

EXHIBIT A-10

DR. SEAN A. KINGSLEY

PART 10

ANNEX 15

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TO

EXHIBIT A

Examples of ballast heaps defining shipwreck sites.

- 15.1. Rectangular iron ballast blocks from HMS *Fowey*, Florida, 1748: Skowronek, R.K., Johnson, R.E., Vernon, R.H. and Fischer, G.R., 'The Legare Anchorage Shipwreck Site – Grave of HMS *Fowey*, Biscayne national Park, Florida', *International Journal of Nautical Archaeology* 16.4 (1987), figs.3, 7.
- 15.2. Rectangular iron ballast blocks on HMS *Pomone*, England, 1811: Tomalin, D.J., Simpson, P. and Bingeman, J.M. 'Excavation Versus Sustainability *In Situ*: a Conclusion on 25 Years of Archaeological Investigations at Goose Rock, a Designated Wreck-Site at the Needles, Isle of Wight, England', *International Journal of Nautical Archaeology* 29.1 (2000), fig. 15.

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The Legare Anchorage shipwreck site—Grave of HMS *Fowey*, Biscayne National Park, Florida

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Introduction

Reports from the Southeastern United States regarding scientifically-conducted shipwreck investigations along its littoral have not received much publicity. It is not that work of this kind is non-existent, but rather that it has been overshadowed by the public media's focus on the more glamorous activities of the treasure salvage community. One of the few organizations conducting systematic, scientific research of submerged cultural responses has been the United States National Park Service's Southeast Archaeological Center. The Legare Anchorage Shipwreck Site (BISC-UW-20) in Biscayne National Park is one of these resources.

Background

The Center's activities in the past have largely been limited to surveys and assessments in the eight states and two territories of the National Park Service's Southeast Region which embraces North Carolina, South Carolina, Georgia, Alabama, Mississippi, Tennessee, Kentucky, Florida, Puerto Rico, U.S. Virgin Islands. The service has jurisdiction and responsibilities over 786 877 acres (318 449 hectares) of submerged lands in the Southeastern United States, includ-

ing some of the prime areas for historic shipwreck remains to be found in North America. Through this programme nearly 100 sites have been located and recorded, and in compliance with legislative mandates, efforts taken to insure these sites' conservation and protection in the interest of the public (Skowronek, 1986). That role radically changed in Biscayne National Park because of the Legare Anchorage Shipwreck (Fig. 1).

In October of 1979 a sport diver from the Miami, Florida area filed a complaint in Admiralty Court requesting title to a wrecked and abandoned sailing vessel within the Legare Anchorage, Biscayne National Park. Under United States law, this was a petition to obtain rights to salvage the site. The shipwreck had been identified as an historic shipwreck in an assessment of the park in 1975 by a Center archeologist (Fischer, 1975). Although its existence was known, it had not at that time been physically located. The United States intervened in the law suit as a defendant seeking title, arguing that the shipwreck was public property in a National Park and, as such should be preserved as a part of the nation's patrimony.

The litigation over the site was decided in favor of the United States in U.S. District Court,

