



ARCHITECTURE

EHLINGER & ASSOCIATES

THIRD QUARTER 2003



STONEHENGE Wiltshire, England

Stonehenge is an ancient, mysterious, megalithic monument on the Salisbury plain in Wiltshire, England, near the town of Salisbury. This location is on a high rise in the plain that is wind swept year round such that it seems to always be cold and forlorn. The origin and true, exact purpose of Stonehenge is unknown. There are multiple theories, but the one that has been totally debunked is that the Druids built it for their religious rites. The Druids did however utilize it when they came on the scene in approximately 300 BC. Historians are certain that Stonehenge was completed approximately 1,000 years earlier than the Druids arrival.

This monument was built perhaps as an astronomical clock to mark the seasons, particularly for planting. The axis of the site is aligned with the Summer solstice, such that the rising sun of that day aligns with what is called a Heel Stone outside of the outer circle of stones, and a pair of sarsens (large, upright stones) and an altar in the inner circle of stones — much like the sight on a rifle. The equinoxes are also represented by minor axial relationships.

There is a more recent theory by Dr. Anthony Perks that Stonehenge was also built as a symbolic female genitalia, the

parts appear at the time of birth. Dr. Perks theory was presented in the February 2003 issue of the Journal of the Royal Society of Medicine.

What we do know factually though is equally interesting. Stonehenge was begun as a monument somewhere between 9,000 and 8,000 years ago when four Mesolithic pits were dug which contained nine wooden posts erected in alignment 200 m from the present site. Between 5,000 and 3,000 years ago, the present complex was begun.

Stonehenge 1 consisted of the construction of the circular bank at the outer perimeter, the ditch, and the 56 Aubrey holes (named after the antiquary, John Aubrey, who erroneously attributed Stonehenge to the Druids), which holes probably originally contained timber posts.

Stonehenge 2, from 2500 BC, consisted of a complex of timber posts in the interior and the entrance causeway. Cremated human remains have been recovered that had been placed in the ditch and the Aubrey Holes that were partially filled, along

vulva and vagina; including the labia majora and minora, the clitoris and the opening of the birth canal, when viewed by the “Eyes of Heaven”. The depiction of the anatomical parts is being represented by the inner and outer circles of stones, as the

with pottery and animal bones.

Stonehenge 3, from 2100 BC, forward consisted of the stone structures probably constructed in the following sequence:

1. Bluestones from Wales were erected in the inner circle or horseshoe and then dismantled. The Bluestones were from the Prescelly mountains, located roughly 240 miles away at the southwestern tip of Wales. The Bluestones weigh up to 4 tons each and about 80 were used. Given the weight and distance, these stones presented quite a logistics problem.
2. The sarsen stone circle (outermost) and trilithons (3 stones: 2 vertical one lintel in inner horseshoe) erected with possibly also a Bluestone setting which may have included trilithons, this latter then dismantled. The sarsens weigh as much as 50 tons each and came from the Marlborough Downs, roughly 20 miles to the north.
3. Bluestone circle and oval setting.
4. Arc of Bluestones removed from oval to leave present horseshoe setting.
5. Y and Z holes dug (concentric rings about the inner horseshoe) probably for stones which were never erected. During this phase the avenue was also constructed.

The lintels on the sarsens are secured vertically by mortise and tenon joints and horizontally by tongue and groove joints. All of the stones were transported and erected apparently without draft animals,



much less with mechanical equipment.

Today, Stonehenge is owned by the organization English Heritage, and the surrounding lands by the National Trust. There are ongoing efforts to protect, preserve and even enhance this world class treasure. One of the measures being advanced is to move the major highway that is 100 m from the site to a more discrete location.

THE LAST FORT

For thousands of years, the Fort (and Castle) was the stronghold of military defense. With walls high enough to prevent easy scaling, thick enough to prevent projectiles from penetrating, and openings narrow enough to fire weapons safely from within, the Fort was an achievement of architectural durability, planning, and safety.

