

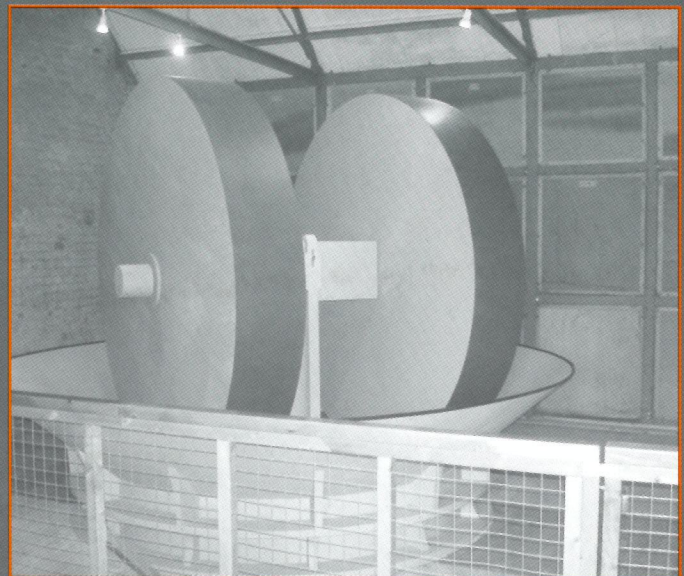
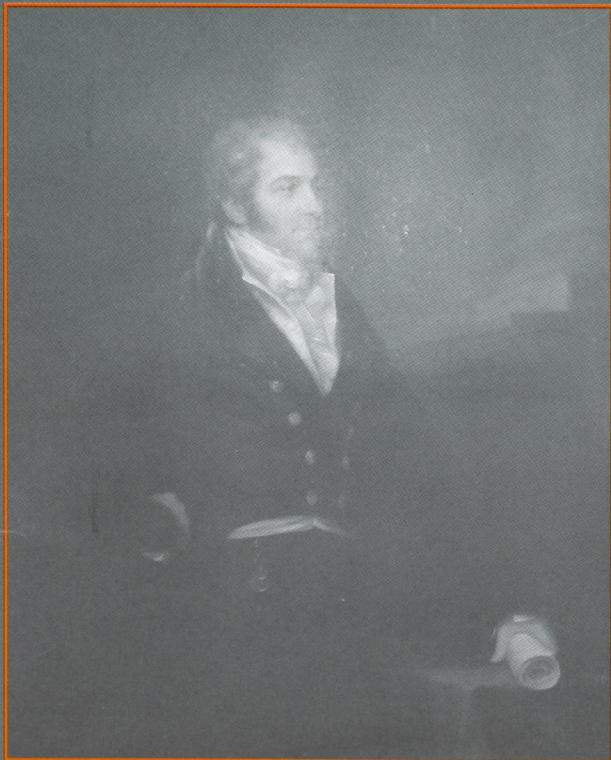
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Front Cover: (Top) A Supermarine Seafire using two off 4 pack 3 inch UP [the ubiquitous British cordite rocket of WW2] RATOs. (Lower Left) Sir William Congreve (1772-1828), who developed the Congreve rocket from 1804. (Lower Right) Completed Replica Mill at Waltham Abbey.

Congreve Rockets in the War of 1812 – Part I

FRANK H. WINTER

Introduction

(This is the first of a three-part comprehensive series of articles on the operational use of British Congreve rockets in the War of 1812 that has also been called by the British “the American War of 1812” and other terms. The remaining parts will appear in later issues of *Space Chronicle*.)

Unquestionably, the line in America’s national anthem, “... *And the Rockets’ red glare, the Bombs bursting in air, Gave proof through the night that our Flag was still there...*” is the most famous in the history of early rocketry, and certainly one of the most stirring in the history of that nation. Yet, surprisingly few histories of rocketry have delved into the overall history of these rockets in that war other than scant mentions of their most famous use in that conflict, namely at the bombardment of Fort McHenry that gave rise to the above line in the American anthem. The following series of articles helps fill in this gap and is long overdue. Moreover, these articles now take on special importance since this year marks the 200th anniversary of the bombardment of Fort McHenry that took place in September 1814. It is also felt that this coverage will be of interest to both U.S. and British readers and, of course, wherever possible both American and British coverages of various aspects of the employment of the rockets in that war are presented here.

Background

Hundreds of books and countless articles on the War of 1812 have been produced over these past two centuries so there is no need to recount the reasons for the war. Likewise, there are many sources on the beginnings of Congreve rocket technology and on Congreve himself so we will not concentrate on these aspects of the history of early rocketry either. This series therefore focuses solely upon the operational side of “Congreve rockets” used in the campaign and includes a necessary background that also reveals hitherto little explored attempts by the Americans to duplicate Congreve rockets which by the time of the war had already achieved considerable fame as a result of their uses in Napoleonic wars in Europe.

We begin by stating that William Congreve (1772-1828), the developer of this technology was the son of the Lt. General of the (British) Royal Artillery of the same name and that in 1804 he originated the idea of the war rockets that later bore his name.

At that time, the basic rocket was already a millennium old

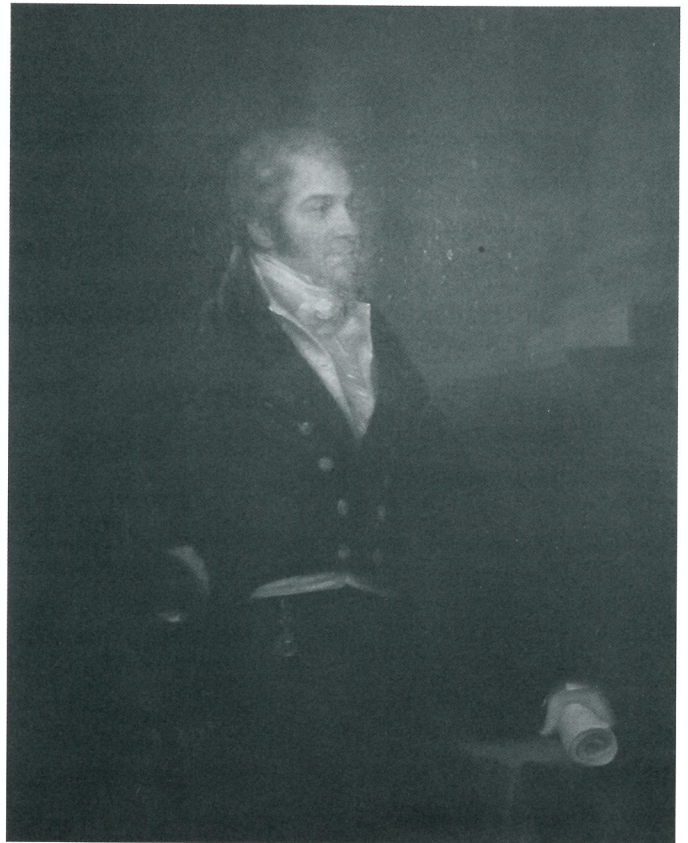


Fig. 1 Sir William Congreve (1772-1828), who developed the Congreve rocket from 1804 that became widely used during the Napoleonic wars and from 1813 to 1815 also saw service in the War of 1812. This was also the first time Americans experienced rocket warfare. (BIS)

and had probably originated in Sung, or Song Dynasty China (ca. 960–1127 A.D.), where gunpowder had also originated. However, the rockets during this period, and for some centuries thereafter, were propelled only by weak gunpowder formula and the rockets were consequently ineffective weapons that ranged just a few hundred feet at most. Therefore, outside of a very few known instances of their early application as weapons by the 13th or 14th centuries and later, rockets were largely relegated to serving mainly as festive fireworks and as conveyors of signals as used by various navies, armies, and merchant sailors. In short, for hundreds of years rocket applications were very limited although they were nonetheless enjoyed for their aesthetic appearances in firework shows, East and West [1].

In the sub-continent of India, however, from at least the 16th century, from the time of Akbar, and especially during the 18th century, the rocket was very extensively used as a favored weapon since they were lightweight, saltpeter (potassium

nitrate, the principle ingredient of gunpowder) was plentiful, as was bamboo that made ideal “guide sticks” that helped stabilize the rocket in flight, and were easy to make. Moreover, rockets, when fired at close ranges or deployed in guerrilla type warfare, the psychological, if not destructive powers of these weapons, could be devastating particularly since the rockets were always unpredictable and often flew wildly, with fire and smoke streaming out of their aft ends. Indeed, in numerous campaigns in India, these rockets were known to particularly frighten Indian war elephants and cause them to flee in panic.

Yet, we also know that by the late 18th century, typical Indian war rockets as used in Mysore, southern India, were furnished with iron tubes as bodies but still had limited ranges so they were more of anti-personnel weapons rather than explosive types [2].

Several histories of rocketry indicate that the younger William Congreve may actually have been inspired to create his own war rockets as a result of learning of Indian rockets as deployed – against British troops, in fact, during the various “Maratha wars”, or Anglo-Mysore Wars – by the late 18th century in the kingdom of Mysore, southern India, by the armies of the sultans of that kingdom, Hyder Ali (ca. 1721-1782) then afterward continued by his eldest son and successor Tipu Sultan (1750-1799), also known as the “Tiger of Mysore”. However, contrary to popular belief, there is no evidence Hyder himself was the innovator of the military use of the iron-cased Mysorean rockets. It is true Gen. Congreve (William Congreve senior) was somehow able to obtain captured specimens of these curious rockets which were afterward displayed in the Royal Military Repository (a military museum for the use of soldiers) that he had created at Woolwich, close to the Royal Arsenal; the Repository was later known as the Rotunda on account of its shape (and also called the Royal Artillery Museum) but presently, it is in a different building and known as the Firepower Royal Artillery Museum and is also situated in Woolwich [3].

Nonetheless, while Congreve the younger did allude to Indian rockets in his later publication, such as in his *Treatise on the General Principles, Powers, and Faculty of Applications of the Rocket System* (1827), he simply made it clear that his rockets and “rocket system” were vastly different and greatly improved. His also informs us that: “In the year 1804, it first occurred to me, that as the...rocket is exerted without any reaction from the point which it is discharged, it might be necessarily applied, both afloat and ashore, as a military engine...”.

That is, Congreve fully recognized that the rocket, unlike the gun, produced no recoil when fired, although beyond this he evidently had no clue as to *why* the rocket flew on its own (self-propelled) and that it was thus ideal as a weapon both on land and sea, from boats or ships. (We well know today that rocket motion is easily explained by Newton’s classic Third of Motion – “For every action there is an opposite and equal reaction.” But for centuries since Newton first laid down this and other laws of motion in 1687 in his *Philosophiæ Naturalis Principia*

Mathematica, Latin for *Mathematical Principles of Natural Philosophy*, and often known as simply as the *Principia*, it was not widely recognized that this fundamental law also applied to rocket motion.)

“I know,” Congreve continued, “that rockets were used for military purposes in India, but that their magnitude was inconsiderable, and their range not exceeding 1,000 yards [3,000 ft or 914 m]. I knew, also, that some years since, several years since, several experiments had been made in the Royal Laboratory by General [Thomas] Desaguliers, the Fire-Master, for the construction of large rockets; but that they had not succeeded, and that very few of them would even rise off the stand” [4].

