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Chapter 2

CONGREVE ROCKETRY REVISITED*

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CONGREVE'S ROCKETS

The English inventor Sir William Congreve (1772-1828) had an influence on the story of rocketry far in excess of the actual results achieved by his rockets. His main achievement was in creating a 'Weapons System,' comprising a wide range of war rockets together with launchers for land and sea use. But despite all Congreve's ingenuity, inaccuracy remained the Achilles heel of the rocket system, as shown by the following eye-witness description of their use in 1810, during the Peninsular war.

> At 7 o'clock Lieutenant Lindsay of the Artillery began to throw Congreve's rockets into Santarem; forty-two let off, about four fell in the town; four burst amongst ourselves; the French seemed to treat us with great contempt. . . . . I have a very poor opinion of Congreve's rockets; they can't be thrown with the precision of shells [1].

Since contemporary artillery proved more reliable and accurate, the Rocket System could only show its full potential if used in massive bombardments of fortresses and towns. However, Britain's best soldier, the Duke of Wellington, did not regard such use as either civilized or necessary [2].

THE ROCKET SYSTEM IN ACTION

During the Napoleonic Wars, there were three 'classic' actions which demonstrated the advantages and disadvantages of the Rocket System: Boulogne 1806, Copenhagen 1807, and Leipzig, 1813.

Boulogne, 1806

Boulogne, where Napoleon's invasion fleet was gathering, was the Congreve rocket's baptism of fire. Congreve suggested that rockets be used to attack this strategic target. Despite the doubts of senior naval officers, the first attempt was made in November 1805, with 12 launches, each carrying 48 rockets. However, the weather was not good enough to allow any rockets to be fired [3].

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Later the next year, another attempt was made to attack Boulogne. In the interval, Congreve had developed improved 24- and 32-pounder incendiary rockets. Iron instead of paper cases enabled the range to be increased from 600-700 yards (550-640 m) to 3,000 yards (2,740 m) [4]. Smaller and lighter rocket launchers carrying four rockets each were also developed. Gun brigs were fitted with three of these frames and cutters with one.

The attack was made on the night of 8 October 1806. The following extract from Congreve's report of 12 October 1806 to Grenville, the First Lord of the Admiralty, make it clear that, although the Rockets damaged the town, they missed the main target, shipping in the basin.

> After a few rounds it was discovered that the place was on fire . . . . it burnt very fiercely in that quarter where the principal storehouses were known to be . . . some of the shipping must have been burnt, as the fire was in the direction of the Harbour, tho' not of the basin . . . . . the number of rockets thrown was about 400 in less than half an hour [5].

In the same report, Congreve attributed this failure to a faulty survey of Boulogne, placing the basin nearer the sea than was actually the case.

The Bombardment of Copenhagen, 1807

Copenhagen made the Rocket System's reputation. From then on, it attracted widespread foreign interest as a weapon to be reckoned with. During the bombardment, land-based batteries of rockets supported conventional artillery bombardment. Some 300 rockets were used, fired by 16 men. The city caught fire, but opinions differed as to whether Rockets or Mortar bombs were responsible.

Congreve had no doubts about their performance, and stated "I am indeed in possession of a considerable body of evidence . . . . which appear fully essential to the conflagration of the town" [6].

This opinion was supported by Baron Eben, a Prussian serving in the British Army, who wrote to Congreve:

> I was in Copenhagen for some time after the capitulation . . . not being an Englishman, I have, perhaps, had some opportunities which your countrymen had not. The Danes were very much afraid of the rockets, and said they had burnt a great many houses and warehouses; and some people said the church had been set fire to by the rockets; and I saw a house myself, which was struck by a rocket, which went through the roof and three of the floors, and stuck into the side of the wall [7].

Later, the bombardment of Copenhagen prompted the development of war rockets in Denmark. The moving spirit behind this development was Andreas Schumacher, a second lieutenant in the Danish engineer corps, who began his work by examining Congreve rockets found after the bombardment [8].

