

circulation of the water in a salt- and a fresh-water lake, under the influence of wind and other physical agents.

In a salt-water loch, again, there is a great profusion of life in depths of 500 and 600 feet, and many organisms from these depths, as well as large numbers of other organisms taken at the surface, exhibit most remarkable displays of phosphorescent light. In a fresh-water loch, from similar depths, and under the same climatic conditions, the dredge or trawl brings up not more than half a dozen dwarfed species, and the phenomenon of phosphorescent light has never been observed in fresh-water organisms.¹ The organic matter associated with the muds and other deposits from a salt-water loch undergoes rapid decomposition, and soon renders the water foul and unsuited for living creatures. In the deposits from a fresh-water loch, although chemical analysis shows abundance of organic matter, the water does not become foul so rapidly, and organisms may live in water associated with the deposits for days and weeks. These phenomena are apparently connected with the activity of two species of bacteria in decomposing the sulphates in solution—*Microspira desulphuricans* in fresh water, and *Microspira estuarii* in salt water.

The above and many similar observations led me to conclude that a systematic survey of the fresh-water lochs of Scotland would in all likelihood result in many new additions to natural knowledge, and would be especially important for comparison with results in other departments of scientific endeavour. I found that many geologists were most anxious for a bathymetrical survey of these lochs, in connection with the discussion as to the origin of lake-basins. Fishermen, and engineers who had to do with the water supply of towns and the development of water power, were also interested in this subject. On my initiation this matter was brought before the Councils of the Royal Society of London and of the Royal Society of Edinburgh. After careful consideration both Councils during the years 1883 and 1884 made very strong representations to the Government, urging that a bathymetrical survey of the Scottish fresh-water lochs should be at once undertaken in the interests of scientific progress. There was no practical outcome from these representations. The reply of the Treasury, dated 17th September 1883, and signed by Mr Leonard Courtney (now Lord Courtney), was to the effect that a survey of the kind indicated did not come within the functions of the Admiralty, which only undertook work in the interests of navigation, nor of the Survey Department of the Office of Works (late Ordnance Survey), which limited its operations to the dry land, and that, however interesting from a scientific point of view, their Lordships were unable

¹ See notes by T. Jamieson in the *Aberdeen Free Press*, 19th November 1908, and in *Nature*, vol. lxxix. p. 309, 1909, as to phosphorescent displays in Loch Builg.