

HMS Pallas

by Paulo Monteiro, subarqaz@hotmail.com, Draft version, February 2000

The wreck

The *HMS Pallas* was a 5th Rate ship, built in Deptford in 1757 (36 guns, 728 tons)

In 1783, under the command of Captain Christopher Parker RN and acting as convoy escort from Halifax, Nova Scotia, to England, several leaks became evident soon after sailing. She became separated from her charges during a gale and the high winds and heavy seas only made the leaks worse. By 5th February 1783, there were eight feet of water in the hold and despite heaving overboard guns and heavy stores, little progress was made in reducing the water level. It was decided to make for the nearest land, which was judged to be the Azores.

The frigate arrived off Faial on 10th February, but contrary winds blew her out to sea again. By then all the crew, officers and men together were working the pumps and bailing to keep her afloat. On 12th February, with the crew exhausted by constant employment at the pumps, she was run ashore on the island of São Jorge. The chance was taken to examine her when ashore and it was found that her keel and garboard strake were so badly worm-eaten, they hardly existed.

For the next two weeks, stores and provisions – wine, brandy, tar, iron, copper and empty casks - were taken out of her before the wreck was burnt, and were stored in the house of José de Sousa Pedroso, before they were auctioned in 1786.

On the 22nd February, the Town Council of Calheta assembled in a hasty meeting. The officials had heard the rumour that the Captain of the stranded frigate wanted to set her ablaze and were afraid of the consequences because they had also heard that the ship had many barrels of gunpowder onboard. Parker was then intimidated by the English Consul in São Jorge, Alexandre Francisco da Câmara e Chaves, to sail his ship towards the bigger village of Velas, a feat that, of course, he could not do. So he refused and ordered the frigate to be burnt.

The day after, the crew of the *Pallas* was transported onboard a local ship towards the Island of Faial. While departing Calheta harbour the sailors of the Faial boat pulled alongside the smouldering remains of the frigate and pulled some of the iron fittings that were upon one of the decks of the frigate.

The burnt hulk was then covertly salvaged by fishermen from Manadas and Velas, who managed to save some muskets, copper plates, a brass cauldron, a large saw, some cables and ropes, barrels with tar, a locksmith lathe, as well as the bell of the ship, removed by Manuel de Sousa, a slave of the sergeant master João José Bettencourt.

Later, more than 200 squares of iron ballast were salvaged from the bottom of the bay, as well as one cannon and an anchor. The pigs of iron were sold at 6\$000 by the ton and some were still being recovered from the bottom of the sea more than 70 years after the wreck. The people of Calheta called the Pallas the “navio das açafras”, which might be a corruption of “navio das safras”. A “safra” is an ancient Portuguese word, derived from the Arab, signifying a square anvil.

The *Pallas* was carrying a French prisoner, the surgeon François Louis Pinot, born in Avranches, Basse Normandie. Pinot stayed in São Jorge and went to practice there, at least until 1805. He was also married in the island, with Ana Silveira Pereira de Lacerda, the daughter of the Captain Diogo Antonio da Silveira.

The frigate

Sir Thomas Slade designed the *Pallas* class 36-gun fifth rates. The three ships of the class were designed to carry twenty-six 12 pdrs on the upper deck, eight 6 pounders on the quarterdeck and two six pounders on the forecastle, a total of 36 guns. By an Admiralty Order dated August 10th, 1779, all three ships were supposed to carry four 18 pounder carronades on the quarterdeck and another four on the forecastle, although neither surviving ship carried the established number of these guns.

The *Pallas* class generated ships that were generally fast – 12.5 to 13 knots in a stiff gale on a broad reach, and 10 knots close-hauled. They were not outstandingly weatherly, but generally very manoeuvrable, being good heavy weather ships, carrying sail in most conditions.

The *Pallas* class was essentially an enlarged version of the *Southampton* class, being proportionately slightly longer having, although, the same midship section, rake of sternpost and stem profile. Only three vessels were built to this design and, despite being rated as 36's by virtue of four extra 6-pounders on the quarter deck, they had little more to offer than the *Southampton*, although with 7 ft between the gun ports it must have been easier to work the main armament. Both classes adopted a variation of the *Tygre* body, a captured French privateer. It may also happen that the design of the Pallas class was influenced by the design of the French frigate *Embuscade* (40), captured by the *Defiance* (60) during the 1739-48 war because the English frigates, although slightly smaller, had a similar midship section and also twenty six 12 pounders on the upper deck.

