

The wreck of the Dutch East Indiaman *Campen* on the Needles rocks, Isle of Wight, 1627—Part 1

Needles Underwater Archaeology Group (NUAG)

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Location

It is quite remarkable that the wreck site of the *Campen* remained undiscovered for so long, despite several serious attempts at relocation, until June 1979. Reference to the loss of the two Dutch East Indiamen in the Calendar of State papers, Domestic and Venetian Series (LXXXII, CXLII, DXXVII and XX) was well known, and the two wrecks were catalogued in a popular 'treasure' book (Larn 1974: 6).

R. Graham and F. Shaw swam and searched the area in 1970/1, and missed the site by perhaps 20 m, finding only scattered lead musket shot. D. Williams, who successfully relocated

the wreck of the British man-o'-war *Assurance* on the Needles, less than 100 m distant, also failed to find the *Campen*. P. McBride and I, when we spent 2 weeks on the Needles and surrounding area in 1972 looking for the *Campen*, were defeated by seemingly near nil underwater visibility and fierce tides.

Six members of the Northampton BS-AC (Branch 13), who did not normally dive together as a group, found themselves thrown together by circumstances on 30 June 1979, with a club inflatable boat on the Needles rocks (Fig. 1). At that time none of the group had heard the names *Campen* or *Vliegende Draeck*, or were

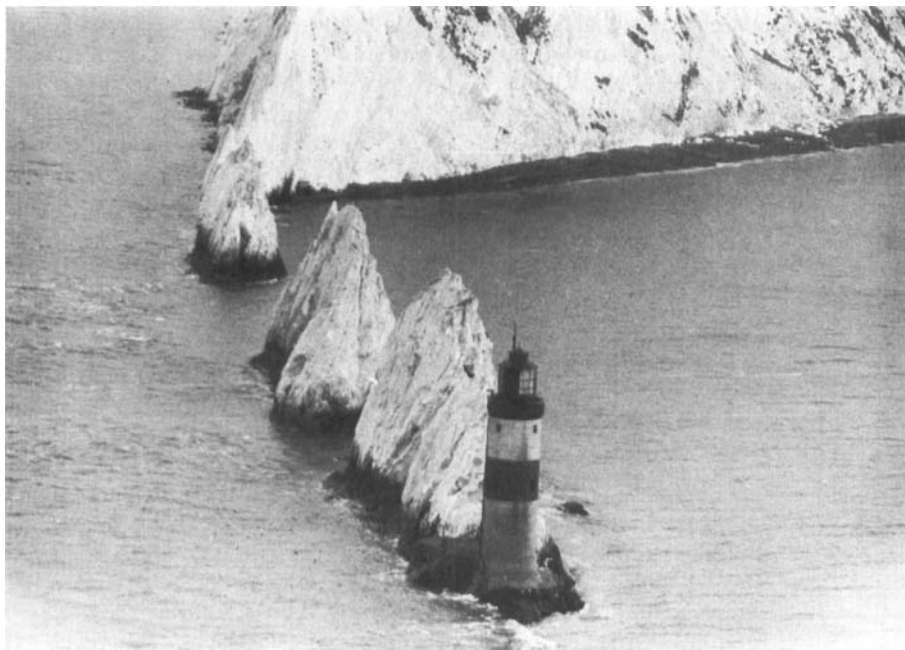


Figure 1. The Needles, Isle of Wight (photo R. Larn).

aware that they had met with disaster at this location. Had the underwater visibility not been an unprecedented 10 m that day, then the wreck site might well have remained undiscovered. As things were, the divers found a scattering of lead ingots on the seabed, and shortly after, K. Punch surfaced with the first coin, a blackened disc whose identity and vintage was not obvious until taken ashore and cleaned.

Uncertain as to the best course of action to take, the group did not return to the site that year, or reveal its discovery for almost 3 months, until agreement was reached that they should seek outside assistance. By coincidence, I had been invited to the Northampton BS-AC club house, along with P. McBride in September 1979, to give a lecture outlining the legal wrangles, intrigues, squabbles and injunctions that frequently accompany the location of a shipwreck site. The following day the nature of the find was communicated to us, and our opinion asked as to the best course of action to take. Knowing the advantages of having a contract with the legal owner of a wreck, as opposed to treating it as 'unclaimed' wreck under the Merchant Shipping Act, the group were advised to apply to the Dutch Government for a salvage contract. To save time and secure a suitable contract at an early date, it was suggested that they approach R. Cowan for assistance in this respect, and in due course a contract was agreed and signed.

From there NUAG emerged which comprised K. Punch, acknowledged as the finder of the *Campen*; P. Lay; J. Tyson; M. Francis; D. Whiting and Diane Whiting, who by invitation were joined by R. Larn, P. McBride and R. Williams, to make a team of 9 divers, and R. Cowan. By then it was too late to contemplate any work on the site that season, so diving commenced on 5 April 1980, and continues to the present time.

Richard Larn

Historical

The 39th edition of England's first printed newspaper, *The Continuation of our Weekly Newes*, appeared on 24 October 1627, and boasted amongst its headlines: 'Newes of certaine East India Ships of the Low-Countrie which have lately been cast away upon the Coast of England' (Fig. 2). The disaster, word

of which had reached Dover ten days previously, concerned two ships in particular; 'the one being in imminent danger to lose great store of provision lyeth stuck fast upon the Needles, and cannot be gotten off' (*Weekly Newes*, pp. 13–14). This ship was the *Campen* (otherwise known as the *Kampen*) built in Amsterdam, a 300-ton 'yagt' (yacht) armed with about 30 guns, and carrying 160 soldiers, sailors and merchants. Built for the Amsterdam Chamber of the Dutch United East India Company (VOC), the *Campen* was on her maiden voyage, one of seven ships in the autumn fleet outward bound from Texel in Holland on 12 October 1627. Of these seven vessels, four were medium-sized merchantmen the *Vliegende Draeck* (*Flying Dragon*), 320 tons; *Prins Willem*, 500 tons; *Nassau*, 550 tons, and the *Campen* herself. Three others (the *Vlieland*, *Terschelling*, and *Wieringhen*) were smaller yachts carrying passengers, victuals and other supplies for the seven-to-eight month journey (Fig. 3). All were laden with consignments of silver and gold bullion for commercial use in the Indies. Three of the fleet were destined for Pulicat, a Dutch trading post, off the Coromandel coast of India. The *Campen*, together with the *Prins Willem*, *Nassau* and *Wieringhen*, was to continue on to the Javan capital of Batavia.

In addition to their sailing instructions, the captains carried specific orders from the VOC Directorate that they were under no circumstances to 'anchor on English ground', but were to give the English coast a wide berth [ARA.KA 453 (VOC 315)]. In 1623, during one of the many disputes between the rival English and Dutch companies over mercantile and political control in the East Indies, the Dutch had tortured and killed sailors and merchants of the English East India Company on the Island of Amboina. In retaliation, James I had harassed those Dutch ships unwise or unlucky enough to touch English shores or come into contact with English warships. A mere two months before the sailing of the *Campen* and her companion vessels, in August 1627, three Dutch ships returning from Surat had been detained at the Isle of Wight with their crews and valuable cargoes, kept 'chained up', a detention that was to last more than a year^[1]. There was therefore every reason for the autumn fleet to steer well clear of England, and indeed Dutch ships seem

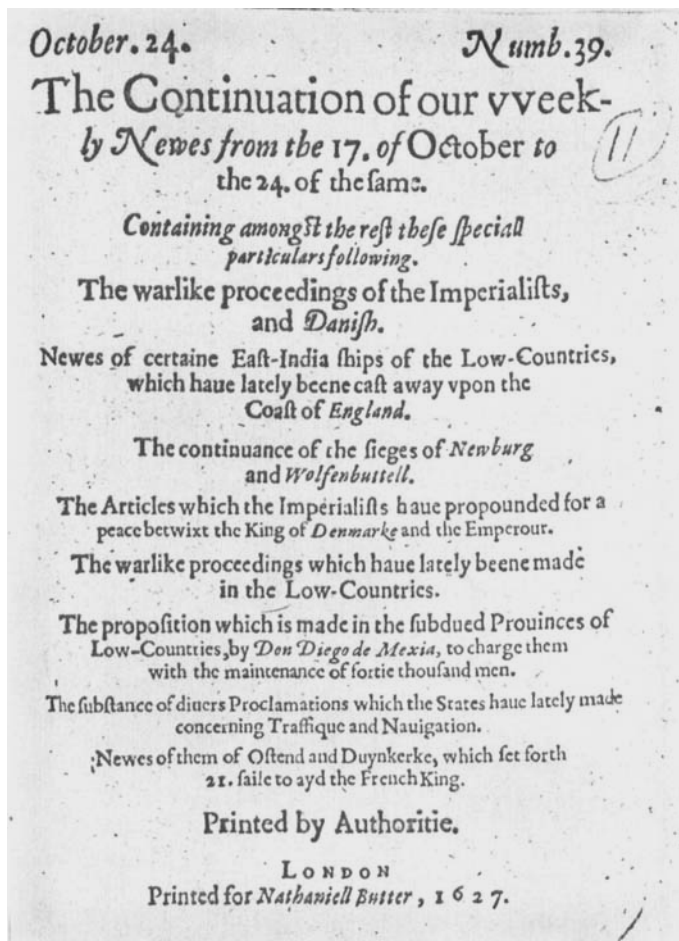


Figure 2. Title page of the *Continuation of our vweekely Newes*. This was the first printed newspaper in England and the *Campen* story the first shipwreck news to be 'headlined' (reproduced by permission of the British Library).

on this occasion to have made every effort to avoid confrontation with the English (C.S.P., Venetian, XX, p. 448).

On 14 October, the ships were overtaken by a severe southerly or southwesterly storm, and found themselves driven toward the English coast. In defiance of their orders, and relying solely on advice from their own ship's councils, all the vessels ran towards the Isle of Wight to seek shelter in the Solent. The *Campen* and the *Vliegende Draeck*, perhaps in ignorance of the depth of water in these passages, attempted to negotiate the largest gap between the Needles. Both ships bottomed. The *Vliegende Draeck*,

carrying 200 men, was holed but managed to limp into the Solent, going aground in a sandy bay on the Island. The less fortunate *Campen* stuck fast on the shallow ground off the Middle Needle, on the windward side. Crew and passengers were able to save themselves by means of hastily fashioned rafts and the ship's small boats. The *Campen* herself, her bottom torn out, was soon smashed to pieces on the rocks.

The wreck very quickly became a focus of attention from numerous parties who stood to gain or lose by the disaster that had befallen her. The crew and passengers had succeeded in taking with them to safety all but two chests of

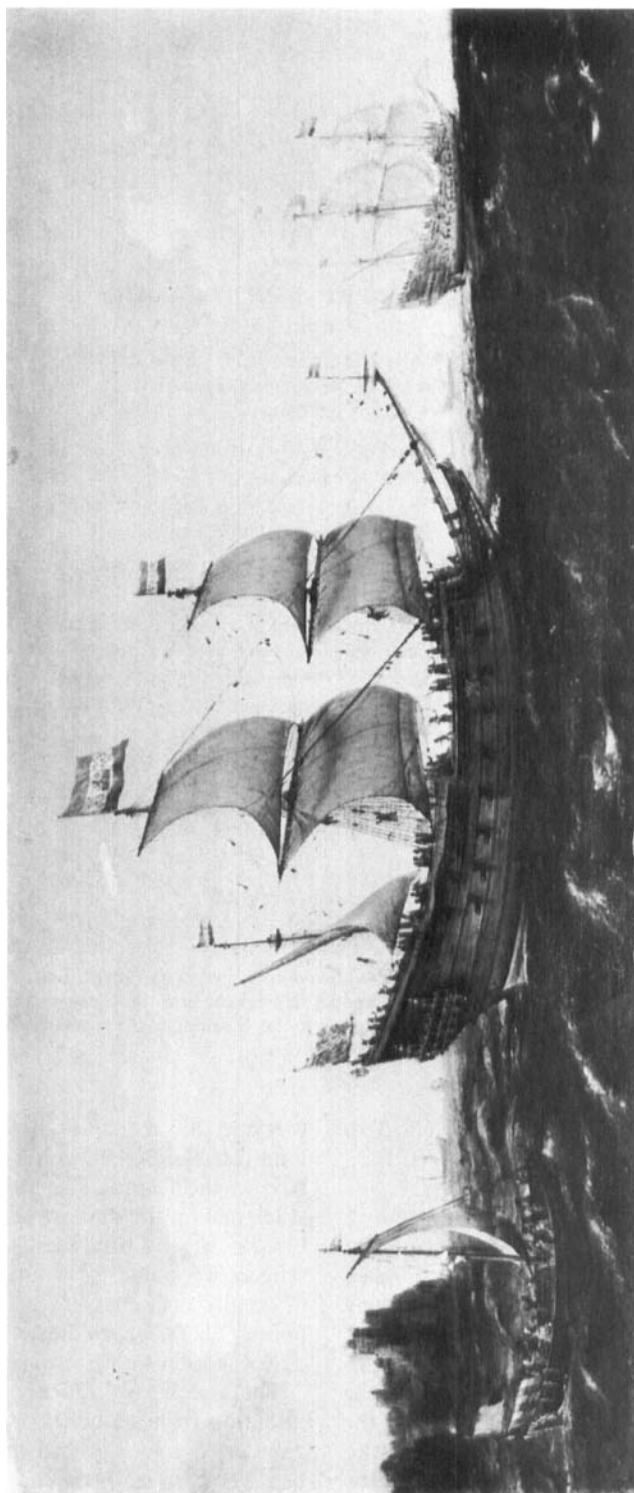


Figure 3. An East Indiaman of the period from a painting by P. Willearts in the Nederlandsch Historisch Scheepvaart Museum, Amsterdam.

the silver coins on board [ARA.KA 453 (VOC 315)]. But there remained on the site a wealth of other cargo, furniture, the personal belongings of those on board, and large quantities of ship's stores and supplies for the Company's settlements in the Indies. Together with the ship's fittings, tackles, guns, anchors, and ballast, this material provided a rich target for the pillagers of the day, and for the divers and 'fishers' who by then had made the salvage of wrecked ships a thriving if limited industry. No less concerned were those who had to deal with the wreck in an official capacity. News of the catastrophe first reached a representative of the Admiralty on 17 October (C.S.P., Domestic, LXXXII. Capt. W. Towerson to Sir J. Hippisley, Lieutenant of Dover Castle, p. 393). On 18 October, Henry, Earl of Holland wrote to Edward Nicholas, Secretary to the Admiralty: 'I understand that the Hollander fleet now bound for the East Indies hath been driven in by the fowle weather into the Needles where two of them are wrecks, they have in them chests of silver and some other things of value which may possibly be recovered, and therefore I made care ye might be speedily advised that ye might in tyme provide that his Majesty nor my Lord Admiral suffered not in their rights to which purpose I have sent our Capt. Towerson to survey and examine the state of the wreck and prevent embezzling or carrying away goods untill you send further orders' (C.S.P., Domestic, LXXXII, p. 397). By this time, Robert Newland, a merchant resident in Newport, Isle of Wight, and a man much interested in the salvage of wrecked ships, had received his own intelligence of the wreck, and with the aid of local boatmen, was already picking up material on the surface where parts of the *Campen's* hull must have shown above water, and fishing with tongs and other instruments for goods visible just under the sea^[2].

