

# The *Stirling Castles* Prince Rupert patent demi-cannon.

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## Introduction

The *Stirling Castle* was one of 30 great ships of the line built as part of Samuel Pepys 1677 shipbuilding programme. The programme consisted of 1 first rate, 9 second rates and 20 third rates (Fox 1980:154). The new ships initial design was found lacking. The cost of the alterations to the vessels was met by the King himself, Charles II. To simplify maintenance the King insisted the masts, spars, rigging and fittings of each rate be standardised, whilst Pepys ensured the ordnance was also standardised. This marked the first steps in the control of naval architecture by the naval administration. The size of the building programme strained the resources of the Royal Dockyards and meant that the new ships were ordered in two instalments. The first instalment consisted of 3 second rates and 12 third rates, and the second instalment of 1 first rate, 6 second rates and 8 more third rates.



Figure 1a      *Stirling Castle* being launched at Deptford

The *Stirling Castle* was a third rate laid down as part of the first instalment of ships in 1677. It was built by John Shish and completed in two years, being launched at Deptford on the south bank of the river Thames in 1679 (figure 1a). At 1,114 tons the *Stirling Castle* was slightly larger than the average 3 rate as laid down in the specifications of the 1677 programme, this being 1,008 tons (see table 1).

Table 1

Specifications	Tons	Keel Length	Gun deck Length	Breadth	Depth of Hold
<b>1677 Programme</b>	1,008	N/A	150 ft	39' 8"	17' 0"
<i>Stirling Castle</i>	1,114	133' 11"	151' 2"	40' 4"	17' 3"

The *Stirling Castle* was amongst the third rates listed in the Revolution Fleet of 1688, then went on to fight as part of the Red Squadron at the battle of Beachy head (1690), and part of the Blue Squadron at the Barfleur in 1692 (figure 1b). During 1699 the *Stirling Castle* was rebuilt, and in 1701 was refitted. In 1702 the *Stirling Castle* was part of an Anglo-Danish fleet of 50 ships of the line sent on the Expedition to Cadiz. Before returning home and wrecking on the Goodwin Sands in the Great Storm of 1703, the *Stirling Castle* was assigned to the Mediterranean.



Figure 1b battle of Barfleur, the Stirling Castel in the middle.

#### *Significance of the ship*

Until the Second Dutch War (1665-1667) fleets engaged each other in a general melee. Each vessel sought out its own adversary, with Admirals seeking their opposite number and visa versa down the line of hierarchy. By the Second Dutch War, fleets were being organised in squadrons and line ahead formation became the standard tactic. This appears to have first been initiated in the English Navy as evident in their standing orders. All the ships of the 1677 programme (1, 2 and 3 rates) were vessels powerful enough to form up in the line of battle. As such the *Stirling Castle* represents a vessel from the earliest period of the Line of Battle.

#### *Project Background*

The *Stirling Castle* became a total wreck and was lost with 4 fifths of its crew in the early hours of 27<sup>th</sup> November 1703. It remained hidden until dived upon by the local Ramsgate Dive Club in 1979. Earlier in the year the dive club had approached Thanet Archaeological

Unit (now Thanet Archaeological Society) requesting help and advice in pursuing maritime archaeological projects (Chamberlain 2002:17). At first the Units field archaeologist, Dave Perkins, tasked the Dive club to find World War II material for a display on “Thanet at War”. After the successful completion of this task the dive Club were entrusted with investigating local net fastenings (Chamberlain 2002:17).

Tommy Brown was a very successful local trawler-man. He had trawled the larger part of the Goodwin Sands and had a number of “net fastenings” plotted on his chart. It is unknown how many times throughout the life of the *Stirling Castle* that such trawler-men “caught” the vessel in their nets, but it was not until Tommy Brown took five members of Ramsgate Dive Club to dive on one of his “net fastenings” on the 23 June 1979 that the *Stirling Castle* was relocated (Chamberlain 2002:17).

