ultimately the same individuals become rhombogens and thenceforth produce only infusoriform young. Certain Dicyemids were found to contain both vermiform and infusoriform young. E. Van Beneden's view, that the infusoriform is the male Dicyemid, was confirmed by a study of its structure and a comparison of this form with the male Orthonectid (Rhopalura). From the fact that deeply staining bodies resembling the granules of the urn of the infusoriform, and probably for that reason spermatozoa were found among the germ-cells of the infusorigen, it was inferred that the infusoriform young may arise from fertilized ova, and that the infusorigen may be an adaptation for accumulating the germ-cells around a central cell to which the spermatozoa are also attracted, possibly by chemotaxis. It was regarded as probable that both the male (infusoriform) and female Dicyemid migrate into the kidneys of the young *Octopus* and there form colonies of nematogenic females before males are produced.

Notes on the Blind Fishes. C. H. Eigenmann.

1. There is a color pattern common to all the species of the Amblyopsidæ. This pattern is due to the arrangement of the chromatophores along the connective tissue septa separating successive muscle segments. The result is a series of longitudinal stripes where the septa are bent on the surface and a series of zigzag cross streaks. This pattern is best marked in *Chologaster agassizii*, in which but little color is present. It is somewhat obscure in *Chologaster cornutus* on account of the great development of pigment. It remains only as an arrangement of chromatophores in the blind members of the family where color is no longer present in sufficient quantity to be evident to the naked eye.

2. *Chologaster agassizii*, which has so far been known from the type only, was secured through a grant from the Elizabeth Thompson Science fund. It is a species with well developed eyes living permanently in caves. Its eye is notably smaller than that of the other species of *Chologaster* which live in open waters. The retina is very much like that of *C. papilliferus*, with thinner pigment layer. The eyes of the species of *Chologaster* show the following measurements:

C. papilliferus, 32 mm. long. Vertical diameter, .832 mm. Longitudinal, .880 mm.

C. agassizii, 39 mm. long. Vertical diameter, .720 mm. Longitudinal, .800.

C. cornutus, 32 mm. long. Vertical diameter, .960 mm. Longitudinal, 1.120.

Thickness of the retina of

C. papilliferus, 29–34 mm. long, .122 mm., 55 mm. long, .162 mm.

C. agassizii, 38 mm. long, .107 mm., 62 mm. long, .130 mm.

C. cornutus 27 mm. long, .73 mm., 43 mm. long, .83 mm.

3. The blind fish from Missouri is of different origin from the blind fishes east of the Mississippi. The details of this part of the paper have appeared in Science.

Regeneration and Regulation in Hydra viridis. Herbert W. Rand.

In a series of regeneration experiments upon *Hydra viridis* it was found that the polyps regenerate, on the average, fewer tentacles than are originally possessed. The more tentacles before regeneration the greater is the mean number after regeneration. Eight-tentacled *Hydras* showed the greatest reduction in the number of tentacles. Six-tentacled *Hydras* showed no reduction.

The average deviation from the mean was practically the same before and after regeneration. The average deviation from the mean after regeneration, and also the average deviation from the original number, was greater in the eight-tentacled groups and least in the six-tentacled.

The mean number of tentacles regenerated by whole six-tentacled *Hydras* was

6.0; by halves of six-tentacled *Hydras*, 4.6; by quarters of six-tentacled *Hydras*, 3.8. Of *Hydras* having the same number of tentacles the larger *Hydras*, or parts of them, regenerate more tentacles than the smaller ones or corresponding parts of them. *Hydras* cut longitudinally into pieces of equal volume, but bearing different numbers of tentacles, regenerate as many tentacles as are required to complete a normal number.

In the regeneration of a small fragment of hypostome with tentacles attached, one tentacle became thickened to form the body. Often in the regeneration of whole 'heads' a tentacle whose axis came to lie approximately in the axis of the body apparently became thickened to assist in the downward extension of the body.

In 'heads' severed immediately below the tentacles forms of very abnormal appearance resulted in the process of closing the wound. Abnormalities, consisting in tentacles abnormally placed and in unusual numbers of oral tentacles, persisted for a considerable period. Regulative processes resulted in the degeneration of abnormally placed tentacles and in the establishment of a normal number of oval tentacles. Tentacles but slightly displaced from the circumoval ring were shifted back into it.

The regenerative and regulative processes are directed toward the regaining of a perfectly normal form.

Notes on the Actinians of Bermuda. A. E. VERRILL.

On the Atlantic Palolo Worm. A. G. MAYER.

The Origin of Blood Vessels in the Chick. L. H. SNOWDEN.

The Evolution of the Color Pattern of Columba livia from that Preserved in C. affinis Blyth. C. O. WHITMAN.

BASHFORD DEAN,
Secretary.

STALACTITES OF SAND.

IN Mr. Rose's black-sand gold mine, on the Oregon coast, about fifteen miles south of Coos Bay, are some curious stalactites of sand which deserve attention on account of their exceptional character.

The mine is along an ancient beach about 160 feet above the sea level and nearly two miles distant from the present shore. The black sand in which the gold occurs rests directly upon the upturned and eroded edges of Tertiary shales. It is about 100 feet in width and four feet in thickness, and is overlain by about thirty feet of horizontal Pleistocene sand beds with some gravel. These have to be removed before the black sand can be reached. The black sand at this point is composed chiefly of garnet, with a number of other heavy ferromagnesian minerals. It is partially cemented by oxide of iron, but may be readily crumbled in the hand.

The gray sand by which the black sand is immediately overlain is composed chiefly of quartz, but contains also many grains of feldspar besides those of other minerals and rocks. In some places this gray sand is cemented so firmly as to form a friable sandstone, and when the black sand is removed from beneath the exposed under surface of the sandstones is found to be covered with stalactites of sand. The cross bedding in the sand dips gently to the west. The stalactites incline westward at the same angle, forming only a small angle with the surface to which they are attached. The forms of the stalactites are well developed; some are small, others nearly a foot in length. Most of them are single, but a few are double, as if two were united in their development. There is no sign of a tube down in the center, as in the case of many stalactites of carbonate of lime.

The cementing material by means of which the sand is held together, making these curious forms, is not soluble in acid.