Within a few weeks, the VOC had despatched to England an agent, Mauritius van Ommeren, to safeguard their interests and to recover as much as possible of the ships' remains. Van Ommeren applied to the High Court of Admiralty for the equivalent of an injunction and appointment of a commission to protect the owners' rights; the judges duly granted an order to this effect (November 1627, CH.C.A. 14 144). Meanwhile, salvage on the Needles site was

further complicated by the arrival in late 1627 or early 1628, of the Dutchman Jacob Johnson, with a vessel, a diving bell (or possibly a barrel), and several assistants. Known by that time as 'Jacob the diver', Johnson is the first recorded salvor of considerable amounts of wreck material from sunken ships around Britain's coasts. In his own words, he 'did relinquish his employment in ye Lowe Countries in Anna 1620 to doe service in recovering sunck ordnance; wrackt goods, and moneys, upon his Majesty's Coastes of England, and Ireland; where he hath out of his industry and at his owne costes, and charges, in his owne person, by a playne and manifest way of dyving deepe under water, brought upp out of ye bottom of ye sea at sundry tymes, much goods and of good benefitt to the Admiralty, whence he had commission for his practice' (C.S.P., Domestic, CXLII, p. 584).

Thus Jacob and his revolutionary diving methods when he appeared at the *Campen* site were already familiar to George Villiers, Duke of Buckingham and Lord High Admiral. As Jacob's statement indicates, he had been employed by the Admiralty in 1620, when Buckingham had granted to him various licences and rights to dive on Spanish galleons and other shipwrecks off the coast of Ireland. Subsequently, in the pay of Lord Zouche, Lord Warden of the Cinque Ports, Jacob returned home to Enkhuizen in 1624. That same autumn, however, he was back in England, commissioned to salvage guns from a Dunkirk-based Spanish ship wrecked in the Downs on the night of 2 October 1624, and a cargo including copper and fabric stuffs from a Hamburg vessel run aground near Ramsgate (Hist. MSS. Commission: Cowper (Coke MSS), I, p. 173). Jacob was also contracted to salvage guns from the 800-ton English East Indiaman *Moon*, cast away near Dover Castle on her return from Jakarta in September 1625. In June 1627, moreover, he had been commanded by Buckingham to join, as engineer, the latter's disastrous expedition to the Isle of Rhé, where he served between July and October 1627. Relations between Jacob and English authorities had often been strained, not least by repeated evidence of deviousness and lack of integrity on Jacob's part; as late as the spring of 1628, Jacob was petitioning the Duke of Buckingham for money he claimed as

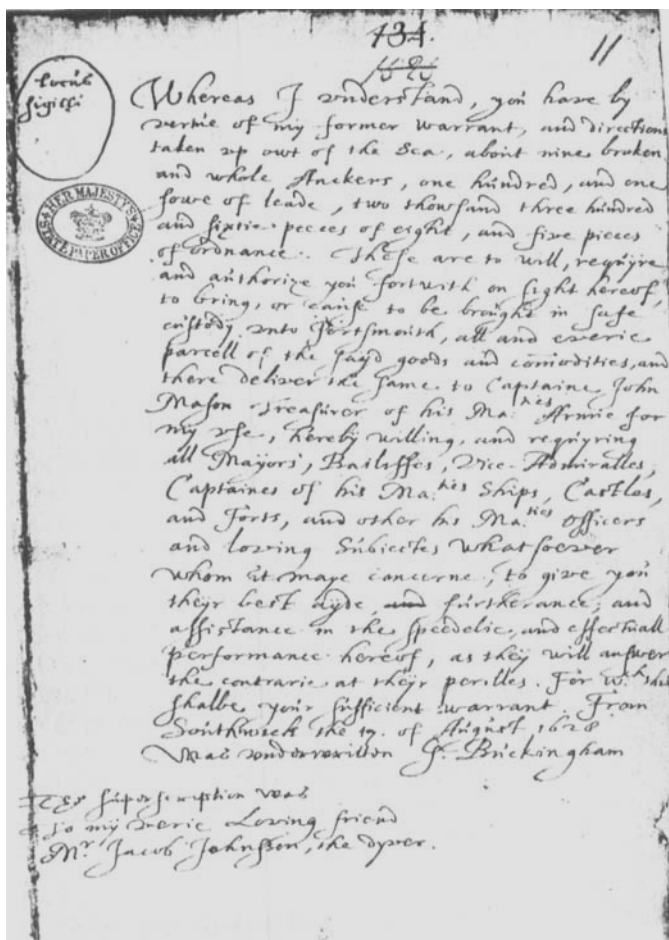


Figure 4. Letter from the Duke of Buckingham to Jacob Johnson, the diver, dated 17 August 1628 (C.S.P., Domestic, 1627–1628, p. 258) (reproduced by permission of the Public Record Office).

expenses from the Isle of Rhé campaign (C.S.P., Domestic, 1628–1629, p. 61). Nevertheless, despite Jacob's annoying persistence in such matters, Buckingham clearly admired him, and there was no other diver of merit to carry out such work.^[3]

This ambiguous relationship came to an end, ostensibly, when Jacob commenced diving on the *Campan* in 1628, for he had in fact sealed an agreement with the VOC (through their representative Van Ommeren, and with the full knowledge of the Dutch ambassador) to salvage goods from the wreck on their behalf; indeed, he had held similar commissions from the VOC in the past. There is little doubt that in this

instance Jacob, possibly with the knowledge or connivance of Buckingham, was prepared to consider breaching his contract with the Dutch. If, for example, it could be successfully maintained that certain material from the wreck did not belong to the Dutch, the Duke stood to profit substantially, and a timely alliance with him might well have rewarded Jacob more handsomely than his contract with the Dutch.

For this and other reasons, it is difficult to gauge precisely Buckingham's role during the early days of salvage operations on the *Campan*. By 1628, however, he was behaving with at least a modicum of propriety as Lord High Admiral. He issued explicit orders on 5 February to Sir

Fulke Greville and Edward Read, Deputy Vice-Admirals of the Isle of Wight, that they should 'restore to the Dutch East India Company, the Goods saved from the *Green Dragon* [i.e. the *Vliegende Draeck*; the name is inaccurately translated here]^[4] and the *Campen*' (C.S.P., Domestic, 1627–1628, p. 545). This decree was also directed to the merchant Robert Newland, with whom Jacob had apparently deposited, for safekeeping, various items already recovered from the *Campen*^[5]. (It is not clear from Buckingham's order whether he was aware of any material collected by Robert Newland or his agents without the help of Jacob.)

Whether or not this order was ever carried out, Buckingham's subsequent behaviour indicates marked duplicity towards the Dutch and their property rights. After several months during which salvage continued, the Duke on 17 August 1628 instructed Jacob to convey all goods recovered under the terms of his former warrant (i.e. from the English authorities)^[6] to Portsmouth, where he was to relinquish them to Captain John Mason, Treasurer of the Army. The goods seem to have amounted, at that point, to 9 broken and whole anchors, 101 sowe of lead, 2360 pieces of eight, and 5 pieces of ordnance (C.S.P., Domestic, 1627–1628, p. 258) (Fig. 4).

It must have been about this time (the document itself is undated) that van Ommeren, acting for the VOC, submitted to the Privy Council a petition complaining by implication, about the fashion in which goods salvaged from the *Campen* had been handled, requesting the Council's intervention to rectify the situation. Van Ommeren referred to 39 pieces of lead, 3 pieces of ordnance, and eight or nine anchors, recovered by Jacob but held by Robert Newland. Also at issue were '2365 reals of eight, 72 pieces of lead, and 2 pieces of ordnance, detained by Jacob in obedience to an order, as is pretended, of the Duke of Buckingham, whose warrant directed the same to be delivered into the hands of Capt. Mason for the Duke's use. Petitioner conceives that this warrant was procured by misinformation, the goods and reals belonging to the Company [i.e. the VOC] as is publicly known' (C.S.P., Domestic, DXXVII, p. 250). Van Ommeren asked for 'delivery of the goods and money to petitioner for the use of the owners, deducting the diver's share by virtue of

his bargain'; failing that, he would countenance 'that the goods be left in the hands of Robert Newland, and the reals with the mayor and magistrates of Portsmouth [*not*, that is, with Mason or Buckingham] till sentence be given in the suit depending in the High Court of Admiralty'.

If van Ommeren's petition had been submitted by mid-August 1628, it may in part have been knowledge of that petition that lay behind Buckingham's writing again to Newland on 22 August—though his message would hardly have cheered the VOC representative. Three cannon and other sundry items still in Newland's possession were to be returned to Jacob, who was to bring them on to Mason in Portsmouth. Buckingham concluded with a firm though conventional reminder of his own stature: 'Hereof you may not faile, as you will answer the contrarie at your perill' (C.S.P., Domestic, Vol. CXIII, p. 264).

As it happened, this letter was one of the last Buckingham wrote, on this or any other matter. On the morning of 23 August, while leaving the house of his friend Captain Mason, the Duke was stabbed by John Felton, a naval lieutenant crippled in Buckingham's service at the Isle of Rhé the previous year, and died shortly afterward.

Though King Charles was inconsolable at the murder of his favourite, Buckingham's death did little to simplify the complications of salvage and legal restitution of goods from the *Campen* and the *Vliegende Draeck*. Jacob himself seems not to have remained very long at the Needles; he had expectations of more profitable activity at the Lizard in Cornwall (where a wrecked cargo of silver bars and reals of eight attracted him), and in Ireland, where a Spanish ship, the *Santa Ana Maria*, had gone down in Castlehaven Harbour. (Warrants were issued to Jacob for these ventures on 8 June 1629; C.S.P., Domestic, CXLIV, p. 571.) But the rival law suits concerning ownership of the *Campen*'s treasure and artefacts continued. Nor was the matter of payment to Jacob for his share of the salvage work easily settled, but dragged on well into 1629. On 4 May of that year, Captain Mason dispatched to Edward Nicholas details of the property in Jacob's possession. 'Jacob', he said, 'doth acknowledge to have recovered [these]; he desires to have his part set out of the

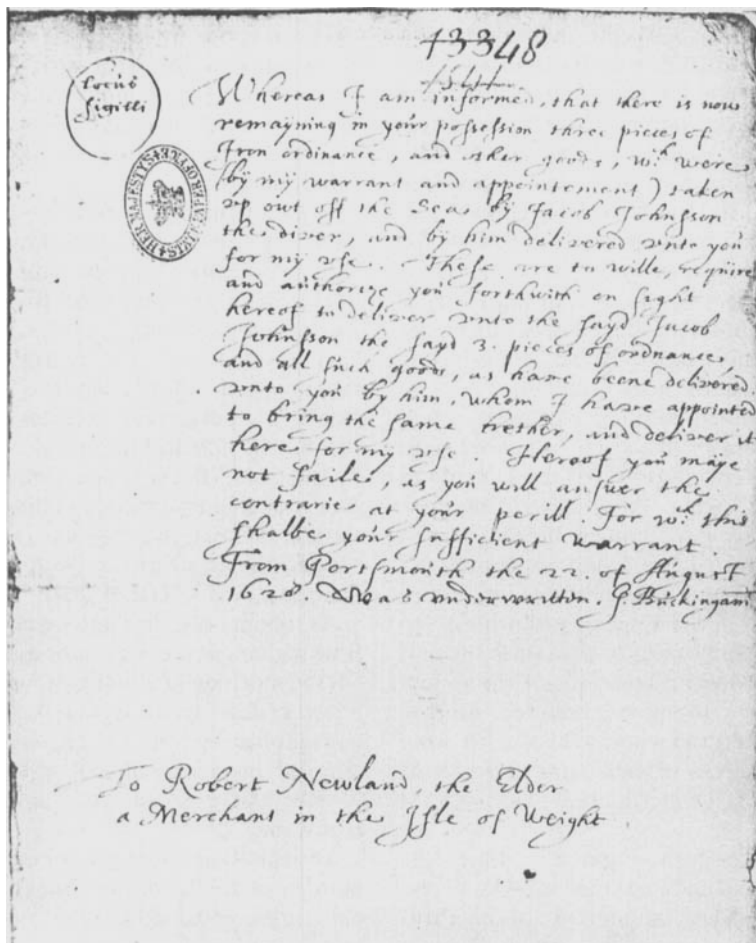


Figure 5. Letter from the Duke of Buckingham to Robert Newland, dated 22 August 1628 (C.S.P., Domestic, CXLII, 1628–1629, p. 264) (reproduced by permission of the Public Record Office).

whole' (C.S.P., Domestic, CXLII, 1628–1629, p. 537). Two days later, again to Nicholas, Mason notes Jacob's 'request that the money and wreckt goods at Portsmouth may be speedily adjudged in the Admiralty's court, so that he may have his part' (C.S.P., Domestic, CXLII, p. 539). Between 16 and 19 May, Jacob delivered to the Admiralty Court an 'Invoyce of the Particulars of certayne wrackt goods recovered out of the Sea near the Isle of Wight ... in July 1628' and awaited the Admiralty's pleasure (C.S.P., Domestic, CXLII, p. 553).