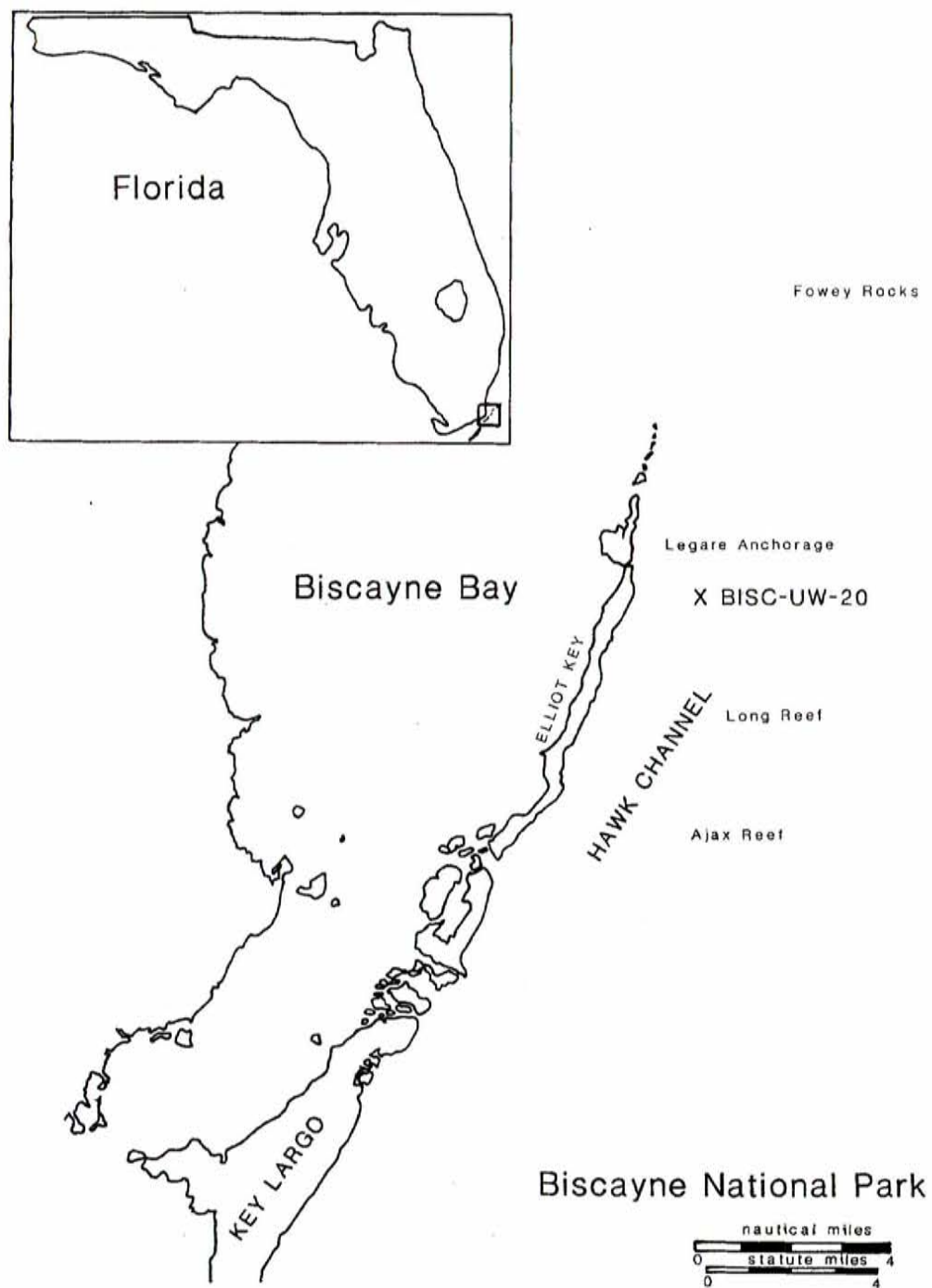


Figure 1. Location Map Legare Anchorage Site BISC-UW-20.

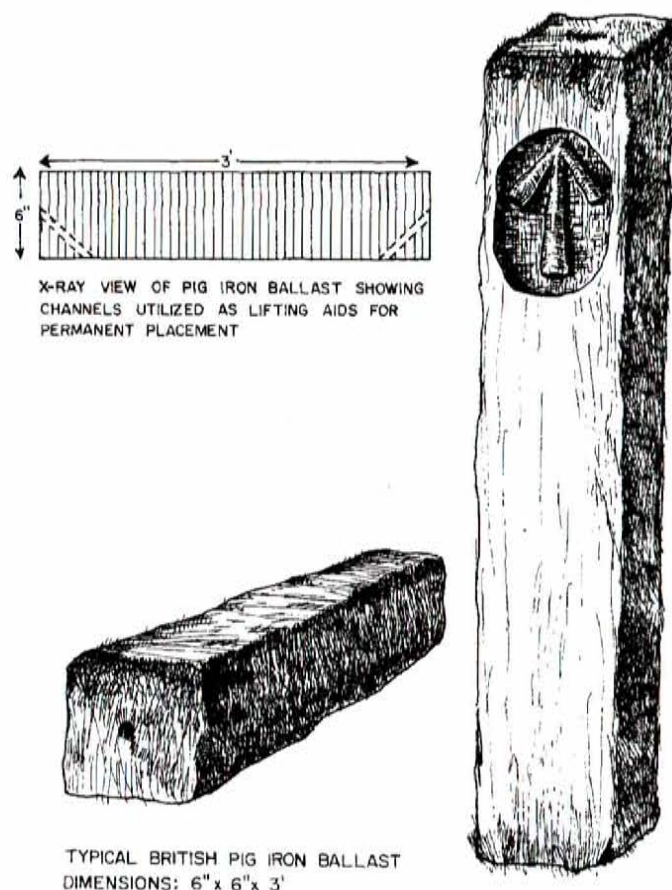


Figure 3. Rendering of iron ballast blocks found at BISC-UW-20.

the Royal family until 1714 (Peterson, 1969: 28), but which continued in use until later in the century (David Lyon, personal communication 2 October 1986). Finally, bricks and tiles fall in the range of statute sizes of English bricks (Noel Hume, 1968: 124).

