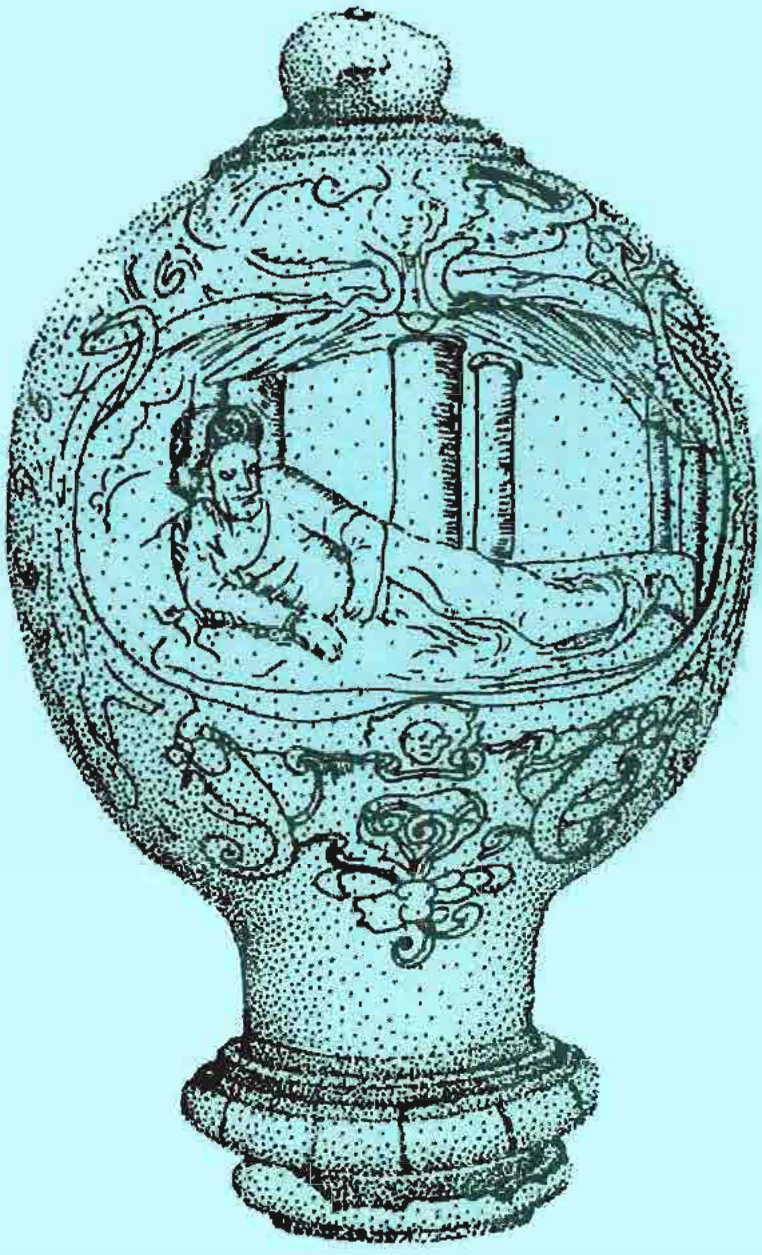
ANCODS Catalogue



Compiled by Myra Stanbury

1985

ANCODS 1985

Catalogue

Myra Stanbury

**Special Publication—Department of Maritime Archaeology,
Western Australian Maritime Museum, No. 6**

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Compiler's Note

This catalogue has been prepared for the seventh meeting of the Australian/ Netherlands Committee on Old Dutch Shipwrecks (ANCODS) to be held on September 18th, 1985 at the Western Australian Maritime Museum, Cliff Street, Fremantle, W.A.

I would particularly like to thank Elizabeth Urbanczyk and Susan Debeljakovic (currently employed under a Community Employment Programme Grant for their assistance with the drawings; also, Dr. Ian MacLeod and staff of the Conservation Laboratory for continuing to produce excellently conserved and restored artefacts; Fairlie Sawday, for helping to sort out the material; and Sue Cox and Lucy Marchesani for fitting the typing into their continually busy schedules.

Myra Stanbury
Assistant Curator
Department of Maritime
Archaeology
W.A. Maritime Museum

September, 1985

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Myra Stanbury
Assistant Curator
Department of Maritime
Archaeology
W.A. Maritime Museum

September, 1985

BATAVIA RECONSTRUCTION: PROGRESS REPORT

Submitted to the 1985 ANCODS Committee Meeting
by Paul Hundley, Research Officer, *Batavia* Reconstruction

1983

In the latter half of this year a number of timbers from the 1975 excavation season were transfered from Conservation into the *Batavia* Gallery. Among these were three transom beams and half of the transom planking. The availability of these remains for study allowed the preliminary design of the transom timber support to be undertaken. Museum staff working in conjunction with the Public Works Department were able to develop a final design for the permanent steel support to hold the timber support framework.

1984

Early in the year department staff disassembled the forward section of the hull reconstruction in order to redesign the steel timber support system. The resulting structure represents the final modification which allows each individual timber to be removed from the support without disturbing the entire reconstruction. This flexibility is necessary in order to monitor and remove any timber if the need should arise.

Work centred on the reconstruction of the transom of the *Batavia*. Nearly 10 tonnes of timber, one-third of the total weight of the timber recovered from the seabed, is located in this area. The entire assembly will be raised and fastened to four steel pillars which were erected with funds provided by a gift of $10,000 from Bunnings Bros. Pty Ltd presented by Dr Dolph Zink, Chairman of the Directors. All available transom timbers were laid out on the Gallery floor to aid in the design and fabrication of the steel support system by Senior Technical Officer, Geoff Kimpton. Allowances were made for the inclusion of timbers still in conservation.

As more timbers were removed from the dehumidification chamber, they were recorded by Photographer, Brian Richards and Technical Assistant, Rosemary Harper. After final documentation the timbers were either incorporated into the hull section currently under reconstruction or stored in the *Batavia* Gallery for future use.

During the year a new tool was employed in the reconstruction of the *Batavia* hull. A newly developed computer program for hull design and drawing of ship's lines plans was purchased, while the computer hardware to run the program was leased. This program will allow the frame shapes, measured from the timber remains, to be entered into the computer. The resulting printout is able to show both the hull shape in three-dimensional graphics and provide a numerical listing of the co-ordinates for any point on the hull. This program will greatly aid in the task of determining frame cross-sections of the ship's design and planning

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1984

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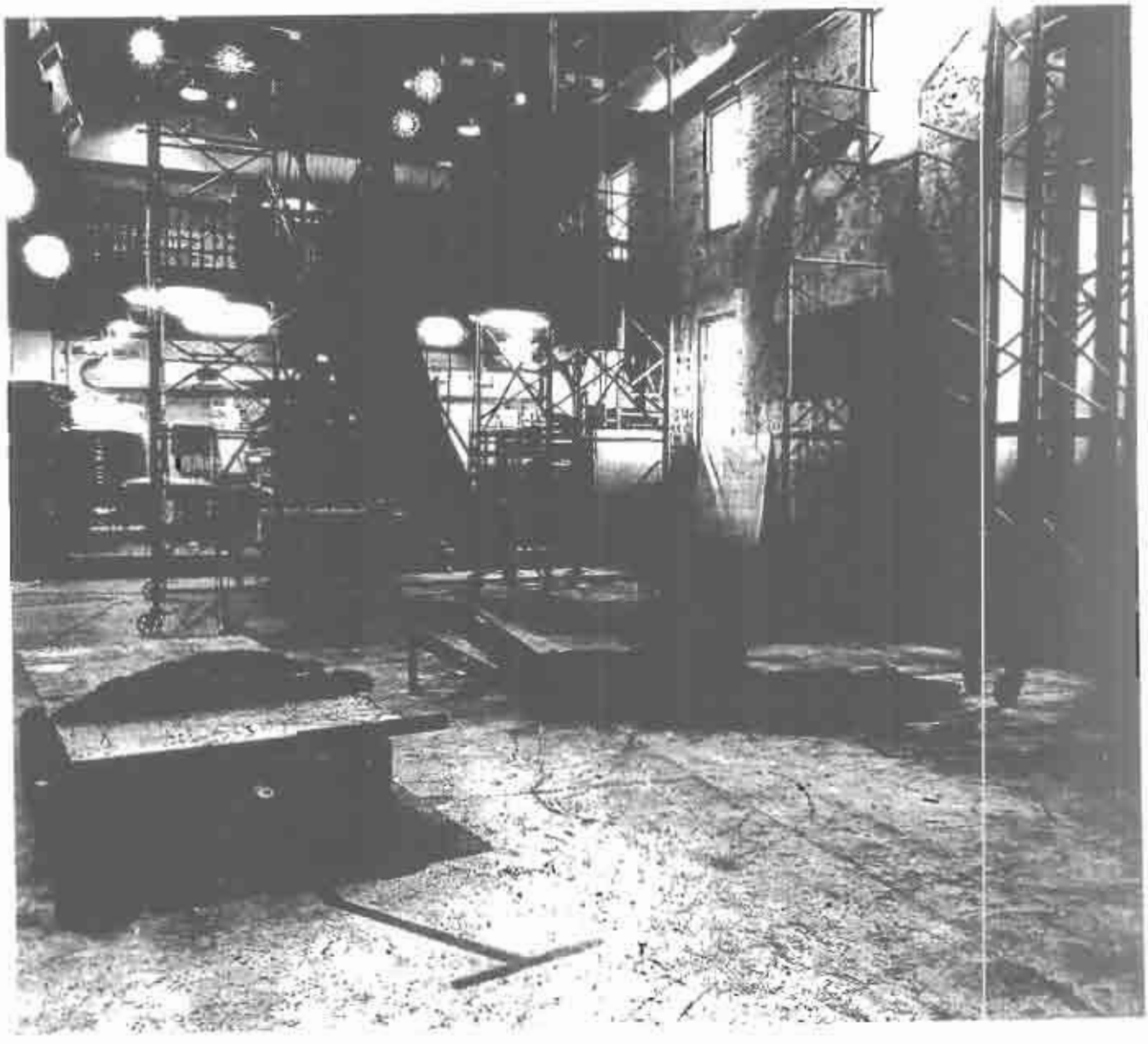
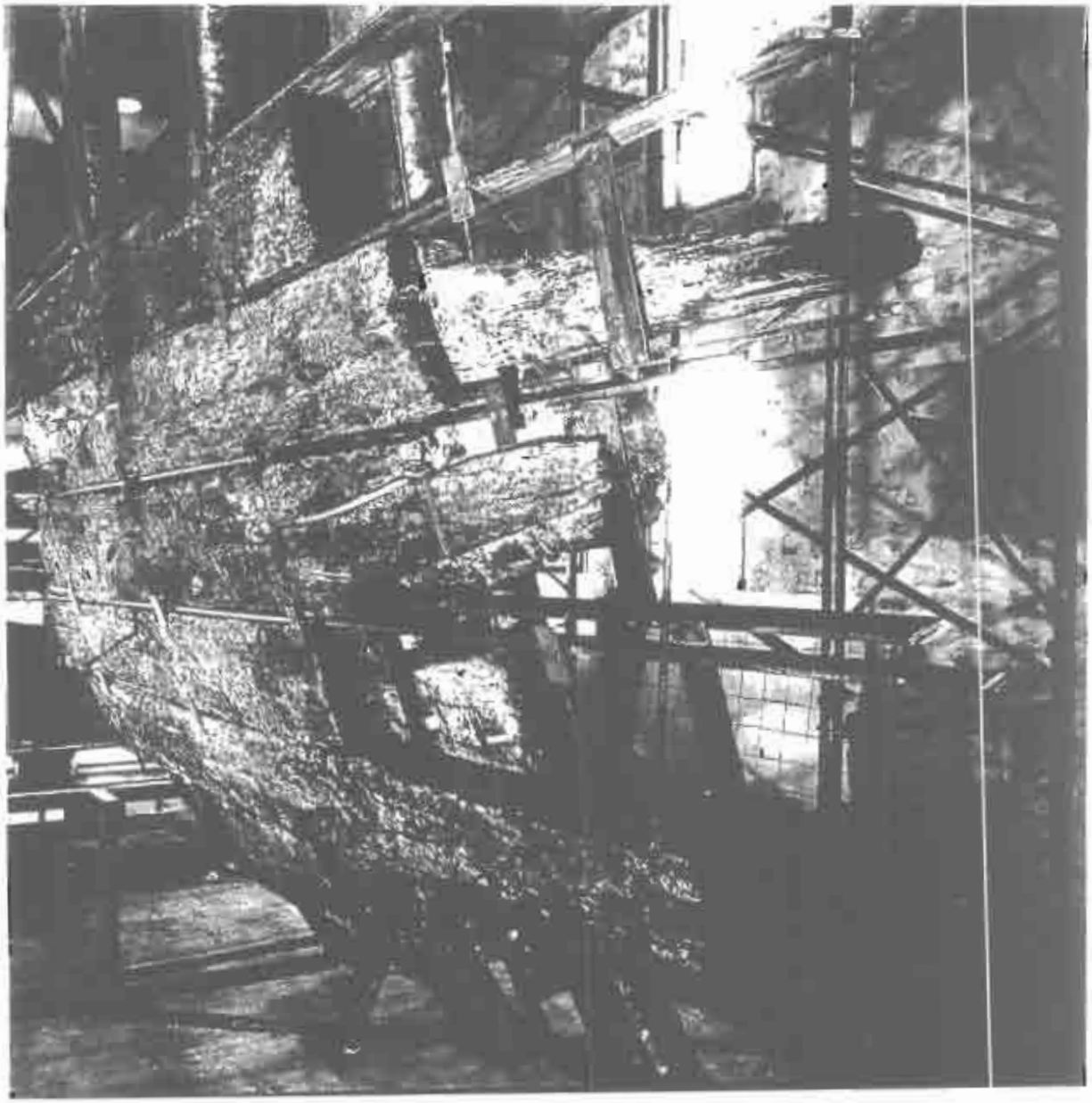
It is estimated that all timbers will have been conserved by March 1986. Working on this schedule the entire hull section of the *Batavia* will be erected in its steel support frame by December, 1986. After this phase of the reconstruction is complete it will be possible to open the Gallery to the public. A further phase of cosmetic reconstruction will follow during which time it may be necessary to retreat some of the first timbers which were conserved. Progress in the conservation of waterlogged timber has resulted in more visually appealing surface treatments than were obtainable previously.



Reconstruction of the hull of the *Batavia*.



Detail of steel reconstruction framework for the [illegible] hull timbers.

CONSERVATION REPORT

I.D. MACLEOD

Curator of Conservation

IRON

The number of iron artefacts that have been completed during the last two years does not accurately reflect the level of activity in this area. With the new hydrogen furnace in operation approximately thirty cannon balls can be treated in any one run and a large number of balls are now in the final stages of washing in 2% sodium hydroxide prior to being stabilized and consolidated by impregnation with microcrystalline wax. It is anticipated that at least one hundred balls will be completed by the next meeting.

The three Dutch iron cannon (BAT 80309, BAT 8724 and GT 1454) are under electrolysis and washing in caustic solutions where the chloride levels are down to 100mg per litre. In simple terms this means that these three cannon should be ready for final washing (to remove excess caustic) and wax impregnation within the next ten months.

Studies on the problems of stabilizing iron and composite iron-wood artefacts have ceased owing to the resignation of the former departmental head, Dr. Neil North. An application for an ARGS grant to employ a research chemist on this problem area is currently being considered by a selection committee. The composite wood-iron canisters from the Batavia are being stored in a mildly alkaline environment pending the outcome of the grant application. Because Dr. North has not yet been replaced the number of iron objects available for consideration is much smaller than had been anticipated.

Work carried out under a C.E.P. programme has resulted in the processing of more than five tonnes of concretion from the Vergulde Draeck site. The material has been relatively sterile with only a small number of cannon balls, lead musket balls, lead sheeting and one hundred ballast bricks coming from the programme. A set of seven wooden boxes filled with iron concretion and corrosion products were also recovered during the 1983 excavation and two of the boxes have been deconcreted and stabilized by controlled dehumidification. Some corroded iron billets were found inside one of the more complete boxes and these have been treated in the hydrogen furnace and are now being washed. Three other box fragments have been excavated and will undergo further conservation treatment.

SILVER

With the help of a technical staff member made available through the Community Employment Programme and from ANCODS we have essentially completed the backlog of coins from the Dutch wrecks. A total of 1213 coins (and coin

can be treated in any one run and a large number of balls are now in the final stages of washing in 2% sodium hydroxide prior to being stabilized and consolidated by impregnation with microcrystalline wax. It is anticipated that at least one hundred balls will be completed by the next meeting.

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WOOD

Since the last report all the outstanding wooden artefacts have been deconcreted and are currently being impregnated with polyethyleneglycol (PEG). This work has been developed systematically with programmed increases in the concentration of PEG in the mother liquor resulting in a more streamlined approach.

The majority of these small artefacts should be completed within the next two years. A total of sixty-six wooden objects have been successfully freeze dried and some restoration work has been done on them to effect cosmetic repairs.

Three batches of Batavia ships timbers have been handed over to Maritime Archaeology after being dehumidified in the Cliff Street facility. Many problems were experienced with plant breakdown and this delayed the treatment programme by more than six months. The stern post was successfully treated after it had been equilibrated in a solution which was 58 wt% PEG (compared with the fashion piece and other timbers which had been equilibrated in solutions containing 95% PEG), and on this basis the remaining structural pieces are now ready for drying. This work will commence as soon as the new chamber has been commissioned at Finnerty Street complex.

LEATHER

Under the guidance of Nancy Mills Reid substantial progress has been made on the treatment of waterlogged leather. Using aqueous glycerol solutions of varying concentrations, a total of one hundred and forty leather artefacts have been successfully treated by impregnation followed by freeze drying. Leather previously treated by lanolin impregnation has been retreated with glycerol solutions, after the lanolin had been removed, and the dimensions of the objects were restored to their original, pre-waterlogged, conditions. A small number of rope and other hemp based materials have also been treated by impregnation in a variety of aqueous media including PEG, glycerol and Luviskol (a polyvinyl-pyrrolidone) - all these objects are freeze dried following the impregnation process.

COPPER ALLOYS

A number of small copper, brass and bronze objects have been treated using the alkaline dithionite method developed in these laboratories. Large sheets of copper have been treated in the conventional way of inhibited citric acid followed by prolonged washing in sesquicarbonate media. The advantages of the dithionite treatment are (i) consolidation of extensively corroded metal surfaces and (ii) a greatly reduced treatment time (e.g. one month compared with fifteen months standard treatment).

