

# Women, weaponry and warfare

A multidisciplinary study of the use of weapons by women in Dynastic  
Egypt

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## Contents

### **Volume Two:**

- Appendix – **3**
- Bibliography – **39**
- List of figures – **61**
- Chapter One Figures – Women and Weapons Outside of Ancient Egypt – **71**
- Chapter Two Figures – A Feminist Approach in Egyptian Archaeology – **75**
- Chapter Three Figures – Literature Review: Warfare and Women in ancient Egypt – **84**
- Chapter Four Figures – Literature Review: Ancient Egyptian Weaponry – **101**
- Chapter Five Figures – Experimental Archaeology – **124**
- Chapter Six Figures – Experimental Archaeology: Comparative Discussion – **161**
- Chapter Seven Figures – Discussion – **184**
- Appendix Figures – **190**

## Appendix - Catalogue of Museum Weaponry Collections

### Catalogue Methodology

This is the catalogue of museum-held weaponry that ties in to the weaponry literature review seen earlier in this thesis (see Chapter 4). As a result, this catalogue of ancient Egyptian weaponry forming part of specific museum collections, including the Harrogate Royal Pump Room Museum and the Yorkshire Museum in York, is one of the key elements of this dissertation. The Harrogate and Yorkshire museums were chosen because they had no published catalogue, other than a general catalogue compiled by Prof Joann Fletcher for museum use. Both the Harrogate and Yorkshire museums allowed the author of this thesis to examine the weaponry held in their collections. The material was also photographed using a Canon EOS 450D digital SLR camera. Appropriate scales were used to highlight the general size of the artefacts, and suitable backgrounds were used to display them to their best advantage.

As with a previous catalogue of the mace-heads in the Harrogate Museum prepared for the author's MA thesis (Dean 2009), the issue of lighting proved problematic. At the Mercer Art Gallery in Harrogate where the non-display artefacts are stored, the lighting was excellent and the photographs taken there reflect that. Yet the low level lighting required for the display of artefacts in the Royal Pump Room Museum nevertheless proved difficult for the purposes of photography. As a result, some of the photographs are only as high a quality as time and resources allowed. Once photographed, the artefacts were then weighed and measured using scales and digital callipers in order to gain the most accurate account of the weapons.

In order to compare these two unpublished collections, weaponry published in the Petrie Museum online catalogue and in the online records of the British Museum and Metropolitan Museum of Art, New York were all utilised. While there are wide variations in terms of weaponry type and range within the aforementioned collections, some of the Petrie and MMA artefacts have distinct similarities with

those in the Harrogate and Yorkshire Museums. Each weapon section will also include, where necessary, a brief discussion of the specific weapon types and other examples mentioned in the earlier weapons literature review (see Chapter 4).

### The Harrogate Museum Collection

The catalogue of weaponry held in the Harrogate Museum collection consists of eighteen artefacts, including the eight mace-heads catalogued in Dean (2009). The cataloguing process was carried out in conjunction with a fellow student cataloguing some of the ancient Egyptian collections in North Yorkshire (Gaunt 2011). Therefore the artefacts' have two 'Item/Catalogue Numbers': one assigned by Gaunt and Dean (e.g. HAR1), and the one assigned by the museum (e.g. [10495]).

#### **HAR1 [10495] (fig. A.1)**

Bronze trilobate arrowhead, of no recorded date, provenance or method of acquisition. The arrowhead is 36.3mm in length, 11mm in width (at the widest point) and a weight of 1g. There is evidence of loop attachment. The arrowhead could possibly be from the Saite site of Defenneh, as it bears a very close resemblance to a bronze trilobate arrowhead held in the Yorkshire Museum collection (YORYM 2008.25 [a]) acquired during excavations by W.M. Flinders Petrie at Defenneh in 1886, yet far more corroded than the Harrogate example.

#### **HAR2 [10494] (fig. A.2)**

Bronze trilobate arrowhead, with no recorded date, provenance or method of acquisition. The arrowhead is 41.25mm in length, 14.67mm in width (at the widest point) and has a weight of 5g. As with the previous arrowhead (HAR1 [10495]), there is evidence of loop attachment and again, this arrowhead could originally be from the Saite site of Defenneh, as it also bears a very close resemblance to the aforementioned bronze trilobate example in the Yorkshire Museum (YORYM 2008.25 [a]). Once again, the Harrogate arrowhead is in a much less corroded condition than the Yorkshire Museum example.

**HAR3 [10476] (fig. A.3)**

Bronze leaf-shaped spearhead, with no recorded date, provenance or method of acquisition. The spearhead is 198.5mm in length, 32.7mm in width (at the widest point) and has a weight of 83g. The spearhead has what is a possible hook attachment, which may have been used to attach it to a wooden shaft. The spearhead is in generally good condition, although there is a large chip on one of the blade edges.

**HAR4 [10468] (fig. A.4)**

Bronze tapered spearhead, with no recorded date, provenance or method of acquisition. The spearhead is 233mm in length, 24.83mm in width (at the widest point) and has a weight of 95g. There is evidence of the use of bronze nails for attachment to a shaft, with four holes in total and a bronze nail remaining in one hole. It is uncertain as to whether the spear would have been thrown or thrust.

**HAR5 [11014] (fig. A.5)**

Bronze tapered spearhead, with no recorded date, provenance or method of acquisition. The spearhead is 296.5mm in length, 25.96mm in width (at the widest point) and has a weight of 115g. As with the previous spearhead (HAR4 [10468]), there is evidence of bronze nails for attaching the spearhead to the shaft with six point holes for attachment rather than four. It is possible that this spearhead has the same provenance as the previous one (HAR4 [10468]), though there are no provenance records for either of them. The spearhead is in relatively good condition, with no warping at the tapered end. There are only a few chips present, and the damage to the blade is limited. There appears to be some evidence of conservation and/or cleaning at the tapered end of the weapon. Again, as with the previous spearhead (HAR4 [10468]), it is uncertain as to whether the spear would have been thrown or thrust.

**HAR12 [10434] (fig. A.6)**

Stone axe-head, with no recorded date but a recorded provenance of Thebes in Egypt. The method of acquisition is listed as having come from the Kent Collection of artefacts bequeathed to the Museum in 1968 by B. W. J. Kent, and in 1969 given to Harrogate Corporation (Dean 2009, 19). The axe-head is 102.93mm in length, 45.78mm in width (at the widest point) and weighs 180g. The axe-head still carries Kent's original label, stating the provenance and its item number from when it was part of that collection (423).

**HAR13 [10433] (fig. A.7)**

Stone axe-head, with no recorded date. Yet, as with the previous axe-head (HAR12 [10434]), the recorded provenance is Thebes in Egypt, and the method of acquisition listed as having come from the Kent Collection. The axe-head is 115.59mm in length, 47.15mm in width (at the widest point) and weighs 195g. As with the previous axe-head (HAR12 [10434]), it still carries Kent's original label, stating the provenance and its item number from when it was part of that collection (421).

**HAR14 [10497] (fig. A.8)**

Bronze arrowhead or small spearhead, with no recorded date, provenance or method of acquisition. The arrowhead/spearhead is 108.8mm in length, 17.5mm in width (at the widest point) and weighs 30g. The arrowhead/spearhead is in generally good condition, although there is a small chip on one of the edges. There is also a small indistinct engraving on one side, perhaps a hieroglyph or some other symbol.

**HAR15 [no museum number] (fig. A.9)**

Bronze arrowhead with no date, provenance or method of acquisition. The arrowhead is 143.7mm in length, 22.5mm in width (at the widest point) and has a weight of 20g. The arrowhead is in excellent condition.

As the mace-heads have been previously catalogued (Dean 2009), they will be referred to in relation to that catalogue. All mace-heads were part of the collection

bequeathed to the Museum in 1969, by the B. W. J. Kent collection (Dean 2009), unless otherwise stated.

**Mace-head 3675 (fig. A.10).**

Predynastic piriform mace-head with no specific date recorded (Dean 2009, 20). It is described in the museum records as being composed of light-coloured quartz, purported to be from Abydos, and had probably been ground down using an abrasive (Dean 2009, 20; Fletcher 2007). The mace-head is 54.49mm in height, 57.45mm in width (at the widest point) (Dean 2009, 20) and weighs 300g (Dean 2009, 20). The central piercing of the mace-head was “drilled from [both] ends (probably using a bow drill), with the holes drilled aslant, missing the centre, and only meeting towards one of the ends” (Dean 2009, 20). The drilling error aside, this mace-head is in relatively good condition (Dean 2009, 20) and is currently on display in the Royal Pump Room Museum in Harrogate (Dean 2009, 20; Fletcher 2007).

**Mace-head 3706 (fig. A.11).**

Predynastic globular mace-head, described in the museum records as being composed of dark brown diorite (Dean 2009, 21). Again there is no specific date recorded, although the provenance is given as Abydos (Dean 2009 21). The mace-head is 38.80mm in height, 55.20mm in width (at the widest point) (Dean 2009, 21) and weighs 200g (Dean 2009, 21). The mace-head was most likely ground down using an abrasive, with a large central piercing drilled using a bow drill (Dean 2009, 21; Fletcher 2007). It is in extremely good condition and currently on display in the Royal Pump Room Museum in Harrogate (Dean 2009, 21; Fletcher 2007).

**Mace-head 10546 (fig. A.12).**

Conical mace-head, described in the museum records as being composed of black porphyry with white crystals (Dean 2009, 22). The mace-head is described as Predynastic and has been dated to c.3200 B.C.E (Dean 2009, 22; Fletcher 2007). It is 38.80mm in height, 55.20mm in width (at the widest point) (Dean 2009, 22) and weighs 200g (Dean 2009, 22). It has a well drilled central piercing, and is in good condition: “there are some chips and breaks on the edges, but these are negligible

compared to the damage sustained by other mace-heads (such as mace-head 10549)” (Dean 2009, 22). This mace-head is currently on display in the Royal Pump Room Museum in Harrogate (Dean 2009, 22; Fletcher 2007).

**Mace-head 10547 (fig. A.13).**

Conical mace-head, described in the museum records as being composed of black syenite, with white marbling (Dean 2009, 23; Fletcher 2007). The mace-head is described as Predynastic and has been dated to c.3200 B.C.E. (Dean 2009, 23). It is 19.98mm in height, 74.56mm in width (at the widest point) (Dean 2009, 23) and weighs 120g (Dean 2009, 23). The mace-head has a well drilled central piercing and is in excellent condition: “there is little or no damage to the mace-head, not even around the edges, which are the most susceptible to wear and tear” (Dean 2009, 23). This mace-head is currently on display in the Royal Pump Room Museum (Dean 2009, 23; Fletcher 2007).

**Mace-head 10548 (fig. A.14).**

Conical stone mace-head, composed of black syenite with white marbling, tentatively dated to the Predynastic period c.3200 B.C.E. (Dean 2009, 24; Fletcher 2007). There is no recorded provenance for this mace-head (Dean 2009, 24), which is 29.14mm in height, 75.34mm in width (at the widest point) (Dean 2009, 24) and a weight of 140g (Dean 2009, 24). It is in relatively good condition, with little damage apparent on either the edges or the main body of the mace-head, though there are a couple of small chips visible on the underside. This mace-head is currently displayed in the Royal Pump Room Museum (Dean 2009, 24; Fletcher 2007).

**Mace-head 10549 (fig. A.15).**

Conical stone mace-head described in the museum records as being a “green-specked hard white stone” (Dean 2009 25; Fletcher 2007). There is no record on the “exact nature and identification of the stone used, though it is possibly a form of syenite (syenodiortite)” (Dean 2009, 25). The mace-head has been dated to the Predynastic period, c.3200 B.C.E., and clearly has the word “Abydos” written on it in ink, “suggesting that Abydos is the site where the mace-head was found” (Dean

2009, 25). This mace-head was the only one in the Harrogate Museum Collection to have a 'Field Collection' date: 1800 AD (Dean 2009, 25; Fletcher 2007). The mace-head is 30.52mm in height, 70.62mm in width (at the widest point) (Dean 2009, 25) and a weight of 100g (Dean 2009, 25). There is a drilled central piercing, with some moderate damage and chipping to the edges, which show the darker colours underneath the white of the stone more clearly (Dean 2009, 25). This mace-head is currently on display in the Royal Pump Room Museum (Dean 2009, 25; Fletcher 2007).

**Mace-head 10550 (fig. A.16).**

Conical stone mace-head, with a well drilled, smoothed central piercing and stated as being Predynastic and having been discovered at the site of Abydos (Dean 2009, 26; Fletcher 2007). It is described as being composed of a "hard white stone, green speckles" (Dean 2009, 26; Fletcher 2007). However, according to Dean (2009), there has been some confusion with the records, as "the mace-head appears to be composed of a dark material, of almost dark green and black colouring, with some patches of red colouring. It would appear to be some form of igneous stone, and the material used for this mace-head resembles some examples of syenite" (Dean 2009, 26). The mace-head is 17.03mm in height, 54.79mm in width (at the widest point) (Dean 2009, 26) and has a weight of 50g (Dean 2009, 26). There is significant wear around the edges of the mace-head and many scratches on the main body (Dean 2009, 26). Dean (2009, 26) believes that while this could be either depositional or post-depositional (excavation and display) damage, it could be a result of its use in combat. This particular mace-head is currently held in the Museum stores in the Mercer Art Gallery (Fletcher 2007).

**Mace-head Unnumbered (fig. A.17).**

Piriform (or globular) mace-head of yellow limestone, which is Predynastic or Early Dynastic in type. There is no specific date or location recorded (Dean 2009, 27), since the mace-head is marked incorrectly with the number 3675 (Dean 2009, 27). The mace-head is 52.15mm in height, 56.60mm in width (at the widest point) (Dean 2009, 27) and weighs 240g (Dean 2009, 27). It has a large central piercing, which

was probably drilled using a bow drill (Dean 2009, 27) and although it is in good condition, there is “some damage, with a large indentation or chip in the side being the most noticeable which, as with the other mace-heads, could be due to use in combat, depositional damage, or excavation damage” (Dean 2009, 27). This mace-head is, at present, stored in the Museum Stores in the Mercer Art Gallery (Dean 2009, 27).

### The Yorkshire Museum Collection

The catalogue of weaponry held in the Yorkshire Museum consists of only two artefacts. The catalogue was again carried out in conjunction with a fellow student cataloguing ancient Egyptian collections in North Yorkshire (Gaunt 2011). However, in this instance the artefacts have just the one ‘Item/Catalogue Numbers’ between them, as assigned by the museum (e.g. YORYM 2008.25). Therefore, I have differentiated between the two artefacts by assigning each one a different letter.

#### **YORYM 2008.25 [a] (fig. A.18)**

Large bronze trilobate arrowhead, dated to the Saite period and discovered at Defenneh during Flinders Petrie’s 1886 excavations. The arrowhead is 41.52mm in length, 14.67mm in width (at the widest point) and has a weight of 5g. As mentioned above, the arrowhead bears a close resemblance to the bronze trilobate arrowheads held in the Harrogate museum collection. This arrowhead is much more corroded than the Harrogate Museum example.

#### **YORYM 2008.25 [b] (fig. A.19)**

Small bronze trilobate arrowhead, dated to the Saite period, and discovered at Defenneh during Flinders Petrie’s 1886 excavations (as with YORYM 2008.25 [a]). The arrowhead is 32.70mm in length, 9.02mm in width (at the widest point) and has a weight of 1g. Once again (as with YORYM 2008.25 [a]), the arrowhead bears a close resemblance to the bronze trilobate arrowheads held in the Harrogate museum collection, but while much more corroded than the Harrogate Museum example is significantly less corroded than YORYM 2008.25 [a].

A comparison of the Harrogate and Yorkshire Museum weapons with weapons held  
in the Petrie Museum Collection

Arrowheads

**UC37386 (fig. A.20)** – A large bronze triangular (trilobate/‘triangular solid’) arrowhead, from Kafr Ammar, and dated to the Third Intermediate Period (anon, nd [a]). This arrowhead has a length of 5.2cm and a width of 1.0cm (anon, nd [a]). The similarities in shape, size, and material with the triangular/trilobate arrowheads in both the Harrogate and Yorkshire Museums (e.g. HAR2 [10494] and YORYM 2008.25 [a]) are obvious.

**UC37366 (fig. A.21)** – A small bronze triangular (trilobate/‘triangular solid’) arrowhead, from Kafr Ammar, and dated to the Third Intermediate Period (anon, nd [a]). This arrowhead has a length of 2.1cm and a width of 1.05cm (anon, nd [a]). Again, the similarities in shape, size, and material with the triangular/trilobate arrowheads in both the Harrogate and Yorkshire Museums (e.g. HAR1 [10495] and YORYM 2008.25 [b]) are obvious.

**UC63240 (fig. A.22)** – A small copper alloy triangular (trilobate/‘triangular solid’) arrowhead, with a hollow shaft, and with no recorded date or find site (anon, nd [a]). This arrowhead has a length of 3.9cm and a width of 1.2cm (anon, nd [a]). There is some evidence of corrosion in the green patches (anon, nd [a]). Again, the similarities in shape, size, and material with the triangular/trilobate arrowheads in both the Harrogate and Yorkshire Museums (e.g. HAR1 [10495] and YORYM 2008.25 [b]) are obvious.

**UC63241 (fig. A.23)** – A small copper alloy triangular (trilobate/‘triangular solid’) arrowhead, with a hollow shaft, and with no recorded date or find site (anon, nd [a]). It is noted that the arrowhead possibly has some wood remaining inside the hollow shaft (anon, nd [a]). This arrowhead has a length of 4cm and a width of 0.8cm (anon, nd [a]). There is a lot of corrosion evident in the white bloom over the copper

alloy (anon, nd [a]). Again, the similarities in shape, size, and material with the triangular/trilobate arrowheads in both the Harrogate and Yorkshire Museums (e.g. HAR2 [10494] and YORYM 2008.25 [a]) are obvious.

**UC63243 (fig. A.24)** – A small copper alloy triangular (trilobate/‘triangular solid’) arrowhead, with a hollow shaft, and with no recorded date or find site (anon, nd [a]). This arrowhead has a length of 2.4cm and a width of 0.9cm (anon, nd [a]). There is a little corrosion on the arrowhead, with some small green patches (anon, nd [a]). Again, the similarities in shape, size, and material with the triangular/trilobate arrowheads in both the Harrogate and Yorkshire Museums (e.g. HAR2 [10494] and YORYM 2008.25 [a]) are obvious.

**UC72076 (fig. A.25)** – A group of four bronze triangular (trilobate/‘triangular solid’) arrowheads and one bronze leaf-shaped arrowhead, tentatively dated to the Late Period, with no recorded find sites (anon, nd [a]). There are no recorded lengths and widths for these arrowheads. There are many similarities in shape and style between the triangular arrowheads in the Harrogate and Yorkshire Museums (e.g. HAR2 [10494] and YORYM 2008.25 [a]).

**UC72009 (fig. A.26)** – A group of twenty-one bronze triangular (trilobate/‘triangular solid’) arrowheads, and one flatter bronze arrowhead, tentatively dated to the Late Period, with no recorded find sites (anon, nd [a]). There are no recorded lengths and widths for these arrowheads. There are many similarities in shape and style between the triangular arrowheads in the Harrogate and Yorkshire Museums (e.g. HAR1 [10495] and YORYM 2008.25 [b]).

**UC47730 (fig. A.27)** – A group of bronze triangular (trilobate/‘triangular solid’) arrowheads of “roughly the same size and type” (anon, nd). The exact number of arrowheads in the box is not recorded. These arrowheads were found at Memphis and are dated to the 27<sup>th</sup> Dynasty (anon, nd [a]). The museum records state a length of 2.2cm and a width 1.3cm, though it is uncertain as to whether or not this applies to every single arrowhead in the box. There four triangular arrowheads, and the

triangular arrowheads in the Harrogate and Yorkshire Museums (e.g. HAR2 [10494] and YORYM 2008.25 [b]).

**UC63378 (fig. A.28)** – A large iron harpoon, with an arrowhead at one end, dated to the Egyptian Roman Period (anon, nd [a]). There is no recorded find site for this arrowhead. This arrowhead has a length of 23cm and a width of 3.5cm (anon, nd [a]). This arrowhead has some similarities in shape and style with the HAR15, one of the Harrogate Museum arrowheads, although they are made from different metals.

**UC63216 (fig. A.29)** – A large copper alloy arrowhead, with wings (anon, nd [a]). There is no recorded date or find site for this arrowhead. This arrowhead has a length of 8.5cm and a width of 1.8cm (anon, nd [a]). Due to the “reddish-brown” colour, it has been suggested that this arrowhead was perhaps treated in some way, in order to preserve it (anon, nd [a]). This arrowhead has definite similarities in shape and style with the HAR14 [10497], one of the Harrogate Museum arrowheads.

#### Bows and Arrows Discussion

The woods employed in the manufacture of bows were studied and published in 1995. Six bows were examined in the Ashmolean Museum in Oxford and the Phoebe Hearst Museum in Berkeley, California (Western and McLeod 1995, 77). Only two were complete examples. Three of the bows were dated to the First Intermediate Period, one was dated to the Sixth Dynasty (or possibly First Intermediate Period), another to the Ninth or Tenth Dynasty, and the final bow was undated (Western and McLeod 1995, 79-80). The undated bow [1885.375] was from the Ashmolean, and was a complete self (or simple) bow found at Thebes (Western and McLeod 1995, 79). The botanical analysis revealed the bow was most likely made from *Acacia* sp (Western and McLeod 1995, 79). The Sixth Dynasty bow [6-1588], from the Hearst Museum and found at Naga el-Deir cemetery 3500 was actually a bow fragment. It was the nock end of a self bow which analysis again showed to have been made from *Acacia* sp (Western and McLeod 1995, 80). The Ninth or Tenth Dynasty self bow [1921.1301], an Ashmolean artefact, was originally from Sidmant, and was practically complete except for one end (Western and

McLeod 1995, 80). The botanical analysis once again revealed this bow to have been manufactured from *Acacia* sp (Western and McLeod 1995, 80).

The three First Intermediate Period bow fragments were all from the Hearst Museum collection (Western and McLeod 1995, 80). All three bow fragments were from Naga el-Deir, although only the two of them had cemetery attributions (cemetery 3500) (Western and McLeod 1995, 80). The first of these [6-2757] was the nock-end of a self bow which botanical analysis revealed to be composed of *Ziziphus* sp (Western and McLeod 1995, 80). The second bow fragment [6-2778] was also the nock end of a self bow, and was composed of *Tamarix* sp (Western and McLeod 1995, 80). The final of these three bow fragments (also the nock end of a self bow) had no cemetery or tomb attribution, but was shown to be manufactured from *Acacia* sp (Western and McLeod 1995, 80). All of these bows and bow fragments were made from wood sourced from trees indigenous to ancient Egypt (Western and McLeod 1995, 77). This could mean that the availability of the types of wood took precedence over the precise mechanical properties of the wood.

According to McDermott (2004, 67), the earliest metal arrowhead that was recovered in Egypt was dated to the 2<sup>nd</sup> Dynasty and found at Saqqara. In earlier periods, arrowheads could be made from flint or wood, with metal arrowheads being developed later (Shaw and Boatright 2008, 43). Wengrow (2006, 47) mentions Neolithic stone tool assemblages found in Egypt, which contained “a significant component of projectile points (Tangri 1992)”. These projectile points were stone arrowheads, displaying evidence of hunting technology for the period (Wengrow 2006, 47). Ebony-tipped reed arrowheads were found with the bodies of the slain soldiers of Montuhotep II (Winlock 2007, 23-24). According to Winlock (2007, 11-14), ten of the soldiers had been wounded or killed by such arrows, and one was even found in the hair of one of the mummified soldiers. Copper arrowheads have been found that dated to the 11<sup>th</sup> Dynasty (McDemott 2004, 67). The advantage of copper arrowheads was that copper was “hard enough to produce a sharp penetrating point, but soft enough to buckle against bone” (McDermott 2004, 67).

The metal arrowheads in the collections at the Harrogate and Yorkshire Museums (discussed above), provisionally dated to the Saite Period (the 26<sup>th</sup> Dynasty - 664-525 BC), are crafted from bronze and are therefore less flexible. The arrowheads in the Yorkshire Museum were excavated by Petrie at the site of Defenneh (the Greek site of Daphnae), which was created in Saite times as the place where Egypt installed its Greek mercenaries (Cook 1937, 227, 229 and 230).

The arrow shaft was usually made of a straight and light material, such as reed which was plentiful in Egypt, although some wooden examples have also been found (Shaw and Boatright 2008, 43) (figs. A.173 and A.172). There have also been several examples of arrows with feather fletching, as well as arrows that were made without feathers (Shaw and Boatright 2008, 43). As fletching gives an arrow greater stability and accuracy, along with increased force, Shaw and Boatright (2008, 43) postulate that feathers were in all probability widely used. While this is a reasonable deduction to have made, it is by no means proven by a great quantity of incontrovertible evidence. It could be that the arrows found without feathers may have been in the process of manufacture. In European medieval practice, as the fletching is easily damaged, it is added last of all, just before the arrows are needed (T. O'Connor, pers. comm. March 2013). This could well be the case in the fletching of ancient Egyptian arrows.

### Spearheads

**UC63130 (fig. A.50)** – A copper alloy spearhead that is in two parts, with a piece missing (anon, nd [a]). The spearhead is heavily corroded, with a green surface (anon, nd [a]). The spearhead has no recorded find site or recorded date (anon, nd [a]). This spearhead has a length of 19.0cm and a width of 2.6cm (anon, nd [a]). This spearhead has some similarities with the spearheads in the Harrogate Museum collection.

**UC63131 (fig. A.51)** – A copper alloy spearhead, heavily corroded with a brown and green surface, and a large chip from one blade edge and tip missing (anon, nd [a]). The spearhead was found at Retabeh in the Wady Tumilat, but has no recorded date

(anon, nd [a]). This spearhead has a length of 15.0cm and a width of 3.0cm (anon, nd [a]). This spearhead has some similarities with the spearheads in the Harrogate Museum collection.

**UC30032xy (fig. A.52)** – A copper alloy spearhead with an ovaloid blade, and a hollow rounded shaft that has an opening along the length with two parallel holes (anon, nd [a]). There is part of the wooden haft (handle) still inside metal shaft (anon, nd [a]). The spearhead has no recorded find site, but is dated to the 18<sup>th</sup> Dynasty (anon, nd [a]). This spearhead has a spearhead length of 24.0cm, a spearhead blade width of 3.45cm, a spearhead shaft diameter of 1.65cm, a wooden handle length of 13.7cm, and a wooden handle diameter of 1.17cm (anon, nd [a]). This spearhead has little in common with the Harrogate and Yorkshire Museum spearheads, but is a good example of a spearhead type, especially as it is an 18<sup>th</sup> Dynasty example.

**UC31164 (fig. A.53)** – A heavily corroded and fragmentary copper spearhead, once broken in two pieces but now repaired (anon, nd [a]). The spearhead has no recorded find site, but is dated to the 18<sup>th</sup> Dynasty (anon, nd [a]). This spearhead has length of 13.4cm, and a width of 3.2cm (anon, nd [a]). This spearhead has little in common with the Harrogate and Yorkshire Museum spearheads, but is a good example of a spearhead type, especially as it is an 18<sup>th</sup> Dynasty example.

**UC63153 (fig. A.54)** – A copper alloy spearhead, bright green in colour due to heavy corrosion (anon, nd [a]). The spearhead has a rounded hollow shaft that is joined lengthways (anon, nd [a]). The spearhead has no recorded find site or recorded date (anon, nd [a]). This spearhead has a length of 16.5cm and a width of 2.5cm (anon, nd [a]). This spearhead has little in common with the Harrogate and Yorkshire Museum spearheads, but is a good example of a hollow spearhead type.

**UC63154 (fig. A.55)** – A copper alloy spearhead, with a rounded hollow shaft, and a lengthways open join (anon, nd [a]). The spearhead is in generally good condition, though there are some patches of green corrosion on the surface (anon, nd [a]). The

spearhead has no recorded find site or recorded date (anon, nd [a]). This spearhead has a length of 33.0cm and a width of 3.0cm (anon, nd [a]). This spearhead has little in common with the Harrogate and Yorkshire Museum spearheads, but is a good example of a spearhead type.

**UC63287 (fig. A.56)** – A copper alloy spearhead, with a double-sided blade, a rounded hollow shaft, and a lengthways open join (anon, nd [a]). The spearhead is heavily corroded (anon, nd [a]). The spearhead has no recorded find site or recorded date (anon, nd [a]). This spearhead has a length of 10.2cm, a blade width of 1.5cm, and a shaft diameter of 1.0cm (anon, nd [a]). This spearhead has little in common with the Harrogate and Yorkshire Museum spearheads, but is a good example of a spearhead type.

**UC63148 (fig. A.57)** – An iron spearhead, heavily corroded with large lengthwise fractures (anon nd[a]). The spearhead was found at Tell el Yehudiyeh, and has been dated to the 26<sup>th</sup> Dynasty (anon, nd [a]). This spearhead has a length of 21.5cm and a width of 5.0cm (anon, nd [a]). This spearhead has little in common with the Harrogate and Yorkshire Museum spearheads, but is a good example of a spearhead type.

**UC63149 (fig. A.58)** – An iron spearhead, very heavily corroded with large lengthwise fractures and the tip missing (anon nd[a]). The spearhead has no recorded date or find site, though the use of iron would possibly suggest that the spearhead could be dated to the late New Kingdom at the earliest (anon, nd [a]). This spearhead has a length of 13.0cm and a width of 4.5cm (anon, nd [a]). This spearhead has little in common with the Harrogate and Yorkshire Museum spearheads, but is a good example of a spearhead type.

**UC63150 (fig. A.59)** – A very heavily corroded iron spearhead fragment, with large fractures lengthwise, and a rounded hollow shaft with bright orange blockage (rust?) at one end (anon nd[a]). The spearhead has no recorded date or find site, though the use of iron would possibly suggest that the spearhead could be dated to the late New

Kingdom at the earliest (anon, nd [a]). This spearhead has a length of 8.0cm and a width of 3.3cm (anon, nd [a]). This spearhead has little in common with the Harrogate and Yorkshire Museum spearheads, but is a good example of a spearhead type.

### Axe-heads

There are three axe-heads in the Petrie Museum online catalogue that are similar to the axe-heads held in the Harrogate Museum Collection:

**UC44070 (fig. A.80)** – A grey granite axe-head, with no recorded date and no recorded find site (anon, nd [a]). This axe-head has a height of 8.5cm, a length of 4.3cm and a width of 7.0cm (anon, nd [a]). This axe-head is very similar in shape, style and colour in particular to HAR12 [10434], and to HAR13 [10433].

**UC44153 (fig. A.81)** – A grey porphyry axe-head, complete with traces of red pigment on the blade edge (anon, nd [a]). There is no recorded date and no recorded find site (anon, nd [a]). This axe-head has a length of 10.9cm and a width of 6.1cm (anon, nd [a]). This axe-head is very similar in shape, style and colour to both HAR12 [10434], and to HAR13 [10433].

**UC44359 (fig. A.82)** – A grey granite axe with a blunted blade, with no recorded date but a recorded find site of Meroe (anon, nd [a]). This axe-head has a length of 7.4cm and a width of 4.9cm (anon, nd [a]). This axe-head is very similar in shape, style and colour to both HAR12 [10434], and to HAR13 [10433].

### 18<sup>th</sup> Dynasty axe-heads

**UC40943 (fig. A.83)** – A broad form bronze battle axe-head, with slight lugs, dated to the 18<sup>th</sup> Dynasty, but with no recorded find site (anon, nd [a]). This axe-head has a length of 13.3cm and a width of 9.0cm (anon, nd [a]). This axe-head is an excellent example of an 18<sup>th</sup> Dynasty axe-head, the type of which has been made for the experimental archaeology for this thesis.

**UC40944 (fig. A.84)** – A broad form bronze battle axe-head, with slight lugs, dated to the 18<sup>th</sup> Dynasty, but with no recorded find site (anon, nd [a]). This axe-head has a length of 13.5cm and a width of 10.0cm (anon, nd [a]). This axe-head, as UC40943, is another excellent example of an 18<sup>th</sup> Dynasty axe-head.

**UC40941 (fig. A.85)** – A slightly lugged bronze battle axe-head, dated to the 18<sup>th</sup> Dynasty, but with no recorded find site (anon, nd [a]). This axe-head has a length of 13.0cm and a width of 5.5cm (anon, nd [a]). This axe-head is narrower than UC40943 and UC40944, but retains a similar form, and is still an excellent example of an 18<sup>th</sup> Dynasty axe-head.

**UC40942 (fig. A.86)** – A broad form bronze battle axe-head, with slight lugs, dated to the 18<sup>th</sup> Dynasty, but with no recorded find site (anon, nd [a]). This axe-head has a length of 13.5cm and a width of 10.0cm (anon, nd [a]). This axe-head is even narrower than UC40941, but retains the typical 18<sup>th</sup> Dynasty form, and is therefore an excellent example of an 18<sup>th</sup> Dynasty axe-head.

**UC40931 (fig. A.87)** – A broad form copper alloy battle axe-head, with very broad lugs, dated to the 18<sup>th</sup> Dynasty, but with no recorded find site (anon, nd [a]). This axe-head has a length of 10.6cm and a width of 12.5cm at the hafted edge (anon, nd [a]). This axe-head is an excellent example of an 18<sup>th</sup> Dynasty axe-head.

**UC40930 (fig. A.88)** – A broad form copper alloy battle axe-head, with very broad lugs, dated to the 18<sup>th</sup> Dynasty, but with no recorded find site (anon, nd [a]). This axe-head has a length of 10.7cm and a width of 10.7cm at the hafted edge (anon, nd [a]). This axe-head is an excellent example of an 18<sup>th</sup> Dynasty axe-head.

**UC63001 (fig. A.89)** – A round blade copper alloy axe-head, with broad and curved lugs, and with an incised fish and lotus design on one side (anon, nd [a]). The axe-head is dated to the 18<sup>th</sup> Dynasty, but has no recorded find site (anon, nd [a]). This axe-head has a length of 10.3cm and a width of 13.0cm at the hafted edge (anon, nd [a]). This axe-head is an excellent example of an 18<sup>th</sup> Dynasty axe-head.

### Axes Discussion

One of the most detailed sources for ancient Egyptian axes is the work of Vivian Davies, whose catalogue of such axes held in the British Museum (Davies 1987) is the most comprehensive source for the many different types found to date. Davies provides several examples of early Dynastic and Old Kingdom axes, the main materials for which would appear to be either copper or arsenical copper. For example, a Late Predynastic or early First Dynasty axe [51185] from an A-Group cemetery in Faras was composed of arsenical copper (Davies 1987, 27) (fig. A.175). The axe-head was rectangular in shape, had a narrow, elongated blade, along with slightly convex sides and butt (Davies 1987, 27). According to Davies (1987, 27) the edge of the axe-head was “hammered more from one face than the other.” Analysis of the axe-head revealed that the composition was 98.7% copper, and 1.3% arsenic, with trace amounts of other metals (Davies 1987, 27). This small amount of arsenic would have strengthened the blade somewhat, as copper alone is not a particularly strong metal. It would seem that the addition of arsenic was deliberate, as can be seen in the manufacture of other weapons discussed below.

There are, however, plenty of examples of axe-heads composed almost entirely of pure copper, with only the smallest trace amounts of other metals in evidence. A First Dynasty example [30065], possibly from Amelineau’s excavations at Abydos (1895-1898), is made of 99.9% copper (Davies 1987, 27) (fig. A.176). It is another rectangular axe-head, with a concave butt and convex sides, one of which is shorter and more convex than the other, giving the cutting edge a somewhat lopsided appearance (Davies 1987, 27). This cutting edge displays some signs of wear, suggesting that perhaps this axe was used in conflict (Davies 1987, 27). There are also markings on one face which are similar to the hieroglyphs  and , which may possibly represent the personal name of the axe’s owner (Davies 1987, 27; Spencer 1980, 84). Dating from the reign of Djet, several burials discovered in the Memphite cemeteries contained copper axes (Wengrow 2006, 249). These axes were inscribed with the Horus name of Djet below a boat borne on wings, in which a falcon rides (Wengrow 2006, 249).

Other Old Kingdom axes had slightly more complex forms as the axe technology developed through the Dynasties. From the late Second Dynasty onwards, in Davies' catalogue at least, single-hole form axes were being made (Davies 1987). These axes would have a single binding-hole, often cast into the blade during its manufacture, so that it could be more easily affixed to the haft (Davies 1987, 28). One such example [35574], dated to the late Second Dynasty, was composed of arsenical copper (97.5% copper, 1.3% arsenic, trace amounts of other metals), and shows distinct signs of wear (Davies 1987, 28) (fig. A.177). The convex cutting end was hammered to a sharp edge, and is cracked on both faces, along with a great deal of surface pitting that covers the entire axe-head (Davies 1987, 28). The axe-head has been cleaned of all surface corrosion, so it is uncertain as to whether this surface pitting was caused by general wear and tear, or by the cleaning process (Davies 1987, 28). Metallographic analysis of the axe-head indicated that the blade was worked and annealed to some degree after its original casting, which may have rendered it more susceptible to cracking (Davies 1987, 28).

Even well into the Old Kingdom stone was still occasionally used to make axes. One round form axe with lugs [67617], from Kahûn, tentatively dated to the Twelfth Dynasty, is made of pale brown chert (Davies 1987, 31) (fig. A.178). The blade itself has been flaked on both faces, but the cutting edge of the axe-head was formed by flaking from one face (Davies 1987, 31). This cutting edge is now very uneven, but still retains some sharpness (Davies 1987, 31).

Bronze axe-heads seemingly first made an appearance in the First Intermediate Period. Certainly, the first appearance of a bronze axe-head in Davies' catalogue is a lugged, perforated, round form axe-head [68873], cautiously dated First Intermediate Period to Middle Kingdom, with no recorded provenance (Davies 1987, 33) (fig. A.179). This particular axe-head has 84.0% copper, 10.5% tin, and 4.90% lead, with trace amounts of other metals (Davies 1987, 33). Though this is one of the first occurrences of a bronze axe-head in Davies' catalogue, it is unlikely to be the first occurrence of a bronze axe-head in Egyptian history. This axe-head is thickly corroded, and the cutting edge appears to have sustained damage due to use (Davies 1987, 33). What is interesting about this particular axe-head is that traces of the

original wooden haft survive along the butt, along with remains of the original binding in one of the lateral holes (Davies 1987, 33).

During this period, copper seems to have remained one of the most popular materials for casting axe-heads, a preference that appears to have continued into the Middle Kingdom. A rounded axe-head dated to the Middle Kingdom [30083] was made of arsenical copper (97.0% copper, 4.7% arsenic, trace amounts of other metals), and still had the original wooden haft and metal ferrule in place (Davies 1987, 36) (fig. A.180). Radiocarbon dating on the haft has dated it to 1870±120 BC, and Davies does not doubt that the axe and the haft belong together (1987, 36). The blade has hooked lugs and four misaligned binding-holes at the base (Davies 1987, 36). The cutting edge of the blade is very thin and is not particularly sharp, and has indentations in parts (Davies 1987, 36). The reason for this is not stated by Davies. Although he speculates that this may have been due to use, he also mentions that the axe was cleaned of corrosion product (1987, 36). It is unknown as to whether this cleaning was responsible for the current condition of the axe-head, if the axe was indeed used (possibly in combat) during its lifetime in Egypt. Of course, this depends on whether the corrosion was surface or replacement corrosion. If it was the latter, then removing it would have reduced the thickness of the object appreciably.

One 'edged-baton' axe-head [51038], dated by Davies (1987, 38) from the First Intermediate Period to the early Middle Kingdom, is made of arsenical copper (fig. A.181). The axe-head is shallow and symmetrical, with a wide, convex cutting edge, a concave butt and short lugs that appear slightly hooked (Davies 1987, 38). There are seven binding-holes in total at the base of the axe-head, evenly spaced in a curved line in order to run parallel with the butt of the blade (Davies 1987, 38). Though the cutting edge of the blade was worked to a sharp edge, it displays no evidence of use or wear (Davies 1987, 38). The fact that other similar axe-head examples, from around the same period, are composed of arsenical copper as well suggests that bronze was not yet the popular option for casting axes that it would later become.

From the Middle Kingdom, and well into the Second Intermediate Period, bronze became the metal of choice for casting axes. One example [67505], cautiously dated to the Thirteenth Dynasty and said to have come from Amarna (although this is highly unlikely, and is acknowledged to be pure speculation), is composed of 90.3% copper, 8.10% tin, and trace percentages of other metals (Davies 1987, 43) (fig. A.182). This small and narrow axe-head has incurved sides, which splay out at the damaged cutting edge, and is distinctive due to the hieroglyphic inscription on one face: . This translates as, ‘the good god Djedankhre, given life’ (Davies 1987, 43).

By the New Kingdom, bronze became the metal of choice, although simple copper was seemingly still in occasional use. One such example [37324] is an 18<sup>th</sup> Dynasty axe-head found in the foundation deposit of the temple of Osiris at Abydos (Davies 1987, 45) (fig. A.183). This axe-head is not made from arsenical copper but 99.3% copper, with only the smallest trace amounts of lead, tin and arsenic (Davies 1987, 45). However, there is good reason for this. This particular axe-head is one of a group of seven objects that were found in the foundation deposits, all of which were models (Davies 1987, 45). This model axe-head was very small (only 5.3cm in length), was originally symmetrical in shape, with incurved sides, but had sustained a great deal of damage due to corrosion (Davies 1987, 45). On one side of the blade was inscribed with ‘The good god, Menkheperre, beloved of Osiris’ (Davies 1987, 45). Perhaps during this period, copper was used primarily for model weapons, rather than wasting bronze on their manufacture.

Another New Kingdom axe, found at Amarna, was made of bronze (90.6% copper, 7.90% tin, and trace amounts of other metals) [67589] (fig. A.184). It is described as being short and squat, but at 10.5cm in length it is almost twice the length of the copper model axe described above (Davies 1987, 45). This particular piece had once been covered in corrosion product, but had been completely cleaned at some stage (Davies 1987, 45). The axe-head is severely pitted on both sides, though whether this is due to wear or the cleaning process is uncertain (Davies 1987, 45). Hammer marks, evidence perhaps of the manufacturing process, are visible on both sides of

the axe-head, and on the cutting edge of the blade (Davies 1987, 45). The metallographic analysis of the axe-head showed that the blade was heavily worked and annealed after casting, with a final cold working, resulting in a high hardness value for the cutting edge of the blade (Davies 1987, 45).

There was some evidence of iron being used to manufacture axe-heads during the later stages of the New Kingdom. One 20<sup>th</sup> Dynasty example, found at Abydos [67587], has been identified as being composed of iron, although the level of corrosion has prevented detailed metallographic analysis (Davies 1987, 40) (fig. A.185). A portion of the blade is missing, and the surface bears several deep cracks (Davies 1987, 41). As it is made of iron, the axe-head, weighing in at 350.5g, is heavier than other examples, which would have made it a formidable weapon if wielded in combat (Davies 1987, 40).

Generally speaking, it would appear that bronze remained the most popular choice for the manufacture of axe-heads, even into the Third Intermediate and Ptolemaic periods. There were still occasional examples of iron and copper being used, although these appear to have few and far between. Another example of an iron axe-head [55576], dated to the mid-fourth century BC, suffers from the problem of extreme corrosion as found with many iron objects from this period (Davies 1987, 48) (fig. A.186). As this is a model axe, the axe-head and haft made in one single piece, comparisons with the previous iron example [67587] are not particularly useful. This model axe-head weighs a mere 7g compared to the other's 350.5g, and the length of the haft on the model is only 6.7cm, which is smaller than both the length and width of the entire Abydos axe-head (14.3cm and 20.8cm respectively) (Davies 1987, 48; Davies 1987, 40).

In Davies' catalogue, there is one example of an iron axe-head that is dated to the Graeco-Roman Period (Davies 1987, 46) (fig. A.187). This axe-head [36288] has not succumbed to the same degree of heavy corrosion as the other iron axes in this catalogue, though the corrosion levels are still quite high (Davies 1987, 46). The blade is in a poor condition, with severe pitting caused by the corrosion, and the tip

of one of the lugs broken and the other missing (Davies 1987, 46). Davies (1987, 46) suspects that these lugs were originally hooked, but with damage sustained in this region it is not possible to know for certain if this was the case. Half the cutting edge of the blade is also missing, and the other half is cracked and damaged through wear and use, although what remains of the edge is apparently very sharp (Davies 1987, 46). This damage, severe though it seems, has not prevented metallographic analysis from being carried out, unlike with some of the examples of iron axes above. The analysis shows that the axe-head is composed of almost 100% iron, with trace samples of nickel and cobalt (Davies 1987, 46). The weight of this iron axe-head is even more than that of [67587], weighing in at 549.2g (Davies 1987, 46).

### Swords and Daggers

The Petrie Museum has several examples of daggers, but no examples of swords at all. Therefore, sword examples have been found in both the British Museum online catalogue and the Metropolitan Museum of Art online catalogue.

### Swords

#### British Museum swords

**BM/Big number 23946 (fig. A.148)** – This record comprises of two heavily corroded pieces “from the haft and blade of an iron sword” (anon, nd [b]). Both the haft and the blade are made of iron (anon, nd [b]). The pommel has a semi-circular shape, and is broken (anon, nd [b]). The sword has a find site of Tell Dafana, “Qasr” (anon, nd [b]). The blade has a length of 6.85cm, a width of 2.62cm, and a thickness of 1.35cm (anon, nd [b]). The haft has a length of 15.4cm, a width of 5.84cm, and a thickness of 2.46 cm (anon, nd [b]).

**BM/Big number 5425 (fig. A.149)** – This record comprises of a bronze sword, with inlaid ivory in the handle shaft (anon, nd [b]). The sword is dated to the New Kingdom (with no Dynasty specified), but only has a recorded find site of “Egypt” (anon, nd [b]). The blade has a length of 40.6cm, but there is no record of the width in the online records (anon, nd [b]).

**BM/Big number 52850 (fig. A.150)** – This artefact is a bronze sword, with the inlay missing from the hilt (anon, nd [b]). The sword is dated to the New Kingdom (with no Dynasty specified), but only has a recorded find site of “Egypt” (anon, nd [b]). The blade has a length of 31.8cm, but there is no record of the width in the online records (anon, nd [b]).

