

the sharp spines of the sprat are distinctly felt, whereas the pilchard and the herring both feel comparatively smooth. To distinguish between young pilchards and young herrings, especially after they have been preserved in oil, is a more difficult matter, the size of the scales, which are relatively much larger in the pilchard, being the best guide.

PROF. A. LAWRENCE ROTCH.

PROF. ABBOTT LAWRENCE ROTCH, whose death we recorded with regret last week, was born on June 6, 1861. He received his education at the Massachusetts Institute of Technology, whence he graduated in the department of mechanical engineering in 1884. He became interested in meteorological investigation, and in 1885 founded a meteorological observatory at Blue Hill, Massachusetts, at a height of 635 feet above sea-level, for the purposes of observation, research, and local prediction. He showed characteristic independence in refusing at the outset to accept official help in maintaining the observatory at the expense of fettering it with official control. His main work was done in connection with this observatory, which he maintained and directed throughout. The results obtained were published from time to time in separate parts of the *Annals of the Astronomical Observatory of Harvard College*. For the first ten years the work consisted principally of the routine of an ordinary first-order observatory with reduction and analysis of the records, and special investigations of certain problems.

In 1894 the exploration of the free atmosphere by means of kites was begun at the observatory, and continued through succeeding years, steel piano wire (first used by E. D. Archibald in the early 'eighties) and a winding gear driven by a steam engine being adopted as the work developed, until a complete series of records up to a height of three miles had been obtained. In this work Rotch was a pioneer, and his methods were adopted at a later date in this country and on the Continent and by the United States Weather Bureau at the Mount Weather Observatory. In 1904 and the three following years seventy-six balloons carrying self-recording instruments were sent up under his direction at St. Louis, and of these seventy-two were recovered. Some of these reached heights exceeding ten miles, and temperatures below  $-70^{\circ}$  C. were recorded. Our knowledge of the higher parts of the free atmosphere in the United States is almost entirely due to the results obtained in this series of ascents.

But Rotch's efforts were by no means confined to his own country. He was a constant visitor to meteorological meetings in Europe, and he was ever alert and ready to help in meteorological enterprise. With M. L. Teisserenc de Bort he fitted out expeditions in three successive years to explore the atmosphere over the tropical Atlantic, and the results obtained have exceeded in interest nearly all other contributions to meteorological discovery in recent years. Our knowledge of the variation

of the height of the stratosphere with latitude rests almost entirely on the evidence obtained in these expeditions. His most recent work was an atlas of charts of the atmosphere for aeronauts and aviators, in which he included a chart showing the best aerial routes in summer for a dirigible balloon travelling across the Atlantic between Europe and America.

The importance of his work was recognised by scientific societies both in Europe and America, and the Governments of France and Germany conferred honours upon him.

He was generous in his recognition of the work of others, and gave kindly encouragement to younger men engaged in research. His death, which occurred suddenly on April 7, 1912, at his Observatory at Blue Hill, will be regretted by meteorologists of all lands.

E. G.

NOTES.

WE are informed that the provisional programme of arrangements for the forthcoming celebration of the 250th anniversary of the Royal Society are as follows:—Monday, July 15—An evening reception of delegates at the rooms of the Royal Society. Tuesday, July 16—In the morning a commemorative service in Westminster Abbey; in the afternoon the official reception of delegates at the Royal Society and presentation of addresses; in the evening a commemorative dinner at the Guildhall. Wednesday, July 17—In the morning visits to places of interest in London; in the afternoon the Duke of Northumberland gives a garden-party at Sion House; in the evening a *conversazione* in the rooms of the Royal Society. Thursday, July 18—In the morning visits to places of interest in London; in the afternoon H.M. the King gives a garden-party at Windsor, to which the delegates and fellows of the society will be invited. Friday, July 19—The delegates will visit Oxford and Cambridge Universities.

IN *The Times* of April 17, and in *The Morning Post* of the following day, reference is made to the drift of a sealed bottle which was thrown overboard from the steamship *Indraghira* on November 17, 1908, in lat.  $51^{\circ} 38' S.$ , long.  $96^{\circ} 15' E.$ , by a passenger during a voyage from London to Melbourne. The bottle contained a note of the ship's position with a request that the finder would notify the sender, Mr. H. P. Adams, of Carshalton, Surrey, of the facts of the discovery. The bottle was picked up early last winter, it is thought, on the eastern coast of Wellington Island, south of Chili, in lat.  $49^{\circ} 42' S.$ , long.  $74^{\circ} 25' W.$ , having drifted eastward a distance of at least 7100 nautical miles, presumably in 1100 days or less, at a minimum rate of six miles per day. This drift, though remarkable, is by no means the longest on record. The late Mr. H. C. Russell, when Government astronomer at Sydney, contributed several papers to the Royal Society of New South Wales on "Current Papers," in which he recorded the drift of numerous bottle messages, ranging from 50 to 5000 nautical miles, and several from 8000 to more than 9800 miles. The ostensible reason for launching these