The Spiny Shells of the Altamaha

by Sam Fuller

With a volume which inspired poetry on either side of the Atlantic, the celebrated Philadelphia botanist William Bartram rhapsodically recounted his adventures in the southern United States almost two centuries ago. Published in Philadelphia in 1791, Bartram's "Travels" was a great favorite of Emerson and a source of imagery for Coleridge. The book, which became a classic in American natural history, also contains perhaps the first mention of a rare, spiny-shelled freshwater mussel found only in the American southeast.

During the course of his "Travels," Bartram visited the great river Altamaha, whose watershed drains most of central Georgia. Today the sickly, pungent odor of pulp mills hangs over the Altamaha, but in Bartram's day this river, the equal of the Delaware or Connecticut, was an unexploited naturalist's fairyland; its shores, the Indians' home, and its waters clean and clear above the white man's settlements.

The size of this enormous river system was repeatedly reduced during Tertiary and Pleistocene times when the low-lying coastal plain was inundated by rising sea levels. During these lengthy isolations of the upland portion of the system, a rich endemic fauna evolved. Today many species, representing numerous animal groups, are known only from the Altamaha and its tributaries.

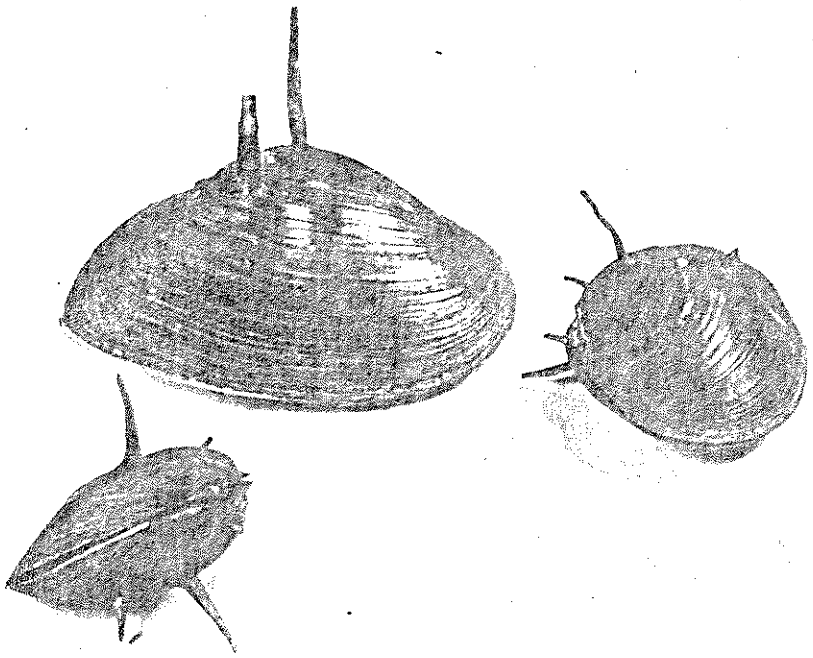
Among the more remarkable of these creatures is a group of unique freshwater mussels with oddly shaped shells, including the species *Canthyria spinosa,* which appears to have been first noticed by Bartram:

> *"We observed a large kind of muscle in the sand; the shell of an oval form, having horns or protuberances near half an inch in length and thick as a crow quill, which I suppose serve the purpose of grapnels to hold their ground against the violence of the current."*

When he wrote the "Travels" (no doubt chiefly from memory) some ten years after concluding his journey, Bartram attributed his "muscle" to the Mississippi River, but nothing of the sort has ever been seen except in the system of the Altamaha.

During the years following Bartram's account, *Canthyria spinosa* seems to have been ignored, until in 1836 Isaac Lea of the Academy of Natural Sciences gave this species its first name, *Unio spinosus.* As a matter of fact, the species has had a history of dropping from public view, and it had been presumed extinct for many years until a few living specimens were recovered in the early 1950's.

Then, in the summer of 1961, a modest expeditionary party of three set forth from Harvard's



These bizarre specimens of **Canthyria spinosa**, photographed from the Academy's collection, are shown life size.

Museum of Comparative Zoology to study the mussels of Georgia's coastal plain river systems. The group consisted of William J. Clench, then Curator of Recent Mollusca; Kenneth J. Boss, his student and now his successor; and myself. During our six-week survey, we "rediscovered" *Canthyria* at several localities.

Our first week in the field was a disaster. We seemed always to be in a part of the state where drought had withered the streams or yesterday's cloudburst had swollen them to dangerous levels. We finally decided to chance a return to the Altamaha itself, which had been very low when we crossed it heading south. Its waters turned out to be lower still, exposing great sand bars in the middle of the river.

We scrambled into the Altamaha ravine, then trudged across the flood plain and through the sands and pools at the river margin, through the shallows, and across the bars. There, along their outer slopes, we found *Canthyria spinosa* in numbers for perhaps the first time in a century or more—living "grapnels" anchored in the sand where the waters rushed by. We took a mussel to supper that evening to show the townsfolk who had taken an amused interest in our search.

Although *Canthyria spinosa* is unique in all the world, there are two other American mussels which are spiny in lesser degrees. Oddly enough, like *Canthyria*, each has been found in only one river system, both of which, like the Altamaha, are part of the Atlantic drainage of the United States. In 1836 Timothy Abbott Conrad of the Academy described *Unio collinus* from the James River of Virginia, and in 1964 Carol Stein of the Museum of Zoology at The Ohio State University found a third, as yet unnamed, spiny mussel in the Tar River of North Carolina.

Today, the classification of freshwater mussels is based primarily on comparative anatomy of the animals which live inside the shells, whereas the shells themselves are considered less reliable indicators of natural relationships. (This is because the shells can be so greatly modified by their immediate environment.) The anatomies of the three spiny mussels are now reasonably well known, but certain key facts, chiefly concerning their reproductive biologies, remain unknown.

Thus the correct genera of the James and Tar species remain unknown, as well. They, too, may be *Canthyria*, or they may not, but the Altamaha mussel stands alone, like the great and now somewhat moribund river which is its home.

Sam Fuller is an invertebrate zoologist in the Academy's Department of Limnology. A previous article of his, "Everything You Always Wanted to Know About Freshwater Mussels (But Were Afraid to Ask)," appeared in the June, 1971, issue of FRONTIERS.