graphical researches was soon felt. When appointed Director in 1844, Professor A. D. Bache gave orders for the collection and preservation of the samples brought up by the sounding machine while the officers were making hydrographic observations, with the double object of showing the relief of the sea-bottom and of forming a collection of the substances spread over the bed of the ocean. DEEP-SEA WORK OF THE U.S. COAST SURVEY.

Professor J. W. Bailey applied himself to the microscopic study of the soundings collected by the U.S. Coast Survey,[1] and in 1851 he showed the important part played by Foraminifera in the deposits off the coast of New Jersey. Owing to the abundance of these calcareous organisms, the deeper deposits differed considerably from the shore deposits, in which mineral particles, especially quartz, predominated. He observes that the quartz grains are angular in the deep soundings, and rounded and polished in shallower water. BAILEY.

Lieutenant M. F. Maury, of the United States Navy, was for a long period associated with investigations relating to navigation. He approached the problems connected with the phenomena of the ocean from a scientific standpoint, and has in a sense popularised the science of the sea. The last edition of his Sailing Directions [2] furnishes an abstract of his views and of the progress made up to that time. The Brussels Maritime conference of 1853 was brought about principally through Maury's influence. The recommendations of this conference led to the adoption of a uniform method of making nautical and meteorological observations at sea among maritime nations, and have largely contributed to the rapid development of ocean meteorology in recent years. MAURY.

The errors arising from the old methods of sounding with a heavy weight attached to a silk or hempen cord induced navigators and others to seek some improved apparatus, by means of which more accurate soundings could be obtained. They had recourse to a detonating apparatus, which exploded on touching the bottom, but this was abandoned on account of the difficulty in hearing the detonation. Ericsson and others constructed sounding machines containing a column of air, the compression of which indicated the pressure and thereby the depth, but all these attempts failed in very deep water.[3] Maury then applied to Baur, a New York mechanician, to construct from his plans a sounding machine with a screw propellor connected with clockwork, showing on a dial the number of revolutions made by the screw; each revolution represented a fathom. This apparatus worked well in comparatively shallow water, but was difficult to manage in very deep water. Lieutenant Walsh, of the United States Navy, sounded with a wire rope more than eleven miles long, and saw his rope run out to 34,000 feet without ERICSSON'S SOUNDING MACHINE. WALSH'S WIRE-ROPE SOUNDINGS.

[1] Microscopical examination of soundings made by the U.S. Coast Survey, off the Atlantic coast of the United States, *Smithsonian Contributions to Knowledge*, vol. ii. article iii. pp. 1–15, 1851.

[2] Maury, Explanations and Sailing Directions to accompany the wind and current charts, 8th ed., Washington, 1858 and 1859.

[3] See Nautical Magazine, 1836, p. 390. Ericsson's principle was subsequently adopted by Sir William Thomson in his Navigational Sounding Machine.