Ceramics recovered from the Legare Anchorage shipwreck included faience, delftware, Rhenish stoneware, gray and brown saltglazed stonewares, agate ware, porcelain and various coarse earthenwares, both glazed and unglazed. The ceramic assemblage does not point unanimously to a British origin for this ship. Twenty-two percent of the assemblage is unquestionably English in origin while another nine percent is possibly English. In contrast, fifteen percent of the sherds are French in origin. The remaining

sherds consist of Rhenish stoneware, Oriental porcelain and coarse earthenwares of undetermined origin. Rhenish stoneware and Oriental porcelain were imported by both France and England. Although the ceramic assemblage cannot be considered either positively English or French, the complete absence in the assemblage of olive jar and majolica, which were ubiquitous among the remains of the Spanish 1733 *flota* (Skowronek, 1984b), make it a near certainty that the Legare Anchorage wreck is not Spanish as had been originally proposed.

Historical documentation

The archaeological picture painted from the data presented thus far shows a warship, dating from the second quarter of the 18th century.

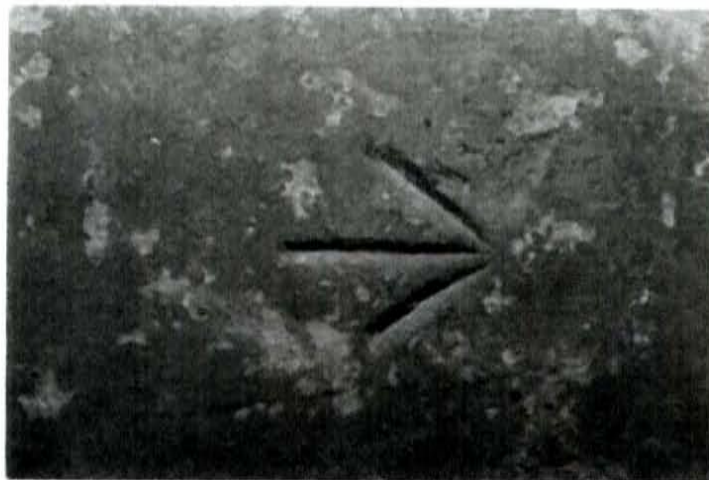


Figure 6. Broad Arrow found on the first reinforce of a nine pounder gun.



Figure 7. Incuse cast Broad Arrow found on cast iron ballast block.

and ownership (Marx, 1979). This corresponds with the mixed picture presented by the archaeologically collected data. However, data from salvaged wrecks of the same fleet indicate that these ships should have been ballasted exclusively with stone and the site should have been littered with Spanish or Spanish-colonial ceramics, including the ubiquitous olive jar. The presence of olive jar storage containers would correspond with a lack of barrel hoops, bottles

and other European ceramics (Skowronek, 1984b).

The Legare Anchorage site fails to meet these criteria for Spanish ships. A better candidate for the vessel's identity is HMS *Fowey*. Classed as a fifth rate Royal Navy vessel, 127 ft in length and 36 ft in beam (Colledge 1969: 218) and mounting a total of forty-four 6, 9 and 18 pounder guns, the *Fowey* matched the guidelines established by the Admiralty for the armament of vessels of

Excavation versus sustainability *in situ*: a conclusion on 25 years of archaeological investigations at Goose Rock, a designated historic wreck-site at the Needles, Isle of Wight, England

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Assurance, a British warship of 44 guns, was lost on the Needles of Wight, UK, in 1753. *Pomone*, a British 5th rate 38-gun frigate of the *Leda* class, followed in 1811. Designated a 'protected wreck' in 1975 this multi-period site was investigated under a UK Government licence. Despite her total disintegration, *Pomone* left artefact scatters attesting to her size, character, resting position and evidence of her cabin plan. This archaeological evidence is compared with two surviving sister ships, and the presumption of incomprehensible 'scrambling' on Muckelroy Class 5 wreck sites is robustly challenged. The licensee reviews the organization and methodology of 25 years of licenced activity on this site and concludes that the UK policy of promoting invasive investigation of historic shipwrecks cannot be readily reconciled with the principles of sustainability which are now embodied in European Agenda 21.