The *Pallas* shared with the *Southampton* class the handicap of the being the prototypes of the frigate type. Both classes worked their cables on the lower deck - which meant capstans on the lower and upper deck instead of the upper and quarter decks – and had the cistern for the pumps on the lower deck, from where it would have been almost impossible to discharge water with the ship heeling to any sort of wind, since that deck amidships was nearly level with the waterline. It looks like the pump was extended, to be worked on the upper deck, somewhere around 1759.

The *Pallas* class has been considered a failure, especially when one considers that no further 36's were built until 1780, and even then, they were given 18 pounders. The answer for this failure might be that, when compared with a 670 tons 32 frigate, a 36 of 720 tons offered only an extra four 6 pounders which was a minimal increase in firepower, making the smaller – and cheaper - vessel do the same job as the larger one.

The copper sheathing

Probably the most important technical innovation to be implemented by the naval protagonists during the American War of Independence was the sheathing of ship's hulls with copper, and it was the British who developed this technique and held the initiative.

The effect of copper was to keep the ships relatively free of weed, and thus improve their sailing performance, while at the same time it afforded better protection for the timbers against the ravages of than the existing sheathing.

Back in 1708, Charles Perry proposed the idea of copper sheathing, but the concept was rejected because of the costs involved. Again, in 1740, Nehemiah Champion suggested using sheets of “brass lateen” as sheathing, and although such an experiment was apparently made, nothing came out of it. Eighteen years later, the Royal Navy conducted an experimental coppering on the false keel of the *HMS Invincible* and then proceeded, in 1759, to use copper plates in the sternpost and keels of some of it's warships.

The first ship ever fully sheathed in copper was the 32-gun English frigate, *HMS Alarm*, in 1761. Following a careful assessment made in 1763 of its effectiveness - after the ships had done service in the West Indies for two years - the Admiralty decided to repeat the process on two other ships, the *Dolphin* and the *Tamar*. This was done in 1764, but in 1766 the *Alarm* was surveyed again, and many flaws and problems were discovered, the major problem being the damage done by the coppering to the iron bolts due to the galvanic activity generated between the iron and the copper. Following the detection of similar problems on the *Dolphin* and *Tamar*, copper sheathing was removed on all three ships.

By 1775, the Navy Board began to show renewed interest in the copper sheathing, a fact that might have been compounded by the inability of the timber contractors to supply enough sheathing board. In the next two years a number of small ships were sent off in voyages with copper bottoms with “composition” to protect the iron bolts from corrosion and, by the end of 1776 one 32-gun frigate, four 20's and a sloop had been coppered. On all of these ships, the bottom was painted with a mixture of white lead and linseed oil, on which the copper plates were to be fixed with nails made of an alloy which included copper. The same material was used to make the braces and pintles while the false keel was fixed to the main keel with copper staples with a thin sheet of lead between them.

A few more English ships were coppered in 1778, and by 1778 the trend had caught on and more and more ships were being coppered, with those already sheathed impressing the sea officers by their handling capabilities.

Finally, in 1779, orders were issued in that all ships of 32 guns and less should be coppered the next time they were in dock, although no solution to the corrosion of iron bolts had yet appeared and copper bolts were trusted only for ships of fifth and sixth rates. The reason for this move was that an apparently successful protection for iron bolts had been found, by the creation of a watertight barrier between the copper and the iron bolts. This barrier consisted in the application of thick paper - soaked in oil of tar and in Dawson's composition - between the copper plates and the hull, an experiment first carried out on a 44-gun ship, the *HMS Jupiter*.

By then, the ships that were copper sheathed were described as "felted and yellow metaled" because the copper protected the felt and tar layer.

Later, it was decided that the whole battle fleet should be coppered. In January 1782, eighty-two capital ships, fourteen of 50 guns, hundred and fifteen frigates and one hundred and two sloops and cutters had been coppered to that time. However, at the end of that year, doubts about the effectiveness of the protection of iron bolts from the corrosive effects of the copper were raised very forcibly. The chief reason was the violent storm of September 1782 off the Banks of Newfoundland, when the captured French ships, the *Ville de Paris* (110) and the *Glorieux* (74), and the British *Ramillies* (74) and *Centaur* (74) all foundered with the loss of 3500 lives. A thorough inspection of the 74-gun ships *Edgar*, *Fortitude* and *Alexander* showed irrefutably that the iron bolts of all three ships were in a dangerous condition.

Another major weakness was the lack of protection which the copper provided against the worm, most notably in the stern area, because neither copper nails nor copper cladding did much to keep teredo worms out of the hull timber. It was the tar soaked felt, applied hot to the hull, that formed a layer impenetrable to the teredo in its planktonic phase. In some hulls that have had copper applied without the felt, the copper seemed to provide a protective layer behind which the worms did their worst, coming to the surface of the wood with impunity.