No documentary records have been found to show the outcome of the numerous law suits and other disputes concerning the *Campen* treasure; nor do the historical accounts refer specifically to further diving or recovery of goods on the site. Jacob must have returned to the *Campen* and possibly the *Vliegende Draeck* in later years though intermittently, for Admiralty records show that he registered a further 12 tons of lead taken up at the Needles in (by?) 1631 (HCA 30/158. Droits 1608–1758). A later account, dated 30 October 1632, notes 7

tons of lead recovered at an unspecified Isle of Wight site, which may also have been from the *Campen* (ibid.).

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Diving conditions and methods

Diving conditions

The proximity of the site to the Middle Needle Rock and a selection of clear transits allow positioning of a boat's anchor or shot line to be a precision exercise, and whereas this could well have led to a site security problem, the presence of permanent staff in both the Needles light-house and the overlooking coastguard station on the Isle of Wight have minimized this risk.

Due to the exposed position and shallow depth (5 m) of the site, diving operations were frequently threatened by the degree of sea swell generated when the locally strong tidal conditions (maximum of 3 knots) combine with a fresh to strong W/SW wind. In an area noted for its poor underwater visibility (seldom greater than 2 m and typically less than 1 m), this alone was an operational limiting factor. However, the combination of shallow depth and the minimal current flow over the localized area of the site, meant that single dive times of 1.5 h were quite common, with weekend individual underwater times of 5 h being typical. Optimum conditions invariably occurred during neap tides, particularly when the tide was in flood.

Diving operations

To complete the number of tasks required of the survey and excavation over the 5 years of work on the *Campen*, the diving team represented by members of NUAG have been enthusiastically supported by amateur divers, too numerous to name individually, from a number of groups and clubs, providing equipment and labour. The excavation of the site has embraced a variety of skills, and utilized the following equipment:

Boats

Apart from the occasional hire of a Keyhaven owned fishing trawler *We'll Try* (C. Cook), when the number of available divers or the task

dictated otherwise, the prime communal diving platform was a 17 ft aluminium dory, purchased by NUAG from group funds, with a supporting array of private inflatable or other small craft. Launching from Keyhaven slipway, the 5 mile journey from Hurst Castle to the Needles could be achieved in any time between 40 and 80 min, depending on wind and sea conditions, with frequent quite hair-raising experiences when passing through the tiderips, overfalls and whirlpools which are a feature of the western approach to the Solent area.

Lifting equipment and nets

The heavy lifting tasks associated with this site included the recovery of over 100 lead ingots, and the annual removal of several tons of boulders, rocks and overburden that infiltrated the site in the winter months each year. The majority of ingots were recovered using the winch of the hired trawler, others being recovered by means of lifting bags, directly into small boats.

The removal of unwanted overburden material was carried out at regular intervals, using two nets at a time on the seabed, with two divers to each. When sufficient material had been piled on top of each cargo net, a short piece of line was threaded through all four corners of the mesh, pulled tight and secured. After lifting to a position just below the surface, the vessel then winched itself clear of the site on its anchor warp, lowered the net to a position clear of the seabed, whereupon a diver would position himself above the net, cutting the short line holding the four corners, releasing the contents.

Recovery of the scores of iron round shot on site was achieved either by individuals bringing up two or three each on the termination of every dive, or else in bags, using a lifting bag as support.

Water dredge

It was necessary to excavate frequently through thick layers of small debris, sand, silt and soft chalk, to reach the bottom of deep pockets in the seabed. A water dredge was employed, kindly loaned by E. Cumming and the *Earl of Abergavenny* Group, consisting of a 200 gal/min pump and petrol engine. This size of unit was found most suitable for transportation and

operation from a 17 ft dory, and took no more than 10 to 15 min to get operational once on site.

Explosives

Due to the very hard nature of the concretion on site, and an initially unacceptable degree of accidental damage to coin and artefacts using hand tools, small explosive charges were used at an early stage, and continued to be employed throughout all phases of the 5-year excavation. Results confirmed the experience on previous sites by two members of NUAG who had held explosives certificates for many years, that the incidence of physical damage to artefacts was greatly diminished, and in many instances prospects of preservation enhanced, by the removal in this way of concretion in which an item was embedded.

Hand tools

Lump hammers of between 4 and 10 lb weight, with a wide variety of cold chisels and masons chisels, were used to remove several tons of concretion, and to excavate small holes in which to place explosive charges. Excavation in this matter often progressed to a depth of 2 m, to the soft chalk bedrock.

Metal detectors

Pulse induction metal detectors, with ferrite rod probe sensors proved invaluable in accurately pinpointing hidden metal artefacts. This reduced the chance of accidental damage using hand tools, and assisted the accurate placing of charges to achieve the best results. One diver in a group, using a detector, was able to circulate the site, initially locating and identifying areas to work, then returning and confirming or otherwise the success of the excavation. Only at a late stage in the 5 years of work on the *Campen*, when a large area of intact iron nails was uncovered, and then scattered across the site the following winter by gales, was there any confusion over the validity of signals in relation to artefacts. Using a ferrite rod probe detector, it was found possible to pinpoint a small single artefact as close as 10 mm.

Magnetometer

The seabed outside the marked off site area has been progressively surveyed with a proton

magnetometer of the small boat type, in an attempt to determine the presence of any ferrous material. With the exception of the iron shot area, and another area containing what was once a barrel(s) of nails, the immediate areas were found to be 'clean'. The complete lack of iron objects such as cannon, anchors etc. serves to confirm the success of the early salvage work carried out by Jacob Johnson and others.

Dive planning

A pre-season meeting of the NUAG members made possible a planned-rota system, by which individual team members were made responsible for particular periods, who then organize the necessary activity, boats, engines, divers and tools, and assume responsibility for diving safety. The decision whether to arrive at Keyhaven or not, and whether to leave Keyhaven for the site, is decided by a telephone call to the coastguard station officer overlooking the actual site, who, by experience, understands the weather conditions which the group considers marginal, or non-diveable.

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Survey

Site characteristics

The following site characteristics were established during initial dives. These identified the physical nature of the site and the conditions under which the survey would have to be carried out.

1. The majority of exposed concretion, organic and non-ferrous material lay over a 20 × 8 m area.
2. Water depth varied from 3–5 m (MHWS).
3. The seabed generally consisted of chalk outcrops interspersed with boulders, chert rocks, gravel and broken shell.
4. Underwater visibility rarely exceeded 3 m and was more often less than 1 m.
5. Tidal currents, although formidable on the surface were helpful underwater, sweeping the seabed at a maximum rate of $\frac{1}{2}$ knot on spring flood tides. Ebbing currents produced a weak eddy over the site reducing visibility.
6. The exposed aspect and shallow water left the site vulnerable to any sea swell from

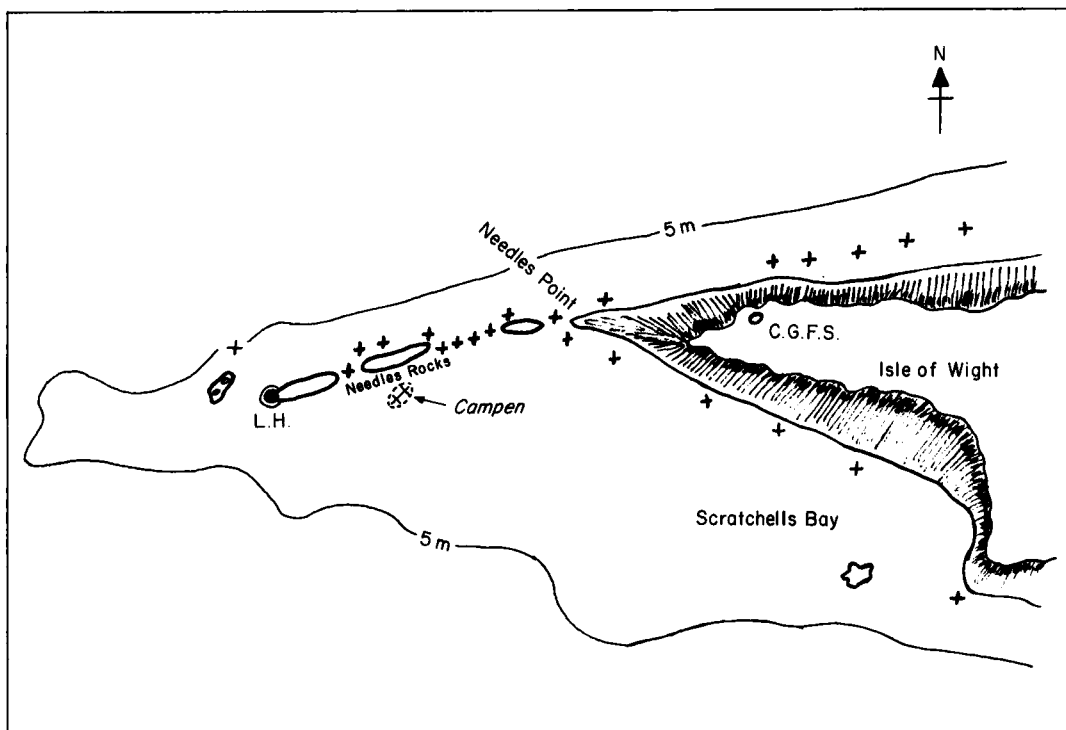


Figure 6. Sketch plan of the Needles site.

SE to SW. The nearby Needles lighthouse keepers confirmed the ferocity of winter gales.

7. The wreck site was bounded naturally on the southeast and northwest sides by steeply sloping ridges coming to within $2\frac{1}{2}$ m of the surface. An undercut mound $1\frac{1}{2}$ m high of ingots and concretion lay central to the site. Reconnaissance dives outside this perimeter showed the site to be the only clear valley like feature in an otherwise craggy confused seabed.
8. Fishermen frequently 'potted' across the site for shellfish, and the Alum Bay boatmen ran their 'Needles' sightseeing trips around the edge of the site in calm weather (Fig. 6).

After consultation with Richard Larn and Peter McBride, a technique was devised which it was hoped would overcome the four major obstacles of low visibility, violent water movement during storms, accuracy and cost. A combination of flexible and rigid lineation of the site was chosen. A large rectangle of fixed lines

would provide a datum lease for a detailed rigid grid survey. Lines marked at 2 m intervals would be accurately and permanently secured to the seabed to form a 20×4 m rectangle. This would then enable a 2×2 m rigid grid square to be accurately located at any one of 48 possible positions, thereby surveying an area 24×8 m (Fig. 7).

To locate the site geographically, datum point 'A' was triangulated from the nearby second Needle (Fig. 7). This datum point was established permanently by driving a $\frac{1}{2}$ inch self-drilling, expanding anchor bolt into the chalk bedrock. A 50 mm length of the bolt was left protruding from the seabed to form the north-east corner of the datum rectangle. After assembly on the surface, the 20×4 m rectangle of 'Gloine' was then submerged. One corner was attached to bolt 'A' while the other corners were temporarily secured so that the squareness could be adjusted using the 3,4,5 triangle principle. Prior to tensioning and final anchoring, the lines were checked for snags.

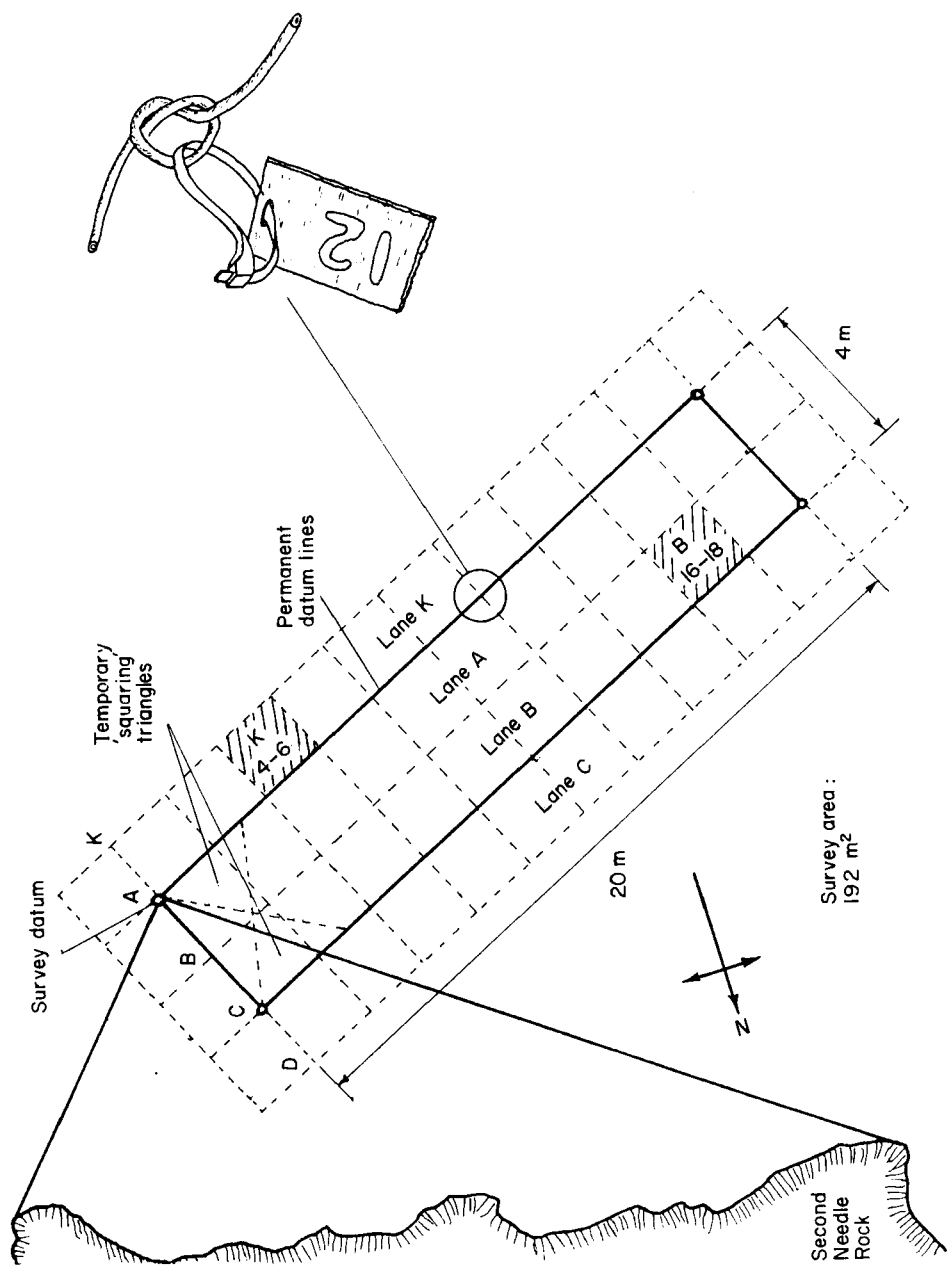


Figure 7. A. Method of survey; B. identification key.