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Key words: protected wreck, sustainability, Isle of Wight, European cultural heritage, Agenda 21, coastal management.

Introduction

For seafarers, the western approach to the historic naval port of Portsmouth is impeded by the Isle of Wight. This island has imposed upon all mariners a choice between an off-shore course in the open waters of the English Channel or a near-shore route which allows craft to approach through the Solent seaway (Fig. 1). The off-shore route takes vessels south of Wight where navigators must stay well clear of the island's dangerous south-western coast as well as the submerged rocks protruding 1.5 km from its eastern tip at Bembridge Ledge.

The inner course offers sheltered waters in the lee of the island but in choosing this route navigators must evade three particular hazards. The first danger lies at the Needles, where a

series of chalk stacks protrude above an ancient wave-cut platform (Fig. 1a). Passing north of these rocks, seafarers must then avoid some treacherous shifting shoals known as the Shingles (Fig. 1b). Once clear of both of these hazards there are powerful and turbulent currents to be overcome in the narrow passage confined by the substantial shingle spit which protrudes from the mainland shore at Hurst (Fig. 1c).

The Needles are today a line of three off-shore stacks projecting westwards from a high chalk promontory. Three hundred years ago they numbered five. Central within the group was the slender 'Needle Rock', sometimes known also as 'Lot's Wife'. This stack fell in 1764. The most westerly upstanding rock is Lighthouse Rock, modified in the mid-19th century to accommodate

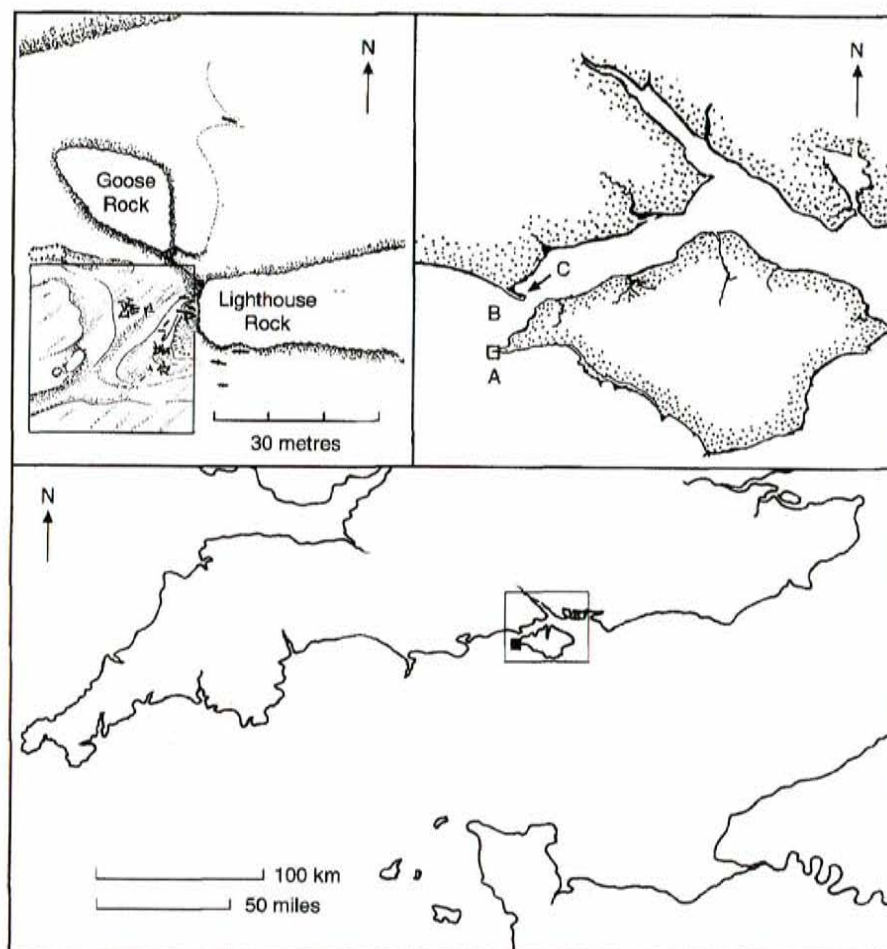


Figure 1. The location of the Goose Rock wreck-site at Needles, Isle of Wight, UK. (Drawing: DJT)

the present lighthouse. Just beyond the tip of this rock lies the submerged stump of another former needle-like stack. Mariners of the 16th century knew this stump as 'the Goose'. It was on or near this concealed hazard that the *Assurance*, a 5th rate vessel, was critically damaged on 24 April 1753.^[1]

