

Reproducing a Bronze Age dagger from the Thames: statements and questions

John C. Whittaker

Introduction

IN THE autumn of 1993, I was examining prehistoric bronze tools in the Museum of London when Jon Cotton, Curator of Prehistory, asked me if I would make a reproduction Early Bronze Age dagger for a new exhibit¹. In doing so, I found myself dealing not only with daggers, but with the way archaeologists think about reproductions.

Bronze daggers are among the first metal artifacts in Britain, associated with the Beaker, Wessex, and related cultures of the Early Bronze Age (c 2500-1400 BC). The earliest forms are simple flat blades of copper, but as metalworking developed, more elaborate forms with ribs, grooves, and incised decoration were made in bronze. Daggers have often been found in graves, and occasionally in hoards². In graves, they are usually with men, and usually accompany other items that we believe indicate wealth or social status. Some early bronze weapons have nicked edges from striking other weapons in battle, and some are heavily worn and apparently were kept and used for a long time³.

The bronze daggers of the Early Bronze Age in Britain were thus the Excaliburs of their day, objects of wealth and status as well as weapons. Do most visitors really comprehend this when they look at the ancient bronzes displayed in museum exhibits? I have a hard time convincing my students that these green and corroded objects, however elegant in form they may be, were once the flashing warlike panoply of leaders, displaying at glance not only the prowess of the owner, but ideals of wealth and beauty. We make modern copies of ancient artifacts, and interpret them in imaginative paintings, films, and dioramas in an attempt to convey some of these nuances. We hope

that the visualisation has an impact on the viewer that mere words cannot.

However, in reproducing an artifact, in presenting it as we believe it would have been, we necessarily add our own interpretations to it, and at each step in the reproduction, we make choices and solve problems. Experimental reproductions or replications of artifacts represent a currently neglected aspect of archaeological investigation. Replicative experiments have a history that extends back to the antiquarian days of the 19th century⁴. However, with a few exceptions, general interest in such work and its theoretical implications seems to have flagged in the last decade⁵. Replicative experiments have most often been used to provide and test hypotheses about manufacturing processes, artifact function, and patterns of use-wear. A distinction is often made among different kinds of reproductions. Coles⁶ considered a "simulation" the lowest level of experiment, a reproduction that merely presents the appearance of an original artifact and is not very useful for experimental purposes. "Replicas," or "replications" on the other hand, are reproductions for experimental purposes and must follow as much as possible the original materials, manufacturing processes, and modes of use of the original artifact.

I am going to refer to all such experiments as reproductions, because I wish to argue that the distinction between simulation and replication, between appearance and experiment, between statements made by the artifact and questions it can be used to attack, are not so easily made. The way we replicate an artifact reflects decisions aimed at two different goals, which I think of as "statements" and "questions." A reconstruction presents what we know

1. Prehistoric Gallery: People Before London.
2. R. Bradley *The Passage of Arms: An Archaeological Analysis of Prehistoric Hoards and Votive Deposits* (1990); D.V. Clarke et al. *Symbols of Power at the Time of Stonehenge* (1985); S Gerloff *The Early Bronze Age Dagger in Great Britain and a Reconsideration of the Wessex Culture* (1975).
3. J. Wall 'The role of daggers in Early Bronze Age Britain: the evidence of wear analysis' *Oxford Journ Archaeol* 6 (1987) 115-8.

4. Two histories of the field by J. Coles are *Experimental Archaeology* (1979) and *Archaeology by Experiment* (1973).
5. For some exceptions see H. J. Jensen *Flint Tools and Plant Working: Hidden Traces of Stone Age Technology* (1994); S. Lewenstein *Stone Tool Use at Cerros* (1987); B. Coles and J. Coles *Sweet Track to Glastonbury: The Somerset Levels in Prehistory* (1986); P. Reynolds *Iron Age Farm: the Butser Experiment* (1979).
6. *Experimental Archaeology* (1979).

or believe about a type of artifact to a specific audience, and thus makes statements about it. The goal of "questions" is embodied in the potential for learning about an artifact by experimental replication and use. Here I wish to describe the making of a reproduction of an Early Bronze Age dagger for the Museum of London, and discuss the issues of statement and question, as well as other issues involved in such a reproduction.