Initially the identification of the site remained a mystery. Pewter plates, wine bottles and human bones were recovered, whilst over 20 guns, on their wooden gun-carriages and pointing out through their gun ports, were counted. Two cannon, one 5 foot 6 inches long and one seven foot long, were raised. The smaller of the two was found to be made of bronze by Assuerus Koster in Amsterdam in 1642. Despite being Dutch it was also marked with a broad arrow denoting it was British Government property. In the first year 172 assorted objects were raised. This included the ships bell, made to Admiralty pattern and stamped with both the broad arrow and a date of 1701. The type of material being raised suggested that the wreck in question was one of those lost in the Great Storm of 1703, be it the *Stirling Castle*, *Northumberland*, *Restoration* or *Mary*. The *Mary* was quickly ruled out due to its smaller size and size of cannon onboard. A pewter plate with the initials “JJ” was recovered and identified as belonging to John Johnson, the Captain of the *Stirling Castle* when it was lost. For the first time in over 250 years the *Stirling Castle* had been found and positively identified. The ship gave up its secrets for just over two years until the sands shifted again and reclaimed the vessel and all its artefacts. It would not be until the summer of 1998 that the Goodwin’s would reveal the *Stirling Castle* for another time.

This time under the direction of Bob Peacock, a local diver and business man, and now Licences for the *Stirling Castle* the site was investigated and recorded under the auspices of “Operation Man-O-War” (OMOW). A full and detailed record of the site was obtained and significant structural features recorded. However it was noted that the site had started to disintegrate, and over a period of two years the gun decks collapsed and the guns, on their gun carriages, that once poked out through the gun ports toppled out onto the sea bed. Without the protection of the rest of the ship the fragile breeching ropes and blocks as well as elm carriages soon started to disintegrate. Before it became too late the decision was made to raise one of the guns with its associated gun carriage.

### **Raising the assemblage**

On 11 September 2000, under the archaeological direction of Simon Adey-Davies the gun and associated gun carriage was raised. After a relatively uneventful trip from the Goodwin Sands to Ramsgate Harbour the assemblage was deposited in the shelter of Ramsgate inner harbour. Here it was left until such time as the appropriate funding was secured and passive conservation facilities were available on shore. In the summer of 2003 with the pre-requisite funding and conservation facilities now available the cannon and carriage was lifted out of the harbour and into a holding tank, under the overall direction of the author, then of Mary Rose Archaeological Services (MRAS). An initial assessment of the carriage and gun was



made during the lift (figure 2). Wooden baits buried with the canon and carriage showed evidence for minor wood bore infestation. The total assemblage weighed over 3.5 tons with the gun alone being 2.432 tons.



Figure 2a Initial assessment of cannon.

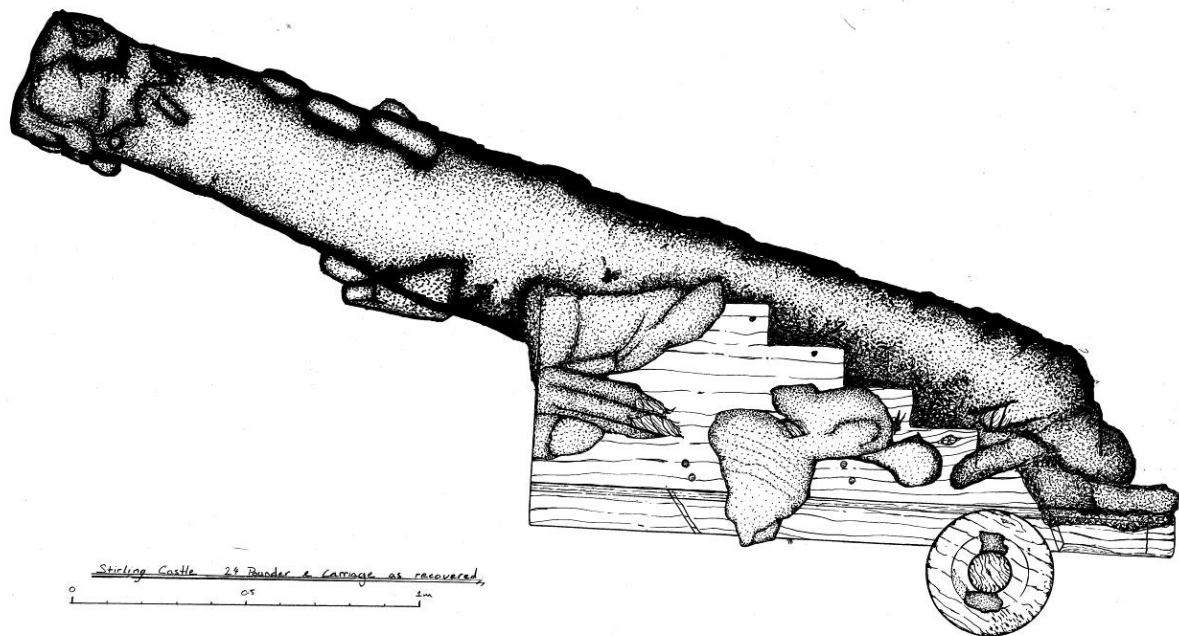


Figure 2b Initial assessment drawing of cannon and carriage.