Military weapons' technology outpaced the architecture technology of the Fort however, and the story of the last and greatest Fort takes place in Savannah, Georgia, at Fort Pulaski.

After the war of 1812, President Madison instituted a plan called "The Third System", the commission of a series of Forts along the Eastern Seaboard, to defend the shores against attack. Fort Pulaski was the last of these Forts to begin construction, and the last to be completed. It cost \$1 million, was completed in 1847, after 18 long years of construction, beginning with Robert E. Lee, who designed and dug the trenches for the moat, and primarily completed by Lt. Joseph Mansfield, who oversaw construction from 1831-1845. It contained over 25 million bricks, with exterior walls 7.5 feet thick.

Built on an island in a marsh to prevent land based sieges, its walls were considered invincible to attack by cannon from ship, which were mostly ineffective at a range over 1,000 feet, which is roughly how far the walls of the fort are from the nearest channel that is deep enough to hold a ship that could bear cannons.

Before the Civil War, the Fort had fallen into disrepair. The Third System had overextended the U.S. military budget, and was neglected during the Mexican-American war. When Georgia split from the Union, there were a total of 2 Federal soldiers manning the Fort, and the Fort was taken and held by a force of 134 Confederate soldiers, in January, 1861.

The Union advanced fast, though, with one of their primary targets being the Forts along the Eastern seaboard, in an attempt to cut off the South's industrial supplies from England and France. By November, 1861, the Union had penetrated and was holding the coast both to the north and south of Ft. Pulaski. The fort with its fleet was the last defense keeping the trading channel to Savannah open, and the Confederacy was convinced they could hold it easily. Even if they lost their fleet, they had enough provisions to last for six months, and the walls were impenetrable.

The Union, however, had a nasty surprise in store for the fort. On the evening of April 9, 1862, the Union set up an artillery battery on Tybee Island, whose nearest shore to Ft. Pulaski is over 1600 yards from the walls of the fort. The Confederate soldiers noticed the enemy movement on the island, but were hardly

increased their range and accuracy: rifling.

Rifling is the engraving of grooves in a spiral pattern on the inside of the gun's barrel, which directs the exhaust gases and forces the projectile to spin, allowing it to pierce the air and go farther. Shortly after this, the shape of the projectiles was changed to a bullet to take advantage of this effect. Before the Civil War, however, this improvement had only been effectively employed in musket rifles.

Union Captain Quincy Gilmore, who was also a materials science engineer, was familiar with the new technology, and to the ridicule of some fellow strategists, decided to employ it in the larger artillery weapons, and to use those mostly untested weapons as his primary strategy in taking Fort Pulaski with a quick bombardment.

The new Union artillery had ranges of 1-2 miles. The first shot was fired on Ft. Pulaski just after 8:00, on the morning of April 10th. The shot missed, but the surprise was that the round had actually gone OVER the fort. It wasn't long before the Union had figured the range correctly, and shots were hitting the walls. With the new shaped bullets, huge chunks of brick were being blasted away with each shot.

By noon the next day, two walls had been breached, and the shots were falling

inside the Fort, striking over 40,000 pounds of powder in storage. Colonel Olmstead, in charge of the fort, gave up hope and ordered the Confederate flag lowered. Then Brigadier General Gilmore (field promoted), of the Union, demanded and received an unconditional surrender. The fall of Ft. Pulaski is considered by many as an important turning

battle of the war, as it effectively closed off the Eastern seaboard shipping lanes from the Confederacy.

So the last and greatest fort fell, ringing the death knell not only on the Confederacy, but also on one of the longest lived building types of architecture.

by: Perrin Ehlinger



concerned: there was no weapon in the world (or so they thought) that had a range of 1 mile.

When Fort Pulaski was built, the Union's battery would have been laughable: a cannon's range was about 350 yards maximum, and at that range it did little more than damage from its weight and mass. In 1855, a new improvement to gun manufacturing was made which