is the nut of another species. Figs. 1063 to 1065 represent species of *Cardiocarpus;* they resemble the fruit of the anomalous Gymnosperms of Africa, Welwitschia (page 435). The peculiar but beautiful fan-shaped leaves, named *Whittleseya elegans* by Newberry, are of unascertained relations. Figs. 1066, 1067 are supposed to be fruit of Gymnosperms, in different stages of development; and Fig. 1068, fruit of doubtful species.

Figs. 1066, 1067 have the forms of half developed flowers or leaf-buds, and were called *Antholithes* by Newberry. They are referred to the Conifers by Grand' Eury. Lesquereux regards *Botryoconus priscus* (Fig. 1067) as a more advanced stage of *B. Pitcairniæ.* Fig. 1068, *Antholithes* of Newberry, is the fruit or flower of a *Cordaites*, according to Lesquereux.

ANIMALS. — The animal life of the Carboniferous period included, besides marine Invertebrates, terrestrial Mollusks, and a large variety of terrestrial Articulates, as Insects, Spiders, Myriapods; and, among Vertebrates, besides Fishes and Amphibians, a higher range of life, in true Reptiles. No evidence has been obtained of the existence then of Birds or Mammals.

1. **Rhizopods.** — Shells of *Rhizopods*, of the shape and size of a kernel of wheat, belonging to the genus *Fusulina*, Figs. 1069, *a*, are common in some of the shales and limestones of the Mississippi valley and beyond, in Illinois, Kansas, Utah, New Mexico, California, and elsewhere. In British Columbia, on Fraser's River, at Marble Cañon, the *Fusulinæ*, of a thick limestone, are associated with a very abundant arenaceous Rhizopod, $\frac{3}{10}$ of an inch long, shaped like an elongated shot, which has been referred to the genus Loftusia, and named *L. Columbiana.* In Europe the Fusulinæ are found in *Subcarboniferous* beds as well as in the Carboniferous and Lower Permian.

1069.

a.

Fusulina cylindrica; *a*, end view.

2. **Actinozoans and Echinoderms.** — Corals, seldom abundant, are of the genera *Lophophyllum, Zaphrentis, Lithostrotion*, and others. *Lophophyllum proliferum* McChesney occurs in roof shales over coal at Springfield, Ill. Crinoids are few compared with those of the Subcarboniferous; Illinois has afforded about a dozen species; and Missouri others. In Nevada, Arizona, New Mexico, Nebraska, etc., have been found a few *Echinoids* of the genus *Archæocidaris.*

3. **Molluscoids and Mollusks.** — The *Brachiopods* are similar in genera to those of the Subcarboniferous, though partly of new species; and the same is true in the main of the marine Gastropods, Lamellibranchs, and Cephalopods. Some of the characteristic species are here figured: a characteristic *Productus* in Fig. 1070, a *Chonetes* in 1071, and Gastropods in 1076 to 1080.

But besides marine Gastropods, the Coal-measures have afforded the first known of *terrestrial* shells. One of the small land-snails, or *Pulmonates*, is represented, a little enlarged, in Fig. 1081, — a species found in the Nova Scotia Coal-measures, and described by Dawson; and Figs. 1082, 1083, from F. H. Bradley, show the forms of two others from Illinois.