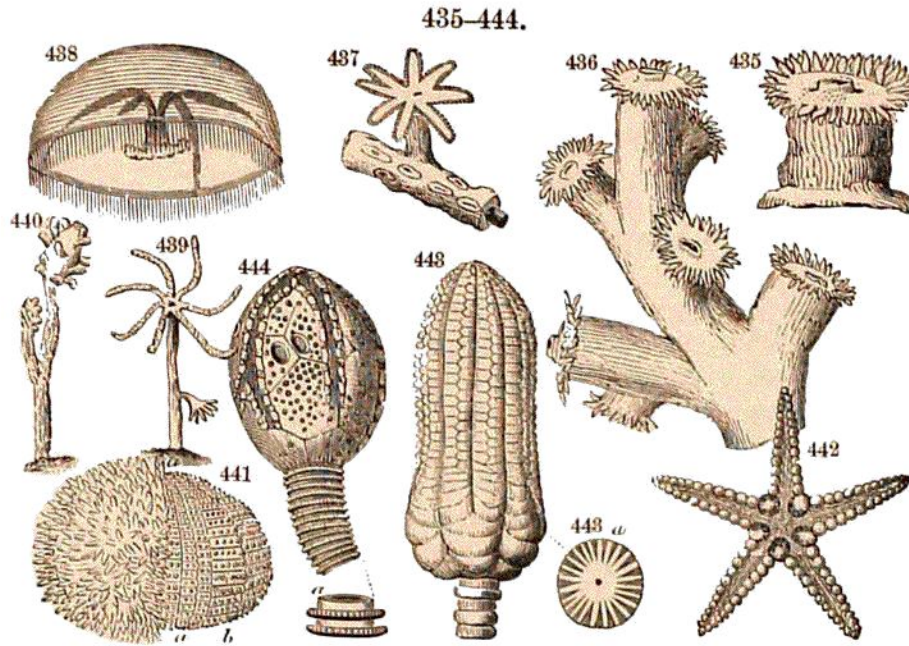


into the arms; mouth below, at center; arms or rays with a groove on the lower side, along which the locomotive suckers protrude through perforated plates; eyes at the tips of the arms. *Ex.*, the *Star-fish*, Fig. 442.

4. **Ophiuroids** (*Serpent-Stars*).— Having a disk-like body with a star-shaped mouth beneath, and long, jointed, flexible arms, which sometimes subdivide by forking, but never bear pinnæ, and have no grooves along the under side, nor eyes at the slender tips. The viscera do not extend into the arms; the ovarial openings are slit-like, between the bases of the arms; and there is no anal orifice. The disk part is homologous with the whole of an Asterioid.

5. **Crinoids** (*including Comatulids*).— Like ordinary star-fishes in having flexible arms or rays; but the calcareous secretions of the rays and body constitute a series of closely fitting solid pieces, and the viscera are confined to the body portion. The rays are



**RADIATES.**— Figs. 435–444. 1. *Polyps*: Fig. 435, an Actinia; 436, a Coral, *Dendrophyllia*; 437, a Coral of the genus *Gorgonia*. 2. *Hydrozoans*: 438, a Medusa, genus *Tiaropsis*; 439, Hydra ( $\times 8$ ); 440, *Syncoryne*. 3. *Echinoderms*: 441, Echinus, the spines removed from half the surface ( $\times \frac{1}{2}$ ); 442, Star-fish, *Palæaster Niagarensis*; 443, *Crinoid*, *Encrinurus lilliformis*; 444, *Crinoid*, of the group of *Cystoids*, *Calocyttites Jewetti*.

often very much subdivided, and bear pinnæ, in which the generative organs are situated. The species are mostly fossil, and are among the earliest in geological history. A few kinds still live in the ocean mostly below 20 fathoms, some at great depths. There are 3 tribes of Crinoids:—

1. The *Brachiates* (*Encrinites*).— Having a radiate structure, and arms proceeding from the margin of the disk; also generally a stem, consisting of calcareous disks, by which, when alive, they are attached to the sea-bottom or some support, so that they stand in the water and spread their rays, like flowers, the mouth being at the center of the flower. Crinoids are represented in Fig. 443, Fig. 433, and Fig. 30 on page 58. The second and third are living species from the West Indies, found at depths below 20 fathoms. The rays open out, when alive, and then the animal has its flower-like aspect. The little pieces that make up the stem, looking like button-molds, are either circular, as in Fig. 443 *a*, or 5 sided, as in Figs. 433 *a, b, c, d*. Under the Crinidea fall the *Comatulæ* (*Antedon*, etc.), which are free when adult, but have jointed cirri proceeding from the back surface for attachment.