

10th Annual Public Lecture - 2001

Historic Wreck Sites of the Solent

Mr John Bingeman

Ladies and Gentlemen, it is a great honour to be invited to give the Annual Lecture to mark the Trust's 10th Anniversary.

Around our coastline, there are 53 protected wreck sites of which 7 are within the greater Solent area. While everyone is familiar with the Mary Rose my lecture tonight, 'Historic Wreck Sites of the Solent' will look at the less well known sites, and in particular, what knowledge we have gained from the Needles and Invincible sites.

The seven Government designated sites:

- The Needles - two 5th rates, Assurance (1753) and Pomone (1811)
- Yarmouth Roads - thought to be the Santa Lucia, a Spanish merchant carrack lost 1567
- Grace Dieu - struck by lightning in 1439
- Mary Rose - lost in 1545
- Invincible - lost in 1758
- The A1 Submarine - lost in 1911
- Hazardous - lost in 1706

Starting at the Needles; from 1978 to 1986 I directed diving operations on behalf of the Isle of Wight Archaeological Committee with Dr David Tomalin as Archaeological Director.

In 1969, the site had been identified by Isle of Wight resident, Derek Williams, who became the first licensee when the site was designated in 1975. Derek generously transferred his licence to a registered charity, the Isle of Wight Archaeological Committee. Derek seen here, gave me every assistance when I took over in 1978. Now the saga on how the Assurance came to be lost.

On the 24th April 1753 Edward Trelawny, just retired after 16 years as Governor of Jamaica, had taken passage home onboard the Assurance with his wife. Charnock, an eighteenth century naval historian, writes that the Governor rather unwisely spoke to the Master, David Patterson:

"he asked a question, suggested by mere curiosity, what depth of water there were around it and how near the ship would pass to that part of the rock appearing above the water. Patterson answered, they should pass so close that the fly of the ensign might touch the rock"

Alternatively, you could believe the Court Martial transcript in the Public Records Office at Kew. Apparently, Assurance hit an uncharted rock some half mile off the Needles. Regardless of the truth, Assurance became a total loss. Captain Carr Scrope, the ship's captain was acquitted, but Patterson responsible for the ship's navigation was held responsible. His sentence, mitigated in view of the "obscurity of the rock", was 3 months in Marshalsea, the debtor's prison in London.

The admiralty was so concerned about the unknown rock that they ordered a survey of the Needles Channel. No rock was found. The survey suggests that Assurance must

have "struck first upon the Shoal" and goes on to report that the channel was "at least one mile and (a) half broad".

POMONE

Fifty-eight years later in 1811, Pomone, another fifth rate of 38 guns was wrecked on the same spot when her master James Sturrock mistook Hurst Castle light for the Needles light in the gloom at dusk. When his error was realised, it was too late to avoid the rocks.

In 1978, our first task was to survey the site. It was carried out as an adventure training activity by members of the Portsmouth Royal Naval Sub-Aqua Club. We identified 4 guns from Assurance to the north, three are over the drop off, in 1979 Number 13 had not yet been found; and 9 Pomone guns to the south including 5 carronades coloured black. The 44 gun Assurance was a two decker built locally on the river Hamble by the Richard Heather Yard at Bursledon and launched in 1747. Over the years, we recovered 8 guns. Three carronades and a 9 pounder from Assurance were taken to the City of Portsmouth Museums Conservation Laboratory in Old Portsmouth for conservation by Chris O'Shea.

When the tampion was removed, the contents consisted of two wads, a solid 32lb shot, a third wad, and powder in a flannel bag.

Examining the three carronades after conservation, the clearest marking was on Number 6 gun: "32 pounder, Clyde standing for the Clyde Iron Company (a Clyde director was also a director of the Carron Company), 1803, No 1696". On the quoin pad of a second carronade was: "H & Co" standing for James Henschell & Company a gun founder at Wandsworth, London.

Carronades were invented by the Carron Iron Company at Falkirk in 1770. They used a half charge, had less "windage" meaning that the cannon ball was a tighter fit in the bore. Firing a lower velocity shot, it was more devastating in close combat having a "smashing" effect. The higher velocity of the main armament at close range made a nice round hole and was less effective.