The prehistoric blade

The dagger chosen for a model is in the Museum of London, catalogue number O.1285. It was probably found in the Thames, but there is no good provenance information and I chose to reproduce it purely because it was accessible for examination, and fairly typical of its type. Gerloff⁷ assigns it to her Armorico-British C daggers, variant Winterbourne Came. This type of dagger is associated with the Wessex culture of Southeastern Britain around 1700-1400 BC. The corpus of other daggers Gerloff provides served as a basis for some of the decisions in reconstructing my dagger.

The blade of the Thames dagger is somewhat corroded, with irregular edges and hafting area, but the overall form is clear (Fig. 1). It is 16.5 cm long and 5.6 cm wide at its maximum, with a maximum thickness of 4 mm at about midpoint. It weighs 67.48 grams.

For replication, I assumed that the damaged haft area had rounded shoulders like those on related specimens. Gerloff recorded this dagger as having 4 or 6 rivet holes; close examination confirms that there were only 4, plus one casting flaw at the top edge of the hafting area. A hilt mark shown in Gerloff's published drawing is not visible today, but other examples show what it should look like and where on the blade it should be.

The ribbed biconvex cross-section of the blade implies that it was cast in a two-piece mould. The Thames dagger has four decorative grooves in the blade. On the original they are shallow but even and distinct, carefully worked. The decorative grooves on Wessex daggers could have been either

cast, or incised after casting⁸. Casting would probably be much easier, and there is some doubt about the ability of bronze tool edges to effectively cut bronze⁹. My experiments with modern tools on a prototype dagger convinced me that including the grooves in the casting was the sensible thing to do. Microscopic examination of tool marks on prehistoric specimens might help to resolve this particular technological question.

Copying the blade

The only other dagger reconstruction I know of is a version of the Ashgrove dagger from Fife, Shetland, made for the Scottish National Museum by Mr. Ian Davidson of the Edinburgh College of Art¹⁰. Mr. Davidson informed me that he forged the blade out of a piece of modern bronze; the original has a simple flat cross-section. The Thames dagger's more complicated blade required a casting, which in prehistory would have been done in a stone or clay mould.

Referring to my measurements and drawings, I carved a wooden model of the original blade. A latex mould was made from this to produce a wax form for a lost-wax casting. This intermediate step was necessary because the founder's sand castings (the modern equivalent of clay moulds) were not fine enough. A prehistoric dagger would probably have been cast directly in a clay mould made using the wooden form. No dagger moulds have yet been found, but moulds for other bronze forms are well known¹¹, as are wooden sword forms that were probably used to make clay moulds later in the Bronze Age¹². The difficulty of grooving the finished bronze, or of carving tiny ridges in a stone mould, also argue for wooden models and clay moulds.

The metal of the blade should have been a tin bronze, copper with 11-12% tin and less than 1% lead, judging by analyses of comparable daggers¹³. The modern founder with whom I worked, Steve Maxon¹⁴, used a modern "50" silicon bronze which is about 95% copper, 4% silicon, and 1% manganese. Accordingly, some working properties of the blade

7. *The Early Bronze Age Dagger*, p. 80.

8. Gerloff, p. 70 suggests casting; D. Britton 'Traditions of metal-working in the later Neolithic and early Bronze Age in Britain' *Proc Prehist Soc* 29 (1963):258-325 suggests incision.

9. P.R. Lowery *et al* 'Scriber, graver, scorer, tracer: notes on experiments in bronzeworking technique' *Proc Prehist Soc* 37 (1971) 167-182.

10. Illustrated in Clarke *et al*, p. 221.

11. For examples see D. Britton 'Traditions of metal-working'; A. E. P. Collins 'Bronze Age moulds in Ulster' *Ulster Journ Archaeol* 33 (1970) 23-36; H.W.M. Hodges 'The Bronze Age

moulds of the British Isles, Part I: Scotland and Northern England - Moulds of stone and clay' *Sibrium* 4 (1959) 129-137; and 'The Bronze Age moulds of the British Isles, Part II: England and Wales - Moulds of stone and bronze' *Sibrium* 5 (1960) 153-162.

12. H.W.M. Hodges 'Studies in the Late Bronze Age in Ireland I: Stone and clay moulds, and wooden models for bronze implements' *Ulster Journ Archaeol* 17 (1954) 62-80.

