JAMES MATTHEWS EXCAVATION SUMMER 1975/76

Preliminary Report for Maritime Archaeology Advisory Committee

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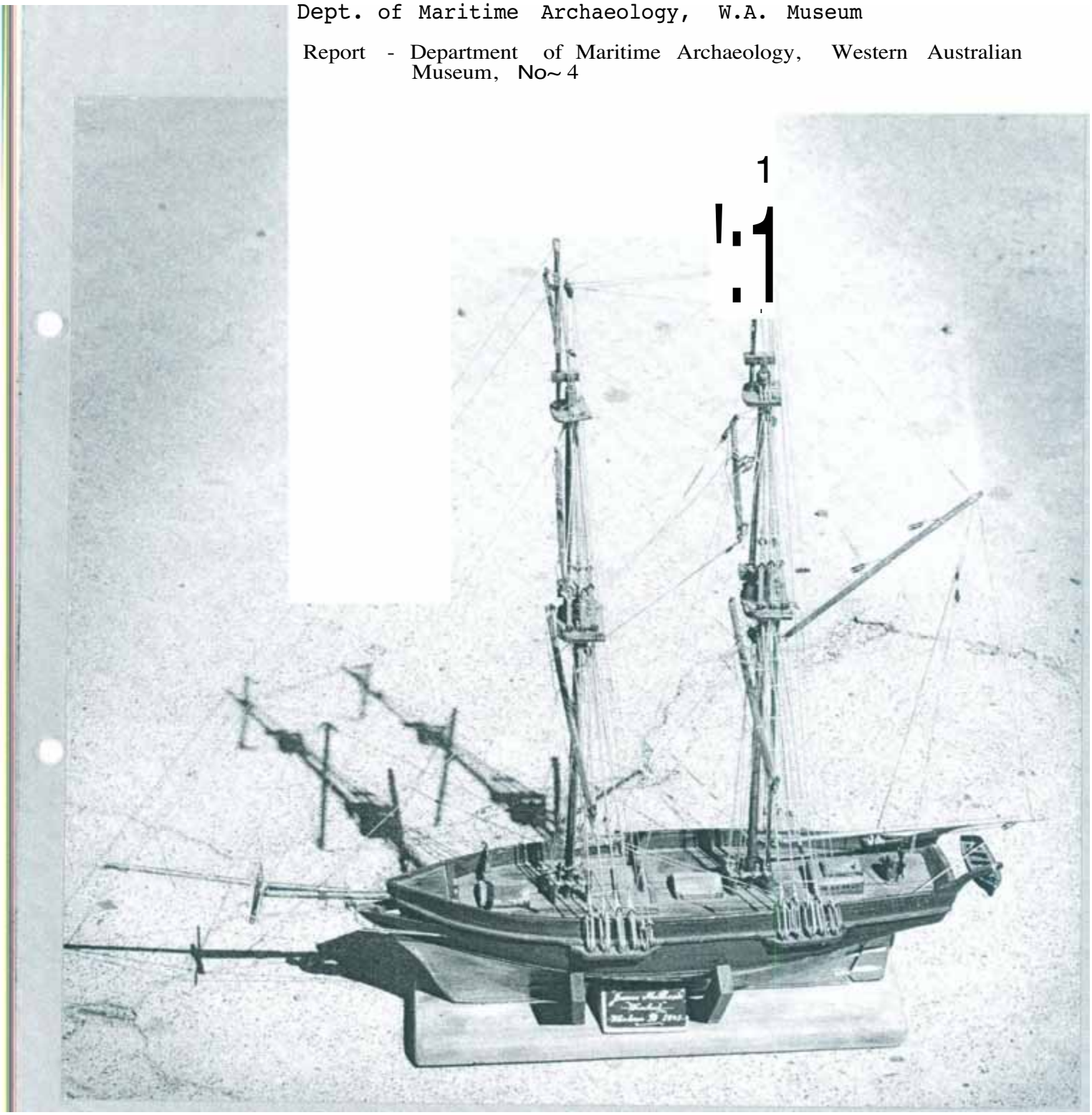

Fig. 1

Model of the J'ames l-latthewsbuilt by Mike McCarthy in accordance \vith Lloyds Survey Register information. ~~491/2A

JAMES MATTHEWS EXCAVATION SU~MER 1975-76, Preliminary Report for Maritime Archaeology Advisory Committee.

~ackground of the Wreck

The James Mat~hews was a snow brig (see Fig.1) of 107 tons and 25 m in length. It appears to have been French built and was employed in the slave trade as the Don Francisco when captured by the British Navy in 1837. After q6ndemnation as a slaver the vessel was re-registered and entered into general trading in the North Atlantic before embarking on a voyage to Fremantle in 1841. A day after arriving at Owen's Anchorage the James Matthews was blown ashore and wrecked at Woodman's Point. The wreck was discovered in 1973 and Museum staff carried out excavation work during the summers of 73/74 and 74/75, raising the upper levels of the slate mound and exposing sections of 'the hull for drawing. The details of that work have been published in The International Journal of Nautical Archaeology (1976), Vol.5 No.2.

