

beneath, with the beam above them. A second bag, or "pocket," open at the bottom, hangs in the outer net, reaching about three-fourths of its length, and acts as a valve, preventing the washing out of its contents; and about a yard of the narrow extremity of the net is lined with "bread-bag," to give a chance of bringing up small things and a small sample of the bottom. The trawl is suspended by a bridle of rope, which is made fast to the runner at each end of the beam, and then continued down on each side and fastened to the end of the trawl-bag. The trawl is usually sent down with the additional weight of three 14-lb. hand-leads, and, as in the case of the dredge, weights to about a hundred-weight and a half are slipped to a "toggle" 400 to 500 fathoms before it on the line.

The tow-net has been constantly worked during the cruise; and Mr. Murray, who has taken charge of this department, has latterly got most remarkable results from using the tow-net just as we use a dredge, pulled along by the drift of the ship with a weight a few fathoms in advance, at different depths, down to 100 fathoms. Mr. Murray finds that frequently, when scarcely any thing is to be found on the surface, all the pelagic animals which congregate there under favorable circumstances are to be met with at different depths below; and on more than one occasion he has taken animal forms with the deep tow-net which he has never seen on the surface. The tow-net used is of the ordinary form: a stout iron ring, a foot or eighteen inches in diameter, and a conical bag, three to four feet deep, of muslin, of bunting, or sometimes of "bread-bag."

The *Challenger* is provided with a steam-pinnace, which is an invaluable adjunct for dredging and sounding in shallow water and in a smooth sea. She is a life-boat 36 feet in length, with two pairs of engines, one pair for propelling her, and another for heaving in the dredge-line. The propelling engines are a pair of high-pressure, direct-acting, vertical engines of six horsepower (nominal), with a horizontal tubular boiler, and a discon-