**BM/Big number 27392 (fig. A.151)** – This artefact is a leaf-shaped bronze sword, “decorated with an incised representation of a duck landing on a papyrus flower” (anon, nd [b]). There is no date for this sword, and the recorded find site is listed simply as “Egypt” (anon, nd [b]). The blade has a length of 31.1cm and a width of 5.0cm (anon, nd [b]).

**BM/Big number 66668 (fig. A.152)** – This artefact is a 20<sup>th</sup> Dynasty sandstone “stela of victory” (anon, nd [b]). The reason why this is included in this catalogue is because this stela depicts “Horus, Lord of Buhen” holding a curved sword (possibly a khopesh sword) (anon, nd [b]). The recorded find site for the stela is Buhen (anon, nd [b]).

#### MMA Swords

**MMA Accession Number 16.10.453 (fig. A.153)** – This is an early 18<sup>th</sup> Dynasty (c. 1550–1458 B.C.) copper alloy sword (anon, nd [c]). The sword has a find site of el-Asasif, Thebes (anon, nd [c]). The sword has a length of 52.0cm, but no width recorded in the online catalogue (anon, nd [c]).

#### Swords Discussion

There are examples of swords from the Middle Kingdom, cast as separate units, but these did not have the metal strength of the New Kingdom swords (McDermott 2004, 164). The sword became an important weapon in the New Kingdom. Before the innovations introduced under Hyksos rule, the sword was limited to a short blade resembling a long dagger. This dagger, usually double-edged and riveted, became widely used in the Middle Kingdom, being used as a weapon for “stabbing and crushing at close quarters” (Shaw 1991, 37) (fig. A.188). Middle Kingdom daggers

were tapered blades manufactured from copper, with short, wide handles featuring crescent-shaped pommels that would fit easily in the palm of a hand (Hayes 1978, 283). Whilst daggers were frequently carried on an arm-band, the sword was generally held on a belt wrapped around the soldier's waist, leading to distinctive wear patterns on the pommel of the long-sword (McDermott 2004, 166). As with other weapons of the time, it is likely that the first blades were manufactured from copper or arsenical copper, before the transition to bronze in the manufacture of swords in the New Kingdom (McDermott 2004, 166). As mentioned with the axe-heads above, the addition of even the smallest amount of arsenic to the copper in the casting process would strengthen the blade a great deal.

An early 18<sup>th</sup> Dynasty short sword housed in the Metropolitan Museum of Art, New York is described as “belonging to an early stage in the development of arm of this class”, as shown by its plain grip and blade, and rounded point (Hayes 1990, 68) (fig. A.189). This particular sword is one cubit (20.5 inches) in length, and cast in a single piece with only traces of the original inlaid wooden plates from the grip remaining (Hayes 1990, 68). The design and construction of this sword clearly show the Asiatic influence, paralleling earlier short swords of Asiatic design (Hayes 1990, 68). Long (straight) swords with tapered tangs were later able to be fashioned due to the further metallurgical developments of the New Kingdom (McDermott 2004, 164). Ancient Egypt was apparently dependent on copper for weaponry longer than other contemporary societies, such as Troy II (Richardson 1934, 556). However, once the development of bronze as the primary metal for weapons manufacture took place, the longer sword blades were strengthened, so they were suitable for military use (McDermott 2004, 164). As mentioned above, the blade and handle of these longer swords could be cast in one single piece (known as the Naue II type), and their development coincided with “the rise in armored infantry in the eastern Mediterranean” (Darnell and Manassa 2007, 76).

Along with the long (or straight sword), there was also a long, leaf-shaped sword that was developed (fig. A.190), and this sword-type was cast with either a plain or a crescent-shaped pommel (McDermott 2004, 166). A number of examples of this type of sword have been found at the city of Amarna (McDermott 2004, 167). This

leaf-shaped blade was also seen on New Kingdom examples of knives, including one example from el Lisht, where the double-edged blade was “shaped like an elongated laurel leaf” (Hayes 1990, 412).

Two excellent examples of the khopesh were found in the burial goods of Tutankhamun (Carter 2004, 76; Reeves 1992, 177; McDermott 2004, 167). Designating them “Arms of Offence” (Carter 2004, 76), Howard Carter (2004, 137) names them as bronze falchions, one large and heavy example being found amongst the single sticks, and the other smaller and lighter, found on the floor with other miscellaneous objects. Carter (2004, 77; Reeves 1992, 177) theorises that the smaller sword (16 inches long; 40.6cm) was made for Tutankhamun when he was a child, and that the larger weapon (23½ inches long; 59.7cm) was most likely made for the pharaoh when adolescent. In the case of both weapons, the blade, the shaft and the handle-piece were all cast in one single piece, with a handle-plate fitted with ebony side plates (Carter 2004, 77; Reeves 1992, 177) (figs. A.191 and A.192).

The larger of the two swords, the model for the khopesh employed in the experimental archaeology, would appear to have been designed for crushing rather than cutting, as the convex cutting edge was only partially developed (Carter 2004, 77; Reeves 1992, 177). This larger khopesh would have inflicted serious wounds due to the sheer weight of the blade (rather than any real sharpness) and a thickness of approximately 0.65 inches on the back of the blade (Carter 2004, 77). This sort of weapon was certainly designed to create “blunt-trauma injuries” on the battlefield, opening gaps in an enemy’s armour (Darnell and Manassa 2007, 76). The smaller khopesh, less curved than the larger one, had what Carter (2005, 77) describes as “more of a knife edge”. The cutting edge was finely honed and sharpened, and would have been more effective at thrusting, cutting and slicing lightly armoured enemies (Darnell and Manassa 2007, 76). Carter was not necessarily correct in assuming that the small size of the smaller khopesh necessarily equated with Tutankhamun as a child; the smaller khopesh could potentially have been a weapon designed for adult use, perhaps for combat practice.

## Petrie Daggers

### 18<sup>th</sup> Dynasty and New Kingdom

**UC63117 (fig. A.120)** – A copper alloy dagger with brown and green corrosion (anon, nd [a]). The dagger is dated to the 18<sup>th</sup> Dynasty, but there is no recorded find site (anon, nd [a]). The model dagger has a length of 28.0cm and a width of 3.5cm (anon, nd [a]). UC63117 is a good example of an 18<sup>th</sup> Dynasty form dagger.

**UC16604 & UC26298 (fig. A.121 a and b)** – UC16604 is a badly corroded bronze dagger blade and hilt case, broken into two pieces (anon nd [a]). The hilt shaped for an inlay, the fragments of which are part of UC26298 (anon, nd [a]). UC26298 comprises of several fragments of the silver inlay from the dagger handle of UC16604, one piece of which is larger than the rest and in the shape of the dagger handle, perhaps designed to fit the hilt on one side (anon, nd [a]). There are also a few pieces of bronze from the dagger blade of UC16604 itself (anon, nd [a]). The dagger and the fragments are dated to the 18<sup>th</sup> Dynasty, and both have a recorded find site of Qau (anon, nd [a]). UC16604 has a length of 28.0cm, and no width recorded, whereas UC26298 has a largest length of 7.8cm and a largest width of 4.0cm (anon, nd [a]).

**UC16603 (fig. A.122)** – A bronze dagger blade and hilt that has been cast in one piece, with the hilt shaped for an inlay (anon, nd [a]). The dagger is dated to only to the New Kingdom, and there is no recorded find site (anon, nd [a]). The shape of the dagger blade is almost identical to the shape of the dagger blade that has been cast for the experimental archaeology for this thesis. UC16603 has a length of 26.2cm, but a no width has been recorded (anon, nd [a]).

### Old Kingdom

**UC16242 (fig. A.123)** – A corroded copper dagger blade, with a midrib and a short sharp tang, which is apparently now believed to be a dagger, rather than a spear-head as was originally published (anon, nd [a]). The dagger is dated to the 6<sup>th</sup> Dynasty, and has a find site of Qau (anon, nd [a]). The dagger has a length of 21.5cm, but no width recorded (anon, nd [a]).

**UC18005 (fig. A.124)** – A corroded copper dagger, dated to the 6<sup>th</sup> Dynasty, with a find site of Qau (anon, nd [a]). The dagger has a length of 33.0cm, but no width recorded (anon, nd [a]). This dagger is very different in shape and style to UC16242, despite dating to the same dynasty.

#### First Intermediate Period

**UC63127 (fig. A.125)** – A heavily corroded double-edged copper alloy dagger (anon, nd [a]). One edge has been corroded away, and the other edge has bore hole in it (anon, nd [a]). The dagger is dated to the 7<sup>th</sup> Dynasty, but has no recorded find site (anon, nd [a]). The dagger has a length of 34.5cm, and a width of 3.5cm (anon, nd [a]).

#### Middle Kingdom

**UC40672 (fig. A.126)** – A bronze dagger blade, which has double parallel ribs in relief along the centre of the blade, and a curved section with a tang attached by three rivets on both sides at the butt end (anon nd [a]). There is one rivet in a squared tang which is for the attachment of the dagger blade to a separate crescent-shaped handle made of hippopotamus ivory (anon, nd [a]). The ivory has become friable, with some green cuprous (copper) discolouration (anon, nd [a]). The dagger is dated to the 11<sup>th</sup> Dynasty, but has no recorded find site (anon, nd [a]). The online collection records do not contain details of the length and width measurements for this dagger.

**UC40673 (fig. A.127)** – A bronze dagger blade, which has much in common with UC40672, with double parallel ribs in relief along the centre of blade (anon, nd [a]). The dagger has a curved section with long tang attached to it by three rivets on both sides at the butt end, and four rivets in the squared tang for attaching the blade to handle (anon, nd [a]). The pommel end of the handle is made of crescent-shaped hippopotamus ivory, with square depressions on either side of the centre (anon, nd [a]). There is also some green copper discolouration on the blade (anon, nd [a]). The dagger is dated to the 11<sup>th</sup> Dynasty, but has no recorded find site (anon, nd [a]).

As with UC40672, the online collection records do not contain details of the length and width measurements for this dagger.

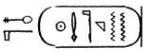
**UC16699 (fig. A.128)** – A section of a wooden model dagger, the tip of which is missing (anon, nd [a]). The model dagger is dated to the 12<sup>th</sup> Dynasty, with a find site of Lahun (Fayum) (anon, nd [a]). The model dagger has a length of 18.0cm, but no width recorded in the online catalogue (anon, nd [a]).

**UC16698 (fig. A.129)** – A wooden model dagger, which is dated to the 12<sup>th</sup> Dynasty, with a find site of Lahun (Fayum) (anon, nd [a]). The model dagger has a length of 33.0cm, but no width recorded in the online catalogue (anon, nd [a]).

#### Dagger Discussion

In Pre- and Early Dynastic times, the dagger was generally a straight copper blade (Cline 1948, 4). This had either a midrib or no midrib, and was usually set into a hilt that had curving projections that enclosed the top of the blade (Cline 1948, 4). As with the majority of weapons manufactured and used in Egypt, the dagger was generally made of bronze (particularly from the New Kingdom onwards), a metal that continued to be used long after other nations had adopted iron or steel (Price 1885, 58).

With regard to the period of Hyksos rule, weapons can provide specific information. One such example is an Asiatic style, inlaid silver-hilted bronze dagger found in the tomb of the ‘male official’ Abdu at Saqqara (Sayce 1903, 350; Säve-Söderbergh 1951, 70-71). This dagger was inscribed with the Hyksos and Egyptian names of Apophis Nebkhopeshre, one of the Hyksos pharaohs (Sayce 1903, 350; Säve-Söderbergh 1951, 70), and possibly the ‘King Apophis’ known to have been the opponent of Theban pharaoh Kamose in the early stages of the development of the New Kingdom (Säve-Söderbergh 1951, 70).

Another example of a Hyksos dagger is described by Dawson in his 1925 article (fig. A.193). Purchased from a Luxor dealer in 1916 by a member of the British military, there is unfortunately no provenance attached to the weapon (Dawson 1925, 216) although a southern Egyptian findspot seems likely. The dagger has a total length of 41.3cm, a handle length of 14.2cm, a semi-circular top of the handle width of 5cm, and a base of handle shoulder width of 4cm (Dawson 1925, 216). It would appear that the handle was originally inlaid, although there is no evidence of rivet-holes that would have held the handle in place (Dawson 1925, 216). The blade itself has a mid-rib that runs down the entire length of the blade, and the whole surface of the dagger is eroded and is covered in green corrosion (Dawson 1925, 216). What mainly interested Dawson (1925, 216) was the cartouche inscribed on the right side of the blade, very close to where it joined the hilt. The cartouche  is the prenomen of Hyksos king Apophis 'Okenenrē', possibly a contemporary of Theban king Seqenenre Tao of the Seventeenth Dynasty (Dawson 1925, 216), who is believed to be Kamose's father.

An example of well-known 18<sup>th</sup> Dynasty daggers are the two elaborate examples found within the wrappings of the mummy of Tutankhamen (fig. A.194). The first of these can be assumed to be ceremonial in design (Darnell and Manassa 2007, 77) and was found underneath one of the girdles placed around the waist of the mummy (Reeves 1992, 177). It measures 31.9cm in length, and has a blade of gold (Gardiner 1941, 1; Reeves 1992, 177). The hilt was particularly ornate, comprising alternating bands of granulated gold and cloisonné bands of lapis lazuli, carnelian, malachite and glass (Gardiner 1941, 1). There are cartouches (of Tutankhamun) on top of the hilt that are made of applied embossed gold (Gardiner 1941, 1), a red tinge to the gold suggesting it was hardened with the addition of copper (Gardiner 1941, 1). The dagger sheath is also very decorative, made of sheet gold delicately inlaid with a hunting scene on the back resembling the standard hunting scenes found on contemporary tomb walls (Gardiner 1941, 1; Reeves 1992, 177)

The second Tutankhamun dagger is perhaps a more unusual example, its blade made of iron making it relatively heavy in comparison to the majority of daggers from this

period, which were generally made from bronze (Shaw and Boatright 2008, 39; Wainwright 1932, 14). This dagger was again found in the mummy wrappings, held in place along the right thigh of the pharaoh (Reeves 1992, 177). The hilt of this dagger is similar to the hilt of the gold one, but this iron dagger has a pommel unusually made of rock crystal (Reeves 1992, 177), recalling the crystal mace head of Senebtisi (discussed above). The sheath of this dagger is also made from sheet gold, and decorated with a feathered *rishi* pattern (Reeves 1992, 177).

Shaw and Boatright (2008, 39) suggest that this iron dagger was a gift from the Hittites, as Anatolia is alleged to have been one of the first places where iron production occurred. Certainly in the Eighteenth or Nineteenth Dynasty, a Hittite monarch was corresponding with a neighbour with regard to iron that the latter wanted, and providing him with blades for iron daggers (Wainwright 1932, 14). It is thought that this neighbour is in fact Ramesses II, but as the names of both the addressee and his country are lost, as are those of the sender himself and his country, a fair amount of supposition is involved (Wainwright 1932, 14). However, there is also evidence that the dagger may have come from another source; there is apparently some resemblance between this dagger, and those sent to the 18<sup>th</sup> Dynasty pharaoh Amenhotep III by the Mitanni ruler Tushratta (Reeves 1992, 177; Darnell and Manassa 2007, 77). The location of the western Asian Mitannian state, located in the area of the Tigris and Euphrates rivers (Shaw and Nicholson 1997), meant that they were well located to serve as an intermediary trader between the Egyptians to the south and the northerly Hittites.

#### Petrie Mace-heads

The following mace-heads examined here have also already been looked at in a previous MA thesis (Dean 2009):

**UC4284 (fig. A.161)** – A black and white conical porphyry mace-head (anon, nd [a]; Dean 2009, 28). The mace-head is dated to the Naqada I period, and has a find site of Naqada (anon, nd [a]; Dean 2009, 28). The mace-head has a diameter of 10.16cm, but no height is recorded (anon, nd [a]; Dean 2009, 28). UC4284 has some

similarities with the Harrogate museum mace-head HM10546 (anon, nd [a]; Dean 2009, 28).

**UC6165 (fig. A.162)** – A black and white conical mace-head, composed of either diorite or porphyry, with two large chips in the rim (anon, nd [a]; Dean 2009, 28). The mace-head is dated to the Naqada I period, and has a find site of Abydos (anon, nd [a]; Dean 2009, 28). The mace-head has a diameter of 7.1cm and a height of 2.15cm (anon, nd [a]; Dean 2009, 28). UC6165 has some similarities with the Harrogate museum mace-head HM10546 (anon, nd [a]; Dean 2009, 28).

**UC15374 (fig. A.163)** – A white-veined black syenite conical mace-head (anon, nd [a]; Dean 2009, 28). The mace-head is dated to the Naqada I period, but has no recorded find site (anon, nd [a]; Dean 2009, 28). The mace-head has a diameter of 6.2cm, but no record of height (anon, nd [a]; Dean 2009, 29). UC15374 has some similarities with the Harrogate museum mace-heads HM10547 and HM10548 (anon, nd [a]; Dean 2009, 28-29).

**UC15373 (fig. A.164)** – Another white-veined black syenite conical mace-head (anon, nd [a]; Dean 2009, 29). The mace-head is also dated to the Naqada I period, but has no recorded find site (anon, nd [a]; Dean 2009, 29). The mace-head has a diameter of 9.0cm, but no record of height (anon, nd [a]; Dean 2009, 29). UC15373 has some similarities with the Harrogate museum mace-heads HM10547 and HM10548 (anon, nd [a]; Dean 2009, 29).

**UC15365 (fig. A.165)** – A black and white conical mace-head, made from syenite (anon, nd [a]; Dean 2009, 29). The mace-head is dated to the Naqada I period, but has no recorded find site (anon, nd [a]; Dean 2009, 29). The mace-head has a diameter of 10.6cm, but no record of height (anon, nd [a]; Dean 2009, 29). UC15365 has some similarities with the Harrogate museum mace-heads HM10547 and HM10548 (anon, nd [a]; Dean 2009, 29).

**UC15371 (fig. A.166)** – A black and white conical mace-head, made from syenite, with a damaged edge (anon, nd [a]; Dean 2009, 30). The mace-head is dated to the Naqada I period, but has no recorded find site (anon, nd [a]; Dean 2009, 30). The mace-head has a diameter of 8.9cm, but no record of height (anon, nd [a]; Dean 2009, 30). UC15371 has some similarities with the Harrogate museum mace-head HM10550 (anon, nd [a]; Dean 2009, 29).

**UC9615 (fig. A.167)** – A yellow piriform mace-head, composed of glazed quartz (anon, nd [a]; Dean 2009, 30). The mace-head is dated only to the Predynastic period, and has a find site of Badari (anon, nd [a]; Dean 2009, 30). The mace-head has a height of 5.08cm, but no record of diameter (anon, nd [a]; Dean 2009, 30). UC9615 bears some resemblance to the Harrogate museum mace-head HM3675 (anon, nd [a]; Dean 2009, 30).

**UC14906 (fig. A.168)** – A light-coloured piriform mace-head, composed of alabaster (calcite) (anon, nd [a]; Dean 2009, 30). The mace-head is dated only to the Early Dynastic period, and has a find site of Hierakonpolis (anon, nd [a]; Dean 2009, 30). The mace-head has a height of 5.7cm, and a diameter of 6.2cm (anon, nd [a]; Dean 2009, 31). UC14906 bears some resemblance to the Harrogate museum mace-head HM3675 (anon, nd [a]; Dean 2009, 30-31).

**UC15381 (fig. A.169)** – A globular mace-head, composed of a dark grey metamorphic stone (anon, nd [a]; Dean 2009, 31). The mace-head is dated only to the Early Dynastic period, and no recorded find site (anon, nd [a]; Dean 2009, 31). The mace-head has a height of 4.9cm, but no recorded diameter (anon, nd [a]; Dean 2009, 31). UC15381 bears some resemblance to the Harrogate museum mace-head HM3706 (anon, nd [a]; Dean 2009, 31).

**UC5131 (fig. A.170)** – A white limestone globular mace-head (anon, nd [a]; Dean 2009, 31). The mace-head has no recorded date, but has a find site of Naqada (anon, nd [a]; Dean 2009, 31). The mace-head has a height of 5.7cm, and a diameter of

6.3cm (anon, nd [a]; Dean 2009, 31). UC5131 bears some resemblance to the Harrogate museum mace-head HM3706 (anon, nd [a]; Dean 2009, 31).

**UC27578 (fig. A.171)** – A yellowing limestone piriform mace-head, with a chipped base (anon, nd [a]; Dean 2009, 32). The mace-head is dated to the Early Dynastic Period, and has a find site of Hierakonpolis (anon, nd [a]; Dean 2009, 32). The mace-head has a height of 6.0cm, and a diameter of 5.9cm (anon, nd [a]; Dean 2009, 32). UC27578 bears some resemblance to the Harrogate museum mace-head ‘Unnumbered’ (anon, nd [a]; Dean 2009, 32).

**UC15393 (fig. A.172)** – A yellowing “sub-spherical” mace-head composed of “geobertite” limestone (anon, nd [a]; Dean 2009, 32). The mace-head is dated to the Naqada II Period, but has no recorded find site (anon, nd [a]; Dean 2009, 32). The mace-head has a height of 3.7cm, but no recorded diameter (anon, nd [a]; Dean 2009, 32). UC15393 bears some resemblance to the Harrogate museum mace-head ‘Unnumbered’ (anon, nd [a]; Dean 2009, 32).

### Mace Discussion

Initially, in Pre- and Early Dynastic times, the conical mace-head is the most common surviving example, before being gradually supplanted by the piriform mace-head (Shaw 1991, 31) (fig. A.195). It is not certain as to why this is the case, since a previous study (Dean 2009) suggested that a conical mace-head would cause a great deal more damage than a piriform one in a smiting situation. In experimental archaeology carried out at the University of York in 2009, a pig head struck with a conical mace-head could be seen both by observation and in X-rays to have sustained more damage than the pig head hit with a piriform mace-head (Dean 2009, 38). Each time the same person wielded the mace to ensure that the experiment was a fair test of the mace heads’ effectiveness as weapons (Dean 2009). This preliminary experiment is the springboard for the further archaeological experiments that are carried out as part of this thesis.

This catalogue of previously unpublished weaponry in local North Yorkshire museum collections, and material from other UK museums, provides further insight into ancient Egyptian weapons assemblages and types, providing an openly archaeological approach to the subject. This catalogue is also a connection between the literary research on warfare and weaponry, and the experimental archaeology that forms part of this thesis. The ancient Egyptian weapons from the museums are a clearer physical link to the replica weaponry used in the experiments than any images or textual descriptions of weaponry found in books and papers.

### Chariots Discussion

Although there are no chariots in the museums discussed in this catalogue, it is worth having some discussion of the examples found elsewhere. As stated in a previous chapter, the Egyptians did make certain changes to the design of the chariot (figs. A.196 and A.197). Those built in Egypt had light wheels with spokes, and the axle was placed towards the rear of the car (McDermott 2004, 131). The chariot was also given a wide wheel track, which allowed it to make sharp turns without overturning (McDermott 2004, 131). The chariot car was completely open at the back, and was broad enough to allow two persons to drive side by side in it (McDermott 2004, 131). These changes ensured that when ranged against enemies such as the Hittites, the Egyptian chariots had increased agility, and therefore something of an advantage against their enemies (McDermott 2004, 101). This advantage was displayed during the Battle of Kadesh, when Ramesses II managed to drive off the Hittite troops until reinforcements arrived, pushing the Hittites back (McDermott 2004, 101) (figs. A.198 and A.199). Indeed, one of the chief functions of the chariot was to break up the enemy formations at the beginning of the battle, which it would be able to do if sufficiently agile (McDermott 2004, 130). However, the lightness of the alterations in the chariot design that the ancient Egyptians made meant that it would be vulnerable in close combat, which is why it was used in conjunction with ranged archery attacks (Shaw and Boatright 2008, 38).

The most intact chariots to have survived from the ancient world are the six found in the tomb of Tutankhamun (Shaw and Boatright 2008, 38; Cotterell 2004, 92) (fig. A.200). These six examples provide a wealth of information about the vehicle,

including its manufacturing process (Cotterell 2004, 92). The lower part of the chariot was composed of two wheels with four spokes, with an axle set towards the rear of the vehicle (Shaw and Boatright 2008, 38). Everything was apparently held together with a combination of leather, rawhide and glue (Shaw and Boatright 2008, 38). The leather was used for straps that would help hold the wheel together, whereas the rawhide was applied in order to strengthen joints and wheel hubs (Shaw and Boatright 2008, 38). As the climate of ancient Egypt was so hot and dry, the regular use of glue and rawhide was a method of manufacture not always possible in other countries in the world where the climate was not so conducive to such methods (Shaw and Boatright 2008, 38).

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### List of Figures

- Figure 1.1: The Borum Eshøj woman's burial equipment - 71
- Figure 1.2: The Ølby woman's burial - 72
- Figure 1.3: Gladiatorial relief from Halicarnassus - 73
- Figure 1.4: Bronze statuette - 73
- Figure 1.5: Three strigils, and a sica from a relief from Heiropolis depicting a gladiator - 74
- Figure 2.1: King Menkaure and Queen Khamerernebtj - 75
- Figure 2.2: Sobekneferu wearing 'male' and 'female' garb - 76
- Figure 2.3: Hatshepsut on the North Obelisk - 77
- Figure 2.4: Nefertiti depicted smiting a female prisoner with a khopesh - 78
- Figure 2.5: Tawosret fighting in a chariot - 79
- Figure 2.6: Screenshot from Tour Egypt website - 80
- Figure 2.7: Screenshot from the LiveScience website - 80
- Figure 2.8: Queen Tuya - 81
- Figure 2.9: Queen Tiye - 82
- Figure 2.10: Eti, queen of Punt - 83
- Figure 3.1: Montuhotep II smiting scene - 84
- Figure 3.2: Tuthmosis III smiting scene - 84
- Figure 3.3: Footstool of Tutankhamun showing the "Nine Bows" enemies - 85
- Figure 3.4: Plans of Egyptian fortifications in Nubia - 85
- Figure 3.5: Chart showing New Kingdom military organisation and hierarchy - 86
- Figure 3.6: Scene of an Egyptian military camp from the tomb of Horemhab - 86
- Figure 3.7: Infantry soldiers of Tutankhamun, from the Colonnade Hall in Luxor Temple - 87
- Figure 3.8: Egyptian chariot team, possibly *maryannu*, fighting Asiatic enemies - 87

- Figure 3.9: Egyptian and foreign (Nubian and Libyan) infantry soldiers in the New Kingdom army - 88
- Figure 3.10: New Kingdom Nubian mercenaries, from the tomb of Tjanuny at Thebes - 88
- Figure 3.11: The siege at Deshasheh – 89
- Figure 3.12: The serekhs of Merneit and Neithotep - 89
- Figure 3.13: Stele of King Merneit - 90
- Figure 3.14: The impressive tomb of Khentkawes at Giza - 91
- Figure 3.15: Axe found in the burial of Ahhotep - 91
- Figure 3.16: The dagger from the burial of Ahhotep - 91
- Figure 3.17: Inscription from Karnak on blocks of Hatshepsut - 92
- Figure 3.18: Graffiti of Ty at Sehēl - 93
- Figure 3.19: Nefertiti depicted smiting a female prisoner with a khopesh - 94
- Figure 3.20: Detail of the Nefertiti smiting scene - 95
- Figure 3.21: First carving of Akhenaten and Nefertiti together, from the tomb of Ramose - 95
- Figure 3.22: Nefertiti worshipping the Aten at a fully-laden altar - 96
- Figure 3.23: A ‘Nefertiti Pillar’ at Karnak - 97
- Figure 3.24: Nefertiti driving her own chariot - 98
- Figure 3.25: Sketch of Tawosret in a chariot, in battle - 98
- Figure 3.26: Statue of Amenhotep III and Queen Tiye - 99
- Figure 3.27: Boundary stela depicting Akhenaten and Nefertiti worshipping the Aten with their daughters - 99
- Figure 3.28: Statues of Ramesses II at Abu Simbel - 100
- Figure 3.29: A priestess, from Abydos - 100
- Figure 4.1: Axes with curved handles - 101
- Figure 4.2: Three-tanged axe-head - 101
- Figure 4.3: ‘Duck-bill’ axe-head - 101
- Figure 4.4: Axe with wooden handle - 102
- Figure 4.5: Axe found in the burial of Ahhotep - 102
- Figure 4.6: Middle Kingdom soldiers carrying axes - 103
- Figure 4.7: Axe held in soldier’s kilt - 103

- Figure 4.8: Tuthmosis IV wielding an axe in battle - 104
- Figure 4.9: Asiatic enemy carrying a duck-billed axe - 104
- Figure 4.10: Range of ancient Egyptian bows - 105
- Figure 4.11: Early leather quiver knotted drawstring - 105
- Figure 4.12: Early leather quiver - 106
- Figure 4.13: Simple bow (A) and Composite bow (B) - 106
- Figure 4.14: Graph of tests carried out with projectile weapons - 107
- Figure 4.15: Seti I in battle against the Hittites - 108
- Figure 4.16 (a): First half of sketch of a woman in battle, in a chariot - 108
- Figure 4.16 (b): Second half of the sketch, showing the opponents - 109
- Figure 4.17: Seti I in battle against the Libyans - 109
- Figure 4.18: The chariot in use – Ramesses III - 110
- Figure 4.19: New Kingdom war chariot - 110
- Figure 4.20: The chariot in use in battle - 111
- Figure 4.21: Piriform mace-head - 111
- Figure 4.22: Damage to the edge of the conical mace-head from experimental archaeology - 112
- Figure 4.23: Damage to the edge of Harrogate mace-head 10550 - 112
- Figure 4.24: Mace-heads from Naqada - 113
- Figure 4.25: Section of Hatshepsut's Karnak North Obelisk - 114
- Figure 4.26: The princess Neferure depicted with a mace - 115
- Figure 4.27: The Narmer Palette - 116
- Figure 4.28: The khopesh in popular culture - 116
- Figure 4.29: New Kingdom swords- 117
- Figure 4.30: Middle Kingdom short sword/dagger - 117
- Figure 4.31: Early 18<sup>th</sup> Dynasty straight sword - 117
- Figure 4.32: Khopesh sword - 118
- Figure 4.33: Bronze khopesh sword - 118
- Figure 4.34: Khopesh sword duel - 119
- Figure 4.35: Soldiers armed with khopesh swords - 120
- Figure 4.36: Statue of Horus and Nectanebo II - 120
- Figure 4.37: Detail of statue, showing Nectanebo II - 121

- Figure 4.38: Nefertiti depicted smiting a female prisoner - 121
- Figure 4.39: Early 18<sup>th</sup> Dynasty dagger, burial of Ahhotep - 122
- Figure 4.40: A town siege, Deshasheh - 122
- Figure 4.41: Relief of an unnamed 11<sup>th</sup> Dynasty king - 123
- Figure 5.1: Mace-head replicas - 124
- Figure 5.2: Testing the mace-heads in 2009 - 124
- Figure 5.3: The visible cut made by the conical mace-head on the pig head - 125
- Figure 5.4: X-ray of pig head hit with globular mace only - 125
- Figure 5.5: X-ray of pig head hit with conical mace only - 126
- Figure 5.6: Defleshed pig skull displaying the conical mace-head damage - 127
- Figure 5.7: Axe-head 123, used for axe-head replica - 128
- Figure 5.8: The hafting of the axe-head - 128
- Figure 5.9: Axe used as model for axe haft - 129
- Figure 5.10: Replica axe, hafted - 129
- Figure 5.11: Dagger of Ahmose I - 129
- Figure 5.12: The cartouche of Ahmose I from the dagger pommel - 130
- Figure 5.13: Replica dagger - 130
- Figure 5.14: Testing the axe on a replica shield - 131
- Figure 5.15: Testing the khopesh on a replica shield - 131
- Figure 5.16: Damage from the axe blows to the rim of the shield - 132
- Figure 5.17: Damage caused by the khopesh blow to the shield - 132
- Figure 5.18: One of the sections of pig ribcage - 133
- Figure 5.19: Axe test by Rebecca Dean - 133
- Figure 5.20: Axe test by Dr Stephen Buckley - 134
- Figure 5.21: Axe test by Dr Joann Fletcher - 134
- Figure 5.22: Mace test by Rebecca Dean - 135
- Figure 5.23: Mace test by Dr Stephen Buckley - 135
- Figure 5.24: Mace test by Dr Joann Fletcher - 136
- Figure 5.25: Dagger test by Rebecca Dean - 136
- Figure 5.26: Dagger test by Dr Stephen Buckley - 137

- Figure 5.27: Dagger test by Dr Joann Fletcher - 137
- Figure 5.28: King's Manor X-ray machine - 138
- Figure 5.29: Test RDA – axe damage - 138
- Figure 5.30: X-ray of axe damage – RDA - 139
- Figure 5.31: RDA transverse fracture - 139
- Figure 5.32: Types of fracture - 140
- Figure 5.33: RDA comminuted fracture - 140
- Figure 5.34: Test SBA – axe damage - 141
- Figure 5.35: X-ray of axe damage – SBA - 141
- Figure 5.36: Test JFA – axe damage - 142
- Figure 5.37: X-ray of axe damage – JFA - 142
- Figure 5.38: JFA transverse fracture - 143
- Figure 5.39: Test RDM – mace damage - 143
- Figure 5.40: X-ray of mace damage – RDM - 144
- Figure 5.41: Test SBM – mace damage - 144
- Figure 5.42: X-ray of mace damage – SBM - 145
- Figure 5.43: Test JFM – mace damage - 145
- Figure 5.44: X-ray of mace damage – JFM - 146
- Figure 5.45: Test RDD – dagger damage - 146
- Figure 5.46: Close-up of RDD dagger damage - 147
- Figure 5.47: Exit wound of dagger – RDD - 147
- Figure 5.48: X-ray of dagger damage – RDD - 148
- Figure 5.49: Test SBD – dagger damage - 148
- Figure 5.50: Close-up of SBD dagger damage - 149
- Figure 5.51: X-ray of dagger damage – SBD - 149
- Figure 5.52: Test JFD – dagger damage - 150
- Figure 5.53: Close-up of JFD dagger damage - 150
- Figure 5.54: Exit wound of dagger – JFD - 151
- Figure 5.55: X-ray of dagger damage – JFD - 151
- Figure 5.56: Close-up of JFA dagger damage - 152
- Figure 5.57: Greater khopesh sword from the tomb of Tutankhamun - 152
- Figure 5.58: Replica khopesh - 152

- Figure 5.59: The piglets used for the experiments - 153
- Figure 5.60: A piglet on the stand prior to the weapon strikes - 153
- Figure 5.61: RDK experiment - 154
- Figure 5.62: RDK first strike trauma - 154
- Figure 5.63: RDK second strike trauma - 155
- Figure 5.64: RDK third strike trauma - 155
- Figure 5.65: JFK experiment - 156
- Figure 5.66: JFK first strike trauma - 156
- Figure 5.67: JFK second strike trauma - 157
- Figure 5.68: JFK third strike trauma - 157
- Figure 5.69: SBK Experiment - 158
- Figure 5.70: SBK first strike initial trauma - 158
- Figure 5.71: SBK first strike blood produced - 159
- Figure 5.72: SBK second strike trauma - 159
- Figure 5.73: SBK third strike trauma - 160
- Figure 6.1: Body D (No. 6) - 161
- Figure 6.2: Body J (No. 36) - 162
- Figure 6.3: Body Q (No. 14) - 163
- Figure 6.4: Body Q (No. 14) - 164
- Figure 6.5: Body Q (No. 14) - 165
- Figure 6.6: Body KK (No. 23) - 166
- Figure 6.7: Defleshed pig skull - 167
- Figure 6.8: The hands and arms of Seqenenre Tao II - 168
- Figure 6.9: The damage inflicted on the skull of Seqenenre Tao II - 169
- Figure 6.10: Possible spear or dagger wound to the face of Seqenenre Tao II - 170
- Figure 6.11: The left side of the skull - 171
- Figure 6.12: Detailed macroscopic aspect of the left most occipitotemporal skull area - 172
- Figure 6.13: Detailed macroscopic view of the excised osseous defect - 173
- Figure 6.14: The inner aspect of the skull defect - 173
- Figure 6.15: Radiograph of the excised specimen - 174

- Figure 6.16: A severe gash wound, mature male, from Giza - 175
- Figure 6.17: A regularly-shaped pierced lesion - 175
- Figure 6.18: A complete sliced lesion, young adult male from Giza - 176
- Figure 6.19: X-ray of the Birmingham mummy displaying torticollis - 177
- Figure 6.20: Antero-posterior view of skull showing arrowhead - 178
- Figure 6.21: Lateral view of skull with arrowhead - 179
- Figure 6.22: Towne's view of skull showing - 180
- Figure 6.23: Bahriyah Oasis, healed depressed fracture - 181
- Figure 6.24: Healed depressed fracture on the occipital bone - 182
- Figure 6.25: Healed depressed fracture on the left parietal bone - 183
- Figure 6.26: Healed depressed fracture on the left parietal bone - 183
- Figure 7.1: The body of the Younger Woman from KV35 - 184
- Figure 7.2: Professor Don Brothwell testing the effectiveness of an axe and machete - 185
- Figure 7.3: Professor Don Brothwell testing the effectiveness of an axe and machete - 186
- Figure 7.4: Professor Don Brothwell testing the effectiveness of an axe and machete - 187
- Figure 7.5: Photograph of damaged Peruvian mummy head - 188
- Figure 7.6: Roentgenogram of Peruvian mummy head - mace trauma - 188
- Figure 7.7: Roentgenogram of Peruvian mummy head - 189
- Figure 7.8: Peruvian mummy skull, displaying extensive mace trauma - 189
- Figure A.1: Arrowhead - 190
- Figure A.2: Arrowhead - 190
- Figure A.3: Spearhead - 190
- Figure A.4: Spearhead - 190
- Figure A.5: Spearhead - 190
- Figure A.6: Axe-head - 190
- Figure A.7: Axe-head - 191
- Figure A.8: Arrowhead - 191
- Figure A.9: Arrowhead - 191
- Figure A.10: Mace-head - 191

- Figure A.11: Mace-head - 191
- Figure A.12: Mace-head - 191
- Figure A.13: Mace-head - 192
- Figure A.14: Mace-head - 192
- Figure A.15: Mace-head - 192
- Figure A.16: Mace-head - 192
- Figure A.17: Mace-head - 192
- Figure A.18: Arrowhead - 192
- Figure A.19: Arrowhead - 193
- Figure A.20: Arrowhead - 193
- Figure A.21: Arrowhead - 193
- Figure A.22: Arrowhead - 193
- Figure A.23: Arrowhead - 193
- Figure A.24: Arrowhead - 193
- Figure A.25: Arrowheads - 194
- Figure A.26: Arrowheads - 194
- Figure A.27: Arrowheads - 194
- Figure A.28: Arrowhead - 194
- Figure A.29: Arrowhead - 194
- Figure A.30: Spearhead - 194
- Figure A.31: Spearhead - 195
- Figure A.32: Spearhead - 195
- Figure A.33: Spearhead - 195
- Figure A.34: Spearhead - 195
- Figure A.35: Spearhead - 195
- Figure A.36: Spearhead - 195
- Figure A.37: Spearhead - 196
- Figure A.38: Spearhead - 196
- Figure A.39: Spearhead - 196
- Figure A.40: Axe-head - 196
- Figure A.41: Axe-head - 196
- Figure A.42: Axe-head - 196

- Figure A.43: Axe-head - 197
- Figure A.44: Axe-head - 197
- Figure A.45: Axe-head - 197
- Figure A.46: Axe-head - 197
- Figure A.47: Axe-head - 197
- Figure A.48: Axe-head - 197
- Figure A.49: Axe-head - 198
- Figure A.50: Dagger - 198
- Figure A.51a: Dagger - 198
- Figure A.51b: Dagger fragments - 198
- Figure A.52: Dagger - 198
- Figure A.53: Dagger - 198
- Figure A.54: Dagger - 199
- Figure A.55: Dagger - 199
- Figure A.56: Dagger - 199
- Figure A.57: Dagger - 199
- Figure A.58: Dagger - 199
- Figure A.59: Dagger - 199
- Figure A.60: Sword fragments - 200
- Figure A.61: Sword - 200
- Figure A.62: Sword - 200
- Figure A.63: Sword - 200
- Figure A.64: Sword stela - 200
- Figure A.65: Sword - 201
- Figure A.66: Mace-head - 201
- Figure A.67: Mace-head - 201
- Figure A.68: Mace-head - 201
- Figure A.69: Mace-head - 201
- Figure A.70: Mace-head - 202
- Figure A.71: Mace-head - 202
- Figure A.72: Mace-head - 202
- Figure A.73: Mace-head - 202

- Figure A.74: Mace-head - 202
- Figure A.75: Mace-head – 202
- Figure A.76: Mace-head - 203
- Figure A.77: Mace-head - 203
- Figure A.78: Linen-wrapped Middle Kingdom arrows - 203
- Figure A.79: Linen-wrapped Middle Kingdom arrows - 204
- Figure A.80: Axe-head - 204
- Figure A.81: Axe-head – 204
- Figure A.82: Axe-head - 205
- Figure A.83: Axe-head - 205
- Figure A.84: Axe -head - 205
- Figure A.85: Axe - 205
- Figure A.86: Axe-head - 205
- Figure A.87: Axe-head - 206
- Figure A.88: Axe-head - 206
- Figure A.89: Axe-head - 206
- Figure A.90: Axe-head - 207
- Figure A.91: Model axe - 207
- Figure A.92: Axe-head - 207
- Figure A.93: Middle Kingdom Daggers – 207
- Figure A.94: Middle Kingdom short sword/dagger - 208
- Figure A.95: Leaf-shaped sword - 208
- Figure A.96: Khopesh swords from the tomb of Tutankhamun - 209
- Figure A.97: The khopesh swords from the tomb of Tutankhamun - 209
- Figure A.98: Bronze Hyksos dagger with cartouche of Apophis I - 209
- Figure A.99: The two daggers from the tomb of Tutankhamun - 210
- Figure A.100: Piriform mace - 210
- Figure A.101 Light and agile ancient Egyptian chariot - 211
- Figure A.102: Light and agile ancient Egyptian chariot - 211
- Figure A.103: Chariots clashing, Battle of Kadesh - 212
- Figure A.104: Illustration of the Battle of Kadesh - 212
- Figure A.105: A chariot from the tomb of Tutankhamun - 213

Chapter One - Women and Weapons Outside of Ancient Egypt

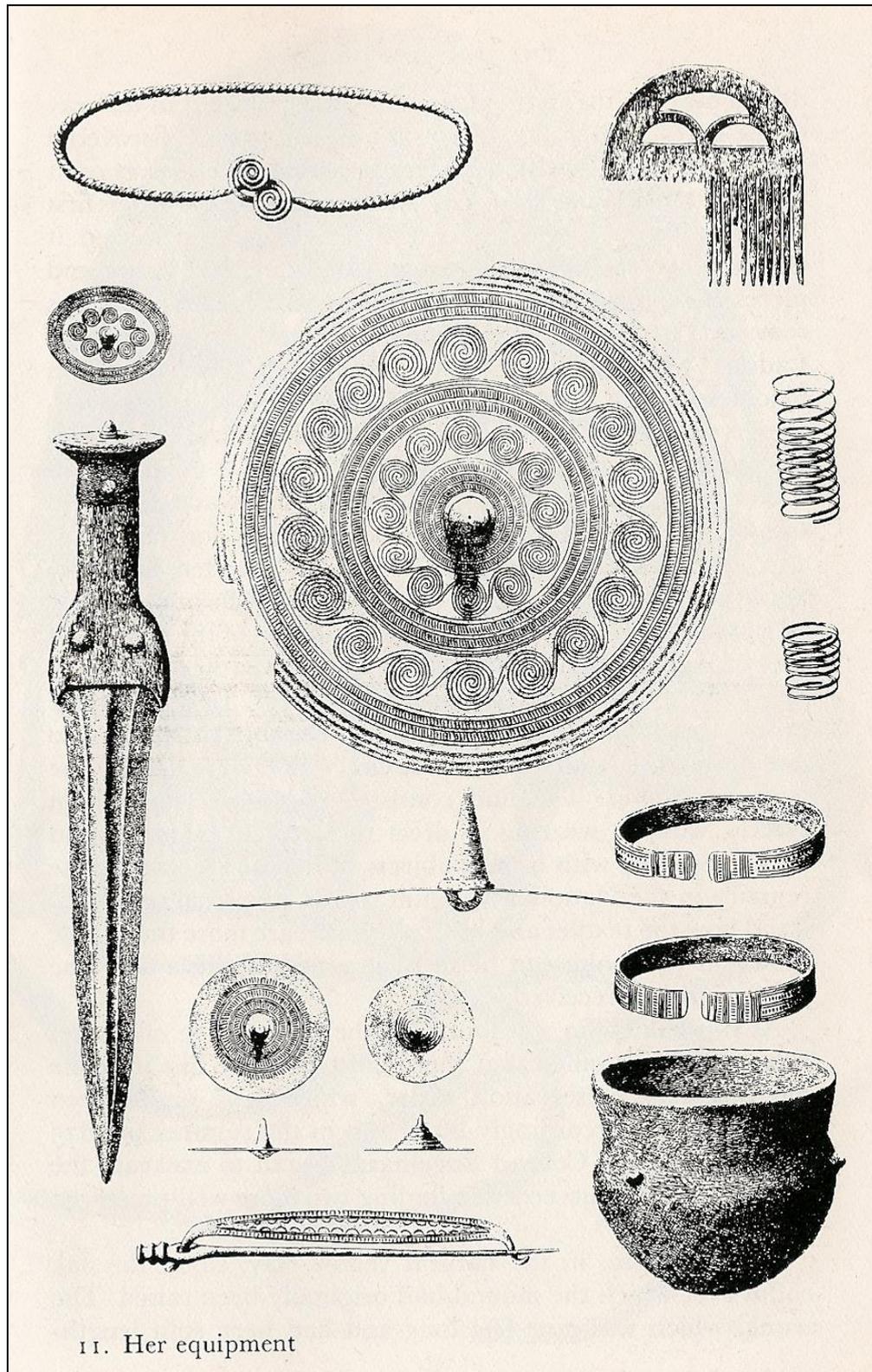


Figure 1.1: The Borum Eshøj woman's burial equipment (Glob 1983, 35, pl. 11).

