

drawn up from a known depth furnished conclusive proof on this question, and some of them, like the Corals and Bryozoa, must have become attached to the cable as germs. It is to be noted, however, that although the pressure is the same, the temperature in the deep water of the Mediterranean is much higher than at corresponding depths in the open ocean, and this fact might have some influence on the bathymetrical range of species.

During Otto Torell's expedition to Spitzbergen in 1864, a great number of animals were taken at a depth of 1000 to 1400 fathoms. They included Rhizopoda, Bryozoa, Sponges, Annelids, Crustacea, and other forms. In subsequent expeditions to Spitzbergen, organisms were frequently secured from similar depths.¹

OTTO TORELL'S
DREDGINGS OFF
SPITZBERGEN.

In 1864 M. Barboza du Bocage, director of the Natural History Museum of Lisbon, announced the occurrence on the coasts of Portugal of tufts of siliceous spicules similar to those of the *Hyalonema* of Japan,² which were taken by the shark-fishers of Setubal at a depth of 500 fathoms. Towards the end of 1868 Professor Perceval Wright proceeded to Portugal to investigate the question and procure specimens in a fresh condition. With a crew of eight men and an open boat he dredged at a depth of 480 fathoms for about the space of a mile, the dredge being filled with sticky yellowish ooze, in which glittered innumerable long spicules of *Hyalonema*, including some perfect specimens.³ "This dredging," says Wyville Thomson, "is of special interest, for it shows that although difficult and laborious, and attended with a certain amount of risk, it is not impossible in an open boat, and with a crew of alien fishermen, to test the nature of the bottom, and the character of the fauna, even to the great depth of 500 fathoms."⁴

BOCAGE'S OBSER-
VATIONS AND
WRIGHT'S DREDG-
INGS OFF SETUBAL.

The considerable part taken by the United States Coast Survey in oceanographical researches has already been referred to. In 1867, the Superintendent, Professor B. Pierce, acting on the advice of Professor L. Agassiz, issued instructions that dredgings as well as soundings should be carried on off the Florida coasts under the direction of Count Pourtalès. Ordinary sounding leads with tallow were first used, but were afterwards replaced by Stellwagen's and Sands' sounding leads. Stellwagen's sounding cup is a conical iron cup screwed to the sounding lead, with a leather lid which firmly closes the cup when the apparatus is drawn up; Sands' sounding lead has a side opening with a spring door, which is forced open when the apparatus sinks into the deposit, and closes when drawn up. These machines were superior to the original form of Brooke's apparatus, as they brought up much larger samples of the deposit. Pourtalès states that in 1870 the number of samples of deposits collected by the Coast Survey amounted to 9000.⁵ After the

POURTALES ON
THE DEPOSITS OFF
THE ATLANTIC
COAST OF
NORTH AMERICA.

¹ *Zeitschr. f. wiss. Zool.*, Bd. xx. p. 457, 1870.

² *Proc. Zool. Soc.*, 1864, p. 265.

³ Notes on deep-sea dredging, *Ann. and Mag. Nat. Hist.*, ser. 4, vol. ii. p. 423, 1868.

⁴ Wyville Thomson, *op. cit.*, p. 277.

⁵ See L. F. de Pourtalès, *Der Boden des Golfstroms und der Atlantischen Küste Nord-Amerikas*, *Petermann's Geogr. Mittheil.*, 1870, p. 393.