Aims of 1975/76 Excavation

The principal aims of the excavation was to expose and record the entire hull remains. Because the site contains the only known slave ship structure in the world it was considered of paramount importance to obtain accurate and detailed survey data: results which would/provide meaningful information for a naval architect rather than simply an illustration of what a wreck looks like underwater.

The second aim was to complete the raising of small artifacts from the site without endangering the stability of the ship's timbers. Previous excavation work had shown that the cargo consisted mainly of farming implements and supplies rather than commodities for Fremantle merchants (as was the cargo of the Eglinton wreck) so the excavation offered the first opportunity to build a collection of the farming implements which an underwater site could yield.

Plant

The plant available for the excavation consisted of the Museum's 12 metre workboat Henrietta, a 3 metre dinghy, two water pumps used as dredges, a hookah unit, and a 125 c.f.m. air compressor for the airlift. The Henrietta was used for 3 reasons:

a. The Museum's 7 metre workboat Ballamara was inoperative due to a number of factors,

b. Because the site is very shallow and buried in sand a large compressor was used (Ford 4 cylinder diesel, 125 cfm) to power the airlift. Thus a large supporting platform was necessary.

c. Because of the nature of the excavation a large team of divers was required on the site 7 hours every day. A large diving platform was thus necessary for the diving tenders and divers resting between dives.

The 3 metre dinghy was used as a supporting platform for the 2 dredge pumps, separating the divers waiting on board Henrietta from the fumes and increasing the output of the pumps by decreasing their height above the water.

Organisation

Logistically the most important factor was the use of the Cockburn Cement Company's jetty at Woodman's Point. Cockburn Cement gave the Museum access to the jetty for the full duration of the excavation. This mooring facility ,obviated the need for daily travel by boat between Fremantle 'and Woodman's Point and thus meant extra time each day for diving. Daily loading and unloading of equipment and artifacts could be done with ease by driving a vehicle onto the jetty to alongside the Henrietta. Staff were also given some security against pilfering of equipment overnight from Henrietta by the continual presence of Cockburn Cement watchmen aboard the barges. Travel by boat was restricted to the daily 300 metre journey from the jetty to the site and back.

Commuting between Fremant1e Museum and Woodman's Poit was done with a Museum Landrover. A~egular schedule was maintained whereby staff left the Museum for the site at 9 AM and returned to the Museum at 5 PM, although photographic processing and registration were done after that time. Work continued on a 7 day week basis over a 12 week period, with a 6 day break for Christmas and 3 days non-diving due to weather or mechanical problems. Between 2 and 4 Museum staff (together with a temporary appointment, Mark Staniforth) worked on the site during week days. During weekends staff were supplemented or relieved by members of the Maritime Archaeology ASsociation and other voluntary divers. During the excavation staff spent an average 4 hours underwater each day, making a total of approximately 1000 diving man hours worked. Diving times were not recorded for voluntary divers, but probably totalled approximately an extra 500 diving hours.

Excavation Procedure

The first stage of the excavation consisted of airlifting to remove the bulk of the barren sand spoil from the site. (see Fig. 2) It was necessary to devise a means of removing a vast quantity of sand (30m x 6m x 0.S-1.5m) a distance of at least 3 metres fronl the wreck site, in order to completely expose the site and avoid substantial re-fill during the excavation season. The previous season of work had shown that the available water dredges could effectively move sand a distance of only about 2 metres, and required a spoil removal system consisting of lifting and. spoil buckets. (see Fig. 3)

This involved excessive effort on the part of the divers so it was decided to experiment with an airlift on the site. The airlift gains efficiency as water depth increases so in very shallow water is particularly inefficient. A compressor of 45 cfm had been tested unsuccessfully on the Elizabeth wreck at a depth of 2 metres. On the James Matthews site the largest available portable compressor (125 cfm) was therefore tested, at a depth beginning at 2 metres. This proved highly successful with a short pipe, so the same compressor was used in conjunction with a much longer pipe (length 12 metres, diameter 15 cm) with similar results. Because of the power of this airlift clearing on any particular point of the site was stopped when the first artifacts were exposed. By this means damage by the airlift was avoided and a thin protective film of spoil was left over the timbers and artifacts. Three weeks of intensive airlifting was sufficient to remove the necessary bulk of spoil from the site. Because of the ample length of the airlift pipe the spoil was deposited a sufficient distance from the site to avoid natural re-fill during the season.