In any case, the younger Congreve was motivated to attempt to produce his own rockets as a way to thwart or destroy Napoleon’s fleet then massed at Boulogne, across the English Channel, for a possible invasion of England. Congreve thus first purchased a number of standard firework type (“skyrockets”) he could find in London, then to improve upon these. His work made rapid progress and in a short time he dispensed with the ordinary pasteboard or cardboard bodies of these rockets and substituted iron bodies instead, as had the Indians. But beyond this, his rockets were far larger, came a variety of “calibers” or sizes, contained different types of warheads, and he also worked out different types of launchers and by strictly empirical trial-and-error firings, he determined their ideal firing angles in order to achieve maximum ranges. These different calibers and warheads he proudly termed his “Congreve rocket system.”

The first Congreve rockets were employed experimentally by both the Royal Navy and Army from 1805 with varying degrees of success and they were still more or less in an experimental status by the time the War of 1812 broke out when the U.S. declared war against Britain on 18 June 1812. In fact, the Royal Navy had “baptized” Congreve rockets in battle, starting with attempts of their use in expeditions against French shipping at Boulogne in 1805 and 1806. In these and other engagements Royal Marine Artillerymen trained in the deployment of the rockets were either temporarily assigned to, or volunteered to handle, the new weapons. But there was never an official (permanent or standing) Naval “rocket troop” or rocket battery organization. The same applied to the employment of such forces in the War of 1812.

However, in September 1811 the first official Royal Army rocket organization began to come into being when the Board of Ordnance placed a detachment of 32 Royal Horse Artillerymen under Congreve’s disposal for experimental use. Then, during 1813 and 1814, more formal arrangements were made with the formation of Royal Artillery “rocket troops.” Yet, by and large, the application of Congreve rockets in the War of 1812 seems to have largely been undertaken on an *ad hoc* basis by the Royal Navy, but mainly utilizing troops of the Royal Marine Artillery that had been trained in using the rockets. We know that in June

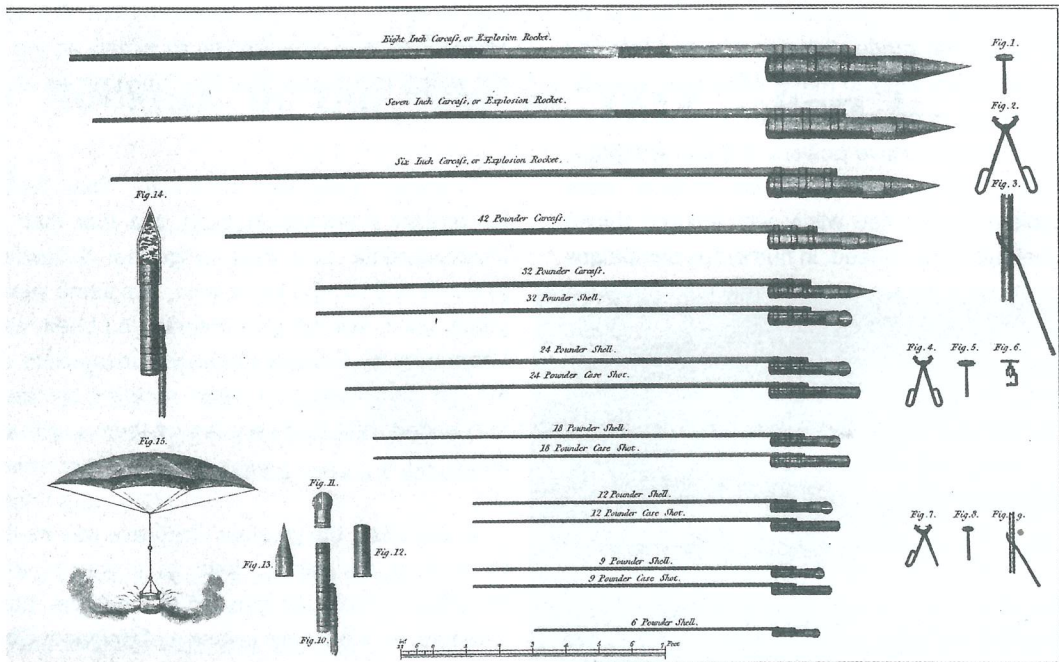


Fig. 2 Congreve developed what he called the “Congreve Rocket System” of ten basic calibers of rockets that could be fitted with different warheads for different applications: the “shell” (explosive warhead), the “carcass” (incendiary warhead), and the “case shot” warhead (carrying carbine balls for scattering among cavalry or infantry troops). However, mainly “lighter” caliber 24-pounder (10.8 kg) types were favored for the campaign in America, either shell or carcass types, and the (32-pounder (14.5 kg) carcass type for bombardments.

(Drawing in Congreve’s treatises, like his *Details of the Rocket System* of 1814)

1813, two Royal Marine battalions arrived off the Chesapeake Bay, Maryland, United States, for the Chesapeake campaign and that in the First Battalion, Lieutenant George E. Balchild was in charge of a rocket half company while Lieutenant John H. Stevens was in charge of another. (Franklin indicates this one RMA company consisted of three sergeants, one corporal, four bombardiers, and 41 gunners.)

But the exception to the above was when one of the newly formed rocket units of the Royal Horse Artillery back in England, sometimes called the 1st Rocket Troop, under the command by Capt. Henry Bowyer Lane, was dispatched to the U.S. later in the war, on 22 August 1814, and principally saw service in the battle of New Orleans. It is also important to note that the employment of British Congreve rockets occurred in three of the four theaters of the War of 1812: (1) along the Atlantic Coast; (2) around the U.S.-Canadian border (also called the “Niagara Frontier”); and (3) the Gulf Coast theater (like New Orleans). There is no evidence they saw service in the (American) West theater [5].

It is finally to be noted here that we still lack a lot of specific information on the rocket equipment these Royal Navy, Royal Marine Artillery, and Royal Artillery troops brought to America, particularly on their launchers and from barges and other ships as well as land use. In the beginning, they brought frame launchers but for “field” use, they appear to have opted later for lighter, more portable launchers; the rockets themselves, with the exception of those for bombardments by the rocket ship *Erebus*, discussed below, seem to have been primarily light

or “field” caliber, 12-pounders (5.4 kg) that were ideally suited for small and quick “raids” and similar, almost guerrilla-like operations. However, the works of C.E. Franklin, in his article “Congreve Rockets of the War of 1812” and his subsequent book, *British Rockets of the Napoleonic and Colonial Wars 1805-1901*, should be consulted for overall Congreve rocket technology of the period; again, we are just concentrating on their still, little known operational history [6].

Earliest Known American Experiments with War Rockets

Ironically, even before Congreve rockets came to be deployed in the war, there had been a suggestion to duplicate Congreve rockets for use by the Americans *against* the British. In fact it is remarkable that this suggestion was made by the British-born Thomas Cooper, Chair of Chemistry at Dickinson College, Carlisle, Pa., who had emigrated to the U.S. in 1794 and became a learned friend of Thomas Jefferson and President James Madison. On 18 February 1813, Cooper wrote to Madison: “I understand some privateer has brought in, an English vessel laden with Congreve rockets...would it not be advisable to distribute a dozen for analysis and imitation, to a committee of two or three men of science in Boston, New York, and Philadelphia?” Professor Cooper’s suggestion was soon partly granted, although the rockets came from a different source [7].

Meanwhile, John Beath, a Boston instrument- and truss-maker (architectural supports) became the earliest-known American to make his own experimental war rockets. This was

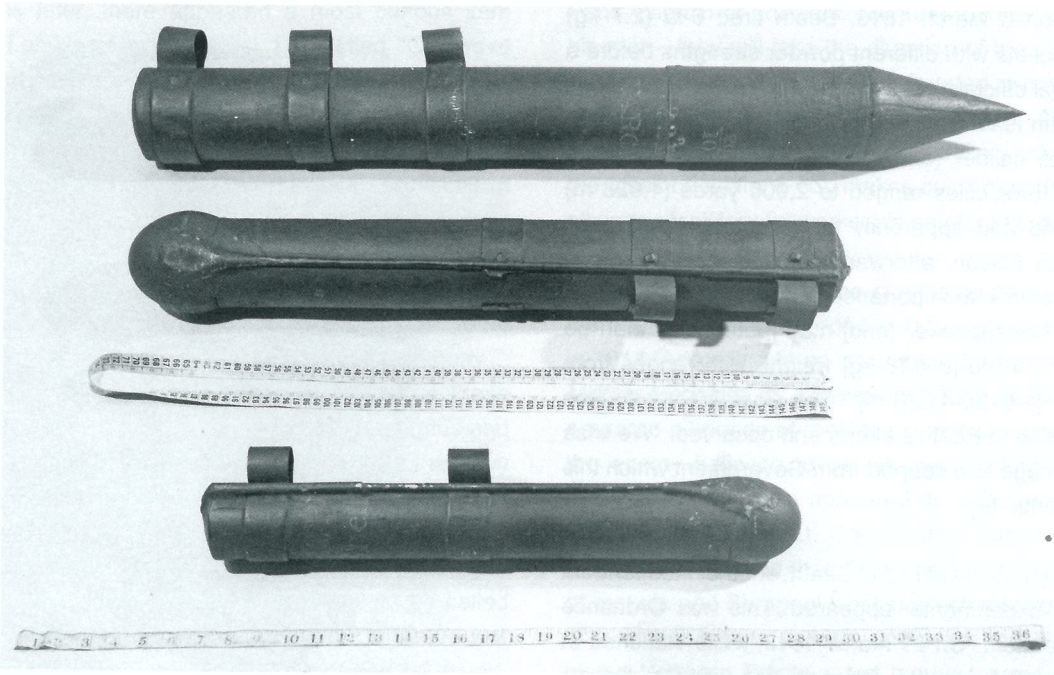


Fig. 3 Three examples of the kinds of rockets probably used in the War of 1812. Note that all are “side-stick mounted (i.e. the guidesticks for stabilizing the rockets during flight, not shown, were attached by ferrules to the bodies. From 1815, the sticks could be screwed to the base of each rocket and were thus called “centrally-mounted rockets.” Top: a 32-pounder (14.5 kg) carcass type; bottom two: shell or explosive types. Note the external fuse channels leading to the warheads. (Smithsonian Institution photo 2008-2099)