The topography and geomorphology of the wreck-site at Goose Rock

The Needles promontory is a classic cuesta in which the chalk bedding rises almost vertically from the southern rim of the Hampshire Basin syncline. The entire structure above sea-level has been admirably modelled in three dimensions (Stamp, 1964). At the southern foot of Goose

Rock the chalk wave-cut platform is characterized by a series of gullies and ridges which are sometimes interrupted by deep corrosion pot-holes filled with captive boulders. The latter vary from 0.7 to 3 m in diameter and may be as much as 2 m deep. These pot-holes lie mostly to south and west of the rock while a few are to be found near its summit (Fig. 2).

Many of the ridges in the wave-cut platform are formed from hard bands of flint some 0.2–0.3 m in thickness. The flint seams follow the strike of the rocks which elsewhere on the promontory generally runs east–west. At Goose Rock the flint outcrops and some of their intervening gullies veer slightly to west-south-west. This means that many of the gullies on the wreck-site are orientated directly into the south-westerly fetch of the English Channel (Fig. 3).

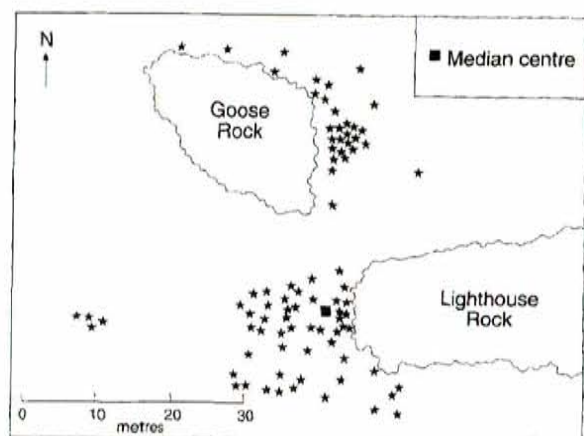


Figure 13. Discontinuity in the distribution of *Pomone*'s copper sheathing at Goose Rock. (Drawing: PS)

artefacts' might be used to reconstruct the plan and character of the ship purely upon archaeological principles. In the first instance, the former position of the keelson of the ship might be sought amongst the distribution of iron ballast blocks. A comparison with the extant *Trincomalee* had shown that standard 2 cwt blocks were generally laid longitudinally in an orderly arrangement on each side of this central member. Contemporary ballast plans for the frigates *Artois* (1794) and *Barrosa* (1812) suggest that none or few of these blocks were normally laid aft of the pump and mainmast foot while the mass was spread alongside the ship's well and the shot-lockers. From here, smaller quantities of blocks would extend forward beneath the water casks of the hold (Lavery, 1987: 190–191). Given their heavy weight and obvious lack of mobility, the position of the blocks on the seabed should closely reflect the final position and orientation of the wreck (Fig. 14).

Once the general whereabouts of the centre of the ship had been established, the next task was to determine the bow and stern positions. Here, other indicating artefacts could be employed, including the ship's grindstone. This was commonly kept near the manger in the bow of English warships of this period. An unresolved question was just how much of the bow portion of *Pomone* had protruded north of the 'saddle' between the Goose and Lighthouse Rock. For this the grindstone could be an important indicator even though it remained uncertain exactly how far back from the stempost it would have been positioned.