Officially, carronades were considered secondary armament and not included in a ship's rating. The 38 gun Pomone had twenty-eight 18 pounders and two 9 pounders. The missing 8 guns were made up by sixteen 32lb carronades. The weight of the sixteen would be similar to eight 18 pounders.

When recovered, one of Pomone's 18 pounders still had a cannon lock attached. The lock, conserved by Chris O'Shea, had lost most of its ferrous parts. The " W Dick" stood for Walter Dick, an American gunsmith working in London from 1789 to 1812. He was contracted to supply gun-locks and during this period specialised in the construction of locks for cannons. Walter Dock as also "Viewer at the Tower" responsible for quality control of small-arms.

At sea, warships kept their ordnance ready to fire. Cannon vent holes were sealed by 'aprons of lead'. Prior to cannonlocks, apron seen on Pomone's Number 2 gun at the Museum of Naval Firepower, Priddy's Hard shows the adaptation suitable for carronades from 12 to 42 pounders.

At sea the apron was bedded down with tallow to prevent water ingress and then firmly secured with cord.

Degradation of silver coins varied depending on the proximity of iron acting as a sacrificial anode; some silver coins were found nearly completely eroded away. We are indebted to Dr Edward Besly now at the National Museum of Wales; who, while on the staff of the British Museum, cleaned and identified all the coins at the

end of the season.

Near the 3 anchors, a hoard of 96 coins totalled ?6 19s 4.5d. They consisted of mainly: 0.5, a and 2 reales, and reflected the currency in every day use in Jamaica in the early 1750's. These examples are pieces of 8, 4, 2, 1 and 0.5. An able seaman was paid a pound per month, so the hoard would represent over six months pay. Eight reales pieces were equivalent to English crowns worth 5/-. In Jamaica, the 26 gram milled pillar dollars were valued at 6/3. Each of the 56 "P of 1" in the coin hoard could have been worth 7.5d though their weights varied between 3.68 to 1.86 grams. While hand struck coins had inconsistent weights, it does identify the infamous practice of "clipping".

Forty Roman coins were found scattered over the site from the same period including this Alexandria Tetradrachm (tetra-dram) with the head of Emperor Probus minted between 276 and 282 AD. David Tomalin believes they may have come from a Roman wreck when history records that:

"Neptune was indisposed towards" a Roman fleet sent to remove Allectus around 289 AD, following some years of UDI. Similar coins have been found south of the Isle of Wight by a local fisherman and by Ed Cumming off Lulworth. A second Roman Fleet successfully brought England to heel two years later.

Pomone, the second Leda Class frigate, was built by Josiah and Thomas Bridley at Frindsbury opposite the Roy Dockyard at Chatham and launched on the 17th January 1805. One of the last tasks to complete a ship build, was coppering a hull. It would have looked similar to another Leda class frigate, the Trincomalee recoppered during her restoration at Hartlepool.

Many pieces of mangled copper were recovered. Some pieces had in the bottom left hand corner the date "Dec 1804" with a "C" and broadarrow. The "C" denotes Chatham Dockyard, and "Dec 1804" was the month and year when the 48 x 14 inch copper sheet was nailed to Pomone's hull.

Two other marks "MR32" and "MR 28" were identified as the manufacturer's trademark of the 'Mines Royal Copper Company'; the 32 and 28 indicated the copper thickness measured by weight in ozs per square foot. Mine Royal had a rolling mill at Neath in South Wales and were in business from the 1750s to 1862.

After examining around 10 tons of copper removed from Victory assisted by Arthur Mack and Peter Goodwin, I was the lead author of a 'Copper Sheathing' paper published in IJNA last year. I visited Hartlepool to examine sheets removed from Trincomalee. Most of hers were unmarked. Her last coppering had been in the civilian dock at Falmouth in 1905. However, a few sheets had broadarrows and identical marks to those found on Victory. Both she and Victory had been training hulks in Portsmouth Harbour in the second half of the 19th century.

No less than 12 different manufacturers' names were found, as well as inspectors' marks, and date stamps - oct 1888 was the last time Victory was completely coppered. "Po" stood for Portsmouth Dockyard and May 1823 the oldest sheet removed from Victory. More recently, an "S" for Sheerness Dockyard dated March 1859 was recovered from a wreck of a coal hulk off the Isle of Grain, previously a ship-of-the-line.