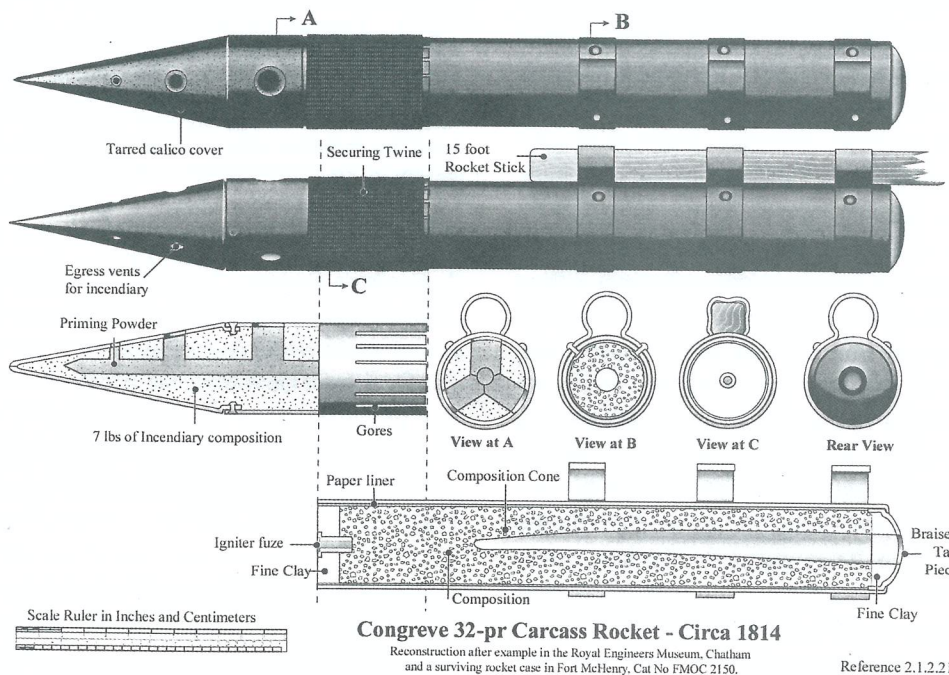


Fig. 4 Drawing of a Congreve 32-pounder (14.5 kg) rocket of the type used in one of the most famous engagements during the War of 1812, the bombardment of Fort McHenry, in 1814. We can also see more detail on how the 15 foot (4.5 m) long wooden guidestick was secured and how the holes in the warhead were arranged to permit the continued burning of the incendiary composition (for up to ten minutes) even after a rocket had landed. (Drawing by Charles E. Franklin)

also in 1813, although he was probably unaware of Cooper's suggestion. Beath fashioned what he called a “spring rocket” that had an iron body and foot long (0.3 m) conical head filled with (probably, lead) balls or with an incendiary mixture. The balls were similar to the “case shot” balls in anti-personnel Congreve rockets to scatter among the enemy, while the incendiary warhead was for burning down enemy ships or other

structures. The so-called “spring” was to help the rockets stick onto enemy vessels although it too was not entirely original as Congreve's “carcass,” or incendiary rockets, also came with their own conical heads with sharp points meant to stick to the wooden hulls of enemy ships. Yet Beath's “spring rockets” did not go unnoticed, even in England where the respected *Naval Chronicle* and *The Times* of London reported on them [8].

Nonetheless, on 6 March 1813, Beath fired 6-lb (2.7 kg) versions of his rockets with different powder strengths before a group of high naval officials including the early American heroes of the war, Captain Isaac Hull and Commodore John Rodgers. Although of small caliber (and smaller than most Congreve rockets), Beath's projectiles ranged to 2,000 yards (1,828 m) and Beath's friend and apparently his assistant, the Boston bank clerk James Ellison, afterward certified that the spring rockets "may be of infinite importance in annoying the enemy's squadron in the Chesapeake...[and] may [potentially] then be made from one to 40 lb [0.4-18 kg] weight, with ranges from 1,2, or 2.5 miles [1,6120-4,020 m]." The *Boston Gazette* was also very supportive of Beath's efforts and observed: "We wish him all that patronage and support from Government which this inventor justly merits" [9].

Simultaneously with the efforts of Beath, another independent American rocket experimenter appeared. This was Ordnance Major George Bomford. On 29 March 1813, while stationed at Albany, New York, he reported to Chief of Ordnance Col. Decius Wadsworth: "I have bestowed much time and reflection on the rocket, and have every reason to believe that I have succeeded in making them range as far in proportion to their weights as any hitherto attempted. My first rocket bursted [*sic.*] after which I covered them [with] two or three turnings of glued canvas. When dry I gave them a brush of rosin varnish to secure them from moisture." We do not hear much of Bomford's progress after this [10].

Just a couple of months later, a Congreve rocket specimen, or according to another account, "a piece of the composition," was picked up after an attack on 3 May against the small town of Havre-de-Grace, Maryland, by barges firing both rockets and guns by forces under British Rear Admiral George Cockburn. In any case, this specimen was deemed so important it was sent to the President who in turn forwarded it to Professor Cooper, Madison evidently remembering and duly honoring his (Cooper's) earlier suggestion. Cooper was soon able to identify the ingredients and their proportions. In a letter of 1 September 1813 from another his friends, Alexander J. Dallas who had served as Treasury Secretary under Madison, Dallas told Cooper: "While I was in Washington, he [Madison] spoke of you in the handsomest terms of respect and good will; your name being introduced on the subject of the Congreve rocket, which you had analyzed for him." But Cooper does not seem to have made any copies of the rockets himself; rather, he sent his own findings to Beath whom he had now heard about by now [11].

Beath's name thus came to the notice of the President but the promised spring rockets were not procured for some reason although for his efforts Beath was appointed Deputy Commissary of Ordnance, although the appointment became so bogged down in the bureaucracy that it was turned down. This prompted the *Boston Gazette* of 28 July 1814 to indignantly point out that a genuine Congreve rocket "was placed on exhibit at No.



Fig. 5 Thomas Cooper (1759-1839), the London-born Anglo-American economist, educator, and political philosopher who emigrated to America in 1794 and, as Chair of Chemistry at Dickinson College in Carlisle, Pennsylvania, made the earliest known American suggestion to use similar types of war rockets. Later, he analyzed a captured British Congreve specimen forwarded to him by his friend the American President James Madison. (Smithsonian photo 76-6666)

1, Scolley's Building, Tremont Street, Boston," but "falls short in some particulars, and in none is superior to his [Beath's]." Nonetheless, so far as can be determined, Beath's case was not redressed and his rockets never became operational. Yet as the war progressed, the Americans acquired additional Congreve rocket specimens but whether this technology was eventually successfully transferred and utilized we cannot tell for certain [12].

There was also the letter of 10 May 1813 from William Duane to Col. Wadsworth of the Ordnance Department in which he recommends a Mr. Cluny, "a Frenchman, very skilful in the *laboratory* [*sic.*]...particularly in...artillery details. [The French-born Brigadier] Gen. [George] Izard employed him as I understand with the pay and allowances of [a] Captain but without rank – he is undoubtedly very useful...and his talents would be very valuable...[and] might be directed to *laboratory* [*sic.*] works...He has a Rocket prepared on the principle of the Congreve Rocket and a machine for loading [i.e., manufacturing] them at Fort Mifflin [on the Delaware River below Philadelphia]." But whether Colonel Wadsworth ever pursued this recommendation or whether Mr. Cluny's "prepared" rocket or loading machine were ever utilized are yet further mysteries we cannot solve [13].

Three months later, there appeared a most curious item in *The Times* (London) for 19 August 1814 titled “Congreve Rockets” that had obviously been copied from an American paper that reads: “These rockets, about which so much has been said, and which are certainly [*sic.*] calculated to do a great deal of injury, have been found to be not quite so difficult of composition as was first imagined. Some of these rockets cast on the banks of the Patuxent [River] have been found decomposed; and their component parts ascertained by a medical gentleman [*sic.*] at the Navy Yard of Washington, to be nitre [potassium nitrate], sulphur, turpentine, and antimony.... Should [the U.S.] Government be disposed to adopt these instruments of destruction, they can have all the apparatus and matter prepared by gentlemen in the neighborhood of the Navy Yard, and as they are calculated to do great mischief to fleets &c. we hope the subject will be taken into consideration.”

Just who and why a “medical gentleman” should be called in by the Washington Navy Yard to examine a Congreve war rocket are unknown. In any case, the composition he found, appears to be the incendiary mixture of a “carcass” rocket rather than the propellant.

Then, in the *Boston Gazette* for 22 September 1814 the following item appeared and was afterward republished in *Nile's Weekly Register* (Baltimore) for 6 October 1814 and perhaps elsewhere:

“ROCKET BATTERY – A correspondent would beg leave to suggest to the committee of defense the utility of erecting a *rocket battery* [*sic.*] on either forts Warren or Independence [both in Massachusetts]. – By means of a recent invention, rockets from one to thirty-two pounds [0,4-14.5 kg], or larger if necessary, may be fired with as much accuracy as [standard] ordnance; and possessing a quality equally destructive as shells, they may be made a powerful weapon of annoyance to the enemy's vessels, should they attempt to come within their reach – and it is said they can be thrown two miles [3.2 km] and upwards. We understand Mr. Beath has expressed a willingness, not only to superintend the making of these rockets, of which it is believed he has a perfect knowledge, but also to be stationed at the battery in case of attack.”

But as we saw, Beath got nowhere with his own plans and this latter suggestion too, never materialized. There was also an offer that circulated in the papers about this time from a self-proclaimed French Lt. Col. of Engineers, M. de Fauvel, offering his own invention of a mortar to the city of Baltimore for their defense as well as “200 rockets, superior to Congreves [*sic.*],” but nothing came of this either.

For certain, a few rockets *were* employed by the Americans against the British but the question of their origin remains unanswered. They were used in September 1814 by the newly formed “Corps of Artillery” created in May of that year and commanded by Brigadier General Alexander Macomb at Plattsburgh, New York. In his General Order dated 5 September, Macomb's adjutant general, William R. Duncan, stated that: “Mr.

Paris, captain of artificers, will form a corps of rocketeers with his men - they will take the direction of the chief engineer.” An “artificer,” now a quaint and antiquated military term, is nicely defined by H. Lallemand in his *A Treatise on Artillery* (New York, 1820) as follows: “An artificer is an artillery soldier who prepares the fuses of shells, & co., makes quick matches, port fires, and all sorts of military fireworks; his pay for this is high.”

As for Captain Paris, he cannot be properly identified, but there is other evidence of the U.S. rocketeers at Plattsburgh in 1814. According to an obituary of Macomb in the *New York Military Magazine* for 4 September 1841, at Plattsburgh he “had prepared a brigade of rocketeers, with Congreve rockets which the enemy believed to be his own exclusive possession.” A more telling clue also appeared in 1839, more than 25 years after the war, when Lt. Col. George Talcott of the Ordnance Department recalled that: “Extensive trials were made in 1813 of rockets and Shrapnel [shells] which resulted in the adoption of the latter for our service, and some rockets were also sent to the Northern Frontiers but they were not extensively used although we succeeded in giving them ranges quite equal to British rockets of similar dimensions. The only serious difficulty met with in the trials of rockets was...inaccuracy.”

Plattsburgh, located in upstate New York near the Canadian border, does fit the “Northern Frontier” description and it logically seems the Ordnance Department itself was responsible for the rockets. Hence, perhaps they did come from Ordnance Major George Bomford, especially since he began developing them at Albany, only about 150 miles (240 km) south of Plattsburgh, down the Hudson River.

But from the recent work, *The Battle of Plattsburgh – September 11, 1814* by Herkalo, we now have more details. Macomb, he says, “ordered rockets sent to Cumberland Head and Dead Creek with an instructional letter to General [Benjamin] Mooers [commanding the New York Militia] that they be used as an advanced signal should the enemy be sighted. The letter described the proper procedures in employing a rocket was accompanied by a labeled sketch itemizing a rocket's features and terms. While the British had some experience with rockets before Plattsburgh, to the Americans of the northern army and the local militia, the weapon was a new, high-tech introduction - hence the instructions to Mooers.”

Thus, it appears these American-made rockets were to first be applied not for war, but in a more modest application, as signals. Herkalo makes it very clear in his back notes that: “In reality, the rockets [turned over to General Mooers] are known to have been larger battle-sized devices; the complete letter, with its accompanying postscript regarding the weight of the rockets, is found among Mooers documents at Plattsburgh State University.” Signal rockets are far simpler and smaller devices weighing but a few ounces and would not have required special instructions, including weights. Whether, these war rockets really were used as signals, is another historical question. It

is also of relevance to note that even if used minimally by the Americans as weapons, the battle of Plattsburgh may be said to have the first occasion in history where: (1) the Americans used war rockets; and (2), the first occasion where both sides on American soil used war rockets [14].