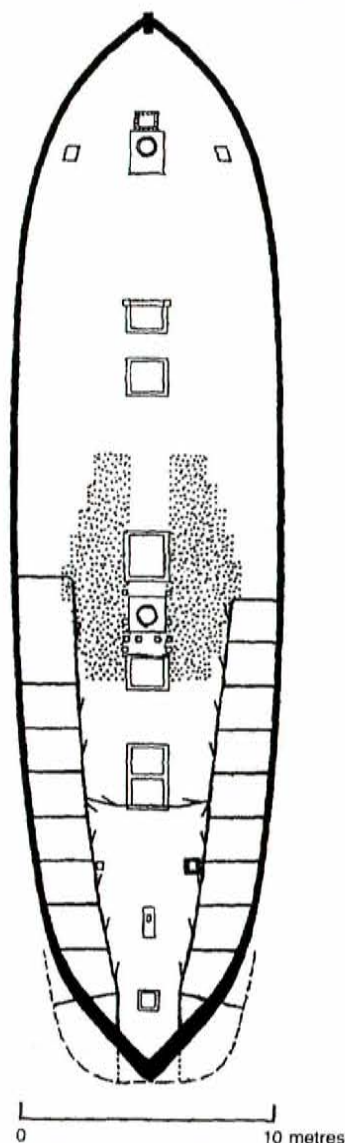


Figure 14. The approximate position of iron ballast blocks (stippled) in a contemporary frigate. (Drawing: DJT after *Artois* 1794 in Lavery, 1987)

Reconstructing and phasing the wrecking process

Ballast dump 1 and lodging position 1

It was conjectured that a detached and compact group of 17 ballast blocks, discernible on the west side of the general distribution, had probably been shed during the initial impact of the ship (Fig. 15; Appendix 3). These blocks were attributed to the first grounding of the ship at 'lodging position 1' (Fig. 16). This evidence suggested that



Figure 15. *Pomone's* 2 cwt iron ballast blocks *in situ* in ballast dump 1. (Photo: Garry Momber)

during the very first stage of the disaster the bow of *Pomone* had ridden up on to the Goose. Such an action would drive the mid and stern sections of the ship down on to the ridges and corrugations of the wave-cut platform. Some broken and buckled links of the chain pump were found near this first dump of ballast blocks and these suggested that initial and critical damage had been sustained amidships and that the floor of the hold and the well had been immediately perforated.

Ballast dump 2, comprising 20 more iron blocks, was centred some 10 m south-east of the first dump. This linear group seemed to represent

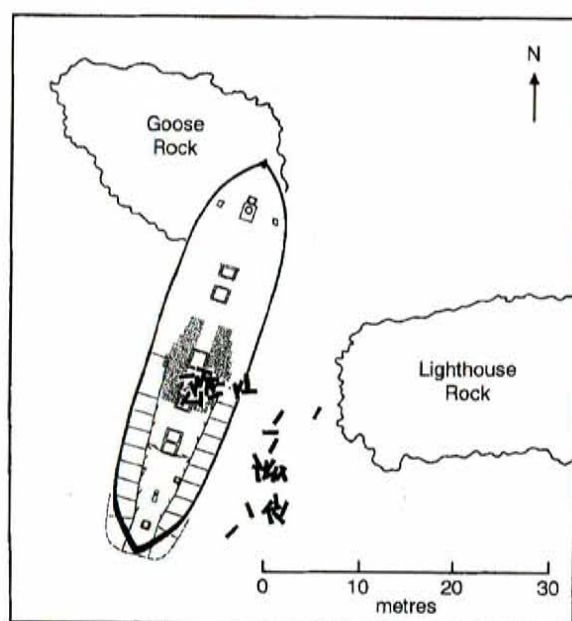


Figure 16. The calculation of *Pomone's* first lodging position centred on ballast dump 1. (Drawing: DJT)

the final lodging of the craft. Between the two dumping events a second or intermediate lodging position could be perceived. Later, this second position was found to accord with the position of the ship as shown in the Sutherland painting. The second position brought the stern of *Pomone* round to the south while the bow remained partially lodged on Goose Rock and the Saddle. This meant that the keel was left unsupported where the hull passed over a declivity in the wave-cut platform at the foot of Lighthouse Rock. Such appears to have been the position witnessed by Thomas Webster when the sea was seen flushing through the ship's gun-ports.

It seems that it was the flushing process that swept many of the smaller personal items like the uniforms, navigational instruments and the surgeon's kit down onto the seabed. Even without the information provided by contemporary paintings, the cumulative evidence offered by these artefacts had strongly suggested that the ship had been jammed in this position; indeed this had been suggested by Derek Williams as early as 1975. Later, the archaeological evidence for the second lodging position was confirmed when documentary accounts were found attesting that *Pomone* had struck and held on a concealed rock before slewing to a second resting place.