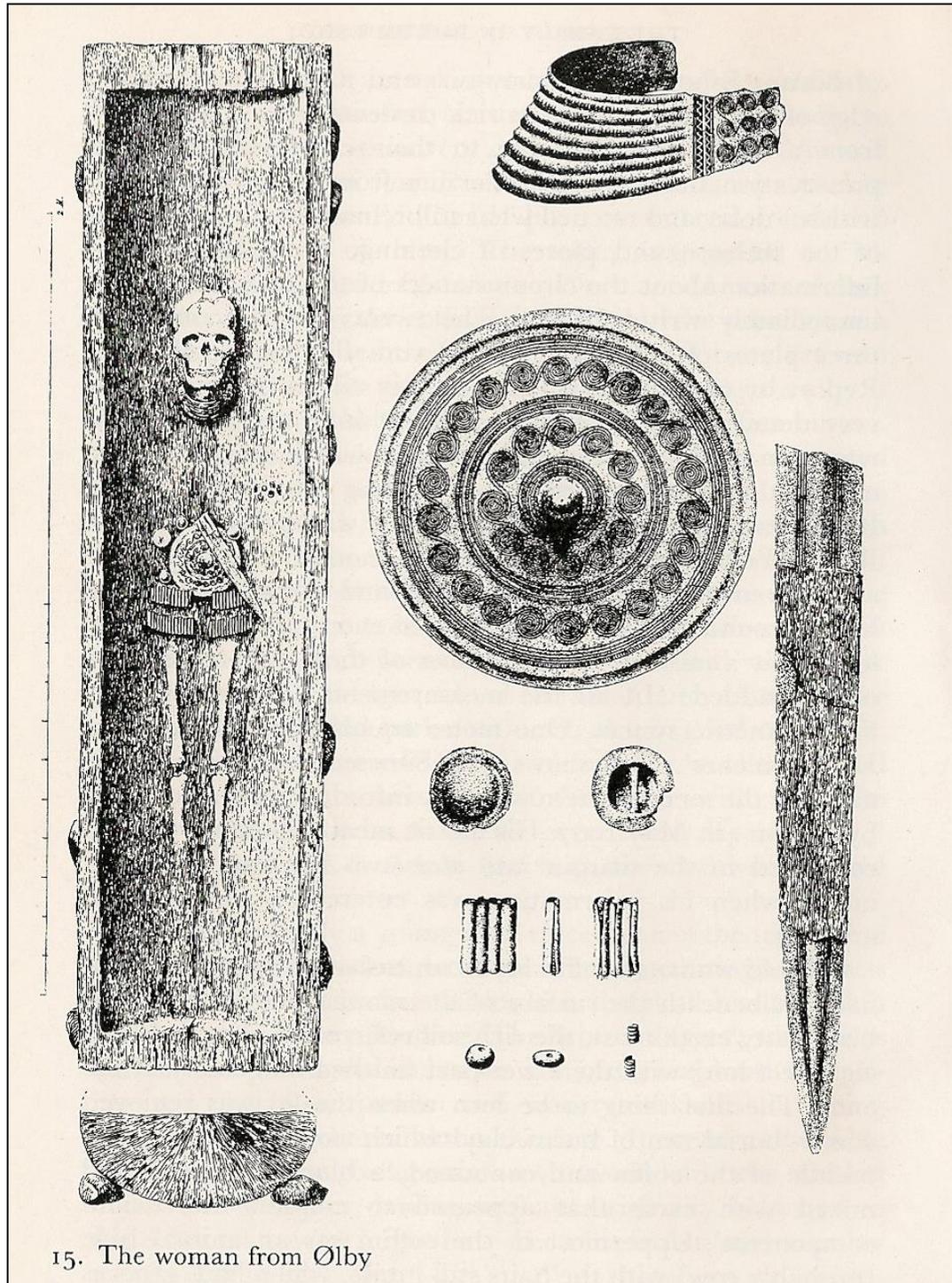


Figure 1.2: The Ølby woman's burial (Glob 1983, 44, pl. 15).



Figure 1.3: Gladiatorial relief from Halicarnassus (Coleman 2000, 489).



Figure 1.4: Bronze statuette (Manas 2011, 2728).



Figure 1.5: Three strigils (left), and a sica (right) from a relief from Heiropolis depicting a gladiator (Manas 2011, 2741).

Chapter Two - A Feminist Approach in Egyptian Archaeology Figures



Figure 2.1: King Menkaure and Queen Khamerernebty, displaying duality of rulership (Lesko 1991, 10).



Figure 2.2: Sobekneferu wearing 'male' and 'female' garb ('Neithsabes' 2007).

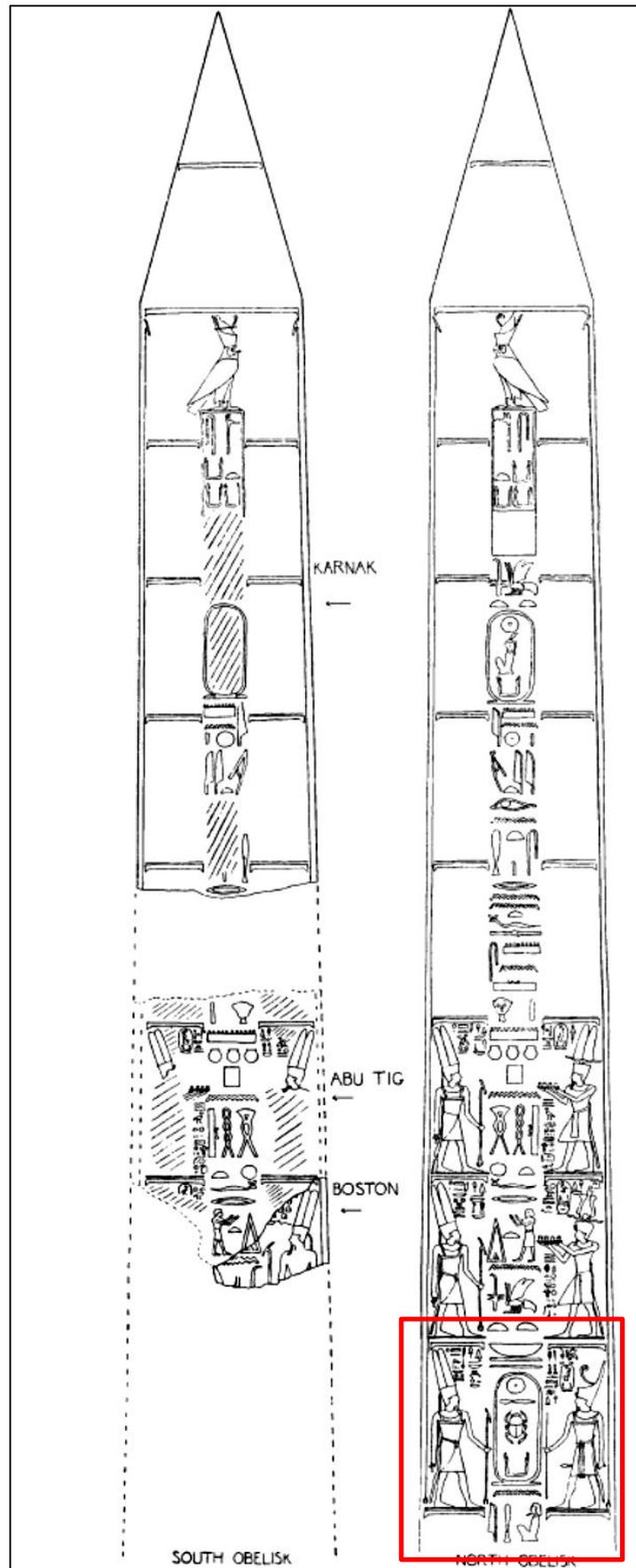


Figure 2.3: Hatshepsut on the North Obelisk (Stevenson Smith 1942, 48).



Figure 2.4: Nefertiti depicted smiting a female prisoner with a khopesh (Captmondo 2007).



Figure 2.5: Tawosret fighting in a chariot (Peck and Ross 1978, 158-159).

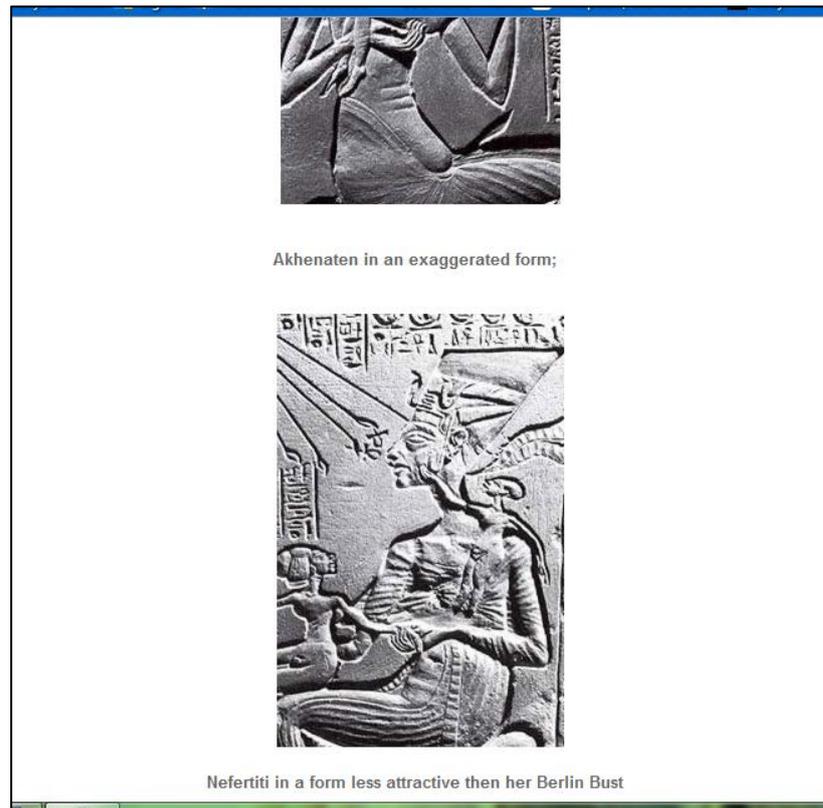


Figure 2.6: Screenshot from Tour Egypt website describing Akhenaten as ‘exaggerated’ and Nefertiti as ‘less attractive’ (Dunn, J. nd).

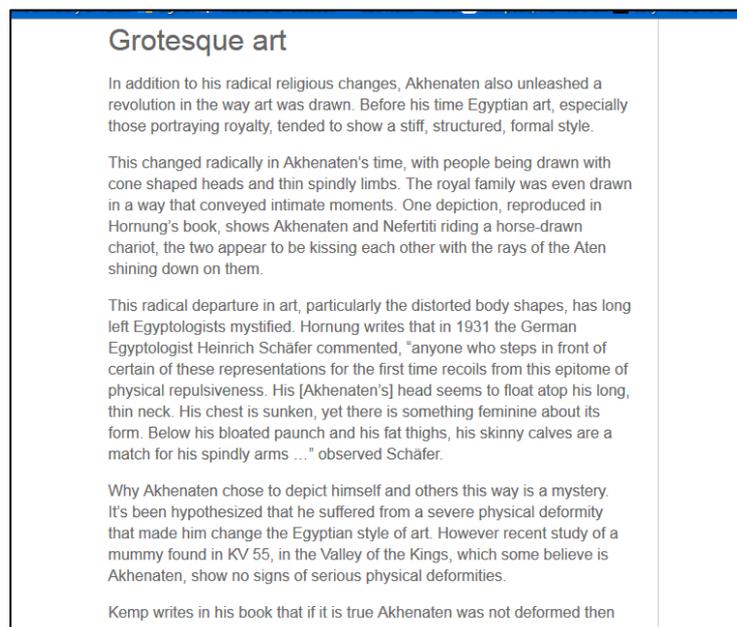


Figure 2.7: Screenshot from the LiveScience website - ‘grotesque’ Amarna art (Jarus 2013).



Figure 2.8: Queen Tuya ('Colin' 2012).



Figure 2.9: Queen Tiye (Schütze 2011).



Figure 2.10: Eti, queen of Punt (Weingarten 2010).

Chapter Three - Literature Review: Warfare and Women in ancient Egypt Figures



Figure 3.1: Montuhotep II smiting scene, originally at Gebelein ('Alyssa P' 2011).



Figure 3.2: Tuthmosis III smiting scene, Karnak (JLCA 2007).

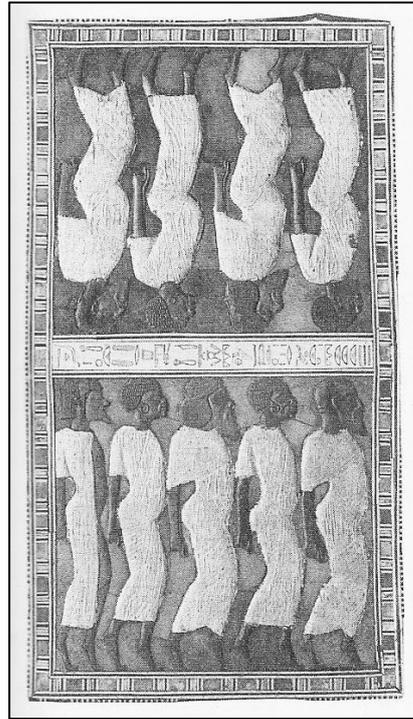


Figure 3.3: Footstool of Tutankhamun showing the “Nine Bows” enemies (Darnell and Manassa 2007, 59).

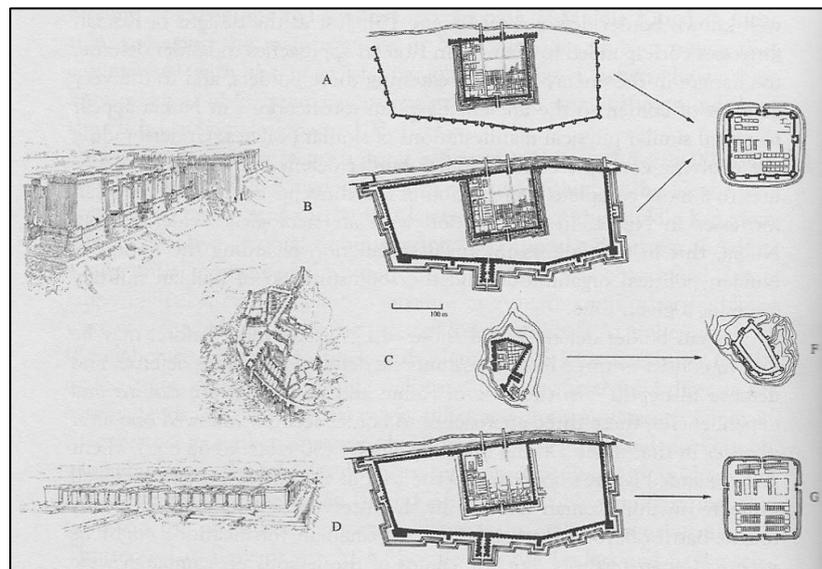


Figure 3.4: Plans of Egyptian fortifications in Nubia (Darnell and Manassa 2007, 100).

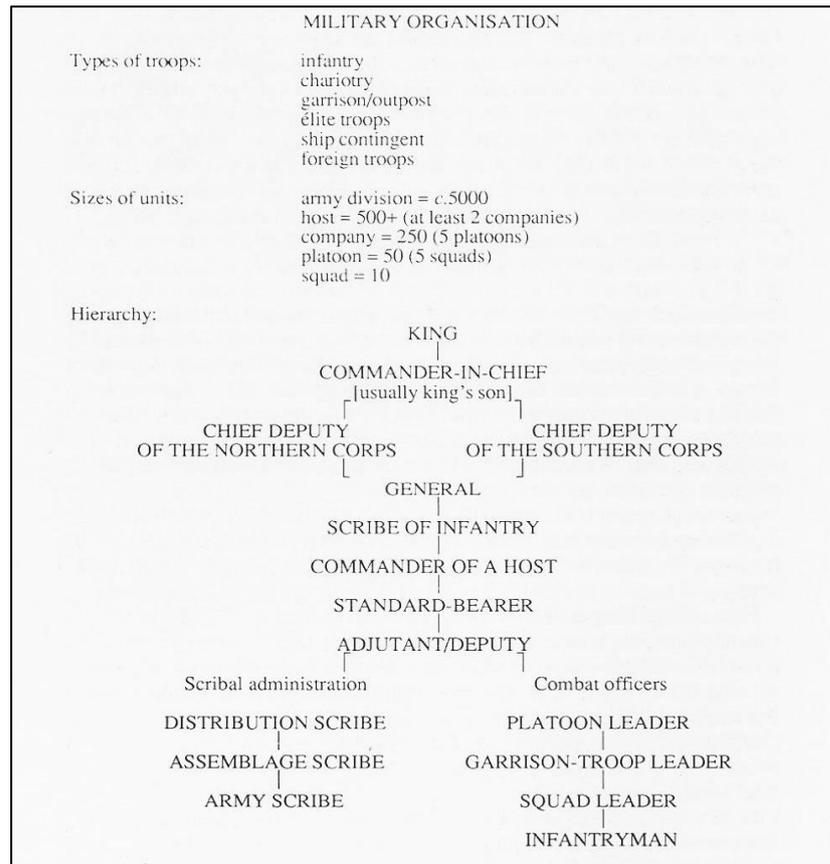


Figure 3.5: Chart showing New Kingdom military organisation and hierarchy (Shaw 1991, 27).

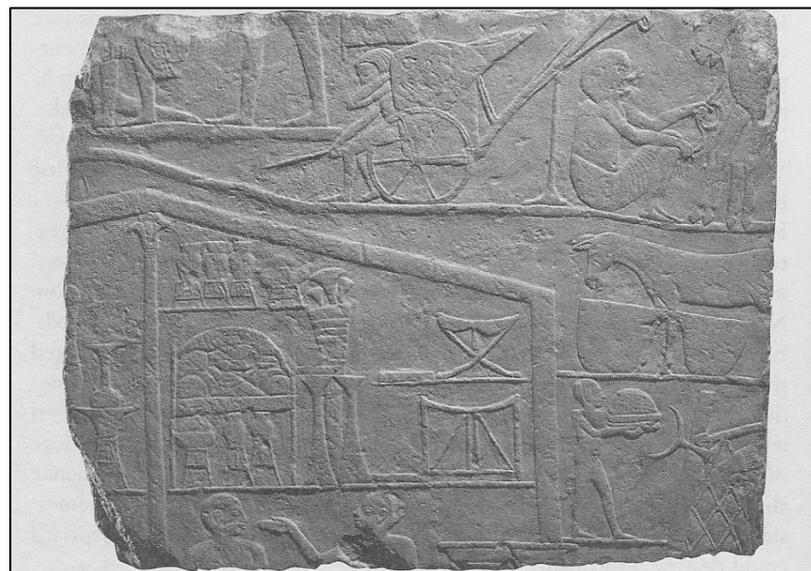


Figure 3.6: Scene of an Egyptian military camp from the tomb of Horemhab (Darnell and Manassa 2007, 88).

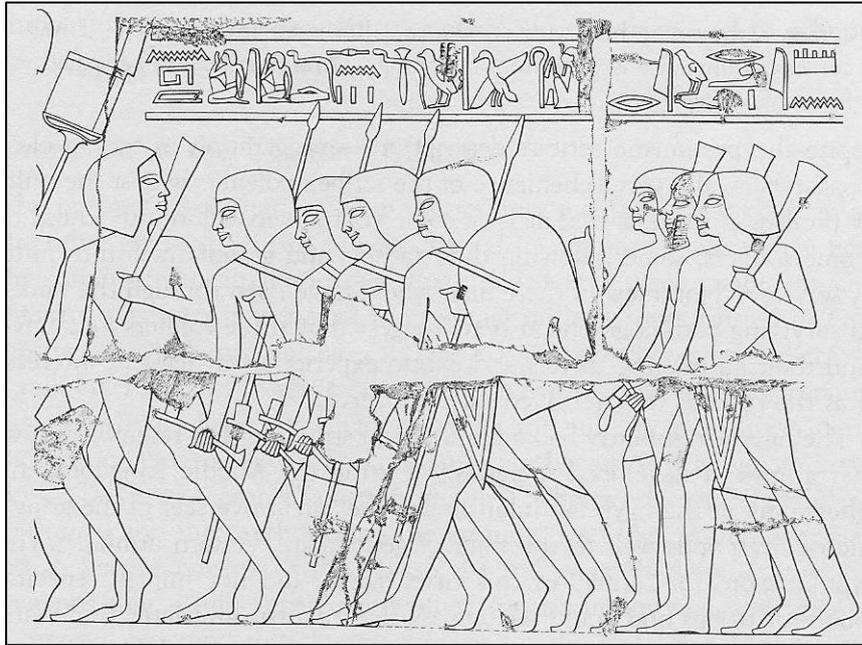


Figure 3.7: Infantry soldiers of Tutankhamun, from the Colonnade Hall in Luxor Temple (Darnell and Manassa 2007, 62).

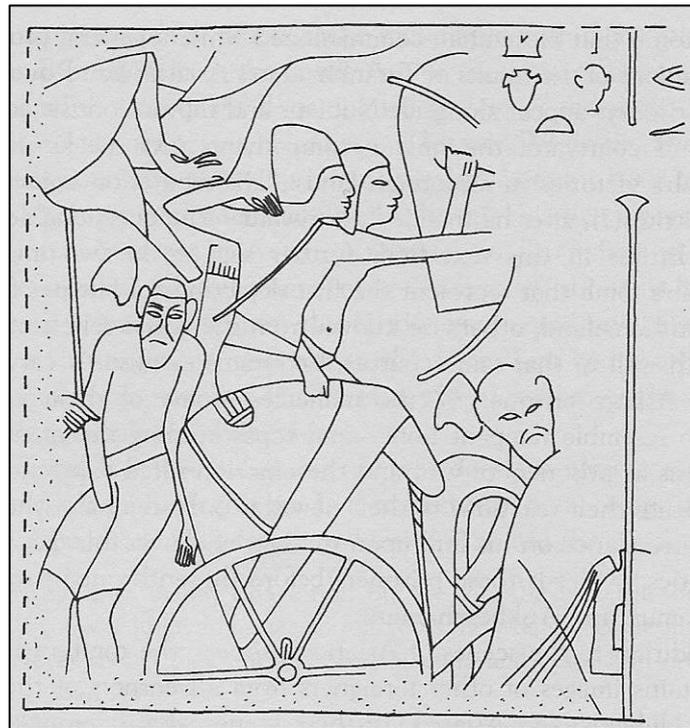


Figure 3.8: Egyptian chariot team, possibly *maryannu*, fighting Asiatic enemies; from the mortuary temple of Horemhab (Darnell and Manassa 2007, 183).

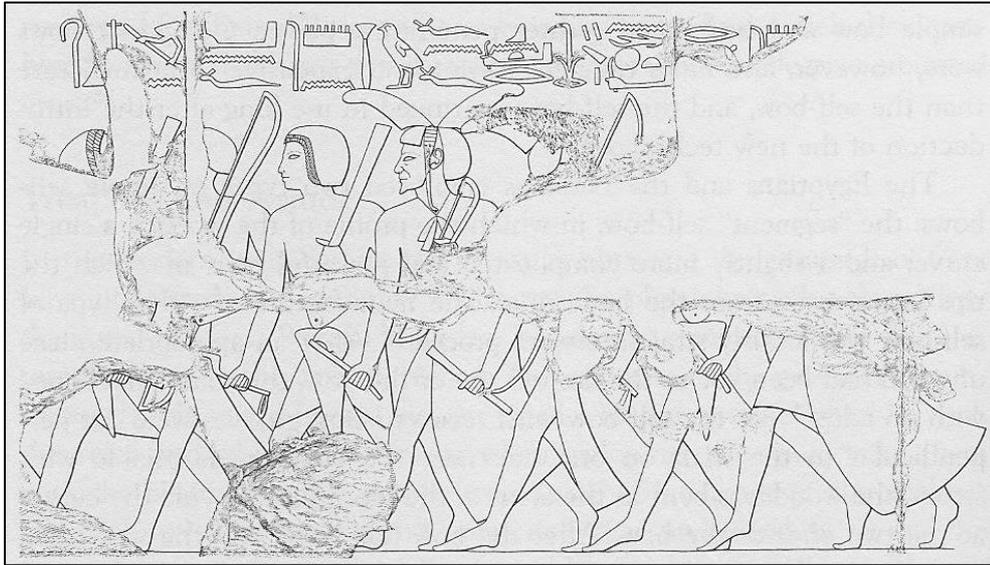


Figure 3.9: Egyptian and foreign (Nubian and Libyan) infantry soldiers in the New Kingdom army (Darnell and Manassa 2007, 72).

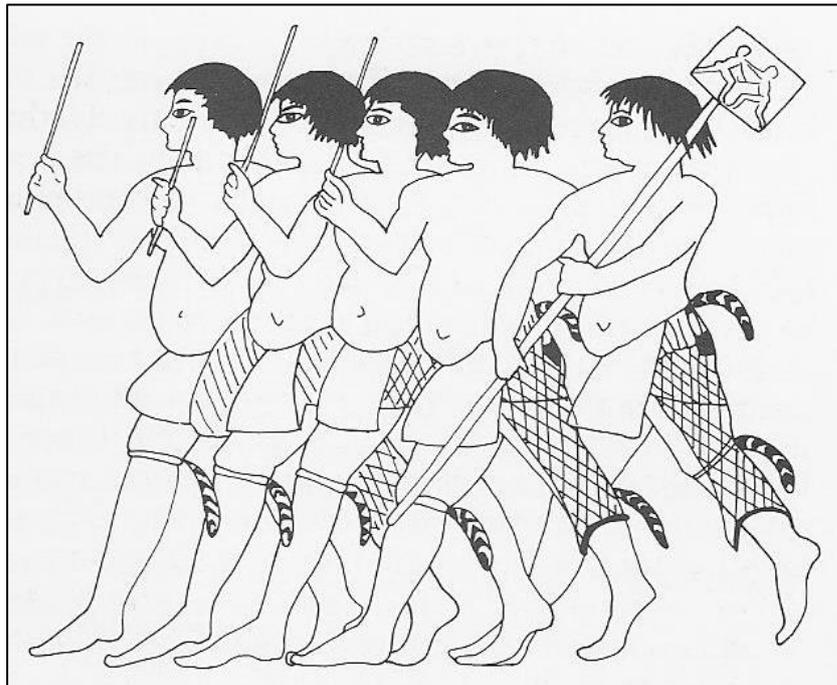


Figure 3.10: New Kingdom Nubian mercenaries, from the tomb of Tjanuny at Thebes (Shaw 1991, 28).

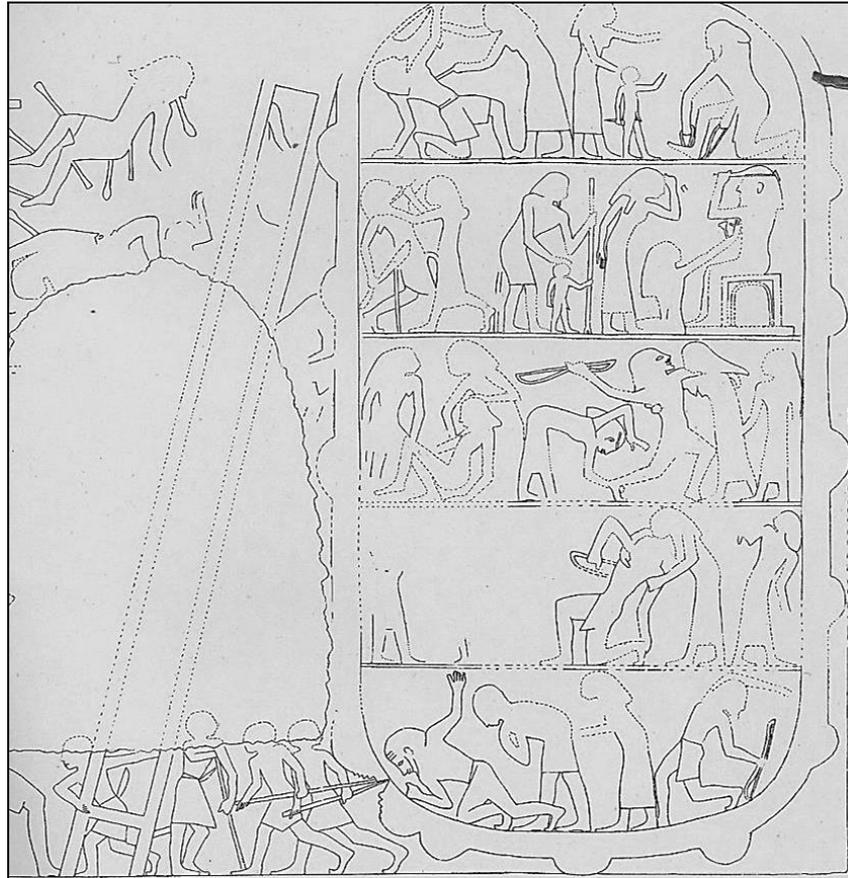


Figure 3.11: The siege at Deshasheh (Petrie 1898, Pl IV).

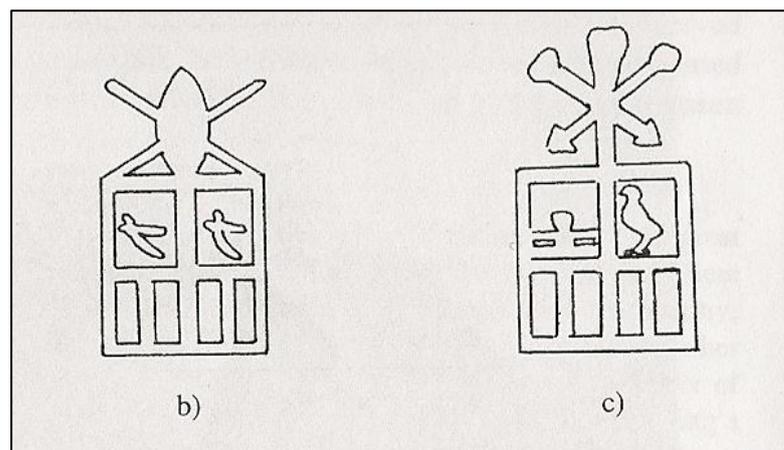


Figure 3.12: The serekhs of Merneit (b) and Neithotep (c) (Callender 1992, 22).

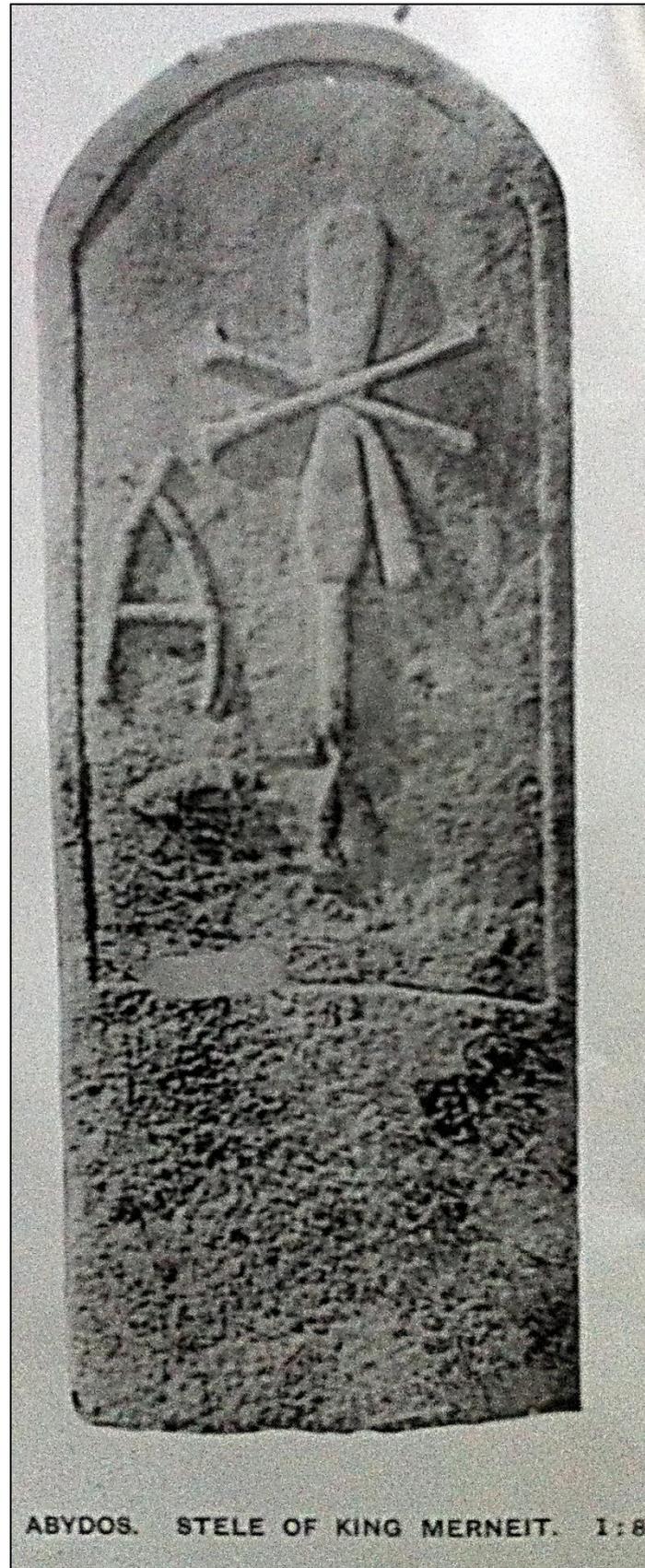


Figure 3.13: Stele of King Merneit (Petrie 1900, *frontispiece*).



Figure 3.14: The impressive tomb of Khentkawes at Giza (Callender 1992, 25).



Figure 3.15: Axe found in the burial of Ahhotep (Shaw and Boatright 2008, 37).



Figure 3.16: The dagger from the burial of Ahhotep (Shaw and Boatright 2008, 37).

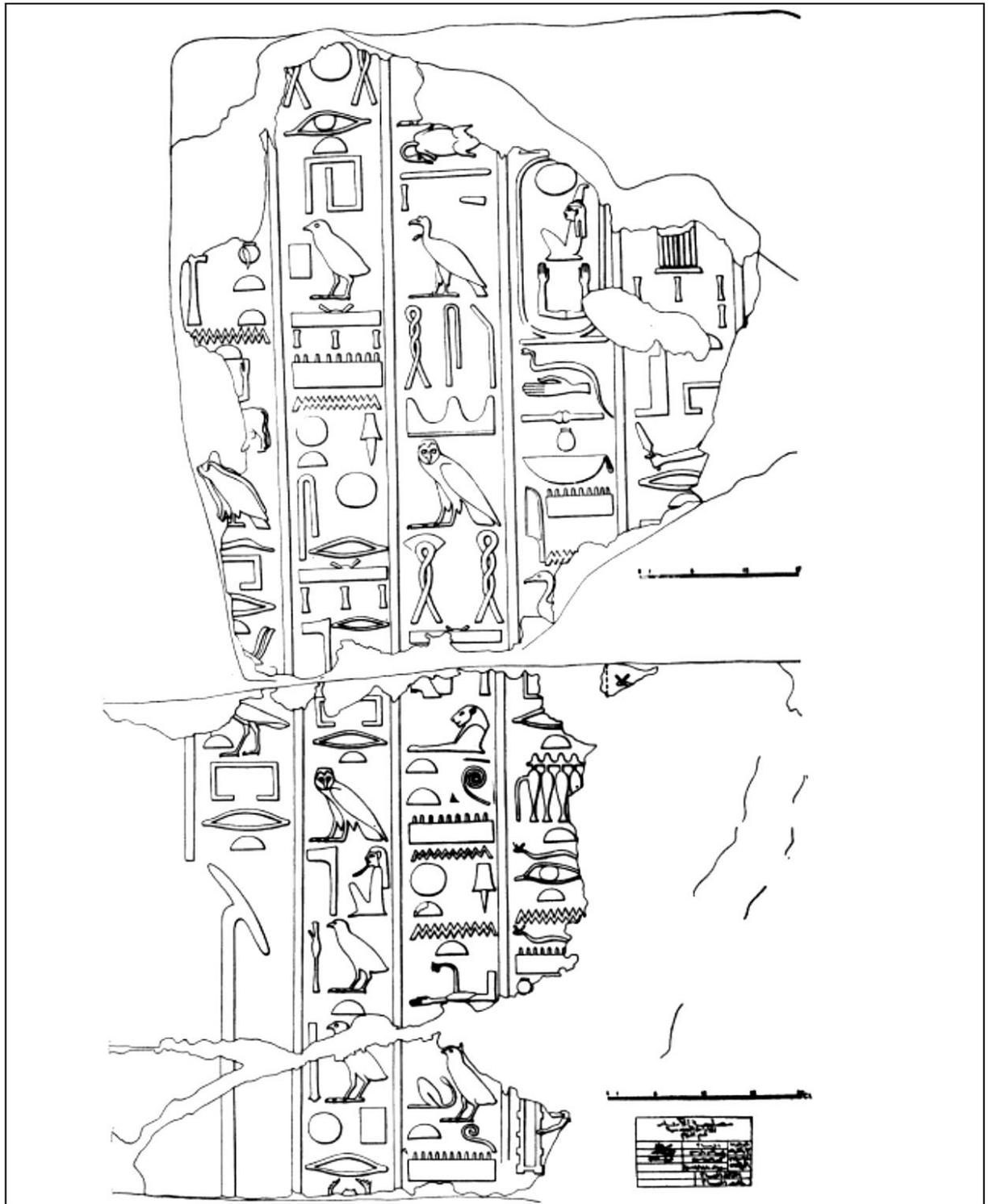


Figure 3.17: Inscription from Karnak on blocks of Hatshepsut (Habachi 1957, 103).



Figure 3.18: Graffiti of Ty at Sehēl (Habachi 1957, 100).



Figure 3.19: Nefertiti depicted smiting a female prisoner with a khopesh (Captmondo 2007).



Figure 3.20: Detail of the Nefertiti smiting scene (Fletcher 2004, 74).

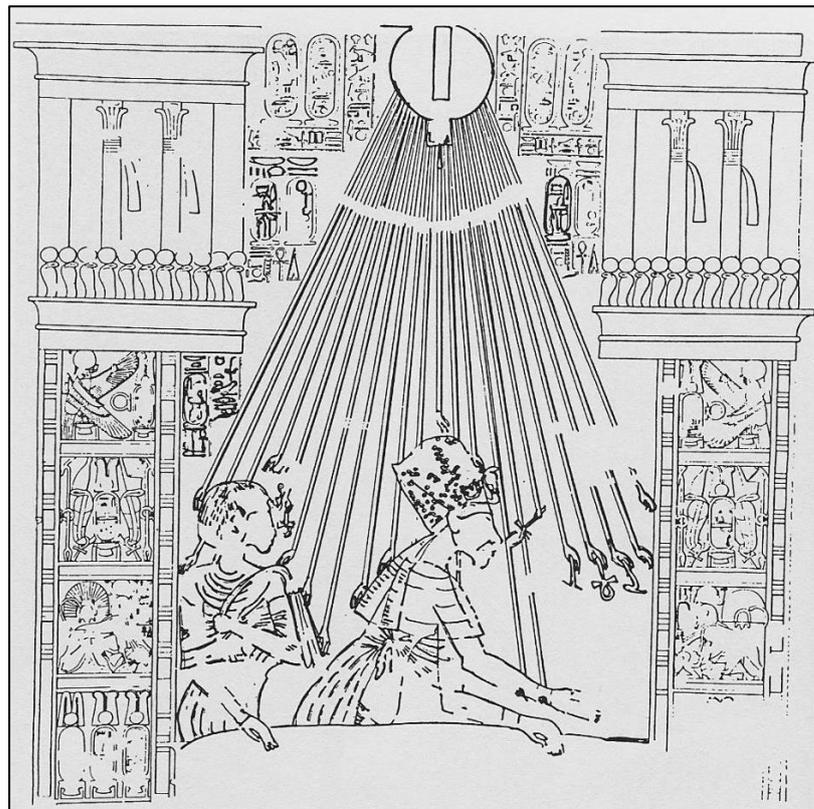


Figure 3.21: First carving of Akhenaten and Nefertiti together, from the tomb of Ramose (Samson 2002, 12).

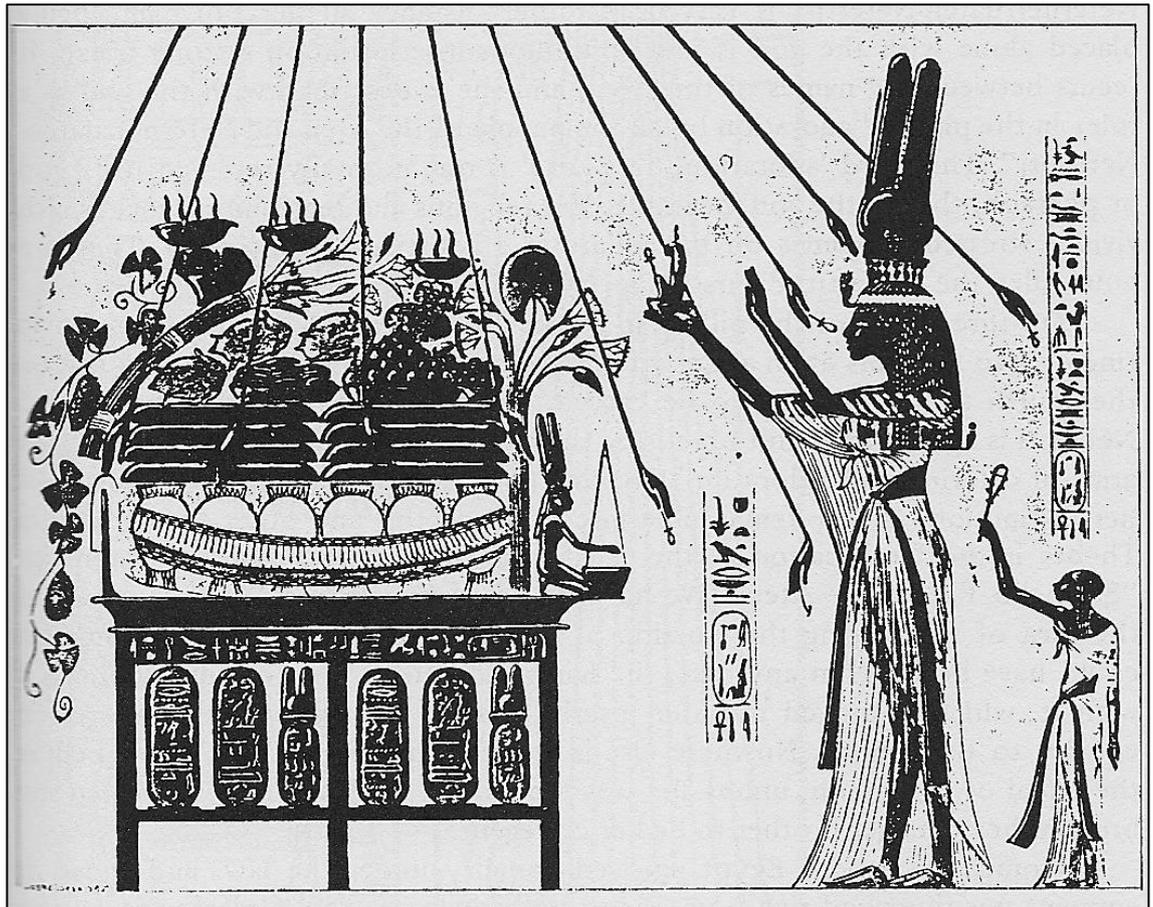


Figure 3.22: Nefertiti worshipping the Aten at a fully-laden altar (Samson 2002, 19).

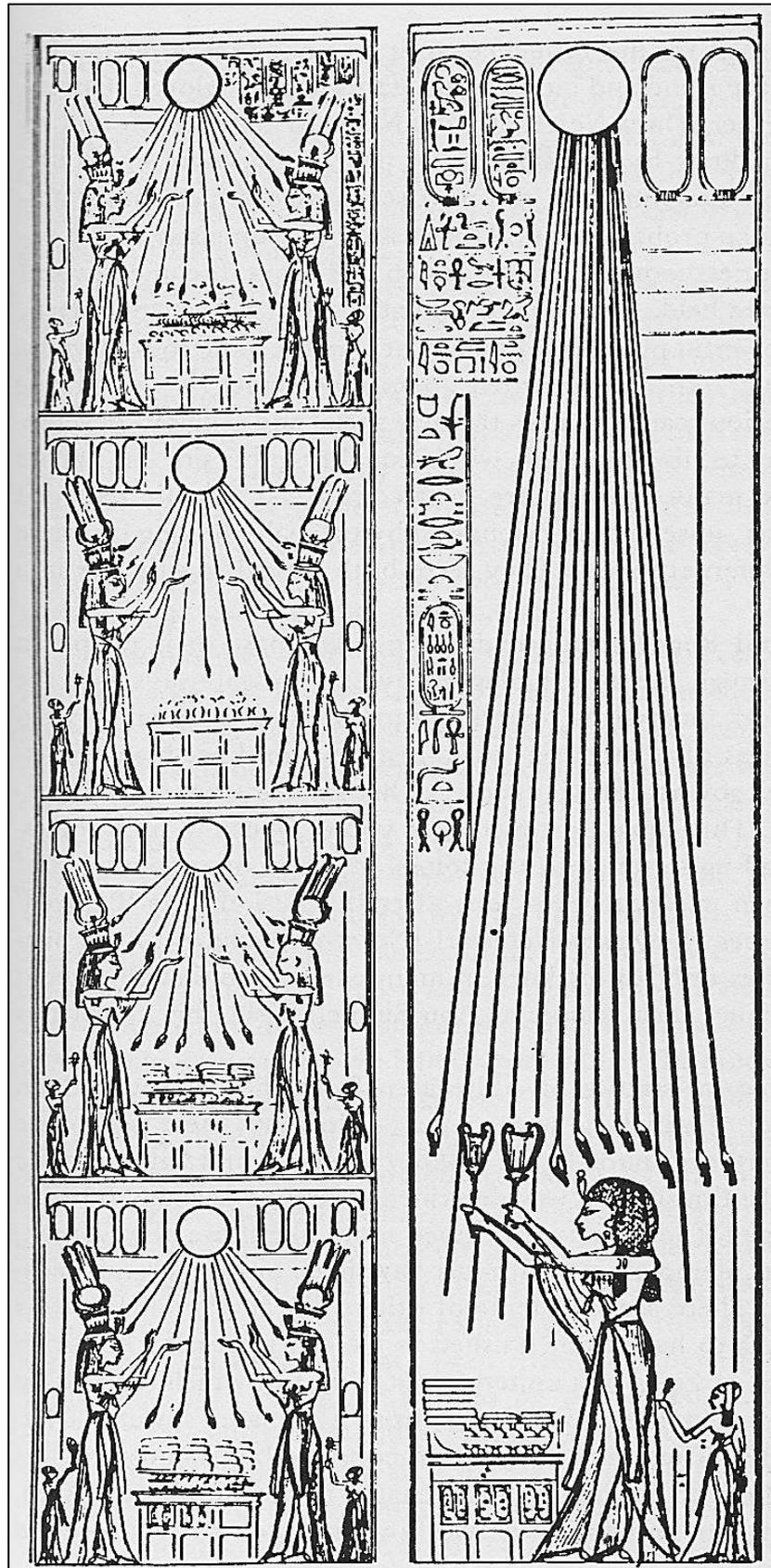


Figure 3.23: A 'Nefertiti Pillar' at Karnak (Samson 2002, 21).