The second stage of the operation consisted of setting up grids for the drawing of the timbers. Triangulation methods were used to erect a 6m x 30m rectangle around the site. Star pickets marked each corner and were placed at fixed intervals along the 30 metre sides. Permanent survey lines were fixed along the 30 metre sides, the zero point being located at the western (sternpost) end of the site. The mobile grid used was shaped like a bed frame (4 legs, 2 sides and 2 ends) in the George Bass tradition. A nvmber of modifications were necessary for the site and these will be discussed later. The mobile grid (6m x 1m) was placed across the site with one leg against each of the 2 star pickets marking the zero points of the 30 metre lines. This grid was formed by tubular steel rods (1" square profile) which were fitted together to form the bed shape by means of 4 sleeves of tubular steel of slightly greater than 1" square profile. The sleeves were fitted with scre,wtighteners on each of the three planes so that the grid could be adjusted and set in position. Once the grid had been placed in the first position on the site it was necessary to adjust the height and level the plane. The levelling was done by means of a bubble tube, which could be extended over the full 6m length of the grid, and a carpenter's level (see Fig..5). When the area contained in the first grid had been recorded the sleeve screws at each end were loosened for the horizontal plane and the end bars slid through 1 m to take the number 2 position. The side bar, legs and sleeves from the zero mark were then moved over the side bar at the 1 m mark to the 2 m mark, and the grid re-assembled. By leaving one side intact each time the grid was moved forward, the height remained constant throughout.

Simultaneously with the setting up of the grid in each position dredging was carried out in that area to remove all remaining spoil before recording began (see Fig. 6). Two water dredges were used, directing spoil to each side of the site. Because of their lesser power the dredges could be used in close proximity to small delicate artifacts without danger of damage or loss, and thus were 'convenient for final 'sweeping up' before recording.

Small loose artifacts were located by triangulation prior to setting up the mobile grid in that position (see Fig. 7 and 8). The legs of the grid were used as location points for triangulating. Fixed artifacts were left in place until recorded under the.grid, and then removed. The bulk of material requiring shifting consisted of granite ballast stones and stone roofing slates, both of which were bagged and removed from the site with the aid of a lifting bucket.

Survey

The basic operation of setting up and shifting the mobile survey grid has already been described. Tapes were fixed to the two 6 m sides of the grid, the zero mark being at the north end in each case (see Fig. 9). A sliding 'H' piece was placed on the two sides of the mobile grid, the horizontal bar of the 'H' joining the two sides and being parallel to both ends of the grid. Another tape was affixed to the sliding bar, and a plum-bob on an adjustable line was sl~ng from this bar.

For drawing underwater, divers used pencils on drafting plastic sheets which were taped to perspex boards. A separate sheet \Vas used for each of the 27 mobile grid positions. A diver drew a sketch plan of the material lying below that grid and numbered each significant point (see Fig. 10). On most of the grid positions between 150 and 350 points were numbered. For each of the points numbered, 3 coordinates were measured. The/A coordinate was the distance along the side of the grid plane, the B coordinate was the distance along the end of the grid plane, and the C coordinate was the vertical distance below the grid plane. For locating each point the H bar was slid along the sides of the grid into position above the point and the plumb-bob line moved across the H bar until vertically above the object. The plumb-bob line was then adjusted in length to touch the object (see Fig. 11). The A coordinate was then read from the tape along the side bar and the B coordinate from the tape along the H bar. The C coordinate was measured with a spring tape placed against the plumb-bob line. This data was recorded by the diver on the sheet bearing the numbered sketch of the grid position (see Fig. 12).

The survey technique gave a detailed and accurate 3 dimensional record of the site. As it required no calculations by the divers and was a straightforward recording operation once the grid was positioned and the numbered sketch prepared, the chance of error was negligible. The system involved a built in check for minor inaccuracies because each time the grid was shifted one bar remained in the same place, thus involving repetition of some of the points being located.

The system developed had many advantages. Being of tubular steel it was quite rigid. The sag of Scm in 6 m 310ng each side of the grid was corrected with clamped supporting rods, so that once positioned and levelled error in the plane was negligible. The tubular steel legs could be hammered into the sea bed to provide firm support. This contrasts with the plastic gridding used at Kyrenia (Katzev) whiCh bowed

considerably and could not be hammered. The steel sleeves used at each corner made assembly quite easy and, because one bar remained in place during each shift of the grid, the height of the plane remained constant - a factor of utmost importance for the 3 dimensional aspect of the recording.

The system was easy enough for divers to understand with a 1 hour introduction, so recording could be shared by a large labour force. The most important criticism which might be made of the system relates to man hours spent on the bottom: approximately 1500 diving man hours were necessary on the 1975/76 season. This was not a prohibitive factor on the James Matthews excavation because the Maritime Archaeology Association ensured a good supply of skilled divers. In addition the site was close to Perth, very shallow and always calm, thus enabling uninterrupted diving.

On land,transfer onto graph paper of the survey data was a simple but lengthy procedure. No calculations were necessary but the great quantity of detailed information took time to translate into paper. Work is at present going ahead on the preparation of a detail plan of the wreck site from the A and B coordinates. The C coordinate data will then be used to draw profiles of the wreck at any point, and the next stage will be to draw the lines of the vessel. With this data it will be possible to make observations about the construction of the vessel in terms which have meaning to the naval architect.