The Battle of Leipzig, 1813

Leipzig, where the British Army's experimental rocket brigade went into action against Napoleon's army, was the Rocket System's finest hour. They were the only British troops present during this battle, at which the armies of Prussia, Russia, and Sweden defeated Napoleon. The performance of Congreve rockets during this

battle led to the development of war rockets by the Austrian army, which went on to create the most successful European rocket establishment. The moving spirit behind these developments was Vincenz von Augustin, who served at Leipzig as a Major of Artillery [9].

During an attack on the village of Paunsdorf on 18 October 1813, the Rocket Brigade played an important part in the capture of the village, after which 2,500 French troops surrendered.

Sir Charles Stewart, British representative with the Allied Armies wrote:

> Congreve's formidable weapon . . . achieved the object of paralysing a solid square of infantry, which, after our fire delivered themselves up as if panic-stricken. . . . I felt great satisfaction at witnessing during this day a species of improved warfare, the effects of which were truly astonishing and produced an impression upon the enemy of something supernatural [10].

However, a more objective view was given by General Comte de Rochechouart, Aide-de-Camp to the Tsar of Russia:

> As this (Congreve rocket) artillery was obliged, in order to produce an effect, to approach within half grapeshot range of the enemy and was engaged against formidable French batteries, half of the company had been put out of action in the twinkling of an eye [11].

Actual casualties were not so heavy as this account implies. The rocket brigade had only two men killed during the whole battle, but one was their commander, Captain Bouge, and they also had about a quarter of their horses killed [12].

However, the Rocket Brigade had only achieved success by getting so close to the enemy that they could not miss. At that range, neither could the French, but the terrorizing effect of rockets at close range carried the day.

Afterwards, the Allied sovereigns showered decorations on Congreve and the survivors. On 1 January 1814 the Rocket Brigade became the British Army's permanent rocket corps, and in 1815 was granted the battle honor of 'Leipzig.'

PEACEFUL RELICS OF THE CONGREVE ROCKET SYSTEM

The Whaling Rocket

In 1821, Congreve and Lieutenant James Colquhoun of the Royal Artillery took out patent 4563, 'Application of Rockets to the Destruction and Capture of Whales &C.' This was a blanket patent as it stated:

> ". . . we do not limit ourselves to the use of any particular form of rocket, but secure to ourselves generally the right of using the projectile commonly called the rocket in the destruction and capture of the whale and other animals . . . for which purposes it has never been employed.

These rockets were to be used both with and without lines attached, and the patent also describes the launchers that were to be used; either small rocket muskets, launching tubes similar to the modern bazooka, or open launching troughs. The rockets were to be launched at ranges from 30 to 50 yards (27 m to 46 m).

The wording of the patent shows that these were results actually achieved rather than optimistic predictions. In 1820, Colquhoun and two gunners went on a voyage in the whaler *Fame*; William Scoresby and his son were keenly interested in new ways of killing whales. During the same period, they also tested harpoon guns and harpoons with explosive warheads [13].

The rockets worked, for on 9 September 1821 *Fame* arrived back in port "Having killed 9 whales and a finner with the rocket apparatus; this and the 9 whales were dead in less than 15 minutes, and 5 of them took out no line at all" [14].

Fortunately, a 2-pounder Congreve Whaling rocket and its launcher survive in the collections of the Museum of Artillery in the Rotunda, Woolwich, London [15]. The rocket, which is currently on show in the 'Exploration of Space' gallery at the Science Museum, London, is an adaption of the standard Congreve center-stick war rocket. Instead of a warhead, it carries a bronze spear-point and is approximately 38 mm diameter and 1,520 mm long.

Of equal interest is the launcher, which corresponds exactly with the description in patent 4563:

> A plain iron tube of the same size in every part, and open at both ends so as to allow of passing the rocket into the breech end of the tube for loading, this tube having either a common flint lock or a detonating lock .... fixed to that part of the tube where the rocket is placed when charged for firing; the breech end of this tube may be closed after the rocket is inserted, and the rocket running through the cylinder acquires the necessary accuracy for striking the object.