After a period of stabilisation and desalination it was time to separate the two artefacts for active conservation. The initial assessment suggested that there was a large area of concretion below the gun in between the two checks. It also highlighted the structural integrity of the carriage bed but the relative weakness of the checks. The carriage could not be expected to support the weight of the gun, and therefore had to be separated in its present state before each part could be righted. Thus it was accepted that the gun would have to be separated from underneath the carriage.

### Separation of gun and gun carriage

The de-concretion of the barrel and its separation from the carriage began in March 2004. Whilst on the whole this was a “one man” job, the initial phase required the recording of features as they appeared and the “bagging and tagging” of all artefacts and pieces of concretion assessed as being of importance. Thus a small team of three people was assembled including a researcher on the end of the phone, able to identify any features as they appeared.

The de-concretion started at the muzzle and worked towards to the cascabel (figure 3), then back in and around the carriage. Where breeching ropes were encountered they were recorded. Concretion deemed to be important was to be investigated at a later date after radiography. All other pieces of concretion were crushed and disposed. The de-concretion process and composition of the team allowed for the initial identification of the piece as a “Prince Rupert Patent gun”, and then two hours later when the guns number was unveiled, as a specific gun on the ships list. Once the full length of the barrel was de-concreted attention was then turned to the carriage and how to separate it from the barrel. It was however at this stage that the author noted a red color to the barrel, a feature noted of such guns. This could not be washed off and did not appear to be corrosion products. It is of interest that the piece also gave a resounding ring when hit, just as if it was new.



Figure 3 Deconcreting the muzzle.

The rear axle was removed from the base of the carriage to facilitate the turning of the gun through 45 to 60 degrees, and to allow access to the underside of the assemblage (confusingly the actual top of the carriage and cannon) but without damaging any part of the assemblage.



The axle pin concretions were removed and the trucks slide off. The port axle bolt proved to be rotten which facilitated the initial separation of the axle. However the starboard axle bolt proved to be more stubborn. Attempts at separation proved futile until such time as a power saw with metal cutting blade was used. Even with this powerful tool it took 15 minutes to cut through the bolt, which still shone bright after 300 years underwater.

Once the axle had been removed work could start on the inside of the carriage. The concretion here proved to be relatively thin, with the bulk of the interior of the carriage made up of clay and clay sand. A single turned wooden platter was found in-between the checks (figure 4).



Figure 4      Wooden platter inside gun carriage.

A similar platter was found in an identical place in one of the other carriages still on the seabed. The inside of the carriage up to the breech ring was successfully de-concreted. All that remained now was to attempt to “split” the “seam” of concretion between the cannon and carriage. This was successfully done by the delicate use of a bolster chisel and then the more brutal use of wooden wedges. The bolster chisel “fractured” the concretion whilst the wooden wedges helped to open up and join these fractures. Once it was confidently ascertained that the seam of concretion had fractured all the way around the gun then the carriage was delicately “pulled” away from the gun. Initially the chain hoist took the weight of the back of the carriage, and the carriage slowly rotated around its trunions for the first time in 301 years. After this it was an easy process to lift the carriage off the gun, and to then rotate the carriage back to the upright position. Once separated the barrel and carriage could be worked on separately and fully de-concreted. It was during this stage that it was realized the barrel was still loaded. The ball, wadding and sample of the gunpowder were successfully recovered during the conservation.

### Barrel description and identification

Once de-concreted and separated a full record of the gun leading to its positive identification could be undertaken (figure 5). The main dimension of the piece are given in the table below (Table 2)

<b>Type</b>	Demi-Cannon (Turned and Annealed)
<b>Length</b>	2.955 metres (9 1/2 foot)
<b>Length overall</b>	3.255 metres
<b>Bore</b>	Diameter = 160mm (6 inches) Length = 2.86 m (9 foot 4,1/2 inches)
<b>Maximum diameter at breech mouldings</b>	0.495 metres
<b>Maximum diameter at muzzle mouldings</b>	0.320 metres
<b>Trunnion diameter</b>	169 mm
<b>Touch hole diameter</b>	20 mm
<b>Weight</b>	2470 kg (48 -2/4-12)
<b>Stamped weight</b>	49 - 0 - 3 (49 hundred weight and 3 pounds)
<b>Inscription</b>	6221, broad arrow, T W.
<b>Decoration</b>	Charles II cypher (bare) with crown.