It was only in December 1783 that the new copper and zinc bolt, hardened by mechanical means and developed by William Forbes, entered in service. By August 1786, all ships were changed to the new bolts.

The iron ballast

The *Pallas* used metal ballast. Because of its greater density, iron ballast laid next to the keel would have a greater effect than the same weight of shingle, by lowering the centre of gravity further. This was particularly necessary in the case of frigates because they had to carry a large weight of iron, in the form of guns, above the waterline. In addition, if less of the stowage space were occupied by shingle ballast there would be more room for provisions.

Old guns or iron shot were first recast into iron ballast in 1727 in order to serve eight new sloops that were being built at that time. In 1735 the iron ballast was cast in plates not less than 2 in. (5 cm) thick, in bars 6 in. (15,25 cm) square and 3 ft. (1 m) long, weighing 320 lb. (145 kg). From 1779, a smaller kind of ballast was used, being 4 in. (10, 2) square and 1 ft. (33 cm) long, weighing 56 lb. (25 cm).

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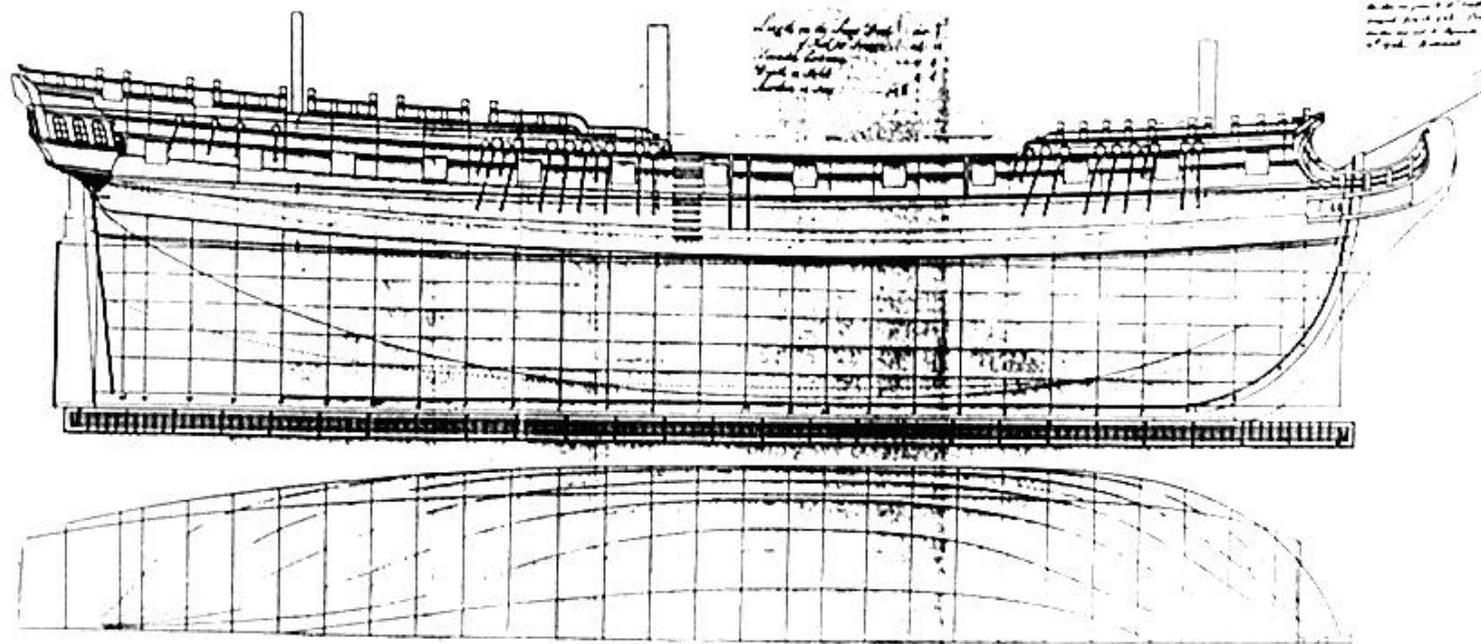
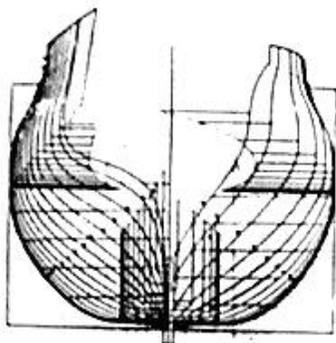
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Illustrations:

The following illustrations are: line drawing of original ship, site plan, and iron guns on site covered by concretions.

Scale
1/1000
1/2000
1/4000



Scale

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Planos da Fragata *H.M.S. Pallas*, com linhas de reconstrução.

