STUDIES OF ANCIENT EGYPTIAN FOOTWEAR. TECHNOLOGICAL ASPECTS. PART XIV. LEATHER EARED SANDALS

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ABSTRACT

Leather Eared Sandals, *i.e.* sandals with pre-straps that are cut from the sole's leather, are a well known category of sandals in ancient Egypt, mainly because the manufacturing is depicted in scenes that decorate tombs. Based on archaeological finds, we can recognise several subcategories and types. The present paper, as part of the Ancient Egyptian Footwear Project's publication series, presents the technological details of this category of leather sandals. As usual in this series of papers, other topics are discussed in passing.

Introduction

Ironically, eared sandals are perhaps the type of footwear best known in Egyptology but Egyptian Eared Sandals (as opposed to Nubian Eared Sandals[1]) are, archaeologically, predominantly represented by incomplete specimens and are also relatively few in number. Nubian Eared Sandals are, by contrast, abundant from archaeological sites. The 'ears', which are cut out from the same leather as the sole's leather, forming an integral part, are situated at the waist. These are actually the pre-straps, but since in literature these parts of sandals are known as 'ears', this term is used by the Ancient Egyptian Footwear Project (AEFP) to refer to the sandals. That these sandals are commonly referred to in publications is due to the fact that leatherworking scenes, if showing the manufacture of sandals, show Eared Sandals (figure 1). However, they show a certain type of Eared Sandal: there are several other types that are not shown in two-dimensional art or cannot be recognised as such. Some of these other types are not Egyptian at all, but are Nubian or possibly even of a more southerly (*i.e.* African) origin. The Egyp-

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Figure 1. The scenes that show the manufacturing of sandals only show Leather Eared Sandals. After Davies (1943: pl. LIII).

tian archaeological record, despite being rather scanty in nature, suggests a long tradition of use of the leather Eared Sandal, from Predynastic to at least Roman times.

The present paper, part of the AEFP publication series,[2] presents the technological details of this category of leather sandals. The research is based on the hands-on study of 54 sandals in various collections and from several excavations (table 1) as well as drawing on previously published material. As usual in this series, other topics (such as textual evidence) will be discussed only in passing, and will be dealt with in the final archaeological analysis of the Project (Veldmeijer, In preparation b). The terminology used in describing leather and footwear follows Goubitz *et al.* (2001, but see the annotated glossary in Veldmeijer, 2010a: 266-269; new terms are explained in the present work).

Typology

As explained elsewhere (Veldmeijer, 2010: 14-15) it is not possible to base a footwear typology on a single feature.[3] Distinctions between the various types of Eared Sandals are based on two features (table 2): the shape of the sole and the layout of the front strap (single or double).[4] The type of decoration helps to distinguish Nubian from Egyptian sandals, but several Predynastic exceptions makes it non-universal in character. Although other categories of sandals have comparable pre-straps, the shape of the sole usually differs markedly. Further categories of sandals with integral pre-straps are excluded from the Eared Sandals type because they have other features that are here regarded as more characteristic and more important. For example, Leather Composite Sandals usually have a different sole shape and are (elaborately) decorated with appliqué and colours (Veldmeijer, 2009a). The sandal from Meir (Veldmeijer, Submitted) differs in many ways from Eared Sandals, but still

has pre-straps that are cut from the leather of the sole. They are, however, much longer and, like those in Leather Composite Sandals, clad – cladding of pre-straps in Eared Sandals is a rare exception – and are cut from the heel's circumference.[5] Also, the pre-straps in an open shoe in the Egyptian Museum in Cairo (Veldmeijer, 2009b) are integral with the sole (actually, pre-straps are cut from both sole layers), which are secured with the attached back strap.[6] But the sole shape is much more comparable to Leather Composite Sandals (*cf.* Veldmeijer, 2009a). Pre-straps that form an integral part of the sole are also seen in another type of sandal, Classic Nubian Sandals (Veldmeijer, In preparation a[7]). However, instead of ears that project from the waist, in these sandals the heel is expanded at either side, usually into a triangular shape but rounded and extremely elongated rectangular-like expansions also occur, and slits or, more often, holes, are cut in the terminal ends. The back straps, as well as the heel straps, if present, are attached to these slits/holes. These sandals are of Nubian (or African) origin.

