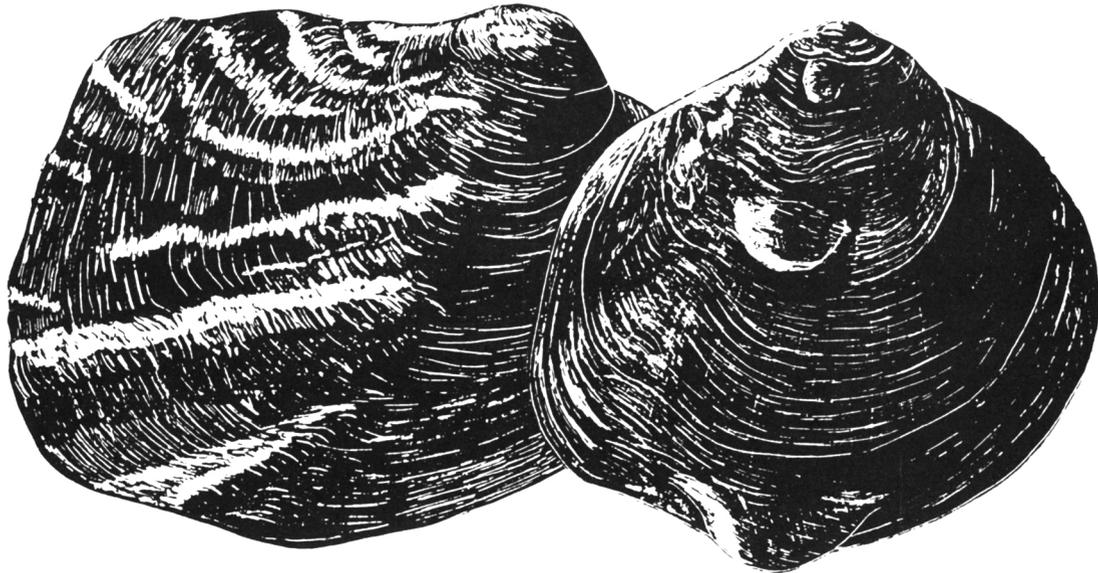


THE UNIONIDS OF THE MISSISSIPPI RIVER DRAINAGE - AN EXAMPLE OF NON-ADAPTIVE EVOLUTIONARY MORPHOGENESIS IN A TIME STABLE ENVIRONMENT.

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Sanders (1968) proposed that in deep-sea benthic environments the most important factor for species diversity is environmental time stability. Similarly, Gorthner (1992) found an evolutionary shell sculpture diversification in the freshwater gastropods (genus *Gyraulus*) of a long-lived crater lake in southern Germany. An adaptive explanation was not forthcoming and Gorthner's conclusion was that variation could be tolerated in the lake as selective pressure decreased due to "domestication" of the endemic forms. Endemic forms were superiorly adapted to their environment compared to any immigrants and variation could be tolerated and allowed to propagate, even without significantly increasing fitness. Internal construction then led to self-organizational pattern formation and a phase of decreasing adaptive morphogenesis was attained.



Unionids of the Mississippi River drainage of North America and other great rivers elsewhere, exhibit weak functional control of morphology as a consequence of this time-stable environment. Several species did evolve unusual shell ornamentations which can not satisfactorily be explained in terms of functional morphology. *Amblema plicata* and *Obliquaria reflexa*, serve as examples.

References

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