Additional U.S. war rocketry experiments were carried out in New York, but they were completed *after* the affair at Plattsburgh. Bomford gave his rockets to Captain Alden Partridge, instructor of engineering at the Military Academy of West Point. On 9 December 1814, Partridge told Bomford: "I at length have the pleasure to give you some account of the experiments with the 4, and 6-pound [1.8 and 2.7 kg] rockets that you sent me some time ago."

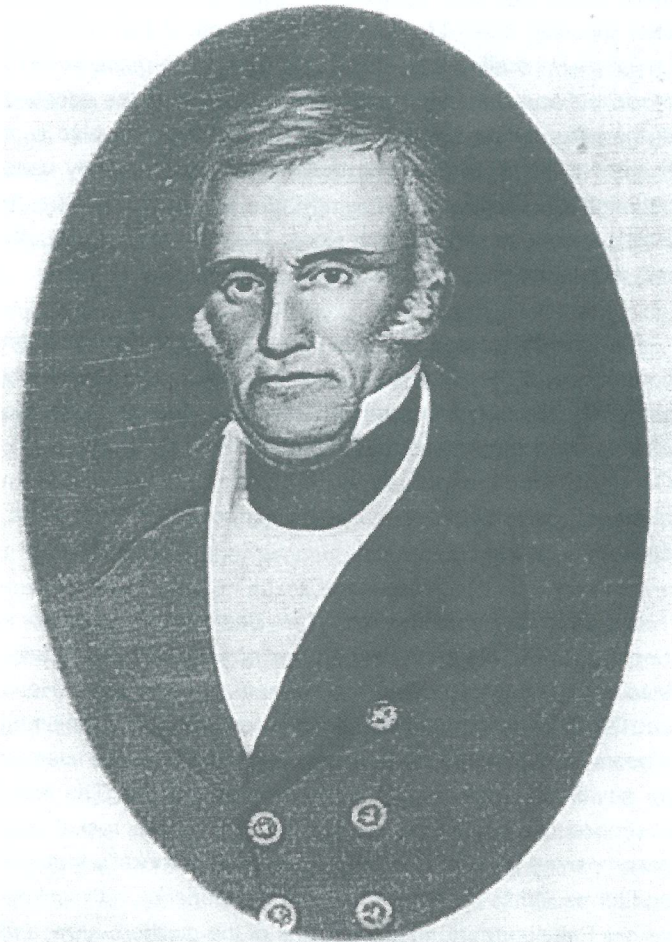


Fig. 6 United States Captain Alden Partridge (1785-1854), who, as Superintendent of the U.S. Military Academy, designed and made his own Congreve-type rockets of small caliber, at least 4- and 6-pounder (1.8 and 2.7 kg) models, although it is unknown whether these were ever deployed in battle. (Smithsonian photo 77-10208)

Partridge, for his part, with the assistance of Prof. Andrew Ellicott of the Academy, had fired them vertically, to attempt to gauge their power by computing their altitudes by timing their ascents and descents with a stopwatch. However, the vertical direction would have been hardly useful in working out their ranges when as normally fired horizontally, although average altitudes of 2,718 ft (828 m) were attained. At any rate, it does appear Bomford had still been making rockets up to and probably after the use of rockets by General Macomb in September 1813



Fig. 7 American General Alexander Macomb (1782-1841) who did indeed, prepare a "brigade of rocketeers, with Congreve rockets" for use again the British on the "Northern Frontier" of the war, in upstate New York, but the origin of these rockets is unclear, although they may well have been made by Captain Partridge who was situated relatively close.

(From Benson Lossing, *Lossing's Pictorial Field Book of the War of 1812* [1868].)

at Plattsburgh so he is still the most likely creator of America's first, albeit short-lived and crude military rockets. At this point then, we now turn to the actual use of Congreve rockets by the British during the war [15].

Known Uses of Congreve Rockets in War of 1812

It is thus clear from the above that from the earliest periods of the war, Americans from a variety of spectrum – political, military, as well as scientific besides the general public – were well aware of, and many dreaded, the possibilities of the "terror weapons" known as Congreve war rockets in their country. Indeed, the *London Times* of 8 May 1813 published the following dire prognostications: "The financial and military difficulties of Mr. [President James] Madison seem approaching a crisis. He obtains 60,000 dollars toward a loan of 16 millions and he is alarmed with the terrors of invasion. The Congreve rockets which are said to be on board the blockading squadron, have made a deep impression on the imagination of the Americans, and instead of thinking about conquering [British] Canada, they already 'in their minds' eye' behold Baltimore in flame, the fort knocked down, the wharfs burnt, and the shipping destroyed" [16].

As matters unfolded, the Americans were most fortuitous in being spared these terrible fates – although they came

very close – especially the prediction of the destructions of Baltimore, at the time one of the largest and most important cities in the U.S. But as for “the fort,” this was likely merely an allusion to American forts in general, but it is possible (and also an uncanny one) that it referred to Fort McHenry that guarded Baltimore.

It is also important to point out, however, that the primary strategies of the Chesapeake campaign by the British were to blockade the trade of the U.S. and to harass the Americans. For these reasons, the vast majority of the rocket actions occurred against small towns all along the Chesapeake waterways, not usually against major cities. For the same reasons, it was likewise strategic of the Royal Navy to incorporate these small but potentially very effective weapons in this campaign not only for their destructive powers – although this was not always predictable – but due to their psychological effects as well.

The British well knew this still “new” mode of warfare was a most frightening one. Once ignited, rockets eerily moved on their own (i.e. they were self-propelled), their smoke and fire trailing behind them and their apparition made more frightening by a horrible hissing sound while often flying wildly and in wholly unpredictable courses that frequently caused havoc, especially among untrained troops. In brief, as crude as they were, they were among the world’s first “terror weapons.” But we will also see War of 1812 vintage examples of American criticisms of this mode of warfare in the conclusion of this series of articles.

Besides the above characteristics, rockets were very easy to transport and did not require cumbersome carriages to lug around, like standard artillery guns, yet possessed comparable firepower; William Congreve was entirely correct when he also clearly recognized their great naval value in that the rockets had no recoil like guns and were therefore ideal weapons as deployed from even small boats, barges, and larger vessels. Smaller calibers of the “carcass” (incendiary) rockets could also burn wooden structures of small towns, not to mention the wood hulls of ships of the day. Thus, for all these reasons, the rockets were deployed in the American campaign, especially after having proved their worth in several battles and campaigns in the Napoleonic wars, notably in the Peninsular War (1807-1814), and at the bombardment of Copenhagen in 1807 and the siege of Danzig in the same year. Moreover, the types of warheads very carefully chosen by the British for their rockets in the American campaign were mainly of the carcass (incendiary) type, rather than the “shell” or explosive type, or anti-personnel (with shot), to scatter among troops.

It is true the rocket ship *Erebus* was sent, loaded with the larger 32-pr. (14.5 kg) rockets, to America but this was largely meant for the bombardment and destruction of forts, like Fort Henry, rather than for small harassment purposes. But as we will also see time and again, the state-of-the-art of the rockets was then so crude that they did not perform as well as hoped by the British in this war. It may also be that not only could they

not be aimed with any precision at all, but the environment (mainly humidity from constant exposure to sea and river water in the atmosphere during their Chesapeake employment) that this may have seriously affected the composition of the hand-rammed gunpowder propellant in the rockets and weakened and hindered their combustion. However, we have not found any observations along these lines in the extensive literature of the War of 1812 and these are only latter day conjectures.

We thus present encapsulated accounts of many of these actions of employment although this treatment should not be considered definitive, especially since there were so many minor actions particularly during the Chesapeake campaign, that may well have included rockets but were simply not recorded as such; we also have to bear in mind that newspaper reporting was then, hardly as thorough and certainly as rapid as is now taken for granted.

Hampton Roads, Virginia, Attempt, and Lewes Town, Delaware

It is difficult to learn the very first use of Congreve rockets during the War of 1812 that had been declared on 16 June 1812 but it was evidently not until the following year that we see, at least, the earliest known *arrival* of the rockets. According to a statement of Matthew Rich of Baltimore dated 7 March 1813 and found in the *Calendar of Virginia State Papers*, he had then just recently arrived by ship from Europe and learned that the British vessel *Victorias* had “arrived lately at Bermuda from England...[and] was loaded with Congreve rockets which were distributed through the [British] fleet on the day before yesterday [5 March 1813].” Possibly he meant the HMS *Victorious* that served as part of Rear Admiral Sir George Cockburn’s fleet in the Chesapeake Bay.

But it is curious that the earliest *attempted* employment we know of was to destroy the famous American frigate USS *Constellation* later that month. “On the night of March 20,” in the Hampton Roads area of Virginia, writes Christopher T. George in his *Terror on the Chesapeake*, “Cockburn ordered a barge attack on the *Constellation* under the command [the British barges] of Lt. George Augustus Westphal, first lieutenant of the *Marlborough*...One line of barges would launch an assault on the American gunboats while the other division, including two boats armed with Congreve rockets, attacked the *Constellation*’s stern...However, within two miles [3.2 km] of the U.S. frigate, contrary winds and tides interfered. The attempted attack had to be cancelled.”

To this may be added the statement in the dispatch of 23 March 1813 written on HMS *Marlborough* at Hampton Road by Rear Admiral George Cockburn, RN, to Admiral Sir John Borlase Warren, Commander-in-Chief on the North American Station: “...I gave...the necessary directions for converting some of our prizes [captured vessels] into Fire vessels to endeavour by means of these and our Boats with Congreve’s Rockets to

destroy the Enemy's Frigate [the USS *Constellation*]..." Yet the hope on Cockburn's part to destroy the *Constellation*, or other large American warships, did not come about.

(The appearance of the rockets at Hampton Roads is the first mention of Congreve rockets in the three-volume work, *The Naval War of 1812 - A Documentary History*, that includes naval documents from both the American and British sides.)

Later during the following month, in his report of 19 April to Admiral Warren, Cockburn already expressed designs of rocket warfare upon Baltimore when he said: "...should it appear practicable to annoy their Fort or Vessels above it with Rockets &c. I shall not hesitate in attempting it."

But perhaps the earliest actual usage of these weapons was at Lewes Town (also give as Lewistown), Delaware, during 5-6 April 1813. Here, apart from the fact that the Royal Navy set out to establish a blockade of the Delaware Bay and adjoining rivers as part of their Chesapeake campaign strategy, the Lewes Town bombardment was also tied to a matter of victualing for the British fleet. In fact this takes on a somewhat humorous note. In a present-day exhibit in the center of the town of Lewes is a framed copy of a handwritten letter from the commander of the British squadron that first approached the town, Commodore (later, Captain Sir) John Poo Beresford, addressed to the town's chief magistrate and dated 16 March 1813. The letter states:

"Sir,

As soon as you receive this, I request you will send 20 live bullocks with a proportionate quantity of vegetables and hay to the [HMS *Poictiers*] for the use of His Britannic Majesty's squadron now at this anchorage, which will be immediately paid for at the Philadelphia prices. If you refuse to comply with this request I shall be under necessity of destroying your town. I have the honor to be, sir, your very obedient servant,

J. P. [John Poo] Beresford Commodore and commander of the British Squadron in the Mouth of the Delaware."

Col. Samuel Boyer Davis, Commander of American troops in Lewes, refused Beresford's demand and consequently, during 6 and 7 April Beresford shelled the town. According to a later commemorative book on the engagement, published by the Historical Society of Delaware, *The Bombardment of Lewes by the British, April 6 and 7, 1813* by William M. Marine, "The eyes of the country were at this juncture on Delaware. A dispatch from Cape Island to the *Baltimore Patriot*, April 7, read: "This morning a very steady smoke was seen in the direction of Lewistown, supposed to be occasioned by throwing rockets into that place...A further account mentions that one [British] bombshell fell in the town, but failed to explode; the rockets passed over the town...and fell some distance beyond. The damage suffered by the destruction of property was estimated to be two thousand dollars." This amount was considerable at the time.