Photography

Site conditions were frequently unsuitable for photography due to poor visibility. The recording of activities of divers working on the site was therefore done with cameras using extreme ~lide angle lenses (Nikonos lSmm water-corrected lens) which allowed the photographer to record from a very. close range. Photography was also used as an integral pa~t of the hull survey. A steel pyramid was erected with two cameras mounted 25 cm apart and positioned at the apex (see Fig. 13 and 14). The pyramid was then positioned on the mobile grid and a series of overlapping stereo photographic pairs were taken of each grid area. These photographs were subsequently used to make up photomosaics of each 6 x 1 metre grid area. In addition the individual stereo pairs were viewed under a mirror stereoscope giving an enhanced dimensional view of $ite detail and relief. The photographic record was designed as an aid to the interpretation of detail on the site and as such has already proved invaluable in drawing up the detail plan. Nevertheless the photography was essentially an aid in interpretation rather than the basis of the survey: Photography alone could not give the accuracy necessary for this survey, and would not cater for the 3 dimensional survey_ Experiments are to be made to produce comparative plans from the stereoscope pairs.

Artifacts

Most of the cargo items raised appear to have been destined for either farmhouse or farmyard. Dray axles (see Fig. 15), chain traces with hooks and eyes attached, part of a harness, straw, nails, carpenter's tools (see Fig. 16), stone slates for roofing (some 1000 intact), cases of glass for window frames, large and small door hinges, iron rods for blacksmithing, and domestic items such as smoothing irons, brick brooms, stoneware tobacco and preserved fruit jars, china dishes, glass tumblers, bottles of wine, a candlestick, some 500 clay pipes, shoes, part of a chair, and an almost complete chess set (see Fig. 17) were all found in good condition. Equipment from the ship included pulley blocks, sheaves, deadeyes, glass skylights, an assortment of rope, nails, bolts, deck scuppers, sheathing, loose wood structures, and dunnage. (Also see Fig. 20)

Future Excavation

A short season of excavation is planned for summer 1976/77 when it is planned to excavate and incorporate in the survey material found outside the bulwarks near the bow section of the wreck. The material in that area includes a quantity of material from the rigging of the vessel. Probe and metal detector surveys will also be carried out to determine whether any other concentrated areas of wreCkage exist outside the mairi structure.

The main work at present however is that of processing in the drawing office the data recorded on the bottom during the summer 1975/76 excavation. This data, when processed, may indicate that the site is of such importance as to warrant further major work in the future.

Acknowledgements

The assistance given by the Cockburn Cement Company was very much appreciated. Without a mooring close to the site it would not have been possible to spend sufficient time on the wreck to complete the survey.

As the diving hours show, the work done was the result of a dedicated effort by a large team of divers. Pat Baker not only took on the entire photographic work load, but was responsible for a large share of the recording work on the grids, and clocked amazing bottom hours which he followed up by working in the photographic laboratory until late hours each evening. Mark Staniforth, employed for the duration of the excavation, proved invaluable with his dedication both underwater and in the laboratory during evenings of registration. I am particularly grateful to Jeremy Green for his advice and assistance throughout the season in all aspects of the work. Scott Sledge's enthusiasm on the grid frame during the latter half of the season was an inspiration to us all. Colin Powell built the mobile grid and spent many hours recording on it. Warren Robinson took care of the maintenance of Henrietta in addition to his diving work. Lous Zuiderbann

used her talents to execute sketch views of site features, and Jim Stewart, Catharina Ingelman-Sundberg and Myra Stanbury also assisted on the site. In the laboratory Myra Stanbury maintained a rapid pace of drawing and registration of artifacts going into conservation. I am grateful also to the staff of the Conservation Laboratory for their efforts in the laboratory during, and after, the season.

During weekends the assistance of voluntary workers was invaluable. In particular I would like to thank Mike Pollard and Joan Sewell for their weekends of recording on the seabed. Lindsay Hill, Conrad Groen and a number of other Maritime Archaeology Association members spent many hours on the bottom working on all phases of the excavation.

Visits to the site during the season by Ian Crawford, John Bannister, Geoff Shaw, Frank Broeze and Colin Pearson were most encouraging.

The help given by these and other people made it a very enjoyable and productive season of excavation.

