

delicate tubular calcareous spines, such as *Globigerina* and its allies, which float everywhere on the surface, and the dead shells of which form the vast calcareous deposits on the deep-sea bottom known as *Globigerina* mud.

At night, the pelagic animals render themselves conspicuous by their phosphorescence. The kind of light emitted, and the manner of its appearance, varies according to the nature of the animal causing it. Sometimes the sea far and wide, as far as the eye can see, is lighted up with sheets of a curious weird-looking light, and wherever the water breaks a little on the surface before the breeze, the white foam is brilliantly illuminated. This particular kind of illumination is due to *Noctiluca*. One night, when we were between the Cape Verde Islands and St. Paul's Rocks, the sea was thus illuminated by myriads of *Noctiluca*, and the lower sails of the ship were seen to be distinctly lighted up by the light given off from the broken water thrown up by the hull of the vessel.

At other times, the water where disturbed is seen to be full of small luminous scintillating specks. This is the commonest form of phosphorescence, and is due to various small animals, principally small Crustacea, which give out their light thus by flashes. Some Crustacea certainly derive their phosphorescence from containing in their stomachs phosphorescent food, and their excrement is phosphorescent, as was first pointed out to me by my friend, Captain Tupman, R.M.A. When large fish, or porpoises or penguins, dash through water full of luminous Crustaceans or *Noctiluca*, their bodies are brilliantly lit up, and their tracks marked by trails of light.

The most beautiful kind of phosphorescence is however that of the Ascidian colony *Pyrosoma*. This, when stimulated by a touch, or shake, or swirl of the water, gives out a bright globe of bluish light, which as the animal drifts past several feet beneath the surface lasts for several seconds and then suddenly goes out.

A giant *Pyrosoma* was caught by us in the deep-sea trawl. It was like a great sac, with walls of jelly about an inch in thickness. It was four feet in length, and ten inches in diameter. When a *Pyrosoma* is stimulated by having its surface touched, the phosphorescent light breaks out at first at the spot stimulated, and then spreads over the surface of the colony as the stimulus is transmitted to the surrounding animals. I wrote my name with my finger on the surface of the giant *Pyrosoma*, as it lay on deck in a tub at night, and the name came out in a few seconds in letters of fire.

Pelagic animals range through a considerable depth of water, near the surface of the sea, ascending to the surface at