Since the last meeting one of the Batavia bronze cannon at Geraldton (BAT 3638) has been treated by Jill Worsley under the direction of the conservation laboratory. A total of 4.28kg of chloride ions was removed in the 360 day treatment programme. After the extended washing period the cannon was given a protective coating and is now on display at the Civic Centre.

As part of a systematic study of corrosion of metals on shipwrecks samples of the Batavia bronze and composite cannon were taken for chemical analysis. The analyses have shown that the composition has a direct bearing on the extent of corrosion of the bronze cannon. The remaining Batavia bronze door pintles have also been treated by the alkaline dithionite method and have been successfully stabilized.

.../3

CERAMICS

Systematic monitoring of the amounts and types of salts that are released during desalination has resulted in some surprising observations. Significant amounts of chloride salts have been removed from salt glazed stoneware jugs from the Batavia (0.7 wt% chloride) - it was previously thought that such material was relatively impervious to the ingress of sea water. The release of salts is controlled by the rate at which they can diffuse from the surface of the artefact and such processes are linearly dependent on the square root of time. Once the chlorides have been removed the conductivity of the wash solutions increases as the sulphates of calcium and magnesium slowly diffuse out of the glass and ceramic materials.

Approximately sixty artefacts have been desalinated during the period under review - it should be noted that many registration numbers incorporate a large number of fragments. The weights and surface areas of the ceramics have all been recorded as part of the research programme.

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BATAVIA - Conserved artefacts for viewing

1. STONE

1.0. Building

BAT 1146 Building block fragments

1.1. Slate

BAT 1150 Fragment

1.2. Coal

BAT 1147 (2); 1152 (8); 1154 (4).

2. CERAMICS

2.1. Stoneware

Necks and sherds of stoneware jugs.

BAT 21499; 21500; 21501; 21503; 21504;
21508; 21509; 21510; 21511; 21512;
21513.

2.2. Earthenware

BAT 21502 Base of small jar
BAT 21506 Sherds

2.3. Majolica

BAT 21507 Sherds

3. NON FERROUS

3.2. Brass/Copper

BAT 3379 Unidentified brass instrument in concreted remains of wooden handle
BAT 3870 Copper fragment

3.4. Lead

BAT 3844 Musket ball (1)
BAT 3869 Lead shot - various shapes

3.6. Gilt

1.2. Coal

BAT 1147 (2); 1152 (8); 1154 (4).

2. CERAMICS

2.1. Stoneware

Necks and sherds of stoneware jugs.

BAT 21499; 21500; 21501; 21503; 21504;
21508; 21509; 21510; 21511; 21512;
21513.

2.2. Earthenware

4. MISCELLANEOUS

4.3. Resin etc.

BAT 4615 Amber bead. Diam: 7 mm
BAT 4618 Amber bead. Diam: 12 mm

4.4. Glass

BAT 4617 4 fragments : 1 blue-green case bottle base;
1 greenish-brown case bottle base;
1 pale green case bottle frag; and
1 flat clear glass

4.6. Rope

BAT 683 Small fragment of 5 mm diameter, 2 strand marline.
BAT 8531 Length of single strand twisted cordage formed into a loop - from plug of grenade. Diam: c. 6 mm

4.7. Textiles

BAT 4460 Small fragments of fine, loosely woven fabric
VAT 4515 4 fragments of canvas type textile, orange in colour. Cellulose fibre.

6. TIMBER

6.1. Ship's timbers

BAT 4419 (associated with BAT 6221 & 6222);
6004; 6005; 6154; 6256; 6280; 6453;
6469; [See Batavia Cat. 1974; ANCODS 1979]

6.2. Armament

BAT 4353 Wooden handle from ramrod - restored from fragments

6.3. Cargo

BAT 4381 Barrel hoop fragments - 2 restored pieces

6.5. Tools

Wooden handles

BAT 4085 Handle with metal tang (see Batavia Cat, 1974-WOOD)
BAT 4403 Section of wooden handle. Diam: c. 17 mm
BAT 4416 Section of wooden handle. Diam: c. 9 mm
BAT 4434 Handle from sledge hammer. Length: 685 mm
BAT 4438 Wooden handle with remains of metal ferrule
Length: 310 mm
BAT 4456 Unidentified tool handle(?) with flat metal shaft.
Square nail holes at intervals along wood.
Length: 530 mm

6.6. Bark

BAT 4407 Birch bark
BAT 4464 Birch bark

6.7. Miscellaneous

BAT 4089A	Fragment of wood - found in association with pulley block 4089 but not part of it. Sample analysed by N.K.Mills. Does not appear to match any available timber samples. Could possibly be tropical. Growth rings are discernible but very close (lines of poors similar to Castanea sativa but closer together).
BAT 4427	Unidentified wood fragment
BAT 6448	Wooden rod - possibly dowel
BAT 6471	Unidentified fragment - associated with but not part of pulley block 4089.
BAT 8248	Fragment from cannon ball concretion

8. FERROUS

8.1. Armament

Bomb Shot

BAT 8058	Diam: 93 mm Wt. 2.6 kg
BAT 8502	Diam: 84 mm Wt. 0.8 kg
BAT 8503	Diam: 82 mm Wt. 0.6 kg
BAT 8510	Diam: 82 mm Wt. 0.6 kg
BAT 8697	Diam: 86 mm Wt. 1.1 kg [Indentation possibly a casting defect]

Grenades

BAT 8534	Grenade with wooden plug. Diam: 86 mm [This was cut open to examine the structure. The wooden cup was removed intact. Gunpowder and sand were collected from inside. Replica of cup already requested by ANCODS]

Cannon Balls

Small	Medium
BAT 8084	BAT 8003
BAT 8112	BAT 8062
BAT 8457	BAT 8064
BAT 8473	BAT 8101
BAT 8518	BAT 8109
BAT 8528	BAT 8171
BAT 8542	BAT 8368
BAT 8545	BAT 8467
BAT 8556	BAT 8639
	but not part of pulley block 4089.
BAT 8248	Fragment from cannon ball concretion

8. FERROUS

8.1. Armament

Bomb Shot

BAT 8058	Diam: 93 mm Wt. 2.6 kg
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BAT 8697	Diam: 86 mm Wt. 1.1 kg [Indentation possibly a casting defect]

Cannon Balls (continued)

Small	Medium
	BAT 9066
	BAT 9074
	BAT 80063
	BAT 80112

Large	Very Large
BAT 8024	BAT 8004B
BAT 8029	BAT 8015
BAT 8053	BAT 8093
BAT 8067	BAT 8098
BAT 8071	BAT 8441
BAT 8078	BAT 8444
BAT 8089	BAT 8449
BAT 8102	BAT 8450
BAT 8129	BAT 80106
BAT 8130	BAT 80115
BAT 8456	No.No. x 2
BAT 8634	
BAT 8986	
BAT 9010	
BAT 9068	
BAT 9069	
BAT 80116	
BAT 80312	
No.No. x 7	

Spike Shot

BAT 8456

Bar Shot - expanding

BAT 8479)
BAT 8480) See Batavia catalogue, 1974.

8.6. Concretions

BAT 3638	Frags. from cannon concretion
BAT 6165	Frags. from cannon ball concretion
BAT 8038	Complex iron and wood concretion. Wooden base supports an iron mechanism with cog wheel (or. ratchet) devices. Small piece of lead and musket ball associated with concretion.

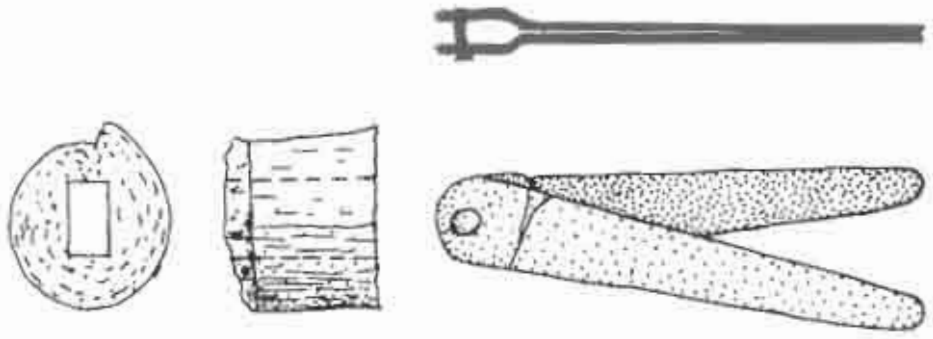
BAT 8029	BAT 8015
BAT 8053	BAT 8093
BAT 8067	BAT 8098
BAT 8071	BAT 8441
BAT 8078	BAT 8444
BAT 8089	BAT 8449
BAT 8102	BAT 8450
BAT 8129	BAT 80106
BAT 8130	BAT 80115
BAT 8456	No.No. x 2
BAT 8634	
BAT 8986	
BAT 9010	
BAT 9068	
BAT 9069	
BAT 80116	

8.6. Concretions (continued)

BAT 80324	Nail concretion
BAT 80329	Concretion
BAT 80333	Bolt head & 2 misc. frags.
BAT 80334	Part of large fitting formed from two curved plates of iron connected by fastenings - unidentified

Replicas

BAT 80313R	Head of iron bolt with clinch ring
BAT 80318R	Shaft of iron bolt.



BAT 3379 SCALE 1:1

VERGULDE DRAECK - Conserved artefacts for viewing

1. STONE

1.1. Chalk

GT 1543 Chalk

2. CERAMICS

2.2. Earthenware

A number of earthenware cups, jugs, plates and skillets were recovered during the 1982-83 excavations (see ANCODS Cat. 1982:24 and ANCODS Cat. 1983:6-7). The following are now fully treated and restored:

Cups

GT 2162 Cup with ring foot. Restored from fragments. Section of rim and upper body missing. Clear lead glaze on inner and upper outer surfaces giving a honey brown colour. Vertical pinched handle, unglazed and a little worn.
Rim diam: 135 mm;
Base diam: 65 mm;
Ht. 85 mm.

Jugs

GT 2138 Tripod jug with clear lead glaze on inner and upper outer surfaces giving mid to dark brown colour. Colour differentiation on the outer body is the result of a 'one side flash', i.e. one side has been more exposed to the flame in the kiln. The effect of this on the unglazed lower body has resulted in a grey reduction mark. Vertical pinched handle.
Rim diam: 122 mm;
Mid-body diam: 122 mm;
Ht. 104 mm

GT 2139 Tripod jug with clear lead glaze on inner and upper outer surfaces, giving a rich honey brown colour. The inner glazed surface shows a strong iron speckle. Kiln defects are apparent on the upper outer body and vertical pinched handle, indicating contact with other wares in the kiln. The jug has been restored from several pieces and is complete save for a very small section of the rim and lower body.
Rim diam: 120 mm;
Mid-body diam: 120 mm;
Ht. 98 mm.

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Cups

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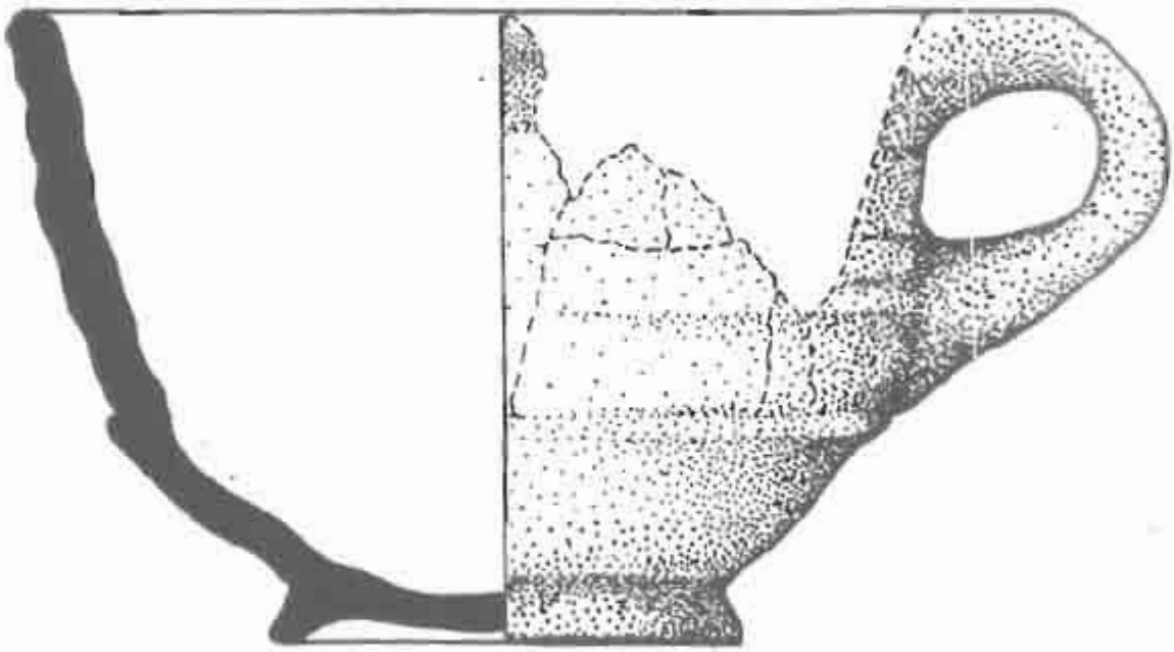
Rim diam: 135 mm;
Base diam: 65 mm;
Ht. 85 mm.