The piece is a demi-cannon of 9 ½ feet long with a bore of 6 inches and bears the following marks: 49-0-3 on the base ring, a “T” and “W” either side of the vent, and on the top between the trunnions a raised irregular shaped block. The numbering is the weight of the gun, 49 hundred weight, 0 quarters and 3 pounds (5491 pounds or 2496 kg), though its measured weight is 48 hundred weight 2 quarters and 12 pounds (5443.88 pounds or 2470 kg). This was inscribed when the gun passed proof and used for the method of payment to the gun founder, who was paid by the weight of the piece. The discrepancy between the measured weight of the piece and its stamped weight can be accounted for in the loss of iron in the concretion. The T and W are the mark of the well known late seventeenth century gun founder Thomas Westernnee (Trollope 2005:49). The irregular shape on the top between the trunnions is an unfinished cipher block for James II (Trollope 2005:54).

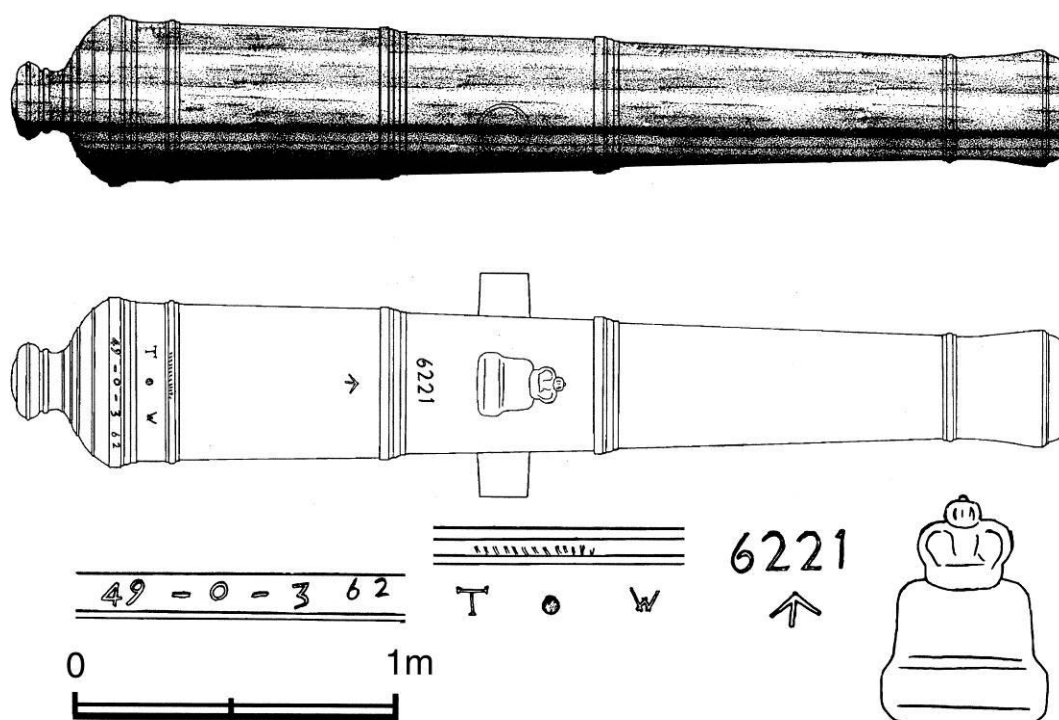
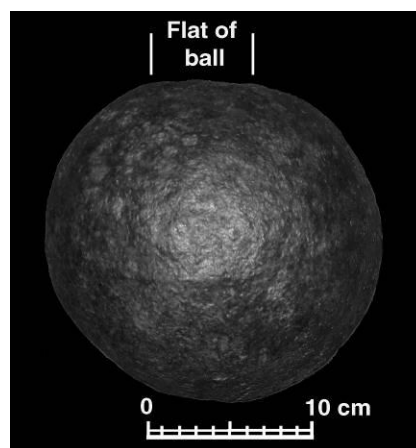


Figure 5 Drawing of Prince Rupert Patent Gun

### Ball, wadding and powder

A cast iron ball, 5 and 9/10 of an inch in diameter was excavated from the bore of the barrel. The bore is recorded as being 6 inches in diameter which makes this a very tight fitting ball, a feature associated with Drakes (Trollope 2002:57). The ball was cast in a bi-partite mould, its casting seam visible half way up ball. At the top where the casting spur might be expected the ball is flat. The flat is 2 inches in diameter with the evidence for the spur being 1 inch (figure 6). The flat is the result of the iron cooling after pouring and suggests that the mould was not filled full. The ball could represent the last ball poured in a batch. It is of interest however



that the ball was still considered usable and had not been taken out in a quality assurance process.



