific team, wrote an account of the journey, before dying of exhaustion. Another of his scientists, John Murray, took over the collation of results. It took him two decades to produce the expedition's findings — in 50 large volumes. A less exhaustive account by William Spry became a Victorian bestseller, running to 12 editions. Other members of the crew also produced versions.

The distinguished marine scientist Richard Corfield now recounts the facts of the journey again — the loss of crew overboard (as well as to desertions and diseases), the adventures in ports of call, the storms of the southern ocean, the glassy waters of the Pacific. He gives a good sense of the ship's main task: the dredging and trawling, the endless running out and hauling in of thousands of feet of wire. He misses, though, the story in the original accounts of the ship's parrot that learnt to squawk: "What? Two thousand fathoms and still no bottom?"

The success of Corfield's book lies in the intermingling of the Challenger's findings with the current state of oceanographic knowledge. The debt to the Challenger remains enormous. The ship's scientists returned with samples of 13,000 species. They discovered the lungfish, which was thought, erroneously, to represent the Darwinian link between sea and land creatures. Their sounding of the mid-Atlantic Ridge gave rise many years later to the theory of plate tectonics. They dropped their trawl seven miles into the deepest place on earth — the trench in the western Pacific still known as the Challenger Deep. They first identified in the Antarctic ice the stratified shades of blue that have since given us a precise picture of the planet's climatic history. They also discovered the calcite compensation depth, which, according to Corfield, is "one of the most important and fundamental properties of the deep ocean".

Such is his enthusiasm for marine science that Corfield does not limit himself to the Challenger's legacy. He cannot resist a digression into the Gulf Stream and how it works, or the mass of floating sargassum kelp that gives the Sargasso sea its name. He also explores the strange phenomenon of methane hydrates. In vast areas of ocean, deposits of methane remain chemically trapped in the water. It is possible that releases of these deposits in the past caused moments of sudden and catastrophic planetary warming. Methane hydrates also have the alarming potential for causing the water, and the air above it, to lose their capacity for suspension — hence one explanation for the Bermuda Triangle. A more positive aspect of these gases lies in their possibilities as a fuel source. It is estimated that, properly harnessed, they could provide energy for hundreds, even thousands, of years.

The Silent Landscape is a compelling reminder of the God-like powers of the waters around us, and how little is really understood about them. Oceanography has become one of science's most urgent areas of inquiry. Yet, until the Challenger, there was no oceanography. The group of scientists hunched over microscopes in their on-board laboratory were glimpsing an entirely new world. The status given to them by their successors is hard to exaggerate. But it's also difficult to avoid the thought that in part this is envy, that every marine scientist would give their right arm to have been there on the Challenger, staring over the ship's side and listening to the spooling in of the dredge. ❑