13. In Gerloff *Bronze Age Daggers* pp. 78, 267, and Britton, 'Traditions of metal-working.'

14. Max-Cast Metal Casting, Kalona, Iowa.

would differ from the original, and the colour is probably somewhat too yellow.

The blade was finished with a high polish — the bright gleam of valuable metal. It was easier for me to achieve with modern buffing equipment than it would have been for a Bronze Age smith.

I applied a bit of floor wax to prevent the blade from smudging and tarnishing: picturing a Bronze Age owner ordering a son to polish his dagger before each feast, but realizing that mine was destined for a more static existence in the museum.

Reconstructing a hilt

The hilt provided the most interesting reconstructive problems, as none of it survived on the original. There are, however, a number of extant Early Bronze Age dagger hilts and pommels¹⁵. The most striking thing about them is their complexity. Almost all had a separate pommel piece capping a hilt, and in at least some cases the hilt was of two separate side plates rivetted together, and covering a core of a different material. The Ashgrove specimen for instance¹⁶, had two plates of horn over a core which decayed away. The core would have had a tang that fit into the pommel cap of ivory. The pommel cap was fastened on with three small organic pins, three large rivets held the hilt together, and another three secured it to the blade. This seems unnecessarily complicated; a single-piece hilt carved of wood or antler would be much easier to make. In fact, the many daggers whose hilts did not survive may have been furnished with such simple hilts. The complex hilts may reflect a desire to use different, and presumably decorative materials; the surviving pommels are of bone or ivory, and amber. Other hilts were decorated with gold mounts, or with gold pins in wood as at Bush Barrow.

The other problem with early hilts is their apparent weakness. The very short tang¹⁷ inserted in the hilt must have been susceptible to damage any time the blade was used hard, and many of the rivet holes in dagger specimens seem to have been broken out, while the hilt too must have often broken. It is possible that a multi-piece hilt allowed tougher materials such as horn to be used at the weak point of attachment with the blade.

In reconstructing a hilt for the Thames dagger, I chose a simplified compromise. I made the hilt of a single piece of oak, with an attached pommel to provide decorative contrast. The evidence of vari-

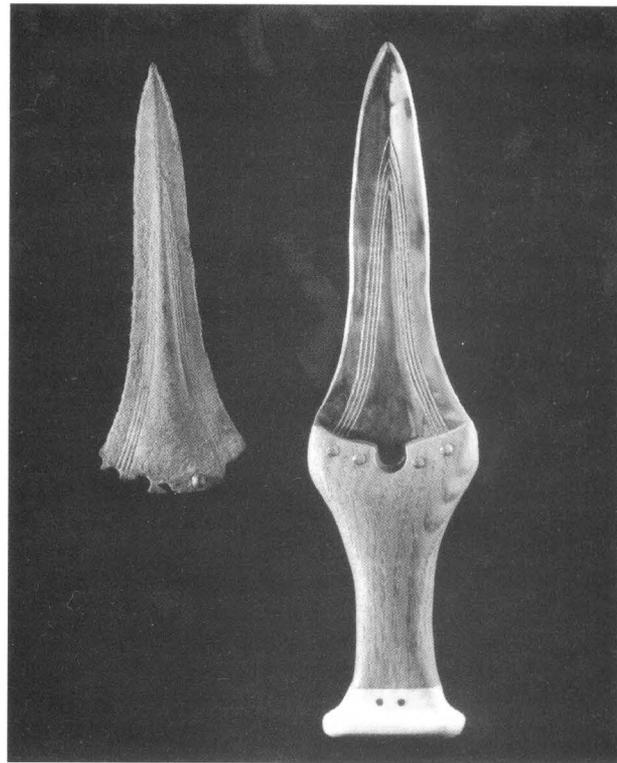


Fig. 1: left: The Thames dagger blade, O.1285. Right: How it might have looked. The finished reconstruction.

ous pommels lacking hilts and apparently without rivets which would imply multi-plate hilts supports this reconstruction. As ivory is hard to come by, I made the pommel of American moose (= British elk) antler. Gerloff (1975) suggests that gold pin and sheet gold decoration is associated with other dagger types than the one under study here, an argument which my budget was happy to accept.