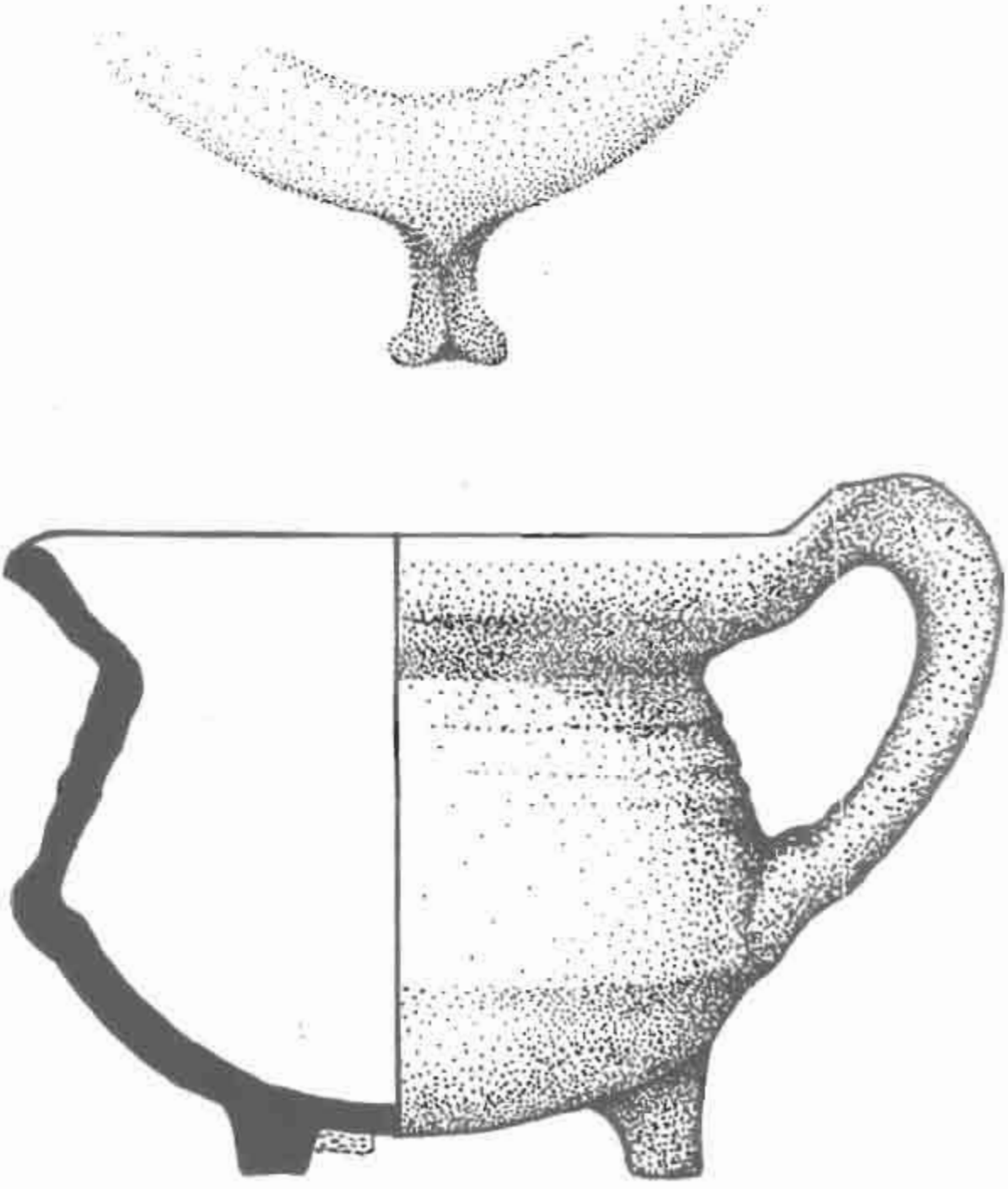
Jugs



GT 2162

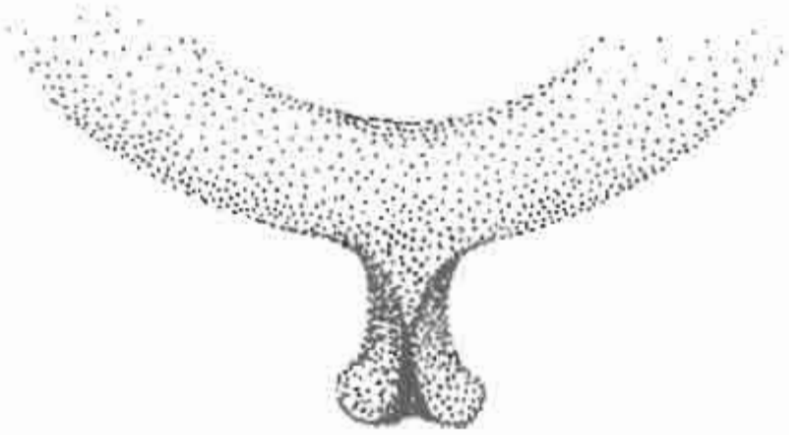
5 cm

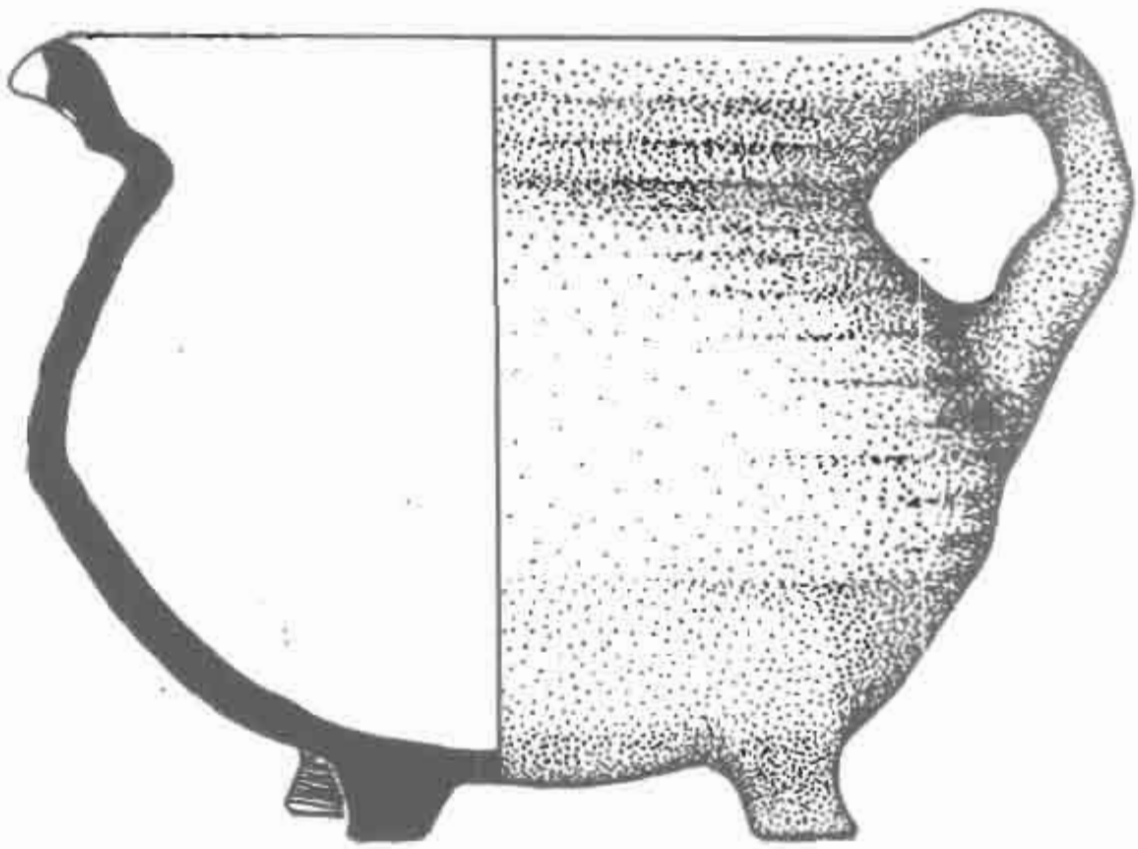
Drawing by: Elizabeth Urbanczyk



GT 2138

Drawing by: Elizabeth Urbanczyk

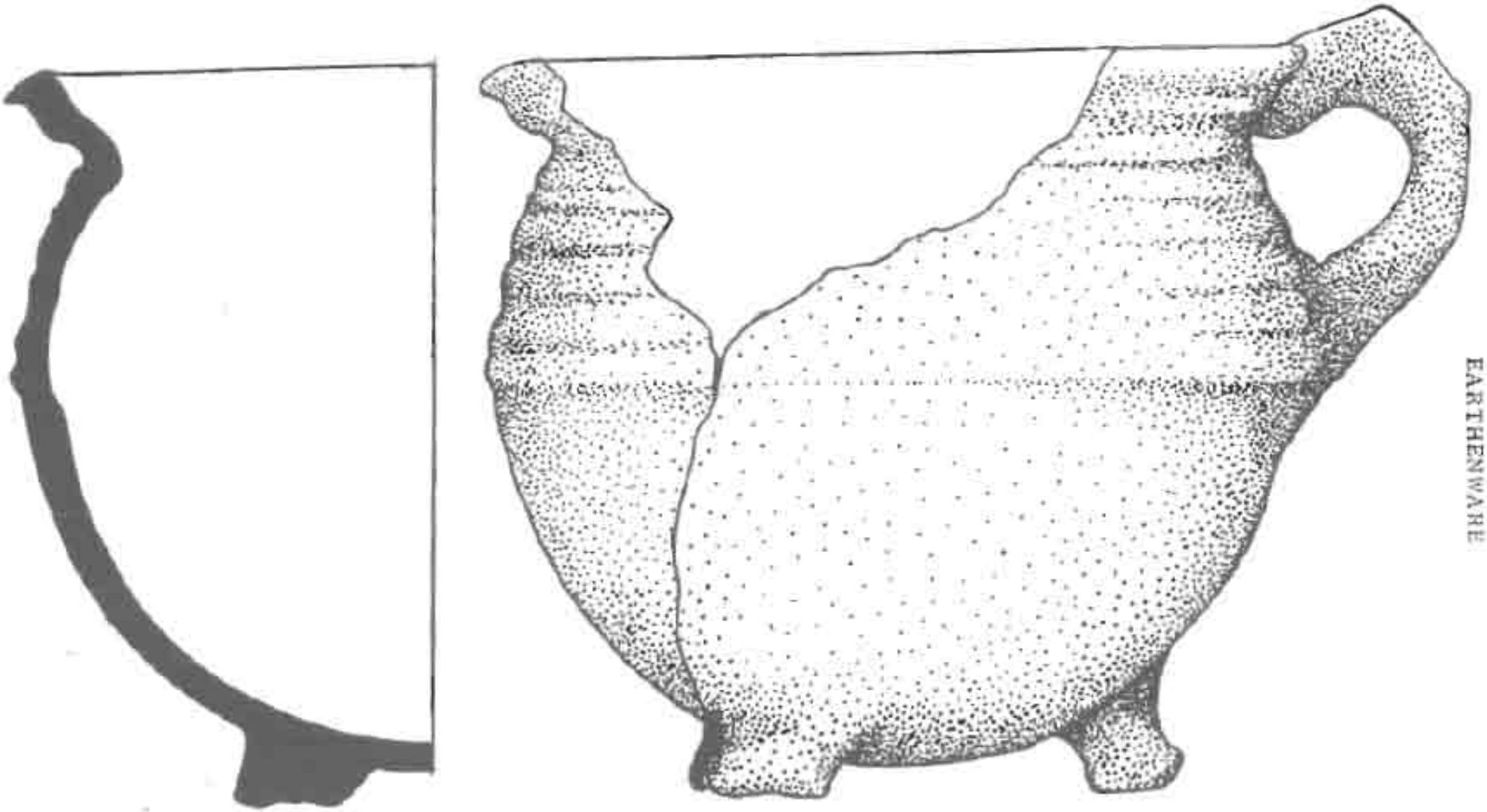




GT 2139

Drawing by: Elizabeth Urbanczyk

5 cm



Drawing by: Elizabeth Urbanczyk

GT 2166

3. NON-FERROUS

3.1. Bronze

GT 3096 Strap associated with bell GT 3080 (not yet completed)

GT 3112 Unidentified object, possibly clapper from small bell.

3.2. Brass

Book mounts and clasps

GT 3117 Part of book mount
GT 3126 Part of book mount
GT 3163 Hinged book mount and clasp
GT 3119 Bracket - right angle shape, with fastening holes
Arms: 79 mm and 95 mm long;
27 mm and 22 mm wide;
Thickness 3.5 mm

Buckles and belt fittings

GT 3084 Buckle with pin
GT 3101 Baldric buckle and heart shaped hasp
GT 3106 Round buckle with pin
Diam:
GT 3108 Baldric buckle
GT 3130 Buckles (2) with no pins
GT 3138B Baldric buckle
GT 3133 Belt rider
GT 3153 Heart-shaped hasp

[See also GT 1346; 1347; and 1348 in leather section]

GT 3144 Cauldron, small, with one of three copper legs remaining
Diam ;
Ht:
[cf. GT 1016, Green, 1977:178]
GT 3141 Charcoal tong (?) - one arm only
GT 3142 Charcoal tongs - one pair, one arm broken

GT 6112 Ferrule from wooden handle
GT 3113 Gimbal mount - two sections joined with copper rivet.
Length c. 365 mm;
Width: 8.7 mm;
Thickness: 1mm

Hooks and Eyes

Book mounts and clasps

GT 3117 Part of book mount
GT 3126 Part of book mount
GT 3163 Hinged book mount and clasp
GT 3119 Bracket - right angle shape, with fastening holes
Arms: 79 mm and 95 mm long;
27 mm and 22 mm wide;
Thickness 3.5 mm

Buckles and belt fittings

GT 3084 Buckle with pin
GT 3101 Baldric buckle and heart shaped hasp
GT 3106 Round buckle with pin
Diam:
GT 3108 Baldric buckle

Hooks and Eyes continued

GT 3140 Lamp, two wick, triangular shaped with handle
GT 3114 Oval box with hinged lid (cf. GT 3057 & GT 891 - ANCODS 1982:30)
GT 3127 Rod, bent. Length c. 450 mm; diam: 5.3 mm
GT 3120 Rule, section of. Marked '8, 9 & 10'
GT 3088 Strips
GT 3137 Tube, fragment of (possibly part of ferrule)
GT 3139 Miscellaneous brass fragments
GT 3132 Irregular shaped piece of brass
GT 3085 Tapered rod, possibly eroded nail or spike.
GT 3129 Wire, twisted.

3.2. Copper

GT 3083 Musket stock plate
GT 3134 Fragments of copper with rivets
GT 3159 Copper fragments (3)

Copper sheathing GT 3006; 3007; 3033; 3148 (3); 3156.

GT 3054 Copper sheathing, tapered (possibly from sternpost)

3.3. Pewter

GT 3099 Bowl of a small goblet (possibly for schnaps), with patterned band just below rim. Inside the bowl at the junction with the stem, is a crowned maker's mark with the initials 'PB'. The bowl and part stem are similar to larger goblets from the Batavia (cf. BAT 3376).
Rim mishapen: aprox diam: 38 mm
Stem diam: 12.5 mm

GT 3115A Bottle top collar with screw neck.
Flange diam: 37.8 mm
Lower insert diam: 25 mm
Screw neck diam: 18 mm

GT 3115B Bottle top collar with screw neck (similar to 3115A)
Flange diam: 37 mm
Lower insert diam: 24.7 mm
Screw neck diam: 17.5 mm

[N.B. These collars are similar to GT 1339 (Green, 1977:) which is a complete example. Tops of this type are not represented in earlier allocations].

GT 4105 Rim of green glass bottle with remains of pewter collar.
Diam of bottle rim: 60 mm.

GT 3085 Tapered rod, possibly eroded nail or spike.
GT 3129 Wire, twisted.

3.2. Copper

GT 3083 Musket stock plate
GT 3134 Fragments of copper with rivets
GT 3159 Copper fragments (3)

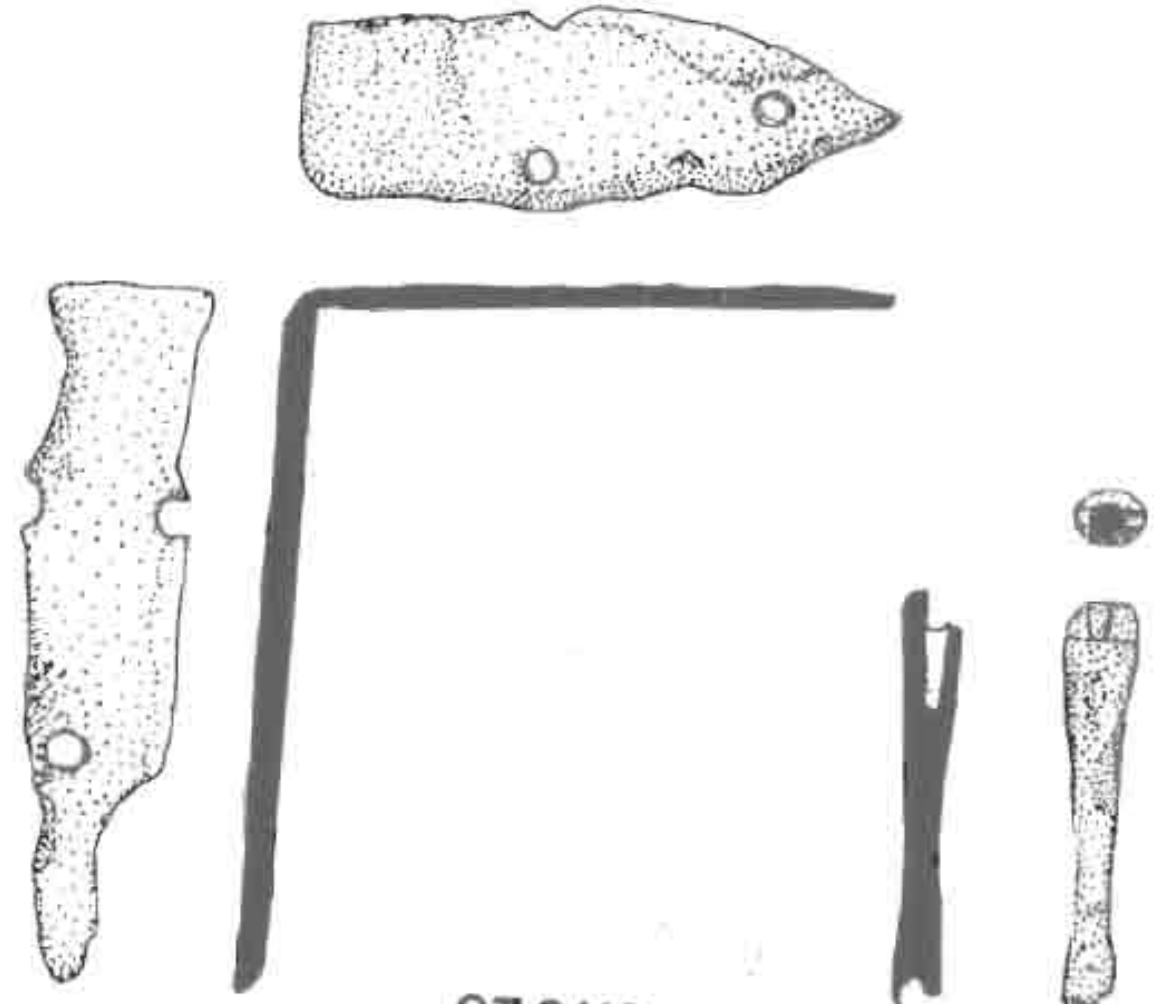
Copper sheathing GT 3006; 3007; 3033; 3148 (3); 3156.

GT 3054 Copper sheathing, tapered (possibly from sternpost)

3.3. Pewter

GT 3099 Bowl of a small goblet (possibly for schnaps), with patterned band just below rim. Inside the bowl

BRONZE and BRASS



GT 3119

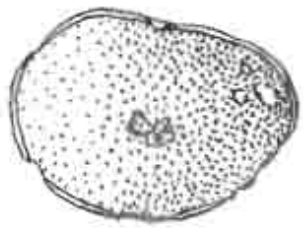
GT 3112

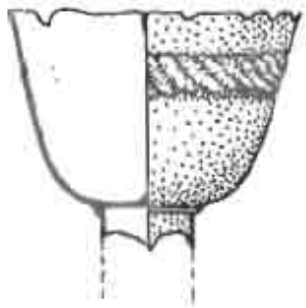
GT 3162

GT 3163

SCALE 1:1

PEWTER

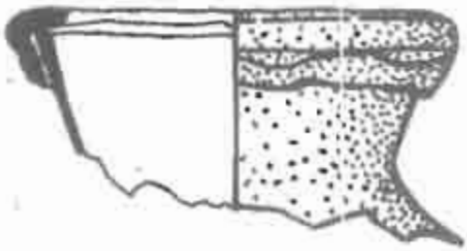


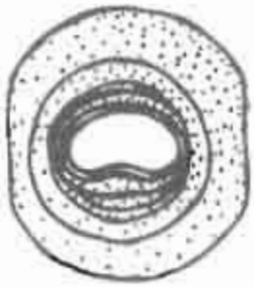


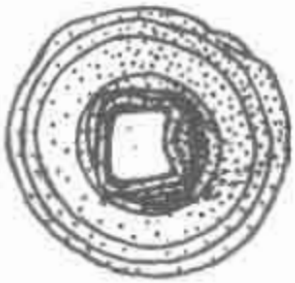
GT 3099

SCALE 1:1

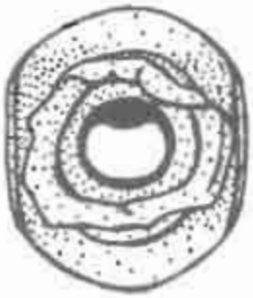
PEWTER

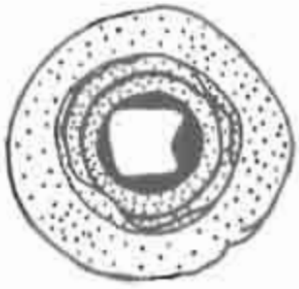






GT 1056



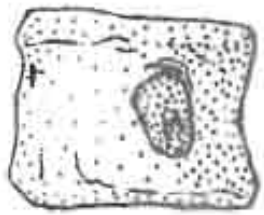


GT 3115

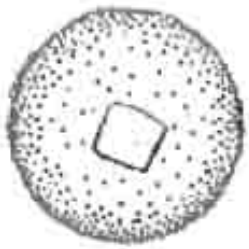
GT 3115

Drawings by: Susan Debeljakovic
SCALE 1:1

LEAD

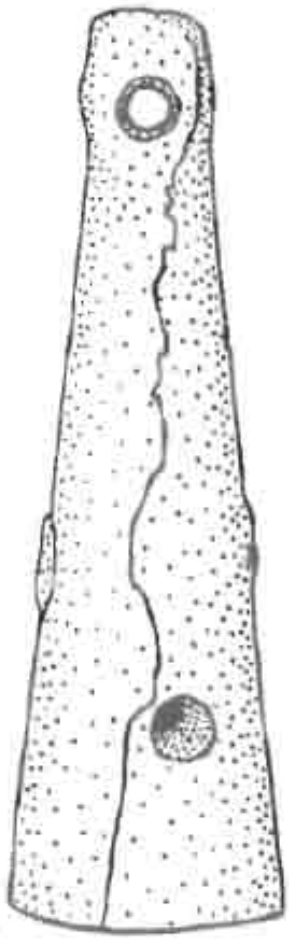


GT 3146



GT 3058

GT 3097



GT 3135

Drawings by: Susan Debeljakovic

SCALE 1:1

Lead

GT 3097 Irregular shaped disc with small protrusion on one side.
Diam: c. 38 mm

GT 3058 Dome-shaped lead disc with central square opening.
Diam: 31 mm; Thickness: 10 mm
Square opening 8 mm x 7.5 mm. Wt. 52.6 g.
[Similar to GT 8033 - Ferrous Section]

GT 3135 Small conical sounding lead with 2 small holes bored part way into the body, near the base.
Ht. 120 mm; base diam: 36.5 mm; Wt. 592.1 g

GT 3146 Unidentified circular object.
Diam: 36 mm; thickness: 27 mm; Wt. 232.6 g
Plug of iron in the edge of the object. Possibly some kind of slung counter-weight.