There were 3 samples of wadding recovered from the barrel. Each sample is composed of oakum, unpicked strands of rope also used in ships for caulking seams. The strands appear to have been picked from hawser laid, left hand twist, rope of 1 inch diameter, the large strands being half an inch in diameter and the smaller strands a quarter of an inch in diameter. This is the type of rope used for the lighter breechings. A single sample of wadding was found in front of the ball whilst 2 separate samples came from behind the ball.

Of interest is a piece of cord with an overhand knot and a reef knot in it (figure 7). The reef knot is made from two separate cords and creates a smaller and separate loop on the outside of the larger loop. There is no direct evidence to allow us to clearly state that the cord and knots are directly associated with a specific function, they could just be part of the wadding. Alternatively they could represent a means of tying the wadding to keep it together, or possibly tying up the powder cartridge.



Figure 7 Wadding from gun barrel

### **Gun carriage and associated tackle**

A full description and analysis of the gun carriage and associated tackle will be part of a forthcoming separate article (M<sup>c</sup>Elvogue Forth Coming a). A cursory description is given here. The carriage, commonly known as a truck carriage (figure 8), is of a type generally associated with shipboard use. It consists of two elm cheeks, with the ubiquitous steps cut into their aft part, fastened either side of the bed by two oak tenons held in place by oak pegs. The cheeks are also supported by three iron through bolts. Along the forward upper part of the cheeks are deep trunnion cut outs and the remains of the cap squares. The cap squares are made from wrought iron and hinged at one end and shaped to fit over the trunnions. The front of the cap square fits over a square post which holds a forelock to keep the cap square in place.



Figure 8      Gun carriage

Breeching ropes and tackle were excavated underwater from around the carriage and gun, and from the concretions on the barrel itself. The ropes found around the muzzle suggest it was tied against the side of the ship, in preparation for the storm to come (M<sup>c</sup>Elvogue Forth Coming a).

### **Demi-cannon significance**

The demi-cannon's significance is its rarity, the history of its casting and the personalities and people associated with it. Throughout the history of cast metal cannon, (as opposed to wrought) there have always been attempts to improve the final product by the casting methods, metals used or post casting treatments. Most efforts have been to try and improve the strength of the piece to make it more powerful or to reduce the weight of a given size of ordnance. An example of such are the Drakes cast by the Kings gun founder John Browne which had a smaller chamber and tighter fitting ball which allowed for a lighter gun (Trollope 2002:57). The Prince Rupert Patent method of producing cast iron guns was such an effort to improve the quality and performance of the standard rough cast iron gun.

### *Surviving guns*

There were only 11 known Prince Rupert Patent guns before the fateful exposure of the Kings cypher on the top of the piece from the *Stirling Castle*. These have been catalogued and presented by Sarah Barter Bailey in her thoroughly authoritative and definitive book, *Prince Rupert's Patent Guns*. The catalogue of 11 pieces (reproduced as table 2) consists of several types of guns but no demi-cannons. Thus the *Stirling Castle's* demi-cannon is, to date, unique amongst the known Prince Rupert's Patent Guns.

