

ON THE FOSSIL *CONOSTICHUS*

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The true nature and taxonomic position of the object known as *Conostichus* have long been in doubt. The question was recently revived by Dr. Kelley Hale, of Wilmington, Ohio, who has made a large collection of these forms. At the Delaware meeting of the Ohio Academy of Science on April 22, 1955, members of the Geology Section engaged in a lively discussion of the subject and some of the divergent views are here presented with the hope that additional ideas may be brought forward.

The genus *Conostichus* was erected by Lesquereux (1880) for specimens from the lower part of the Coal Measures of Pennsylvania. He described the stipe as:

"cylindrical, continuous; frond enlarging from the base upwards in the shape of a plate or of a cup, or increasing by successive, superposed layers or concentric laminae; top cup-shaped, concave.

"These organized bodies, whose reference to plants is questionable, have in their mode of growth a relation to some marine algae of our time, the Acetabulariae, which bear, on a continuous stipe, successive umbrella-shaped fronds, the lower rendered solid by incrustation of calcareous matter."

Lesquereux divided his material into three species; *C. broadheadi*, short, . . . semiglobular . . . deeply wrinkled lengthwise on the outside; *C. prolifera* with fronds thick and disciform, disposed in successive series upon a continuous narrow stipe; and *C. ornatus* (fig. 1) characterized by the regularly lobate cup, marked by deep lines diverging star-like from the axis and passing up to the top. He remarks that his examination shows that the laminae were not agglutinated, but free.

Lesquereux further supported his hypothesis of the plant origin of *Conostichus* by comparing the stellate pattern of the base with that of *Asterophycus* and by noting the peculiar, hard, whitish siliceous material of which both forms are composed. "It is a well known fact," he says (Lesquereux, 1876), "that though the algae do not take their food from the rocks to which they adhere, they often modify the composition of these rocks by their growth. Their influence . . . is even more marked upon sand or any soft substances surrounding them." He ruled out the possibility that *Conostichus* might be considered as a sponge for while there may be a degree of analogy in some species of the *Hexactinellidae* none of the sponges has a continuous axis and even in a fossil state, their surface is always rugose.

James Hall (1852) described a very similar fossil, from shaly sandstones of the Clinton group, Oneida County, New York, under the name of "Roots of *Buthotrephis*" a marine plant. He compared the cone to the depression made by the stem of the plant as it swayed to and fro. Such depressions are seen today around marine plants growing in the mud of tidal flats.

At the Delaware meeting Dr. Kenneth Caster took the position that *Conostichus* was the sand filling of the upper end of the burrow of a marine worm. He supported this opinion with the observation that certain modern marine worms make conical depressions in the sea floor by the swaying of the anterior part of their bodies while the posterior part remains in the tubular burrow below. The siliceous nature of the fossil was deemed the sand which washed into depression, possibly even accounting for the death of the worm. The longitudinal ridges are, in his view, molds of markings made by the worm's body. The successive laminae represent successive positions of the worm as it drew itself upward in its mucus-lined burrow.

Dr. Wilber Stout considers *Conostichus* to be a plant which grew in fresh or brackish water. From his intimate acquaintance with Ohio rocks and his many years of study of their problems, Dr. Stout has prepared the following statement of the occurrence of *Conostichus* and his views as to its nature.