MISCELLANEOUS

4.1. Animal

GT 4107 Small girdle bone (pelvic or pectoral) - unidentified

Butchered, domestic animal bones:

GT 4005 (24); 4011 (2); 4014 (9); 4026 (20);
4027 (20); 4033 (27); 4041 (1); 4045 (12);
4046 (2); 4059 (1); 4065 ( ); 4066 ( );
4067 ( ); 4071 ( ); 4072 ( ); 4084 ( );
4091 ( ) [previously deferred from 1982 and 1983 Catalogues]

Elephant tusk fragments: Elephant tusks:

GT 4073 (6); 4021 (1); 4122 (2) GT 1371; 1372

4.4. Glass

GT 4120 Clear glass disc
Diam: 21 mm; thickness: 1 mm

4.6. Horse Hair

GT 4131 2 pieces of horse hair from sacrificial planking (see 1983 Cat. Appendix 2).

Leather

GT 1057 Shoe leather
GT 3146 Unidentified circular object.
Diam: 36 mm; thickness: 27 mm; Wt. 232.6 g
Plug of iron in the edge of the object. Possibly some kind of slung counter-weight.

MISCELLANEOUS

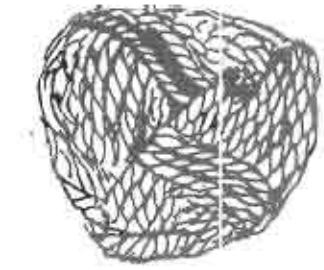
4.1. Animal

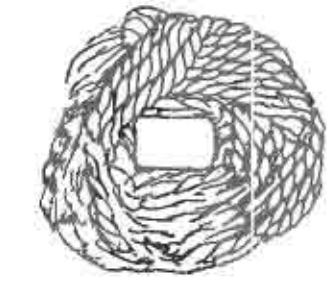
GT 4107 Small girdle bone (pelvic or pectoral) - unidentified

Butchered, domestic animal bones:

GT 4005 (24); 4011 (2); 4014 (9); 4026 (20);

GT 4101





GT 1294

GT 4135

Leather (Continued)

GT 1128 Leather in concretion of shoe sole
GT 1346 Strap with small buckle (see Green, 1977:181)
GT 1347 Wide belt or baldric buckle on leather strap (see Green, 1977:180)
GT 1348 Oval buckle (minus metal plate) on leather strap (see Green, 1977:181)
GT 4074 Fine flat leather
[N.B. There is more of this to come]
GT 4088 Fragments of shoe leather
GT 4096 Belt or strap fragment

Rope

GT 1294 Turks Head
GT 4053 2 or 3 strand rope
GT 4070 Rope
GT 4090 Possibly part of cable
GT 4101 3 strand rope, 16 mm diam.
GT 4117 3 strand rope, 25 mm diam.
3 strand rope, 22 mm diam.
[Several pieces from bulk lot]
GT 4135 3 strand rope, 10 mm diam.

Wadding

GT 1059 Stuffing from Cannon 14 mm (GT)
- unrefined plant fibres

4.7. Fabric

GT 1112 Fragments of woollen fabric
GT 4115 1 piece of knitted (stocking stitch) textile - wool
GT 4129 4 fragments of plain weave textile - cellulose fibre
GT 4130 Small fragments of tightly woven textiles - possibly jute fibre

6. TIMBER

6.1. Ship's Timber

GT 1404 6 pieces of wood. The larger fragments have rows of square nail holes c. 4 mm x 4 mm which suggests this may be sacrificial planking. The wood appears to be a soft wood but the exact species has not been identified (sample required for analysis).

GT 1405 Fragments of timber. These include:

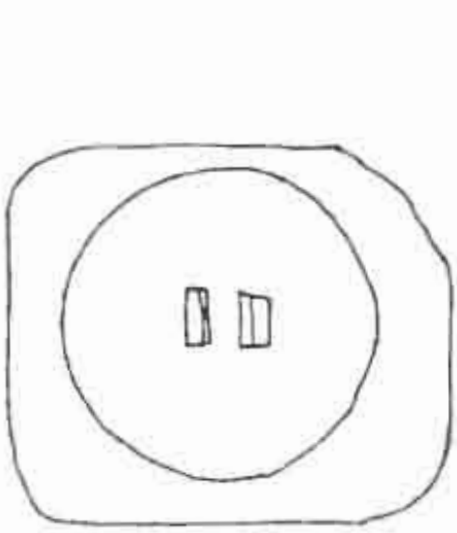
Rope

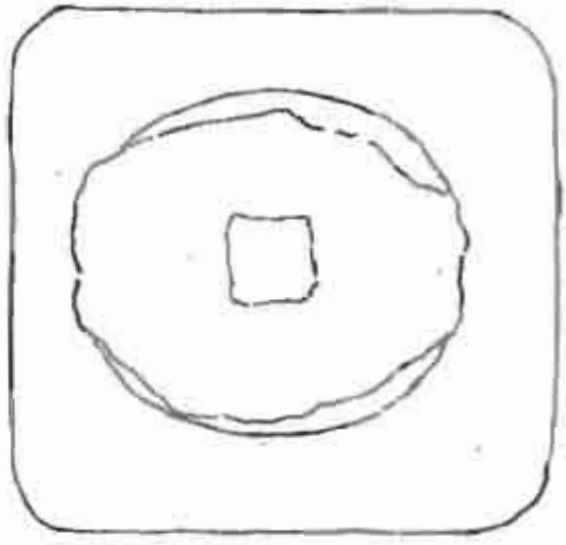
GT 1294 Turks Head
GT 4053 2 or 3 strand rope
GT 4070 Rope
GT 4090 Possibly part of cable
GT 4101 3 strand rope, 16 mm diam.
GT 4117 3 strand rope, 25 mm diam.
3 strand rope, 22 mm diam.
[Several pieces from bulk lot]
GT 4135 3 strand rope, 10 mm diam.

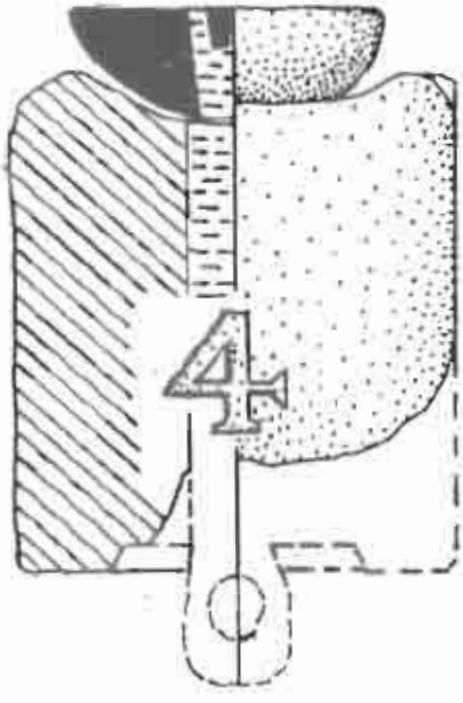
Wadding

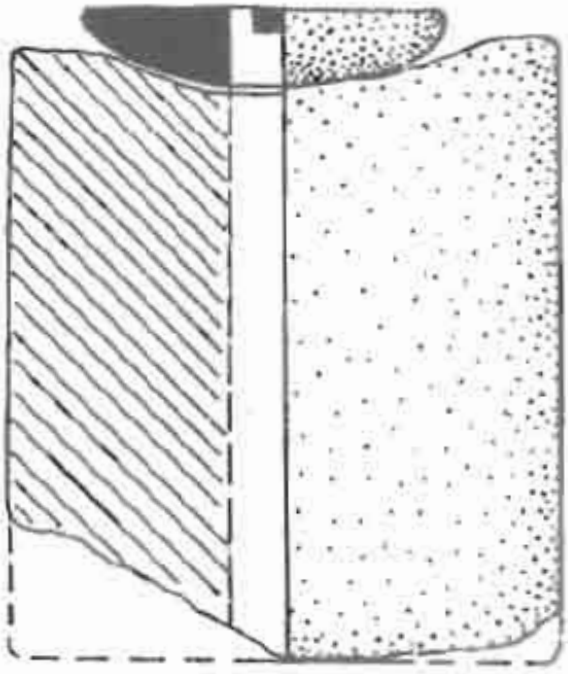
GT 1059 Stuffing from Cannon 14 mm (GT)
- unrefined plant fibres

IRON









GT 8033

GT 8034

6.7. Miscellaneous

GT 6099 Wooden sword scabbard with leather covering and fragments of iron sword blade.

FERROUS

8.1. Armament

GT 8003 Cannon ball
Diam:
GT 8007 Cannon ball (1) Diam: 59 mm
GT 8008 Bar shot - 2 halves, broken, with bar.
Diam: 88 mm

8.2. Fittings

GT 1407 Demineralized iron handle (?) - fragments.
GT 8033 Cast iron block with dome-shaped lead disc in the top, connected by wrought iron bands. Figure 4 marked on one side. Unidentified: possibly a weight. Lead disc diam: 40 mm.
GT 8034 Cast iron block with lead dome-shaped disc - similar to GT 8033
Lead disc diam: 45 mm

[N.B. One iron billet box is available for viewing but conservation treatment is not fully complete].

GT 8008 Bar shot - 2 halves, broken, with bar.
Diam: 88 mm

8.2. Fittings

GT 1407 Demineralized iron handle (?) - fragments.
GT 8033 Cast iron block with dome-shaped lead disc in the top, connected by wrought iron bands. Figure 4 marked on one side. Unidentified: possibly a weight. Lead disc diam: 40 mm.
GT 8034 Cast iron block with lead dome-shaped disc - similar to GT 8033
Lead disc diam: 45 mm

[N.B. One iron billet box is available for viewing but conservation treatment is not fully complete].

ZEEWIJK - Conserved artefacts for viewing

3. NON-FERROUS

3.3. Pewter

ZW 4605	Pewter spoon - part of handle missing (from land site)

3.4. Lead

ZW 3027	Lead shot
ZW 5558	Lead shot
ZW 3054	Lead sheathing
ZW 3091	Lead sheathing

ZUYTDORP - Conserved artefacts for viewing

3. NON-FERROUS

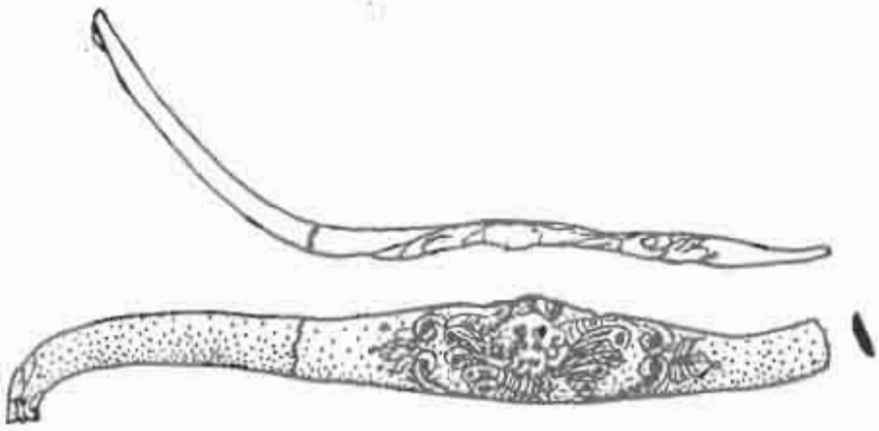
3.2. Brass/Copper

ZT 555A	Ornamental fitting - unidentified
ZT 555B	Musket plate - no markings
ZT 2413	Square shank tacks (3)
ZT 2413A	Part of brass scissor handle.

3.3. Pewter

ZT 1820	Pewter bottle top with remains of glass

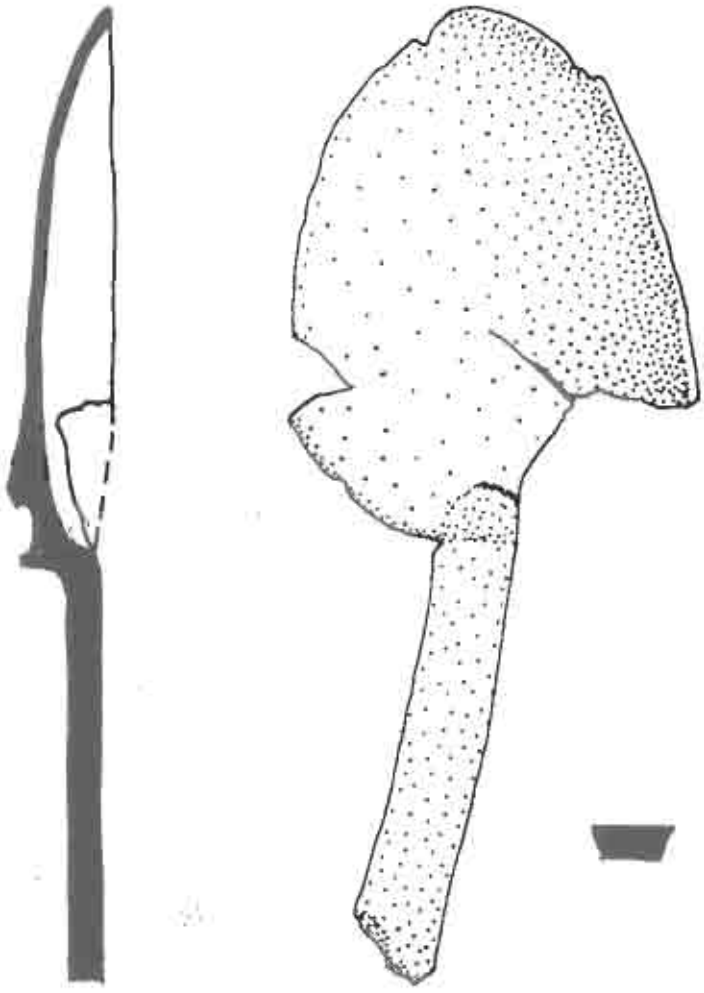
ZT 2431A



SCALE 1:1

ZT 555 A

PEWTER



ZW 4605

SCALE 1:1

Dutch artefacts previously on loan to the Art Gallery of South Australia.

Batavia

BAT	540	Stoneware jug - neck and handle with beardman mask
BAT	538	Stoneware jug - neck and handle with part of mask

Vergulde Draeck

GT	755	Stoneware jug with mask and three Rose-Crown-Heart medallions (see Green, 1977:128)
GT	1028	Clay pipe - RP maker's mark and Fleur de lis pattern on stem.
GT	1431	Ballast brick
GT	3059	Brass candlestick
GT	53	Cannon ball
GT	8016	Conglomerate containing clay pipe bowl and stem fragments.
?		10 Coins. (12)

Heavy objects not yet assigned to ANCODS

Anchors:

Batavia

✗ BAT 80311 — Wrought iron anchor.
Raised in 1971.
Treatment complete 1974.
On display, Maritime Museum.

Vergulde Draeck

✗ GT 672 — Part of wrought iron anchor.
Raised in 1969.

Iron Cannon:

Batavia

Reg. No.	Site No.	Length (cm)	Bore (mm)	Raised	Location
BAT 8720	1	278	110	1974	Beacon Island Jetty
✗ BAT 8721	2	305	125	1974	Finnerty Street
[N.B. This cannon is now fully treated. Wadding from the bore is on display BAT 4566.]					
BAT 8722	3	N/A	N/A	1973	Conservation
[N.B. This cannon has a broken muzzel, which was located in a nearby concretion - see BAT 3302.]					
BAT 8723	4	N/A	N/A	1971	Conservation
BAT 8724	5	c.236	110	1973	Conservation
[N.B. Has cascable missing.]					
BAT 8726	8	c.290	115	1973	Conservation
[N.B. Has cascable missing.]					
BAT 8731	13	N/A	90	1973	Conservation
BAT 80309	20	N/A	N/A	1971	Conservation

Vergulde Draeck

✗ GT 672 — Part of wrought iron anchor.
Raised in 1969.

Iron Cannon:

Batavia

Reg. No.	Site No.	Length (cm)	Bore (mm)	Raised	Location
BAT 8720	1	278	110	1974	Beacon Island Jetty

GT 1455 — Cannon No. 16, almost completely eroded away.
Raised 1972.

GT 1456 — Cannon No. 13, marked AVOC, 1700A, 1D and 48 on trunnions.
Length 2.2m. Bore unknown.
Raised March 1970.
Disintegrated during conservation.

GT unregistered — Cannon No. 25, marked AVOC, 1700A, 1D on trunnion.
Length and bore unknown.
Raised May 1973.
Disintegrated due to lack of conservation.

GT 1104 and 1408 — Part of cascable of cannon, GT 1454.

Zeewijk

ZW 5572 — Cannon, underside worn but some surface features still intact.
Length 2.86m. Bore 110mm.
Raised in 1952.

ZW 5573 — Cannon, muzzel section worn away and trunnions.
Length 2.41m. Bore 70mm.
Raised in 1952.