Thompson, one of the early historians of the war, likewise wrote of the action here: "The cannonade continued nearly 20

hours; at the end of which time, the enemy drew off his vessels and descended the bay, having discharged upwards of 600 shot, shells and Congreve rockets. The shells did not reach the town; the rockets passed over it..."

In the meantime, on 30 March 1813, Lieutenant George E. Balchild of the Royal Marine Artillery commanding a detachment of 50 marine artillerymen "trained as a rocket-corps and attached to the first battalion [of Lt. Col. Charles Napier of the Royal Marines]," according to Nicolas in his *Historical Record of the Royal Marine Forces*, "...sailed from Plymouth, and arrived at Murray's anchorage, Bermuda, on the 23rd of May...This... force sailed from Bermuda on the 8th of June and arrived at the Chesapeake on the 18th..." It is thus possible that the first action in which Balchild's unit of rocketeers participated in during the war was at Hampton, Va., on 25 June [17].

Frenchtown, Maryland

The small settlement of Frenchtown, Maryland, about fifteen miles (24 km) up the Elk River, was struck the same month with these weapons during a raid of 29 April 1813 conducted by a British landing party during Sir John Warren's harassing operations in Chesapeake Bay. Here, says James, "The Americans lost one man killed by a rocket, but none wounded." This was the first of three known fatalities directly from a Congreve rocket during the war [18].

Havre de Grace, Maryland

The engagement at Havre de Grace (sometimes given as Havre-de-Grace), Maryland, at the west side entrance of the Susquehanna River, was one of the more notable employments of Congreve rockets during the War of 1812 in several respects. On the morning of 3 May, some fifteen to twenty British barges from an overall force of Rear Admiral George Cockburn were seen approaching this small community that then amounted to only about fifty houses. Even so, the proud townspeople were ready and had erected a couple of defensive batteries.

When the enemy came more fully into view, drums began to beat (perhaps prematurely) and the battery guns started firing. The British quickly responded with their rockets besides grapeshot, from the barges. The "Congreve rocket boats," as they were also called, were under the lead of Lieutenant George Augustus Westphal, first lieutenant of HMS *Marlborough*. As Thompson wrote, this force: "...when within a short distance of the town, commenced a tremendous bombardment, accompanied by the firing of cannon and the discharge of numerous rockets."

In the version by James: "Lieutenant Westphal, having in the meantime stationed his rocket-boat close to the battery, now landed with his boat's crew, turned the guns upon the American militia, and drove them to the extremity of the town"

In Cockburn's account: the men started "a warm fire...from

our Launches and Rocket Boat, which was smartly returned from the Battery for a short time.” But soon, the British were able to overtake the larger battery near Concord Point. Thompson adds that “so incessant” were the enemy’s “discharges of shells and rockets, that five or six men only, were fearless enough to repair to their breastwork, and resist the approaches of the British barges.” By this time, some of the brick and wooden dwellings of the town were now ablaze, with the help of the rockets according to Dawson, and more than half of the town was burned down.

It was during the initial skirmish that a Mr. Webster, one of the defenders, was killed by a Congreve rocket. According to one British participant in this engagement, “...a Congreve rocket having been well directed at the outset put them into confusion. It passed through the [American] Battery and struck a man in the back, when not a single vestige of him was to be found. This tremendous engine of death afterward struck the ground & forced itself full a mile into the country, tearing up everything in its way.” (Christopher George says the man had been hit on the head by the rocket, which seems more reasonable.) In either case, this individual was apparently the second of at least three known casualties caused by Congreve rockets during the entire war.

Educator and historian Jared Sparks, in his description of the same action, wrote: “Congreve rockets began to be throw from the barges, the threatening appearance of which produced a still greater agitation, and when one of the [American] militia was killed by a rocket, it was a signal for a general retreat [by the Americans]. They left their ground, and escaped with great precipitation and disorder to the nearest woods, even before a man of the enemy had landed.” In a contemporary 1813 published account of this engagement, Wilmer adds that the rocket that killed Webster “...was afterward taken up and is now to be seen in town, as one of their [the British] curious inventions of destruction.” In other words, the rocket that struck Webster, for a short time became a kind of town trophy, but its later fate is unknown.

A rare, color etching by William Charles, a Scottish-born engraver who immigrated to the U.S., and titled “*Admiral Cockburn Burning & Plundering Havre de Grace on the 1st of June 1813, done from a Sketch taken on the Spot at the time,*” [sic.] is one of only two known near-contemporary pictures that actually depict rocket equipment used during the war. In this case, the viewer sees (as clearly identified under the bottom edge of the picture in a short, numbered list of the principal elements in the scene), No. 5, a “Machine for throwing Rockets.” Hence, this particular scene is particularly unusual as it shows a ladder-like land-launcher that also reveals that the rockets used at Havre de Grace were fired from barges as well as from land. The original picture is now held by the Maryland Historical Society.

We also saw above that a Congreve rocket specimen was

recovered at Havre-de-Grace and wound up being sent to the President who then forwarded it to Prof. Thomas Cooper for analysis. Still another distinction of the use of Congreve rockets at Havre de Grace is that, so far as we now, it may have been the first time in which the rockets appeared in a poem during the war. This literary work was *The Lay of the Scottish Fiddle; a Tale of Havre de Grace*, published soon after the engagement, in 1813, with the additional distinction that it was “Supposed to be written by Walter Scott.” Moreover, the rockets are referred to several times in this lengthy work, but are all in Canto VII, “The Burning.” Also, it was originally published in Edinburgh, although we do not have access to that version, only to the alleged “first American [edition], from the fourth Edinburgh edition,” also dated 1813. A typical line is: “The Congreve rockets whizz’d about, The fiery missives dreadful gleam’d...” [19].

Fredericktown, Maryland

On 6 May 1813, Admiral Cockburn turned his attentions to the village of Fredericktown (or Frederick’s Town), Md., and sent his fifteen large barges plus three small boats up the Sassafraz River to this point. At the time, Fredericktown was modestly defended by only one small cannon and about 80 militia under Lieut. Col. Thomas Ward Veazey (later, Governor of Maryland).

According to Thompson, “On the approach of the barges, the latter commenced a heavy fire, and, having discharged an immense number of langrage rockets [types of rockets used in naval warfare for tearing sails and rigging and consisting of pieces of iron enclosed in a canister], grape shot, and musket balls, within a very few minutes, more than one half of the militia fled. [But] 35 only, under the colonel, stood their ground, and worked the canon with such skill, that the boats...suffered very severely.” However, the village was eventually burned by the attackers, as was nearby Georgetown, the latter possibly also with the help of the rockets.

Scott similarly recalled: “Directing the launches and rocket-boats to return the fire, he [Cockburn] immediately pushed on shore at the head of the marines and seamen, attacked the enemy in their entrenchments...[who] immediately fled through the town into the woods, leaving Frederick’s Town at our mercy.”

Later that month, on the 22nd, appeared a little item in *The Olio; a Literary and Miscellaneous Paper* (New York) that: “By the ship *Brutus* arrived at Newport, R.I., from Liverpool, we learn that a large fleet was ready to sail for America with two thousand troops on board, and ten thousand Congreve rockets.” (Whether the latter was true or not, that is, whether it was just a rumor at the time – or even a “planted rumor” to create panic and demoralize the Americans – we just do not know, particularly since Franklin, in his article “Congreve Rockets of the War of 1812,” says: “There was an acute shortage of rockets during the whole [war] period. In December of 1813 Congreve reported that he had 26,000 rockets on order but could only make 36 a day. In fact the situation was so bad that in December of 1814

he was authorized to obtain rocket cases from [a] Mr. Kenrick, a founder of West Bromwich, on the express understanding he did not disclose the use to which they were put" [20].

Craney Island Virginia, and Newport News

On 22 June 1813, Congreve's rockets were deployed on tiny Craney Island, Va., at the mouth of the Elizabeth River off Hampton Roads. That morning, a British landing party of 700 Royal Marines and other troops came ashore at Hoffer's Creek near the Nansemond River to the west of the island. "The attack began with a discharge of Congreve rockets," according to Dawson, "but without producing any other effect than alarming a body of the [American] militia..."

Similar accounts are found in several American newspapers of the time. For example, in the *Albany Register* (Albany, N.Y.) for 26 July 1813, from a letter sent from Norfolk (Va.), it is said: "They [the British] were led on by admirals [Sir John Borlase] Warren and [George] Cockburn in person. The attack was commenced by the firing of Congreve rockets from the boats which, however, produced no injury..." and in the same paper, "They threw a couple of rockets at our troops, but they either fell short of or overshot their mark."

But this was not the only instance of the Congreve rockets deployed on Craney Island since others were fired when the British troops had advanced further on the land and one account says a half-company of Royal Marine Artillerymen opened up with Congreve rockets from behind a farmhouse to divert attention from the British barges close by. We now know that Lieutenant John Harvey Stevens commanded the half-company of Marine artillerymen in this action. "The marines," says George, "started to send their diabolic rockets screaming to the U.S. battery. The rockets, though, served only to draw the American fire." The Americans, according to Simmons, were "mesmerized by the rocket fire" but "actually only two houses were set on fire..."

But the terrain of the island gave advantages to the American defenders and the British attackers were driven off; some barges were destroyed and they retreated back to the ships. In his message of 23 June to the U.S. Secretary of the Navy William Jones, Captain John Cassin wrote: "Admiral Warren[']s boats...were lost by sinking; twenty Soldiers and Sailors were saved & the boat haul'd up; from the [British] boats I presume there was [sic.] forty prisoners, the troops that were landed fell back in the rear of the Island & Commenced throwing rockets from Mr. [George] Wise's house, when [U.S.] Gun Boat 67 [then] throw'd [sic.] a few shot over that way, they dispersed & went back..."

In a postscript to his letter, Cassin hastily added: "This moment Captain [Joseph] Tarbell has just come up, and informs [me that] the enemy have withdrawn their Troops from Craney Island, and have landed at Newport News – and were firing Congreve Rockets."

Although fought on a tiny strip of land, Craney Island was a strategic location and the American victory here is said to have saved the far larger and important ports of Norfolk and Portsmouth (as well as the Gosport Navy Yard), further down the Elizabeth River, from being captured and pillaged [21].

Hampton, Virginia

The historic town of Hampton, Virginia, where the first permanent English settlement was made back in 1607, is also a very strategically-located site at the southeastern end of the Virginia Peninsula and thereby became another target for the British and their rockets during the Chesapeake campaign, under Rear Admiral George Cockburn. Rockets were deployed here on 25 June 1813.