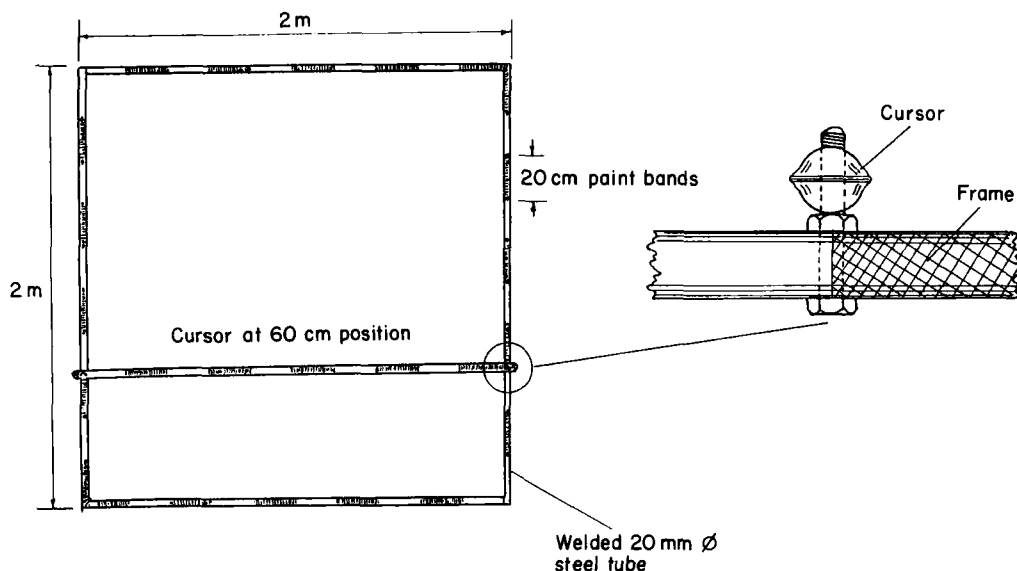


Figure 8. Portable grid and cursor.

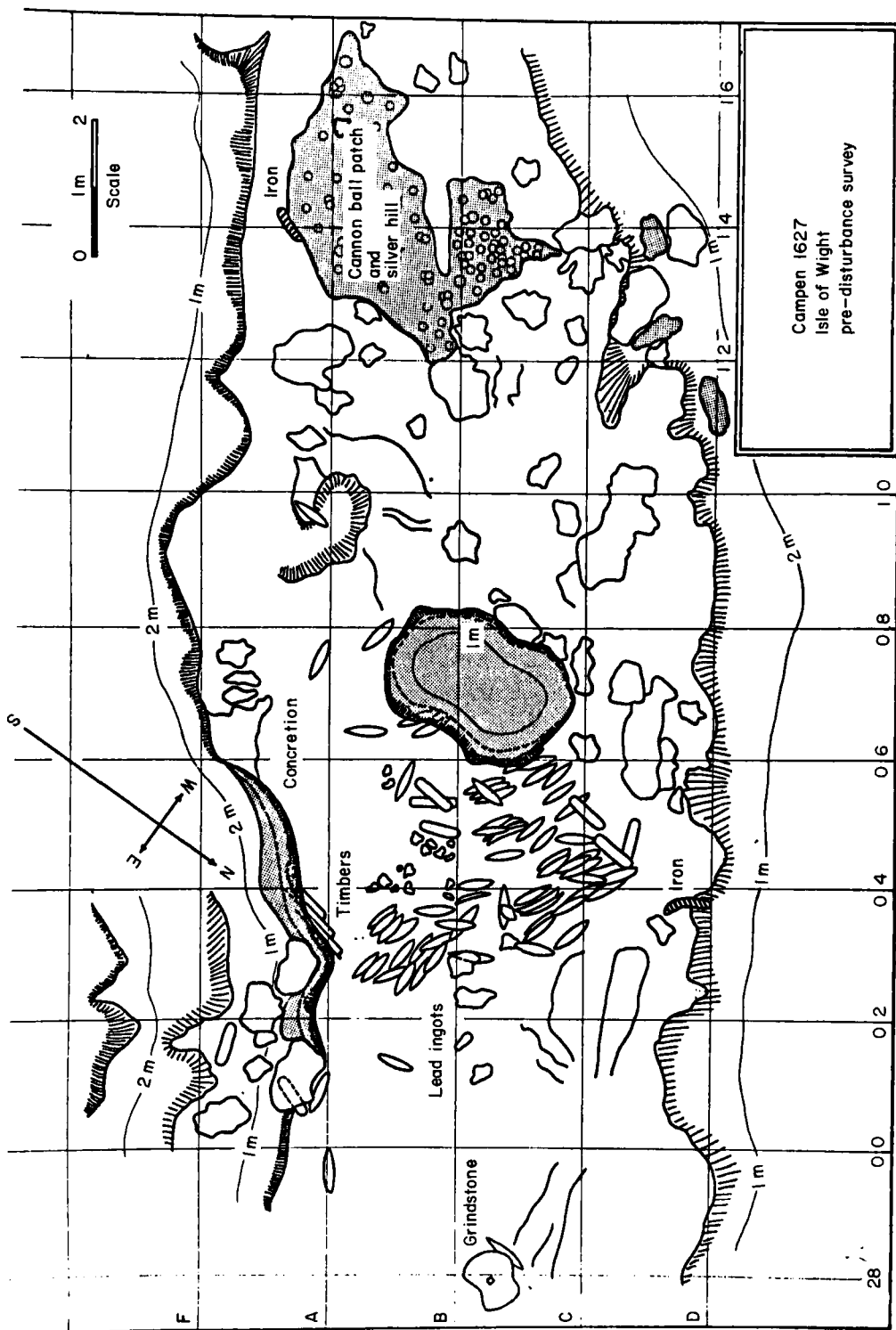
Fortunately the lie of the site was such that no large features obscured 'line-of-sight' between datum points. However, some kelp required cutting, and a few small loose rocks had to be moved to enable the lines to lie unhindered. The rectangle was then made permanent by driving in anchor bolts at the three remaining temporarily secured corners. The two 20 m lines were marked at 2 m intervals by durable numbered tags. These tags, made of nylon webbing and numbered using white silicon rubber sealant, were secured to an overhand knot by a self-locking, plastic, electrical cable tie (Fig. 7). The tags on the two lines were coloured differently to ease identification in poor visibility.

Having accurately lineated the wreck site, detailed sketching began aided by a 2 m square template. The design of the template allowed a 2 x 2 m square to be subdivided into 20 x 20 cm squares, i.e. a grid. The features in each 20 cm square could then be sketched onto a similarly subdivided plastic drafting sheet by the diver. The square template was constructed from 20 mm conduit, welded for rigidity. A fixed interval cursor could be positioned on the square from 20 cm to 180 cm in 20 cm steps. Both cursor and frame were painted in alternating black and white 20 cm bands (Fig. 8).

Each square in the survey was given a unique reference number, e.g. K4-6. To survey this square the template would have been placed south and adjacent to line 'A' between markers 4-6 (Fig. 7). This information was noted on the diver's survey sheet prior to diving. The average time taken to sketch one square of the pre-disturbance survey was approximately 35 min. Most divers could complete 2 squares per dive. The shallow depth, less than 5 m, meant there were no decompression limits to restrict the time spent underwater. The majority of elevations were measured using the 2 m detachable cursor. Away from the site the underwater sketches were transposed onto a master survey drawing (Fig. 9).

Assessment of survey

The original plan was adhered to and proved to be successful, with only a few minor modifications to the tags and template. All the special survey equipment was made by members of the group, and proved sufficiently durable for one season on site. The cost of the survey materials was not excessive and well within budget. By far the most expensive single item was the 'Glo-line' (costing £40), the remaining items totalling less than £30. As predicted, the survey was carried



out in visibility as low as $\frac{1}{2}$ m, though this considerably extended the time taken to complete a square. Visibility of 2 m or more was found to be ideal as long as the surface swell was less than $\frac{1}{2}$ m. Overall positional accuracy was estimated to be better than ± 50 mm which was considered acceptable for the well broken and distributed remains of the *Campen*. (No part of the ship's structure has yet been positively identified.) The surprising simplicity of the technique allowed the pre-disturbance survey to be completed in an underwater time of 38 man h. Thorough planning and surface preparation minimized the more valuable time spent submerged. The datum points first secured have since been reused over four seasons. This has enabled rapid installation of new datum lines as necessary. The lines proved strong enough to withstand summer storm conditions but not those of winter, nor the careless weighing of anchors on boats departing from the site, which resulted in several broken lines. This survey technique would not have been acceptable had the site been deeply fissured or very uneven, since 'line-of-sight' between datum points would have been difficult to establish.

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Artefacts

Distribution

The *Campen* lies in a broad shallow gully with an undulating seabed of rocky nature strewn with small boulders, and until recently, a profusion of heavy lead ingots (Fig. 9). The inshore section of the site to the northeast abutting the central pillar of the Needles rocks is in extremely shallow water (6 m), and the exposed position and orientation of the gully render the wreck site completely vulnerable to the full forces of the prevailing southerly winds throughout the year. These circumstances cause a constant scouring of the seabed which has resulted in a high dispersal and erosion factor relating to artefacts. The *Campen* has also been heavily salvaged, and the overall situation is compounded by intrusive surface material which has migrated from two other shipwrecks of different periods wrecked nearby. As a direct consequence of these various factors the yield

of artefacts has been disappointingly low, in proportion to the estimated size of the ship and cargo, and the considerable amount of progressive excavation undertaken. The few artefacts recovered are badly fragmented and eroded making identification difficult. Careful recording has produced little evidence of a coherent pattern of distribution related to the layout of a ship, and limited credence can be placed on the interrelationship of artefacts except where retained in deep concretion. The most that can be said at this stage about distribution is that the highest incidence of domestic and culinary origin occurs in the very general area below the sloping rock ridge containing the eastern perimeter of the site (Fig. 9). Two other features are worthy of note; a central mound of concretion yielding hundreds of nails, and a large wide patch of iron shot bearing concretion to the south.

The ship

A few fragmented ship's timbers were found buried in concretion under the ridge to the north-east of the site (Fig. 9). Of the several pieces located, the longest (0.78 m) retained two protruding wooden trenails (0.028 m diameter) placed 0.21 m apart. Both were too badly disintegrated or worn to establish an architectural origin. Small sections of thin deal planking (0.01 m thick) were also found in association with short tufts of animal hair and could be part of hull sheathing. Matted horsehair was present beneath thin deal planking of similar thickness on the hull of the *Dartmouth* (Martin, 1978: 49). According to Witsen where a ship was sheathed (*verdubbeld*), a layer of tarred cow hair covered the outside of the hull below the waterline. Thin planks of wood were laid over this, and then grey paper covered with *harpais* (resin), which was all nailed onto the hull with numerous large-headed nails (*verdubbelen nagels*) (Witsen, 1690). A quantity of eroded and crumpled lead sheet found was insufficient to suggest sheathing in this material, although pierced by fixing holes. This could have been from isolated patching, lining of the bread room or merely lead carried as stock for remelting and general use on board.

Ship's armament

Despite a great deal of research very little information has been found about the build of the

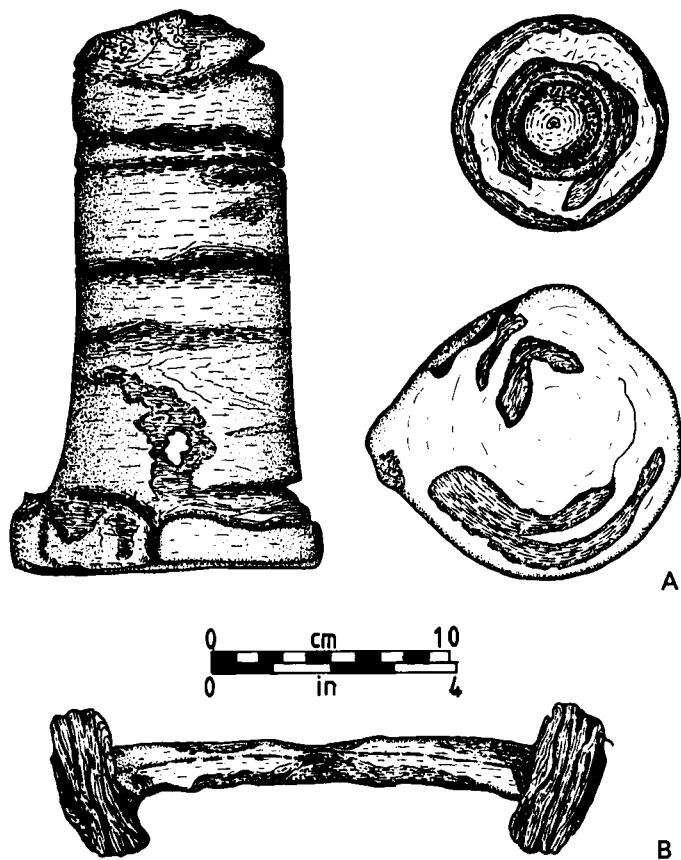


Figure 10. A. Iron chamber pot from a breech-loading gun; B. iron bar-shot.