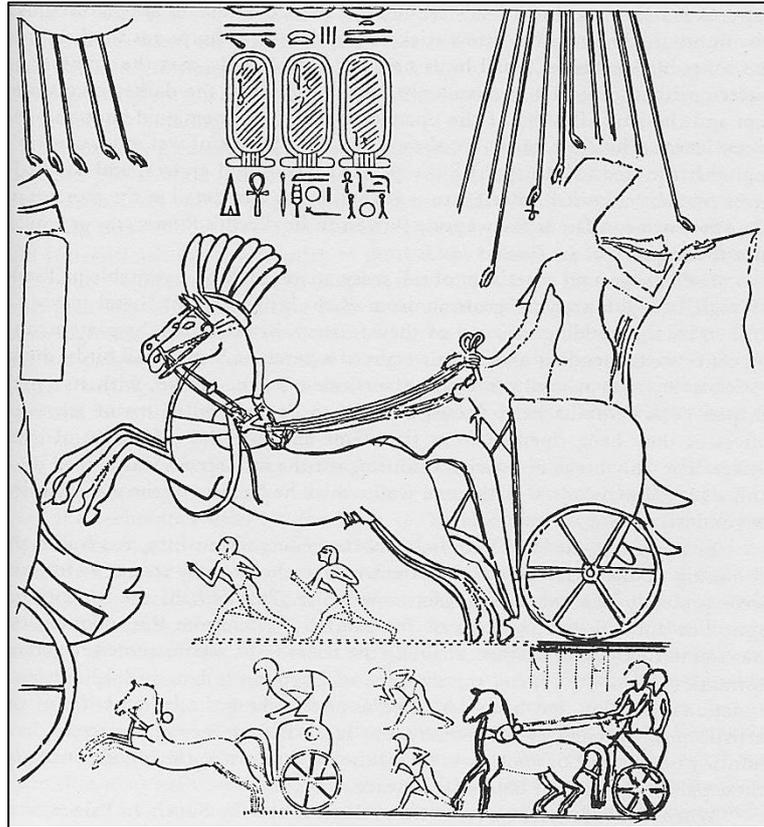


Figure 3.24: Nefertiti driving her own chariot (Samson 2002, 65).



Figure 3.25: Sketch of Tawosret in a chariot, in battle (Peck 1978, 158-159).

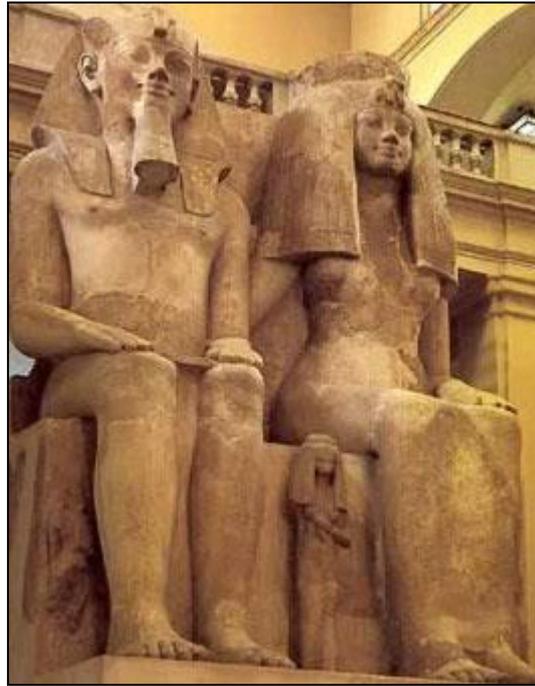


Figure 3.26: Statue of Amenhotep II I and Queen Tiye (Dunn 2011).

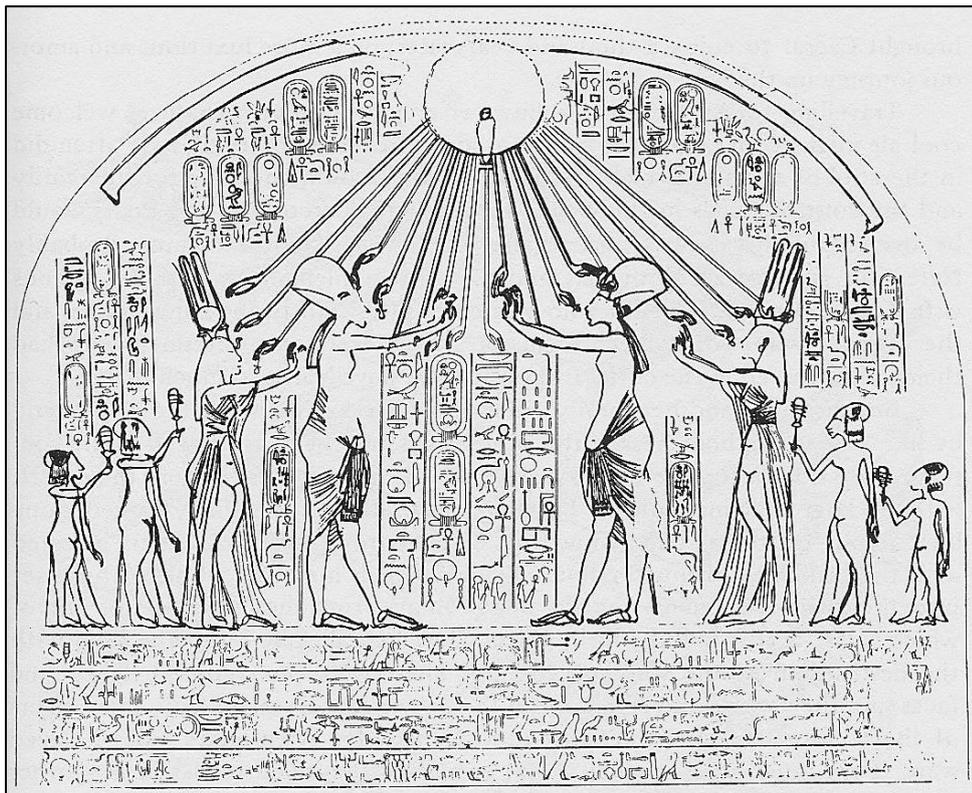


Figure 3.27: Boundary stela depicting Akhenaten and Nefertiti worshipping the Aten with their daughters (Samson 2002, 35).

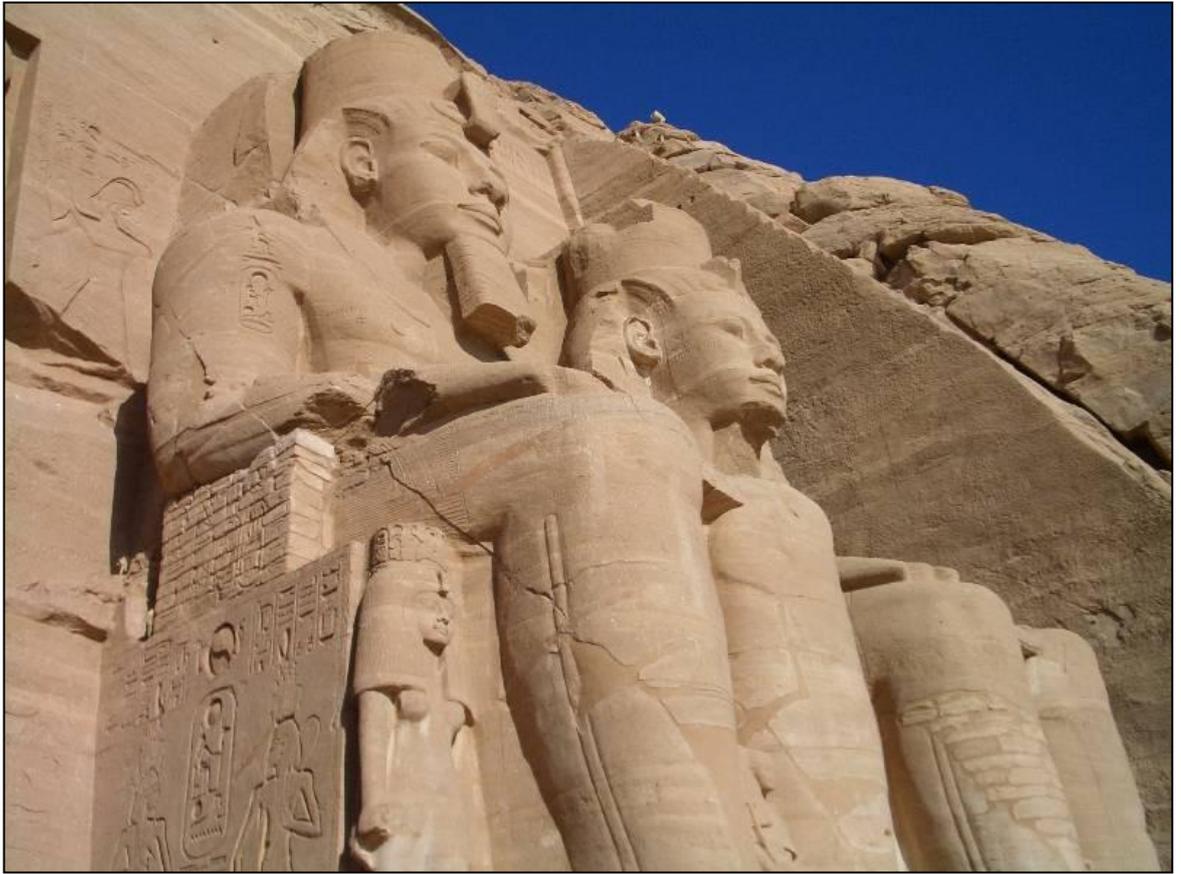


Figure 3.28: Statues of Ramesses II at Abu Simbel, with his queens depicted much smaller (anon, nd [d]).



Figure 3.29: A priestess welcomes the king into the temple, from Abydos (Blackman 1921, 8).

Chapter Four - Literature Review: Ancient Egyptian Weaponry Figures



Figure 4.1: Axes with curved handles (McDermott 2004, 76).



Figure 4.2: Three-tanged axe-head (Mc Dermott 2004, 73).

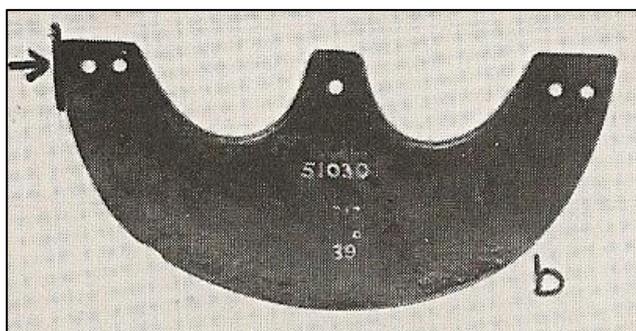


Figure 4.3: 'Duck-bill' axe-head (Davies 1987, Pl. 34).



Figure 4.4: Axe with wooden handle (Shaw and Nicholson 1997, 219).



Figure 4.5: Axe found in the burial of Ahhotep (Shaw and Boatright 2008, 37).

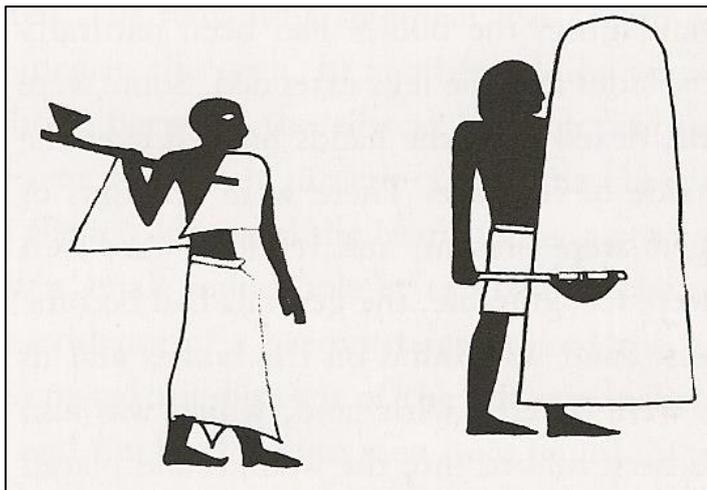


Figure 4.6: Middle Kingdom soldiers, from tomb paintings at el-Bersha, carrying axes (McDermott 2004, 52).



Figure 4.7: Axe held in soldier's kilt, Temple of Montuhotep II, at Deir el-Bahri (McDermott 2004, 77).

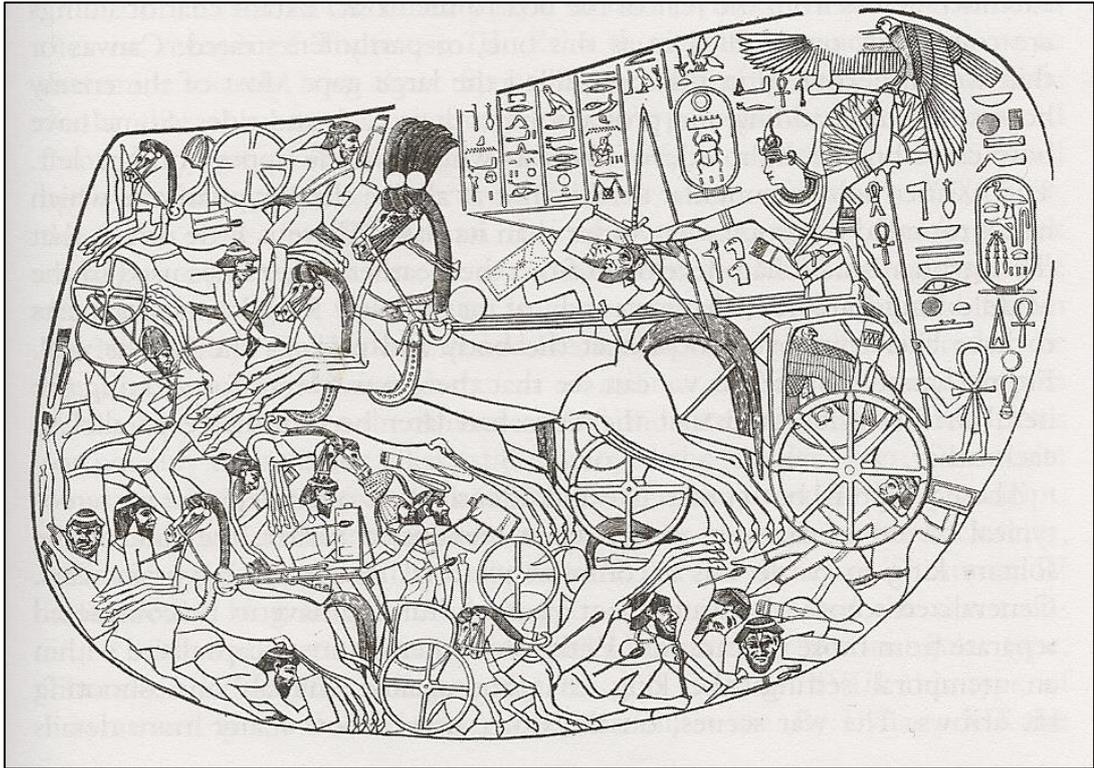


Figure 4.8: Tuthmosis IV wielding an axe in battle (Spalinger 2005, 119).

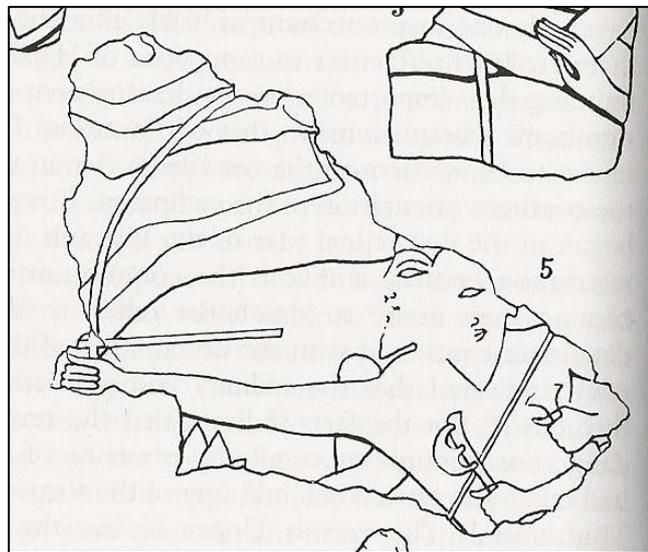


Figure 4.9: Asiatic enemy carrying a duck-billed axe, Temple of Tuthmosis II, Thebes (Spalinger 2005, 60).

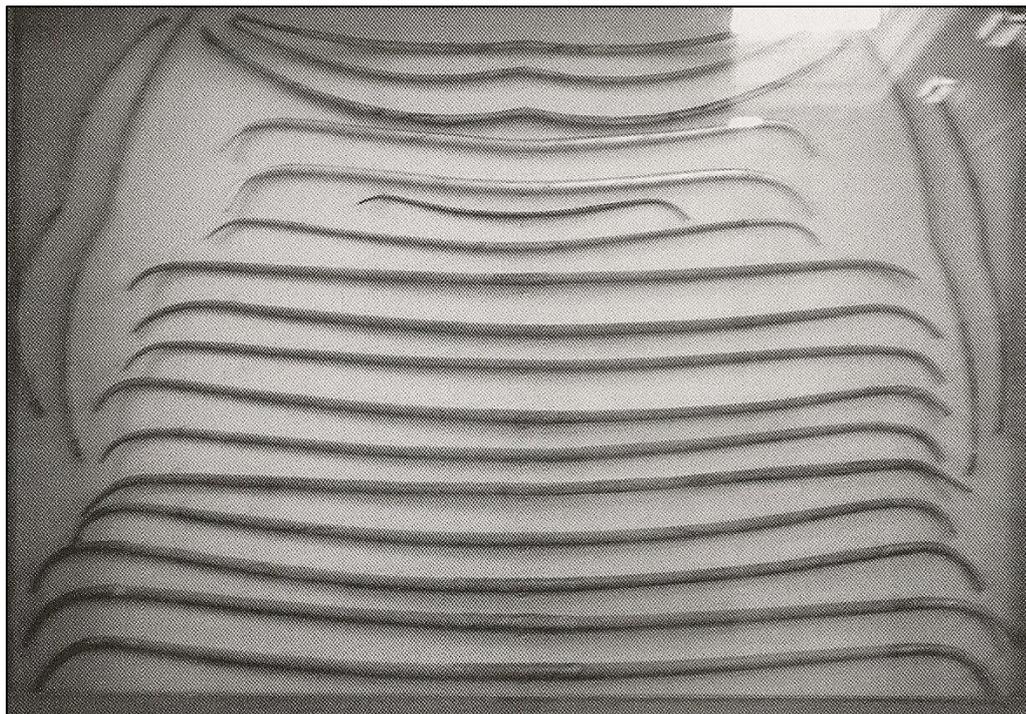


Figure 4.10: Range of ancient Egyptian bows, Cairo Museum (McDermott 2004, 151).



Figure 4.11: Early leather quiver knotted drawstring, British Museum Collection (McDermott 2004, 32).



Figure 4.12: Early leather quiver, British Museum Collection (McDermott 2004, 32).

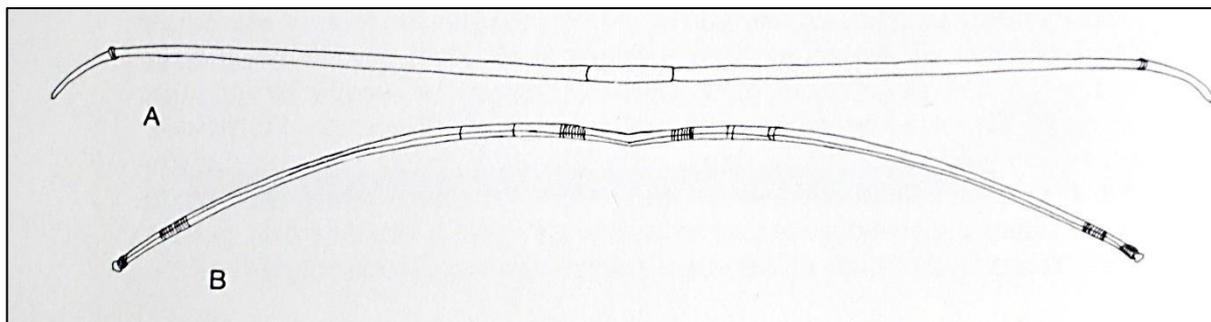


Figure 4.13: Simple bow (A) and Composite bow (B) (Shaw 1991, 36).

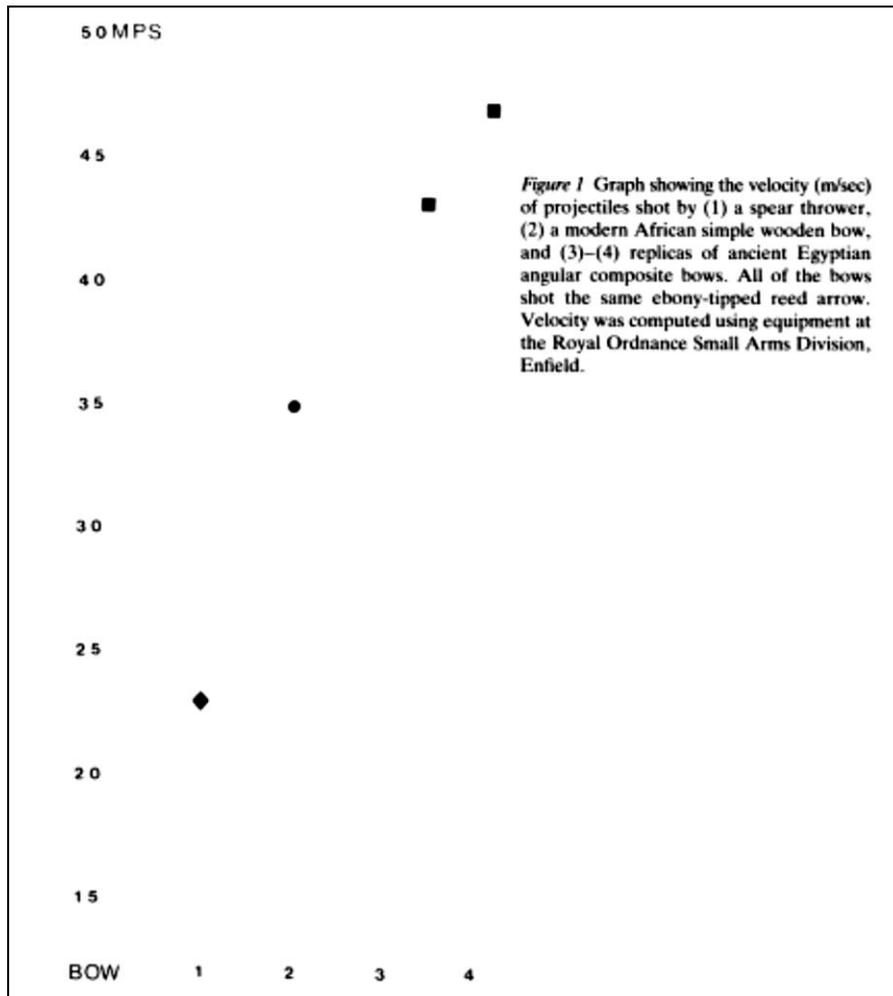


Figure 4.14: Graph of tests carried out with projectile weapons (Miller et al 1986, 179).

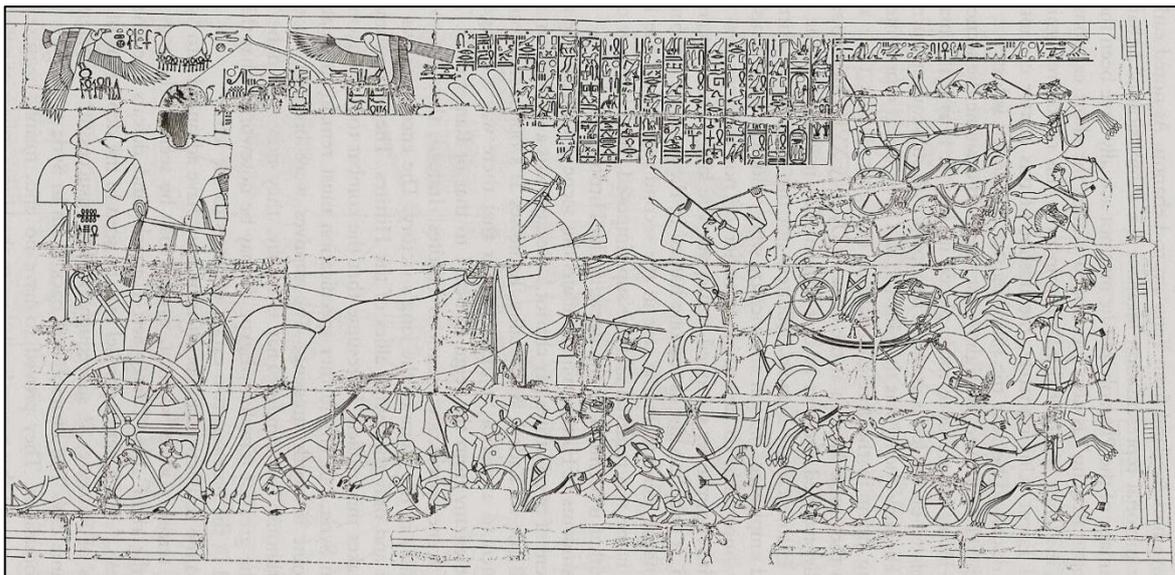


Figure 4.15: Seti I in battle against the Hittites, Karnak (Spalinger 2005, 197).

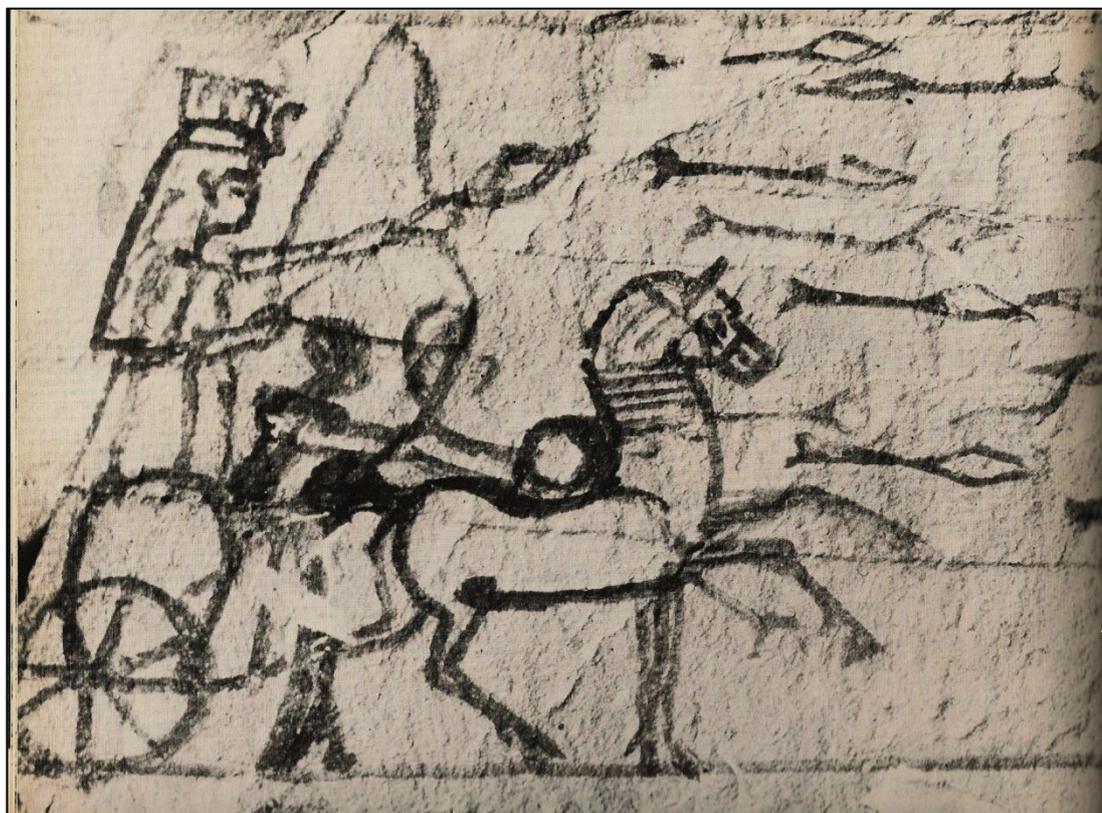


Figure 4.16 (a): First half of sketch of a woman in battle, in a chariot (Peck 1978, 158-159).



Figure 4.16 (b): Second half of the sketch, showing the opponents (Peck 1978, 158-159).



Figure 4.17: Seti I in battle against the Libyans, Karnak (Spalinger 2005, 194).

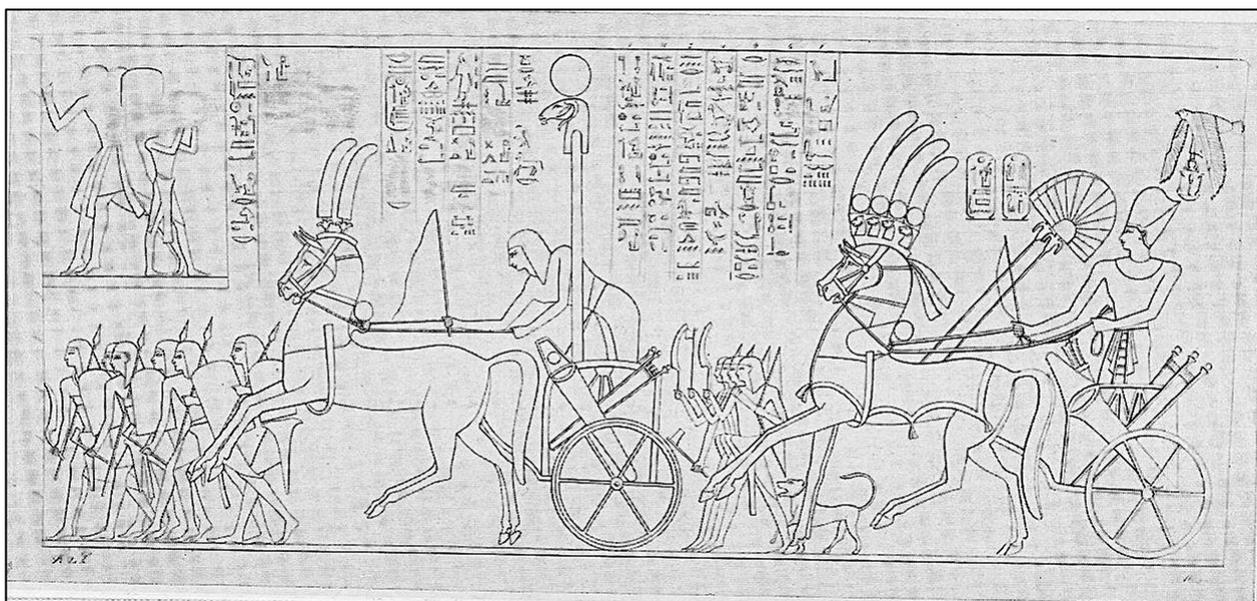


Figure 4.18: The chariot in use – Ramesses III, Medinet Habu (Curto 1971, 20).

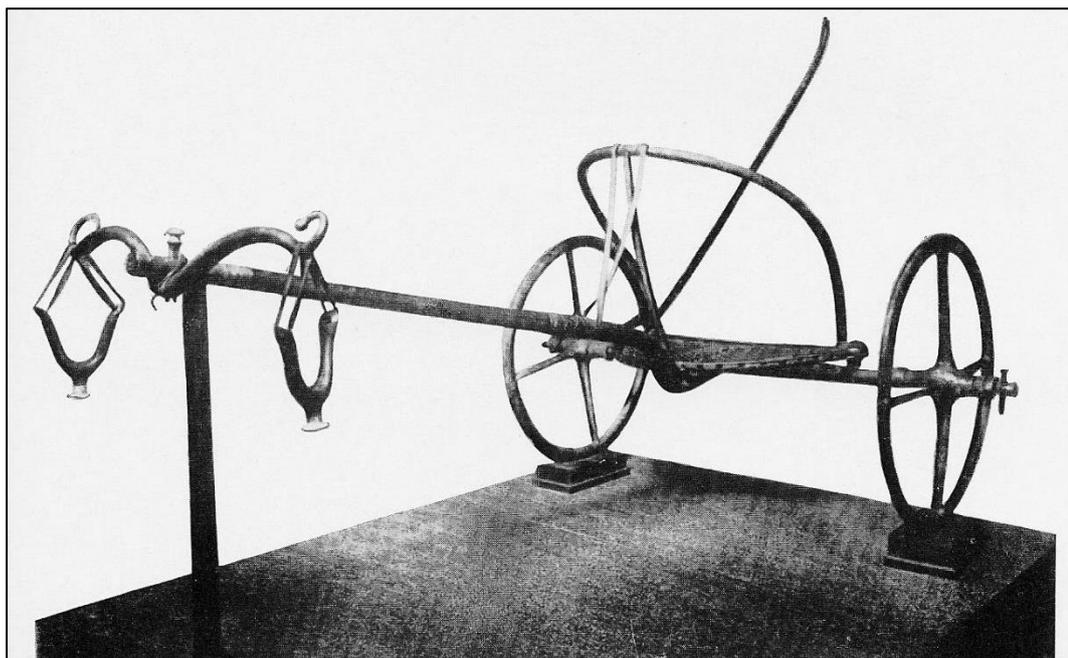


Figure 4.19: New Kingdom war chariot, *Museo Archeologico* of Florence (Curto 1971, 17).

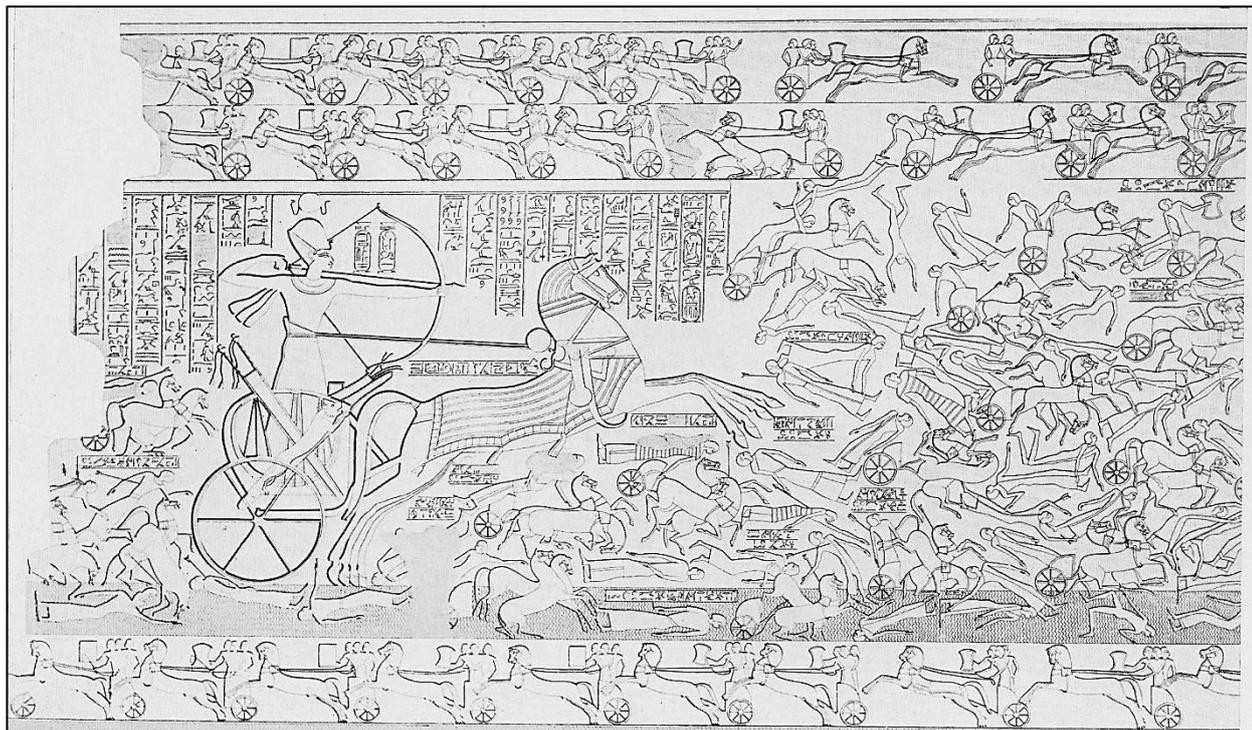


Figure 4.20: The chariot in use in battle – Ramesses II at the attack of Kadesh; Major Temple, Abu Simbel (Curto 1971, 28).

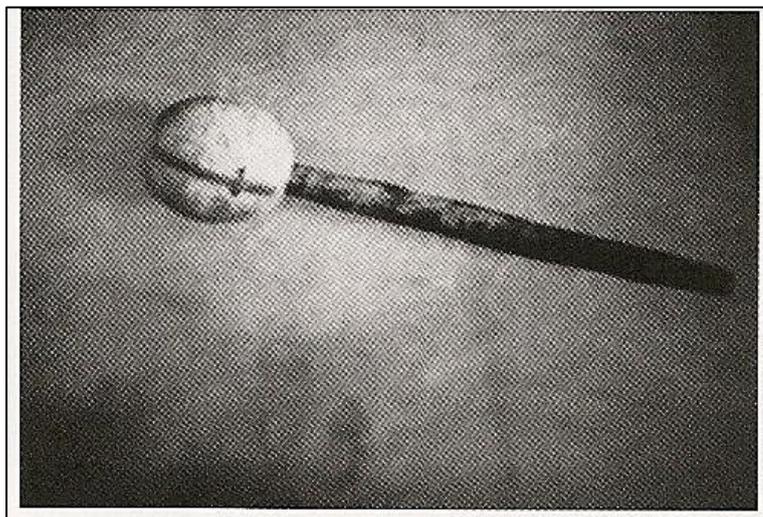


Figure 4.21: Piriform mace-head (McDermott 2004, 36).



Figure 4.22: Damage to the edge of the conical mace-head from experimental archaeology (Dean 2008, 115; Fletcher, J. 2008).



Figure 4.23: Damage to the edge of Harrogate mace-head 10550 (Dean 2008, 92).

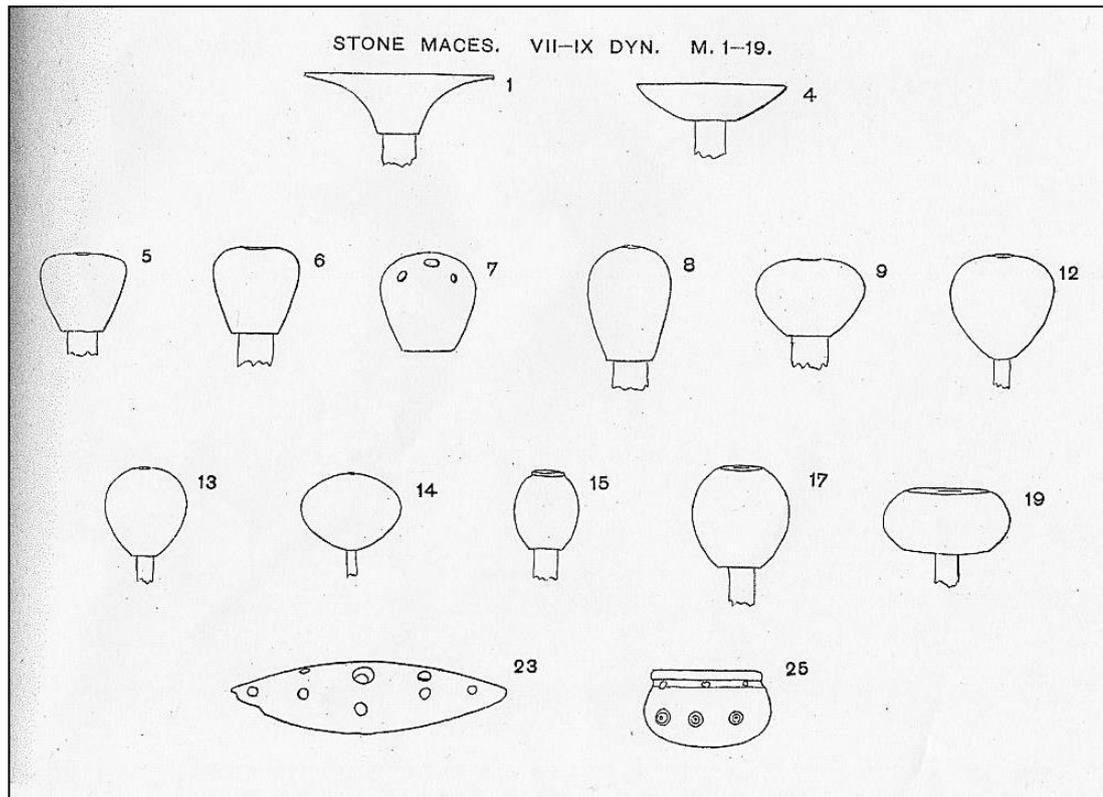


Figure 4.24: Mace-heads from Naqada (Petrie and Quibell 1896, Pl. XVII).

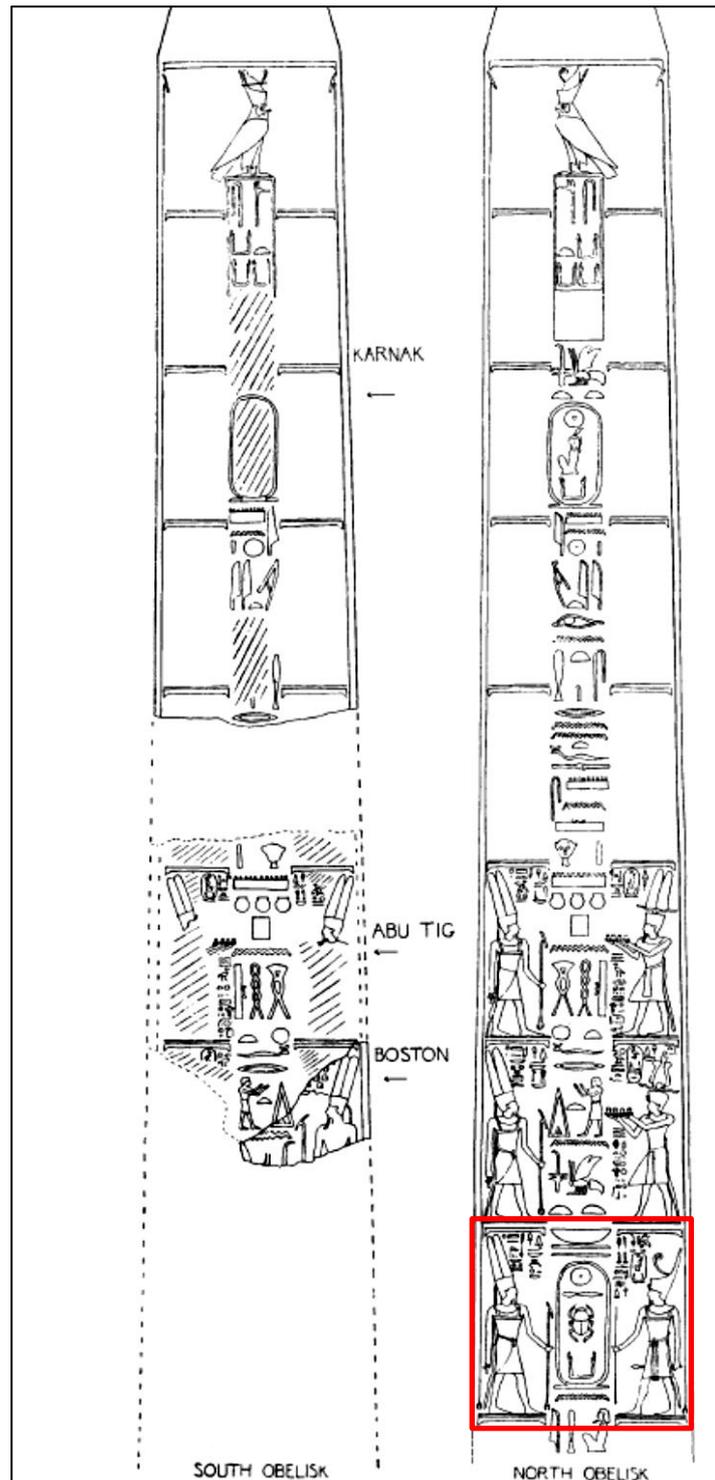


Figure 4.25: Section of Hatshepsut's Karnak North Obelisk - Hatshepsut is depicted holding a mace in the bottom right corner (Stevenson Smith 1942, 48).