On this occasion, the rocketeers were possibly the Royal Marine Artillery detachment under Captain George E. Balchild, although by about this time, another Royal Marine Artillery rocket detachment, under Lieutenant John H. Stevens (probably part of Balchild's group) was also in the area and on 4 July, according to Nicolas, were with Cockburn's squadron and had "dropped down to Lynhaven Bay," while on the 11th, the fleet of Admiral Sir John Warren, including a "marine rocket-vessel," had "quitted [the] James's [sic.] River to proceed up the Chesapeake."

In any case, according to a letter from Major Sta.[pleton] Crutchfield to the Governor of Virginia and published in *The Daily National Intelligencer* (Washington, [D.C.]) for 5 July, under the heading "Operations at Hampton," there were fired at Black-bear's Point, at the mouth of Hampton Creek, "...A great number of rockets, charged with combustible matter, with very few exceptions, and those without injurious effect upon our detachments or encampment, either fell short or over-reached their object." (The latter detail on the type of warhead is rarely given in the original accounts of the war.)

The *Albany Register* (Albany, New York) for 6 June reported more on the damages caused: "The attack was made at 4 o'clock on the morning of the 25th ult. by the enemy's forces (about 3,000 men) in three divisions of boats...Before a landing was attempted, an immense number of Congreve rockets were discharged against the town; but they had no other effect than to set fire to three houses, which were afterward extinguished."

A different account by Major Crutchfield sent to the Governor is found in the *Calendar of Virginia State Papers*. "I have to perform the painful duty of apprising you of my retreat with the Garrison under my command at Hampton to this place ['Half Way house' between Hampton and York, Va.]," he began. "This morning a little after five o'clock the Enemy commenced a fire of round and rocket shot from their tenders and barges in the river and creek opposite to Hampton...Their attack from the water direction which was kept up incessantly, was repelled by our batteries..."

The British naval officer Captain James Scott presents a more colorful version of the affair at Hampton: “The launches and rocket-boats under Captain Russell had engaged the batteries while the troops were marching on towards the enemy; the rockets had committed much mischief, but the alarm they created drove the poor inhabitants almost out of their senses, and they fled in every direction. The slaves profited by the opportunity to quit their masters’ service without notice” [22].

Fort Norfolk, Virginia

Nearby Fort Norfolk was struck a few days later, on 29 June that may have included Congreves.

Meanwhile, the *Daily Intelligencer* (Washington, [D.C.]) for 5 August 1813, ran a short report, “from the Camp at Mattox Church, Va.”, dated 30 July (possibly Mattoax, Va.), that: “They [the British] appeared to be busy on carpenter’s work, particularly on a species of frame, which was supposed to be part of the machinery for firing the Congreve rockets. Something must be on tapis [i.e. on tap].” This interesting piece does, at least, indicate that frame-type rocket launchers could apparently be easily fashioned in the field and that this happened during the War of 1812 [23].

Ocracoke Harbor, North Carolina Coast

The North Carolina coast also saw at least one rocket action during mid-July 1813. On the 11th, Admiral Sir John Warren dispatched Cockburn and his ships to Ocracoke harbor, on this coast, according to James, to put an end to commerce at that port and to destroy any vessels that might be found there. Very early on the 13th, the advanced division embarked in their boats on the Ocracoke bar, although it was difficult to maneuver them and they had to be hauled ashore by ropes that left the men exposed to the Americans. “The instant the British boats doubled the point,” James continues, “they were fired upon by the two [American] vessels; but Lieutenant [George Augustus] Westphal, under cover of some rockets, pulled directly for them and had just go to the brig’s bows, when the crew cut the cables and abandoned her...The British boats, in this affair, lost three killed...” The rocket troops themselves, however, were evidently under the command of Lt. John H. Stevens. Possibly there were other actions with the rockets off the North Carolina coast as well [24].

Lake Ontario, Canada

Perhaps the earliest known use of Congreve rockets in or near Canadian waters occurred in an action on Lake Ontario on 10 August 1813, not far from Sackett’s Harbor, New York, when the rockets were launched by a brig accompanying the HMS *Wolfe* sloop of war against attacking American schooners, although the schooners reportedly “sustained but little injury” [25].

Fort Wellington, Canada

Congreve rocket actions were also undertaken in Canada since it was then a British colony and, as noted, the “Niagara Frontier” was one of the four theaters of the war; in fact, the Canadians refer to the conflict as “The Canadian War of 1812.” The action at Fort Wellington, on the north shore of the St. Lawrence River at Prescott, Ontario, is perhaps the earliest known land employment of Congreve rockets in Canada. On 6 November 1813, according to the later recollections of Lieutenant-General Winfield Scott, who was a colonel at the time: “The scene [of the opening firing] was sublime. The roar of cannon was unremitting, and darkness rendered visible by the whizzing and bursting of shells and Congreve rockets” [26].

La Colle Mill, Canada

It is interesting to note that rocket troops had already been assigned to posts in Canada as early as September 1813 since, according to Nicolas, “In consequence of an application [request] from Sir George Prevost, the [British] commander of the forces in the Canadas, to Sir John Warren for a reinforcement...,” part of the Chesapeake forces were transferred first, to Halifax, Nova Scotia, Canada, and included Royal Marine Artillerymen with rockets. On the 9th this detachment of rocketeers sailed from Halifax towards Quebec, then towards Montreal.

Nicolas also says that on 8 November, “...the first battalion moved forward about 15 miles [24 km, from Fort Prescott] to La Chine, on Lake St. Louis, where the rocket company under Lieutenant Balchild arrived on the 10th, whilst Lieutenant [John H.] Stevens with two 6-pounders [2.7 kg guns] proceeded to Coteau du lac, on St. Francis.” (Evidentially, Stevens’ men were temporarily switched to standard gun artillery although they were soon re-armed with the rockets.)

An order of the same day, 10 November, from Edward Baynes, Adjutant General, writing from H.Q. La Chine, that later became a borough of Montreal, reads in part: “The Detachment of the Royal Marine Artillery Rocket Company is to Land, and will proceed to La Chine - the Commanding Officer will apply to the Ordnance Storekeeper for conveyance for a Moderate proportion of Rockets, the remainder are to be taken in to Store at Montreal.”

An order on the following day, also from La Chine, says: “All Officers belonging to [the] Corps in Upper Canada, are immediately to repair to Head Quarters at La Chine where they will receive instructions...1 Subaltern [and] 20 Rank and File of the Rocket Company of Marine Artillery...” But an order of the 17th states that: “The Division of Royal Marine Rocket Artillery [is] to be quartered at Montreal in Reserve.” But so far as we know, these particular troops stationed here were not activated.

There is also a letter from the “Military Secretary” to the Canadian-born Lt. General Gordon Drummond, the Lieutenant-

Governor of Upper Canada' of 4 February 1814, that was a reply to Gordon's letter of 28 January "relating to the deficiency of artillery officers for the post of Kingston, and requesting to be furnished with a supply of Congreve rockets and a proportion of men who understand the use of them, to be employed as occasion may offer..."

"His Excellency," the Secretary continued, "has ordered a detach't [detachment] of rocketeers with sleighs containing 72 rockets to move on from Coteau du Lac to Kingston, [Ontario,] whenever circumstances have rendered them disposable." Surely, this was one of the most unusual and colorful modes of transports of the rockets throughout the War of 1812 – or any war for that matter.

Then, an order of 15 April 1814 from Lt. General Gordon Drummond to the Governor General, Sir George Prevost, informed him: "His Majesty's Schooner, *Beresford*...sailed yesterday morning...for Niagara with [among other troops]...a proportion of Rocketeers, with a supply of Rockets..."

Meanwhile, another rocket engagement on the Canadian side occurred the previous month, on 30 March 1814, at the British outpost of La Colle Mill, [Ontario,] a small garrison blockhouse consisting of a stout stone-built mill building with other outpost positions and blockhouses nearby. The defenders of this installation included a Congreve rocket detachment of the Royal Marine Artillery. But Gosling, in his article on the battle of La Colle Mill, reveals that this defensive unit was very small and consisted of just "Four Marine artillerymen equipped with Congreve rockets." Also, when attacked by an American force under Major General James Wilkinson, according to one account, the enemy "used his Congreve rockets without producing any effect, [and] retired to La Colle, where he was pursued." Yet other sources say the rockets fired on this occasion were inaccurate although caused several American casualties and added that these particular American troops had not encountered these weapons before in battle and were unnerved.

In his journal entry of 30 March the American officer from Pennsylvania, Lieutenant-Colonel George McFeely observed: "In this affair I saw for the first time I saw the Congreve rocket used for the first time. The enemy threw a number which passed over [our heads] and burst in the air harmless[ly]. They might answer a good purpose for burning towns or frightening raw troops but in the field they are a poor contrivance for killing men, when compared to the rifle and musket."

Similarly, in the issue of 19 April 1814 of the *Constitutionalist and Weekly Magazine* (Exeter, New Hampshire), under the heading of "Frontier Operations," is an "Extract of a letter from an Officer to the *Albany Register*" (also found in other papers) that reads of the affair at La Colle Mill: "We also had the pleasure of witnessing the inefficiency of the Congreve rocket, several of which were thrown by the enemy in and about our column, exploded and proved as harmless as the smoke."

It so happened, that a few days later on 23 April, the British officer Lieutenant John Le Couteur, then based at Kingston Ontario, noted in his journal: "Walked out...to witness the effect of rockets on a picketed fence which had been erected for the occasion. These Congreve rockets explode a shell at a given distance and when accurately fired, which is rarely the case, are very destructive. One of them struck the picketing and carried away a great part of it, a fragment of the shell came back & fell near [Lieut.] Col. Carl Viktor] Fischer. The last that was fired mounted into the air perpendicularly and, for some moments, the spectators were in doubt whether it would not fall among them. We all agreed that the rushing noise of them would frighten any cavalry."

Thus, it appears small shell (explosive) type rockets were now being introduced into service for the Canadian theater although they remained unpredictable [27].

Oswego, Lake Ontario, Canada; Sandy Creek, New York

Another military action of Congreve rockets in Canada occurred at Oswego, Lake Ontario, on 3 May 1814. Here, the Royal Marine Artillery "rocket company," or rather, half-company, under Lieutenant John H. Stevens, supported the landing party and was later cited in dispatches for his services. Stevens and his rocket company, along with other troops, had arrived aboard the *Prince Regent* off Oswego. (Malcomson and Nicolas also indicate the rockets were used in the expedition against Oswego fought from 5-6 May).

Later that month, on 29 May after British naval forces were destroyed at the battle of Sandy Creek in northwestern New York, Royal Navy Captain Sir James Lucas Yeo had to call off a planned Congreve rocket attack on Sacketts Harbor, also in upstate New York, since he was now deprived of gunboats with rockets. (Although a village, Sacketts Harbor was in a strategic – ally protected harbor on Lake Ontario with very important American military installations there, including a major shipyard and headquarters for the Great Lakes [28].