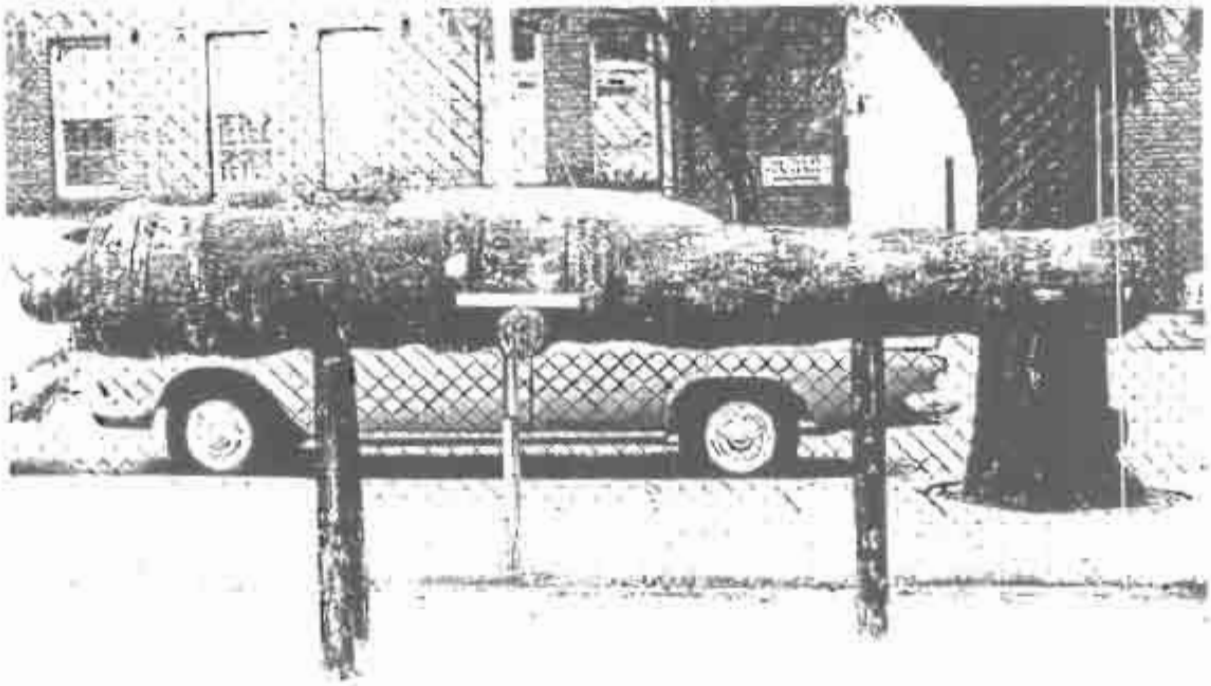
Both these cannon were raised by the R.A.N. in 1952 and delivered to the W.A. Museum. As evidence of corrosion became apparent, they were buried 1m in the Museum grounds to exclude oxygen. Water was sprinkled over the top soil in an endeavour to remove salt contamination. This spraying was continued for several months then ceased. In 1958 the cannon were dug out, given a phosphoric acid inhibitor treatment, and placed on display in the Museum grounds. The cannon were subsequently returned to the Conservation Laboratory but have not undergone further treatment.

ZW 5574 — Cannon, very pitted and eroded.
Length 2.4m. Bore 90mm.
Raised 1963.

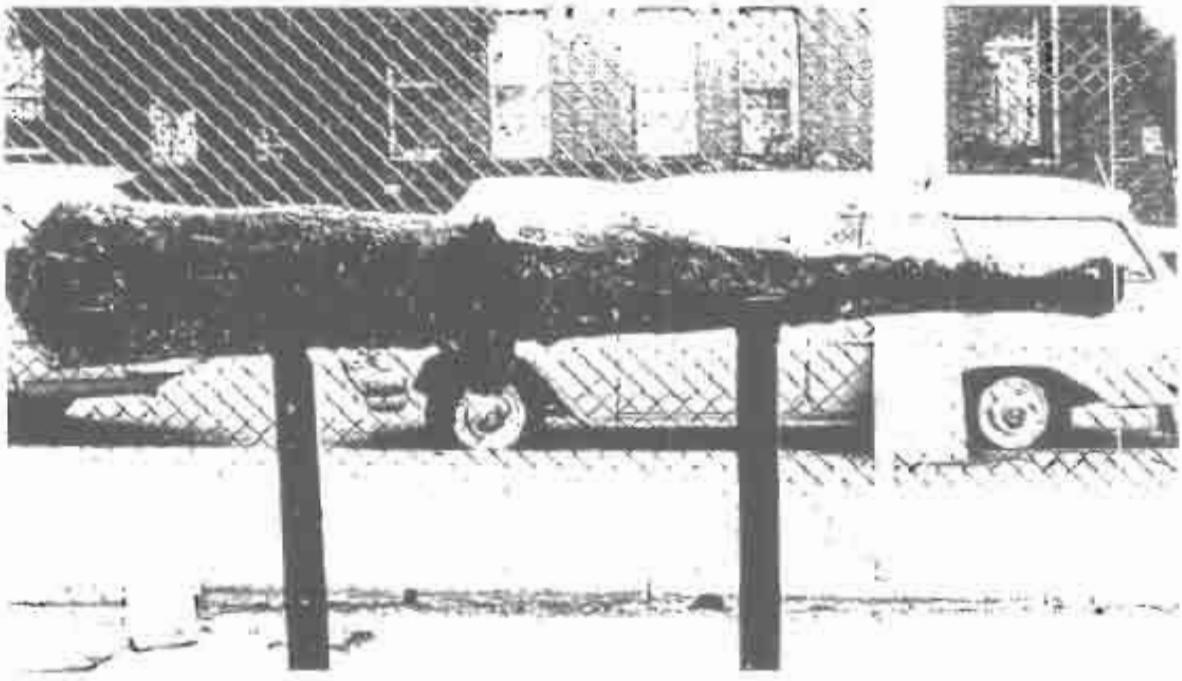
ZW 5575 — Cannon, very pitted and eroded.
Length 2.41m. Bore 70mm.
Raised 1963.

Both these cannon were raised in 1963 by Hugh Edwards and the W.A. Newspapers. The cannon remained in the yard at the rear of the W.A. Newspapers until sent to the scrap metal dealer Krasnostein at the end of 1967. The Museum was informed and took possession in 1968. Both cannon have lost all surface features with just solid core remaining.

ZW 5578 — Cannon, surface layers eroded away.
Length c.2.40m. Bore c.110mm.
Raised 1962.
Owner: Geraldton Tourist Centre.



Iron cannon from the Zeewijk (1727) ZM 5572



Iron cannon from the Zeewijk (1727) ZM 5573

This cannon was raised in 1962 by Mr. T. Sutcliffe of Geraldton and left in the Council yard. It was then moved to the R.S.L. Hall before going on to another yard. A scrap metal dealer then bought it for $10.00 and then offered it to Mr. M. Cramer for sale. The Tourist Bureau eventually bought it for $20.00 and it is now on display outside the Geraldton Library and Tourist Centre.

Other heavy items

Armament:

Zeewijk

ZW 1345 — Part of copper alloy breech loading swivel gun (similar to Stokes' gun).

ZW 2163 — Part of copper alloy swivel gun - trunnion section.

Grindstones:

Vergulde Draeck

GT 1429 — Sandstone grindstone.
Diam. 0.872m. Thickness 0.112m. Hole size 0.060mm.

GT 1427 — Sandstone grindstone.
Diam. 1.096m. Thickness 0.120m. Hole size 0.072mm.

GT 1428 — Sandstone grindstone.
Diam. 0.920m. Thickness 0.104m. Hole size 0.060mm.

Concretions:

Zeewijk

ZW 3117 — Barrel of nails concretions.

Appendix I

THE SILVERWARE COLLECTION FROM THE VOC SHIP BATAVIA (1629)

Myra Stanbury

The silverware recovered from the wreck of the Batavia is a unique collection, the wares ranging from baluster-shaped bed-post knobs to delicately engraved bowls, ewers and salvers. Few of the objects have survived intact. Indeed, much of the hollow-ware was unrecognisably misshapen when found. After careful conservation and restoration, however, many of the objects have been re-formed as close to their original shape as possible.

It seems almost certain that the objects were part of a consignment of goods intended to promote the so-called aristocratic "toy" trade in India. The term "toys" referred to luxury imported goods, curios, works of art or other rare objects which might ingratiate foreign high officials and advertise the skills of European craftsmen. Francisco Pelsaert (Commander of the Batavia), was instrumental in persuading the Directors of the Dutch East India Company that involvement in such trade might be to their advantage.

Between 1620 and 1627, Pelsaert had been the Company's resident merchant in Agra, the seat of the Mogul Court in India and an important centre of the indigo trade. In addition, it had an excellent market for spices, India's major import from Asia. Agra, therefore, had important commercial interests for the Dutch and, to ensure their success, it was essential to establish good relations with the local rulers and leading merchants.

The market for European imports in India was limited, largely because the mass of the population was too poor to buy them. English merchants, however, had demonstrated that the wealthy princes were attracted to "toys" - European goods that would add to their wealth and status or provide them with some amusement. In this regard, the ruling Emperor Jahangir had a noted reputation.

Pelsaert envisaged that by promoting the Dutch "toy" trade among India's aristocrats, the Company's commercial interests could be fostered and the outward bound cargoes from Europe to India made more remunerative. With a knowledge of the

It seems almost certain that the objects were part of a consignment of goods intended to promote the so-called aristocratic "toy" trade in India. The term "toys" referred to luxury imported goods, curios, works of art or other rare objects which might ingratiate foreign high officials and advertise the skills of European craftsmen. Francisco Pelsaert (Commander of the Batavia), was instrumental in persuading the Directors of the Dutch East India Company that involvement in such trade might be to their advantage.

Between 1620 and 1627, Pelsaert had been the Company's resident merchant in Agra, the seat of the Mogul Court in India and an important centre of the indigo trade.

As an initial trial, Pelsaert recommended that a few articles of common usage be manufactured from gold and silver. They should be designed in keeping with local styles and tradition and made to the value of 8,000 to 10,000 reals-of-eight (about 22,000 to 24,000 guilders), or equivalent in gold (Drake-Brockmar, 1963:85). Such items included:

> 'Feet for katels, or bedsteads, hollow, and as light as possible, but artistically wrought.
>
> Aftabas, or ewers used by Moslems for washing hands.
>
> Betel boxes
>
> Fan handles
>
> Handles for fly-switches
>
> Dishes and cups with covers' (Drake-Brockman, 1963:85).

On returning to Amsterdam in 1627, Pelsaert appears to have freely pursued his ideas for the Indian "toy" trade, visiting various skilled jewellers, goldsmiths and silversmiths to commission goods to his own specifications. When he sailed on the Batavia in 1628, he not only had in his possession a large cameo fashioned by the Amsterdam jeweller Gaspar Boudaen but 'gold and silver services for domestic use....., valued at 62,811 guilders' (Drake-Brockman, 1963:86). Clearly, the consignment was incomplete as several items ordered by Pelsaert were sent to the Indies on a later ship. They comprised 'four posts for a bed, a chamber-pot, a ewer, and a big dish' (Drake-Brockman, 1963:86). All were made from pure gold and destined to be sold to the Mogul Emperor, or other 'mighty men of the same Realm' (Drake-Brockman, 1963:86).

From Pelsaert's journals, it is evident that some of the silverware carried on board the Batavia was in fact salvaged from the wreck. Several attempts had been made by divers to recover the money chests, but one trapped underneath a cannon and anchor remained a problem. While attempting once more to locate this chest on 5 November 1629, divers 'fished up the Box [Casse] with the Tinsel, as well as 4 silver Moorish fruit-dishes, with a ditto hand-basin [lampetschotel].....' (Drake-Brockman, 1963:220). Again, on 12 November 1629, divers returned with a further two silver dishes.

Thus, in addition to 10 chests of coin, Pelsaert returned to Batavia (Jakarta) from the Houtman Abrolhos with a casket of jewels, (including the Gaspar Boudaen cameo), and some of the wrought silverware. By this time, however, Emperor Jahangir (with whom Pelsaert had been personally acquainted), had died. Furthermore, he had been succeeded by a son, Shah Jahan, who displayed little of his father's

interest in frivolous "toys". He was more concerned with architectural pursuits and later built the Taj Mahal.

The Council of the Indies were doubtful, therefore, whether the goods would still prove good merchandise at the Mogul Court. Nevertheless, subsequent to Pelsaert's death in 1630, efforts were made by the Company to sell the gold and silver services and Cameo in India. They were consigned there in 1632, but while the gold plate was finally sold for a price far below its estimated worth, the Cameo was returned unsold to Batavia. After several unsuccessful attempts to sell the jewel in Surat, Sumatra, Persia and Siam, it was finally returned to Holland in 1656.

The fine engravings on the Batavia silverware are attempts by European craftsmen to imitate the culture and lifestyle of the Indian aristocracy. The hunting and fishing scenes depicted on the edge of a large plate (BAT 3432) and around the body of a circular pedestal bowl (BAT 3009) were obviously designed to appeal to Jahangir's love of big-game hunting. It is interesting here to note that similar scenes of bear hunts, killing hog deer and fox and wolf shooting appear on early 19th century blue-printed English Spode dinnerware entitled 'Indian Sporting' Series (Coysh & Henrywood, 1983).

Motifs on the ewer (BAT 3035) link this object more closely with Moslem practices and, indeed, confirm its function. While one engraved motif shows a servant presenting his seated master with a covered bowl, another shows a servant carrying a basin and ewer, while the princly Mogul figure sits drying his hands on a towel. The ewer depicted on the engraving is a replica of the object itself.

A third motif on the ewer is unclear, but appears to show a covered bowl (similar to BAT 3009) being presented on a plate or tray. In keeping with Moslem tradition, the three scenes demonstrate the ritual cleansing of hands prior to the partaking of food or drink. Again, the motifs of reclining Moorish figures on the bed-post knobs confirm their function and emphasise the life of luxury and pleasure engaged in by the wealthy Indian lords.

Figures of women are notably absent from any of the engravings which clearly reflects the lesser status they held in such societies. Pelsaert however, was intently aware of their position and pitied the wealthy "secluded" ladies, servant-girls and peasant women alike. While he was prepared to exploit the wealth of the ruling princes for the benefit of Dutch commercial enterprise, he personally deplored their glittering lifestyle in the midst of poverty and oppression.

Although small silver items have been recovered from other 17th and 18th century Dutch wrecks (for example, the Lastdrager (1653) and Hollandia (1743)), the finds in no way compare with those of the Batavia. A set of nine cast silver figurines (or poppenzilver) from the Lastdrager were probably among the effects of one of the passengers, rather than being trade goods (Stenuit, 1977:454). A baluster-shaped sword (or rapier) pommel, (Stenuit, 1977:458) however, may well have fallen into the category of "toy" goods. Similar pommels were recovered from the Hollandia (Nienhuis, 1974:30) and show a strong resemblance to the style of the Batavia bed-post knobs. After their first, (not too successful) venture into the "toy" trade, it is probable that future items commissioned by the Company were limited to smaller less expensive wares, such as the silver sword pommels. These assumptions, however, require further investigation.

Whether the Batavia silverware was the work of one silversmith is difficult to ascertain since few pieces have remains of any maker's mark. To date, the only identifiable piece is the plate (BAT 3432), which bears the town mark of Amsterdam, the date letter 'S', (1628), and the mark of the maker - Abraham van der Plaetsen (Citroen, 1975:14). The engravings on many of the objects, however, are similarly executed, the same types of scrolls and flowers appearing on dissimilar objects, for example the plate and bed-post knobs.

It is likely, therefore, that they were made in one workshop, either by the master himself or craftsmen working under his supervision. This would perhaps account for the slight difference in shape of the hollow bed-post knobs, while their fundamental design is similar.

Altogether, the collection is rare inasmuch as it represents a special consignment of wares designed for a specific economic purpose. Manufactured with the highest degree of Dutch skill and craftsmanship, the inherent value of these goods lay not so much in their monetary (or aesthetic) worth (and profits that might accrue from their sale) as in their calculated potential for furthering the broader economic pursuits of the Dutch East India Company.

Batavia bed-post knobs. After their first, (not too successful) venture into the "toy" trade, it is probable that future items commissioned by the Company were limited to smaller less expensive wares, such as the silver sword pommels. These assumptions, however, require further investigation.

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The Batavia silverware was produced in competition with "Buyse" from other European countries with the aim of enhancing trade in India. It is perhaps a tangible reminder, therefore, of the efforts made by the Dutch in the 17th century to attain commercial supremacy of the Indian Ocean.

References:

Carroen, K.A., (1975)
Amsterdam Silversmiths and their Marks
Amsterdam and Oxford: North Holland Publishing Co.

Coysh, A.W. and Henrywood, R.K., (1982)
The Dictionary of Blue and White Printed Pottery 1780-1880
England: The Antique Collectors' Club

Drake-Brockman, H., (1963)
Voyage to Disaster
Sydney: Angus and Robertson. Australian Classics Edition 1982.

Nienhuis, H.S., (1974)
Catalogus Van De Kunstveiling 427
Kunstveilingen Mak Van Waay B.V.
Amsterdam: Algemene Bank Nederland N.V.

Stemmit, R., (1977)
The Wreck of the V.O.C. Fluit Lastdrager Lost off Yell, (Shetland) 1653
In Green, J. (Ed) The AVOC Jacht Vergulde Draeck Wrecked Western Australia, 1656, Part II:403-461.

Restored silver bedposts and stemmed bowl from the [illegible]

BATAVIA SILVER - Non-ferrous 35

BED-POST KNOBS

BAT 3030 — Baluster-shaped bed-post knob with engraving. 2 retangular box-like openings at right angles to each other at mid-diameter of bowl.
Ht. 270 mm; upper bowl diam 138 mm;
Lower ring diam 90 mm;
Lower bowl diam 90 mm

BAT 3032 — Lower ring of bed-post knob.
Partly restored.
Lower ring diam 80 mm.

BAT 3177 — Fragmented bed-post knob - partly restored. Engraved with scrolls and motif of Morish gentleman reclining on a couch.
Ht. 218 mm; upper bowl diam 130 mm
Lower ring diam 73 mm
Lower bowl diam N/A.

BAT 3178 — Lower bowl of bed-post knob - restored. Engraved with scrolls.
Lower bowl diam c. 91 mm.

BAT 3245 — Bed-post knob - complete. Restored. Engraved with scrolls and flowers. An oval motif supported by seraphic figures depicts a Moorish gentleman reclining on a couch. Columns in the background support a canopy
Ht. 220 mm; upper bowl diam 130 mm
Lower ring diam 75 mm
Lower bowl diam N/A.

BAT 3651A — Fragments of bed-post knob. Engraved with scrolls and other designs.
Measurements N/A.