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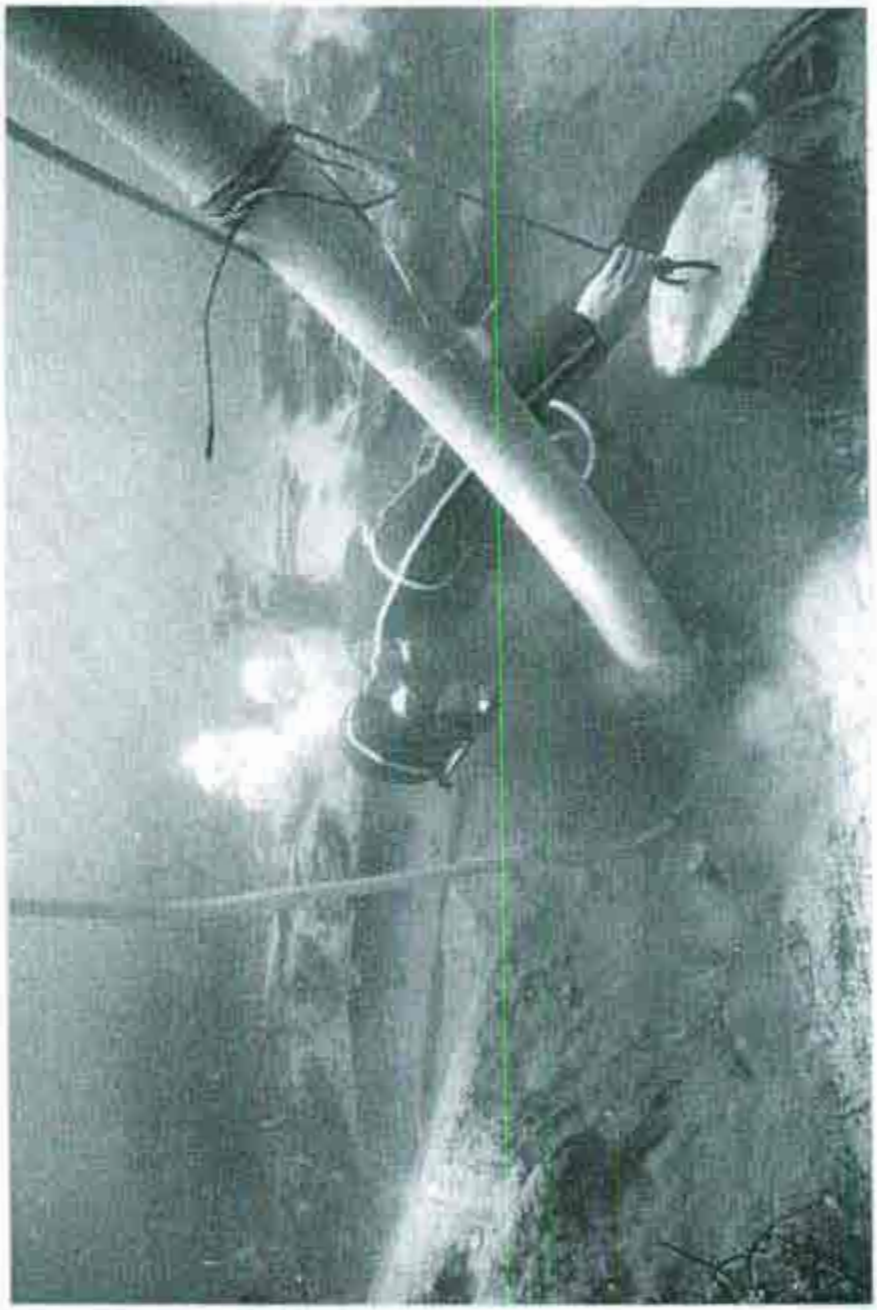

Fig. 2 Diver airlifting on the site. The concrete block holds the airlift on the seabed. MA474/24.

Fig. 3

Lifting bucket being used to float a basket of artifacts from the site. MA511/25

Fig. 4 Permanent survey line at upper right running past legs of mobile grid. Note white vertical sleeves holding legs in position. MA480/6A.

Fig. 5 Divers levelling grid with carpenter's level. A bubble tube was also used successfully for levelling. MA504/26

Fig. 6 Water dredge being used to expose a group of clay pipes. MA490/22

Fig 7. Leather shoe in situ. MA497/4A

Fig 8. Leather shoe being raised on a board which has been slid beneath it. MA497/12

Fig. 9 Mobile grid showing tapes fixed to sides, H bar across grid and plumb-bob attached to H piece. MA483/19

Fig. 10

Diver with perspex drawing board. The numbered sketch appears on the left, and the three coordinate data columns on the right.
MA492/11A

