

Fort Matanzas

National Park Service
U.S. Department of the Interior

Fort Matanzas National Monument



Coquina - The Rock that Saved St. Augustine

A Fort Made out of Seashells?

Who would think that a fort made of seashells would last 300 years? Who would think that a fort made out of seashells would last three days under cannon fire?

But the Castillo de San Marcos, made of local *coquina* stone, did and has survived very well for over 300 years. What exactly is this strange rock? How was it formed, and where did it come from? **And** how did this rock shape the history of St. Augustine?



How Coquina is Formed

Thousands of years ago, the tiny coquina clam *donax variabilis* lived in the shallow waters of coastal Florida, as they still do today. These are the small pink, lavender, yellow, or white shells one sees along the beach at the waterline. As the resident clam died, the shells accumulated in layers, year after year, century after century, for thousands of years forming submerged deposits several feet thick.

During the last ice age, sea levels dropped, exposing these shell layers to air and rain. Eventually, the shell became covered with soil, then trees and other vegetation. Rain water percolating through the dead vegetation and

soil picked up carbon dioxide and became carbonic acid, the same ingredient that makes soda pop fizz.

As this weak acid soaked downward, it dissolved some of the calcium in the shells, producing calcium carbonate, which solidified in lower layers much like flowstone and stalactites are formed in caves. This material "glued" the shell fragments together into a porous type of limestone we now call *coquina*, Spanish for "tiny shell".

A Stronger Fort Is Needed

Although found in very few places in the world, conditions were just right that several deposits of this shell rock formed along the east coast of Florida. The Spanish knew about this rock, and while they might have picked up loose chunks, the people of St. Augustine were primarily soldiers, not stone masons, and so this rock sat mostly unused and unappreciated for years. Wood was more plentiful, at first, and easier to work with.

But then the British, settling to the north, edged into the Carolinas. Spanish Florida was only a short sail away. Something more than a wooden fort was needed to protect St. Augustine and to keep the British from taking over Florida and using it as a base of

operations to attack the Spanish treasure fleets and the more wealthy colonies of the Spanish Caribbean.

So, in 1672, the Spanish began to build the Castillo de San Marcos out of coquina stone from a quarry located in the area of present-day Anastasia State Recreation Area on Anastasia Island. Military engineers and stone masons were brought from Spain. Convicts and additional soldiers were brought from Cuba. Oyster shells were burned into lime, mixed with sand and water to make mortar.