The surviving launcher has a spring-loaded clip, which prevented the rocket from accidentally sliding out of the tube. It is fitted with an early detonating lock, which, unlike a flint-lock, could be used in wet weather—vital if being used aboard a small whaleboat. A tube filled with a mercury fulminate compound was clipped into the lock; when hit by the hammer, the compound ignited, flashing flame into the tube just behind the rocket vents and igniting the rocket. The launcher is 1,480 mm long with a bore of 40 mm.

Although apparently successful, the whaling rockets were not adopted. Prejudice and unreliability no doubt played a part in this, just as the Congreve war rocket was eclipsed by improved artillery, the Congreve whaling rocket was forgotten and harpoon-throwing guns adopted later in the 19th century.

The Life-Saving Rocket

The earlier life-saving rockets of Henry Trengrouse prompted Congreve to develop his own design. In applying his rockets to saving life at sea, Congreve's aim was to save the crew of a shipwrecked vessel "without assistance from the shore." He proposed to do this by modifying his standard design of 32- or 12-pounder war rocket to produce a line-carrying rocket capable of firmly anchoring itself to the shore.

The line was attached to the rocket at two points; to the base of the anchor itself, and to the end of the stick for stability. Wisely, a chain was used "in addition to the rope near the rocket, lest the rope should burn" [16].

The anchors were designed to break off close to the attachment point to the rocket, to avoid leverage on the end of the rocket stick from dislodging them.

Congreve also developed a spear-pointed folding anchor for the life-saving rocket, which would easily bury itself in the ground, and open out and fix firmly when strain came on the rope. The crew would then use a life-buoy to get to shore.

Maximum range of the 32-pounder life-saving rocket was "more than a quarter of a mile," or about 400 m [17].

By 1822 Congreve had placed a model of the life-saving rocket and its equipment in the Museum of Artillery in the Rotunda at Woolwich (catalog Class XX 94). During a recent survey of the Congreve collections at the Rotunda, only its launcher was found [18].

However, when examining several Congreve models transferred to the National Maritime Museum, Greenwich, from the Rotunda, the remaining parts of the life-saving rocket were discovered. These had been wrongly catalogued as part of a model of a rocket launch, showing the plan adopted for using the rockets in the Basque Roads' (Rotunda catalog Class XX 99). In addition to the rocket, a model of the life-buoy was also discovered at Greenwich.

The models are approximately 1:4 scale. The launcher is a simple wooden trough in two parts, supported on two legs. It measures 970 mm long. The model rocket is of the Congreve center-stick type, and is approximately 895 mm long, with a 25 mm diameter rocket case. At a scale of 1:4 this corresponds to a 32-pounder rocket. Interchangeable anchors screw into the flat head of the rocket. Two model anchors survive, one with folding flukes. Both have chains and rings for attaching ropes.

The life-buoy, complete with mariner, is approximately 350 mm high, 390 m wide, and 330 mm deep. It was designed to be fixed to the line thrown ashore by the rocket. The buoy could be drawn along the line by its passenger, or a block and tackle worked from the stranded ship. According to Congreve, the metal cage would protect the passenger when the buoy was driven on shore. It was also self-righting, otherwise it would be just as likely to drown its passenger as to save him!

Congreve's life-saving rocket appears to have been a low-priority project. Although the model dates from 1820-1822, full size rockets do not seem to have been tested at sea until 1826. In the trial, the rockets fell short and trips in the life-buoy proved slow and exhausting [19].

Although Congreve's life-saving rocket was a failure, shortly afterwards John Dennett used Congreve 12-pounder rockets as ship-to-shore life-saving rockets relatively successfully [19].

This leads to the realization that it was Congreve's arrangement of ropes and grapnels that was at fault, rather than fundamental problem with the rocket itself. The performance of the life-buoy also left something to be desired.

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