Hilt forms and dimensions are difficult to reconstruct and variable. Hilts apparently ranged from long and slender to short and fat, with cross-sections varying from round to ovoid to flattened. Comparative examples include a few surviving organic specimens, bronze hilted daggers (mostly continental), and three bone daggers that I examined in the Museum of London. I chose a flattened ovoid cross section that seems, on the basis of surviving pommels, to be the most common. The pommel cap is a rounded rectangle, not quite as ovoid as most prehistoric specimens. It is hollowed to fit over a projecting tenon from the hilt, and pinned on with two copper pins. Hilt proportions are a guess, loosely compromising between pub-

tion, and Hardaker 'Dagger Pommels' for drawing.

17. In most modern knives the blade continues as a tang which passes through the whole hilt.

15. R. Hardaker *Early Bronze Age dagger pommels from Great Britain and Ireland* BAR 3 (1970).

16. See Clarke et al. *Symbols of Power* for photograph and descrip-

lished examples from Bush Barrow, Great Cubley, and Ashgrove, and using the length of rivets on other specimens as a guide to thickness. The rivets are lengths of brass rod, with heads formed by hammering. It took a number of failed attempts to get the right length and thickness of rivet, a problem which an experienced Bronze Age smith should not have had.

Lessons from a reproduction

The finished dagger is shown in Fig. 1. There are several points I wanted to bring out in describing its making and the numerous interpretive decisions involved. First, the process began with the decision to reconstruct a dagger, which implies that the prehistoric specimen does not adequately convey information we consider important. As should be clear, my version of the dagger is an interpretation based on reasoning from diverse pieces of evidence. It gives what I believe to be a reasonably close representation of the original appearance of daggers such as O.1285, at least in as much as it conveys some of the gloss and beauty of such weapons, although the dagger is small and not as impressive as some would have been. However, in many details, it knowingly differs from any prehistoric example. This reflects a second point, that reconstructions involve several kinds of decisions, which are most strongly affected by two goals involved in replications, the statements and questions mentioned above.

Some of the decisions in reconstruction involve materials and techniques. Some of these are attested by archaeological evidence, some were probably available in the past but are not attested, and others could not possibly have been used by a Bronze Age smith. The choices among alternatives depend on such factors as the weight given to evidence as opposed to final appearance, my skill or lack of it, and the availability of suitable materials. A prehistoric smith would have also had a suite of alternatives to choose from, although they would have differed from mine, and his choices would have been influenced by the different cultural context and intended uses.

The final appearance of the dagger also reflects choices made to meet the two goals of statement and question, my desire to present an interpretation of an ancient weapon, and my desire to learn something about Bronze Age daggers in the process. My dagger is a relatively loose reproduction. The blade is as close a reproduction of an individual specimen as I could make, but the hilt is much more imaginative, although based on available evidence. In this reproduction conveying an

appearance was more important than anything else. Accordingly, I could use materials such as antler which are not documented prehistorically, and equipment such as power tools that no Bronze Age smith could envision. Had my purpose been more experimental, I would have had to hew more closely to prehistoric conditions. The use of modern tools means that I cannot draw conclusions about the time expended in making prehistoric daggers, other than knowing that they were a lot of work. If I had wanted to experiment with hammer hardening of cutting edges or use-wear from cutting with the dagger, I would not have used a metal with properties different from tin bronze. The two goals of statements and questions are not entirely separable; both required detailed evaluation of archaeological evidence, and even with modern materials and tools I was forced to think out technological problems such as how the hilt was fitted to the blade and what this might imply about materials and uses.

Finally, I consider an awareness of the interpretation embodied in the dagger important too. Murals, pictures, and reconstructed artifacts are too often presented without discussion of the choices made and the alternate interpretations that could have been followed. Even a simple reproduction like this one, intended for museum display rather than experiment, is a good archaeological exercise, not just good public education, because it involves serious thought about fundamentally *archaeological* questions of form, function, material, technology, and meaning. If I have succeeded with the dagger, the viewer will understand my interpretation of the Early Bronze Age dagger as a symbol of power, wealth, and warfare; a deadly weapon, a rich man's display, a leader's regalia. I would hope that a few go farther and question the reconstruction, asking why such a weak hafting was used, or thinking that a different wood would look better, or considering the decorative possibility of filling the grooves with pigment. In the end, the statements and questions blur into one another, because you cannot make an interpretive statement about an artifact without answering some questions in your own mind, and if you are lucky, raising them in others.

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