The chain pump and lodging positions 1 and 2

A significant indicator of the ship's precise location on the north-south axis of the second lodging position was provided by the chain pump (Appendix 3). On *Leda*-class frigates this vital apparatus was sited some 20 m forward of the sternpost, a distance which represented some 46% of the ship's length. Originally the large cast-bronze articulated links of the pump had been captive within substantial wooden tubes. This meant that while some of the lowest links in the chain might be broken off during the initial impact, the remainder of the chain could not so readily break free during the first stage of the wrecking process. In a disintegrating hulk the links were most likely to remain trapped *in situ* within the central section of the ship. On the seabed some links of the chain pump seemed to be associated with lodging position 1, while more links of the pump were observed and recovered 2 m north-west of gun 2 (Fig. 17). Here they occupied a hollow which probably lay at least 2 m below *Pomone's* partially perched or suspended hull while trapped in lodging position 2. At this

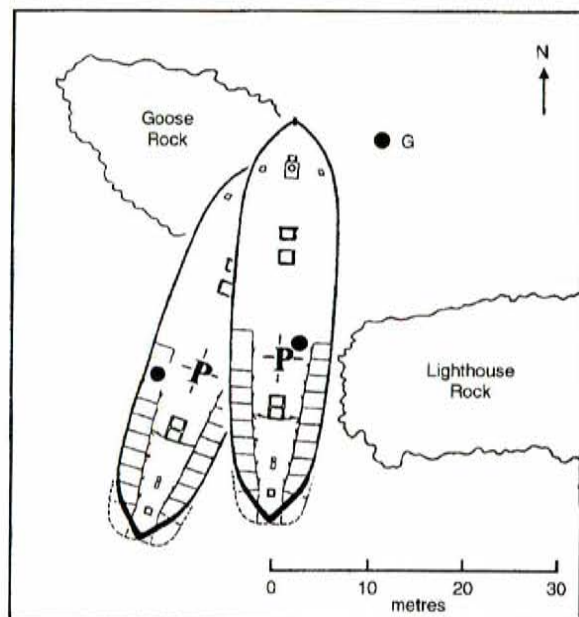


Figure 17. The loss of *Pomone*'s chain pump components in lodging positions 1 and 2. The original onboard position of the chain pump (P) is indicated in both lodging positions and the find-spot of the bow grindstone (G) is also shown. (Drawing: DJT)

location the links may have finally run out through the break first sustained at lodging position 1. This second group of pump components provided a highly agreeable fit with the more ephemeral evidence offered by the distribution of select personal items. All this evidence showed reasonable accordance with the proposed bow position indicated by the grindstone.

The loss of heavy ordnance and the listing of Pomone in lodging position 2

Further confirmation of *Pomone*'s second lodging position could be perceived in the distribution of her guns. Most of the surviving heavy ordnance was to be found tight against Lighthouse Rock. Here it seemed that the guns had come to rest in positions which had defied their recovery. Of the nine guns strewn south of Goose Rock, six were orientated with their muzzles to the east. These appeared to have been shed from the starboard side of the ship. The only gun which appeared as though it might have slid from the port side was gun 12. Its muzzle faced westwards (Fig. 11). A further gun facing west was no 3, but this lay beneath a submerged overhang below Lighthouse Rock; here it might easily have been overturned

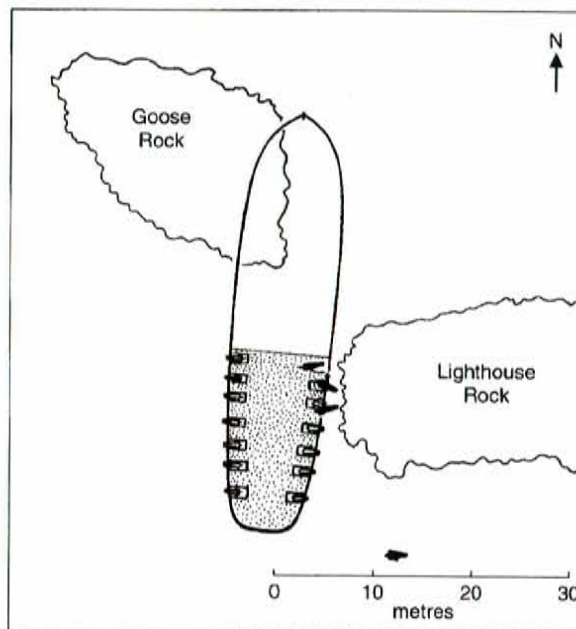


Figure 18. *Pomone*'s second lodging position and the loss of her quarterdeck carronades. (Drawing: DJT)

during its descent to the seabed. Particularly revealing was the distribution of carronades. These ordnance pieces had been arranged in a complement of 14 on *Pomone*'s quarterdeck. Their final resting position at the foot of Lighthouse Rock provided further persuasive evidence to demonstrate that the ship had been trapped for some time in lodging position 2 (Fig. 18).