**Table 2**

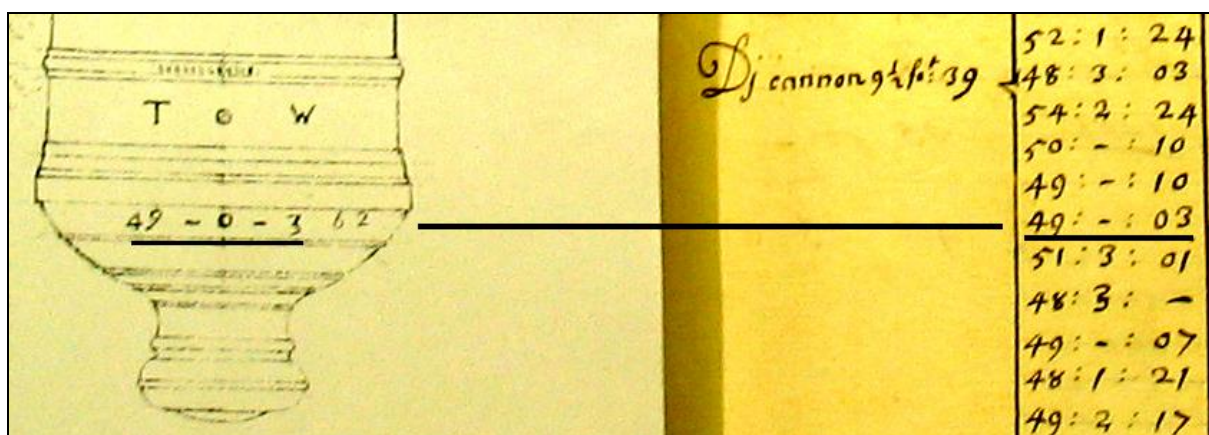
<b>Known nealed and turned guns</b>	<b>Calibre</b>	<b>Length</b>	<b>Stamped weight</b>	<b>Held at</b>
<b>1.</b>	7.05	10' 10"	60 cwt. 2qr. 5 lb.	Chatham Historic Dockyard
<b>2.</b>	6.45	11'	53 cwt. 0 qr. 20 lbs.	Unknown
<b>3.</b>	4.35	6" 7.5'	6 cwt. 0 qr. 28 lbs.	Science Museum
<b>4.</b>	6.25 (32lb Howitzer)	2" 9'	6 cwt. 0 qr. 28 lbs.	Unknown
<b>5.</b>	6.25 (32 lb Howitzer)	2" 9'	6 cwt. 0 qr. 73 lbs.	Unknown
<b>6.</b>	Demi-culverin	7"	16 cwt. 2 qr. 02 lbs.	Chatham Historic Dockyard
<b>7.</b>	3'	6"	7 cwt. 2 qr. 14 lbs.	Phoenix Park, Dublin.
<b>8.</b>	Demi-culverin	10'	31 cwt. 0 qr. 13 lbs.	Barbados
<b>9.</b>	Demi- culverin	9' 6"	30 cwt. 3 qr. 11 lbs.	Barbados
<b>10.</b>	Culverins	9' 6"	41 cwt. 0 qr. 17 lbs.	Barbados
<b>11.</b>	Culverins	9' 6"	41 cwt. 0 qr. 17 lbs.	Barbados

### *Associated Historical Documentation*

This piece of ordnance, no.6221, is traceable in the archives of the ordnance board. A demi-cannon of this length, weight and stamped with its survey number 6221 is noted to be assigned to the *Stirling Castle* but in storage in an undated document of ordnance in store at Chatham. This document is thought to originate in or around 1697. It certainly postdates 1690 as the *Stirling Castle* did not receive its armament until then. Gun founders were paid for the weight of the cast piece and as such the weight of each piece was usually recorded and inscribed on to it. There are two further dated references to a demi-cannon with the same recorded length and weight as that from the *Stirling Castle*.

The first dated reference is to a gun of this weight, length and size is in the 1677 contract of ordnance required for the 20, later to be 30, new ships voted for by Parliament (WO50/13 f. 3v). The piece is described as being "...new iron ordnance..." and was ordered specifically for the 30 ship program. It was delivered to the stores at Woolwich along with a further 40 demi-cannon of 9 ½ feet and paid for on the 4 July 1678. This piece however was paid for at a rate of 18 pounds per ton, the rate for rough iron cannon, and not the higher rate for "neiled and turned" cannon, which at this time was around £60 a ton. It is also known that Parliament only sanctioned rough iron cannon for the 30 ship program. Thus this piece can be discounted.

The second dated reference is by the Board of Ordnance, which tells us a piece such as this was received into store by the 15 June 1690 (WO51/41 f.13). It tells us that this piece was owned by Thomas Westernee Esquire, and therefore probably inscribed with his initials, and was one of 39 guns "received into his majesties store ... at Woolwich ..." between the 4 and 9 of June 1690, along with an order of shot. It is recorded as being 49 hundred weight and 3 pounds and is classed as being "neiled and turned" as opposed to being of "Rough iron". Between January 1692 and September 1697 Thomas Westernee is known to have cast at least 320 demi-cannon 9 ½ feet long. Whilst it is unfortunate that the individual weights of these guns were not recorded, it is significant that none of them are recorded as being "turned and nealed". There is no record of Westernee ever making "turned and nealed" guns; this had been the preserve of the Brownes (Caruana, 1994.77).