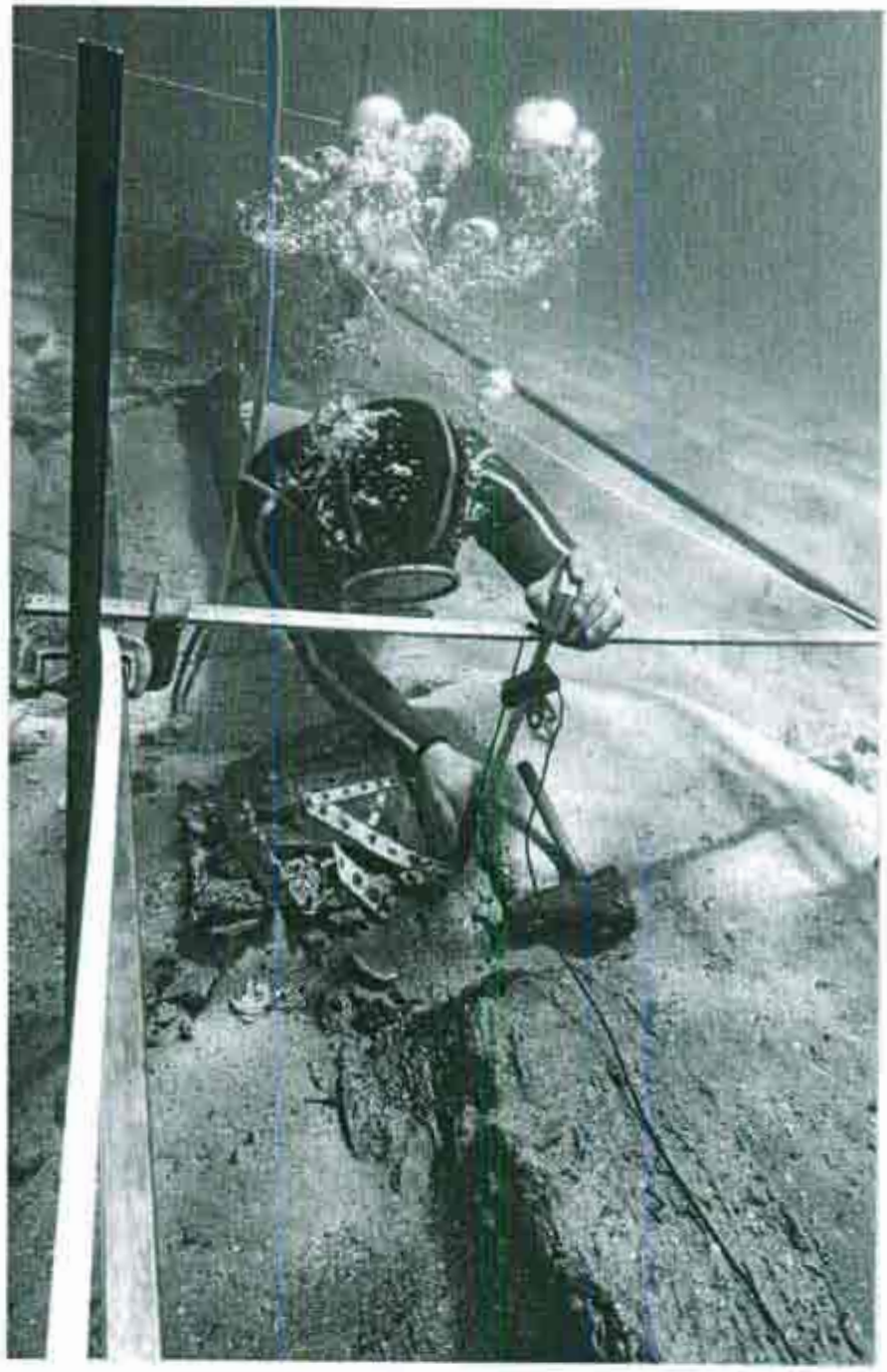

Fig. 11

Diver using plumb-bob for 3rd coordinate.
MA479/26

Fig 12. Diver recording with drawing board. MA486/23

Fig. 13

Photographer on photo tower.
MA517/30

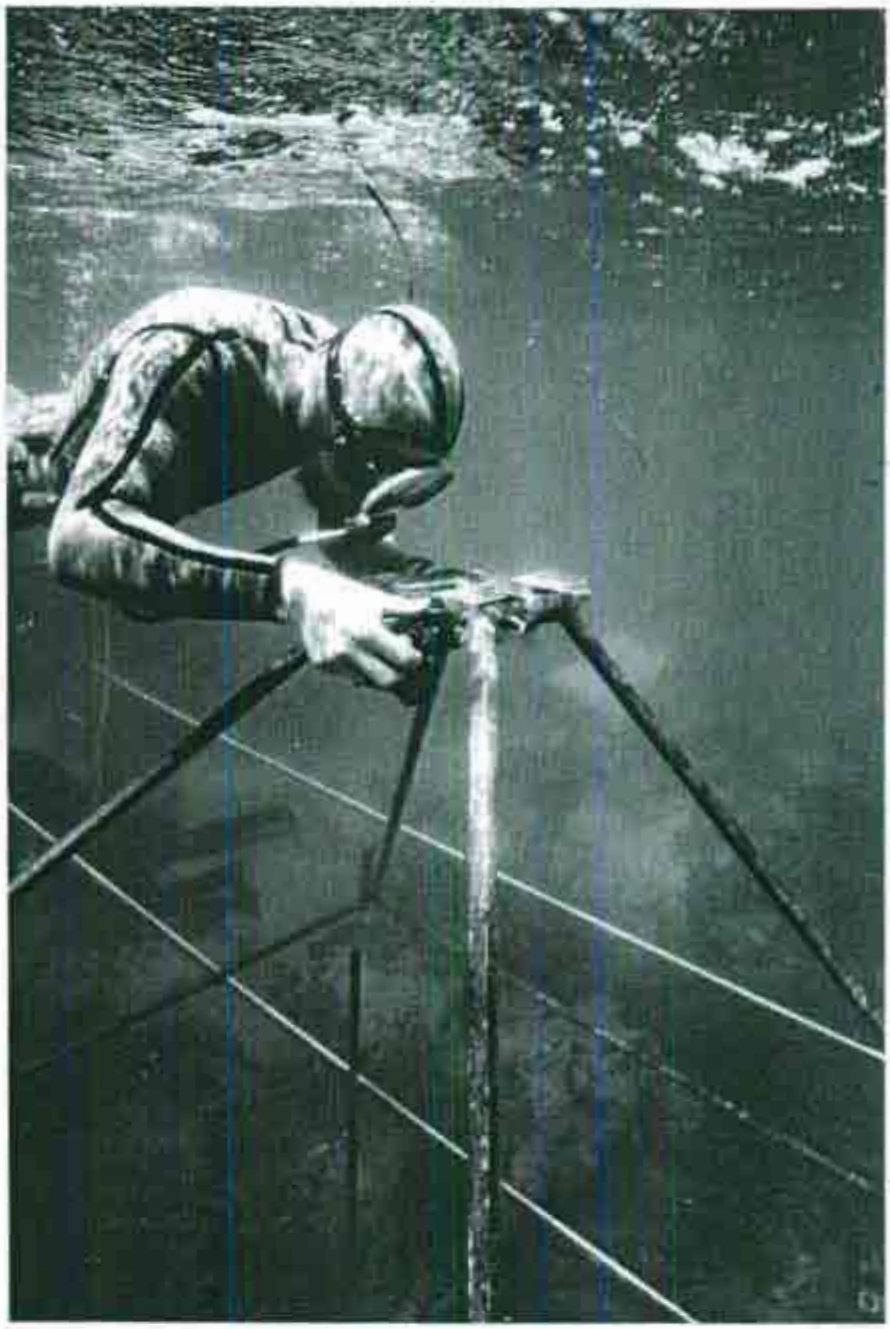

Fig. 14