The evidence offered by the heavy ordnance had long suggested to the archaeological team that although some 76% of it had been recovered, the ship had listed significantly to starboard in its second position so that the remainder of the guns had been shed on this side of the craft. This listing position for *Pomone* was proposed in 1988 yet it was not until 1993 that the paintings of Sir James Sutherland were to provide precise confirmation of the archaeological conjecture.

Ballast dump 2 and lodging position 3

An incongruity in *Pomone*'s conjectured second lodging position was ballast dump 2. The comparative evidence offered by the frigates *Artois* and the *Barrosa* had shown that iron ballast was normally assembled forward of the chain pump (Fig. 14). The evidence strewn at the foot of Lighthouse Rock was contrary to this for it

Appendix 1

Coins attributed to *Pomone*

Excavation reference	Mint	Denomination	Date	Location
Spanish-American specie				
4/7/76	Lima or Potosi	8 reales	1772-18251	DW Squ. B
22/8/76	Lima	8 reales	1808	Foot of Lighthouse Rock
1976/7 Droit 208?	?	8 reales	1772+	Foot of Lighthouse Rock
1976/7 Droit 208	Lima	8 reales	180- (1803-1808)	Foot of Lighthouse Rock
29/4/77	Mexico City	8 reales	1808	Foot of Lighthouse Rock
21/6/77	Mexico City	8 reales	1809	Foot of Lighthouse Rock
1977/8 M1 Dive 2	Mexico	8 reales	1808	Foot of Lighthouse Rock
1977/8 M1 Dive 2	?	8 reales	1808	Foot of Lighthouse Rock
1977/8 M1 Dive 2	Mexico	8 reales	1809	Foot of Lighthouse Rock
1/9/78	?	8 reales	1808	(2 m S of gun)
30/6/79 DW14-15	Lima	8 reales	1803-1808	(1 m N of S14)
30/6/79 DW	Potosi	8 reales	1808-1808	(1 m N of S14)
1/8/82 JH 15/82	Mexico	8 reales	1803	(10 m W gun 3)
19/6/83 EM 1	Mexico	8 reales	1803-1808	(Piton 14)
3/8/83 JMB 59	Mexico	8 reales	1807	(Gun 8)
21/7/84 JMB 22/84	Mexico City	8 reales	18-	(20 m W of guns)
DJT/96	?	8 reales	1797	(1.3 m W of piton 60)
Other coins attributed to <i>Pomone</i>				
Mediterranean States				
17-19JH15/82b	Malta	4 tari (pre-1646)	1778	(15 m SW of gun 3)
			4th countermark	
21/5/83	Naples & Sicily	10 tornese	1798	(2 m N of gun 8)
JMB9/82	Naples	6 tornese	1799-1805	(10 SW of gun 3)
LP 12a/84	Naples Rep.	6 tornese	1799	(10 m NE of guns)
2/8/82 JMB10/82	Sardinia	1 reale Vic. Amad. III	1795	(10 SW of gun 3)
29/8/82 LP15/82	Palermo	10 grani. Ferdinand III	1803	(Under gun 8)
United Kingdom				
19/6/77	England	Copper halfpenny	1805-1807	(DW square X in gully)
23/7/77	Ireland	Copper halfpenny	1805	(DW Square X in gully)
16/82 JH	Ireland	Geo. III Gold half guinea	1806	(10 m SW of gun 3)
3/7/83 JMB 28	Ireland	Geo. III halfpenny	1806	(Piton 17)
3/8/83 SNR 15	Ireland	Geo. III halfpenny	1775	(Piton 14)
1985/ CS 1/85	Ireland	Half sovereign	1790	(Near gun 4)
1986 LP 44/86	Ireland	Half guinea brass token		(2 m S end of Lighthouse Rock)