BAT 3823 — Fragments of bed-post knob. Engraved with scrolls and 2 circular motifs framed by draped curtains. One has a reclining figure with a ewer and hand-basin at the bottom of the motif. Other features are not identifiable.
Ht. 186 mm; upper bowl diam 125 mm.

The rectangular box-like openings in the main body of the bed-post knobs are all approximately 40 mm x 34 mm. Set at right angles to one another in one quadrant

BAT 3032 — Lower ring of bed-post knob.
Partly restored.
Lower ring diam 80 mm.

BAT 3177 — Fragmented bed-post knob - partly restored. Engraved with scrolls and motif of Morish gentleman reclining on a couch.
Ht. 218 mm; upper bowl diam 130 mm
Lower ring diam 73 mm
Lower bowl diam N/A.

BAT 3178 — Lower bowl of bed-post knob - restored. Engraved with scrolls.
Lower bowl diam c. 91 mm.

BAT 3245 — Bed-post knob - complete. Restored.

BOWLS

BAT 3009
[including 3010 & 3011]

Circular bowl engraved with hunting scenes, griffins and scrolls on short pedestal with a spreading rim foot. Incomplete. Partially restored. One motif depicts a fox hunt with hunter and hounds attacking the fox; the second, a deer hunt with hounds attacking a deer. The hunter with spear is only partially seen on the right hand side of the motif.
Ht. 147.5 mm
Diam of bowl 153 mm
Diam of footrim 109mm.

BUTTON

BAT 565A

Button

CANDELABRUM

BAT 3643

Restored silver object - possibly candelabrum (or foot of bedstead)

CHALICES

BAT 3563

Engraved object - possibly chalice. Decorated with scrolls, flowers and one motif with pillared building. Incomplete and fragmented.
Ht. c. 190 mm
Rim diam 167 mm

BAT 3565

2 Fragments of engraved silver - possibly footrim of chalice. Zig-zag tooling marks on underside.

CLAW FOOT

BAT 3564

Claw foot with four talons supporting a ball

CURLED OBJECT

BAT 3562

Curly object - possibly handle or foot of object.

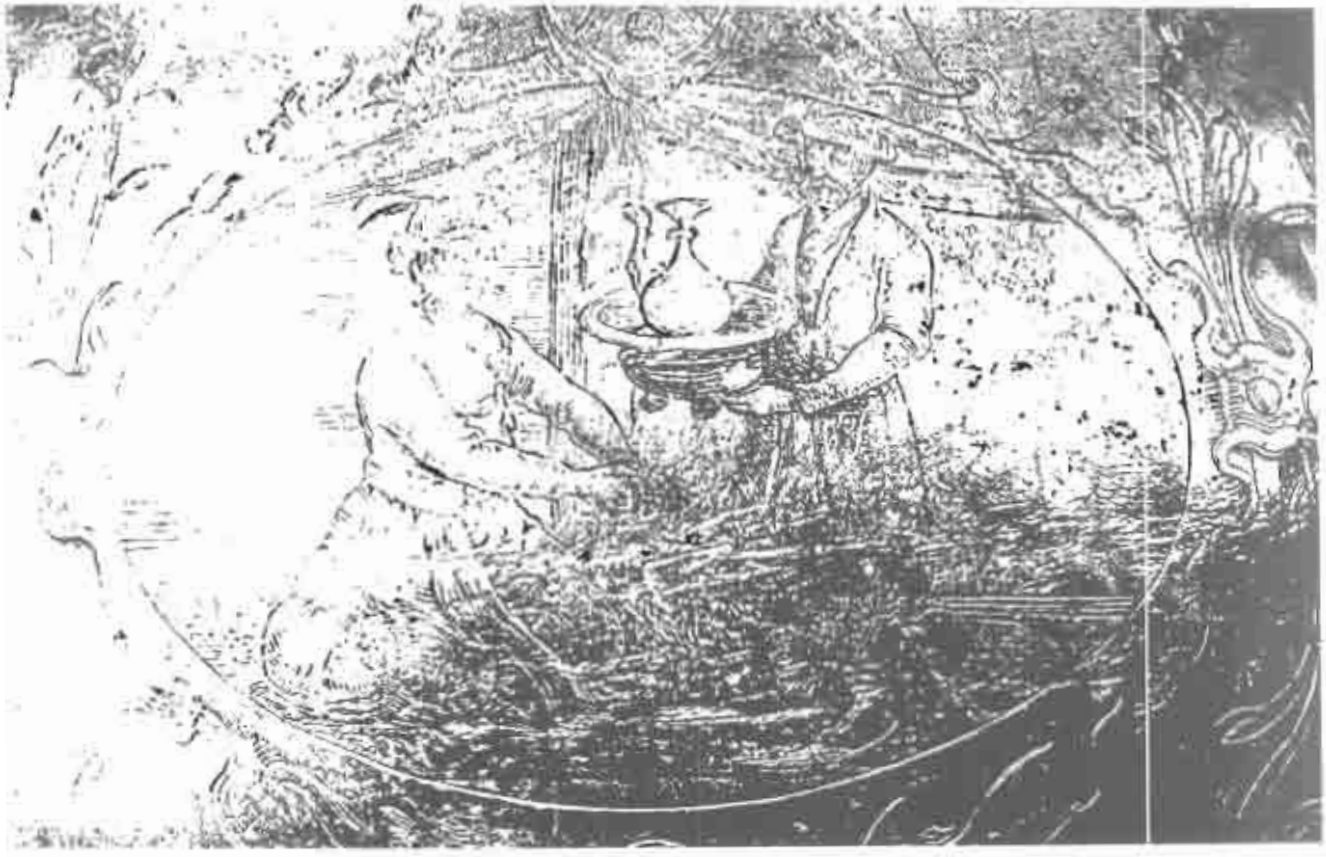
EWERS

BAT 3035

Ewer engraved with cherubs, garlands of flowers and scrolls, with 3 motifs depicting Moorish scenes. One scene shows a figure carrying a vessel similar to the object on a tray. Spout and pouring rim missing.
Ht. 250 mm; Footrim diam 113 mm; belly diam 530 mm neck diam 40 mm; volume 1850 ml.

BAT 3059

Neck of ewer (similar to 3035). Engraving obscured.



Engraved motif from silver ewer BAT 3035
Shows ewer similar to the object itself.

Engraved motif from silver plate BAT 3432.
Shows hunter and hounds chasing a hog deer.

BAT 3069 — Spout with lion's head mouth. The mane of the lion extends down the remainder of the spout which is slightly S-shaped. [From the engraving on 3035 this spout would come from a similar vessel but does not fit 3035]
Length 170mm; diam c. 14 mm.

BAT 3505 — Spout similar to 3069 but very eroded.
Length 114 mm.

PENDANT

BAT 3594 — Baluster-shaped pendant (or shoulder belt fastening - bandeliersluitingen).

PLATES (or Salvers)

BAT 3432 — Plate with engraved edge. Approximately 2/3 of plate intact, remainder eroded. Three motifs around the rim depict hunting and fishing pursuits:
(a) shows a fishing scene;
(b) a hunter and hounds chasing a hog deer;
(c) two hunters about to spear a bear.

On the reverse of the plate are the:

(a) town mark of Amsterdam;
(b) date letter 'S', denoting 1628;
(c) maker's mark A.V.P. - Abraham Van Der Plaetsen.

Diam. 334 mm; Rim width c. 47 mm
(Ref. Citroen, 1975:14)

BAT 3626 — Flat fragment of engraved silver - possibly part of plate.

QUILL HOLDER

BAT 3644 — Triangular engraved object with central circular holder - possibly for quills

RINGS

BAT 3573 — Ring - with copper coating. Appears to have a flat base as if part of a tubular object.
Diam. 31 mm; thickness 35 mm (but worn).

SCREW TOP

BAT 3835 — 2 sections of screw top.

SWORD HILT

BAT 3605 — Unidentified object, possibly part of sword hilt.

BAT 3744 — 3 fragments of unidentified object, possibly sword hilt.

MISCELLANEOUS FRAGMENTS

BAT 3601 — Fragment of silver

GILDED SILVER: Non-ferrous 36.

CHERUBS

BAT 3568 — Part of winged cherub with flute (or pipe) held to mouth with right hand and trumpet held in left arm.

BAT 3603 — Winged cherub blowing a trumpet.

BAT 3874 — Part of winged cherub with trumpet held in left arm.

These small cast figures range from 2 to 3 cm in height. All have remains of silver on the reverse indicating they were attached to a hollow silver object of some kind. In view of their similarity, and the fact that all three were recovered in the same general locality of the wrecksite, it is possible that they came from the same object.

Gilded silver cherub
BAT 3603
Photo. Pat Baker

Appendix 2

THE PEWTER COLLECTION FROM THE *BATAVIA* (1629)

In contrast to the silverware collection from the *Batavia*, the pewter items are representative of the common inventory of wares used on board ship by the officers and crew. Jugs, plates, beakers, measures and so on, are among the lists of ship's equipment issued by the *Kaeren XVII* for a *Retourschip* (Green, 1977:375). Surprisingly, a greater variety of pewter objects have survived from the *Batavia* than from the *Vergulde Draeck* (1656), making this a more interesting collection.

As a complement to the photographs of the pewter collection issued to the Netherlands and Commonwealth Governments, the various items in the collection have been re-collated from earlier catalogues. Rather than provide a list of the individual pewter bottle caps, a preliminary analysis of these finds is included.

Pewter objects from the *Batavia* collection.

BAT 3031 BAT 3004

BAT 3220 BAT 374 BAT 3376

BAT 503 BAT 373

BAT 529 BAT 3687

A PRELIMINARY ANALYSIS OF THE PEWTER BOTTLE CAPS FROM THE *BATAVIA*

Myra Stanbury.

The pewter bottle caps from the *Batavia* are similar to those recovered from the *Vergulde Draeck* (1656) (Green, 1977:216) and other Dutch wrecks of the period. They consist of a screw threaded cap which fits a matching collar attached to the rim and upper neck of the bottle. The collar thus acts as a reinforcement for the fragile glass neck.

While several caps were recovered from the wrecksite intact, most are only partially complete, some being entirely fragmented. In many instances, remains of the glass bottle necks are in situ and may give some indication as to the probable size of the bottle. As with the *Vergulde Draeck* examples, the pale green glass remains are indicative of square shouldered case bottles. Such bottles are frequently depicted in 17th century Dutch paintings of apothecary shops, (e.g. Hendrick Heerschop's *The Alchemist*), and doctors' surgeries, (e.g. Joos van Craesbeeck's *The Doctor's Diagnosis* and Adriaen Brouwer's *The Bitter Draught*). The distilling of "Geneva" (or Dutch gin) was a profitable side-line for 17th century apothecaries and the square case bottles are believed to have been used by them for retailing this spirit.

It is likely that the case bottles from the *Batavia* were the property of the Officers on board. In addition to their sea-chests, senior officers were entitled to include '4 fleskelders' among their personal possessions (Green, 1977:348)[1]. Other officers were allowed one *kelder* in addition to their sea chest.

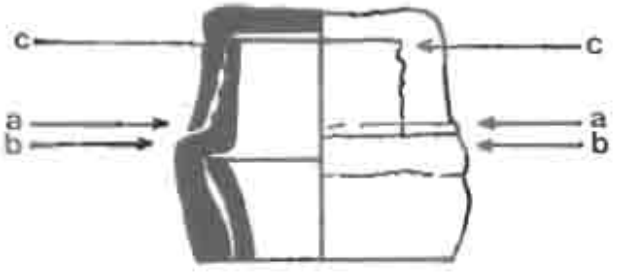
The caps in the *Batavia* collection fall into two main categories:

a) those with rings and/or attachments for rings;

b) those without rings.

Within these two groups there is both a variation in size and in individual stylistic features. Some of the larger bottle caps, for example, are decorated with turned markings, whereas others are entirely plain.

In order to demonstrate the variation in size, (both within and between each category), the registered artefacts have been listed in statistically significant groups (see Tables I, II and III). Measurable indices were chosen as follows:



Where:

a = Cap diameter - maximum diameter of base of screw cap

b = Collar diameter - maximum diameter of collar

c = "Screw" diameter - maximum diameter of screw neck of collar

1. The *kelder* or *fleskelder* were small wooden chests holding 15 square case bottles: van Dale (1970) cited in Green, 1977:348

TABLE I

A. Bottle Caps with Ring and/or Ring Attachment

Group A	Reg. No.	Cap Diam(mm)	Collar Diam(mm)
I	BAT 3421	17.0	27.0
	BAT 3344	19.0	21.5
11.76%		18± 1.4 Var. 1.0	
II	BAT 3675	21.0	N/A
	BAT 3723	21.0	N/A
	BAT 7060C	21.0	N/A
	BAT 3503A	22.0	31.0
	BAT 3466	23.5	30.0
	BAT 624A	24.0	N/A
	BAT 711	24.0	N/A
	BAT 3314	24.0	30.0
	BAT 3821B	24.0	N/A
	BAT 3445	25.0	28.0
	BAT 3503B	25.0	N/A
	BAT 3821A	25.0	N/A
	BAT 7060A	25.0	N/A
76.47%		23.42± 1.6 Var 2.37	
III	BAT 3479	31.0	N/A
5.88%			
IV	BAT 3342	N/A	32.0
5.88%			

Total number of caps = 17

N.B. Two rings (BAT 3734), with diameters of 25 mm and 28 mm are thought to be rings from bottle caps, but are not included in this analysis.

TABLE II

B. Bottle caps with no ring

Group B	Reg. No.	Cap Diam(mm)	Collar Diam(mm)
I	BAT 7101	17.0	N/A
6.67%	BAT 3414	17.5	N/A
		17.25±0.35	
		Var. 0.0625	
II	BAT 624B	20.0	N/A
	BAT 709A	21.0	26.0
	BAT 3709	21.0	c. 26.5+
	BAT 3789	21.0	30.0
	BAT 3067	21.5	N/A
	BAT 3782	22.0	N/A
43.33%	BAT 3255	22.5	30.0
	BAT 3727	23.0	30.0
	BAT 3733	23.0	N/A
	BAT 3298	24.0	30.0
	BAT 3299	24.0	26.5
	BAT 490	25.0	N/A
	BAT 7060B	25.0	30.0
		22.5±1.6	
		Var 2.44	
III 3.33%	BAT 3317	32.0	40.0
IV	BAT 3285	35.0	37.0
	BAT 3286	35.0	38.0
	BAT 3510	35.0	N/A
23.33%	BAT 3374	36.0	41.0
	BAT 3319	36.5	40.0
	BAT 7045	37.0	42.0
	BAT 3046	37.0	N/A
		35.9±0.9	
		Var 0.7	
V	BAT 3758	40.0	N/A
	BAT 669	43.0	N/A
6.67%		41.5±2.12	
		Var 2.25	
VI	BAT 664	N/A	N/A
	BAT 3446(3)	N/A	N/A
16.67%	BAT 3768	N/A	N/A

Total number of caps = 30

TABLE III

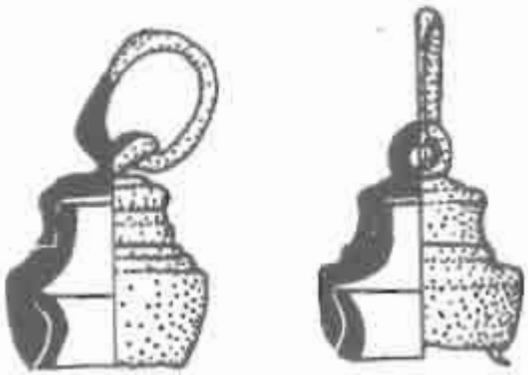
C. Bottle top collars

Group C	Reg. No.	"Screw" Diam(mm)	Collar Diam(mm)
I 8.00%	BAT 7005	15.0	N/A
II	BAT 3172	17.0	25.0
	BAT 3668	17.0	28.0
	BAT 3722	17.5	32.0
	BAT 3466	18.0	28.0
	BAT 7051	18.0	30.0
	BAT 3342	18.5	32.0
50%		17.67±0.6 Var 0.3	29.17±2.7 Var 6.14
III	BAT 7002	20.0	N/A
	BAT 7073	20.0	N/A
17%		20.0	
IV	BAT 3503C	N/A	25.0
	BAT 7004	N/A	35.0
25%	BAT 7114	N/A	N/A

Total number of collars - 12

Pewter Bottle Caps from the *BATAVIA*

AI



3344 3421

AII

3445 3466 3314

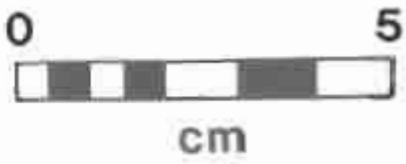
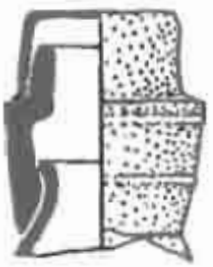


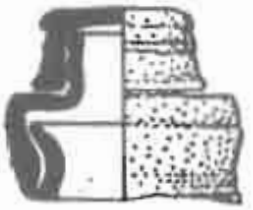
Figure 1

Pewter Bottle Caps from the *BATAVIA*

BII



3299

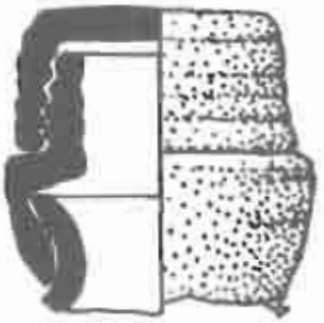


3255

BIV

3285

3286



3319

3374

CII

3172

3466

0 5

cm

Figure 2

From the results tabled, it will be seen that there is less variation of size among the bottle tops with rings than there is among those without them. In the former group, cap diameters range from 17.0 mm to 31 mm while in the latter the range is from 17.0 mm to 43 mm. The largest proportion of bottle caps in both groups fall into Groups AII and BII where the average cap diameters are 23.42± 1.6 mm and 22.5± 1.6 mm respectively. Of the larger bottle caps, those in Group BIV with an average cap diameter of 35.9± 0.9 mm have survived in more significant numbers (23.33%) than those of 40 mm or more (6.67%).

Among the bottle top collars, the greater proportion are found to fall into Group CII (50%) with an average "screw" diameter of 17.67± 0.6 mm. Comparative measurements of complete bottle caps in groups AII and BII (Figs. 1 and 2) indicate that this size of screw neck would be compatible with the cap diameters associated with these two groups. So too, would the 20 mm screw necks in Group CIII.