Accomack, Virginia, and St. Leonard's Creek, Maryland

The Atlantic coast of the U.S., particularly the Chesapeake region, bore the brunt of the war. Even tiny, though historic Accomack, Virginia, was not spared. Situated on the Eastern Shore of Virginia, and part of the Delmarva Peninsula, the town traced its history back to the early 17th century and was given this name by the first British settlers after the *Accawmacke* nation of Indians who then inhabited the area. Here, on 31 May 1814, according to a letter from the American Lt. Col. Thomas M. Bayley to the Governor of Virginia, at half past seven in the morning, "...the enemy commenced his attack upon Major [John] Finney with 18 lb [8 kg] shot and Congreve Rocketts [*sic.*], which was returned with rapid fire...The enemy used his 18 lb,

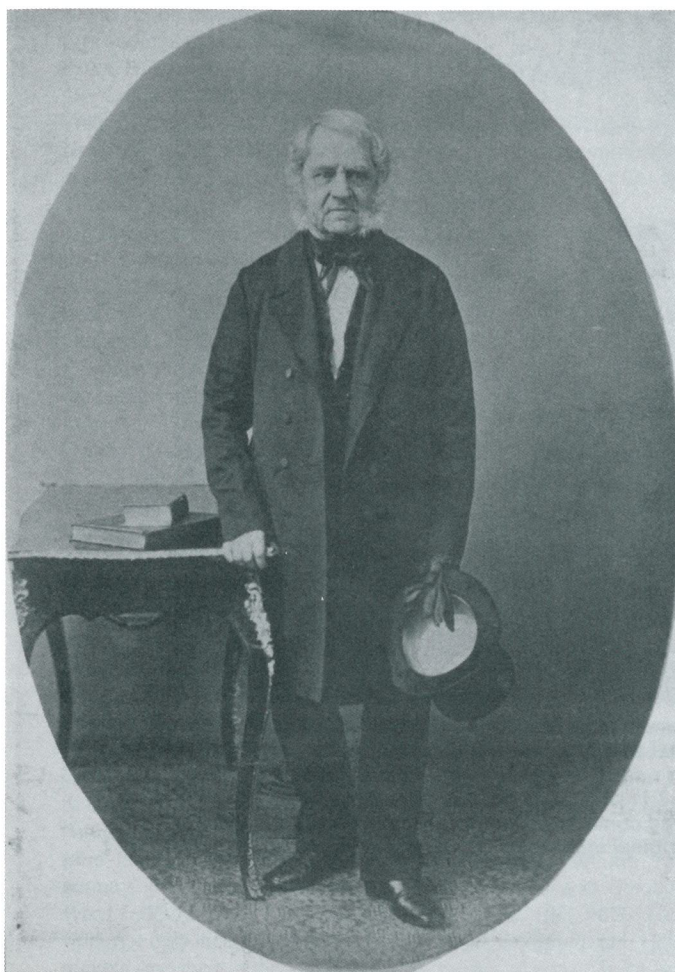


Fig. 8 A rare photo of a commander of one of the British rocket units that fought in the War of 1812, John Harvey Stevens (d. 1866), usually just given as John H. Stevens. Then, as a lieutenant, he commanded one of the Royal Marine Artillery rocket detachments sent to North America in 1813 to fight in that campaign. Attached to the forces of Rear Admiral Sir George Cockburn, Stevens participated in the battle of Craney Island, Virginia, and the attacks on Hampton, Virginia, and Ocracoke Island, off the North Carolina coast, among others. He eventually rose to the rank of Major-General and is shown here, after he retired, probably in the 1860's. (Courtesy, Royal Marines Museum, Hampshire, UK)

12 lb, 4 lb., canister and grape shot and Congreve Rockets [*sic.*] with great profusion, but without effect. He soon landed from eight barges...During the whole of this time an incessant fire of musketry was kept up on both sides, with cannon and Congreve Rockets [*sic.*] from the barges then in the creek, three of which had never landed and had moved up the creek..."

Olejar, in his article, also brings in the importance of the Chesapeake campaign but says mistakenly that: "The first recorded use of rockets against American forces came during a naval engagement on 1 June 1814, during the War of 1812." British warships, he continues, by this time "had driven American defenders from the lower portions of the Chesapeake Bay and [the American] Commodore Joshua Barney's tiny fleet of barges charged with guarding the area had taken refuge in the mouth of the Patuxent River. A British barge advanced and discharged the new Congreve rockets, which did so much damage. What impressed Commodore Barney was...that their range exceeded that of his 24-pounder [10.8 kg] guns."

"On 8 June," he adds, "Barney's barges were in St. Leonard's Creek, a better refuge, and British rockets again were discharged while shell from American guns fell short. A rocket killed one man and caused injuries to three more on one barge." According to the version of Christopher T. George, the British attacks failed, "although one Congreve rocket [had] slammed into a barge, passing through the body of a flotilla man. Flames [consequently] ignited a barrel of gunpowder and another of musket cartridges, the explosions hurling sailors into the creek."

Shomette identifies the man and relates the grisly details. "When one of the fiendish devices [a Congreve rocket] landed on board [American] barge No. 4 [*sic.*], one of the Baltimore City boats in [Lieutenant Solomon] Rutter's division, passing through the body of a hapless seaman named Thomas P. Gilbert, the vessel was immediately set ablaze. The flames spread rapidly, igniting a barrel of powder and another loaded with musket cartridges. The resultant explosion hurled seamen into the water in every direction. Three men were wounded, one of whom was burned 'perfectly crisp' on the hands, face, and other exposed portions of the body. The two magazines on board were set afire, and the barge's commander, accompanied by officers and crew, hastily abandoned ship."

Thus, this may have been the third Congreve rocket casualty of the war, after a man at Frenchtown, Maryland, on 29 April 1813 and Mr. Webster at Havre-de-Grace, also in Maryland, on 3 May 1813. Congreve's occasional lethal rockets were thus frequently used through the several skirmishes along St. Leonard's Creek throughout 8-26 June 1814 and in an action of the 26th, Col. Wadsworth reported to the Secretary of War, as copied in *Nile's Weekly Register* (Baltimore) for 2 July 1814: "One of the enemy's rockets passed through an ammunition box, which had been injudiciously placed, and exploded it, which did some damage. An ammunition cart was covered with the fire, but fortunately did not explode. Some other trifling accidents were sustained."

But in another one of these actions in this area, Barney was able to fire a shot through a rocket boat by a direct hit. This must have been the action that we can date to 10 June in which he informed the Secretary of the Navy: "The [British] commodore's boat was cut in two; a shot went through the *rocket* [Barney's emphasis] boat..." (The rocket barges in these Leonard's Creek encounters had been under the command of Commodore Robert Barrie.)

Olejar adds that Barney's men recovered an "unexploded rocket" and sent it "as a curiosity to the Secretary of War." This is confirmed by Howard who adds that the rocket was actually sent to the Secretary of the Navy, William Jones, on 9 June in which Barney told Jones: "I send you by express this letter & one of the *Rockets* [*sic.*] which went into the ground and did not explode." It thus seems that there were several instances of Americans recovering the enemy's rockets during the war. Ironically, on following day after the rocket was mailed, one of these same projectiles had set fire to one of Barney's barges [29].



Fig. 9 A rare scene that includes a British rocket equipment in action during the War of 1812, the action at Havre de Grace, Maryland, on 1 June 1813. Note that Fig. No. 5 in this scene is called a "Machine for throwing rockets" in the original colour etching. It is seen as a ladder-like frame launcher and was adjustable for launching at different angles. Fig. No. 2 is 1st Lt. George A. Westphal who, although suffering from a previous wound (note the arm sling), had commanded some of the rocket boats used in this assault, although not shown with the rockets. (Original etching in the Maryland Historical Society)

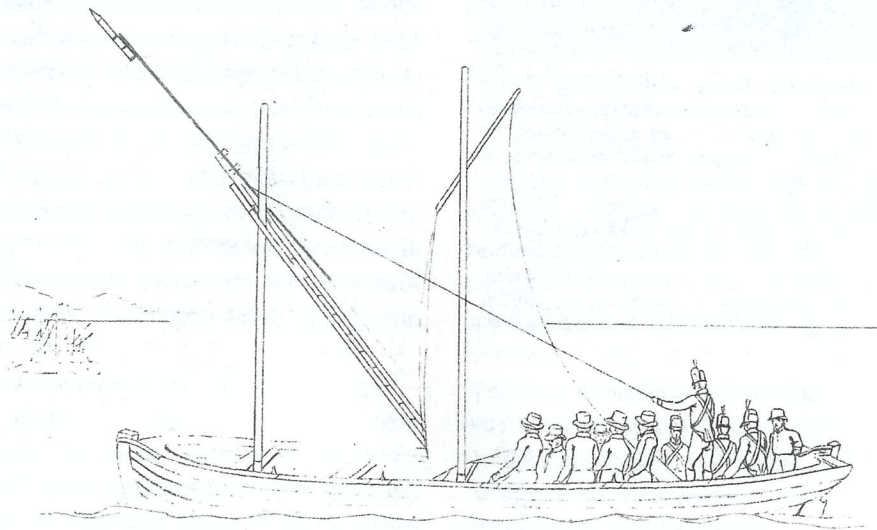


Fig. 10 Typical British rocket boat deployed during the War of 1812, especially in the Chesapeake campaign. However, as noted in John Harvey Stevens' booklet *Some Description of the Methods Used in Pointing Guns at Sea* (1834), later British rocket boats used "tubes of different lengths" instead of this earlier and cumbersome frame-type launcher. Moreover, Congreve's greatly improved, centrally-mounted stick rockets (originated in 1815) facilitated their use from tubes compared with the side-stick type shown here.

(Drawing, based upon Congreve's treatises, like his *Details of the Rocket System of 1814.*)

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Conservation and Restoration at the Royal Gunpowder Mills, Waltham Abbey

D. SIMS

The problems for a small visitor attraction can be split into 4 areas:

- Money
- New exhibits
- Lack of expertise
- Difficulty in finding volunteers

Money

We are a charity so quite dependent on the number of paying visitors that we can attract. So how do you get them in? Obviously advertising is one answer but there is a difficult balance between publicity, which is very expensive, and the return from this. Also once visitors have been they are not likely to come again for some time unless you can put on new exhibitions.

We have a special problem at Waltham Abbey since we only have very limited exhibition space. Although we have lots of buildings when the site was cleared Royal Ordnance said they were contaminated (about x parts per million of explosives) therefore our insurers will not let them be used until someone will declare them "safe". The fact we worked in these buildings for more than 30 years and we are still alive doesn't count. Another major problem now emerging is that the buildings were of lightweight construction so that in a bang they fell apart. Of course after 30+ years with no maintenance they are in need of expensive repairs.

New Exhibits

We have a good exhibition on the history of gunpowder but it is a bit dry. We have managed to purchase an excellent arms exhibition and with the help of the friends a good collection of rocket motors from Westcott and other places. But what next?

If we cannot get something new we will not attract so many future visitors

Lack of Expertise/Facilities

Long gone are the days of nipping down to the main MoD workshops to get something repaired. We now have to make do with mainly hand tools or the goodwill of outside bodies. It

is also difficult to get volunteers with skills such as carpenters, builders or electricians since even when retired they prefer to earn something on the side. In any case their work is severely restricted by Health and Safety rules. However as you will see the friends are a versatile lot.

Volunteers

We depend as most places on volunteers since we only have 5 full time staff. We have some good volunteers but most prefer to be in contact with the visitors rather than work unseen on projects.

Nevertheless we are not downhearted and we have survived for the last 10 years.

The Gunpowder Mills as an exhibition site started from a low base. After the site closed there was no plan to set up a visitor centre so most of the items we might have wanted to retain for display were destroyed. The Mills started off with a good film and a modest display together with a collection of interesting old buildings. Relatively recently we acquired an outstanding collection of old guns.

What I thought I would do in this talk is to show those of you who haven't visited us a few general illustrations of the place and then tell you what the friends and volunteers have been doing during the last few years to improve things apart from raising money. Volunteering is a great way of enjoying your spare time

Waterwheels

The Gunpowder Mills were originally driven by waterwheels. Many people particularly children do not know how they worked so our very first project was to build a waterwheel.

