

ture determinations, including series of temperatures at various distances from the surface. On this trip about 105 species of Invertebrates were obtained, not including the Foraminifera and other minute forms. There were among these 14 species of Anthozoa; 2 of Hydroids; 22 of Echinoderms; 38 of Mollusca; 15 of Crustacea; 1 of Pycnogonida; 10 of Annelida; 1 of Bryozoa; 2 of Sponges.

The Echinoderms were among the most abundant and interesting of the deep-sea animals. About sixty species were dredged by the Albatross, many of which are new to our coast, though previously dredged on the European side, or in the Caribbean Sea and still more distant regions. Others are undescribed forms. Among the Holothurians were two gigantic species, belonging to a peculiar deep-sea family of which many species were brought to light by the Challenger expedition. These occurred in large numbers at several stations, mostly between 1000 and 1500 fathoms, in some cases more than a barrelful of one of them coming up in a single haul. The largest and most singular one is a new species of *Benthodytes* (*B. gigantea* V.)* which is a very large, oblong, massive species, flat below and convex above, sometimes 18 inches long and 5 or 6 broad, having a gelatinous, translucent appearance, but with a firm cartilaginous texture when fresh. The cartilage-like walls of the body are very thick, often an inch or more, and the visceral cavity is very small in proportion. Owing to the dense and impervious, cartilage-like tissues, this species is very difficult to preserve in alcohol, the interior decaying before the fluid can penetrate the tissues, even when the visceral cavity is cut open.

The second species is also a new form, *Euphronides cornuta*

* *Benthodytes gigantea* V. Body massive, usually elliptical or oblong, broadly rounded at the ends, strongly convex on the upper surface. The whole dorsal surface is smooth and lubricous but covered with numerous, minute, soft papillæ, both above and below. On the upper surface two alternating rows of rather small, tapered ambulacral papillæ run from one end to the other, on each side, about midway between the center and margin, but these usually stand so nearly in line as to appear like a single row, consisting of about eleven papillæ. The margin is crenulated, each crenulation is surmounted by a small, tapering papilla, or modified sucker. The mouth is situated on the under side, a short distance from the anterior margin. The tentacles are twenty, short and thick, terminated by a group of small conical papillæ. The cloacal opening is situated on the upper surface, close to the posterior margin. Two rows of small suckers occupy the median ambulacrum on the posterior half of the ventral surface; the two rows are a short distance apart and often lie in a more or less sunken groove; there are about twelve suckers in each row, the anterior ones smaller and farther apart. The color is translucent, pale flesh-color, or purplish white, reticulated with whitish lines or wrinkles, and sometimes irregularly mottled above with dark purple or dull orange, deeper toward the margin. Ventral suckers and tentacles dark purplish brown. Length of the largest specimens, about 18 inches, breadth, 6. Ordinary specimens, in alcohol, are from 250 to 300^{mm} long by 75 to 100^{mm} broad.

V.,* related to *E. depressa* of the Challenger expedition. It has two pairs of large, elevated, teat-like anterior tubercles, to which character the name refers. In form it is not unlike *B. gigantea*, but it is smaller, narrower, less massive, and has a much thinner, reddish brown integument, without the cartilaginous character of the latter.

The starfishes were very numerous in the deep dredgings and are represented by many interesting species. The most abundant starfish was a fine, new, orange-red species of *Zoroaster*, of large size, with slender spinose arms, (*Z. Diomedæ* V.)† About 200 specimens of this occurred at station 2035. It was taken at many stations, in 1000 to 1600 fathoms. The most common genus, as usual in very deep water, was *Archaster*, of which numerous species occurred. Many of these are very large

* *Euphronides cornuta* Verrill, sp. nov. A very large species, oblong in outline, with both ends rounded, the upper surface strongly convex, the lower flat, in transverse section nearly semicircular. On the upper surface, a little in advance of the middle, are two very large, divergent, blunt tubercles, often more than an inch in length, usually swollen at base, with a narrow central tube. A little in front of these is a similar but smaller pair, usually about half as large, the size and shape varying according to the state of contraction. In front of the second pair there are usually about four pairs of much smaller tubular papillæ, the anterior ones smallest. At about the posterior fourth there is a very large, double median tubercle, swollen at base, rounded or emarginate at the summit, and terminated by a pair of tubular verrucæ. An orange-brown longitudinal band runs along just outside the bases of all these tubercles, on each side, and branches go from these to the central tube of each tubercle. The margin is thin, with small scollops all around, between all these there is a small prominent papilla or modified sucker. The mouth is situated on the under surface, at about the anterior sixth; tentacles eighteen, short, blunt, thick, covered with small papillæ. Cloacal opening situated on the under side, near the posterior end. A median ambulacrum, visible through the skin, runs between the two openings, with two alternating rows of small suckers near together. The general color is dull flesh-color, or pale brownish, usually with fine specks of orange-brown. The dorsal and submarginal ambulacral bands and their branches running to the suckers and tubercles are deep purplish brown, fading to orange at the margin; the bands are bordered on each side by white or pinkish. Tentacles, buccal and cloacal regions dark purplish brown. The whole lower surface is often purplish brown, reticulated with darker lines or wrinkles. When distended the skin is more or less translucent, with a somewhat gelatinous appearance, but in contraction it becomes more opaque and darker colored. The whole surface is roughened with minute dermal plates. Length of an ordinary specimen, 300^{mm}; breadth, 70^{mm}; height, about 60^{mm}.

† *Zoroaster Diomedæ* V., sp. nov. Arms five, long, slender, tapered, angular above, with three or five rows of acute spines; one median dorsal, and one lateral, or in large specimens two, on each side; these spines arise from rows of prominent close plates: the surface between is covered with small sharp spines; two or more rows of large single pores between the dorsal and lateral rows of plates; three to five rows of smaller lateral plates along the sides of the rays, with rows of pores between; each plate bears a single long, slender spine and several much smaller ones. Four rows of suckers on the basal part of arms. Adambulacral plates alternately unequal; the larger ones bear each a transverse row of four or five slender, sharp spines; the inner spine projects inward between the suckers and bears 3 to 12 large, elongated, tapering pedicellariæ. Similar large pedicellariæ are scattered over the back and sides. Madreporic plate very small. Color in life orange-red. (Diameter radius of a large one. 150^{mm}; lesser radius,