

by the lateral junction of pairs of uniserial arms, but rather to call attention to the fact that the arms of certain cystids apparently present similar problems. Since these cystids are not as fully known as desirable, a more detailed description of *Comarocystites* is given here, and a few notes on *Caryocrinites* are appended. Moreover, these are the only cystids known at present in which the arms are free and pinnuliferous, and, as such, possess special interest. Both genera are American, occurring both in Canada and in the United States.

II. DETAILED DESCRIPTION OF COMAROCYSTITES PUNCTATUS BILLINGS.

5. *Chief characteristics of the theca.* Theca obovate, sometimes attaining a length of 75 millimeters, composed of about 150 plates, most of which are hexagonal in outline. Theca moderately compressed from front to rear. The two primary food-grooves diverge toward the right and left from the mouth in such a manner as to present the appearance of a single transverse, slightly curved, food-groove (Plate II, figs. 1A, 1B). The mouth does not present the appearance of a slit, as in *Aristocystis bohemicus* Barrande, and apparently also in *Caryocystis angelini* Haeckel, but takes the form of a more or less circular or elliptical aperture located in the bottom of the transverse apical food-groove already described. At each end of this food-groove the latter branches dichotomously on the proximal side of a nodular protuberance of stereom about 10 or 11 millimeters in diameter. Each nodular protuberance supports two arms. There are, therefore, four arms, arranged in pairs, one pair at each end of the transverse apical food-groove. These correspond in position to the lateral arms of the five-rayed cystids, there being no arm corresponding to the anterior arm of other cystids. The anal pyramid (Plate II, figs. 1A, 1B, 2; also Plate III) is situated a short distance below the protuberance supporting the pair of arms on the right side of the specimen. In larger specimens the transverse apical food-groove, between the points of dichotomous branching, has a length of about 13 millimeters, thus giving to each of the two lateral primary rays a length of 6 millimeters. Throughout its length the transverse apical food-groove follows the suture line between the anterior and posterior peristomial thecal plates. Along the basal margin of the nodular stereom protuberance, the exterior surface of the adjoining thecal plates of some specimens presents the appearance of being crowded back by the growth of the protuberance, and consequently of being reduced in size. The upper margin of these thecal plates appears to rest against the lower half of the protuberance, but cross-sections of other specimens indicate that the upper inner margin of these thecal