6219	48	3	03	9 ½	6 ½	16 ¾	0	0	0
6220	51	3	17	9 ½	6 ½	17 ½	0	0	0
6221	49	0	03	9 ½	6 ½	17	0	0	0
6222	49	3	15	9 ½	7	17 ¾	0	0	0
6223	47	8	03	9 ½	7	16 ¾	0	0	0

Figure The weight and dimensions of the cannon take from original documents.

Taking all the evidence to hand it seems highly likely that this gun represents one of forty eight 9 ½ foot demi-cannon supplied by John Browne between August 1674 and January 1675 (Barter Bailey 2000). If this is the case then this piece represents a John Browne "turned



and nealed” demi-cannon mortgaged to Thomas Westernne “... upon ye account of Mrs Mary Browne ...” but not taken up by the Navy until the 1690 (M<sup>c</sup>Elvogue D.M., Forth coming b).

## **Personalities**

### *Prince Rupert*

Prince Rupert was the well known nephew of Charles I and brother of Charles II, both Kings of England. During the English civil war he distinguished himself in the Royalist army as a highly competent cavalry officer. Until the defeat of the Royalists at the battle of Marston Moor, Rupert’s military career had been one of virtual uninterrupted success. During his enforced overseas exile, after the defeat of the Royalist by Cromwell, Rupert served with distinction in the army of the French King.

Rupert had his first naval experience in June 1648 when he accompanied the then Prince Charles, later to be King Charles II, in the Royalist Fleet in a battle against the Parliamentary Fleet under the command of the Earl of Warwick. Rupert experienced great success as a Royalist naval commander, capturing many prizes and destroying much merchant shipping from the Irish Sea to the Mediterranean where he played cat and mouse with Blake. After the Restoration, Prince Rupert was well received by the new King. Rupert served as an Admiral in the Restoration Navy and as Vice-Admiral of England. He fought with distinction at the Battle of Solebay, Schonveldt and Texel. From 1673 to 1679 he was Lord of the Admiralty. Rupert died on 29 Nov 1682.

### *Prince Rupert’s Patent Gun.*

During his “retirement” Prince Rupert undertook a number of scientific experiments, the least of which was to patent a new form and type of ordnance. The story of this episode in the development of ordnance is more than well covered by Sarah Barter Bailey in her book “Prince Rupert’s Patent Guns”. Information relevant to this report is presented here. The ordnance was termed “nealed and turned” and delineated in the Ordnance board records by an “nt” besides the guns. The process seems to have been perfected by Prince Rupert at Windsor, but with the financial help and assistance of the Ordnance board and its officers.

### *The Browne Partnership*

Once the method and design was perfected the manufacturing process seems to initially have been handed over to the Browne Partnership, the most experienced of the Kings gun makers. Browne had no problem making the guns, and indeed made more than seemed to be required. Unfortunately the money ran out and the extra guns were not required leaving Browne and, then later on after his death, his partners with a large number of guns on their hands but no money.

It would appear that the guns were then used in mortgage payments until such time that the Navy required a large batch of ordnance. This appears to have happened with the re-arming of the navy in the 1690's (Barter Bailey 2000:98-99). After this the history of Prince Ruperts Patent guns or “turned and nealed” guns appears to have been short lived, though they still appear in inventories into the 1700.

### *Thomas Westernne Esq*

Thomas Westernne was born the youngest son of grocer William Westernne but on 30 September 1651 he married the younger sister of Samuel Gott, an ironmonger in St Dunstan-in-the-East (Brown R R 2001). The marriage brought Westernne into the sphere of the iron

mongers and set into motion a course that would see Westerne eventually usurping the monopoly of the King's Gunfounders, the Brownes family, and becoming one of the largest customers to the board of ordnance. In his will Westerne was said to be worth £200,000 at the time of his death 1707 at the age of 81 (Brown R R 2001).