I believe the reason for dating was an attempt to discover why copper varied from good to bad. Coppering ships served two purposes. It prevented worm attack, especially important in the West Indies where new hulls could be destroyed in under two years. The second need was for the copper to erode slowly preventing excessive fouling. This was known as "good" copper and relied on small quantities of impurities to achieve this effect, since completely pure copper eroded quickly and needed

replacing in less than two years. Really bad copper had too many inclusions and did not erode at all; fouling was then just as bad as plain wooden hulls. In an attempt to recognise good from bad, the Dockyards recorded the plate's life by dating each sheet. I would stress that these copper marks are not easily discernable when hidden by an oxide coating.

Leaving copper and moving on to rigging, a manufacturer's mark "WT" standing for Walter Taylor can be seen on the eight inch lignum vitae pulley wheel with brass coak. In the year 1800, Taylor's works in Bugle Street, Southampton supplied 100,000 blocks to the Admiralty. The date marking "MY and 02" stands for "may 1802", this date is appropriate for Pomone. Assurance blocks in 1753 would not have had brass coaks.

Marc Isambard Brunel's designs for block making machines were first offered to Samuel Taylor, Walter's son, who declined the offer. Brunel, father of the even more famous Isambard Kingdom Brunel, then went to the Admiralty and set up the famous blockmills at Portsmouth Dockyard in 1803. Two years later in 1805, Taylors lost their lucrative Admiralty contract.

Among the 4000 artefacts, there is a silver scent bottle with South American provenance which may have belonged to Mrs Trelawny. Before conservation, the dipstick had grains of sand attached to the bottom quarter inch, an ingenious way of providing bigger drops. While the Trelawnys were Cornish, the Governor's father, Sir Johnathan Trelawny had been Bishop of Winchester.

We will now move on to have a look at other sites in the Solent before going on to the Invincible.

Yarmouth Roads

In the 1980's, county archaeologist Dr David Tomalin was both licensee and archaeological director for the Yarmouth Roads site on behalf of the Isle of Wight Archaeological Committee. The site has remained untouched for the last 12 years. Recently Kit Watson, who was closely involved with the site in the 1980's and wrote a report for the International Journal for Nautical Archaeology with Alison Gale, has been granted a license to inspect the site which is very vulnerable from yacht anchors. Various artefacts and the pre-disturbance survey suggested that it could be the remains of a Spanish carrack. This identification is based on a Spanish merchant's petition to the High Court at the admiralty in 1567 for the return of wool salvaged off Yarmouth from the Santa Lucia. Among artefacts recovered, a more positive connection with the period was a bronze mortar identical to one recovered from a 1588 Spanish Armada Wreck.

A bronze minion was found by John Cross and Mike Markey a short distance from the site. The Naval Sub-Aqua Club was asked to lift the minion and gun carriage. The barrel had recent scratch marks from a wire trawl and these may explain why it was off the wreck site. The marking "ZA" stood for Zuane Alberghetti an Italian bronze-founder. The minion is on display at Fort Victoria.

Grace Dieu

Next Henry V's Grace Dieu, the very first wreck to be designated under the 1973 Protection of Wrecks Act. Her ribs are visible at very low spring tides on the River Hamble just north of the M27.

A carrick, built between 1416 and 1418 at Southampton, she was far too large for the shipbuilding technology of the period. The problem was that she was 'crank'. Not an

expression we use today but my Oxford dictionary does define it: weak, shaky, liable to capsize. No wonder tradition has it that authorities could not man her locally but brought a crew from Devon. After sailing from Southampton to St Helens Roads, the crew mutinied. She was a dismal failure and never sailed again. An Italian visiting Southampton wrote that he had never seen "so large and splendid a construction". Later banished to the river Hamble, she was struck by lightening in 1439. Her remains today measure 130 feet by 37.5 feet suggesting that she was probably over 170 feet with a beam of 50 feet. These silhouettes show her great size; she appears much the same size as Victory.