Campan, her tonnage or main armament. A vague VOC rule of 1630 stated that all outgoing ships of the larger size should carry 32 guns, of which 24 were to be iron, 6 brass, and 2 minions, either of brass or iron; whereas smaller ships would carry 20 iron guns and four brass guns (Sténuit, 1974: 224). Reports of the wreck say she had a crew of 160 men and some passengers. Contemporary accounts relating to salvage work by Jacob Johnson refer to the recovery of, first, three and then a total of five cannon, without giving sizes or weights. It is apparent from the value of the *Campan*'s cargo, the number of her crew and passengers, that five guns would have formed a very small part of her total complement of guns. Despite this fact only one item of her heavier ordnance was found.

A wrought-iron chamber pot from a breech-loading gun was located in a bed of concretion off the northeast of the main site (Fig. 10A). The long breech block (0.288 m) has the projecting stump of a broken handle at the rear, whilst the bore was packed with hard congealed gunpowder and closed with a hardwood plug, wedging a thinner circular seal of soft wood against the wall of the chase. A touch hole cannot be seen and may be plugged or obscured by corrosion, since the wrought iron has in places badly deteriorated. The forward neck of the breech block which enters the stepped recess in the rear of the missing cannon has a diameter of 0.063 m. The bore diameter of the chamber is 0.04 m, and it has two small opposing longitudinal seams at top and bottom, suggesting

that the cylindrical bore was formed by forging two long half-round bars together, and then built up by forging round successive layers of wrought iron. The small bore is compatible with that of a breech-loading swivel-mounted wall piece of the period.

Ammunition—main armament

Throughout the site small numbers of iron shot of different calibres were located together with a

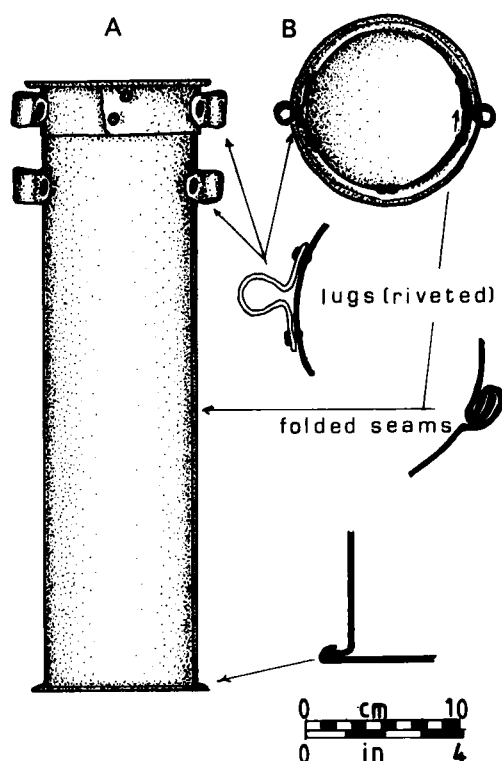


Figure 11. Copper cartridge case.

few squashed and fragmented copper cartridge cases and lids. The construction of one such case with a copper body, lid and brass base is illustrated (Fig. 11). The early 17th-century mariner Captain John Smith comments on the use of cartridge cases. 'They also have cartrages or rather cases for cartrages, made of latten to keepe the cartrages in, which is to have no more powder in them than just the charge of your peece; and they are closely covereded in these cases of latten to keepe them dry and from any mischance by fire, and are farrer more ready and safer than your ladles or budgebarrels' (Smith 1627: 85). Similar cases have been found on later Dutch East Indiamen, some of which have been marked with specific weight on the lids. The *Campen* specimen carries no such mark.

To the south of the site an extensive mound of concretion contained large numbers of round iron shot in two basic sizes together with one wrought-iron bar shot (Fig. 10B). A cross-section of the iron shot was sampled and sizes are listed in the tables below. The internal measurements of the cartridge cases are also shown with estimated adjustments to allow for the comfortable replacement of a cartridge. These measurements compared with the published scales of ammunition engraved on the gunner's tallystick from the *Batavia*, allow us to estimate the size of the guns she was carrying (Green, 1977: 285; McGrail, 1974: 157–60). The *Batavia* scale measurements were also confirmed in some instances by recovery of corresponding shot gauges. The weights shown in Table 1 are the Amsterdam *pondt* (0.494 gm).

Ammunition—small arms

The range of small shot found is diverse and

Table 1. *Weights and measurements of the iron shot found from the Campen*

Description	No. in sample	Diameter (m)	<i>Batavia</i> tallystick	
			Weight	Diameter (m)
Iron breech block	1	0.04	1 pondt	0.0495
Iron round shot	6	0.069/0.072	3 pondt	0.0705
Iron round shot	10	0.082/0.083	5 pondt	0.0838
Iron bar shot	1	0.082	5 pondt	0.0838
Copper cartridge case	1	0.095/adj. 0.089	6 pondt	0.089
Copper cartridge case	1	0.105/adj. 0.100	8 pondt	0.100

diameters and weights are not clearly compatible with contemporary research so far undertaken. This is probably due to the lack of standardization at the time and the crude methods of casting lead shot by the use of wooden moulds. Several of the latter for 16 mm shot, a size found on the *Campen*, were recovered from the wreck of the *Vergulde Draeck* (Green, 1977: 265, 266). These were appropriate to a caliver, a shorter lighter weapon than the musket more suitable for the confined spaces at sea (McBride, 1976: 198).

According to Van Dam (1701) it was resolved in 1659 that the old normal musket ball of 14 to the Amsterdam pound ($18.1 \text{ mm} \times 35.38 \text{ g}$) was to become 16 to the pound ($17.3 \text{ mm} \times 30.87 \text{ g}$),

Table 2. *Weights and measurements of the lead shot found from the Campen*

Diameter (m)	Weight (g)	No. of shot to Amsterdam pondt (0.494 g)	Identification
0.0138	14.7	34	Pistol
0.0142	16.1	31	
0.0143	16.6	30	
0.0153	21.2	23	Caliver
0.0154	21.8	23	
0.0155	22.0	22	
0.0166	24.1	20	?
0.017	27.7	18	Musket ?
0.017	27.5	18	
Squashed	38.1	13	?

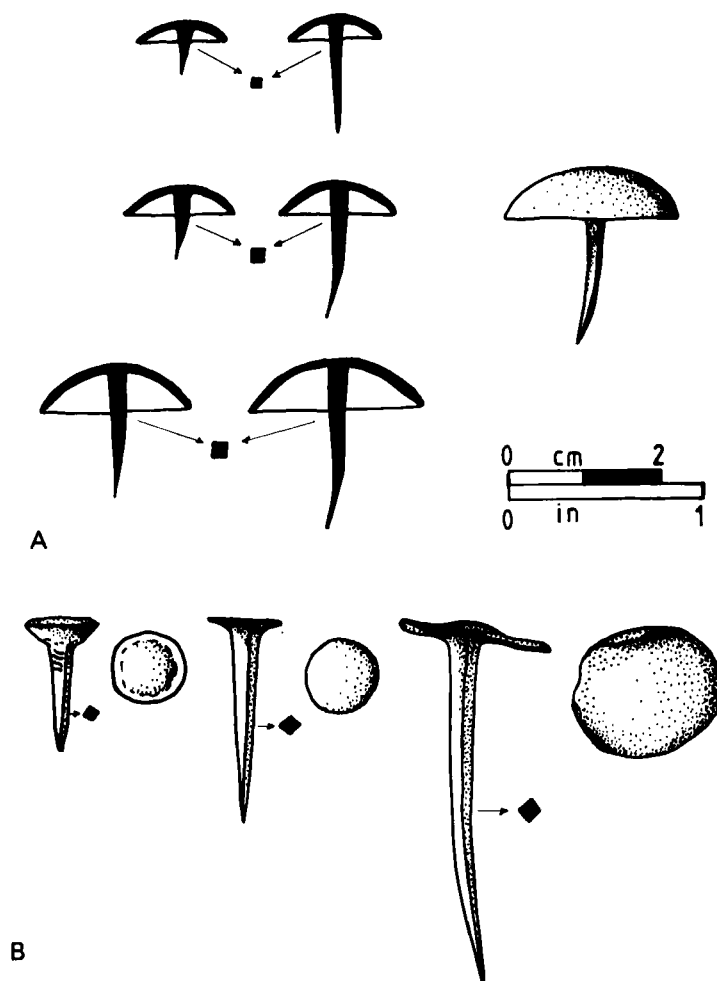


Figure 12. A. Brass upholstery tacks; B. copper tacks.

but the *Campen* balls of 17 mm are nearer to the new specification than the old. Kist (1974) states that the bore of a caliver was 15.9 mm (compatible with *Campen* size), and that of the musket was 18.6 mm (not compatible with the *Campen*).

Table 2 lists the sizes and weights of lead shot recovered, the number of each to the Amsterdam pound and a tentative identification.

Ship's fittings

Brass and copper tacks Numbers of brass dome headed tacks in various sizes (0.007 to 0.022 m) were obtained from scattered locations (Fig. 12A). From their design they are upholstery tacks, cast in one piece, and similar to those still in use on modern leather upholstery. A range of copper tacks of two differing types (0.017 to 0.047 m) were found in similar circumstances (Fig. 12B). Both brass and copper varieties do not appear abundant enough to be cargo and some of each were badly corroded beneath the head. The latter are likely to have been inserted in ship's fittings, whilst the majority were probably carpenter's stores.

Domestic artefacts

Pottery This group of artefacts is by nature

the most vulnerable to erosion and movement. Those sherds found have been mostly in fine pieces making positive identification and commentary difficult. Intrusive material has been eliminated as far as possible leaving only a small handful of items to be considered.

(a) **Coarse ware** The largest sherds are from large heavy gauge storage jars with heavy rounded rims in hard well-fired grey/terracotta brown fabric (Fig. 13A). The grey surface texture is probably derived from its past marine environment. These would appear to be similar to sherds from the *Batavia* site identified as Sawankhalok ware (Stanbury, 1979, Bat. 2562, 609, 545).

(b) **Salt glazed stone ware** A rim sherd from a small jug or jar with greenish grey salt glaze finish. A small piece of handle may be seen (Fig. 13B). A second sherd from another vessel similar in design, with the same base colours, but with fine crazing probably caused by oxidization during firing.

(c) **Tin glazed materials** A small blue and white sherd with a slight curve (Fig. 14A) appears very similar in design and shape to the necks of blue Majolica drug jars found on the *Batavia* (Stanbury, 1974, Bat. 2326, 2318). A small blue and white sherd is probably from a Delftware dish (Fig. 14B). A Delftware jug with

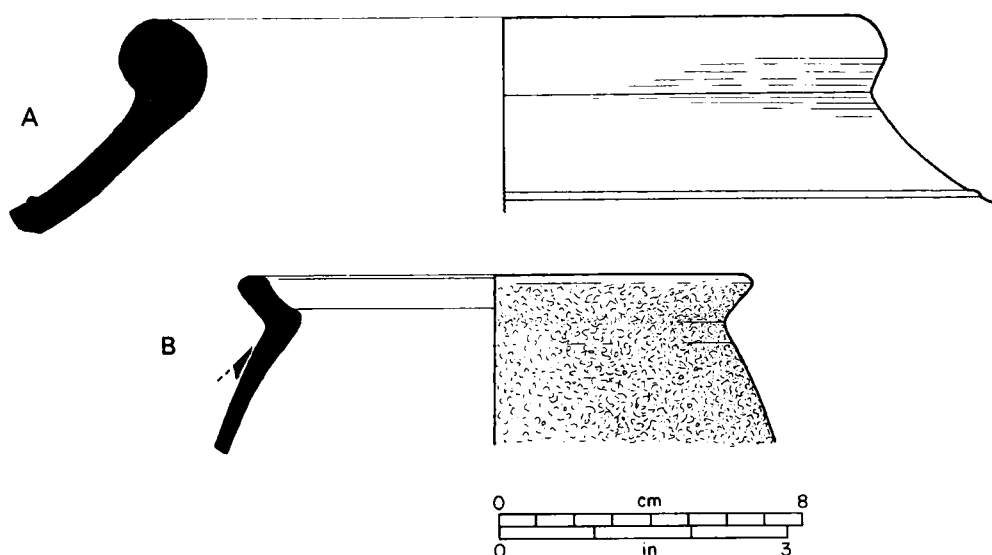


Figure 13. A. Storage jar; B. salt glazed jar.