In 1664 a rearmament programme was initiated in anticipation of the coming hostilities with the Dutch. As part of this programme Westerne received a contract to supply the Ordnance board with "Round Shott and Iron Ordnance". The outbreak of war with the Dutch and the loss of large parts of the Navy to them saw a crisis in the Navy and need for more shot and iron ordnance. By February 1666 Westerne had completed his first contract of up to 50,000 shot (cannon to minion size) and 54 guns (demi-cannon to saker) all of various sizes (Brown R R 2001). The iron ordnance was noted to be nothing out of the ordinary being described as home-bored and fortified. In June 1666 Westerne received his second contract, this time for 163 iron guns the majority of which would be destined for the Royal Navy. By 1669 Westerne was established as one of the main munitions contractors for the Government (Brown R R 2001). By this time he was casting the largest and heaviest of guns, including the cast iron cannon of 7, unusually heavy pieces for this period (Smith R D 1992).

By the Second Dutch war the board of ordnance decided to invest its limited resources in what was considered as the latest in iron ordnance technology, "Turned and Nealed" guns. Initially these were only supplied by the Kings gun founder the Brownes, but in 1677 the board of Ordnance decided to cease this monopoly, Thomas Westerne was also to supply "Turned and Nealed" guns. Within 2 years Westerne supplied the board with 550 guns. These were to consist of demi-cannon, demi-culverins, sakers and 3 pounders. From these beginnings Westerne was to go on and become a very successful gun founder.

#### *Arming the Stirling Castle*

The standard armament of a 3rd rate is considered to be: 26 demi-cannon on the lower deck, 26 twelve pounders on the upper deck, 10 sakers on the quarter deck, 4 sakers on the forecastle and 4 three pounders on the poop deck. Research however shows that the *Stirling Castle* was armed with 22 demi-cannon (including number 6221), 4 culverines, 26 twelve pounders, 14 demi-culverines and 4 six pounders noted to be made of brass. Out of the 22 demi-cannon 17 can be found to be "turned and annealed" whilst the other five are assumed to be rough. It is known from documentary sources that the *Stirling Castle* had 9 demi-cannon in store at Chatham in 1697 which had the same stamped weight as those noted as being received into Woolwich in June 15, 1690. It is therefore very probable that there are a further 8 "turned and nealed" demi-cannon still to be recovered (McElvogue D.M., b).

#### **Conclusion**

A higher level of significance was placed on the gun carriage after the initial underwater assessment of the cannon and carriage. Subsequent de-concretion of the cannon revealed it to be a significant piece in its own right, a Prince Rupert patent demi-cannon cast by the Browne Partnership but owned and sold to the board of ordnance by Thomas Westerne. The survival and successful recovery of the gun and gun carriage has allowed another piece of tangible archaeology and history to be saved from the ravages of time and nature for the greater enjoyment of the general public and academia.

## Acknowledgements

Foremost is Robert (Bob) Peacock of *Sea dive*, site Licensee and constant “cannon companion”. Bob is acknowledged for his foresight in pushing ahead in adversity to have the carriage and cannon raised. Richard Endsor a fellow “cannon companion” is acknowledged for his unrelenting enthusiasm and detailed research. Brian Smith, Charles Barker (MRAS), Michael Cates (East Kent Maritime Trust), Simon Adey-Davies (site archaeologist) Norman Temple (*Sea Dive*), David Parham (Bournemouth University) are all acknowledged for their individual contributions during the lifting and de-concreting of the cannon. Robert (Bob) and Ruth Smith are both thanked for their open minded discussion on the identification of the gun. Any mistakes and omissions are the sole responsibility of the author.

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M<sup>c</sup>Elvogue D M a Forth coming (a) The Naval Gun Carriage of the Restoration Navy. An example from the *Stirling Castle*.

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## Figures

Figure 1a Launching the Stirling Castle at Deptford on the south bank of the river Thames in 1679 (Courtesy of the Trustees of the National Maritime Museum: VV571).

Figure 1b The Battle of Barfleur (Courtesy of Richard Endsor).

Figure 2 Carriage and barrel as found (Photo: D M M<sup>c</sup>Elvogue).

Figure 3 De-concreting the barrel (Photo: D M M<sup>c</sup>Elvogue).

Figure 4 Turned wooden platter found in-between the checks (Photo: D M M<sup>c</sup>Elvogue).

Figure 5 The *Stirling Castles* Prince Rupert patent demi-cannon (Drawing: D M M<sup>c</sup>Elvogue)

Figure 6 A 2 inch flat with evidence for the spur being 1 inch (Photo: D M M<sup>c</sup>Elvogue).

Figure 7 The overhand knot and a reef knot in the wadding (Photo: D M M<sup>c</sup>Elvogue).

Figure 8 The carriage, commonly known as a truck carriage (Photo: D M M<sup>c</sup>Elvogue).