From the overall results of this preliminary analysis, it can be demonstrated that of a total of 59 bottle caps and collars, 57.63% fall into a medium range category of bottle cap with diameters of 20 to 25 mm. Caps with diameters ranging from 35 to 37 mm form the next largest group (11.86%); caps of 19 mm or less 8.47%; and those of 40 mm and above only 3.39%. The remainder is made up of 3.39% of 31 to 32 mm caps and 15.25% unmeasurable.

Whether or not there is any significant relationship between the size of the pewter bottle cap and the type and/or size of bottle it belongs to has not yet been determined and requires further investigation. It is interesting to note, however, that caps with diameters of 20 mm and c. 35 mm form two of the three basic types of caps in the *Vergulde Draeck* collection (Green, 1977:216-217). Green has suggested that these medium and small caps may possibly have belonged to 'onion' bottles or schnaps flasks.

From the limited collection of glass remains from the *Batavia*, there is little indication of any onion bottle sherds. Rather, the majority of fragments are bases, necks and wall sherds of square sided bottles. Measurable bases indicate at least three sizes of bottle, these being 95 mm x 95 mm; 80 mm x 80 mm; and 68 mm x 65 mm. This would appear to indicate a collection of bottles of smaller average size than those from the *Vergulde Draeck* (i.e. 107 mm x 105 mm) (Green, 1977:224). However, a detailed comparative study is required to confirm this assumption.

While this preliminary analysis of the bottle caps was to a certain degree experimental, the results are significant to indicate that, with a closer comparative study of their association with the glass components, some definitive statements may ensue as to the relationship between particular sizes of bottle caps and the size and type of bottle to which they belong.

References:

Green, J.N. ed. (1977)
The AVOC Jacht Vergulde Draeck *Wrecked Western Australia 1656*
Oxford: British Archaeological Reports. BAR SS.36.

CONTAINERS

Chamber Pots (Waterpotten)

BAT 3031 Chamber pot - handle missing.
Base diam. 135 mm; body diam. 175 mm;
Rim diam. 148 mm; ht. 136 mm.

BAT 7112 Chamber pot - handle intact.
Diams. N/A

BAT 3173 Fragments of chamber pot.

Measures (Maatjes)

BAT 3209 Fragments of small measure with part of handle.
Ht. 52.5 mm

Lidded Measures (or tankards)

BAT 437 Lidded measure - complete
Ht. c. 115 mm

BAT 3427 Lid with knob (similar to 437) - incomplete
No remnants of hinge lug.
Diam. c. 79 mm

BAT 7068 Fragments of hinge lug, lid and side wall of lidded measure (or spouted flagon)

BAT 461 Handle fragment)
BAT 3153 Handle fragment) From lidded measure or spouted flagon.
BAT 3764 Handle fragment)
BAT 7035 Handle fragment)

BAT 438 Pewter mount (lid) with remains of stoneware handle

Spouted Flagons (Jan Steen jugs or pipjpkan)

BAT 439 Spouted flagon - complete

BAT 3004 Spouted flagon (as 439) - spout and most of lid missing
Ht. 200 mm; base diam. 107 mm; rim diam. 90 mm

BAT 333 Lid with part of hinge lug (similar to lid of 439)
Diam. 78 mm.

DRINKING VESSELS

Beakers (Bekers)

BAT 529 Beaker - incomplete. Upper part only
Rim diam. 66 mm; ht. c. 70 mm

BAT 563 Beaker - partly eroded
Rim diam. 73 mm; base diam. c. 54 mm; ht. c. 72.5 mm

BAT 3220 Beaker - complete
Rim diam. 66 mm; base diam. 41 mm; ht. 67.5 mm.

Goblets (or chalices - miskelkjes)

BAT 373A Base and stem of goblet (as 3376)
Base diam. 41 mm; stem diam. 30 mm; ht. 3.5 mm

BAT 494 Part of footrim of goblet
Base diam. 63.5 mm; stem diam. c. 53 mm

BAT 692 Part of footrim of goblet
Base diam. 70 mm; stem diam 52 mm

BAT 3088 Part of footrim of goblet
Base diam. 66.5 mm; stem diam. 53 mm

BAT 3376 Goblet - complete
Ht. 82 mm; base diam. 40 mm; rim diam. 63 mm;
Stem diam. 30 mm
Crown of maker's touch mark only

BAT 374 Base and stem - probably from large chalice.
Engraved band of leaf and scroll motifs on
underside of footrim.
Base diam. 82.5 mm; stem diam. 50 mm

BAT 3152 Part of stem - possibly from goblet

PLATES

BAT 441 Plate.
Diam: N/A

BAT 442 Plate.
Diam: N/A

BAT 560 Plate. Maker's touch mark on edge of rim - Tudor
Rose and Crown: on underside - an Angel with staff.

Goblets (or chalices - miskelkjes)

BAT 373A Base and stem of goblet (as 3376)
Base diam. 41 mm; stem diam. 30 mm; ht. 3.5 mm

BAT 494 Part of footrim of goblet
Base diam. 63.5 mm; stem diam. c. 53 mm

BAT 692 Part of footrim of goblet
Base diam. 70 mm; stem diam 52 mm

BAT 3088 Part of footrim of goblet
Base diam. 66.5 mm; stem diam. 53 mm

BAT 3376 Goblet - complete

SPOONS

Maker's touch mark

1. Crowned tudor rose with initials G.A. in crown.

BAT 3073B Complete spoon with round bowl and flat end.
Diam. 59 mm; length 171 mm

2. Crowned tudor rose with initials B.D.W. in crown.

BAT 3073A Complete spoon with round bowl and flat end.
Diam. 61 mm; length 166 mm

BAT 3200 Complete spoon with round bowl and flat end.
Diam. 58 mm; length 163 mm.

BAT 7092 Round bowl and part handle. Graffiti on reverse of bowl.
Diam. 63 mm

BAT 7094 Round bowl and part handle.
Diam. 60 mm

3. Crowned tudor rose with initials L.I.F. (?) in crown.

BAT 3111 Round bowl - no handle. Several graffiti marks on inside of bowl.
Diam. 52 mm

4. Crowned tudor rose - initials not identifiable.

BAT 3080 Complete spoon with round bowl and flat end
Diam. 60 mm; length 181 mm

BAT 3179 Part of round bowl and handle with flat end.
Diam. c. 60 mm; length 170 mm.

BAT 3334 Fig bowl with erosions
Diam. 53.5 mm.

5. Crowned tudor rose with date in crown.

BAT 3687 Complete spoon with round bowl and flared flat end.
Crowned tudor rose bears date 1627. Alongside are crowned arms of Friesland with initials M.S. in crown.
Several graffiti marks and initials W.I.A. on inside

BAT 3073A Complete spoon with round bowl and flat end.
Diam. 61 mm; length 166 mm

BAT 3200 Complete spoon with round bowl and flat end.
Diam. 58 mm; length 163 mm.

BAT 7092 Round bowl and part handle. Graffiti on reverse of bowl.
Diam. 63 mm

BAT 7094 Round bowl and part handle.
Diam. 60 mm

3. Crowned tudor rose with initials L.I.F. (?) in crown.

BAT 3111 Round bowl - no handle. Several graffiti marks on inside of bowl.

7. Spoons with no (or unidentifiable) touch marks

BAT 3081 Complete spoon with fig bowl and baluster knop. Diam. 54 mm; length 182 mm.

BAT 3115 Part of round bowl with concretion attached. Diam 55 mm

BAT 3180 Part of round bowl and part handle

BAT 3190 Part of round bowl (small section only)

BAT 3402 Part of round spoon bowl - very encrusted

BAT 3662 Round bowl - no handle or markings

BAT 7049 Part of round spoon bowl and handle - encrusted

BAT 7053 Part of bowl and handle - very encrusted

BAT 7091 Part of very eroded round bowl with part of handle. Signs of graffiti on inside of bowl. No touch mark. Diam. 75 mm

8. Spoon handles

BAT 671 Handle with flat end

BAT 3102 2 Handles with flat ends

BAT 3135 Handle with flat end

BAT 3164 2 Handles (& 2 fragments) with flat ends

BAT 3182 Handle - end eroded

BAT 3202 Handle with flat end

BAT 3676 Part of handle

BAT 3704 Handle with flat end. Bears graffiti on two sides of handle: side (a) XXXX XXIII
side (b) M N(?)A

BAT 3766 Part of handle with flat end

BAT 3771 Handle with flat end

BAT 7082 Handle with flat end

BAT 3402 Part of round spoon bowl - very encrusted

BAT 3662 Round bowl - no handle or markings

BAT 7049 Part of round spoon bowl and handle - encrusted

BAT 7053 Part of bowl and handle - very encrusted

BAT 7091 Part of very eroded round bowl with part of handle. Signs of graffiti on inside of bowl. No touch mark. Diam. 75 mm

8. Spoon handles

BAT 671 Handle with flat end

WEIGHING PAN

BAT 568 Weighing pan with 3 brass suspension wires
Diam. c. 122 mm

WRITING EQUIPMENT

BAT 566 Rectangular pen and ink tray and square inkwell.
Tray: 10 cm x 16 cm x 1.7 cm with partition for pens and holder for circular inkwell or pen holder.
Sides are decorated with crosses and dots.

Sides are decorated with crosses and dots.

A GENUINE SIXTEENTH CENTURY FORGED COIN

Dr. Ian D. MacLeod
Department of Materials Conservation and Restoration

Introduction

An interesting byproduct of the conservation treatment given to corroded silver coins recovered from the *Batavia*, and the *Rapid* is that some contemporary forgeries have been discovered. One forged Spanish silver dollar from the *Rapid* was found to have been made of a copper based core which was laminated with sterling silver and which bore the correct impressions of a coin made at the Mexico mint in 1796. After being stabilized by the alkaline dithionite method (MacLeod, 1979:165), the core of the coin was seen to have been corroded inwards from the milled edge which exposed the thin silver top and bottom layers. A fragment of a Rijksdaalder c1620 from the *Batavia* was examined after previous treatment had revealed the laminated structure. The lack of records of previous treatments and absence of a sample of corrosion products precluded a detailed analyses of the base-metal core. Despite these problems there was sufficient residual material to establish that a 0.5 mm layer of sterling silver had been formed around a copper alloy to effect the forgery (MacLeod, 1982:317). Recently, a second example of a forged coin from the *Batavia* was examined in its untreated state and the report below describes how the coin was stabilized and how, through an analysis of the corrosion products and residual metal, the composition and probable mode of fabrication of the original coin was ascertained.

Description of the coin

The coin (BAT916) was recovered during the 1974 excavation on the *Batavia* site and was first examined by the author in October 1982. The coin appeared as a fragmented hollow disc about 4 cm diameter and 2 mm thick. It was covered with marine organisms and corrosion products. The seaward surfaces had the same type of concretion and corrosion products that are commonly found on aerobically corroded coins that assay at 93.5 ± 1.0% silver and 6.5 ± 1.0% copper. The coin was fragmented (Fig. 1) with about 5% of one surface missing. Lustrous ruby red crystals of cuprite (Cu_2O) lay amongst patches of red brown iron stained concretion and large areas of the blue-green copper (II) hydroxy chloride atacamite, $Cu_7Cl_4(OH)_{10}\cdot H_2$). The inner surfaces of the coin (Fig. 2) were partly covered with a grey blue corrosion product film which was all that remained of the base metal core.

Before any chemical treatment was initiated, samples of the

which was all that remained of the base metal core.

Before any chemical treatment was initiated, samples of the corrosion products on both faces of the coin were taken for subsequent nondestructive analysis using X-ray diffraction (XRD) and Scanning Electron Microscopic (SEM) techniques (Robinson, 1979:1322). After the SEM and XRD work was completed the corrosion products were dissolved in 5 wt% nitric acid, 2 wt% hydrochloric acid and 1 wt% tartaric acid and analysed for nine elements using an atomic absorption spectrophotometer (AAS). The SEM analysis of the inner corrosion products showed that they contained a large amount of tin, antimony, lead, silver and traces of gold as well as a large amount of silica (SiO_2). The chemical analysis combined with the XRD and SEM data showed that approximately 72% of the silver was present as silver chloride with the balance being metallic silver. The other elements are present in the form of the corrosion products which were identified by x-ray diffraction techniques (see Table I). The absence of any metal sulphides amongst the oxidized metal is consistent with the well oxygenated nature of the *Batavia* wreck site.

Fig. 1. Obverse of the forged coin (BAT 916) before any treatment

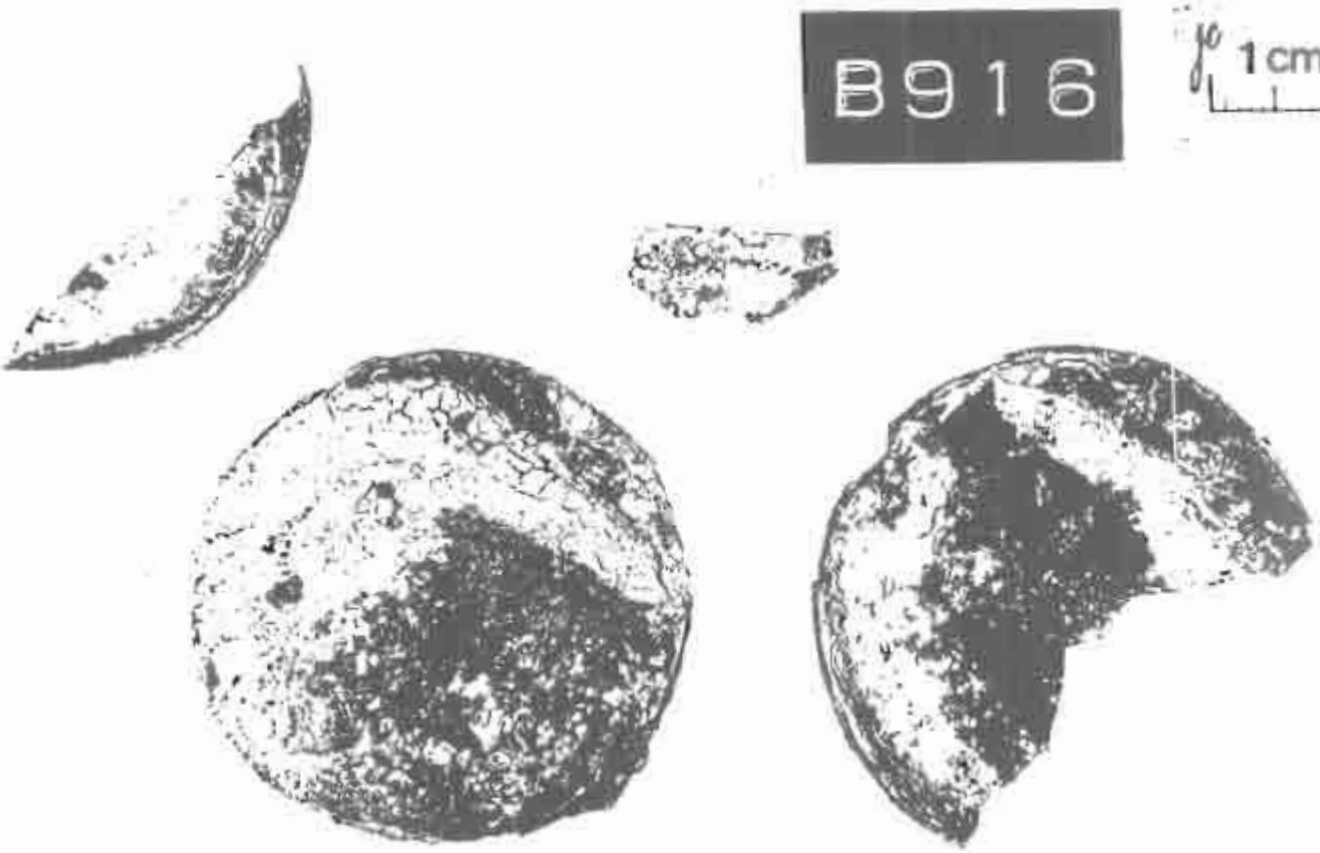


Fig. 2. The inner surfaces of the forged coin showing the corrosion products (light grey) from the core material on a background of silver chloride

TABLE I

Composition of corroded core material from the forged *Batavia* coin

Element	wt% of element measured in corrosion products (AAS)	Mineral phase (XRD)	Calculated composition (wt% of mineral phase in corrosion products)
Silver (Ag)	30.96	Ag AgCl	8.66 29.62
Tin (Sn)	19.89	SnO_2	22.19
Zinc (Zn)	2.18	$ZnSn(OH)_6$	9.54
Copper (Cu)	6.87	Cu_2O	7.73
Lead (Pb)	5.32	$3PbCO_3 \cdot 2Pb(OH)_2 \cdot H_2O$	6.78
Iron (Fe)	1.58	FeO.OH	3.09
Antimony (Sb)	0.63	$Sb_8O_{11}Cl_2$	0.79
Bismuth (Bi)	0.45	Bi_2O_2	0.50
Nickel (Ni)	0.11	NiO	0.14
Silicon (Si)	-	SiO_2	10.86
TOTAL	67.99	-	99.9

	ucts (AAS)		phase in corrosion products)
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Tin (Sn)	19.89	SnO_2	22.19
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Lead (Pb)	5.32	$3PbCO_3 \cdot 2Pb(OH)_2 \cdot H_2O$	6.78

Having established the composition of the corrosion products it is possible to use this data to calculate the composition of the original core if we assume that the ratios of metals is the same in both cases. Analyses of corrosion products and parent metals from a wide range of shipwreck sites has shown that for non ferrous metals on an aerobic site the normalisation method would tend to slightly overestimate the tin, lead and zinc values and underestimate the copper and antimony levels. (MacLeod, 1984:). Since the total metal values in the oxidized layer add up to 67.99%, each element can be multiplied by a factor of (100/67.99) to 'normalise' the total to 100%. The normalised values of 45.5% silver, 29.3% tin, 10.1% copper 7.8% lead and 3.2% zinc, plus smaller amounts of other metals, appear to be very unusual on first inspection (see Table II). Why would forgers use such a large amount of silver when it is the most expensive of all the components? The high silver content of the core on the *Batavia* forgery is in marked contrast to the 2.2% in the *Rapid* coin but it is similar to the amount found in some modern forgeries of 19th century Dutch coins where the silver analysis ranged from 54.2 to 74.8% (see Table II). One possible reason for the large amount of silver in the blank material is the melting point of such a mixture. If the components of the core behaved like a simple silver-tin alloy of similar composition the mixture would have melted at approximately 460 degrees C (Hawkins, 1973:256) which is more than 500 degrees C lower than that needed to melt the core of the forgery from the *Rapid*. The practical implications of this are obvious - the *Batavia* coin and the modern forgeries from Penang could be melted at temperatures reached by a hot wood fire without the need of a sophisticated furnace since the m.p. range of 460 degrees C to 840 degrees C is readily attained in such fires.