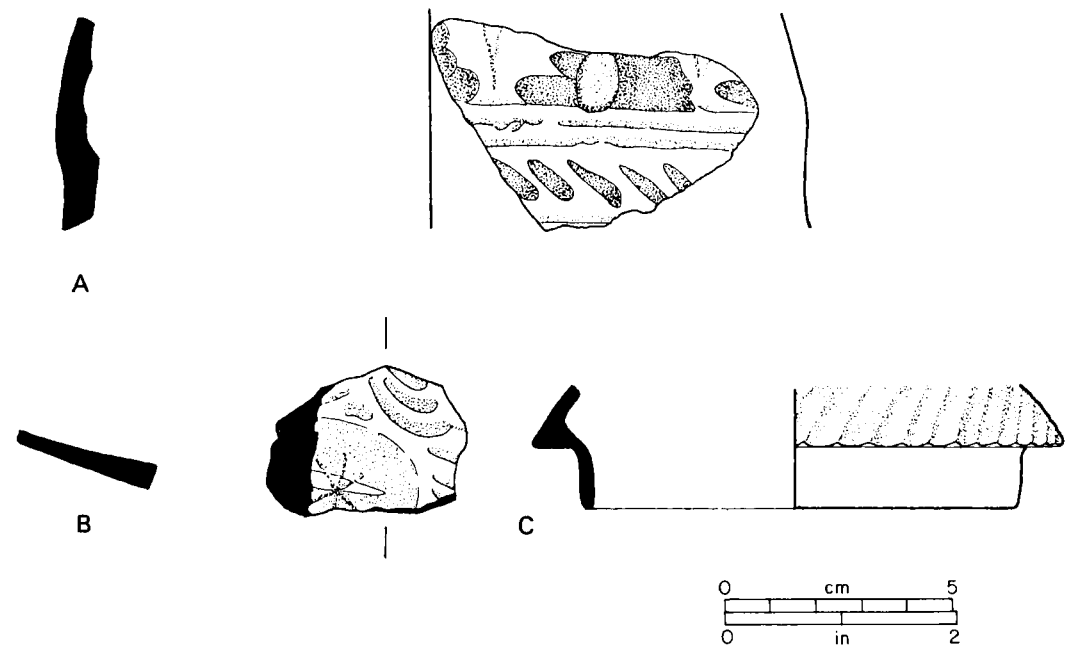


Figure 14. Sherds of A, B, blue and white tin-glazed ware; C, white porcelain.

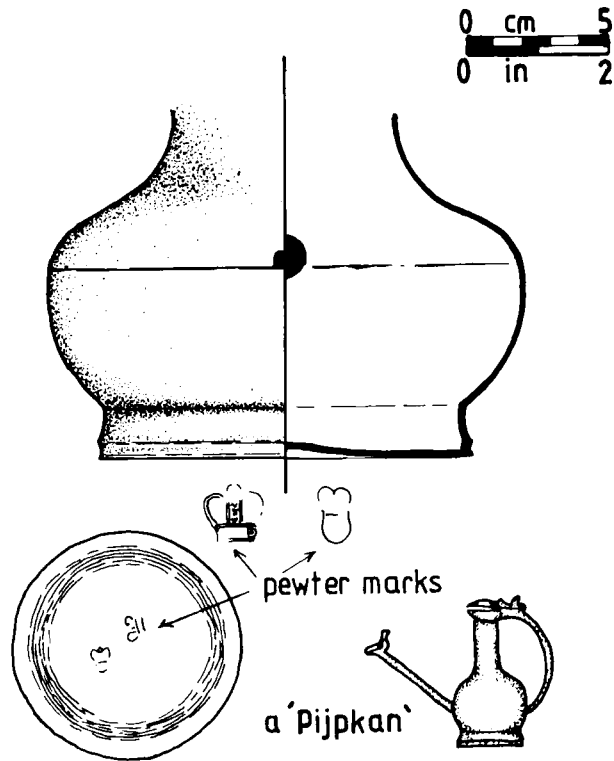


Figure 15. Pewter jug.

a somewhat similar pattern was found on the *Batavia* (Stanbury, 1974, Bat. 2555).

(d) *Porcelain* A fragment from a scalloped decorative porcelain lid in a hard white finish (Fig. 14C).

Glass ware Several eroded fragments of thick green bottle glass were raised, but without any identifiable shape worthy of illustration. A very small section of the base rim of a delicate fine clear wine glass with a skilfully created edge fold enveloping decorative mother of pearl was also recovered.

Pewter jug The most significant pewter item

was a large round container with two small opposing orifices placed in the centre of the wide belly. This is clearly the body of a pewter *pijpkan* (pipe jug). The hinged lid, handle and long spout, terminating in a small hinged cover, have been torn off and are missing (Fig. 15). These vessels were common in the early 17th-century and by the 19th century were popularly referred to as 'Jan Steen' jugs from the illustrations in the 17th-century painter's work. They were also described in contemporary terms as *wijnkan met pijp* (wine can with pipe) (Dubbe, 1979; 343). Similar jugs were recovered

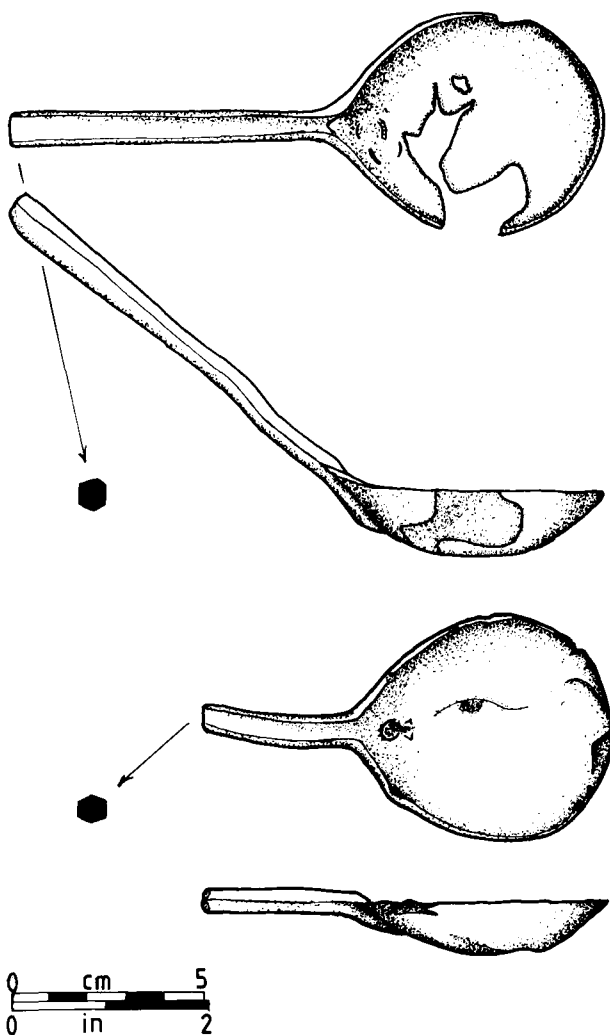


Figure 16. Pewter spoons.

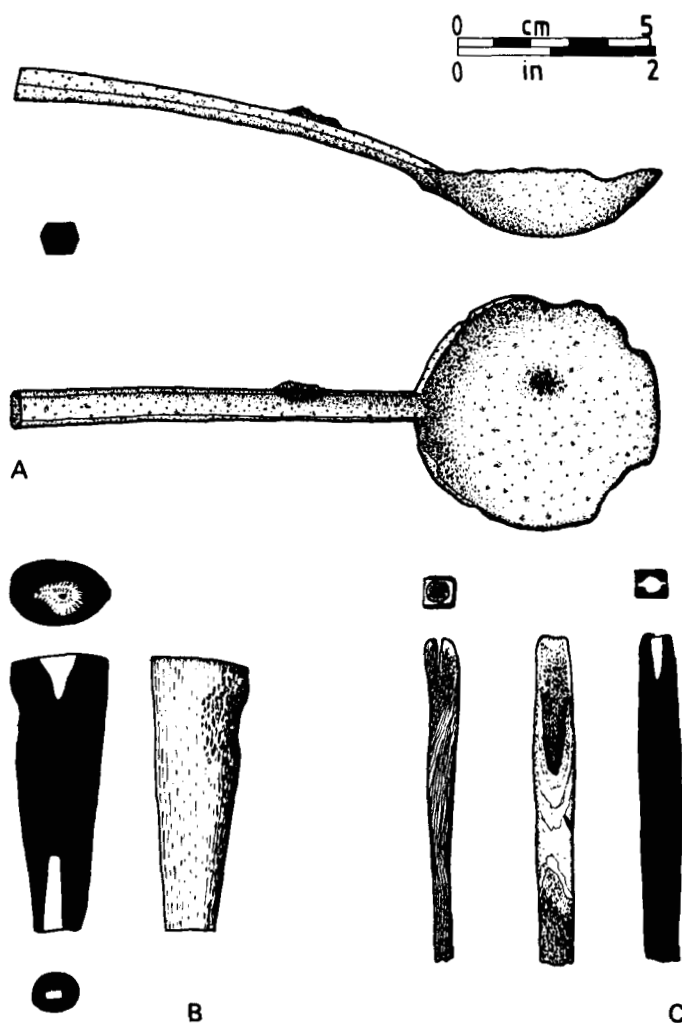


Figure 17. Pewter spoons and horn and ivory knife handles.

from the *Batavia* (Stanbury, 1979, Bat. 3004) and were initially catalogued as coffee pots. It is not known whether this alternative identification has been confirmed. The base of the vessel carries two badly eroded touch marks, both crowned, one almost certainly the mark of an Amsterdam pewterer with a surname initial 'D'. The other is likely to have been the quality mark of a crowned Tudor rose.^[7]

Pewter spoons Four damaged pewter spoons and several fragmented handles were excavated, some in an area adjacent to the *pijkan* and the bulk of the culinary artefacts (Figs 16, 17A).

These were of two basic designs typical of those recovered in increasing numbers from 17th and 18th Dutch shipwrecks. One spoon bore the worn touch mark of a crowned Tudor rose in the rear of the bowl, but the initials of the pewterer were not legible. Spoons with similar marks were recovered from the *Batavia* (Stanbury, 1979, Bat. 3073, 3200, 3111, 7092) and the *Vergulde Draeck* (Green, 1977: 217–20). Similar marks were also noted on a pewter plate found on the *Santo Christo de Castello*, a ship built in Amsterdam in 1666 (Larn *et al.*, 1974: 78)^[7]. The spoons were for the use of officers

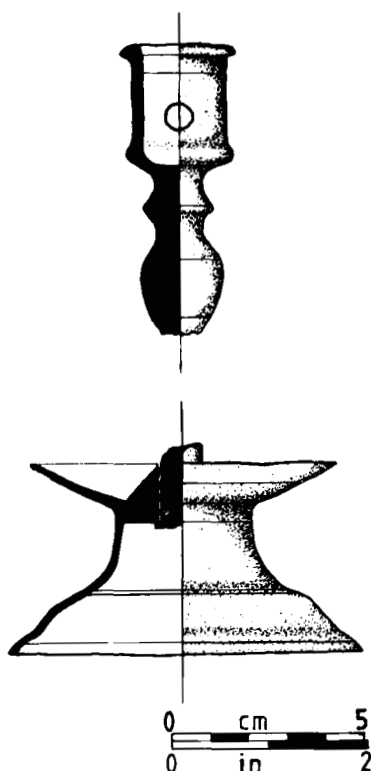


Figure 18. Brass candlestick.

and important passengers, for as late as 1656 wooden spoons were still being provided in large numbers for the crew. A mess for a retour ship of 250 men was allowed 400 wooden spoons (K.A. 187).

Horn and ivory handles Two handles were recovered; the first, a knife handle made from a section of tapering reindeer horn with a small natural recess in the base, the other end drilled to accept the tang of a blade (Fig. 17B). The other handle is of ivory, long (0.084 m), narrow and of a more delicate nature, with a double curve in its length (Fig. 17C). The diameter of the tang hole is also fine and would retain a slender instrument. The likely origin is a barber-surgeon's chest.

Brass candlestick Two sections of a brass candlestick were located a short distance apart. From their dimensions and design they were probably related and components of the same item (Fig. 18). The upper portion comprises a stem and a candle bowl pierced by opposing holes for wax removal, characteristic of Dutch work of the period (Larn *et al.*, 1974: 74). The bottom portion has a wide base, short wide hollow stem and saucer-shaped wax tray reinforced by a conical centre piece designed to support the upper stem. The lower part of the latter

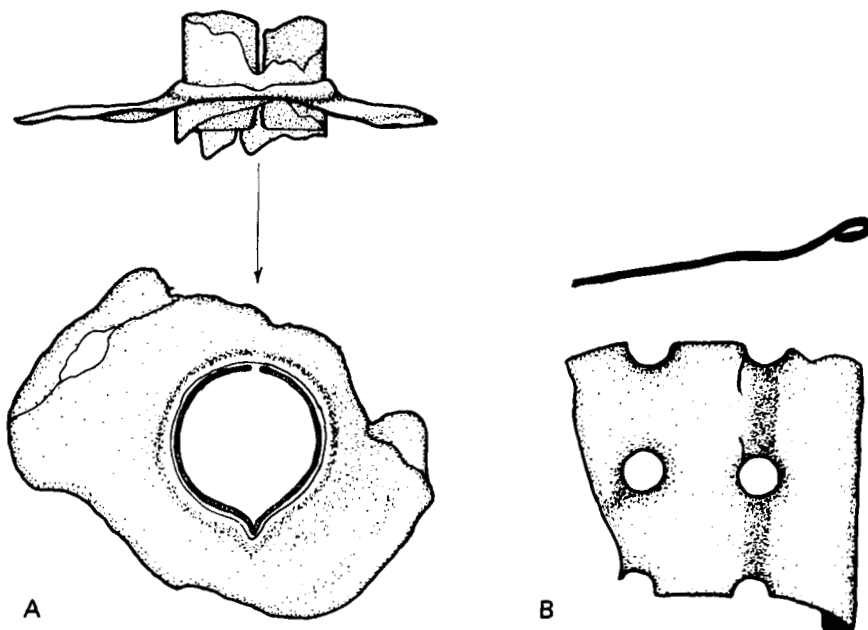


Figure 19. A. Copper candleholder; B. scoop/strainer.

passes through the centre and is riveted to the underside of the base. The base and wax tray are moulded in one piece, and this type of candlestick comprised two separate basic mouldings. A similar candlestick of this construction was found on the *Batavia* (Stanbury, 1974: Bat. 3397), but there are slight variations in the upper patterns. It is interesting to note that 36 brass candlesticks were raised from the *Vergulde Draeck*, each of which had a separate wax tray and comprised four basic mouldings. The lower stems in these cases were of a narrow solid construction (Green, 1977: 190–1).