Her main mast was around 200 feet high and had a diameter of 6 to 7 feet at its base. Her clinker construction was three layers of 1.5 to 2 inch thick planks only 6 or 7 feet long clenched together with iron and the whole treenailed to her frames. Very light construction when you compare her with 18th century ships of similar size.

Funded by English Heritage, the site is one of four used to monitor degradation of wreck timbers in research headed by Dr Mark Jones at the Mary Rose Trust. The study has been on going for 10 years and the other sites are: the Mary Rose, Invincible and Hazardous. Water purity is monitored by a submersible data logger which is interrogated every 3 months by raising the logger from the seabed and downloading the information. Timber degradation is monitored using wooden blocks. Anaerobic conditions are monitored using textile samples attached to perspex stakes; on the Grace Dieu site the lower textile sample had completely dissolved after 12 months.

Hazardous

Next we have the French built 50 gun Hazardous built in 1698. In 1703 she had been captured by the Channel Squadron commanded by Admiral Sir Cloudisley Shovell, only after:

"She resisted in the most determined way for six hours and struck her colours only after she had become a perfect wreck"

Towed into Portsmouth, she was rebuilt, enlarged, and a year later commissioned as a 54 gun 4th rate armed with a mix of French and English ordnance.

Two years later she came to grief off Bracklesham Bay. Trapped on a lee shore, the Captain, Lieutenant John Hares ran the ship ashore at high water and saved his crew.

Hares was acquitted at the Court Martial onboard the Torbay but Captain John Lowan, the commander in Advice was blamed for leading Hazardous into shoal waters in the dark and "that he did not make the proper signals". The verdict was: "bee dismissed from his employment and commission".

The site was discovered in 1977 and after regular visits by Sub-Aqua Association club 308, the late Norman Owen appreciated the importance of the site and they carried out a pre-disturbance survey. The club set up a display of artefacts and information in a caravan in Bracklesham carpark. The display has now moved to Earnley Gardens. One of the French cannon recovered 20 years ago before the site was designated in 1986.

Today, Club 308 has formed an alliance with the Hampshire and Wight Trust for Maritime Archaeology, and Garry Momber is their archaeological advisor. Last August, the latest innovation was the opening of a 200 meter circular dive trail by Stuart Bryan, a member of the Advisory Committee on Historic Wreck Sites, and archaeological co-ordinator for the Sub-Aqua Association.

A1

In 1999, the A1 submarine lying two miles south of Chichester Harbour was added to the list of protected wreck sites. She was the successor to the Holland class and 40 feet longer. The Holland Class had been designed by the Irish-born American JP Holland, and the "H" boats were built under license from the Electric Boat Company of America.

Launched on the 9th July 1902, the 103 foot A1 was the first all British submarine built by Vickers. In 1904, during exercises in the shipping lane close to the Nab Lightship, she was carrying out an attack at periscope depth on the cruiser Juno. While possibly not paying sufficient attention to other vessels in the area, she was struck in the conning tower by the Union Castle passenger steamer 'Berwick Castle'. The single compartment submarine flooded immediately with the loss of all her crew. After the First World War, the Nab lightship was replaced by the Nab Tower. The tower had been intended to support a planned submarine barrier across the Dover Strait.

A1's sinking was the Royal Navy's first submarine accident. Her Captain, Lieutenant Loftus Mansergh, First Lieutenant and 9 ratings were buried in Haslar Cemetery on a large plot which later would contain the graves from future submarine tragedies. There is an obelisk which records the accident, the Captain's grave is to the left, the First Lieutenant, Sub-Lieutenant Churchill on the right, and the ship's company graves are behind.

Salvaged, the A1 was repaired, serving until 1910 when an internal explosion while alongside at Haslar Submarine Base ended her operational career. Fortunately, on this occasion no one was killed and the injured crew members, including Petty Officer Drury who had been blown out of the conning tower into the sea, were taken to the Royal Naval Hospital at Haslar. These submarines were powered by a 16 cylinder 350 hp Wolseley petrol engine. Petrol vapour was given as the cause of the explosion. She was repaired again and modified as an unmanned target for the Admiralty Anti-submarine Committee. A year later she vanished while submerged under automatic control. Searches failed to locate her.