Photographer shooting stereo pair photo sequence along mobile grid.
MA517/32

Fig. 15 Dray axles partly chipped from concretions on site.
MA512/11

Fig 16. Part of carpenter's rule showing markings. MA476/3

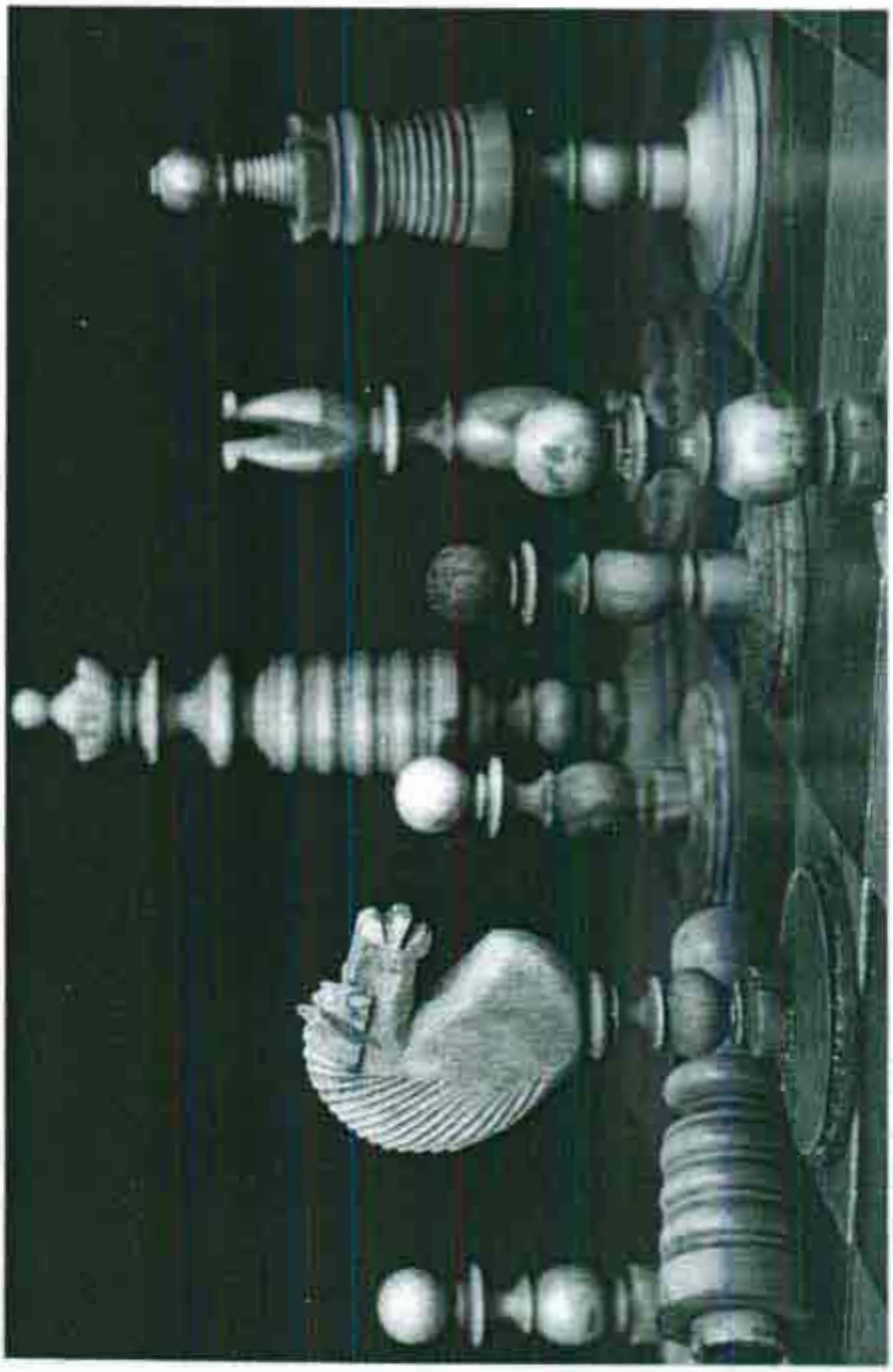

Fig. 17 Chess set. MA516/36

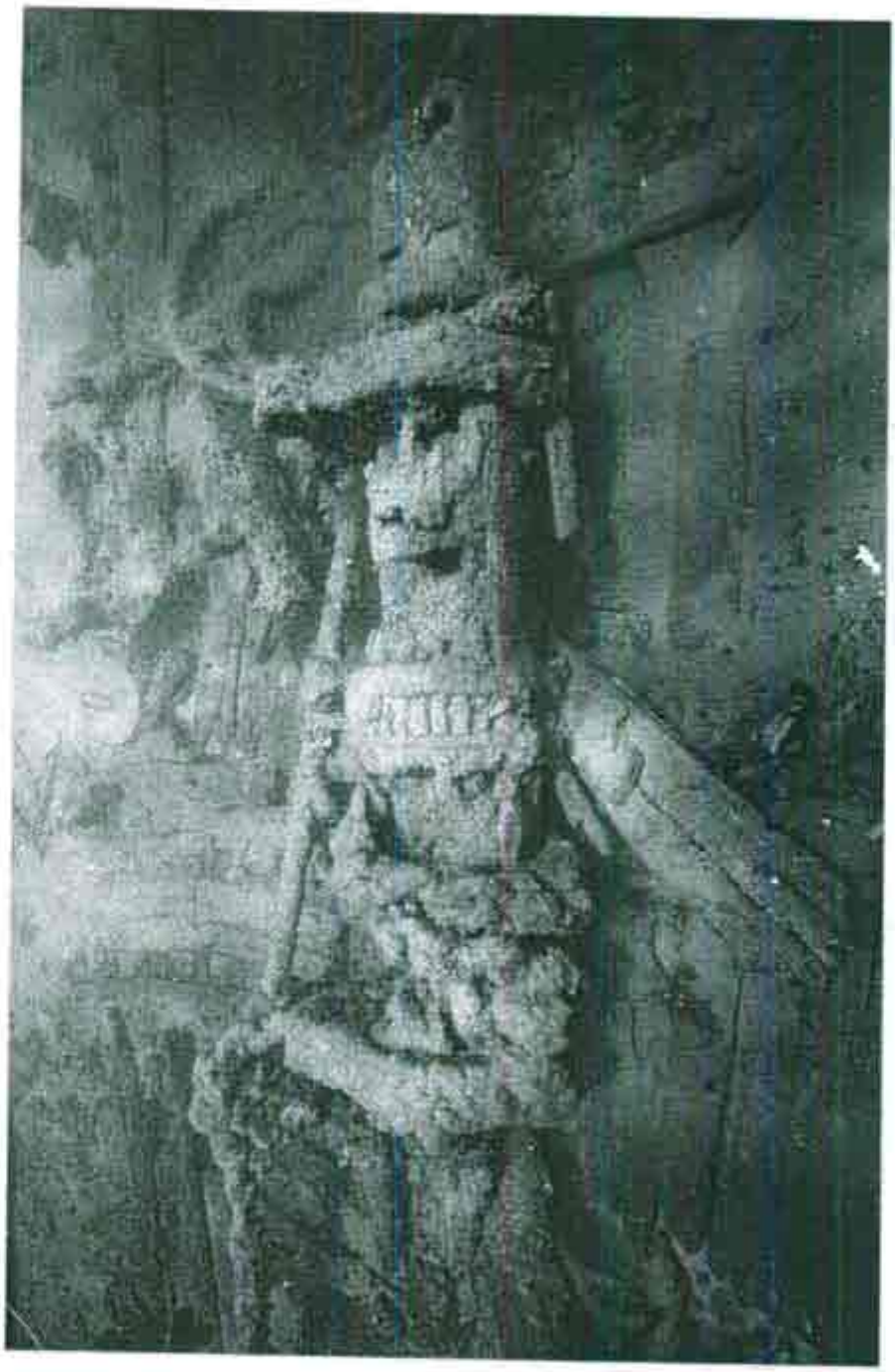

Fig. 18 Wirdlass showng cogs and chain leading off to left.
MA509/5

Fig 19. Mainmast step showing step for trymast. MA514/14

Fig. 20. Groups of artefacts from the James Matthews including pottery, clay pipes, shoe, brass candle stick, pulley blocks and glass. MA474/12A