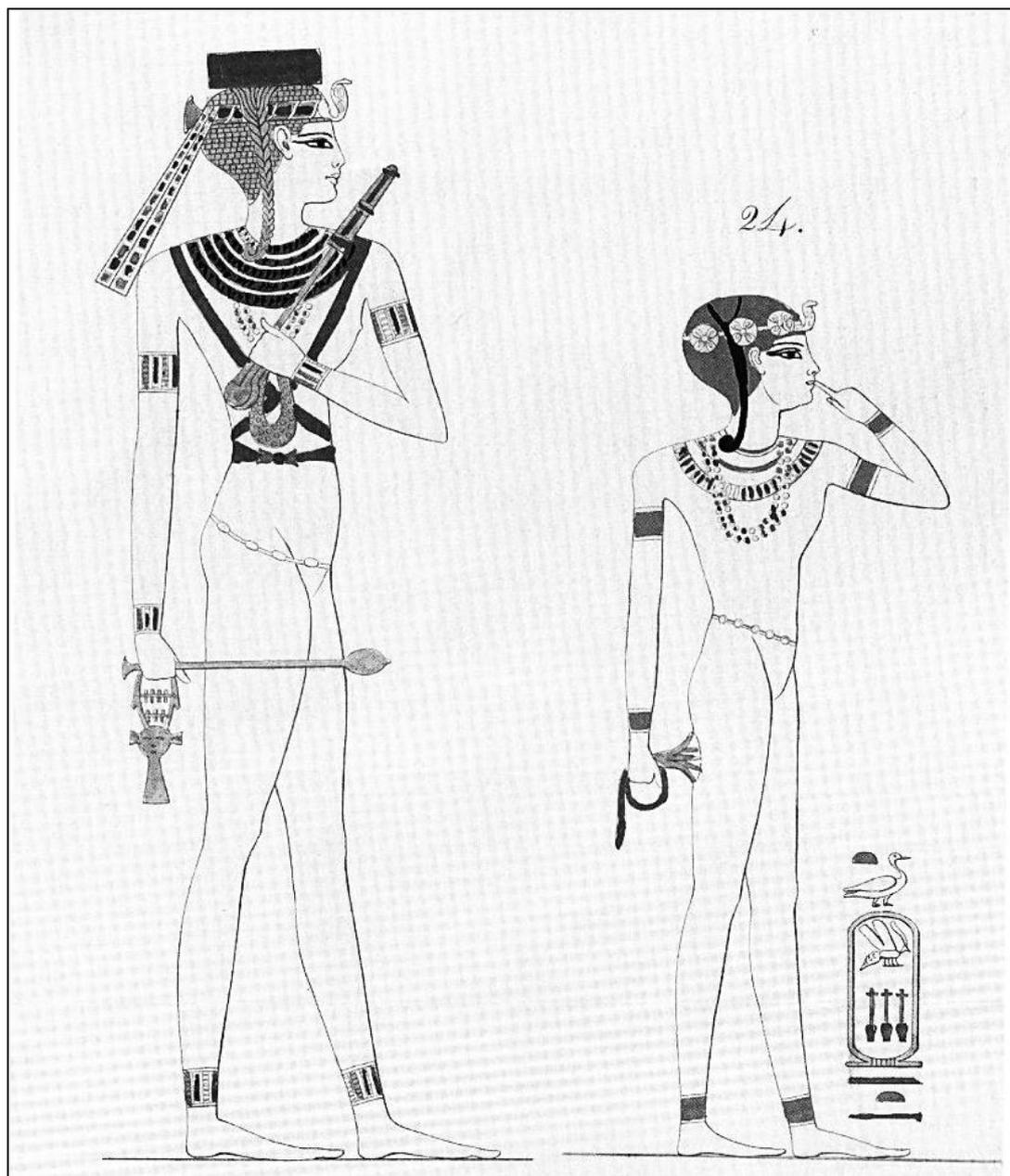


Figure 4.26: The princess Neferure depicted with a mace (Roehrig *et al* 2005, 202).

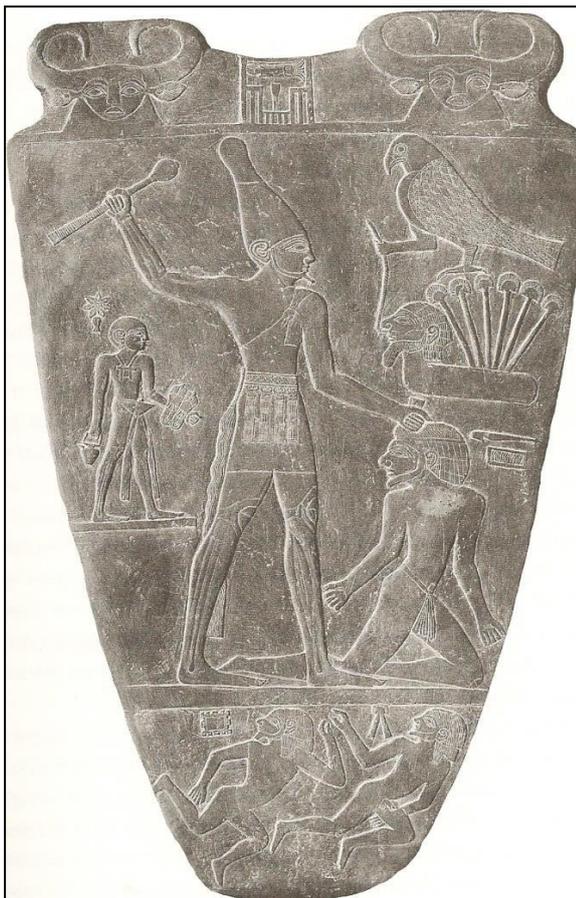


Figure 4.27: Use of the mace in a smiting scene - the Narmer Palette (Davies 1992, 163).



Figure 4.28: The khopesh in popular culture – still shot from the 1999 film ‘The Mummy’ (Ford 2004).



Figure 4.29: New Kingdom swords, British Museum (McDermott 2004, 165).



Figure 4.30: Middle Kingdom short sword/dagger, University of Liverpool Museum  
(McDermott 2004, 165).



Figure 4.31: Early 18<sup>th</sup> Dynasty straight sword, Metropolitan Museum of Art (Hayes  
1990, 68).

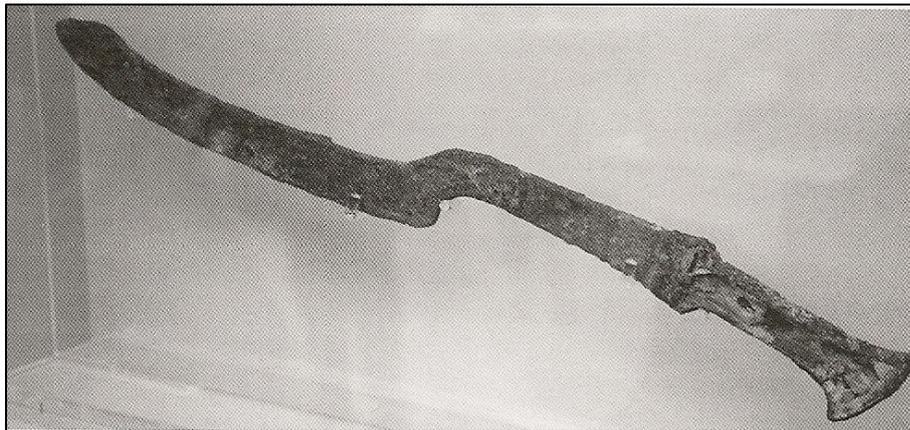


Figure 4.32: Khopesh sword (McDermott 2004, 167).

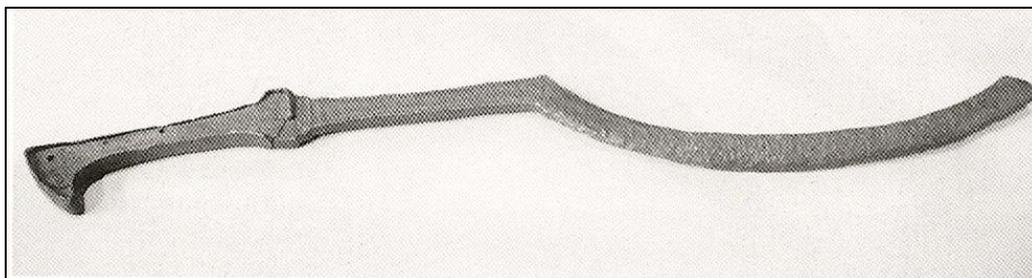


Figure 4.33: Bronze khopesh sword (McDermott 2004, 167).



Figure 4.34: Khopesh sword duel - Hatshepsut's temple, Deir el-Bahri (McDermott 2004, 169).



Figure 4.35: Soldiers armed with khopesh swords (McDermott 2004, 147).



Figure 4.36: Statue of Horus and Nectanebo II (anon, nd [h]).



Figure 4.37: Detail of statue, showing Nectanebo II holding a khopesh (anon, nd [h]).



Figure 4.38: Nefertiti depicted smiting a female prisoner with a khopesh  
(Captmondo 2007).

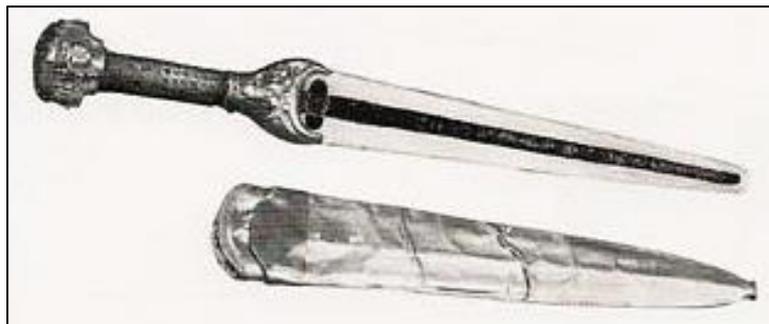


Figure 4.39: Early 18<sup>th</sup> Dynasty dagger, burial of Ahhotep (Shaw and Boatright 2008, 37).

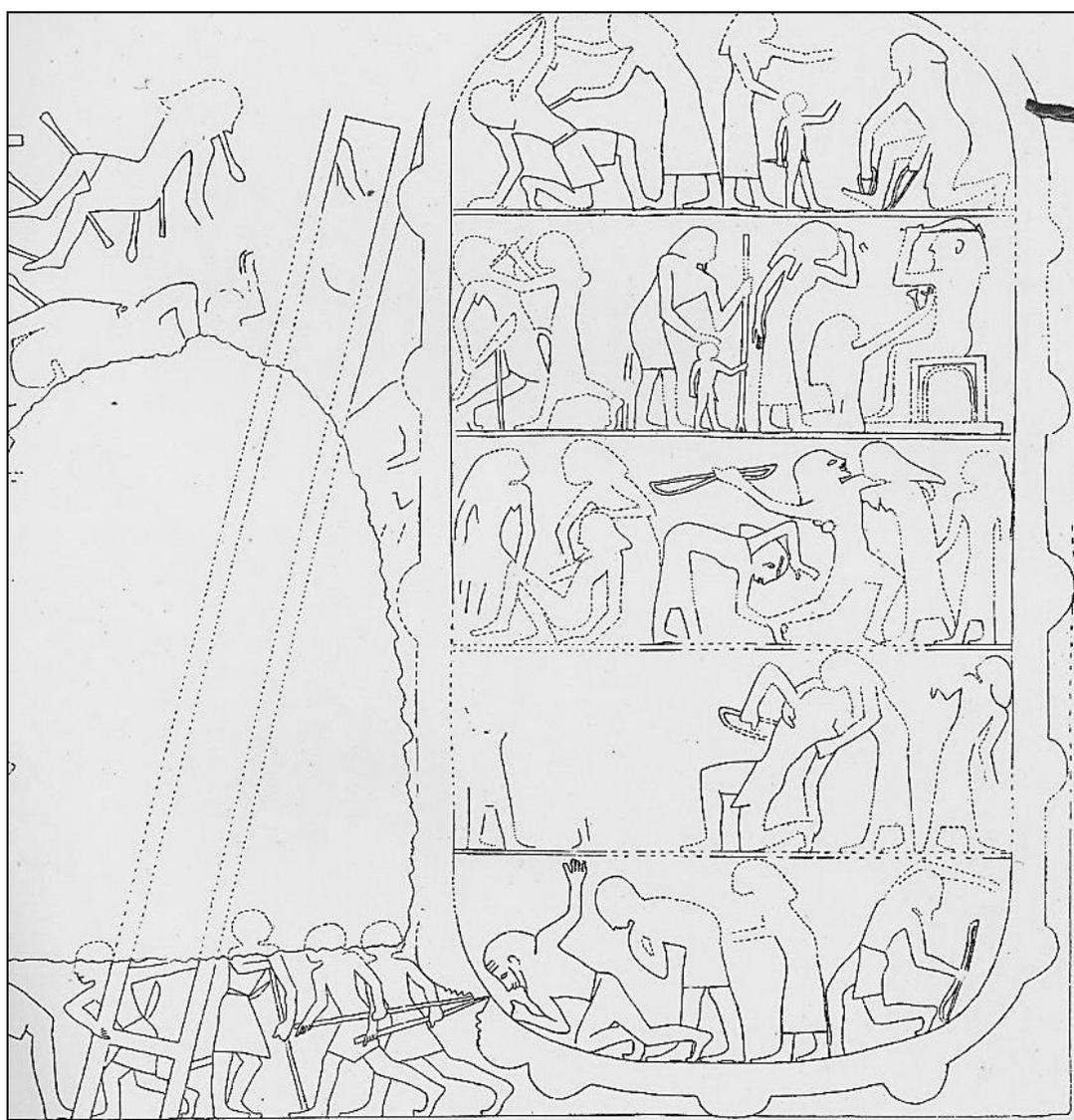


Figure 4.40: A town siege, Deshasheh. The leaning officer can be seen to the right of the base of the ladder (Petrie 1898, Pl IV).



Figure 4.41: Relief of an unnamed 11<sup>th</sup> Dynasty king, armed with several weapons, including a dagger at the waist (Edwards 1960, Pl. IV).

Chapter Five - Experimental Archaeology Figures



Figure 5.1: Mace-head replicas (courtesy of Dr Joann Fletcher).



Figure 5.2: Testing the mace-heads in 2009 (Dean 2009, 114).

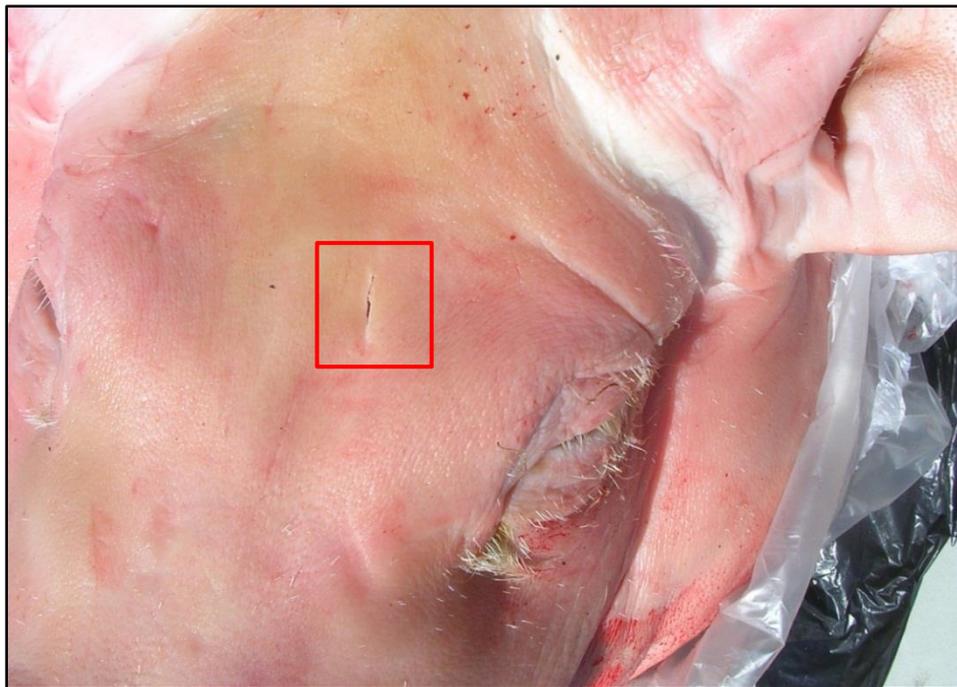


Figure 5.3: The visible cut made by the conical mace-head on the pig head (Dean 2009, 115).

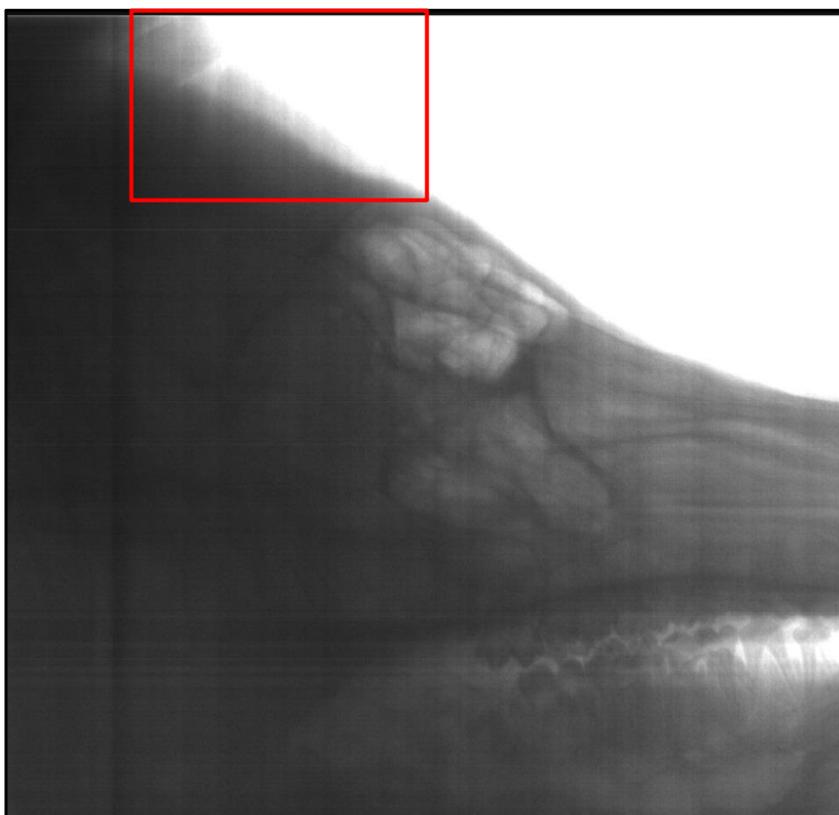


Figure 5.4: X-ray of pig head hit with globular mace only (Dean 2009, 116).

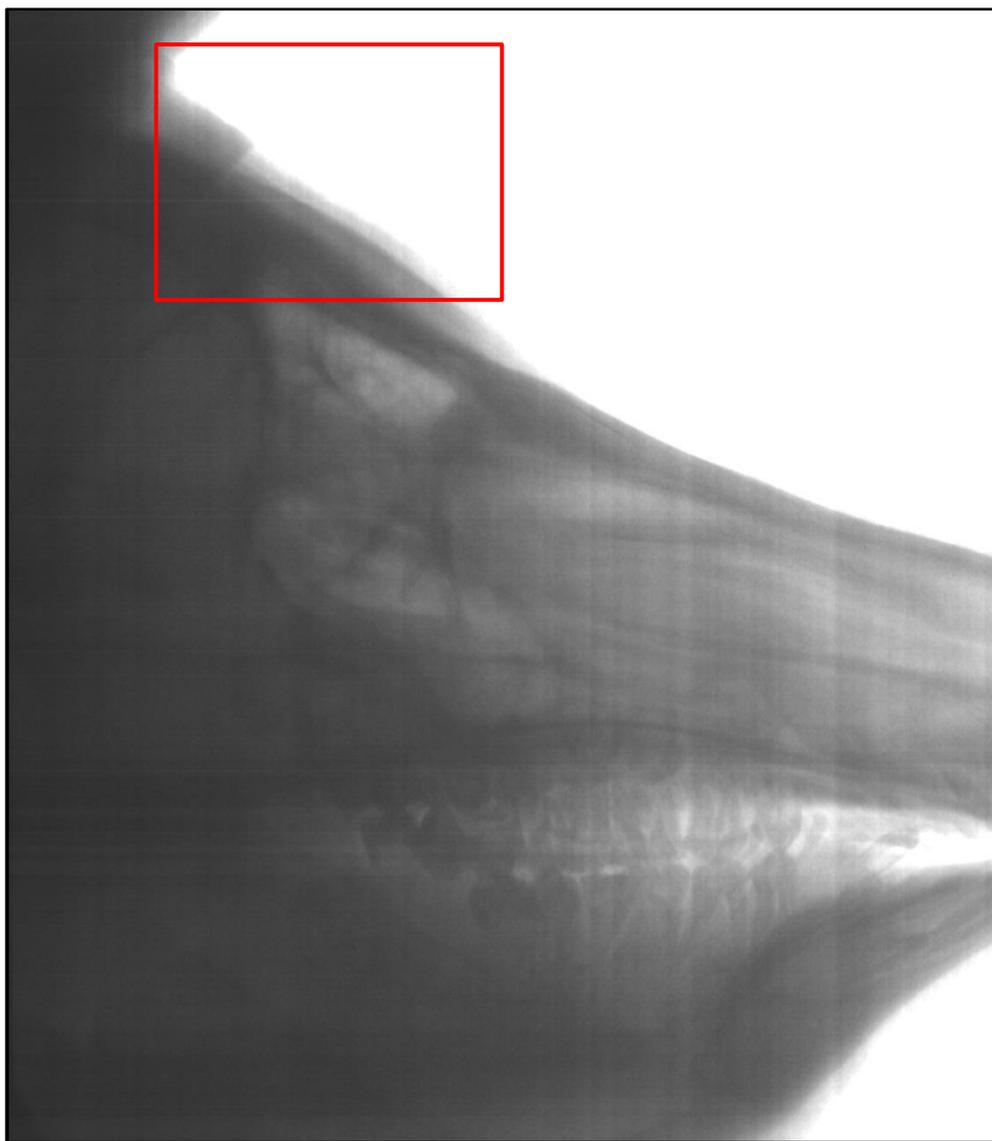


Figure 5.5: X-ray of pig head hit with conical mace only (Dean 2009, 117).



Figure 5.6: Defleshed pig skull displaying the conical mace-head damage  
(Photograph: author's own).

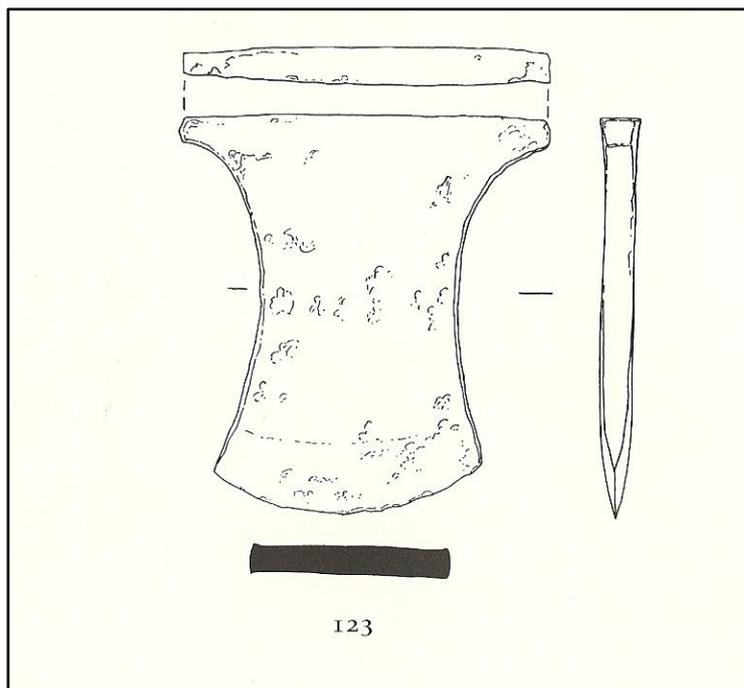


Figure 5.7: Axe-head 123, used for axe-head replica (Davies 1987, pl. 22).



Figure 5.8: The hafting of the axe-head, carried out by Neil Raval (Photograph: author's own).

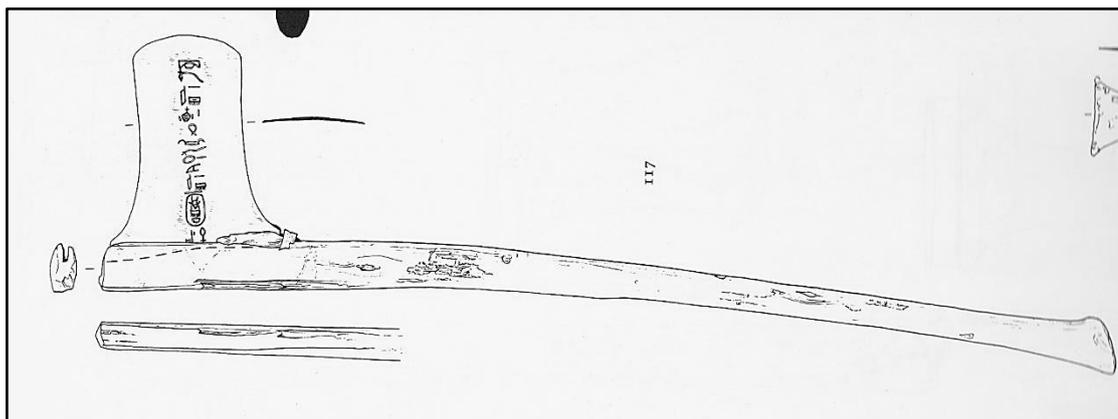


Figure 5.9: Axe used as model for axe haft (Davies 1987, pl. 20).



Figure 5.10: Replica axe, hafted (Photograph: author's own).



Figure 5.11: Dagger of Ahmose I (Needler 1962, 173).



Figure 5.12: The cartouche of Ahmose I from the dagger pommel (Needler 1962, 174).



Figure 5.13: Replica dagger (Photograph: author's own).



Figure 5.14: Testing the axe on a replica shield (Stonborough 2011, 119).



Figure 5.15: Testing the khopesh on a replica shield (Stonborough 2011, 120).



Figure 5.16: Damage from the axe blows to the rim of the shield (Stonborough 2011, 121).



Figure 5.17: Damage caused by the khopesh blow to the shield (Stonborough 2011, 123).

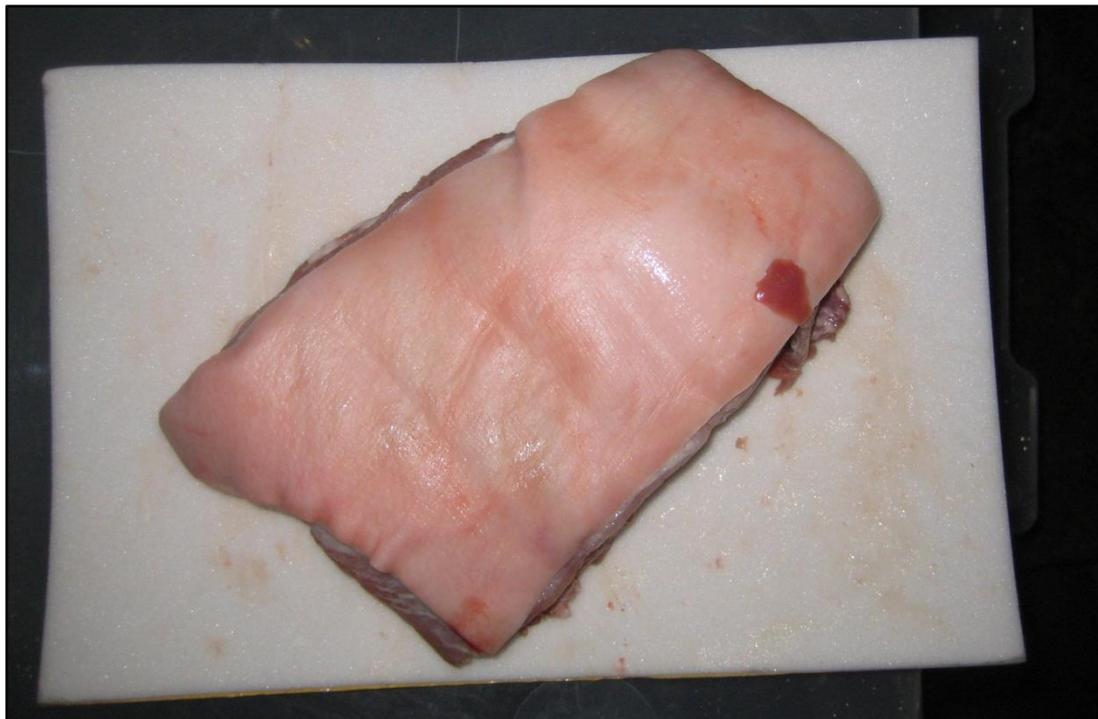


Figure 5.18: One of the sections of pig ribcage (Photograph: author's own).



Figure 5.19: Axe test by Rebecca Dean (Photograph: author's own).



Figure 5.20: Axe test by Dr Stephen Buckley (Photograph: author's own).



Figure 5.21: Axe test by Dr Joann Fletcher (Photograph: author's own).



Figure 5.22: Mace test by Rebecca Dean (Photograph: author's own).



Figure 5.23: Mace test by Dr Stephen Buckley (Photograph: author's own).



Figure 5.24: Mace test by Dr Joann Fletcher (Photograph: author's own).



Figure 5.25: Dagger test by Rebecca Dean (Photograph: author's own).



Figure 5.26: Dagger test by Dr Stephen Buckley (Photograph: author's own).



Figure 5.27: Dagger test by Dr Joann Fletcher (Photograph: author's own).



Figure 5.28: King's Manor X-ray machine (Photograph: author's own).

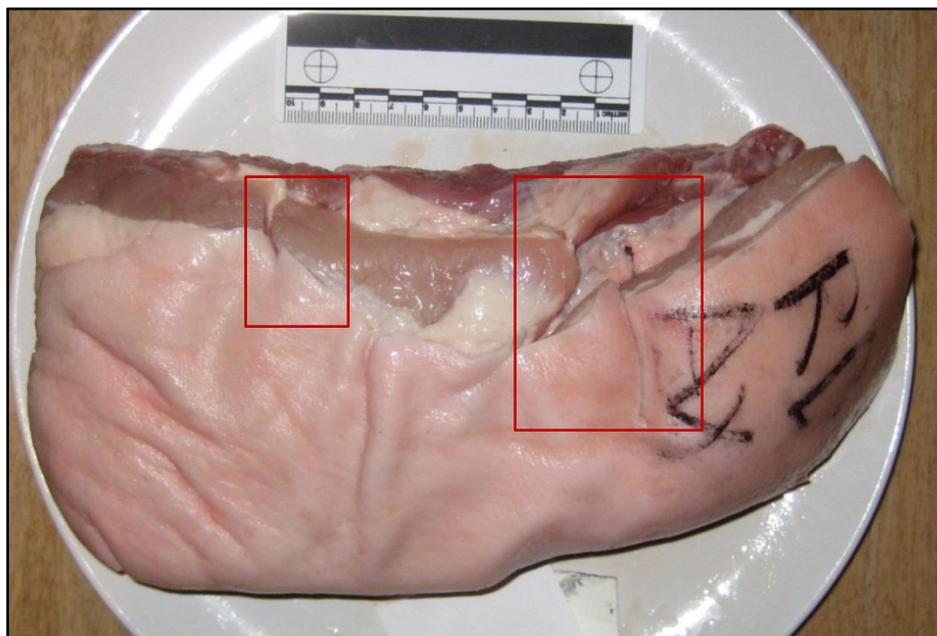


Figure 5.29: Test RDA – axe damage (Photograph: author's own).

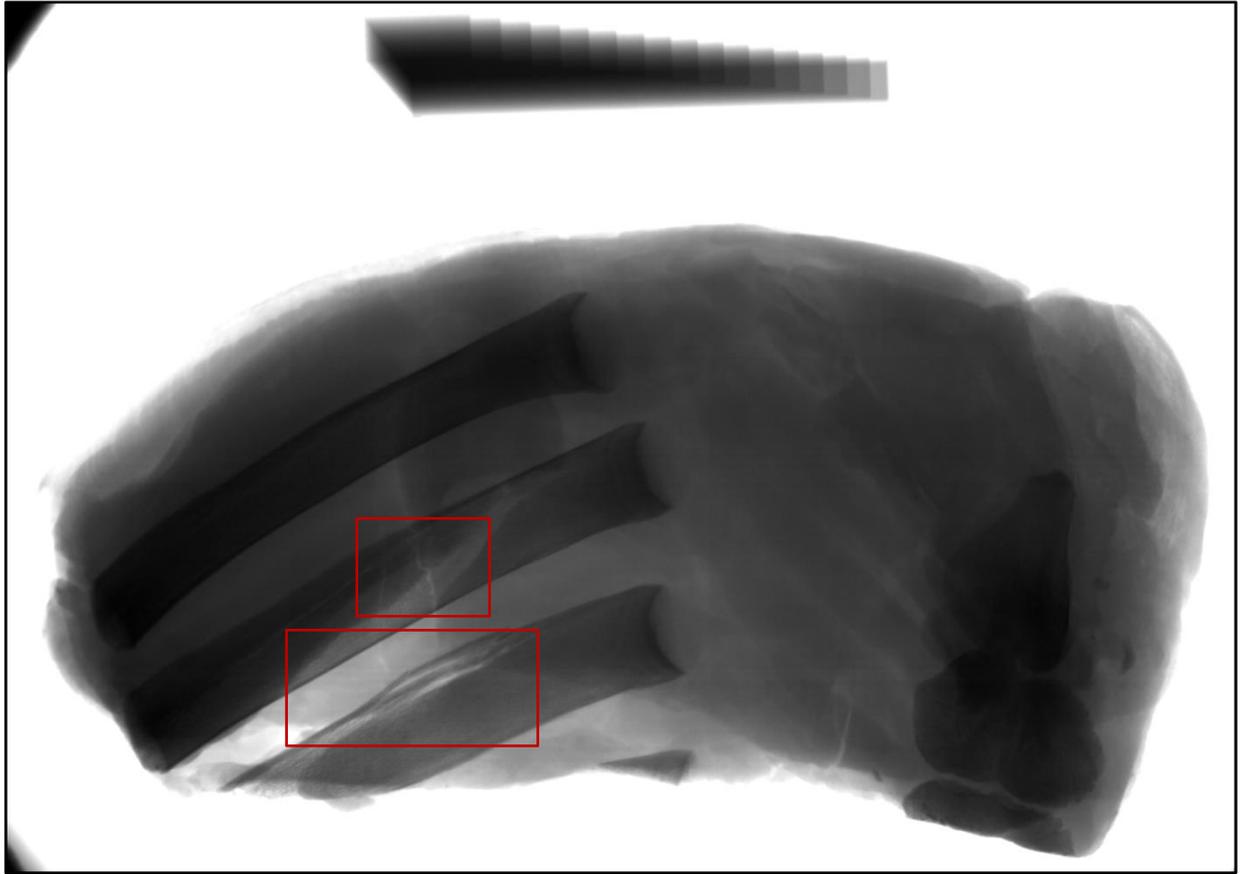


Figure 5.30: X-ray of axe damage – RDA (Photograph: author's own).

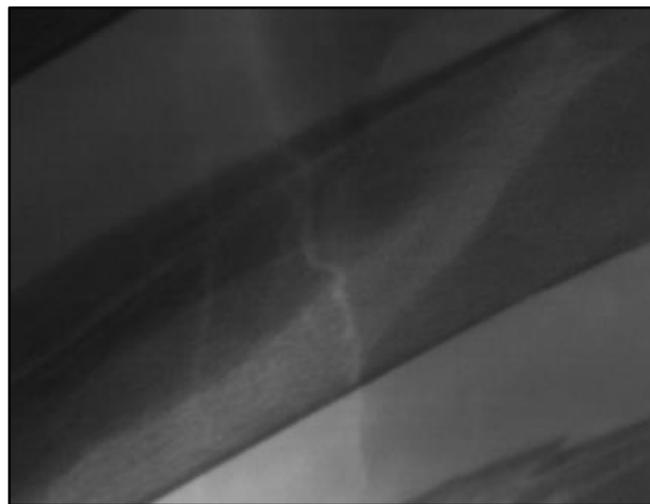


Figure 5.31: RDA transverse fracture (Photograph: author's own).

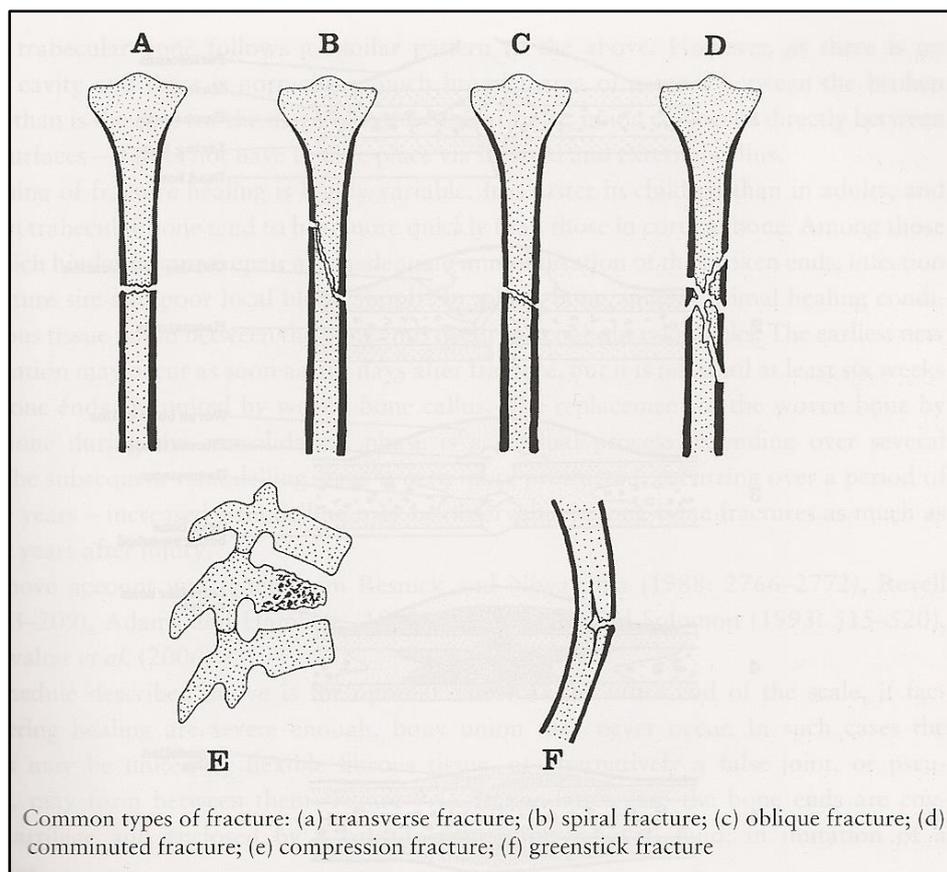


Figure 5.32: Types of fracture (Mays 2010, 239).

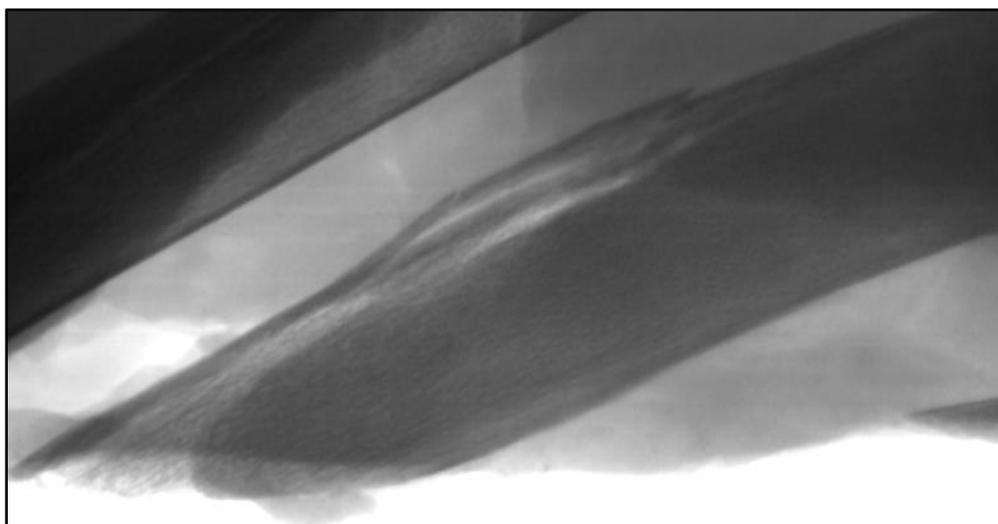


Figure 5.33: RDA comminuted fracture (Photograph: author's own).

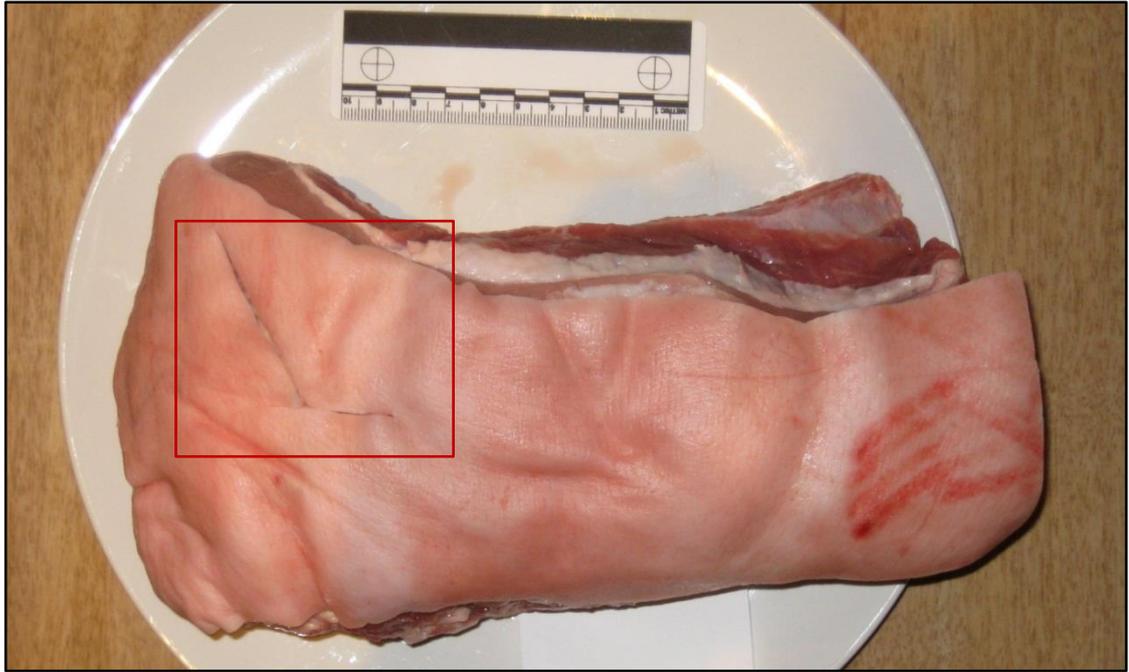


Figure 5.34: Test SBA – axe damage (Photograph: author's own).

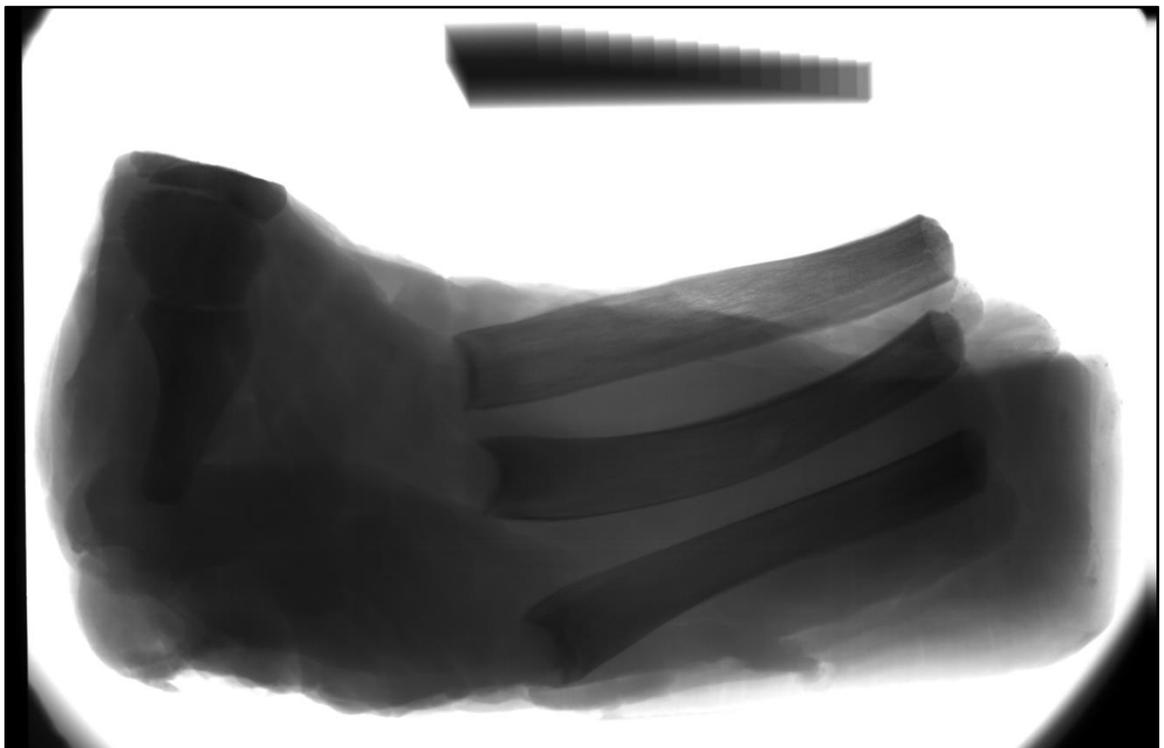


Figure 5.35: X-ray of axe damage – SBA (Photograph: author's own).



