AML REPORT 2807

1225

Title	INVESTIGATION AND CONSERVATION OF A MEDIEVAL DAGGER
Author	Maureen A Robson
Date	2 January 1979
Abstract	This report describes the examination and conservation of a medieval dagger exhibited at the Tower of London.
Keywords	Dagger, Medieval, composite materials (plating, iron, copper alloy) Photographs, radiograph, laboratory report. Conservation.

THIS REPORT IS LEVEL 3

A MEDIEVAL DAGGER AML, 776276 EXCAVATIONS NO X-+30
CHELMSFORD ESSEX

Introduction

The dagger consists of two metal components; a decorative copper alloy hilt and an iron blade. It was taken from exhibition at the Tower of London due to accelerated corrosion of the iron blade. Outbreaks of active salts were in evidence on the blade, causing severe lamination and deterioration of the iron structure which was reduced, at a touch, to powdery fragments.

A photographic record was made to establish its shape prior to treatment.

Exploratory investigation with the aid of a binocular microscope was undertaken on the decorative copper alloy hilt to reveal possible inlay/outlay decoration.

Exploratory investigation

The hilt was inspected under a binocular microscope. There was a well preserved copper alloy patina over most of the hilt surfaces, mid/dark green in colour, with a few worn areas, brown in colour on the pommel. The underside of the latter area was pierced with holes of three, arranged in a decorative manner. The pommel, shaft and plate of the hilt were all decorated with incised line (fig 1). There was no evidence of remains of an organic scabbard on the iron blade.

Cleaning and conservation

The hilt was firstly swabbed successfully with moistened cotton wool buds dipped in a mixture of acetone and white spirit in water, with a drop of detergent added to reduce the surface tension. This treatment removed all surface dirt and revealed white metal decoration remaining in some areas. It was observed, with the aid of a binocular microscope that the incised lines of the hilt plate were filled with a brown, compacted bubbly deposit, similar in fact to a cleaner such as "Brasso" which may have at some stage been used in previous attempts to clean the object. This desposit was removed by picking with a sharpened needle held in a pin-vice and also a hand-hold vibrotool.

The hilt was passed on to a colleague Justine Bayley, for specialist examination of the white metal areas (Appendix 1). The iron blade was carefully handled to prevent further disintegration and the laminates, brushed free of surface salts with a glass bristle brush and readhered in their correct relative positions with HMG cellulose nitrate adhesive. For a stronger bond between two sections of the blade cores, Super Epoxy adhesive was used and abraded lightly to give a matt finish.

Stabilisation

It was considered essential to stabilise the composite dagger. This presented a problem as it is not generally advisable to subject copper alloy to the intensive washing treatment of iron to remove active chlorides. (Water may accelerate corrosion of copper alloy metals). It was therefore decided that the copper alloy hilt should, firstly, be stabilised with 3% solution of Benzotriazole in industrial methylated spirits. The hilt and plate were immersed in the above solution under vacuum, until all bubbles ceased, removed and allowed to dry.

It was then lacquered twice with Ineralac containing santocel, a matting agent. The separated hilt section with pommel was not immersed as the hollow interior has remains of replaced wood a sample of which has been taken for identification. (Appendix II). This area was painted with the same solution and placed under vacuum. The treatment continued as described above.

The iron dagger was then washed free of soluble salts by suspending the blade in a tank connected to a detonised water supply forming a continuous cycle of washing (Fig 2). The washing treatment took eight days when three consecutive conductivity readings matched that of the original distilled water (1). The blade was then removed and allowed to dry. It was finally immersed in molten microcrystaline wax(cosmolloid 80H) until all bubbles had ceased. Excess wax was removed with the aid of an industrial air blower. The two sections of the hilt were joined with a spot of Super Epoxy adhesive, care being taken not to contaminate the replaced wood remains.

Display Requirements

The dagger must continue to be housed in a dry atmosphere. For this purpose it is recommended that it is exhibited in a showcase which is suitably adapted to house trays of silica gel - a self indicating drying agent which under moist conditions changes colour from blue to pink. It can be readily reconditioned by heating in an oven until it regains its original deep blue colour. This cycle of reheating can be repeated.

Periodic checks must be made on the state of the dagger and any further signs of deterioration reported immediately.

M. A. Robson.

M A ROBSON
Conservation Officer

2 Jan 1979

REFERENCE

1. AML No 1502 1975 J E Cross A recirculating dionizing/ wash system for archaeological artifacts.

APPENDIX I

Chelmsford Essex

Dagger AML 776276

The white metal remains could not be analysed by Xray fluorescence using the laboratory milliprobe because of the objects shape. Chemical tests on the very thin surface coating were found to be inconclusive. Negative evidence for silver may suggest that the white metal is tin but no positive results were obtained. The white metal is probably mainly tin or silver and appears on the raised areas of the design. The white metal seam may possibly be a solder or a brazing metal which was used to make the join. The hilt plate showed the base metal (yellow in colour) where the design had cut down through the white metal plating.

Justine Bayley 8 January 1979

APPENDIX II

Chelmsford Essex

Dagger AML 776276

APPENDIX III

List of figures

APPENDIX IV

List of plates

Plate 1.

Dagger before conservation

Plate 2.

Dagger after conservation.

ANCIENT MONUMENTS LABORATORY

MATERIAL

SITE:..... (DATE:)

SHEET: .....

AM No	X-Ray No	Photo No	Description and Report	Ref No