

SIZE CLASSES IN A DEVONIAN AMMONOID FROM THE MIDDLE DEVONIAN CHERRY VALLEY LIMESTONE OF NEW YORK STATE, U. S. A.

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The agoniatites in the Cherry Valley Limestone (Middle Devonian) of New York State, U.S.A. occur in discrete beds throughout their range. This and the lack of small juveniles preserved in these beds have led workers to suggest that the agoniatites represent periodic immigrants into the area during times of transgression. Before a viable reproducing population could become established they suffered a mass mortality event.

One of these beds, possibly the most extensive, is well exposed at the Seneca Stone Quarry as a large bedding plane exposure. It was originally thought that such an exposure would be ideal to study the population structure of the agoniatites. Unfortunately most of the specimens were lying oblique to the bedding surface and/or weathered in such a way as to make accurate measurements impossible.

A much smaller bed had been collected previously and is in public view in the New York State Museum, Albany.

It is the lower surface of a slab of the Cherry Valley Limestone, measuring ~ 1.6 m x 2.0 m. The slab contains 43 specimens of Agoniatites vanuxemi in lateral view, of which 39 were measureable. The following measurements were made: total diameter, the accompanying whorl height, phragmocone diameter, whorl height at the end of the phragmocone, and body chamber angle. Septal angles were also measured where possible.

Phragmocone diameter was considered a more constant measure of size because the body chamber measurements suggested that none of the specimens were complete. A size frequency histogram of phragmocone diameter (N=25) indicated the presence of three discrete size classes. Size classes in ammonoids have been used to suggest two things: sexual dimorphism and the presence of different age groups in a population. Sexual dimorphism is discounted here based on the lack of evidence of maturity. There are no adult apertural modifications known in Agoniatites, leaving septal approximation as the only evidence of maturity. In the 18 specimens where septal angles were measured, only four showed any indication of a decrease in septal spacing and in three of these it was slight. In none of the smaller sized individual was there any evidence of septal approximation.

It is concluded from this that the three size classes present in this sample represent different age classes in the population of Agoniatites vanuxemi, possibly three annual cohorts. The smallest and presumably youngest individuals were subadults. The largest and presumably oldest individuals were probably near maturity since a few of them were beginning to experience the slow down in growth inferred from septal approximation. Smaller juveniles probably lived elsewhere, as suggested by their absence. Only upon reaching a certain size and age did they enter the adult habitat.