Copper candleholders The centre section of a sheet copper utilitarian candleholder has an interesting construction worthy of consideration (Fig. 19A). The commonest method of attaching the copper tube to the handled wax tray, was by dividing the bottom section of the tube into three separate tabs, which were bent at right angles to the tube and riveted to the tray. A candleholder of this design was recovered from the *Vergulde Draeck* and they are widely illustrated in contemporary Dutch paintings (Green, 1977: 186). The holder from the *Campan* is different. In this instance a special mounting has been formed by piercing the wax tray centrally and skilfully folding the edges of the hole downwards below the tray. The internal edge forms a perfect cylinder except for a small recess in the perimeter. A second component, a cylindrical holder, fits into the mounting, where a small protrusion in the wall mates with the recess, preventing rotation. The natural spring of the metal retains the tube in position, but it is instantly removable for the replacement of the candle.

Copper scoop strainer A piece of copper sheet with a turned edge and symmetrical pattern of holes could be part of a culinary scoop/strainer with a folded edge (Fig. 19B). An example of a similar scoop/strainer in brass can be found in the *Batavia* finds (Stanbury, 1979: Bat. 3816).

Brass escutcheon plate An oval plate of thin sheet brass with faint eroded surface etchings could well be an escutcheon plate (Fig. 20A).

Brass rings Two small brass rings, one thick (0.020 m), the other much thinner (0.018 m) and badly eroded were excavated (Fig. 20B, C). The items could be functional, or merely cheap finger rings.

Brass needles and pins The shank of a brass

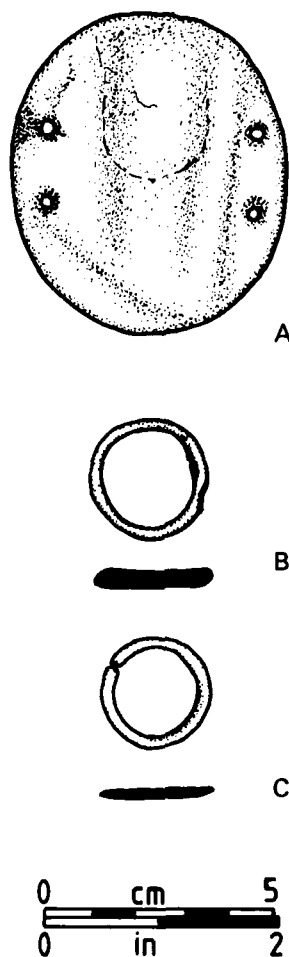


Figure 20. Brass escutcheon plate and rings.

needle, broken off just below the eye, has faint seams showing its construction (Fig. 21A). Thin brass latten had been folded and shaped to create an eye in the thick upper end, and the shank had been formed by beating the latten to a fine tapering point. A pin with a spiral wound head is similar to those recovered from the Mullion Pin Wreck (Fig. 21B) (McBride, 1972: 138).

Brass ornamental item Two thin brass artefacts with a convex design, the upper part heart shaped, were found (Fig. 21C). They were pierced at the top centrally for fitting or hanging. Identical items were found on the *Batavia*

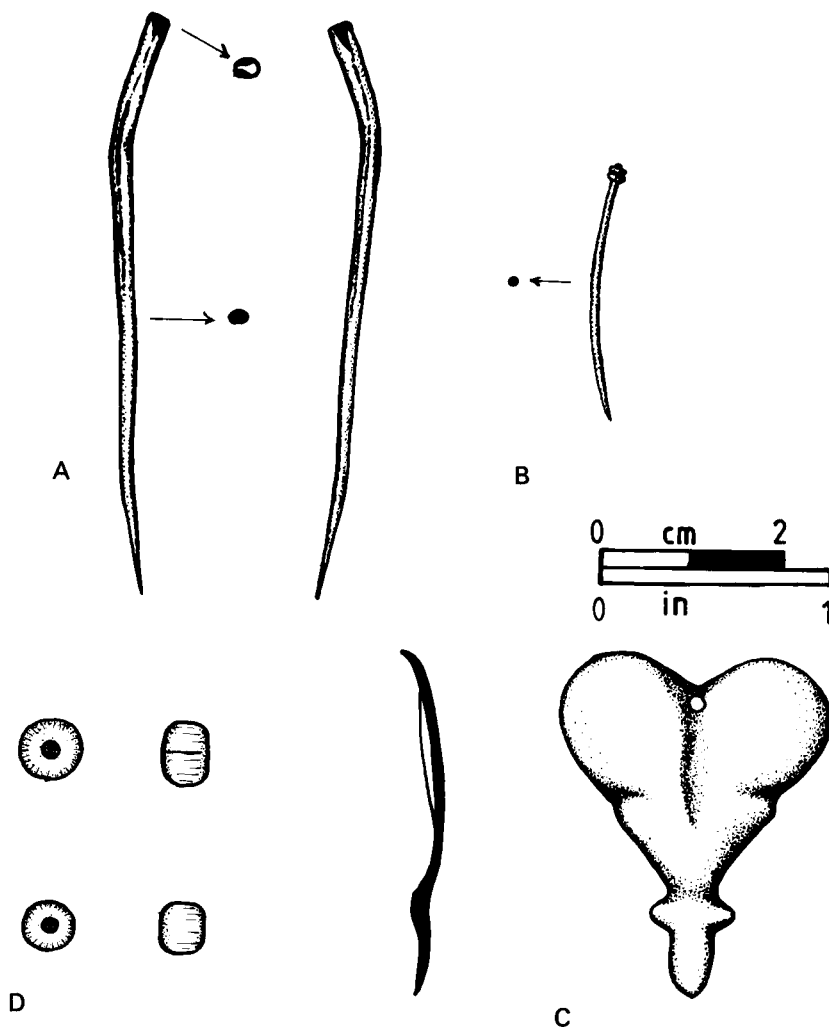


Figure 21. A, B, C, Brass needles, pin and ornament; D, glass beads.

and were described as hasps (Stanbury, 1974, Bat. 3240; 1979, Bat. 3711).

Lead inkpot A very heavy plain lead container (0.09 m × 0.83 kg) with a wide square base tapering to narrow shoulders and mounted by a threaded central pewter neck is particularly interesting (Fig. 22).

The identification of this item was facilitated by damage to one side which had torn open the lead allowing the interior to be viewed. A deeply worn pit in the centre of the upper base surface directly below the pewter neck had been dug by the constant dipping and erosion of pens. So deep had the lead been penetrated that at one

stage the vessel had leaked and the underneath of the base had been crudely repaired with thin lead solder. A threaded pewter cap surmounted by a small lug retaining a pewter ring was found nearby. From the design, size and texture of the pewter it was almost certainly related to the pot, and has been included in the illustration. Lead inkpots were a common item in use on board ships at this time. The wide heavy base of the *Campen* inkpot would have provided the stability needed on a pitching vessel and the cap would have prevented spillage when not in use. **Pewter caps** In addition to the pewter cap previously mentioned three other caps of a

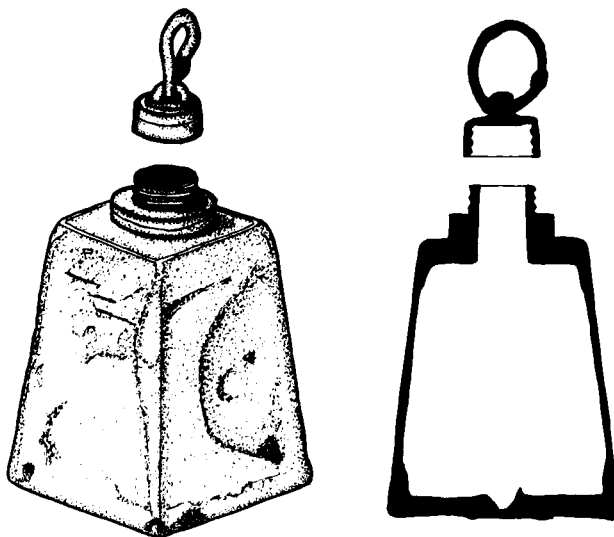


Figure 22. Lead inkpot.

somewhat similar design were located, two rather badly damaged, the third has been illustrated (Fig. 24A). This type of cap has been found on many other 17th century wrecks mainly in relation to glass bottles. It is apparent that they were used on a wide variety of containers made from different materials. An assortment of small caps, some with rings attached, was among the *Batavia* finds (Stanbury, 1974: Bat. 3314, 3344, 3421).

Wood and iron oven spades The blades of two narrow spade-shaped implements with skilfully tapered and hollowed palms were recovered, both with handles broken above the shoulders and missing (Fig. 23). From the pattern of the fixing holes, oxidized ferrous accretion and surface scouring of the timber, it is clear that the curved blades were sandwiched in carefully shaped wrought-iron sheet riveted through the timber blade. The items are too small and narrow for conventional spades. Although yet to be confirmed, they are probably spades with protected blades to feed a bread oven.

Personal belongings and miscellaneous material

Glass beads Two small glass beads of azure blue glass were excavated. They are of different diameter but from the same string. A minute piece of gold is embedded in the eye of one (Fig. 21D).

Leather straps and brass buckles Four identical brass buckles with tapering 2-ply leather straps were found in close association (Fig. 24B). The straps are not pierced by adjustment holes and the buckles have no fixing pins. Each strap is made of 2-ply sandwiched leather riveted with copper fixings, whilst the tail is riveted to the centre bar of the buckle. The only means of fastening the strap is by passing the wide 'T' end sideways through the buckle where small punched recesses in either side of the tongue gently retain it. By the design they would appear to be some form of quick-release strap, possibly of a military nature.

Clay pipes A single clay pipe with a broken stem carries no decoration or maker's mark (Fig. 24C). Although very limited conclusions can be drawn from one specimen, the basic measurements are of value when compared with those of pipes recovered from Dutch East Indiamen wrecked some 25 years later. Specimens from the *Lastrager* 1653 (Sténuit, 1974: 236) and the *Vergulde Draeck* were compared by Green (Green, 1977: 152–68) using Freiderich's method of dating (Freiderich, 1975). This method is based on the height H, the breadth B, and the bowl opening O, the product $H \times B \times O$ in mm^3 being plotted against the date in relation to a number of basic designs.

In Table 3 the average dimensions of the six

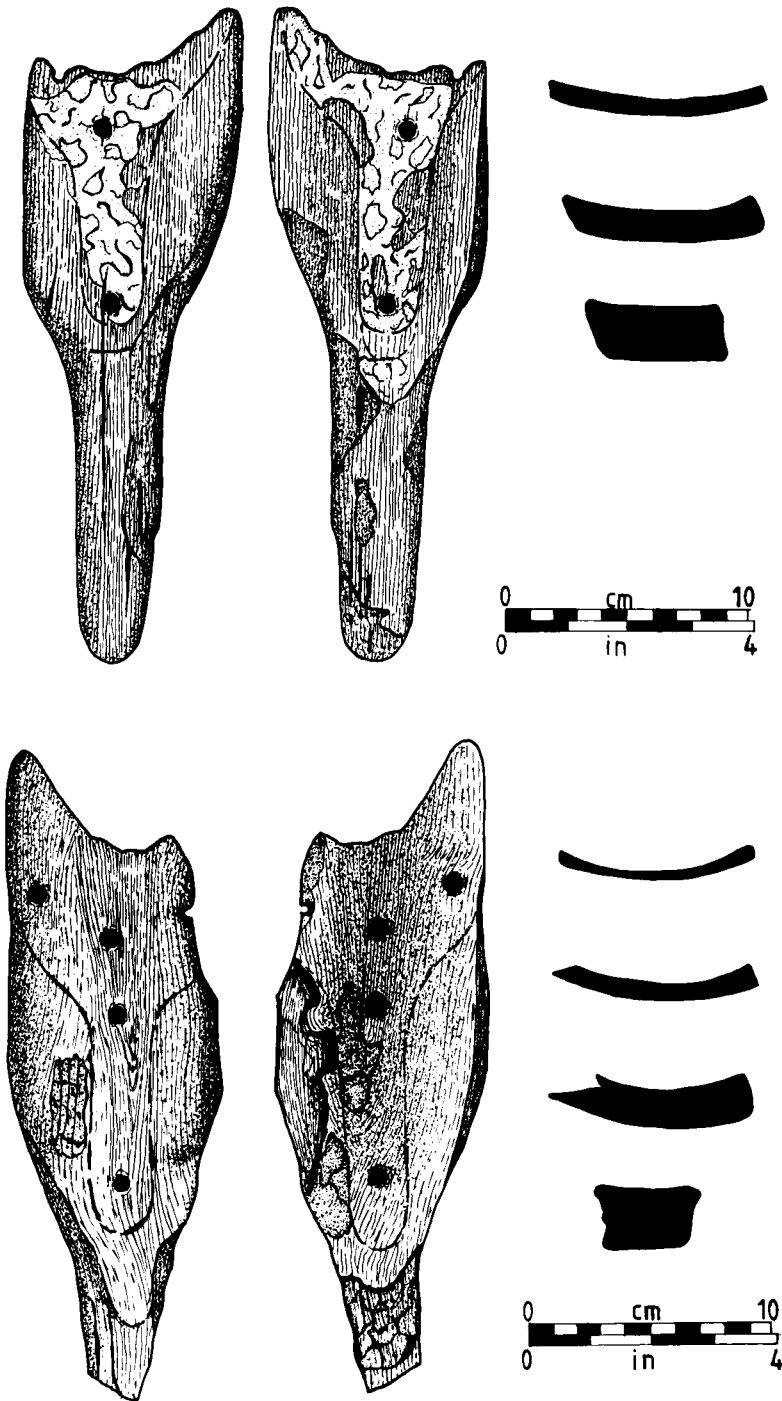


Figure 23. Wood and iron spades.

Table 3. Average dimensions of clay pipes found from the *Vergulde Draeck*, *Lastrager* and *Campen*

Ship	Date	No. of specimens	Height H (mm)	Breadth B (mm)	Opening O (mm)	Bore	H × B × O (mm ³)	Mean date
<i>Vergulde Draeck</i>	1656	6	36.5	18.5	12		8103	1644
<i>Lastrager</i>	1653	9	35.5	18.4	11.7		7642	1645
<i>Campen</i>	1627	1	29	16.5	10	3 mm	4785	?

fully recorded specimens from the *Vergulde Draeck* and the nine specimens from the *Lastrager* are compared with those of the *Campen* pipe.