Re-located by HMS Gleaner, the hydrographer recorded her as an obstruction rather than a wreck in the hope that she would not attract divers. Needless to say she was found and pillaging started. Martin Woodward, owner of Bembridge Maritime Museum and coxswain of the Bembridge lifeboat, took the necessary steps to designate the A1.

Invincible

And now to my site. Invincible is only a little shorter than Victory, had two decks instead of three, and displaced 1800 tons with a draft of 23 feet. Her lines were used for a new generation of 74 gun ships which numbered over seventy by the time of Trafalgar. Her lower gun ports were 6 feet above the waterline. It made her the equal to 100 gun first rates whose lower gunports were only 2 to 3 feet above the waterline and useless in all but calm seas.

In 1748, Keppel wrote to Lord Anson: "the Invincible out sails the Whole Navy of England". A report held in the PRO dated 1752 on 'Observations of (Sailing) Qualities' reported Invincible's speed of over 13 knots.

She was built in France at Rochefort and launched in 1744. Captured in 1747 by Admiral Lord Anson at the first Battle of Finisterre, she was brought back to

Portsmouth, repaired, and commissioned as a flagship.

She had an eventful history told in Brian Lavery's book 'The Royal Navy's First Invincible' so I won't repeat it. Her demise came on Sunday 19th February 1758.

She was at anchor in St Helens Roads as part of the 2nd Louisbourg expedition organised to oust the French from the Fortress of Louisbourg in Canada. Admiral Boscawen in the Namur ordered his squadron to sail at 2.30 am.

Weighing anchor would normally take around 2 hours but on this occasion there was a problem: the anchor refused to break free from the seabed. The cable was taut with 384 men on two double capstans who: "hove till we broke many bars on both capstans", to quote the court martial. The master, Henry Adkins connected a triple purchase with another 100 men. Success! The anchor shot to the surface; but unfortunately snagged itself on the ship's cutwater.

Now underway sailing in an east-south-easterly wind, she altered course to the NE, 60 degrees being the closest that square riggers could sail. Approaching the Horse Tail, she attempted to go about but her rudder jammed at this critical moment, and she went aground. In spite of valiant attempts to refloat her, and pump 12 feet of water out of her hold, three days later she fell over on her beam ends in gale force winds. Nearly all her guns and many stores were recovered at the time.

She lay forgotten until May 1979 when Arthur Mack, fishing with Melvin Gofton, snagged their nets. They brought up an old piece of timber with a treenail from an area where previously no obstructions had existed. This is attributed to the general lowering of the seabed by gravel dredgers meeting the demands when building the M27.

Ten months later, I was invited to head the project and we applied for a designation order after carrying out a pre-disturbance survey.

The site was conveniently level with a mean depth of 9 meters.

The order was granted on the 30th September, the 23rd site to be designated, with Dr Margaret Rule as our Archaeological Director.

The second task was to identify this massive site. Close to the surface we found various artefacts indicating gun calibres of 9, 24, and 32 lb guns and a date pre-1760. Rammer heads for 9 and 24 pounders, a spool of six 32lb tampions and a 9 hole cartridge pouch with a "G2" crown for George II. Invincible seemed the obvious answer but records consulted showed her to be lost off the Owers, and her armament should have been 18 pounders, not 24.

Later, going through Priddy's Hard archive with David Houghton, I came across a letter dated 23 December 1755 from the Office of Ordnance changing Invincible's 18 pounder guns to 24.

At the Public Records Office at Kew, the court martial transcript confirmed the true location as the Horse & Dean Sands. Positive proof came with the finding of a wooden tally stick with the words: "Invincible Flying Jib 26x26 No 6".

The project set up our own conservation laboratory with Simon Aked, a qualified conservation officer. We now had the necessary support to excavate the hull over the next 10 years.

The main body of the wreck is the port side, it lies NW-SE, with bow to the left and the stern at the right. Her starboard side and decks were broken up and scattered to the NE. There were 6 meter square trenches subdivided into quarters.

In 1987 when I had retired from the Navy, the Project increased the rate of excavation. This was further prompted knowing Southern Water were building the Eastney long sea outfall, and it would discharge raw sewage only 1000 meters from the site in 4 years time.

