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Joint 52nd Northeastern Annual Section / 51st North-Central Annual Section Meeting - 2017

Paper No. 49-3

Presentation Time: 8:40 AM

PROBABILISTIC APPROACHES TO PROBLEMS IN TAPHONOMY: PROBABLE ATTACHMENT OF CONULARIIDS TO BRACHIOPODS IN THE UPPER ORDOVICIAN COLLINGWOOD SHALE (ONTARIO, CANADA)

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Likelihoodism is a probabilistic philosophy of scientific inference that is based upon evaluation of the relative likelihoods of alternative hypotheses. We have been applying the law of likelihood to the interpretation of repetitive spatial patterns exhibited by mutually contiguous or overlapping *Onniella rogata* (Brachiopoda, Orthida) and *Conularia trentonensis* (Cnidaria, Scyphozoa) from dark gray shales in the Upper Ordovician (Edenian) Collingwood Member of the Lindsay Formation (Craigleath, southwestern Ontario, Canada). Previously reported independent lines of lithologic, stratigraphic and taphonomic evidence together indicate that the original depositional environment of these shale beds was located near the lower limit of storm wave base and was characterized by extended periods of sediment starvation punctuated by influxes of storm-derived fine sediment. On sparsely to moderately fossiliferous bedding planes, prone flattened specimens of *C. trentonensis* occur as single specimens, in V-like pairs or in radial clusters consisting of three conulariids. In some cases (16 of the 102 *C. trentonensis* specimens observed), the narrowly triangular apical region of solitary, paired or radially clustered conulariids occurs within the sub-rectangular outline of a single articulated specimen of *O. rogata*, overlapping either the pedicle valve or the brachial valve and tapering invariably toward the hinge line. Although the apex of the *C. trentonensis* specimens is not preserved or (perhaps) covered, and no attachment structures attributable to conulariids have ever been found, it can be argued that the observed set of spatial relationships between Collingwood Member *C. trentonensis* and *O. rogata* is *most likely* under the hypothesis that solitary, paired and clustered *C. trentonensis* were attached, in life at their apex, to articulated shells of living *O. rogata*. Further evaluation of this and alternative hypotheses, for example that the observed spatial patterns resulted from concentration of conulariid and brachiopod specimens by bottom currents, might involve actual or simulated flume tank experiments.

Session No. 49

[Paleontology and Stratigraphy I](#)

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