Recently due to reorganisation it had to be moved and in any case after 10 years it was getting dilapidated. We have rebuilt it very modern with a solar power panel providing the power for the water pump (Fig. 1).

Cannons

Originally there were 2 cannons as bollards on the humpback bridge on the main road through Waltham Abbey. When the road was widened these were returned to the site.

This is an abridged version of a paper presented at the British Interplanetary Society "Cosford IV – Propulsion, Projects, People and Places" Symposium, RAF Museum Cosford, 12-13 April 2013.



Fig. 1 Latest Waterwheel.



Fig. 2 Mounted Cannon.

We decided to mount these as they would have been 200 years ago. Not as easy as you might think. The difficulty was in the cutting of the large timbers and then lifting the cannons on to the mounts (Fig. 2).

Fire Alarms

The Royal Gunpowder Mills and the Royal Small Arms at Enfield were in the late 1800s one site so they had a common telegraph fire alarm system. The pillars were around the site before closure then taken to Westcott for safe storage. We retrieved these and set about cosmetically restoring them. To our amazement when we managed to open some pillars we found the workings were intact and made of brass. We also had the main control board. We spent a lot of time trying to understand how it all worked. The basis of the system is in the pillars which contain a grandfather clock type weight and pulley arrangement. When the handle is pulled the weight drives a toothed wheel that activates a Morse key. This sends a signal down the line to the control board in the Fire Station where it rings a bell and is printed out on ticker tape. The fireman would compare this to the signals on the board to find out which alarm had been pulled. We now have a fully restored fire system but unfortunately at present the whole system is in storage since we have nowhere to show it (Fig. 3).



Fig. 3 Restored Fire Pillar.

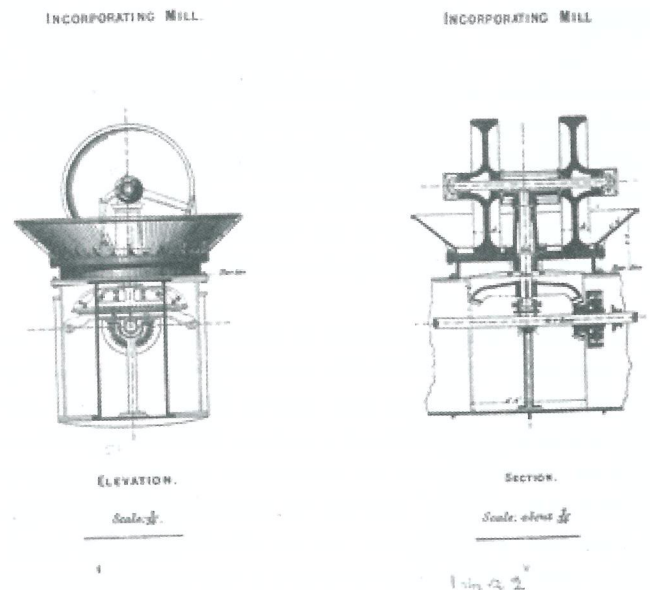


Fig. 4 Original Drawings of Gunpowder Mill.

Gunpowder Mill

Although we were the Royal Gunpowder Factory we had no gunpowder mills. These were taken out by the time of the first World War so as to convert the factory for the making of cordite. We were offered one from Nobels but could not afford the cost of moving it (£25,000). All we had were the original drawings (Fig. 4).

Using these drawings the Volunteers set about constructing a full size working replica as near as possible to the original mill with some ingenuity using all sorts of bits and pieces. For instance the main drive shaft is a piece of 6" water main from Thames Water and the wheels are mainly expanded polystyrene faced with plywood. One of the most difficult tasks was to work in the underground shaft to attach a slow speed motor to allow the mill to rotate at the correct speed of 15 revs/min.

The project took almost 2 years at a total cost of £3000 (Fig. 5).

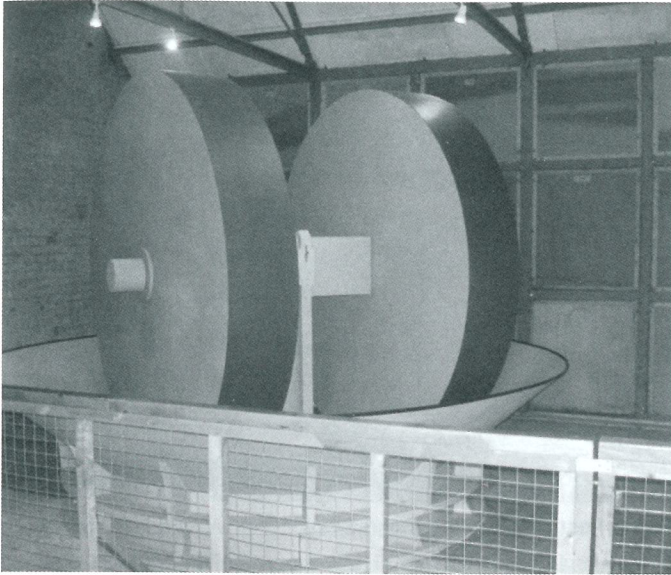


Fig. 5 Completed Replica Mill.

Gunpowder Boat

Originally gunpowder was moved around the site by boat. Those of you who visited the site when open would have seen one moored near the library. After closure it was moved to the Royal Armament Research and Development Agency (RARDE). Unfortunately they didn't look after it and it came back in a very sorry state with much of the woodwork rotten and crumbling. I have spent much of the last 3 years trying to do a cosmetic restoration on the boat.

It has been in a tent for the last 3 years but the winter gales have ruined the tent. We decided to put it in a 70 year old wooden building that has not been used for over 30 years. After clearing it out and painting we are to remove the end of the building and put the boat inside (here's hoping it doesn't fall down) (Fig 6).

Powder Wagon

This was a genuine powder wagon that originally ran on the railway. We thought we could just repaint it and make it smart. No joy it fell to pieces so we now have a nearly original truck.

Cordite Truck

This was quite amusing looking back. It was on show in the woods so we went in the Land Rover to tow it to the workshop. Almost immediately the front wheels fell off. So we got a Slingsby truck, jacked up the cordite truck and tried to haul it back manually to the workshop, about ¼ mile. Well we did get there just and as we stood puffing away it all collapsed in a heap. We now have superb truck very original, well at least the towhook and the wheels are (Fig 7).

Gunpowder Press

This is located in the woods and dates from about 1865.

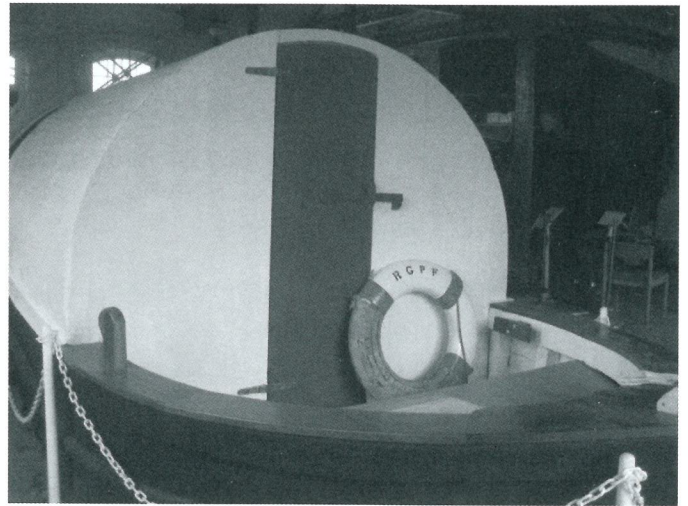


Fig. 6 Partially Restored Gunpowder Boat.



Fig. 7 Rebuilt Cordite drying wagon.

Originally it powered a hydraulic pump and is unique. The waterwheel hasn't turned for about 100 years. To illustrate the problems we have, it took over two years for English Heritage to allow us to coat the wheel with preservative. They do not wish us to restore it. However one of our volunteers has managed to get the wheel rotating almost half a turn. If we can get a full turn then the rules for restoration are apparently different.

Rockets

The Friends have by devious means obtained a reasonable collection of rockets. Some were from the original Westcott collection. We are the keepers of these and I will ask if any of you can get us some more please do (preferably with FFE certificates) (Fig. 8).

Railway

A different group of volunteers are trying to restore some of the railway that was on site. Originally there was some 6 or 7 miles



Fig. 8 Rockets exhibition.

of 18 inch gauge track which ran right down to the Small Arms factory. Only Waltham and Woolwich had 18" track all other factories were at 30". It is being restored at 30" since this is easier to get. You would not believe the trouble they have had. Everybody objected, Local planners, English Heritage, English Nature, and we were only putting back what was there originally.



Fig. 9 Restoring the original railway.

After 3 years it is now moving forward. A railway always attracts lots of attention and could make money for the site providing we can get an operating licence (Fig. 9).

Let us hope that the next ten years will be equally successful.

Appendix – Short History of the Gunpowder Mills

The first reference to the manufacture of gunpowder in the Lee Valley is contained in Dr Thomas Fuller's History of the Worthies of England published in 1662 although rumours of earlier manufacture exist. The first Title Deed to the site was published in 1669. The mills eventually passed to the Walton family and by 1735 were in the hands of the second John Walton. He introduced significant changes to the manufacturing process and engaged the engineer John Smeaton to redesign the mills. Smeaton introduced waterpowered edge runner mills, a very successful design that remained in service until 1940. At a time of deteriorating international relations the Government sought to control the supply of gunpowder and bought the Faversham mills in 1759. After representations by Major William Congreve that the government mills made better gunpowder Waltham Abbey was also purchased from the Walton family in 1787. The Mills were considerably refurbished and 2 decades later in 1810 Congreve was able to prove that the government powder was indeed superior by means of a shoot off. Production between the 2 factories at this time was about 20,000 barrels a year.

Steam driven mills were introduced from the 1860s with a central beam engine driving 3 mills on each side by an underground shaft. These buildings are still in existence today. However gunpowder had disadvantages, it was moisture sensitive, produced much smoke on firing and could not be made fast enough for the big guns being developed. Fortunately research on the Continent particularly by Schonbein showed that nitrating cotton produced a much more useful

product, Guncotton. A plant was set up at Faversham in 1847 but unfortunately there were numerous explosions which killed a number of people. The chemists at Waltham led by Sir Frederick Abel showed that if the cotton was clean and the guncotton thoroughly washed to remove all the acids the product was stable.

At the same time in Italy Sobrero produced nitroglycerine [NG]. Although being warned that it was too dangerous Nobel adopted the process and worked on ways to make it safer. He developed a composition using nitrocellulose, NG and camphor. Sir Frederick Abel heard of this and developed a similar composition and using acetone as a solvent produced a dough and extruded the product into cords—Cordite. So a new era for Waltham Abbey was born and a new factory was set up in 1890 to produce cordite. Cordite was the main propellant of WW1. Waltham continued to do research and development on explosives such as TNT, tetryl and RDX as well as cordite until WW2.

After the war the RGPF was closed but immediately set up as a research centre looking at rocket propellants as well as explosives, gun propellants and materials. The site finally closed in 1991 after 322 years.

The Mills are now open as a visitor centre from Easter to the end of September and all school holidays. They are located in Waltham Abbey near to J26 of the M25. Further information can be found at www.royalgunpowdermills.com.