Recently I put together all the individual hull drawings to produce an overall plan. The hull is 'hogged' with only a metre depth at the centre and four metres at the bow and stern. Lying on her side at 46 degrees, the bow section reaches right down to a forward keel rider marked 114 in Roman numerals; the hull's centre section is broken at the first futtock; and the stern section reaches the keelson.

From 1987, the project had a core team of 4 divers working each summer. Diving was carried out from Viney Peglar, a 40 foot ex-pilot cutter with a Broomwade 80 cubic foot air compressor powering two airlifts. A pair of divers worked the morning shift of 3 to 4 hours, and the other pair would take over in the afternoon.

The French had been experimenting with wrought iron knees and the Invincible's survey at Portsmouth dated 14 August 1747 lists 206 knees. Each knee was made of 4 pieces of iron, heated until red hot and welded together by hammering.

The deck beams were 13" square, the French used feet and inches in the 18th century and just over 13 inches was a Paris foot. Three Paris feet became Napoleon's meter. Invincible reached 13 knots. Speed was measured by logline. A sailor stands ready to turn a 28 second sandglass once sufficient "stray line" has run out. The log line is marked every 47 feet 3 inches. This gives a direct reading of the ship's speed in knots. If the ship is doing over 8 knots, a 14 second sandglass is used and the number of knot doubled.

Four sandglasses were found, two 30 minute glasses used for recording time during a watch. The other two were special 14 and 28 second sandglasses. The line is pulled out by a logship, we recovered a logship with it's lead keel, it measures about 5 inches across.

The hull of the ship remained very coherent, the deck and the half beams protruded above the sea bed. I remember the excitement when my fingers touched the top of a sandglass whilst excavating. I never wore gloves, one relied upon feel to avoid damaging delicate artefacts.

In her two powder stores, Invincible would have carried around 300 powder barrels. Arthur Mack and I successfully brought up 48 of them whole.

From the powder store the underneath of the orlop deck and the outline of the forward magazine is visible. The hanging racks in the magazine were removed and reassembled.

In the magazine we found a bronze adze and cooper's setter used to open barrels.

The barrels would be emptied into a special open topped box with no nails and morticed together. Cartridges were filled from the box and placed in the racks.

The racks from Invincible's forward hanging magazine are re-assembled at Chatham Historic Dockyard. Also recovered were cases full of wooden batons, these were marked with Roman numerals with a corresponding number on the vertical stantions. Around 50 were recovered they were used for 32, 24 and 9 pounder guns, draws at the bottom of the cases would contain charcoal to absorb moisture. These cartridge cases made out of poplar must have been quite valuable. Poplar has a special property that it is a dry wood.

The project received limited sponsorship form the Historic Dockyard with an agreement to hold the representative collection with at least one of every type of artefact recovered.

Excavating Invincible in the forward section was just like excavating in a supermarket. Various ordnance spares were found including a gun carriage stool with its size marked as "9 P 8 ? F" meaning that is is a spare for an 8 ? foot long 9 pounder cannon. Invincible's quarterdeck 90b cannons were jettisoned when she went aground and magnetometer readings indicate they lie 200 metres to the south.

A gun carriage wheel or truck had the markings "24 P 16 and H", the 24P stood for a 24 pounder gun; the wheel diameter is 16 inches, and "H" stood for hind. Other trucks had "F" for fore.

Quoin's, or wedges for raising and depressing guns, were found. The French built *Invincible* had non standard gunports so she needed special quoins and these were stamped with her name. Naval ordnance is normally interchangeable between ships and quoins had no ship's name. Another example of naming came from the Spanish 112 gun *San Joseph* captured by Nelson at the Battle of St Vincent in 1797. One of her quoins is stamped 'San Joseph with an inverted 32P': it is on display at the Valhalla Ships' Figure head collection on Tresco.

Naval hand grenades are larger than the army version, and the origin of the Grenadiers in the 17th century. *Invincible*'s grenades were of poorer quality to those recovered from the *Pomone*; the latter had a smoother more solid finish.