Canhão 2



Lastro de ferro

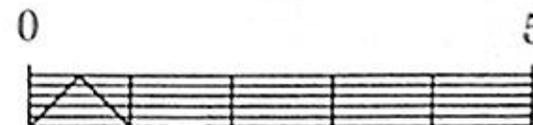
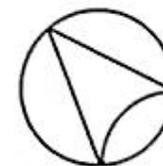
Canhão 1



Lastro de ferro
Projecteis de artilharia em ferro



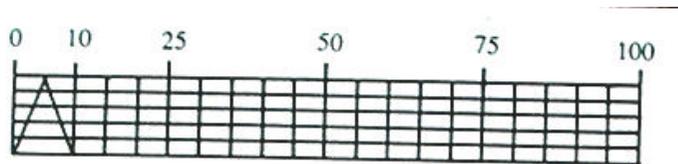
Norte Magnético



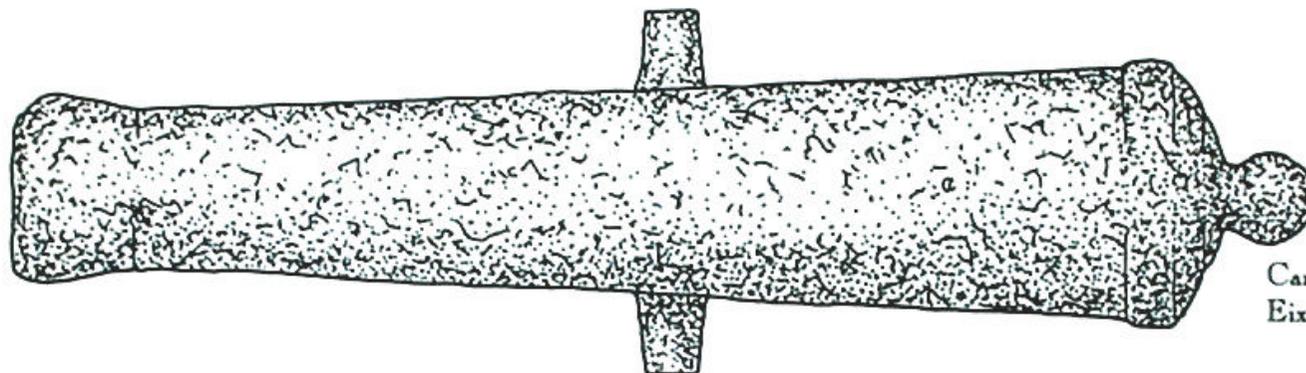
Metros

Royal Navy Frigate Pallas

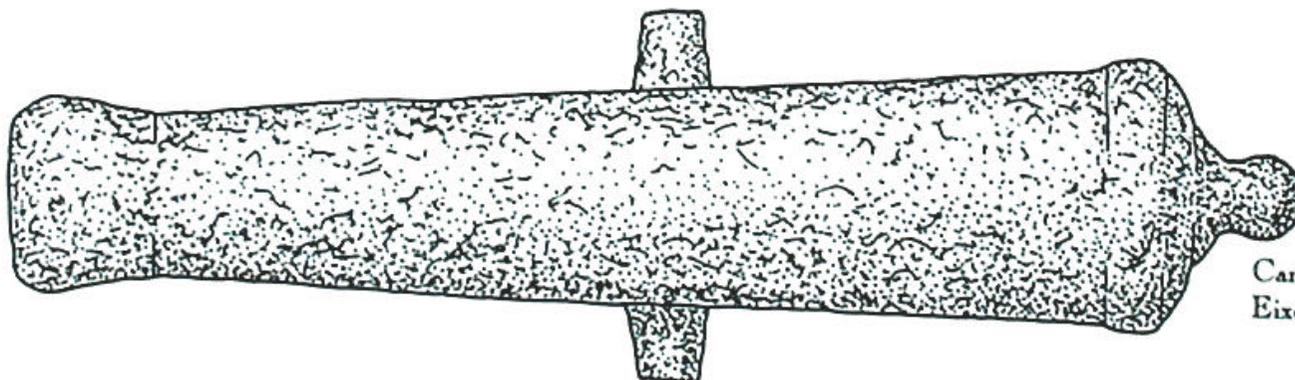
Encalhada a 12 de Fevereiro de 1783, Calheta, São Jorge, Açores



Registo *in situ*
detalhes cobertos por concreções



Canhão 1
Eixo 258° N mag.



Canhão 2
Eixo 155° N mag.

Canhões de ferro fundido
Royal Navy Frigate *Pallas*

Levantamento efectuado em Agosto de 1998
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