Figure 5.36: Test JFA – axe damage (Photograph: author's own).

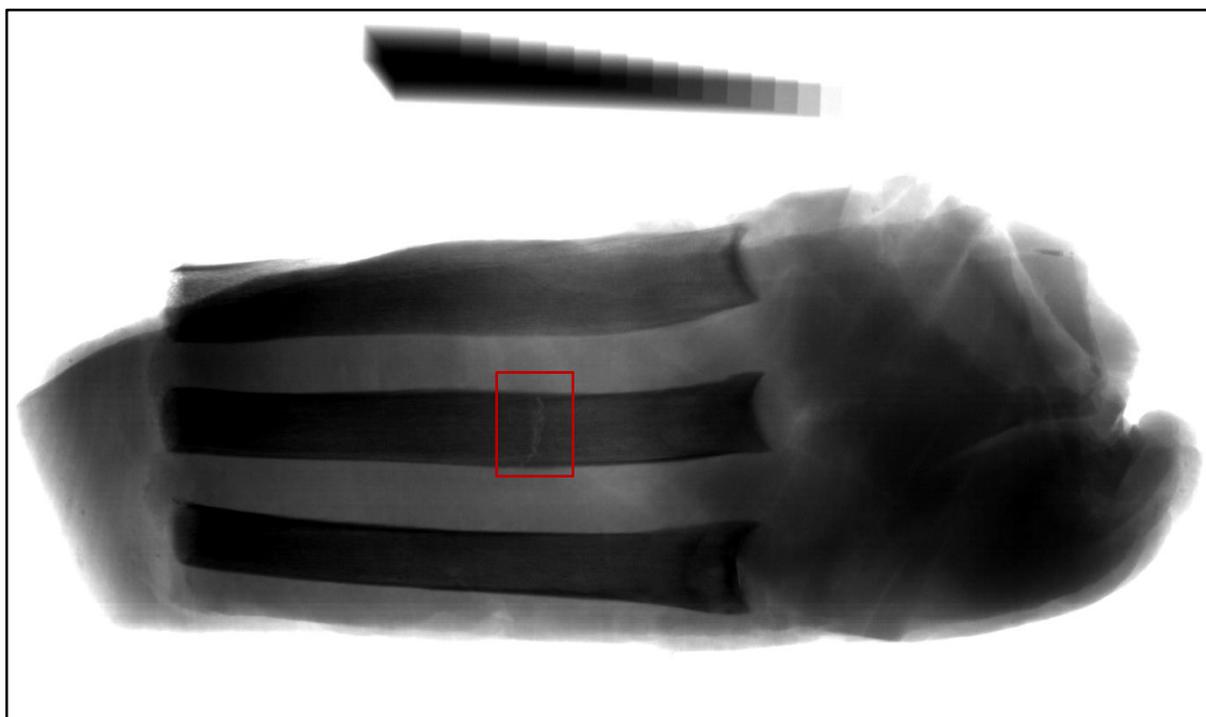


Figure 5.37: X-ray of axe damage – JFA (Photograph: author's own).

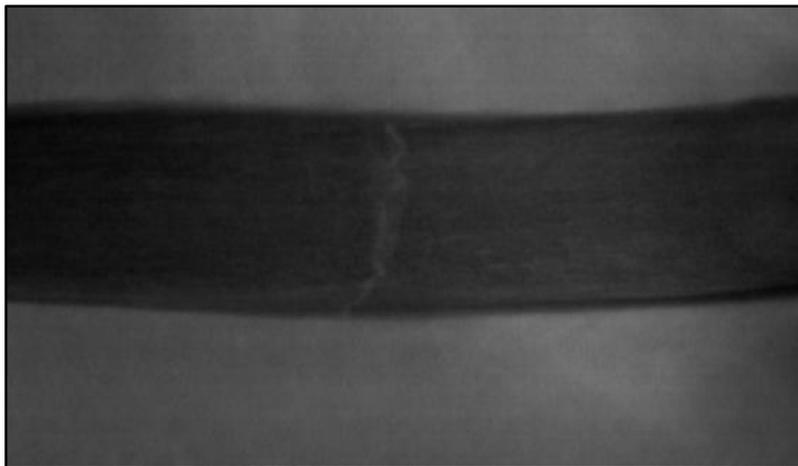


Figure 5.38: JFA transverse fracture (Photograph: author's own).

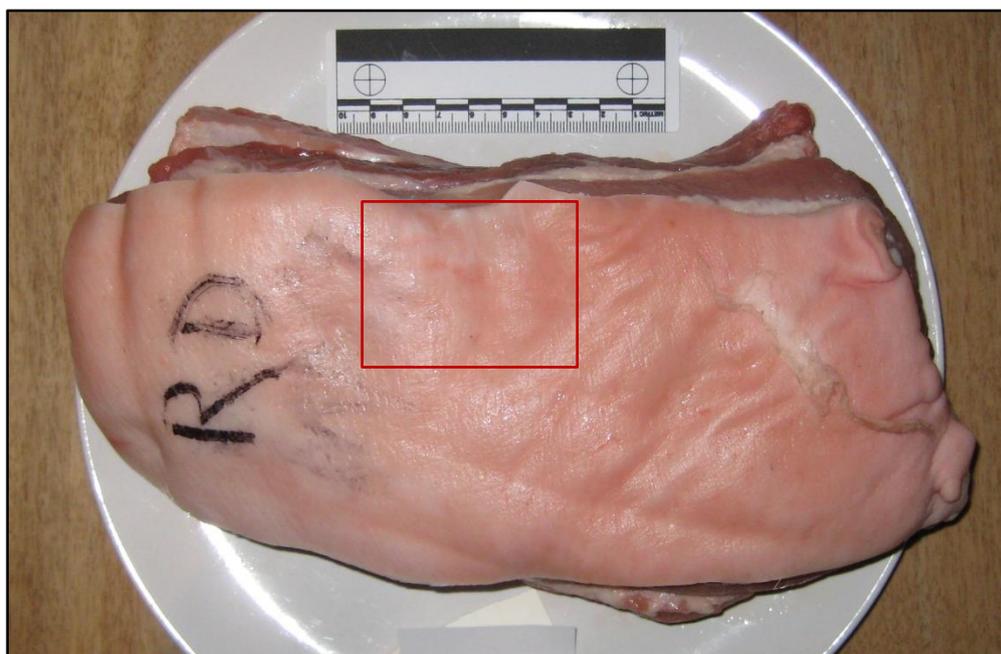


Figure 5.39: Test RDM – mace damage (Photograph: author's own).

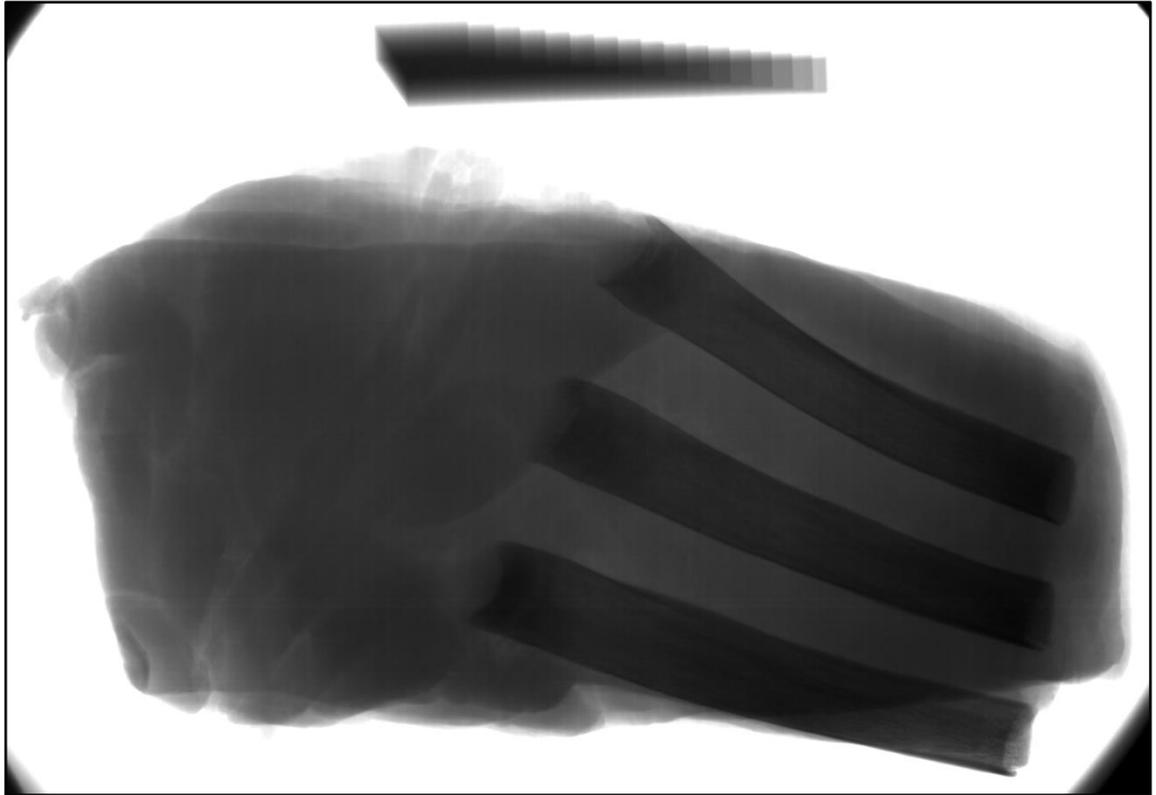


Figure 5.40: X-ray of mace damage – RDM (Photograph: author's own).



Figure 5.41: Test SBM – mace damage (Photograph: author's own).

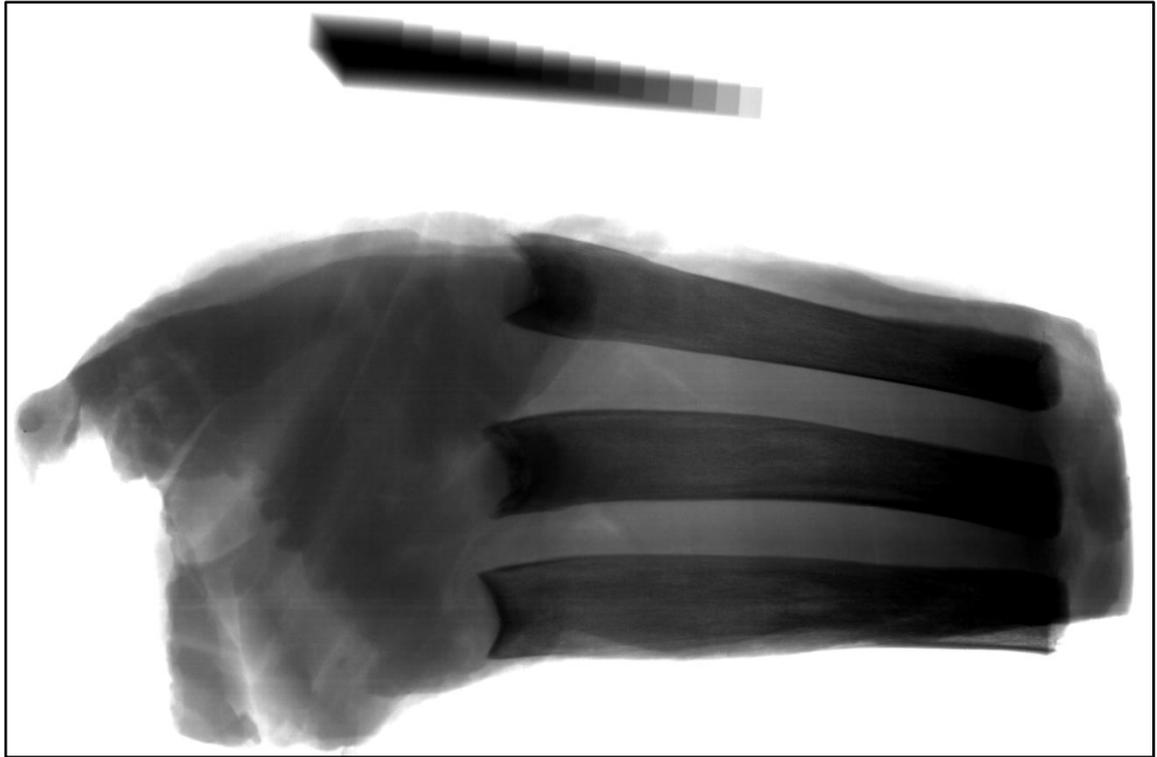


Figure 5.42: X-ray of mace damage – SBM (Photograph: author's own).



Figure 5.43: Test JFM – mace damage (Photograph: author's own).

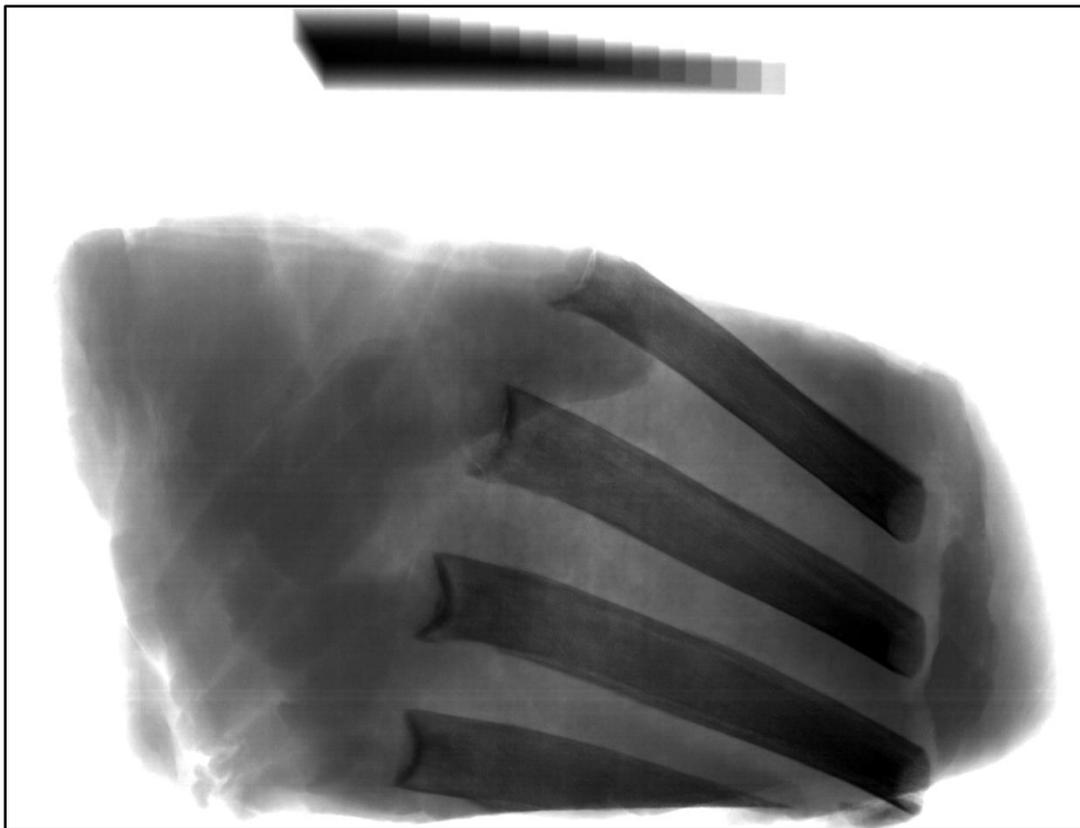


Figure 5.44: X-ray of mace damage – JFM (Photograph: author's own).

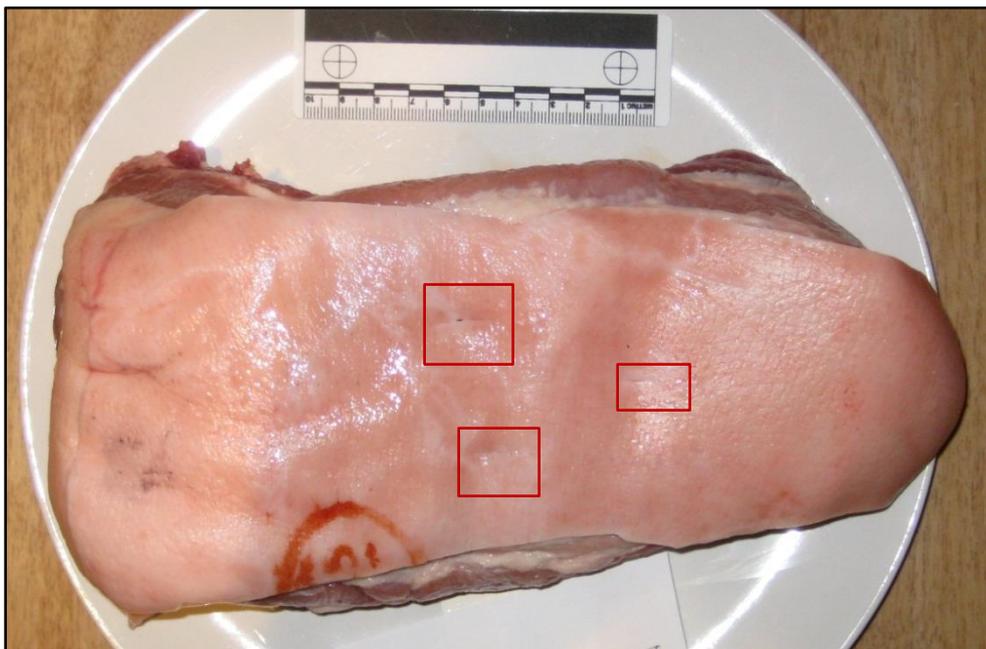


Figure 5.45: Test RDD – dagger damage (Photograph: author's own).

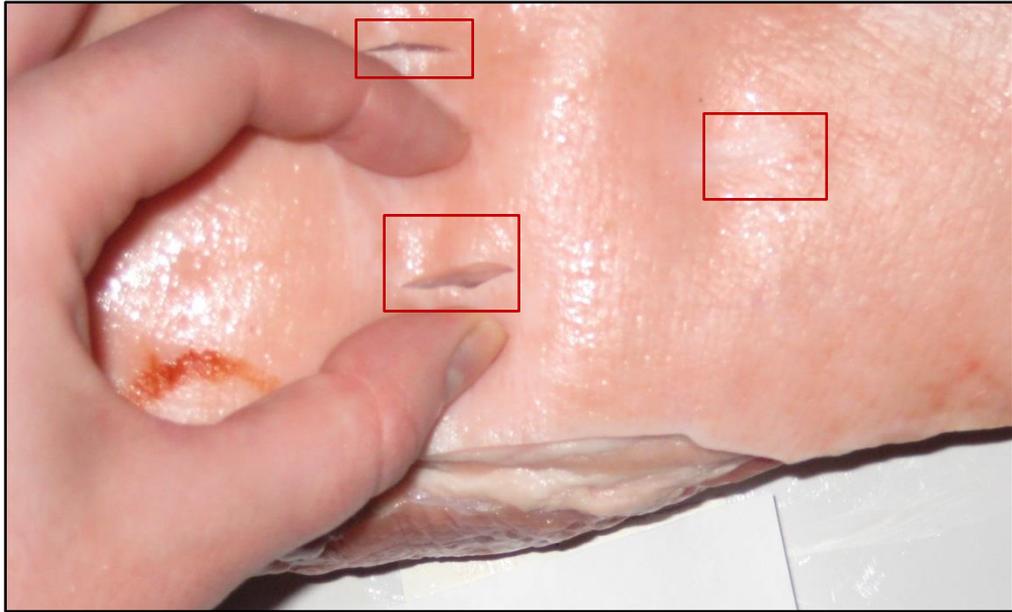


Figure 5.46: Close-up of RDD dagger damage (Photograph: author's own).



Figure 5.47: Exit wound of dagger – RDD (Photograph: author's own).

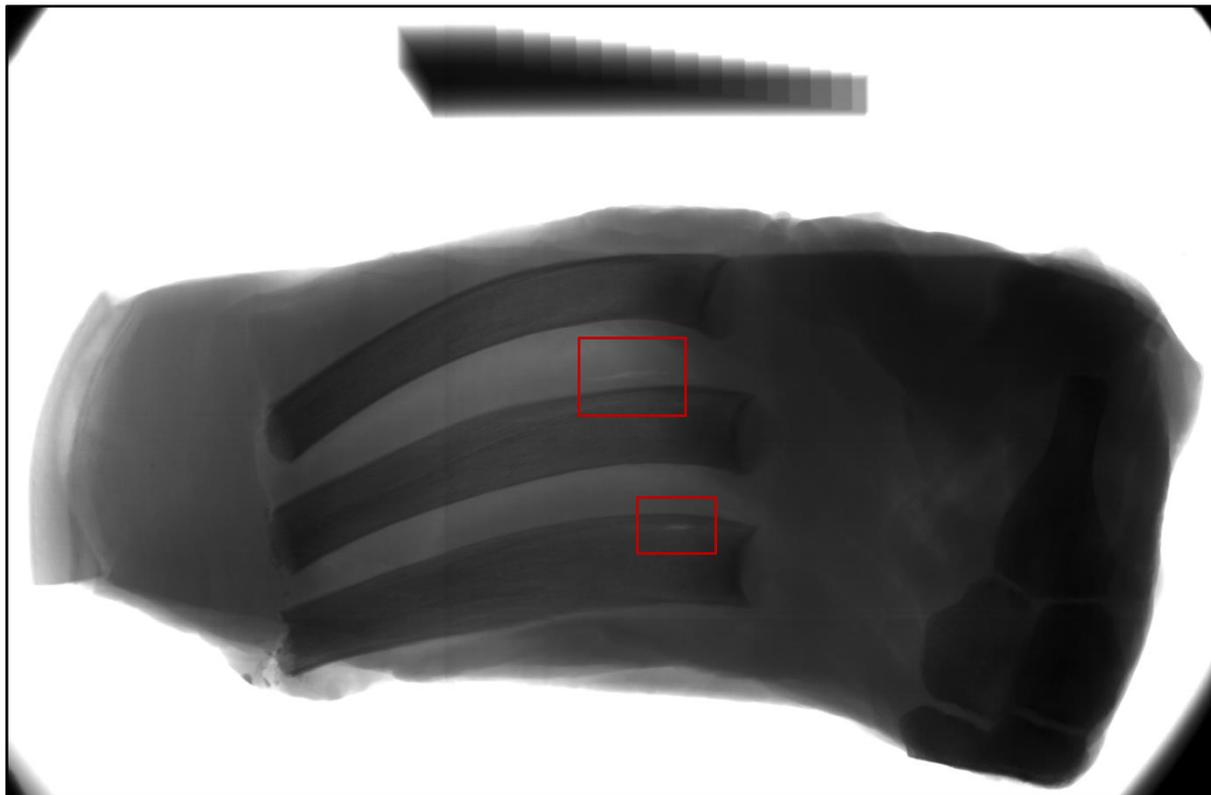


Figure 5.48: X-ray of dagger damage – RDD (Photograph: author's own).

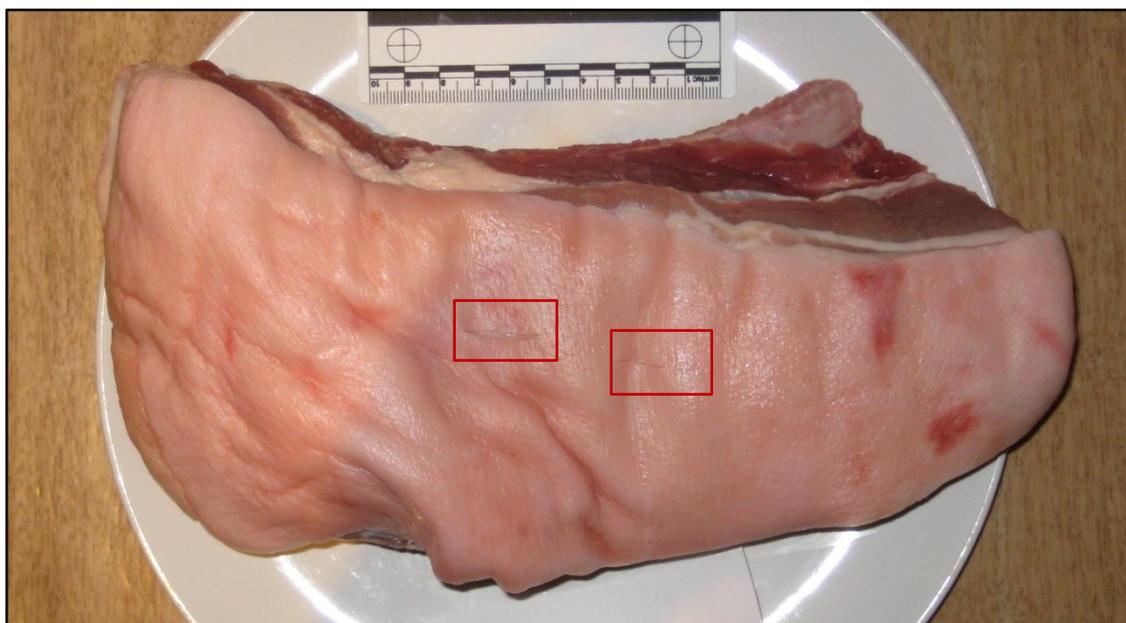


Figure 5.49: Test SBD – dagger damage (Photograph: author's own).

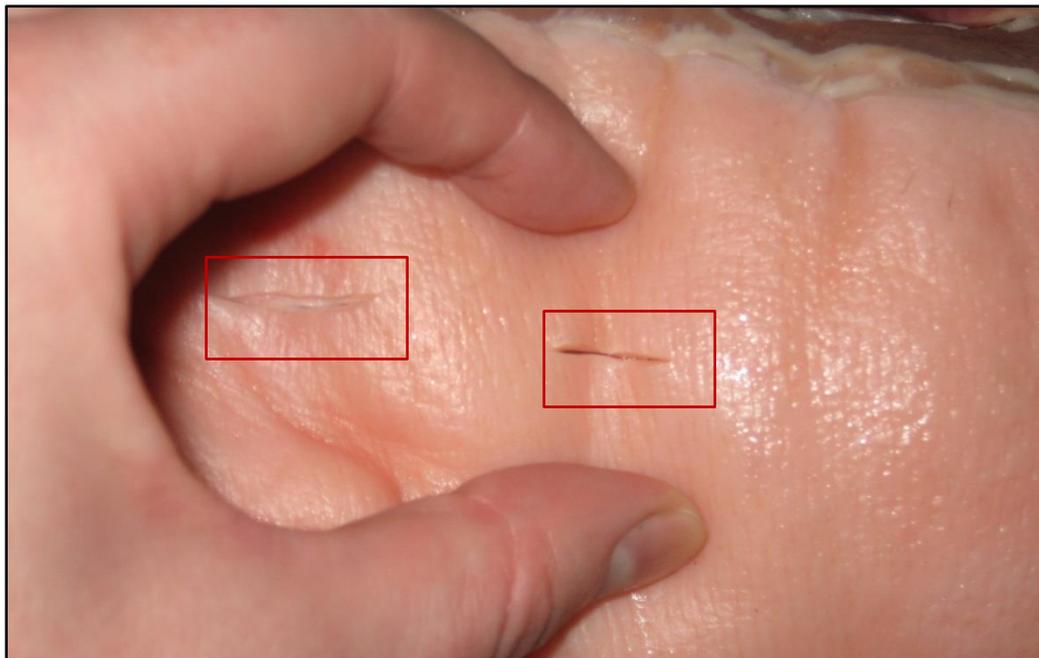


Figure 5.50: Close-up of SBD dagger damage (Photograph: author's own).

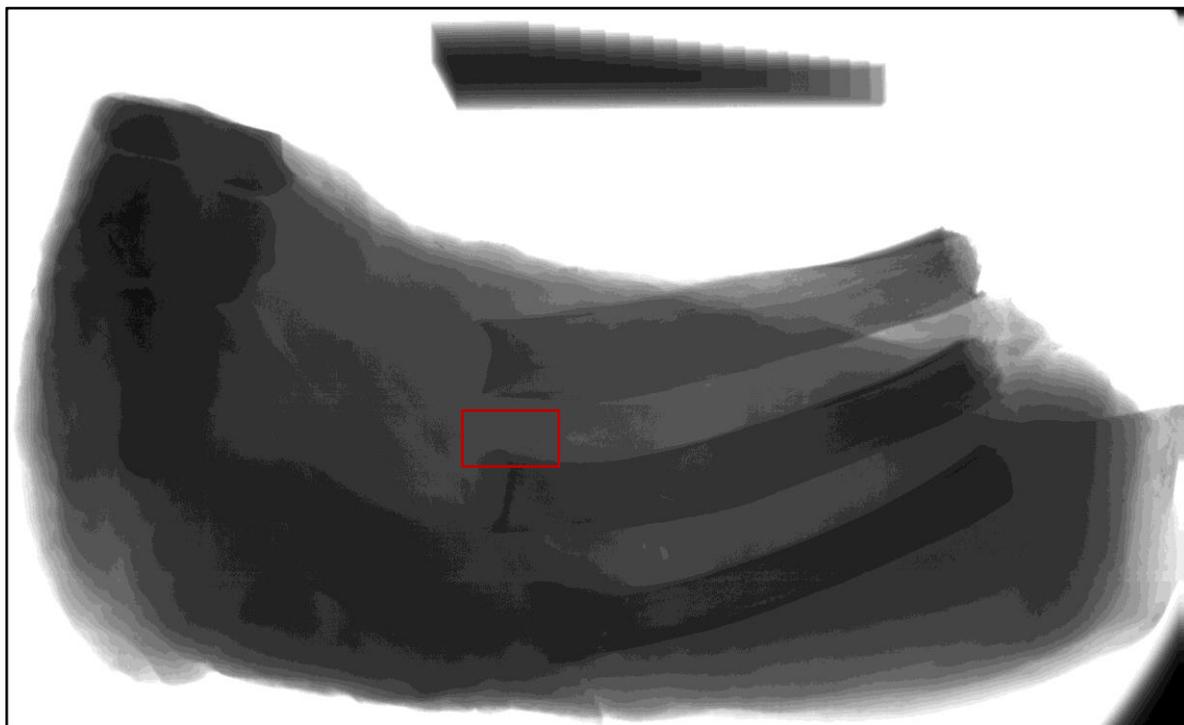


Figure 5.51: X-ray of dagger damage – SBD (Photograph: author's own).



Figure 5.52: Test JFD – dagger damage (Photograph: author's own).

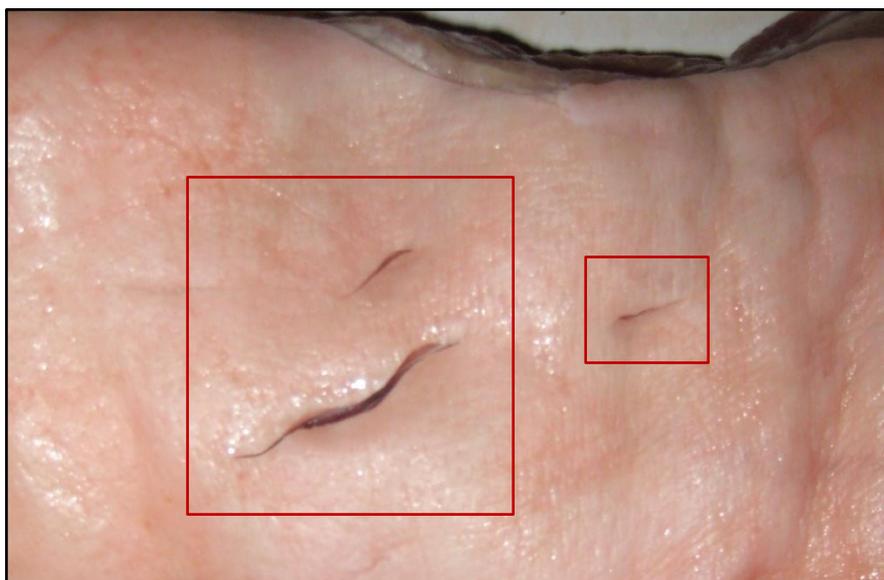


Figure 5.53: Close-up of JFD dagger damage (Photograph: author's own).



Figure 5.54: Exit wound of dagger – JFD (Photograph: author's own).

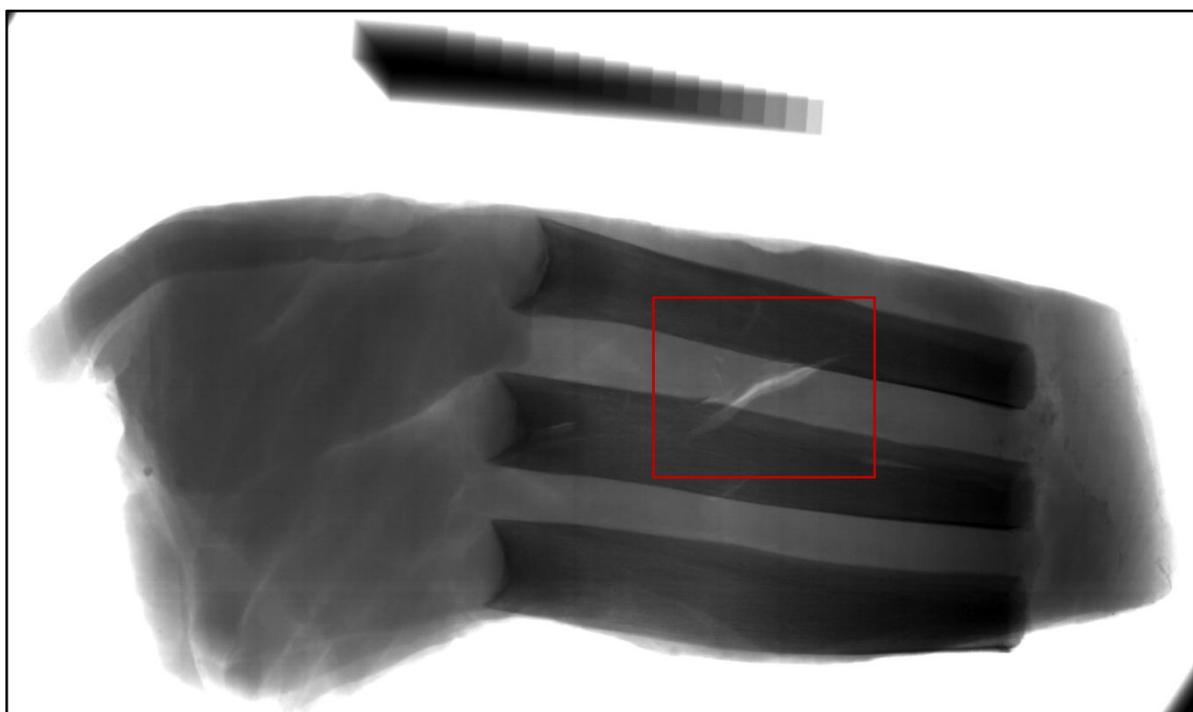


Figure 5.55: X-ray of dagger damage – JFD (Photograph: author's own).



Figure 5.56: Close-up of JFA dagger damage (Photograph: author's own).

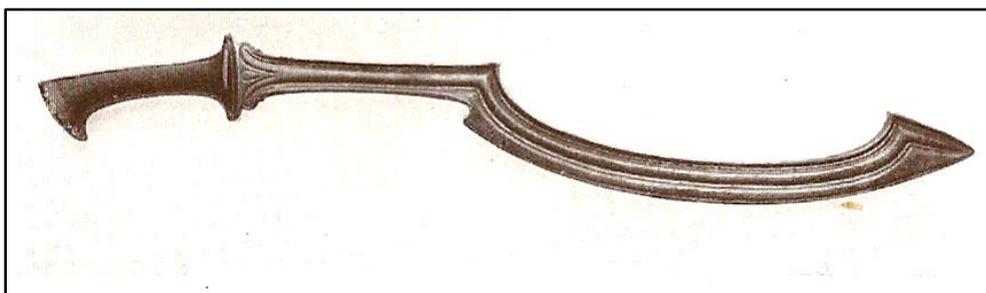


Figure 5.57: Greater khopesh sword from the tomb of Tutankhamun (Carter 2004, pl. XLV).



Figure 5.58: Replica khopesh (Stonborough 2011, 109).



Figure 5.59: The piglets used for the experiments (Photograph: author's own).



Figure 5.60: A piglet on the stand prior to the weapon strikes (Photograph: author's own).



Figure 5.61: RDK experiment (Photograph: author's own).



Figure 5.62: RDK first strike trauma (Photograph: author's own).



Figure 5.63: RDK second strike trauma (Photograph: author's own).



Figure 5.64: RDK third strike trauma (Photograph: author's own).



Figure 5.65: JFK experiment (Photograph: author's own).



Figure 5.66: JFK first strike trauma (Photograph: author's own).

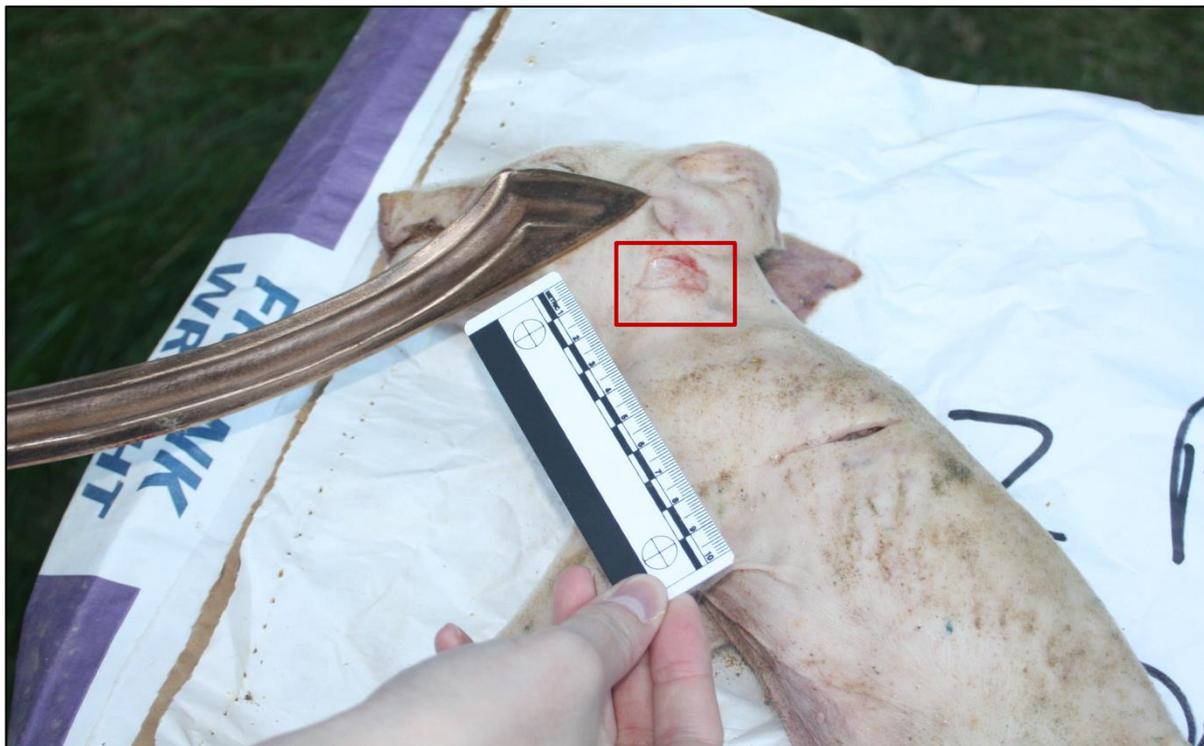


Figure 5.67: JFK second strike trauma (Photograph: author's own).



Figure 5.68: JFK third strike trauma (Photograph: author's own).



Figure 5.69: SBK Experiment (Photograph: author's own).



Figure 5.70: SBK first strike initial trauma (Photograph: author's own).



Figure 5.71: SBK first strike blood produced (Photograph: author's own).



Figure 5.72: SBK second strike trauma (Photograph: author's own).



Figure 5.73: SBK third strike trauma (Photograph: author's own).

Chapter Six - Experimental Archaeology: Comparative Discussion Figures

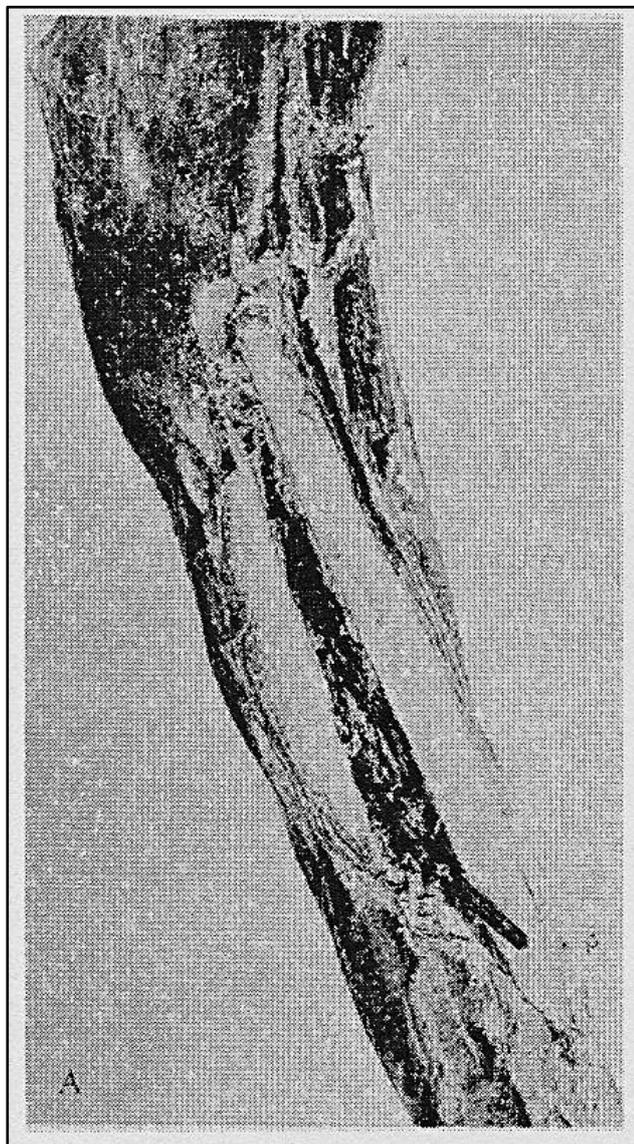


Figure 6.1: Body D (No. 6) – Ebony arrow tip in the forearm (Winlock 2007, pl. 7).



Figure 6.2: Body J (No. 36) – Ebony arrow tip, lodged in the soft tissue connected to the top of the left lung (Winlock 2007, pl. 7).

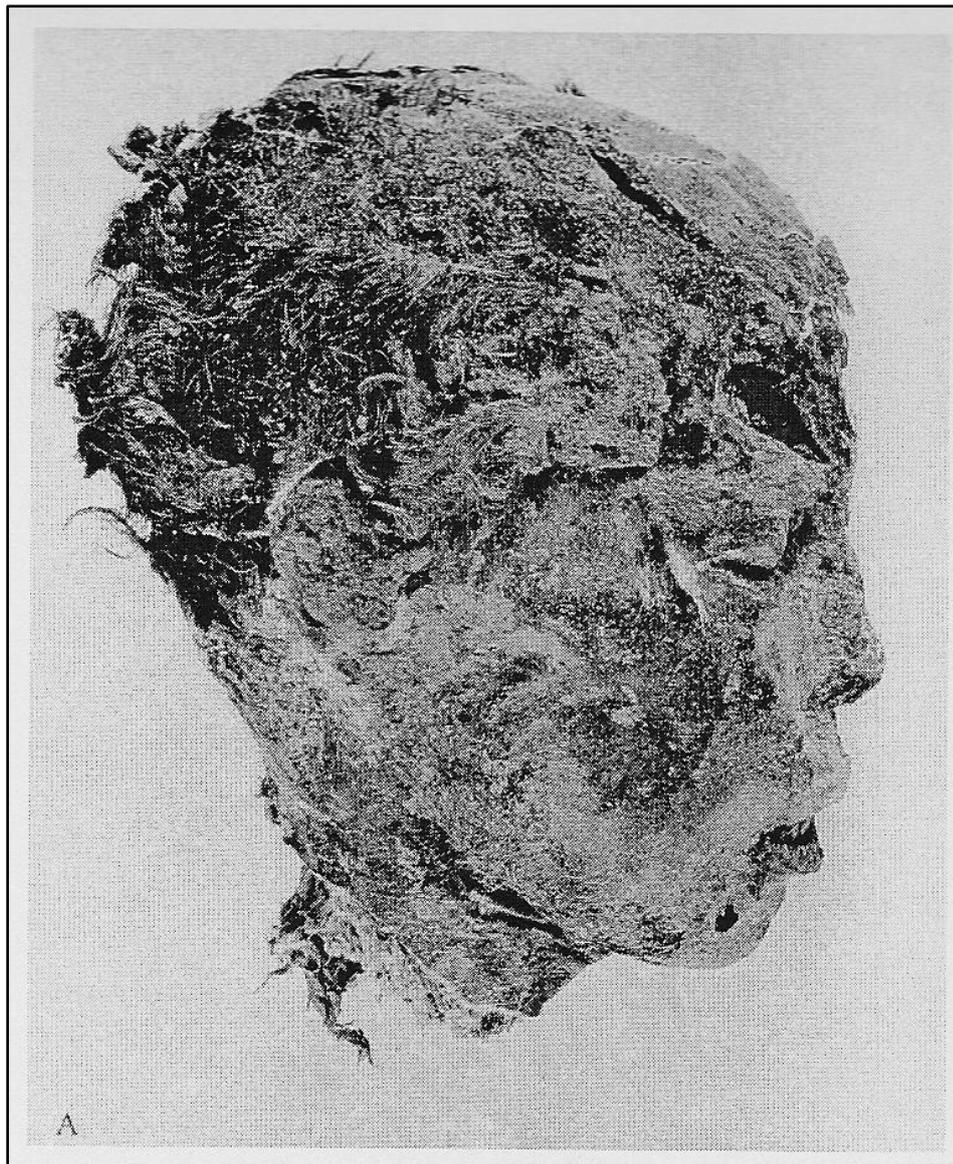


Figure 6.3: Body Q (No. 14) – Possible rock missile damage to soft tissue and skull  
(Winlock 2007, pl. 8).