The filling of fuses had to be very precise to be reliable and not explode prematurely. The 1753 ordnance instructions laid down the exact sizes of fuses and method of charging. A 13" mortar fuse was tamped down with 42 blows with a 2lb mallet and burnt for 35 to 38 seconds. Hand grenade fuses were filled using an 8 oz mallet and 10 blows. The base of the fuse was then cut off and the delay depended on how short the fuse body was cut. Grenades were found in a lead lined box; one unused wooden fuse still had its solid bottom.

Grenades would be carried by Marines in the main tops and the method of ignition was a slow match contained in a fearnought pouch. The design includes a 14 foot length of slow match which was brought out as it burnt.

Invincible's ship's log records embarking troops from the 24th Regiment of Foot which explains why various army artefacts have been recovered. First, two musket cartridge holders; one had a gold leaf crown and came from the stern indicating that it may have belonged to an officer.

Other finds include: the wooden former for making paper cartridges, a brown felt hat, part of a boot and leather leggings.

Army buttons from 13 different regiments were among the recoveries. Some were recovered before we identified the site as *Invincible*. We took 4 or 5 to the National Army Museum at Chelsea for dating. They dated them from 20 to 60 years AFTER *Invincible* had been lost. In 1997 Arthur Mack and I published our findings in *IJNA*. There can be little argument with a wreck site, it is a unique timecapsule with positive dating. The Deputy Director of the National Army Museum, and considered to be the top living authority on uniforms, was to write:

"If actually of 1758 period then many known sources would be wrong and it would be electrifying"

Authorities are still reluctant to accept that numbered regimental buttons existed prior to 1767 when the Parliamentary Act was passed, despite overwhelming evidence to the contrary. Our paper presented not only *Invincible*'s buttons but four other cases, one of which took 'numbered buttons' dating back to 1745.

The buttons were some of the lightest artefacts, one of the heaviest was the 2cwt lead hawser tube with numerous small holes around each rim. The tubes are illustrated in Boudriot's book "The 74 Gun Ship", Volume II. Through these hawser tubes, *Invincible*'s 23 inch circumference anchor cable would have passed. Underwater, the cable when touched fell to pieces unless great care was taken. These pieces were successfully bound with medical bandages before lifting and when slowly dried, their strength returned.

In the Bosun's store we found a large quantity of spare blocks, including rack blocks

which were used to guide the ropes to the sprit sails under the bowsprit. The largest block stood 27 inches high and had a tally stick with the letters "TB" so we christened it the top block. Other blocks of interest include; a neat snatch block which had lost its iron hinged closing plate and a 28 inch fiddle block with the remains of binding holding the strop at its waist and the Roman 28 denoting its size.

The bosun's store contained many unused coils of rope from 1 inch to a large coil of 9 inches.

Now to the domestic artefacts.

A tudor bowl with no less than 8 broadarrows. It's crack was pre-1758 and had been repaired with a whipping.

A turned beech bowl, this type had been copied by the Curator of Victory, Peter Goodwin, for replicas.

Square plates- this discovery caught the public's imagination and made the front page of the Guardian on the 23rd December 1980. They have prompted various comments about 3 square meals a day, and , if you took too big a helping, the food could reach the edge known as a fiddle! A 14th century image shows John of Gaunt being entertained by the King of Portugal, each has a square plate or platter.

A 36" diameter copper cauldron was presumably used for cooking; the crew numbered 600 sailors and 100 marines and at the time of her loss, there were soldiers taking passage for the attack on Louisbourg.

From the stern came pewter plates and a porringer; one plate is inscribed "Invincible to Service April 23 1757".

Pewter spoons with scratched broad arrows.

Wooden buckets, on their bases scratched broad arrows.

Leather buckets, about 30 of these were recovered, one has an inscription in silver paint showing that it belonged to No 18 gun crew.

Originally the miniature barrels had us puzzled. They contained fine sand and a gluey mess at one end. The explanation was 'a writing kit' with sand as the blotting medium and the gluey mess was a carbon black for making ink.

Shod shovels had lost their ferrous edge; one was found in a coal locker at the stern.

Chatham Historic Dockyard exhibition "wooden walls" tells the story of the apprentice joining the yard and building Valiant to Invincible's lines and with the Triumph were the first of a new generation of 74 gun ships. The exhibition is housed in the mast house and the first floor mould loft, built in 1753.