No attempt has been made to date the *Campen* pipe from Freiderich's tables, but datings of pipes from other wrecks are 10 years earlier than the date of actual wrecking. Table 3 shows the principal difference is in the height, reducing the volume considerably in marked contrast to the later pipes. The difference is not visually apparent in design except for a much sharper spur.

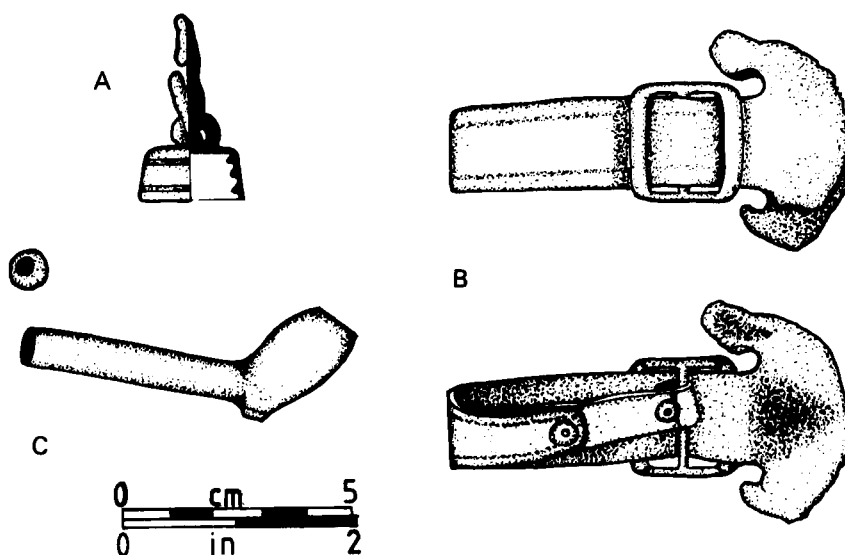
Ship's provisions

A variety of animal bones, some of which were found in relation to pieces of barrel staves, have been recovered. These include large bones from

cow and pig, a few small chicken bones, and several fish vertebrae from a large species of stockfish. It is apparent that these were from the ship's provisions stored in barrels. A small piece of coal was probably part of the galley fuel.

Cargo

Iron nails The most prominent feature of the site plotted during the predisturbance survey was a large prominent mass of concretion, rock and lead ingots in the centre of the gully (Fig. 9). Excavation of this mound revealed hundreds of hand-forged wrought-iron nails in an extensive range of different sizes, and large masses of black matrix retaining the hollow shapes of many hundreds more which had been almost completely corroded away. In amongst this conglomerate were small pieces of wood and

**Figure 24.** A. Pewter cap; B. brass buckle; C. clay pipe.

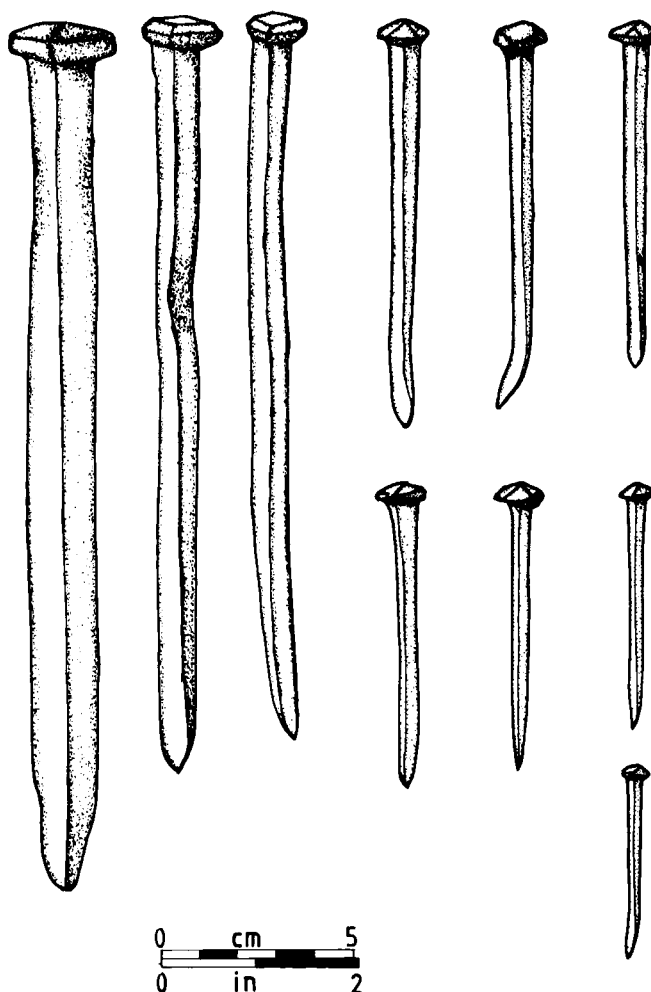


Figure 25. Iron nails.

fragments of hickory wood hoops with a half-round section (Fig. 25). Stave-built barrels with two encircling hoops at either end, containing nails, were recovered from the *Vergulde Draeck* and *Batavia* (Green, 1977: 289). Nails formed a considerable part of the heavy cargo required for the Indies annually and in the early 1630s ranged from 300 to 500 tons annually (KA 10061, 1634/1664).

Milling/grinding/pressing stone The largest item located was a thick coarse-textured circular grey stone with unequal sides ($0.175 \times 1.015 \times 0.985$ m) pierced by a central square drive hole (0.085 m) (Fig. 26). Three stones described as sandstones were recovered

from the *Vergulde Draeck* (Green, 1977: 230) and a similar one was found on the *Kennemerland* (Price & Muckleroy, 1974: 263). The latter concluded that because there was only one of these items on board it was for ship's use as a grindstone. The items would, however, appear very large and unwieldy for shipboard use, and other reports have speculated whether they were millstones carried as cargo, since there were both powder mills and sugar mills in Bantam at this time.

One other use not yet considered is vertical pressing. The *Campen* stone is thicker than the others and has a bevelled edge. During a recent visit to Jersey a large number of similar stones

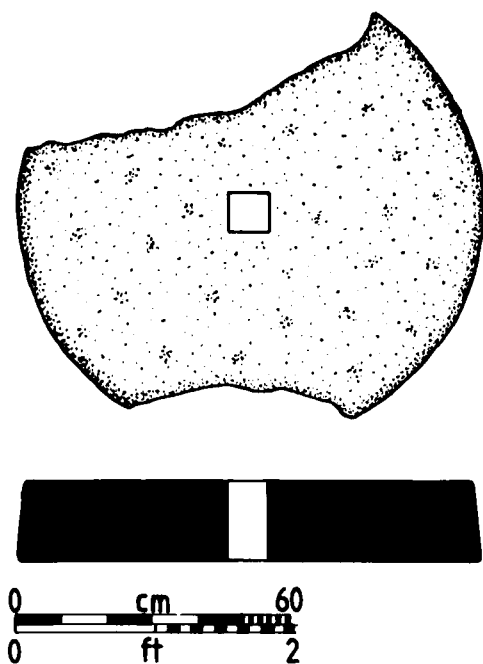


Figure 26. Milling/grinding/pressing stone.

were observed in relation to a number of dis-used and ancient fruit presses throughout the island. The stones were designed to rotate vertically around the perimeter of a circular stone trough, just wide enough to accommodate the pressing edge. The press was worked by a horse harnessed to a long drive shaft attached to a vertical pivot in the centre of the circular stone. Fruit was placed in the trough and small lipped outlets in the perimeter of the trough allowed juices to be collected. The bevelled edge of the pressing stone facilitated the circular travel of edge. The design is basic, and it is assumed that there would have been many applications for such a device in the Indies in the early 17th-century. Research is continuing with this alternative explanation in mind.

Miscellaneous material During excavation of the concretion mound in grid square BC/6-8 (Fig. 9), a 130 × 30 × 4 mm thick fragment of what appeared at first sight to be a very thin plywood was excavated. On examination, after conservation, it proved to comprise a multi-

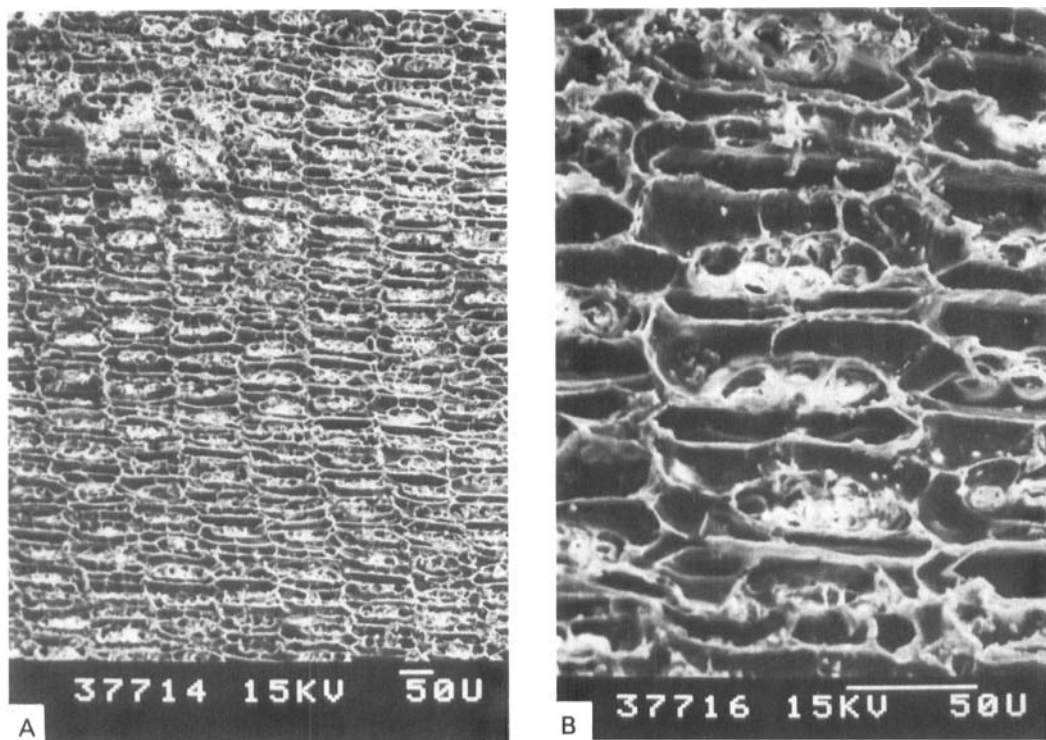


Figure 27. Sections of bark fragment: A. enlargement of grain structure; B. detail of cell structure (photo S. Reardon, Department of Horticulture, Wye College).

layered material, each layer extremely thin and very brittle with an unusual grain structure.

A section was prepared for an S.E.M., and photographs taken of different magnification (Fig. 27), which were sent to the Jodrell Laboratory, Kew Botanic Gardens, for possible identification, on the assumption it had a vegetable base. It was later identified by Dr Paula Rundall as being a fragment of bark of suggested genus *Pterocarpus*, or possibly, but less likely, *Dalbergia*. These are widespread tropical genera, and both have species which are modern commercial timbers (such as *Pterocarpus indica*, and allied species) from the East Indies. Both are hardwoods, used for quality furniture, but

ranging down to spoked wheel hubs etc. They are distributed in the Andaman Islands, Burma, and East and West Africa, where certain species known as camwoods are used as dye woods.

It is difficult to understand why the bark was found in isolation from the wood, unless it became detached in handling, in the wrecking, or was simply being carried as bark. In general, bark can be a source of tannin for leather-making, as a dye, or for medicinal purposes, or more simply as a form of packing.

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Notes

- [1] For one contemporary comment on this event, placing it in September 1627, see Oglander, Sir John, *The Oglander Memoirs*, pp. 35–6.
- [2] According to one contemporary but nevertheless mildly confusing account, Newland was very early involved with the wreck of the *Vliegende Draeck* as well, buying the rights to the stranded vessel for £300, only hours after she went aground. Luck eluded him, however, when he tried to raise her; see Oglander, *His Observations (Royalist Notebook)*, London 1888, p. 47.
- [3] Alan Roddie gives a fuller analysis and description of Jacob's variable relationship with Buckingham; see 'Jacob the Diver', pp. 253–270.
- [4] The *Vliegende Draeck* is also misnamed, as the *Drake*, in the transcription of van Ommeren's petition to the Privy Council. See C.S.P., Domestic, DXXVII, p. 250.
- [5] Roddie's account gives another incident from Newland's rather dubious career, which makes clear why Buckingham may have felt it necessary to keep an eye on him. See 'Jacob the Diver', p. 255.
- [6] Roddie considers that this must refer to a warrant issued after Jacob's petition to Buckingham concerning his Isle of Rhé expenses, filed in April 1628, though other conclusions are possible, pp. 253–270.
- [7] The craft of the pewterer was flourishing in Amsterdam at this time, partly due to the decline of Antwerp and the steady migration of craftsmen from Belgium and Germany. In 1622 out of a total population of 105 000 there were no less than 35 000 immigrants containing a high proportion of skilled craftsmen; during the 17th century no less than 83 foreign pewterers were married in Amsterdam (Dubbe, 1979: 343).

The crowned rose was the mark reserved for fine quality pewter and originated from the Tudor rose. From 1535 the best quality pewter, English, had to be marked in this fashion and was introduced in the first instance in Antwerp, spreading gradually to the Northern Netherlands. The original old fine pewter mark, the hammer and crown was replaced by the rose and crown in about 1613, and the maker's initials were incorporated in the crown or on either side of it (Dubbe, 1965; 1979: 344). The mark was used right up to the 18th century and appears on 90% of all Dutch pewter. English pewterers invariably placed their initials on either side of the crown (Larn *et al.*, 1974: 77–8).

Artefact drawings are by P. McBride

References

References cited in Part I are to be included in the references to appear at the end of Part 2 of the article.