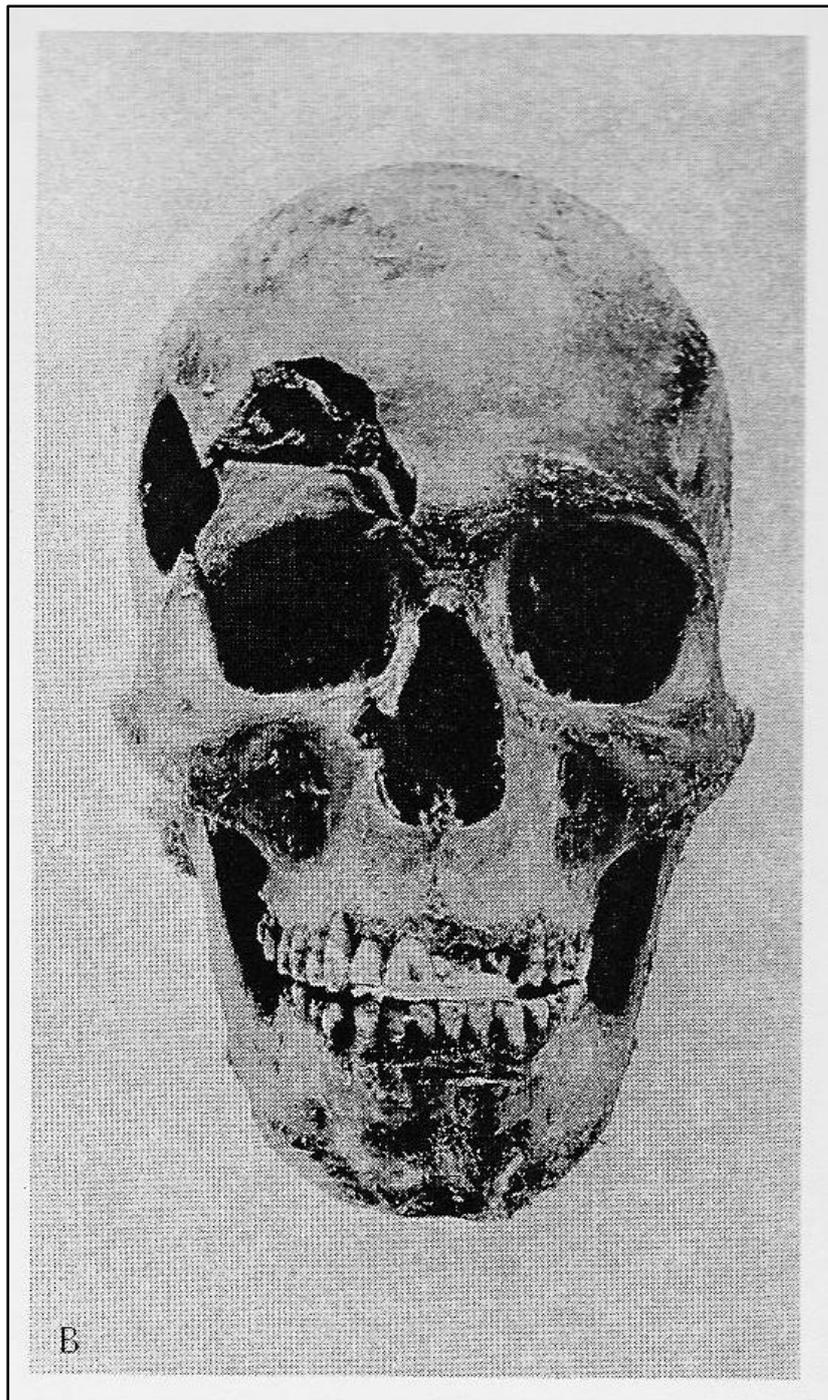


Figure 6.4: Body Q (No. 14) – Possible rock missile damage to skull (Winlock 2007, pl. 8).

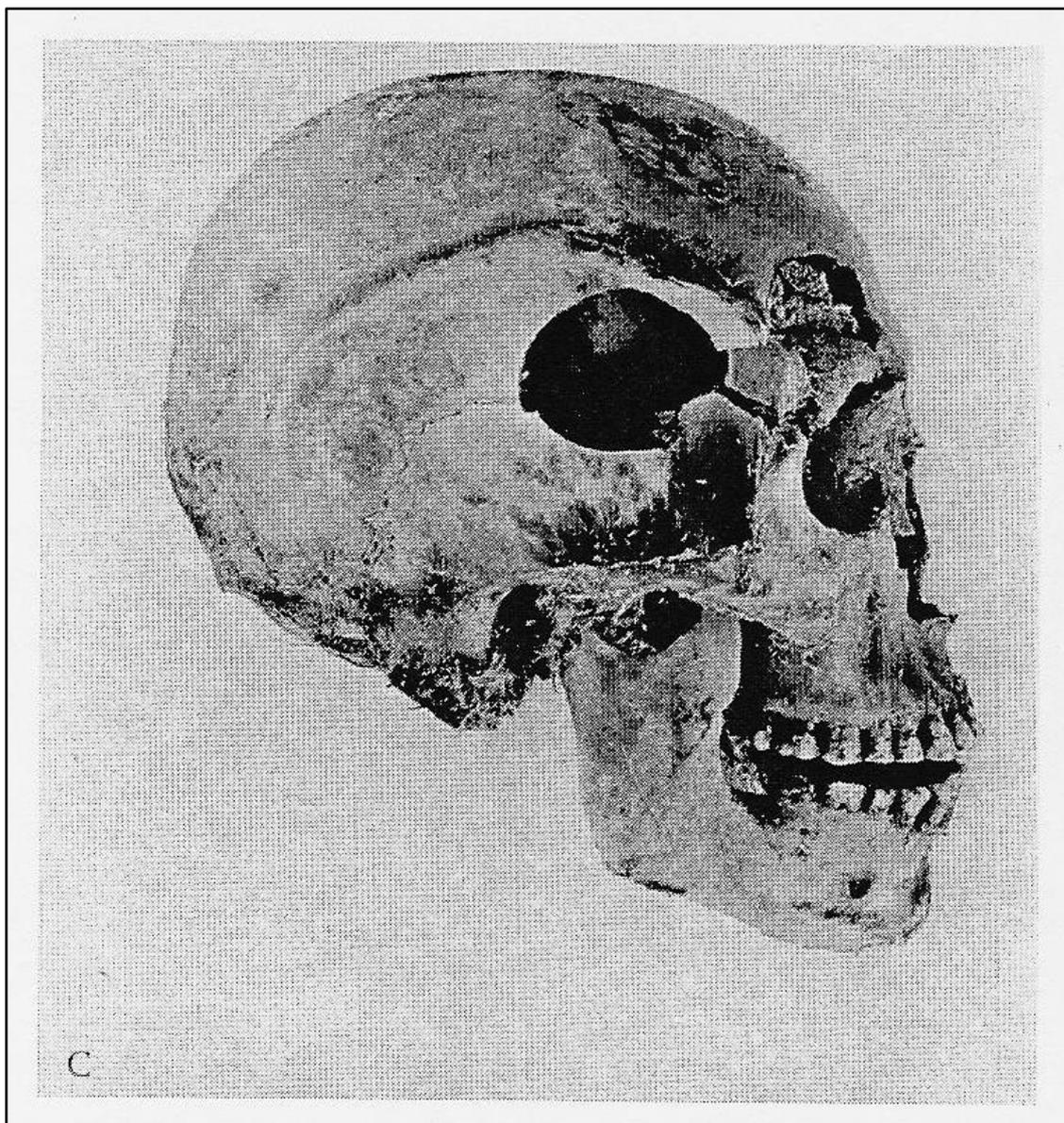


Figure 6.5: Body Q (No. 14) – Possible rock missile damage to skull (Winlock 2007, pl. 8).

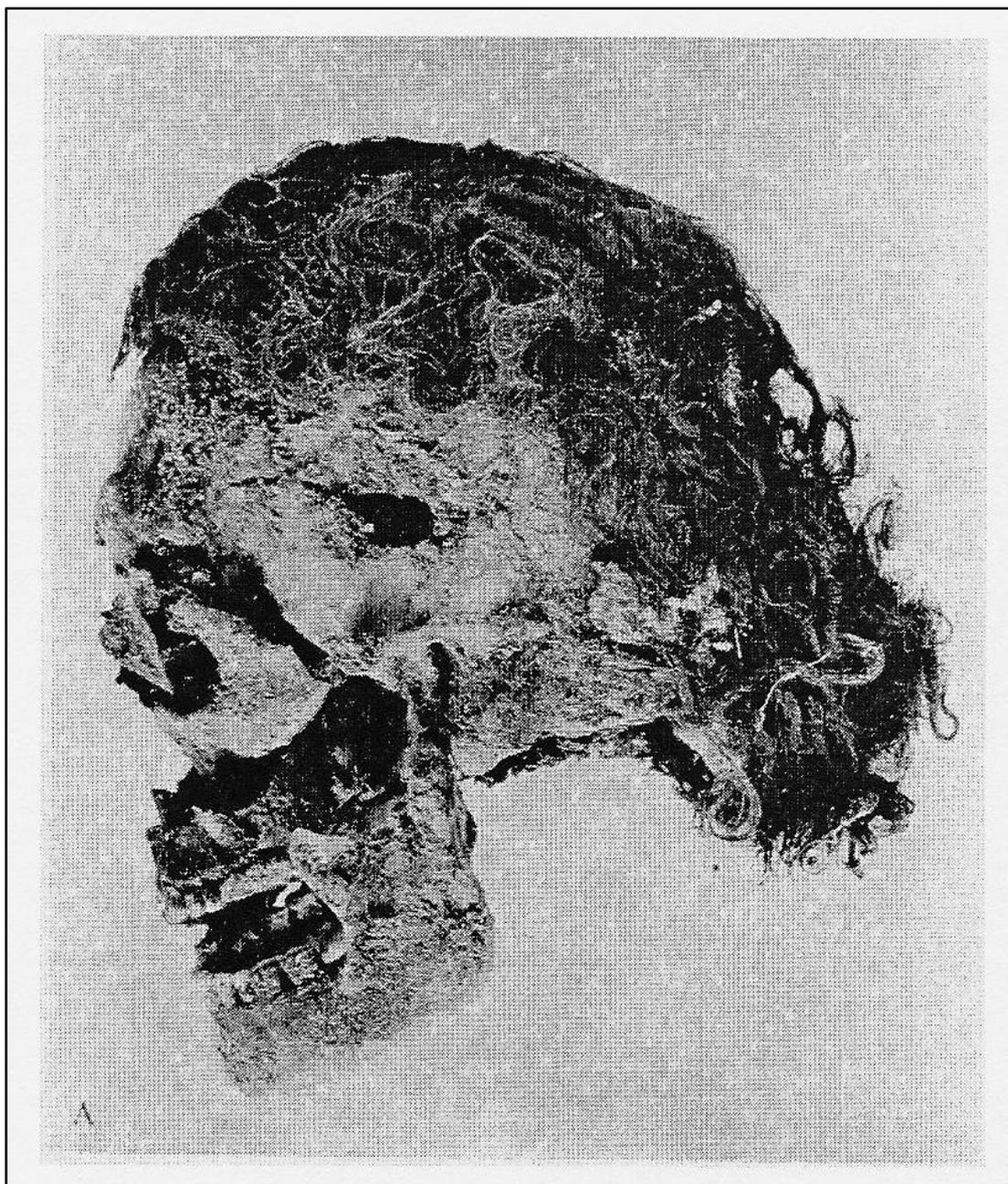
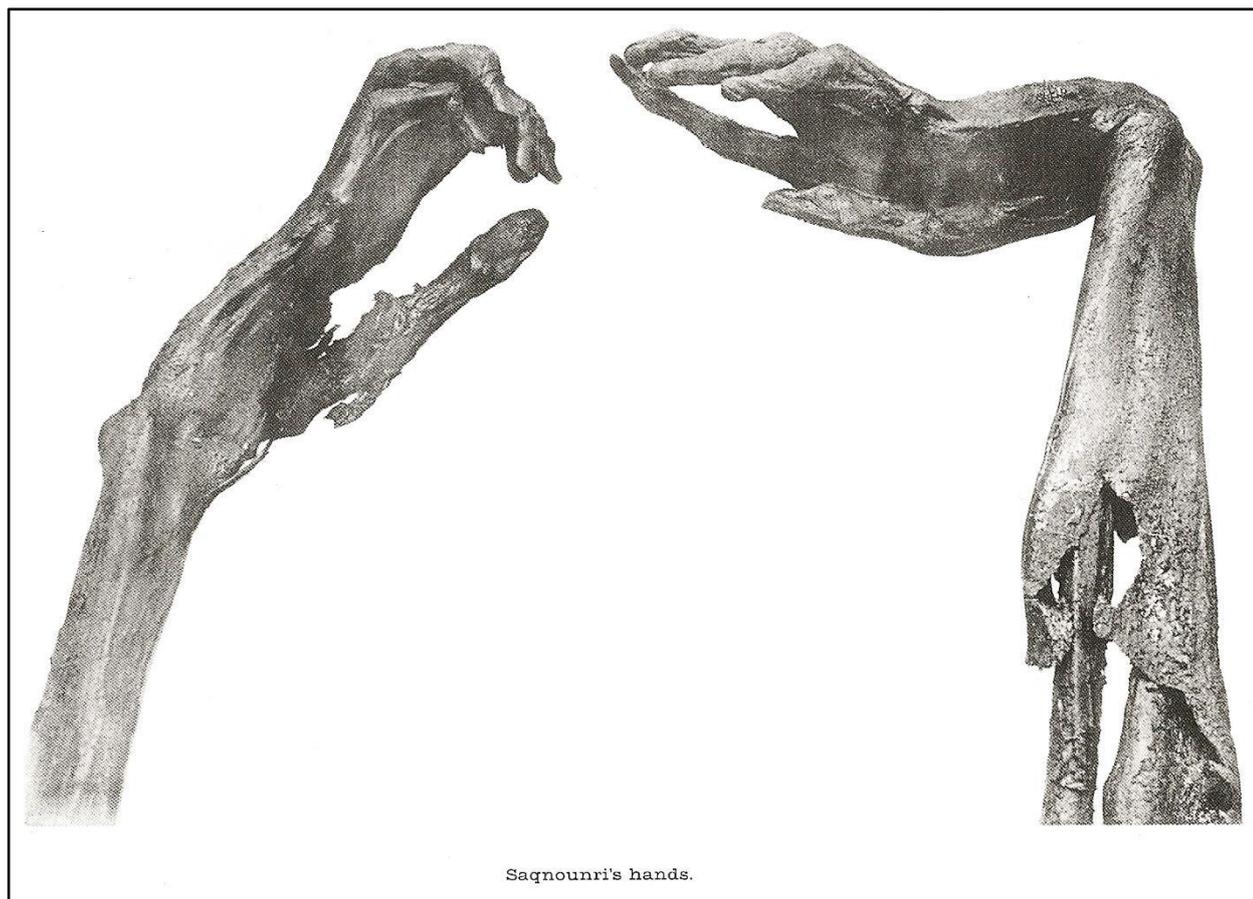


Figure 6.6: Body KK (No. 23) – Possible axe or mace damage to skull (Winlock 2007, pl. 9).



Figure 6.7: Defleshed pig skull displaying the conical mace-head damage from 2009  
MA thesis (Photo: author's own)



Saqnounri's hands.

Figure 6.8: The “agonised” position of the hands and arms of Seqenenre Tao II  
(Elliot Smith 2000, Pl. I).

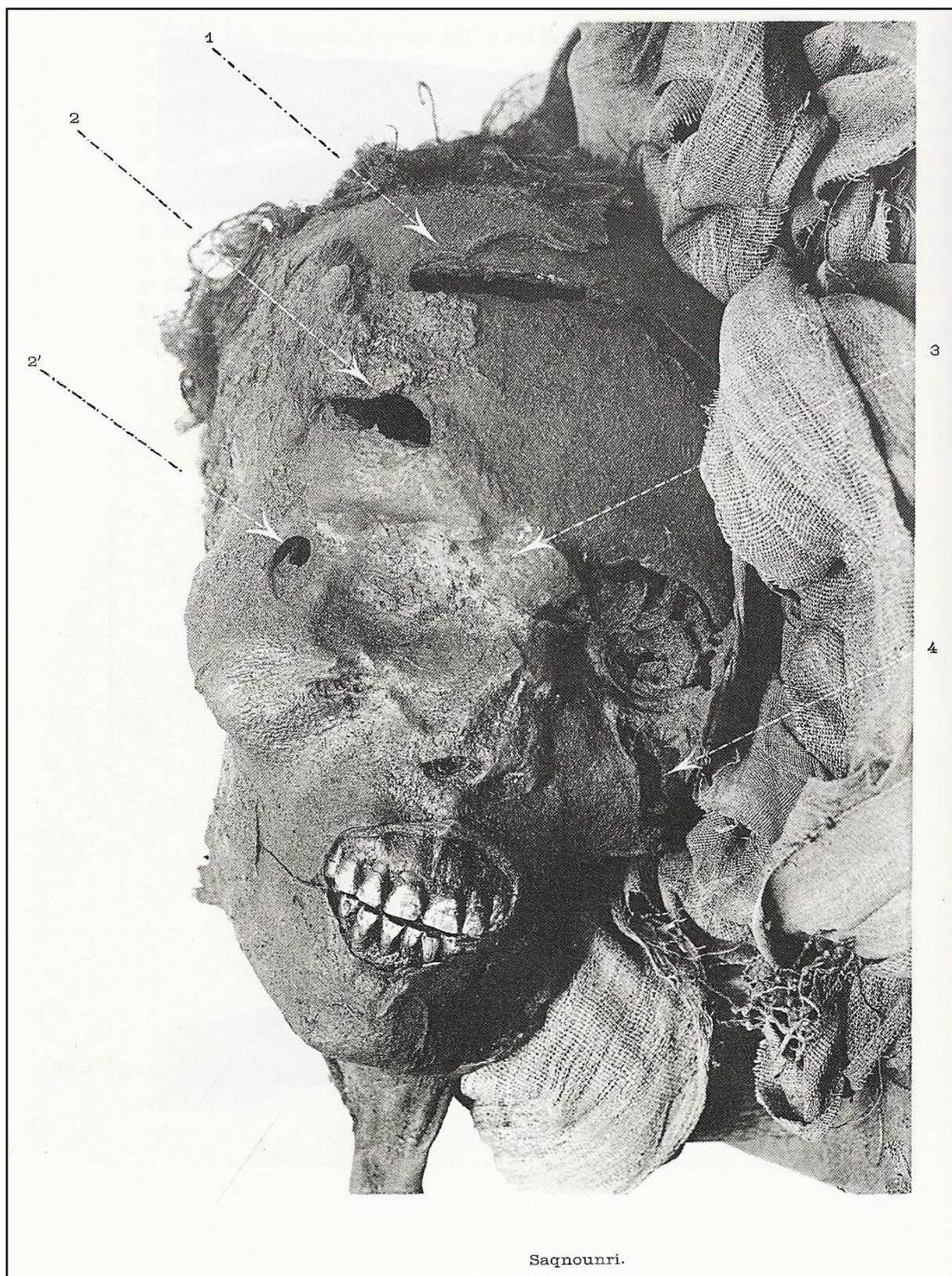


Figure 6.9: The damage inflicted on the skull of Seqenenre Tao II (Elliot Smith 2000, Pl. II).

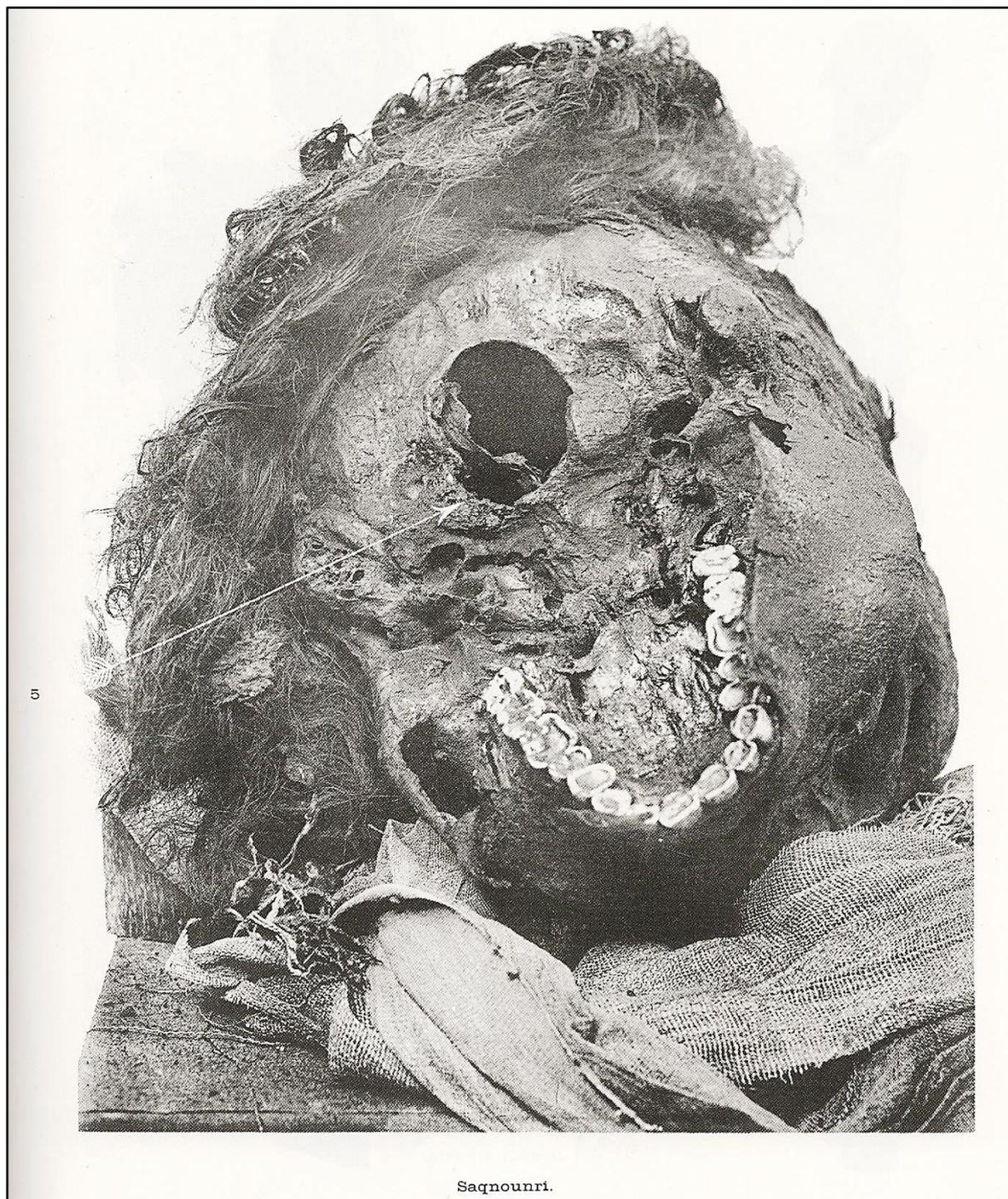


Figure 6.10: Possible spear or dagger wound to the face of Seqenenre Tao II (Elliot Smith 2000, Pl. III).

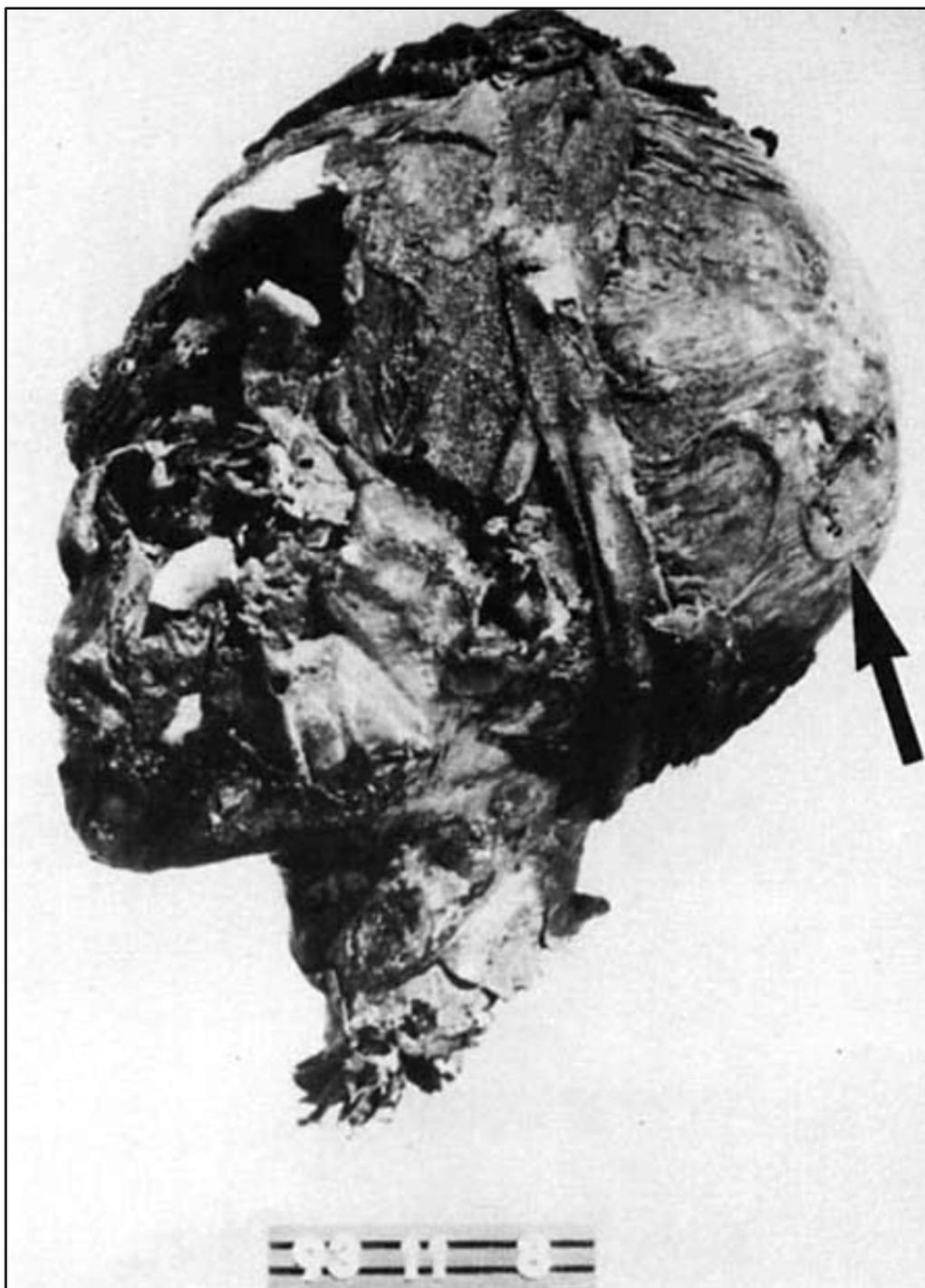


Figure 6.11: The left side of the skull, displaying the extensive destruction of the left side of the face due to a post-mortem attack, and depression of the surface over the left occipitotemporal skull (arrow) (Parsche *et al* 1996, 327).



Figure 6.12: Detailed macroscopic aspect of the left most occipitotemporal skull area showing a slight depression of the skin and a minor crescent-like skin defect (arrows) (Parsche *et al* 1996, 327).



Figure 6.13: Detailed macroscopic view of the excised osseous defect following removal of the overlying soft tissue – The external appearance presents as a sharply demarcated ovoid to round hole of the bone, with a fine fracture line running at right-angles from the defect (Parsche *et al* 1996, 328).

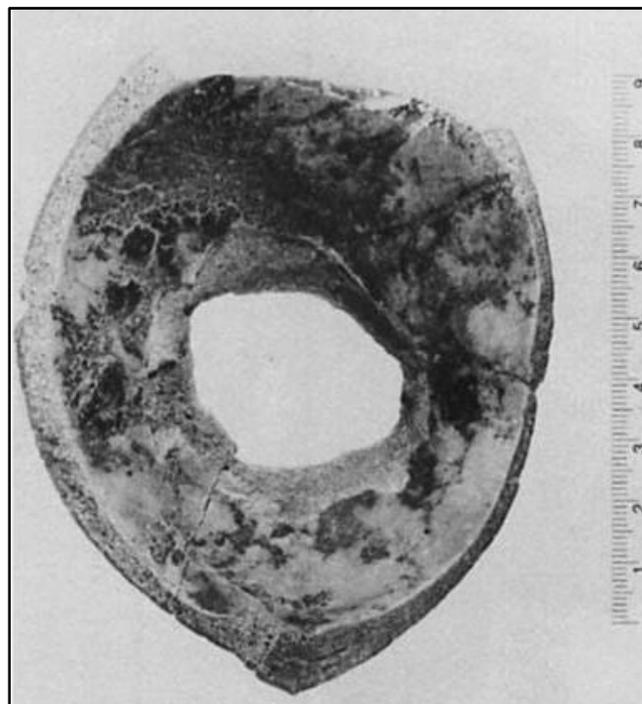


Figure 6.14: The inner aspect of the skull defect, which shows an infundibular widening of the defect (Parsche *et al* 1996, 328).

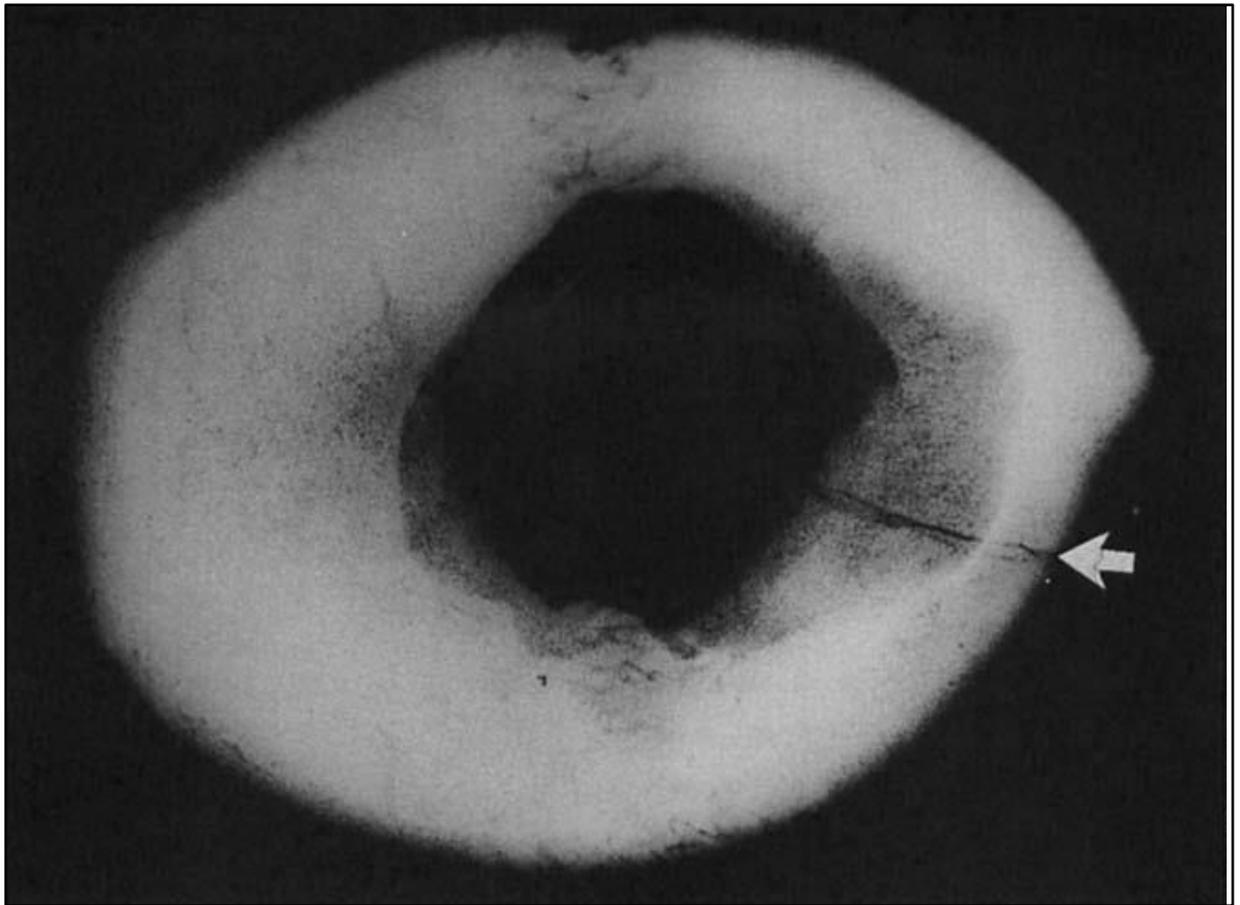


Figure 6.15: Radiograph of the excised specimen showing the well-delineated osseous defect, as well as the fine fracture line (arrow). The skull bone has a somewhat 'spongy' appearance (Parsche *et al* 1996, 329).

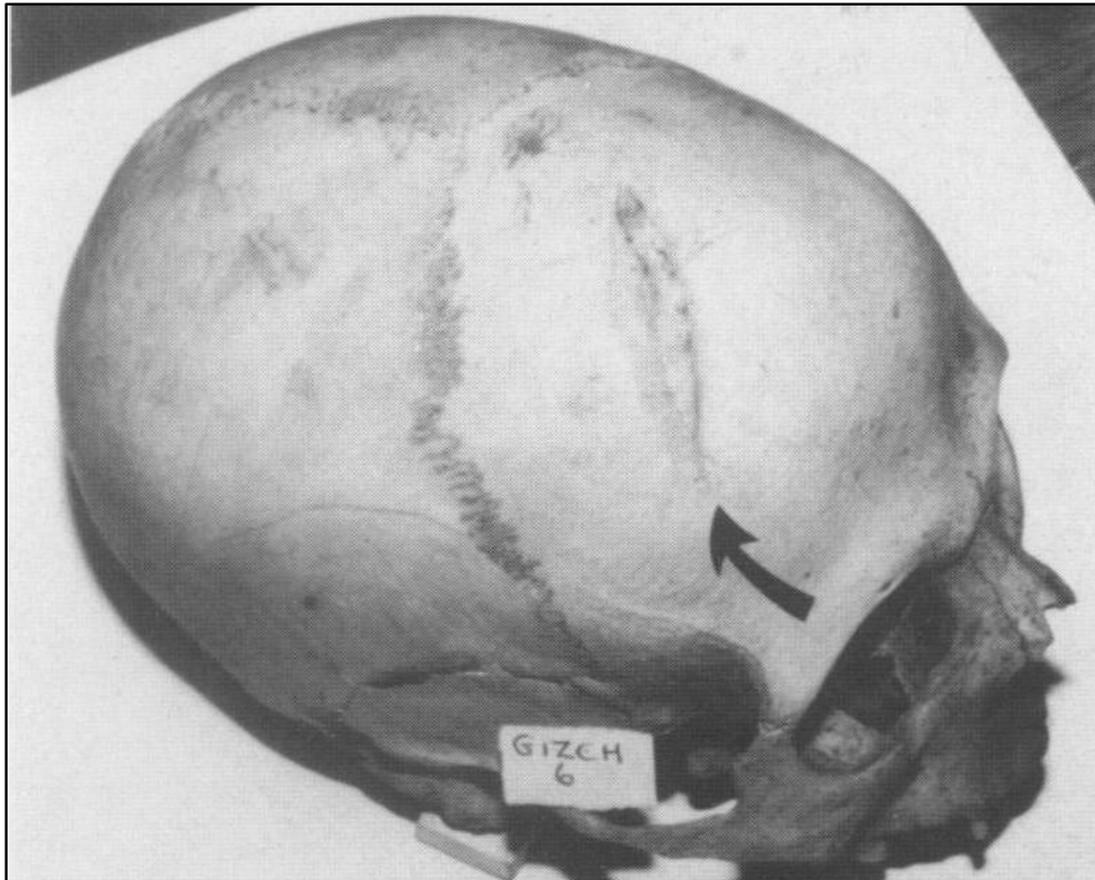


Figure 6.16: A severe gash wound, mid and right frontal bone (arrowed), mature male, from Giza (Filer 1992, pl. XXX).

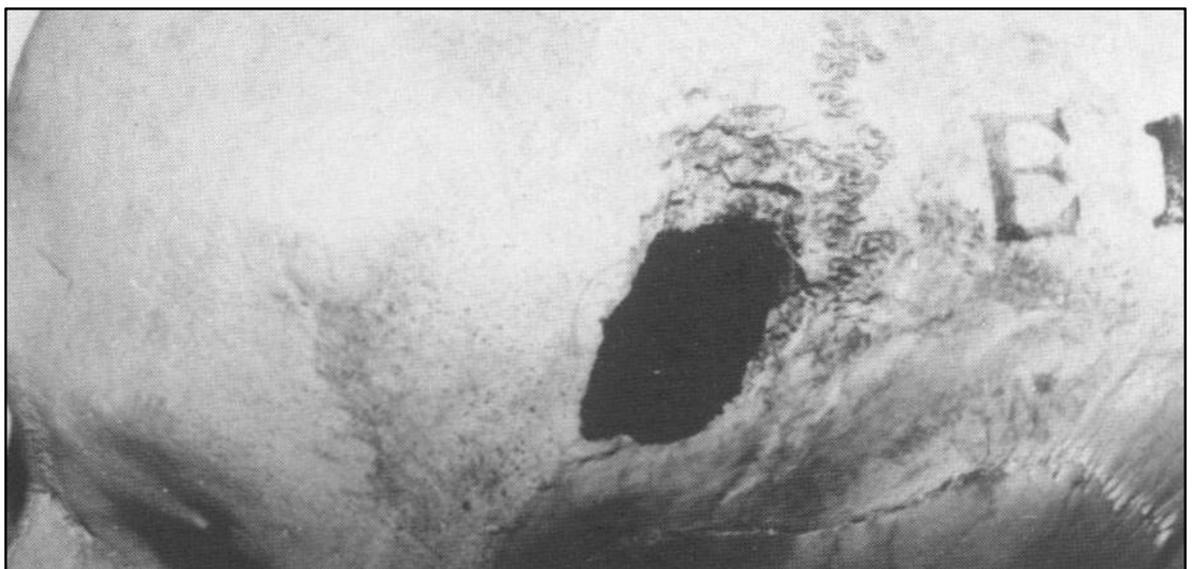


Figure 6.17: A regularly-shaped pierced lesion, left temple. Giza I6 (Ei 463). Mature adult, sex indeterminate (Filer 1992, pl. XXX).

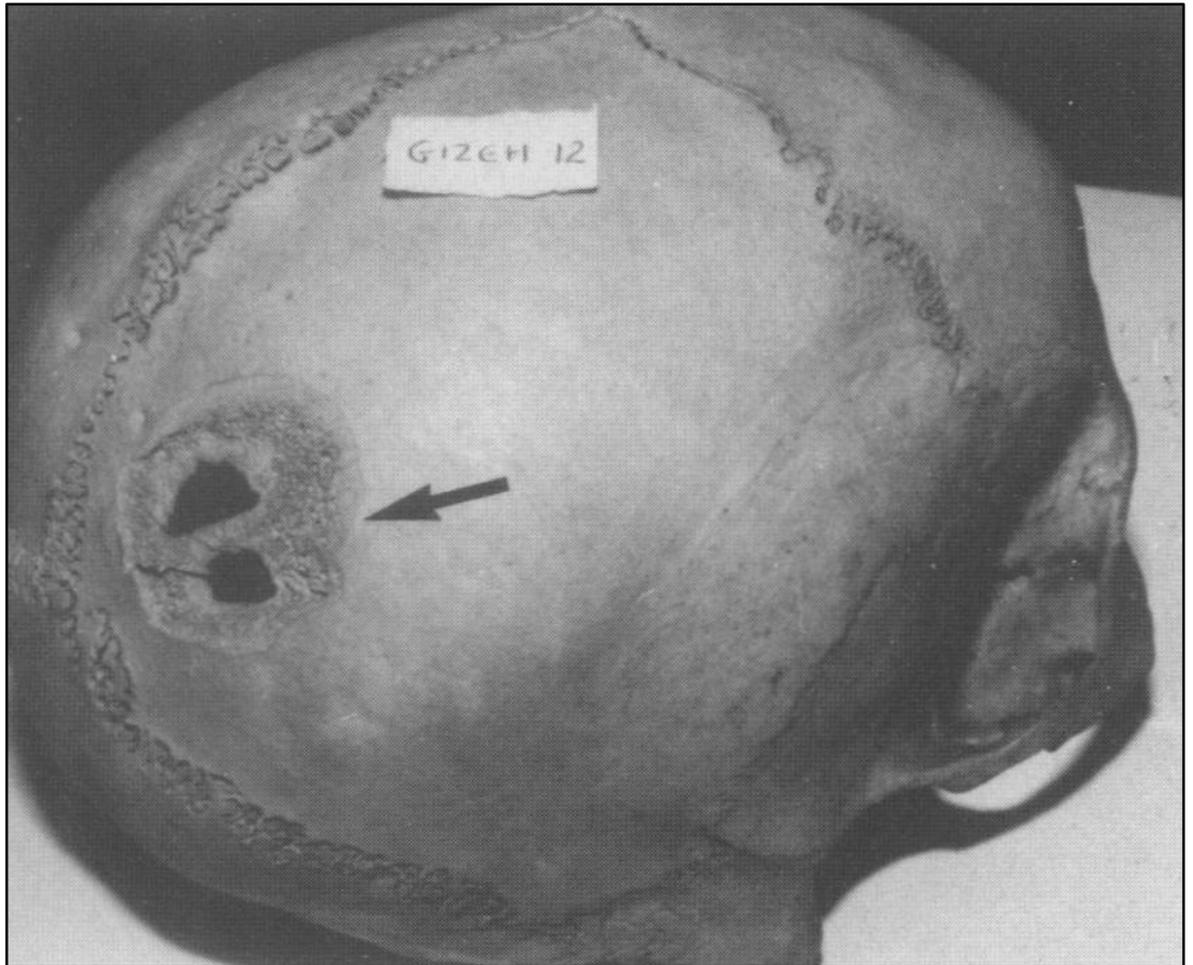


Figure 6.18: A complete sliced lesion, right parietal posterior position (arrowed).  
Young adult male from Giza (Filer 1992, pl. XXX).



Figure 6.19: X-ray of the Birmingham mummy displaying torticollis (Pahor and Cole 1995, 275).

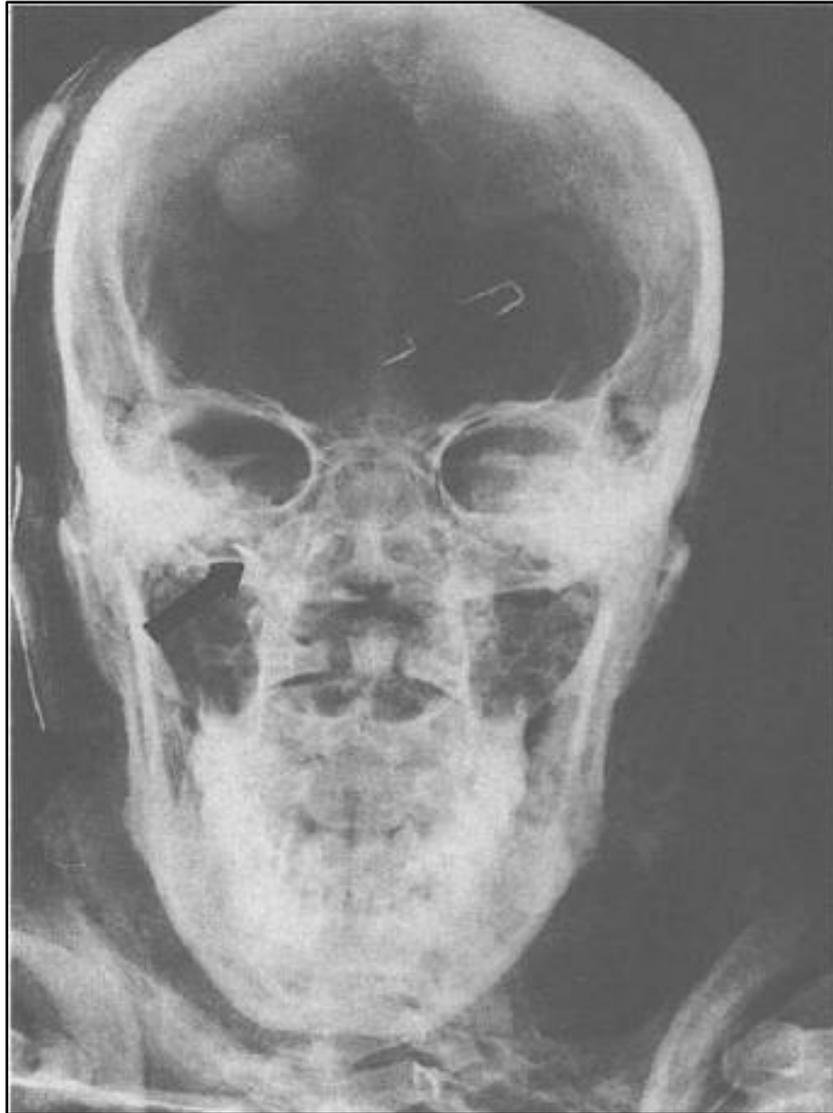


Figure 6.20: Antero-posterior view of skull showing arrowhead in right infra-temporal fossa (arrowed) (Pahor and Cole 1995, 274).



Figure 6.21: Lateral view of skull with arrowhead in right infra-temporal fossa (arrowed) (Pahor and Cole 1995, 275).



Figure 6.22: Towne's view of skull showing arrowhead in right infratemporal fossa (arrowed) (Pahor and Cole 1995, 275).



Figure 6.23: Bahriyah Oasis, healed depressed fracture on the frontal bone (17X 14 mm). Female, old adult (50+ years) (Erfan *et al* 2009, 81).



