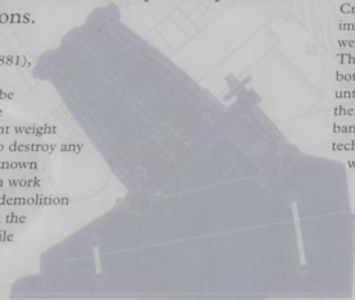


Mallet's Mortar

Robert Mallet's great mortar remains the largest-bore artillery ever built. Conceived in 1854 and built between 1855 and 1857 it was designed to destroy fortifications but never fired a shot in anger.

In 1852 Major John Straith recommended that fortifications should not be besieged with less than forty 24-pounders, eighty 18-pounders and forty-six mortars. Not counting ammunition this totalled around 700 tons (711,200 kg) and would clearly be impractical for most situations.

Robert Mallet (1810 - 1881), an Irish civil engineer, believed that it ought to be possible to deliver, in one devastating blow, sufficient weight of shot from one source to destroy any arched-vault used in any known fortress. Before any design work began, he investigated the demolition capability of shot and shell, the requirements of the projectile and the weapon's method of construction.

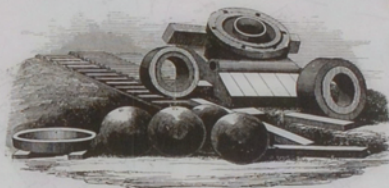
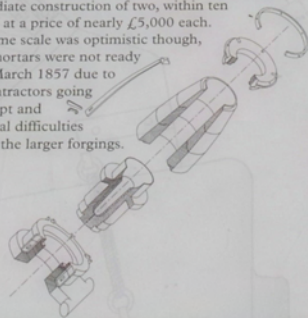


Mallet's 36 inch Mortar
1855

He concluded that a 36-inch shell, strong enough to withstand impact and containing around 480 lb (217.7 kg) of powder, would penetrate at least 15 feet (4.6 m) into compacted earth and, on explosion, produce a 40-foot (12.2 m) wide crater. The shock wave would be the same as an earthquake and Mallet calculated the demolition effect to be 1600 times greater than the 13-inch mortar on display in the North Caponier at Fort Nelson. But the problem remained of how to build a gun to fire such projectiles to a range of about 1½ miles (2.4 km).

What was required was a gun of extra strength to withstand greater propellant charges and Mallet felt this could be achieved in a new way. Instead of using a gun cast as a single piece he believed the answer lay in using superimposed rings in compression around a central tube. The design also had to be capable of separation into several distinct parts to ease transportation and to allow the replacement of damaged parts.

Mallet's proposals sufficiently impressed the Prime Minister, Lord Palmerston in 1855, who, with the Crimean War (1853 - 1856) in mind, ordered the immediate construction of two, within ten weeks, at a price of nearly £5,000 each. The time scale was optimistic though, both mortars were not ready until March 1857 due to the contractors going bankrupt and technical difficulties with the larger forgings.



Between October 1857 and July 1858 four trials were held on Woolwich Marshes. The first three had to be suspended due to ring fractures but each time the damage was repaired. The last resulted in a break in one of the six longitudinal tie bars and a War Ministry refusal to spend any more money on the project.

The mortar remained on the marshes until 1869 when the elm bed was blown-up to render it safe. It may then have been brought ashore and together with the second unfired mortar came into the possession of the Tower Armouries in 1925. On display here is the second mortar brought from Woolwich in 1993 and placed on a concrete replica bed in 1995.

The experiments proved that Mallet's ideas were not fanciful. A projectile weighing one ton had been sent over 1½ miles (2.4 km). An observer wrote of the 'slow and majestic motion of these great globes through the air'. The fact that rings failed supported the concept of using built-up layers under tension for more equal stress distribution - the concept of the 'built-up' gun was born. It was William Armstrong though who benefited from Mallet's brainchild with his range of guns adopted for service in 1858.

Technical Specification

Mortar

Calibre: 36 inches (91.4 cm)
Weight: 40 tons (40,642 kg)
Heaviest individual piece: 12 tons (12,193 kg)
Maximum weight of propellant: 80 lb (36.3 kg) of gunpowder
Maximum Range: 2,750 yards (2,523 m)
Contractors: Thames Iron works, Mare & Co, Blackwall; Horsfall & Co, Liverpool and Fawcett, Preston & Co, Liverpool

Shell

Weight: Heavy 2,940 lb (1,333.6 kg)
Medium 2,660 lb (1,206.6 kg)
Bursting charge: 480 lb (217.7 kg) of gunpowder

Additional Equipment

Two cranes for loading shells into the mortar.
Triangle gun for construction and dismantling of mortar.



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