The cleaned inner surfaces of the silver casing were examined under the microscope to see if details of its structure could give any clues regarding the techniques used in its manufacture. Inspection of the SEM micrograph (Fig. 3) showed that the inner surface of the remaining metal appeared to be somewhat porous and that it may have been cast. Since the practical problems of casting a sterling silver skin (m.p. approx. 900 degrees C) around a low melting blank (m.p. approx. 460 degrees C) are great it seemed unreasonable to assume that such techniques had been used. A closer inspection of the seaward surface of the coin showed that it was microporous (see Figs. 3 and 4 for details) - such porosity is not found on corroded genuine sterling silver coins.

It was decided to analyse a sample of the remaining metal to see if the results would help in our attempts to establish the method of fabricating the coin. A 15mg sample was dissolved in nitric and tartaric acids and the AAS analysis showed up 87.1% silver, 4.1% copper, 2.4% antimony, 2.2% zinc, 1.6% lead, 1.6% bismuth, a trace iron and no tin (see Table II). The composition of the outer layer of the forged coin is significantly different to that calculated for the inner core and so the differences in corrosion characteristics of the inner and outer regions is not unexpected as the higher tin content would make the inner layers more reactive. The most probable explanation of all these observations is that a metal alloy of

amount of silver when it is the most expensive of all the components? The high silver content of the core on the *Batavia* forgery is in marked contrast to the 2.2% in the *Rapid* coin but it is similar to the amount found in some modern forgeries of 19th century Dutch coins where the silver analysis ranged from 54.2 to 74.8% (see Table II). One possible reason for the large amount of silver in the blank material is the melting point of such a mixture. If the components of the core behaved like a simple silver-tin alloy of similar composition the mixture would have melted at approximately 460 degrees C (Hawkins, 1973:256) which is more than 500 degrees C lower than that needed to melt the core of the forgery from the *Rapid*. The practical implications of this are obvious - the *Batavia* coin and the modern forgeries from Penang could be melted at temperatures reached by a hot wood fire without the need of a sophisticated furnace since the m.p. range of 460 degrees C to 840 degrees C is readily attained in such fires.

The cleaned inner surfaces of the silver casing were examined

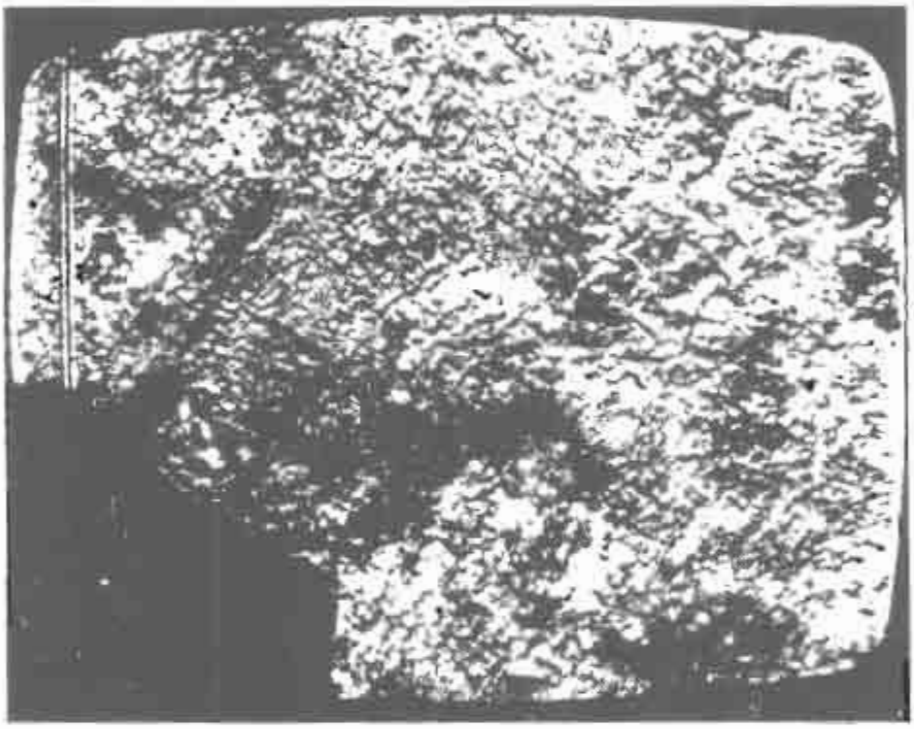

Fig. 3. Scanning electron micrograph of the inner surface of the forged coin showing the flow line pattern of the cast silver casing. Full width 2.64 mm

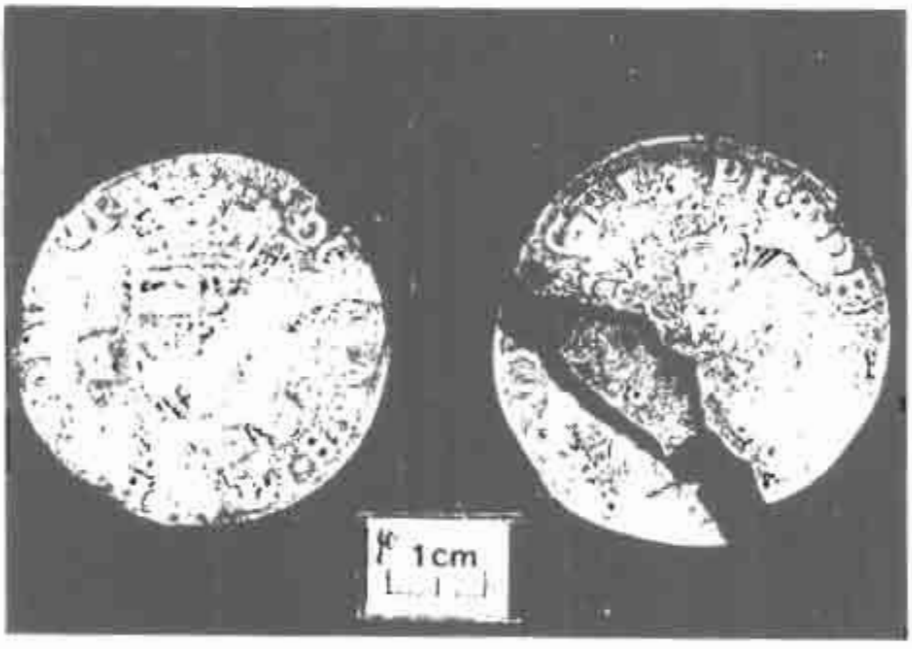

Fig. 4. The forged coin after topical treatment with an alkaline dithionite paste

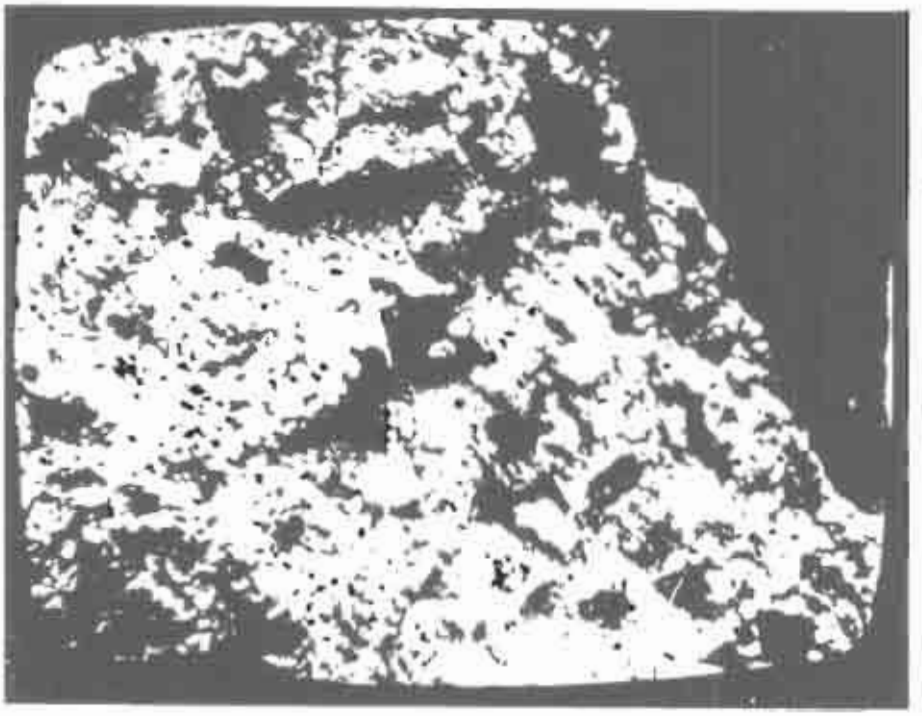

Fig. 5. Scanning electronmicrograph of the outer surface and edge of the forged coin after conservation treatment. The crystaline and porous nature of the surface are readily seen where the metal has been broken. Full width 0.26 mm

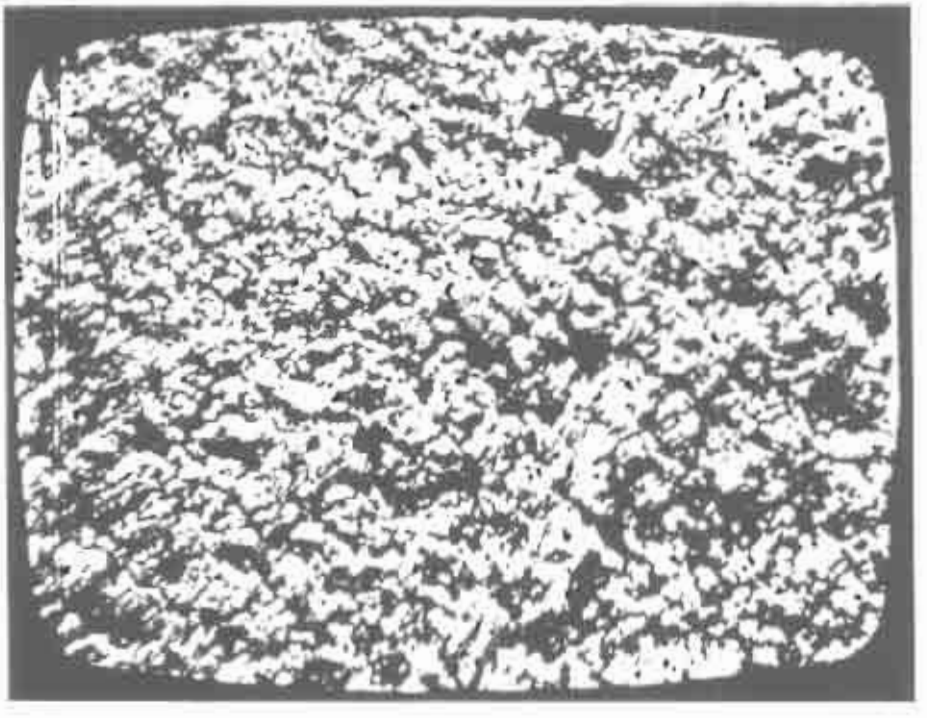

Fig. 6. Scanning electronmicrograph showing the general surface of conserved coin - note the porous nature of the outer layers. Full width 0.26 mm

TABLE II

Percentage (weight) composition of metal cores from forged silver coins

	BAT 916[1]	"1842" 2½ Guilder[2]	"1847 2½ Guilder[2]	"1796" M8R[3]	BAT 916[4] Outer layer
Ag (silver)	45.54	54.2	74.8	2.18	87.1
Sn (tin)	29.26	n.d.	0.15	1.01	<0.01
Zn (zinc)	3.21	0.011	0.07	0.73	2.20
Cu (copper)	10.10	44.8	22.3	94.5	4.12
Pb (lead)	7.82	0.94	2.6	0.67	1.64
Fe (iron)	2.32	n.d.	n.d.	n.d.	0.006
Sb (antimony)	0.93	-	-	n.d.	2.42
Bi (bismuth)	0.66	-	-	n.d.	1.58
Ni (nickel)	0.16	-	-	0.35	n.d.
Total	100.00	99.95	0	99/44	99.066

[1] Calculated values

[2] The 1842 and 1847 coins were modern forgeries from Penang, Malaysia (MacLeod, 1981:65)

[3] Sample from the core of a coin found on the *Rapid* site (MacLeod, 1982:317)

n.d. not detected

[4] Data from analysis of remaining outer layer of the coin.

Ag (silver)	45.54	54.2	74.8	2.18	87.1
Sn (tin)	29.26	n.d.	0.15	1.01	<0.01
Zn (zinc)	3.21	0.011	0.07	0.73	2.20
Cu (copper)	10.10	44.8	22.3	94.5	4.12
Pb (lead)	7.82	0.94	2.6	0.67	1.64
Fe (iron)	2.32	n.d.	n.d.	n.d.	0.006
Sb (antimony)	0.93	-	-	n.d.	2.42
Bi (bismuth)	0.66	-	-	n.d.	1.58
Ni (nickel)	0.16	-	-	0.35	n.d.
Total	100.00	99.95	0	99/44	99.066

Conservation Treatment:

Once the corrosion products had been dusted off the inner surfaces of the silver casing the coin was placed in 10 vol% hydrochloric acid for half an hour to remove any copper, calcium and iron minerals from the seaward surface. The upper surfaces were "cleaned" by rolling a cotton bud, covered with a paste of 1M sodium hydroxide and solid sodium dithionite, over the corroded silver. This treatment converted the oxidized silver back to the metal. A few days after the initial dithionite treatment some blue copper sulphide spots had developed on the coin surface. These spots were simply removed by swabbing with 0.1M sodium cyanide in a 0.2M sodium carbonate solution.

The dithionite treatment revealed the inscriptions and the lettering PHS.DEI G.HISP.Z.REX.DUX.GEL. (1)5 68 on the obverse and DOMINUS.MIHI.ADVITOR on the reverse side (see Fig. 4).

Discussion

The apparent date on the coin is 1568 - only part of the 5 was visible and the 1 was on an area that had been lost on the site. The lettering is the same size and script as genuine Burgundian Crowns of the Spanish Netherlands province of Gelderland dated 1568. The crown on the reverse side of the forgery is larger than that on a 1568 genuine Gelderland coin in the Museum's collection but it is identical to the crown on 1567 coins from both Gelderland and Brabant. The forged coin was 41.7 mm in diameter and 2.14 mm in thickness which is typical of genuine coins of that period.

It is reasonable to assume that the forged coin was part of the general bullion cargo and that the presence of a forgery was not suspected. The outer silver rich layers are thick enough to withstand a deep scratch which was often used in the normal course of commerce to check on the quality of the coin. Since the lettering and other impressions on the surfaces match those of genuine coins from the same province and similar date it appears that the forged coin was stamped in the government mint or with dies that were made to exactly match those used by the mint.

The etching of the cast blank sealed the ultimate fate of the forgery for once it was immersed in the sea the different composition of the layers meant that the coin functioned as galvanic couple, i.e. a short circuited battery. Porosity from the initial casting would have helped the sea water to penetrate into the tin rich layer. Preferential corrosion of the tin rich inner layer continued until no solid metal remained whereupon the previously protected silver rich layers began to corrode to produce a surface corrosion layer similar to that found on genuine coins. The calculated density of the outer layer of the coin is essentially the same as sterling silver (10.17 cf. 10.35g.cm^{-3}) whilst the inner layer would have had a lower value of 9.4 because of the large amount of tin. Any difference between the weights of the forged and geniune coin could have been easily corrected by a slight increase in the thickness of the forgery. Under the conditions normally encountered in commerce the forged coin would probably have remained undetected.

Acknowledgements:

I am grateful to Stan Wilson, Curator of Numismatics of the WA Museum for bringing the coin to my notice and to Jeremy Green for permission to work on the fragments. My thanks go to Jon Carpenter for the macro photographs and to Geoff Kimpton for finding the coin on the wreck site.

APPENDIX 4

Recent Publications Relating to
Dutch Wreck Materials

MacLeod, I.D. & North, N.A., (1980)
350 years of marine corrosion in Western Australia.
Corrosion Australasia, 5:11-15.

MacLeod, I.D. & Ritchie, I.M., (1981)
The detection of debasement in (forged) silver coins by means of corrosion potential measurements.
Archaeometry, 23:65-70.

MacLeod, I.D. & North, N.A., (1982)
Conservation of a composite cannon from Batavia - 1629.
International Journal Nautical Archaeology, 11(3):213-219.

MacLeod, I.D., (1982)
The formation of marine concretions on copper and its alloys.
International Journal Nautical Archaeology, 11(4):267-275.

MacLeod, I.D., (1982)
A study of some forged silver coins recovered from 17th C and 19th C shipwrecks.
Chemistry in Australia, 49:317-20.

Mills Reid, N.K., MacLeod, I.D. & Sander, N., (1984)
Conservation of waterlogged organic materials: comments on the analysis of polyethylene glycol and the treatment of leather and rope. Preprints of 1984 ICOM Committee for Conservation Meeting (Copenhagen), 84(7):16-20.

MacLeod, I.D., (1984)
Conservation, applied science and why treatments must be monitored.
ICCM Bulletin, 10:19-41.

MacLeod, I.D., (1984)
The effects of concretion on the corrosion of non-ferrous metals.
Proceedings of Conference 24 - Australasian Corrosion Association, Rotorua. Paper 27.

MacLeod, I.D., (1984)
A genuine sixteenth century forged coin.
Bulletin of the Australian Institute for Maritime Archaeology, 8(2):1-9

MacLeod, I.D. & North, N.A., (1985)
Corrosion of Metals.
In C. Pearson (Ed.) *The Conservation of Underwater Objects*, Butterworths (In press).

MacLeod, I.D., (1985)
Secondhand metal - conservation and industrial archaeology of shipwreck artefacts.
Proceedings of 2nd Australian Archaeometry Conference (In Press)

MacLeod, I.D., (1985)
Shipwreck conservation chemistry.
Chemistry Resource Book 1985, Ed. Fogliani, C.L., *Royal Australian Chemical Institute*:113-151.