Figure 6.24: Healed depressed fracture on the occipital bone (24 X 20 mm). Male, mid adult (30-49 years) (Erfan *et al* 2009, 81).

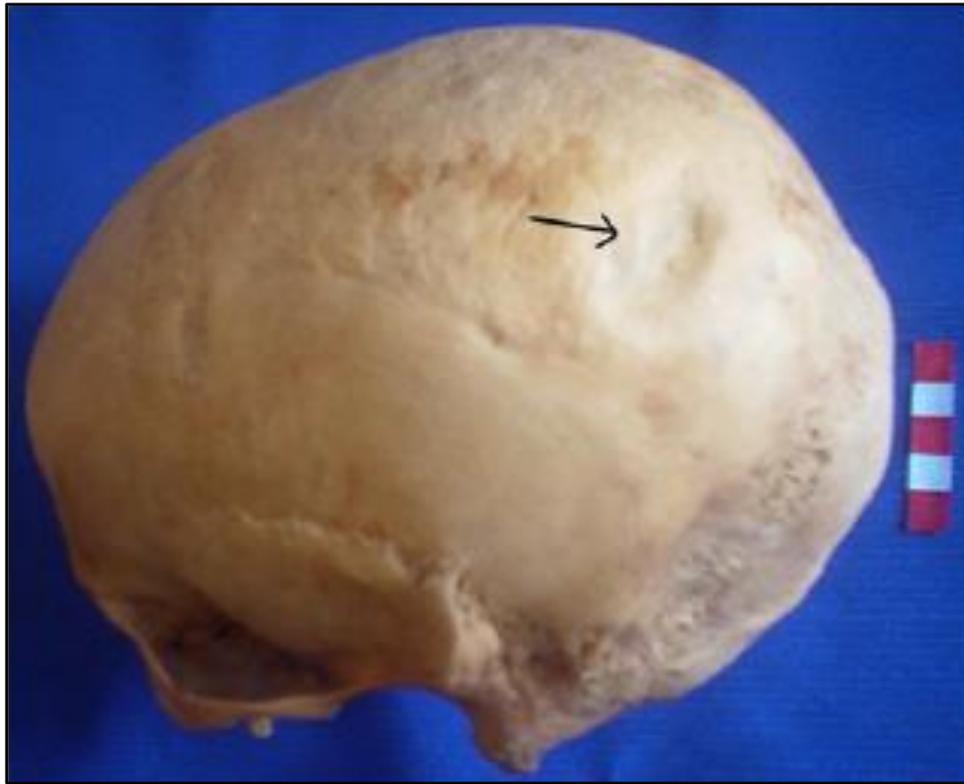


Figure 6.25: Healed depressed fracture on the left parietal bone (28 x 18 mm). Male, old adult (50+ years) (Erfan *et al* 2009, 81).

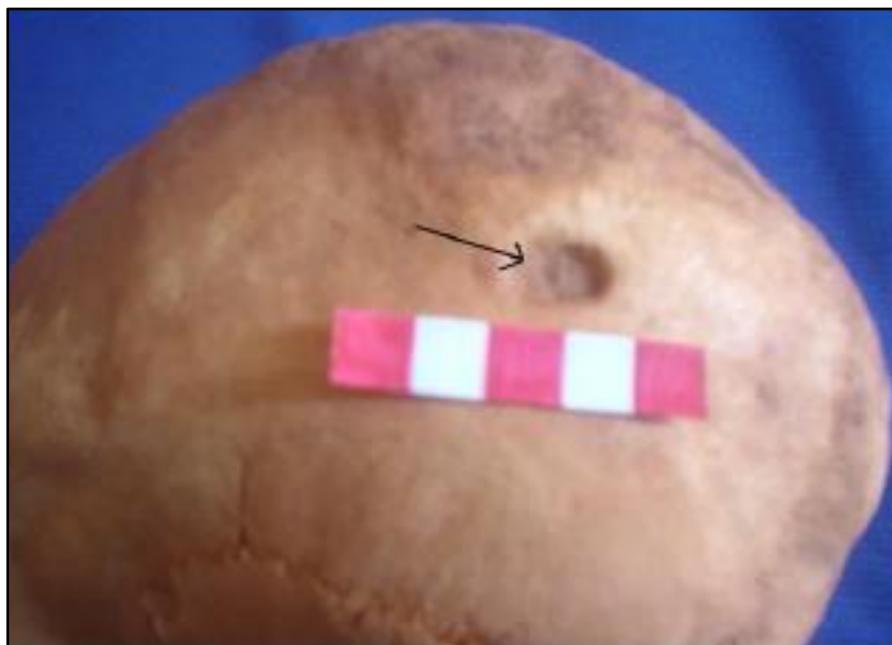


Figure 6.26: Healed depressed fracture on the left parietal bone (15 x 12 mm). Female, mid adult (30-49 years) (Erfan *et al* 2009, 81).

Chapter Seven - Discussion Figures



Figure 7.1: The body of the Younger Woman from KV35, showing the facial trauma (photograph courtesy of Dr Joann Fletcher).



Figure 7.2: Professor Don Brothwell testing the effectiveness of an axe and machete on a semi-wrapped pig carcass at the York Archaeology Trust laboratories in 2003 in order to replicate damage to the mummy of the so-called 'Younger Woman' from tomb KV.35 (photograph courtesy of Dr Joann Fletcher).



Figure 7.3: Professor Don Brothwell testing the effectiveness of an axe and machete on a semi-wrapped pig carcass at the York Archaeology Trust laboratories in 2003 in order to replicate damage to the mummy of the so-called 'Younger Woman' from tomb KV.35 (photograph courtesy of Dr Joann Fletcher).



Figure 7.4: Professor Don Brothwell testing the effectiveness of an axe and machete on a semi-wrapped pig carcass at the York Archaeology Trust laboratories in 2003 in order to replicate damage to the mummy of the so-called 'Younger Woman' from tomb KV.35 (photograph courtesy of Dr Joann Fletcher).



Figure 7.5: Photograph of damaged Peruvian mummy head (Moodie 1931, Pl. LIV).

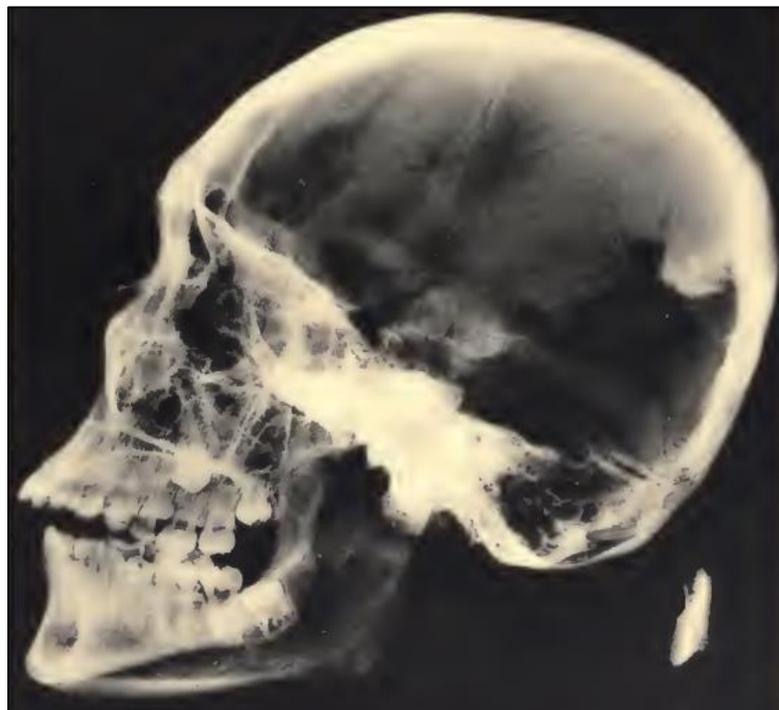


Figure 7.6: Roentgenogram of Peruvian mummy head - mace trauma (Moodie 1931, Pl. LV).

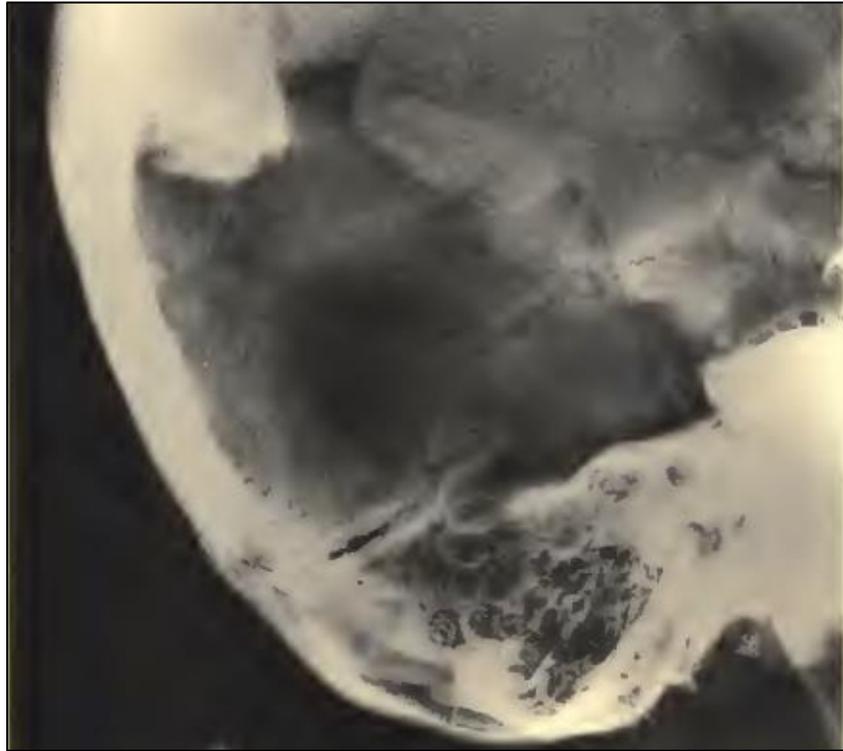


Figure 7.7: Roentgenogram of Peruvian mummy head, showing mace damage (Moodie 1931, Pl. XXIII).



Figure 7.8: Peruvian mummy skull, displaying extensive mace trauma (Moodie 1931, Pl. XXVI).

Appendix - Catalogue of Museum Weaponry Collections Figures



Figure A.1: Arrowhead (Author's Own)



Figure A.2: Arrowhead (Author's Own)



Figure A.3: Spearhead (Author's Own)



Figure A.4: Spearhead (Author's Own)



Figure A.5: Spearhead (Author's Own)

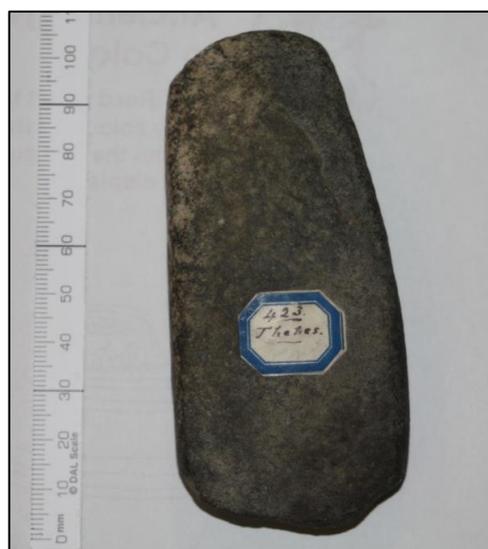


Figure A.6: Axe-head (Author's Own)



Figure A.7: Axe-head (Author's Own)



Figure A.10: Mace-head (Dean 2009)



Figure A.8: Arrowhead (Author's Own)



Figure A.11: Mace-head (Dean 2009)



Figure A.9: Arrowhead (Author's Own)



Figure A.12: Mace-head (Dean 2009)



Figure A.13: Mace-head (Dean 2009)



Figure A.16: Mace-head (Dean 2009)



Figure A.14: Mace-head (Dean 2009)



Figure A.17: Mace-head (Dean 2009)



Figure A.15: Mace-head (Dean 2009)



Figure A.18: Arrowhead (Author's Own)



Figure A.19: Arrowhead (Author's Own)



Figure A.22: Arrowhead (anon, nd [a])



Figure A.20: Arrowhead (anon, nd [a])



Figure A.23: Arrowhead (anon, nd [a])



Figure A.21: Arrowhead (anon, nd [a])



Figure A.24: Arrowhead (anon, nd [a])



Figure A.25: Arrowheads (anon, nd [a])



Figure A.28: Arrowhead (anon, nd [a])



Figure A.26: Arrowheads (anon, nd [a])



Figure A.29: Arrowhead (anon, nd [a])



Figure A.27: Arrowheads (anon, nd [a])



Figure A.30: Spearhead (anon, nd [a])



Figure A.31: Spearhead (anon, nd [a])



Figure A.34: Spearhead (anon, nd [a])



Figure A.32: Spearhead (anon, nd [a])



Figure A.35: Spearhead (anon, nd [a])



Figure A.33: Spearhead (anon, nd [a])



Figure A.36: Spearhead (anon, nd [a])



Figure A.37: Spearhead (anon, nd [a])

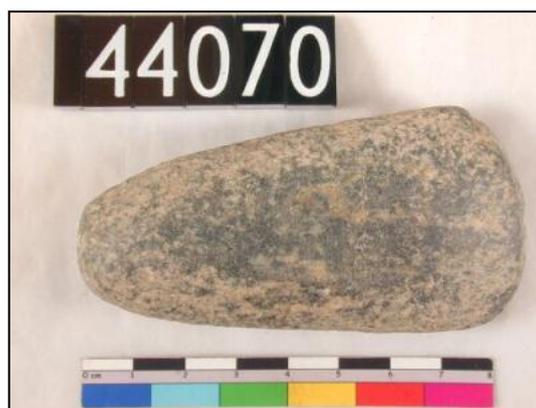


Figure A.40: Axe-head (anon, nd [a])



Figure A.38: Spearhead (anon, nd [a])



Figure A.41: Axe-head (anon, nd [a])



Figure A.39: Spearhead (anon, nd [a])



Figure A.42: Axe-head (anon, nd [a])



Figure A.43: Axe-head (anon, nd [a])



Figure A.46: Axe-head (anon, nd [a])



Figure A.44: Axe-head (anon, nd [a])



Figure A.47: Axe-head (anon, nd [a])



Figure A.45: Axe-head (anon, nd [a])



Figure A.48: Axe-head (anon, nd [a])



Figure A.49: Axe-head (anon, nd [a])



Figure A.51b: Dagger fragments (anon, nd [a])



Figure A.50: Dagger (anon, nd [a])



Figure A.52: Dagger (anon, nd [a])



Figure A.51a: Dagger (anon, nd [a])



Figure A.53: Dagger (anon, nd [a])



Figure A.54: Dagger (anon, nd [a])



Figure A.57: Dagger (anon, nd [a])



Figure A.55: Dagger (anon, nd [a])



Figure A.58: Dagger (anon, nd [a])



Figure A.56: Dagger (anon, nd [a])



Figure A.59: Dagger (anon, nd [a])

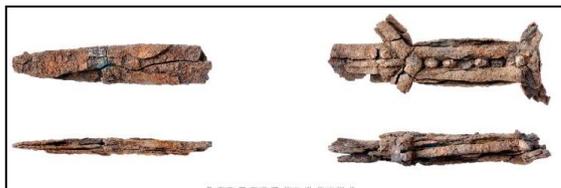


Figure A.60: Sword fragments (anon, nd [b])



Figure A.61: Sword (anon, nd [c])

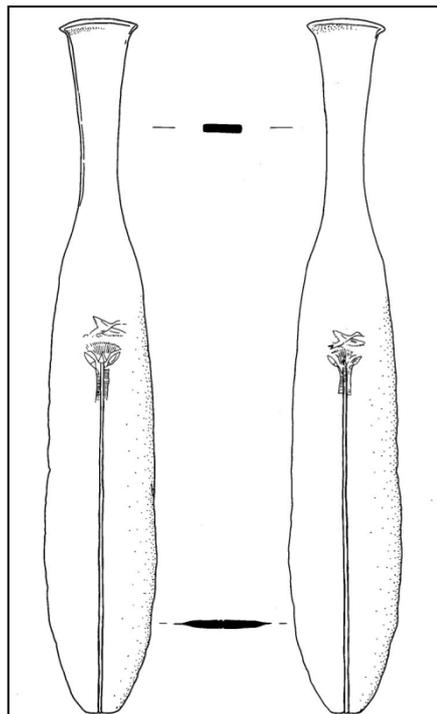


Figure A.63: Sword (anon, nd [e])



Figure A.62: Sword (anon, nd [d])

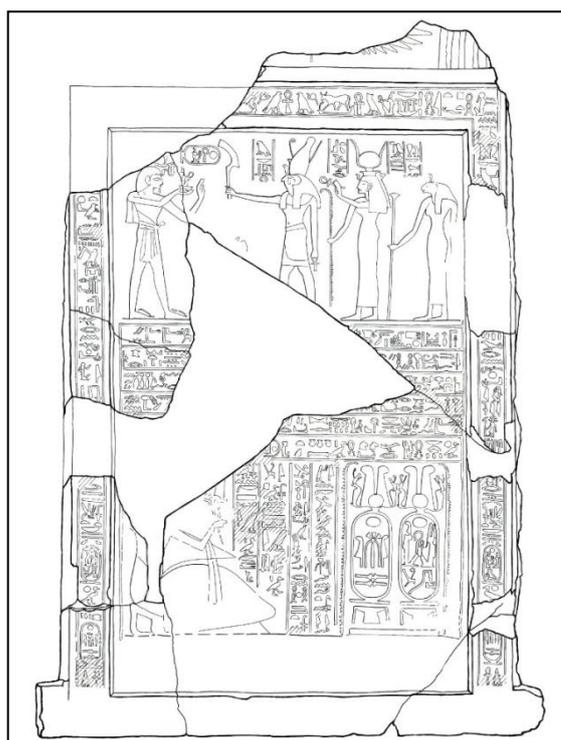


Figure A.64: Sword stela (anon, nd [f])



Figure A.65: Sword (anon, nd [g])



Figure A.67: Mace-head (anon, nd [a])



Figure A.68: Mace-head (anon, nd [a])



Figure A.66: Mace-head (anon, nd [a])



Figure A.69: Mace-head (anon, nd [a])



Figure A.70: Mace-head (anon, nd [a])



Figure A.73: Mace-head (anon, nd [a])



Figure A.71: Mace-head (anon, nd [a])



Figure A.74: Mace-head (anon, nd [a])



Figure A.72: Mace-head (anon, nd [a])



Figure A.75: Mace-head (anon, nd [a])



Figure A.76: Mace-head (anon, nd [a])



Figure A.77: Mace-head (anon, nd [a])



Figure A.78: Linen-wrapped Middle Kingdom arrows, British Museum (McDermott 2004, 70).

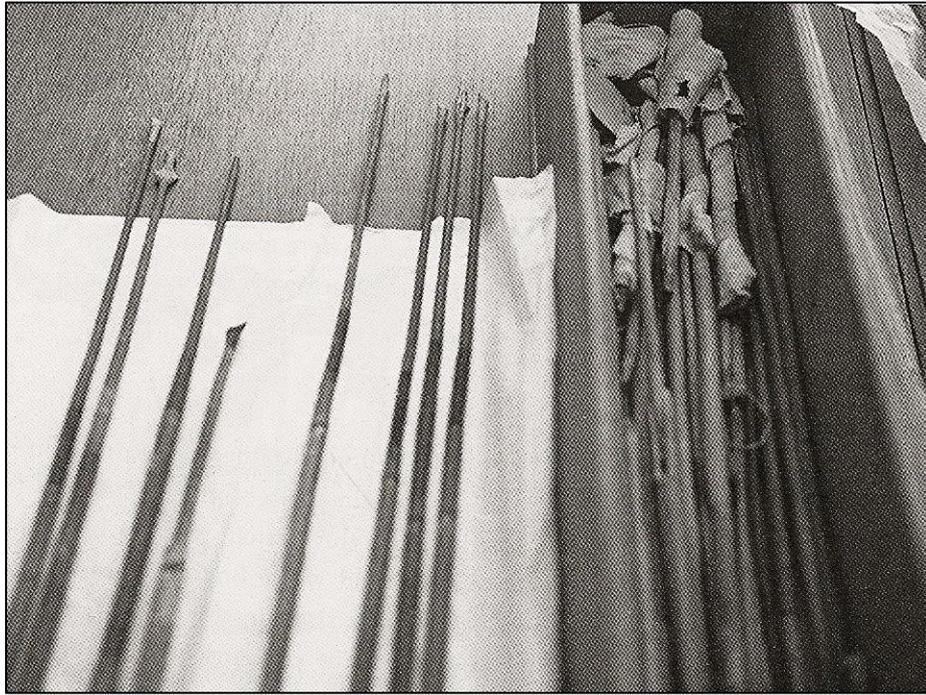


Figure A.79: Linen-wrapped Middle Kingdom arrows, British Museum (McDermott 2004, 70).

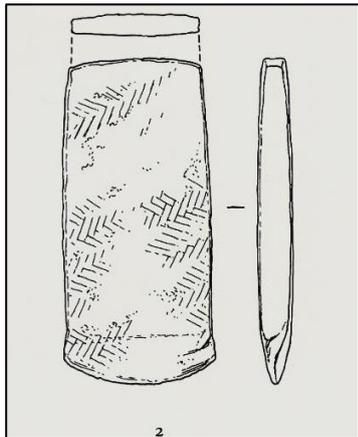


Figure A.80: Axe-head (Davies 1987, Pl. 1).

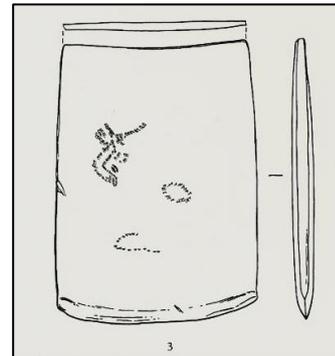


Figure A.81: Axe-head (Davies 1987, Pl. 1).

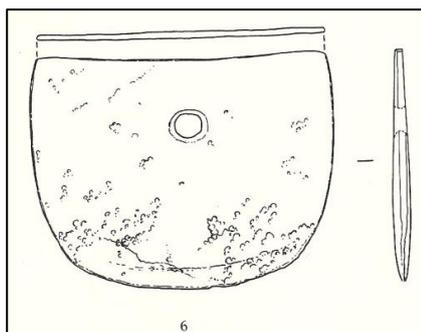


Figure A.82: Axe-head (Davies 1987,  
Pl. 1).

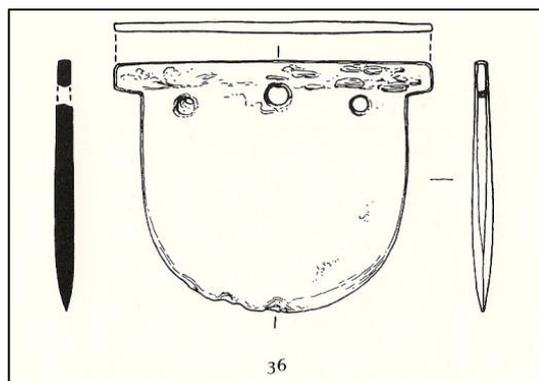


Figure A.84: Axe-head (Davies 1987,  
Pl. 6).

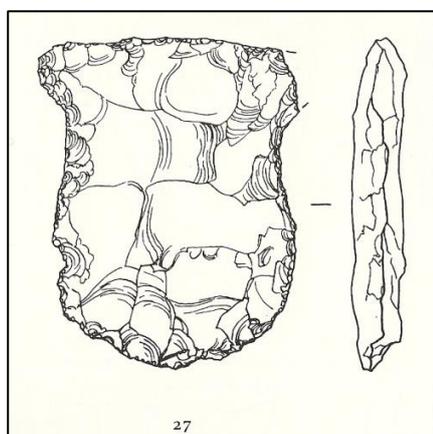


Figure A.83: Axe-head (Davies 1987,  
Pl. 5).

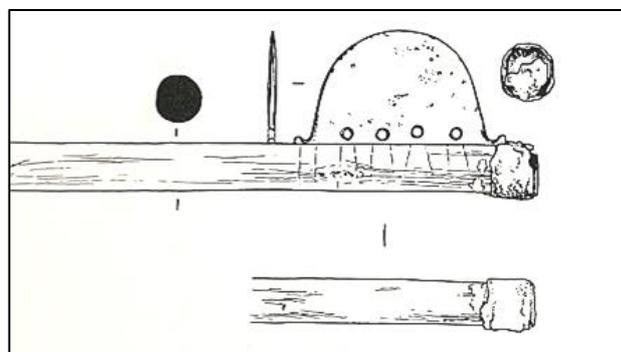


Figure A.85: Axe (Davies 1987, Pl.  
10).

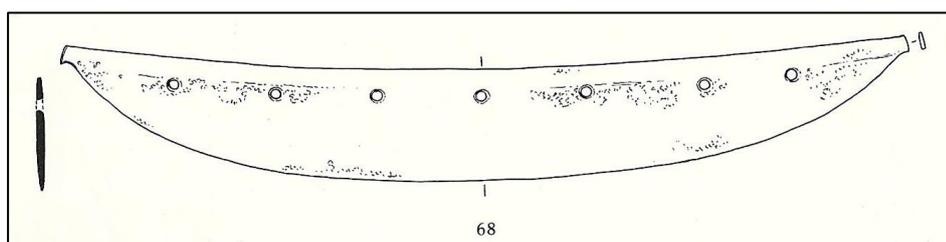


Figure A.86: Axe-head (Davies 1987, Pl. 11).

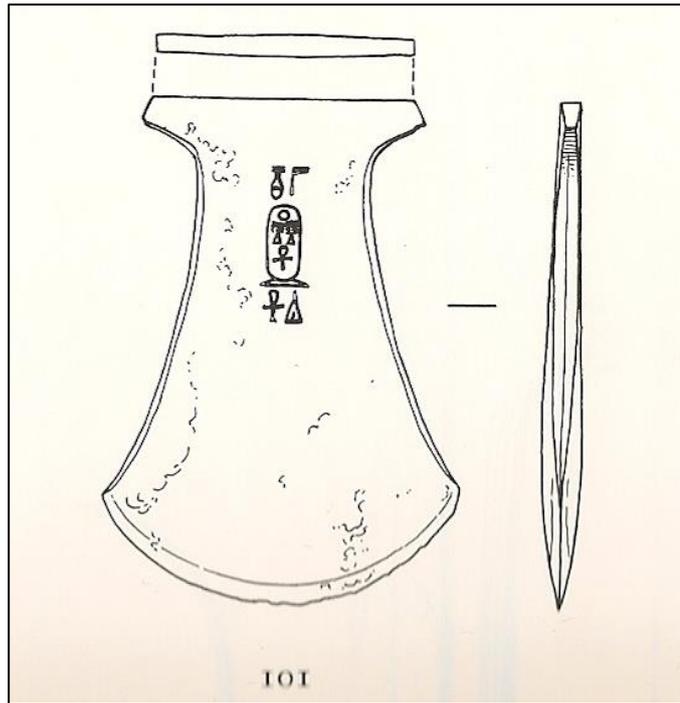


Figure A.87: Axe-head (Davies 1987, Pl. 18).

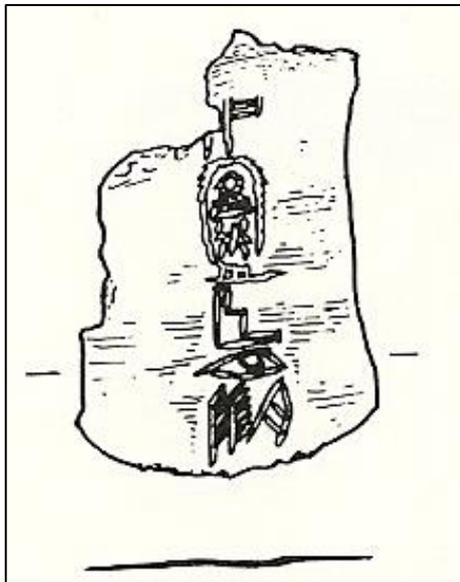


Figure A.88: Axe-head (Davies 1987, Pl. 21).

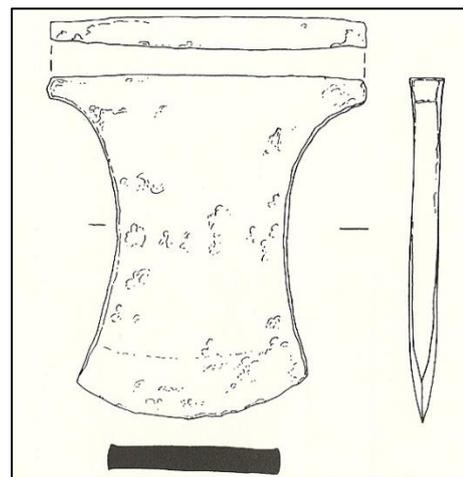


Figure A.89: Axe-head (Davies 1987, Pl. 22).

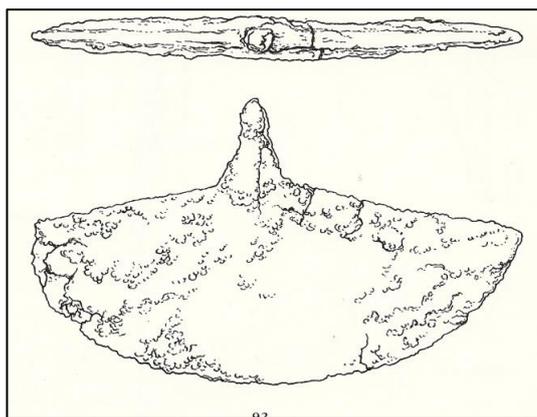


Figure A.90: Axe-head (Davies 1987, Pl. 15).

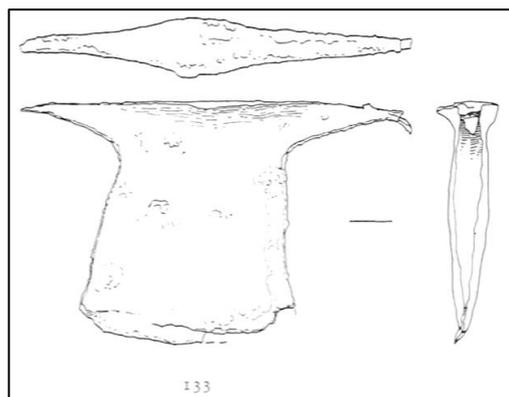


Figure A.92: Axe-head (Davies 1987, Pl. 24).

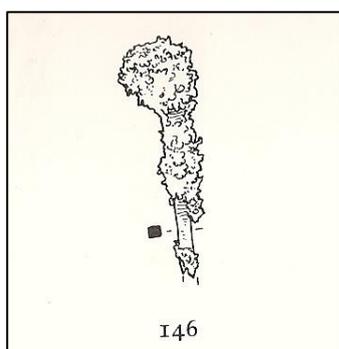


Figure A.91: Model axe (Davies 1987, Pl. 25).



Figure A.93: Middle Kingdom Daggers, Metropolitan Museum of Art. Top row: functional weapons. Bottom row: painted wood funerary votive models (Hayes 1978, 284).

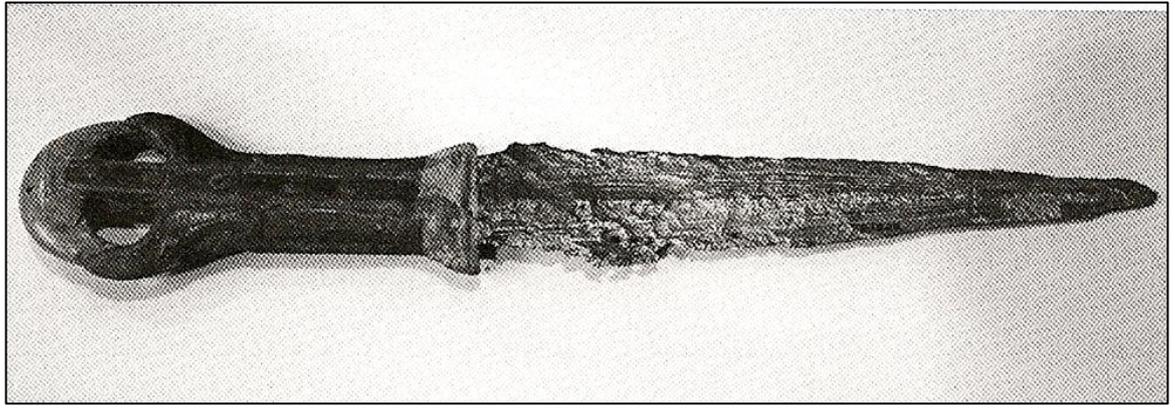


Figure A.94: Middle Kingdom short sword/dagger, University of Liverpool Museum  
(McDermott 2004, 165).

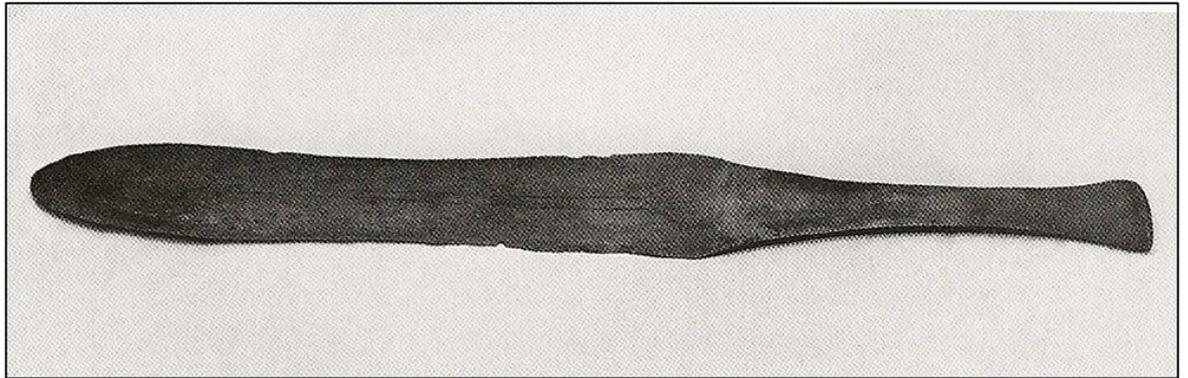


Figure A.95: Leaf-shaped sword, Cairo Museum (McDermott 2004, 168).

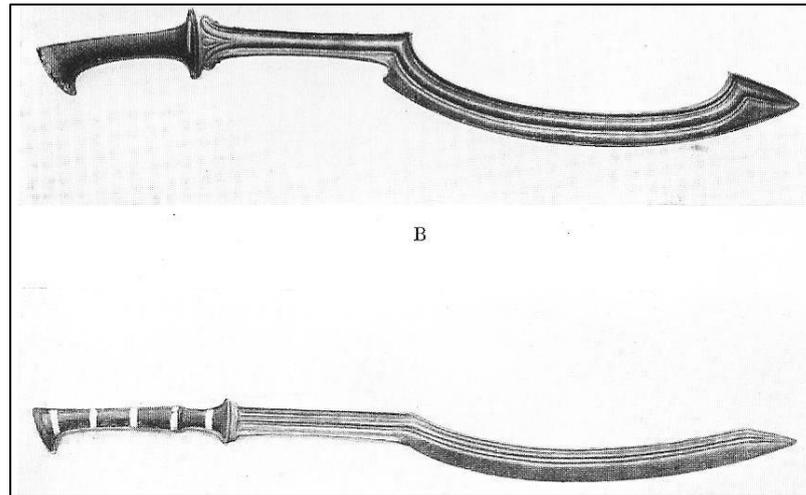


Figure A.96: Khopesh swords from the tomb of Tutankhamun (Carter 2004, Pl. XLV).

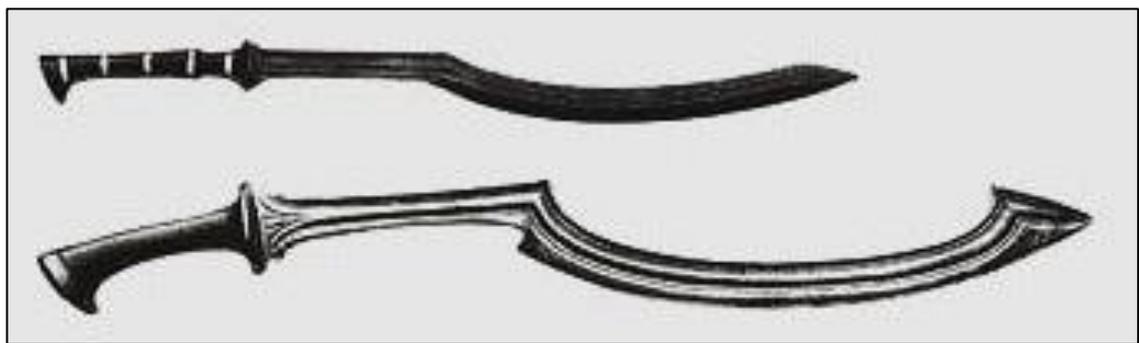


Figure A.97: The difference in size of the khopesh swords from the tomb of Tutankhamun (Reeves 1992, 177).

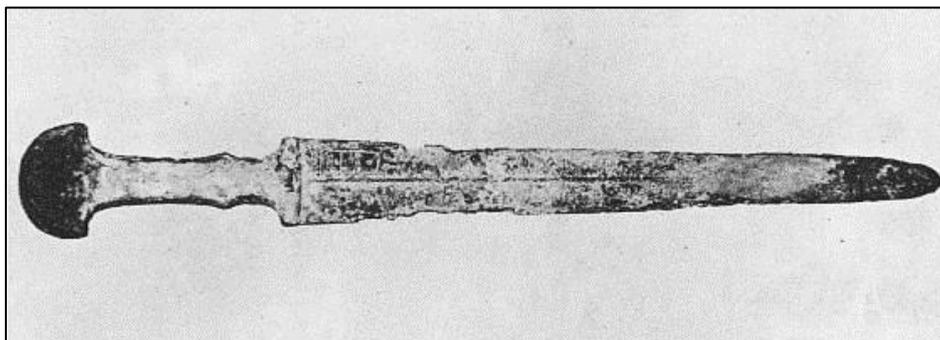


Figure A.98: Bronze Hyksos dagger with cartouche of Apophis I (Dawson 1925, Pl. XXV).



Figure A.99: The two daggers from the tomb of Tutankhamun; gold blade on the left, iron blade on the right (Reeves 1992, 177).



Figure A.100: Piriform mace, Museo Archeologico, Florence (McDermott 2004, 81).



Figure A.101: Light and agile ancient Egyptian chariot, Cairo Museum (McDermott 2004, 133).



Figure A.102: Light and agile ancient Egyptian chariot; Museo Archeologico, Florence (McDermott 2004, 133).

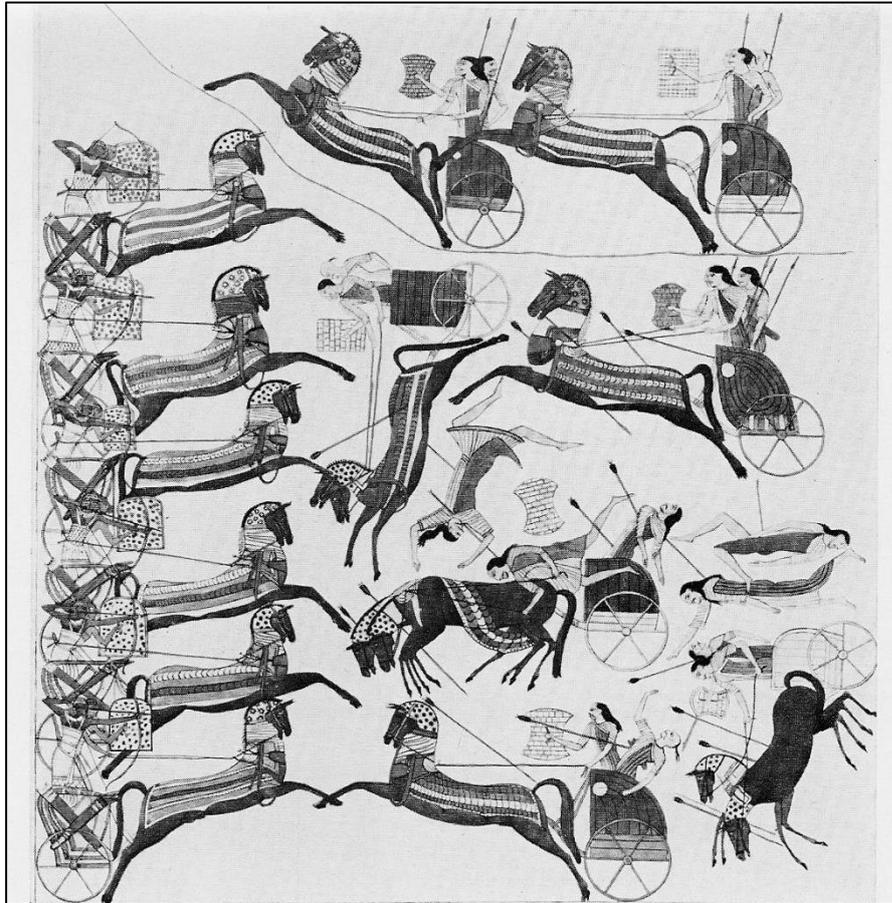


Figure A.103: Chariots clashing, Battle of Kadesh; Major Temple, Abu Simbel  
(Curto 1971, 18).

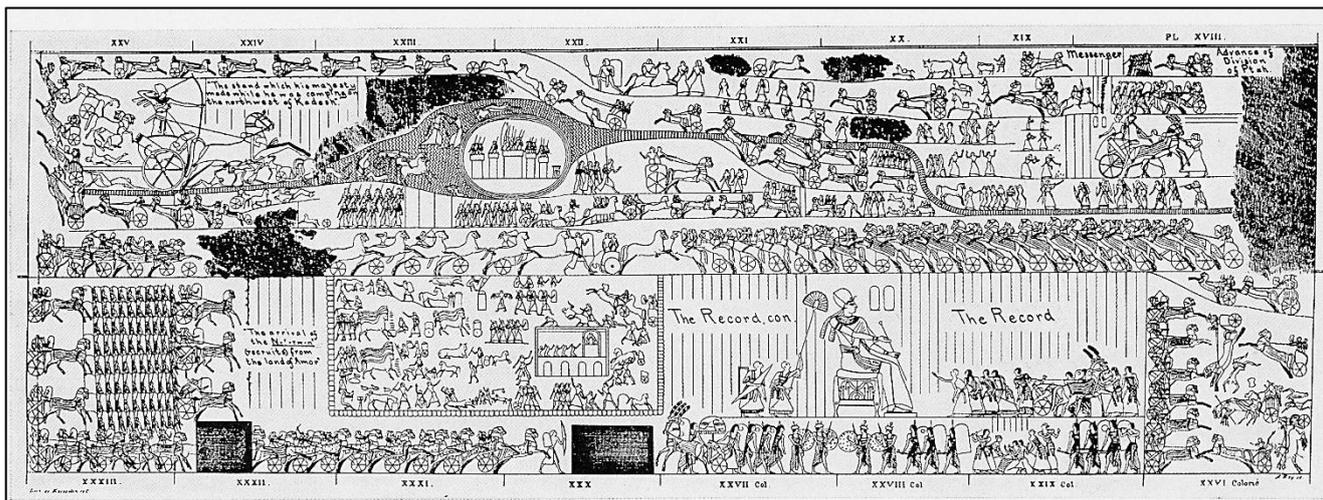


Figure A.104: Illustration of the Battle of Kadesh; Major Temple, Abu Simbel (Curto 1971, 27).

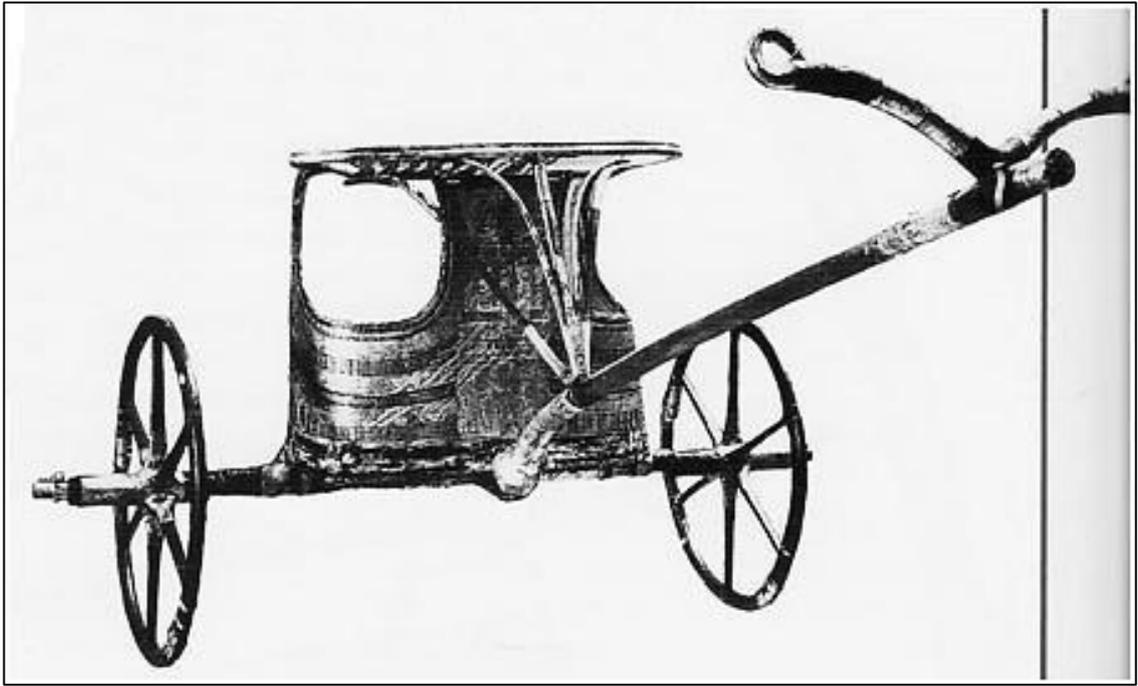


Figure A.105: A chariot from the tomb of Tutankhamun (Shaw and Boatright 2008, 38).