It is worthwile to have a closer look at the typology of the sandals that Williams (1983) described from Adindan in Nubia, as there are specimen that can be seen as Egyptian Eared Sandals (see below). He notes (*Ibidem*: 73) that "since the strap arrangements are so poorly preserved, the classification has to be made on the basis of the shape and structure of the sole and the portion that is most often preserved, i.e., the portion closest to the sole [this is the start of the pre-strap]." (Text between [ ] inserted by present author). He distinguishes four major categories of which one is divided into two subcategories, based on the presence or absence of decoration. Interestingly, Williams' Form II sandals consist of a sole that is cut from one sheet of leather and folded at the toe (1983: 72; *cf.* Museo Egizio S.14043, figure 4).[8] But the specimens studied by Williams show a clearly rounded front, which means that the fold was very small. This is in contrast to the sandals in the Museo Egizio in Turin, described in detail below (figure 4), where the front is square, because the two sole layers are folded at the front. Williams' third form is based on the different construction of the straps (using a slit-and-pull technique rather than simple strips of leather): this is the group that is further divided into undecorated (III-A) and decorated (III-B) sandals. Since the straps are almost never preserved, the AEFP does not use them as a diagnostic feature. Williams' last form "is a single-soled sandal to which a heel has been added" (*Ibidem*: 75). However, the original heel of this specimen (E 23369 in the Oriental Institute Museum, Chicago) is heavily worn and the additional heel is a repair rather than an original feature.[9]

Description

Leather Eared Sandals are, from a technological point of view, simple: the shape of the sole and pre-straps are cut from one sheet of leather. Holes are made in the pre-straps to which simple straps are attached, usually by looping. A hole in the front of the sandal (or two in certain types of Nubian Eared Sandals) accommodates the front strap, which usually is secured with a button at the ventral surface.[10] There are some interesting exceptions, which will be given ample attention in the present work. Egyptian Eared Sandals are usually without any decoration but if decoration is present, it is simple[11] and is not more than one or two impressed lines that run slightly inside the sole's edge. Interestingly, the Single Front Strap type of the subcategory Nubian Eared Sandals often shows elaborate decoration (these were recovered from Adindan, and one came from Kerma, table 1), whereas those of the Double Front Strap type (also identified as Nubian) are without decoration.

Egyptian Eared Sandals

The subcategory Egyptian Eared Sandals can be divided in two types: those with a straight sole (table 1,[12] figure 2) and those with a swayed sole (table 1, figure 3). The heel in both types is rounded and the waist is highly constricted, although in two examples (British Museum EA 4377 and EA 41674) this is far less distinct. In one example (British Museum EA 4381), the constriction seems entirely absent, which is due to the fact that the width increases continuously from the heel to the front. Usually, the width of the front part in one variant, the so-called Single Sole Layer Variant (see below), is about the same as the width of the heel, but in several the width of the front part is larger. This feature is not used in the classification.

Both types can be divided in two variants: those with a single sole layer (figure 2 and 3) and those with additional layers (see Veld-

Figure 2. Pair of Egyptian Eared Sandals of the Straight Type and Single Sole Layer Variant, EA 55441, in dorsal and ventral view (left and right sandal respectively). From a tomb in Nuri, surprisingly, as this is clearly a Nubian site. Scale bar is 50 mm. Photography by Adri 't Hooft Photographic Services. Courtesy of the British Museum, London.

Figure 3. Egyptian Eared Sandal of the Swayed Type and Single Sole Layer, UC 28346ii, in dorsal view. Unknown provenance. Scale bar is 50 mm. Photography courtesy of the Petrie Museum of Egyptian Archaeology UCL, London. Reworked by E. Endenburg.

meijer, 2010b for examples). The collection on which the present work is based includes only two with an additional sole layer (thus consisting of an insole and treadsole; British Museum EA 4380 and Petrie Museum of Egyptian Archaeology UCL UC 71415; table 1); but nearly all of the Eared Sandals from Amarna (table 3; see also Veldmeijer, 2010b) show evidence of multiple sole layers.[13] Although in many sandals, especially those of Nubian origin (the Nubian Eared Sandal from Qasr Ibrim, discussed in more detail below, is an exception[14]), sole layers are secured only by the straps, in Egyptian Eared Sandals the layers can have additional means of securing using stitching along the edge.

Completely preserved straps in Egyptian Eared Sandals are rare. Usually, the front strap consists of a strip of leather folded lengthwise that is inserted into a hole in the front of the sole. At the ventral surface it is either secured with a button, which is the most common method used to secure the front strap and is seen for example in Museo Egizio S. 14043 (arrow in figure 4), or is secured with a coiled construction (seen in British Museum EA 63215 and EA 63216, figure 5). In the sandals that were studied for the present work it was not possible to identify the connection between the front- and back strap, but remnants suggest that the

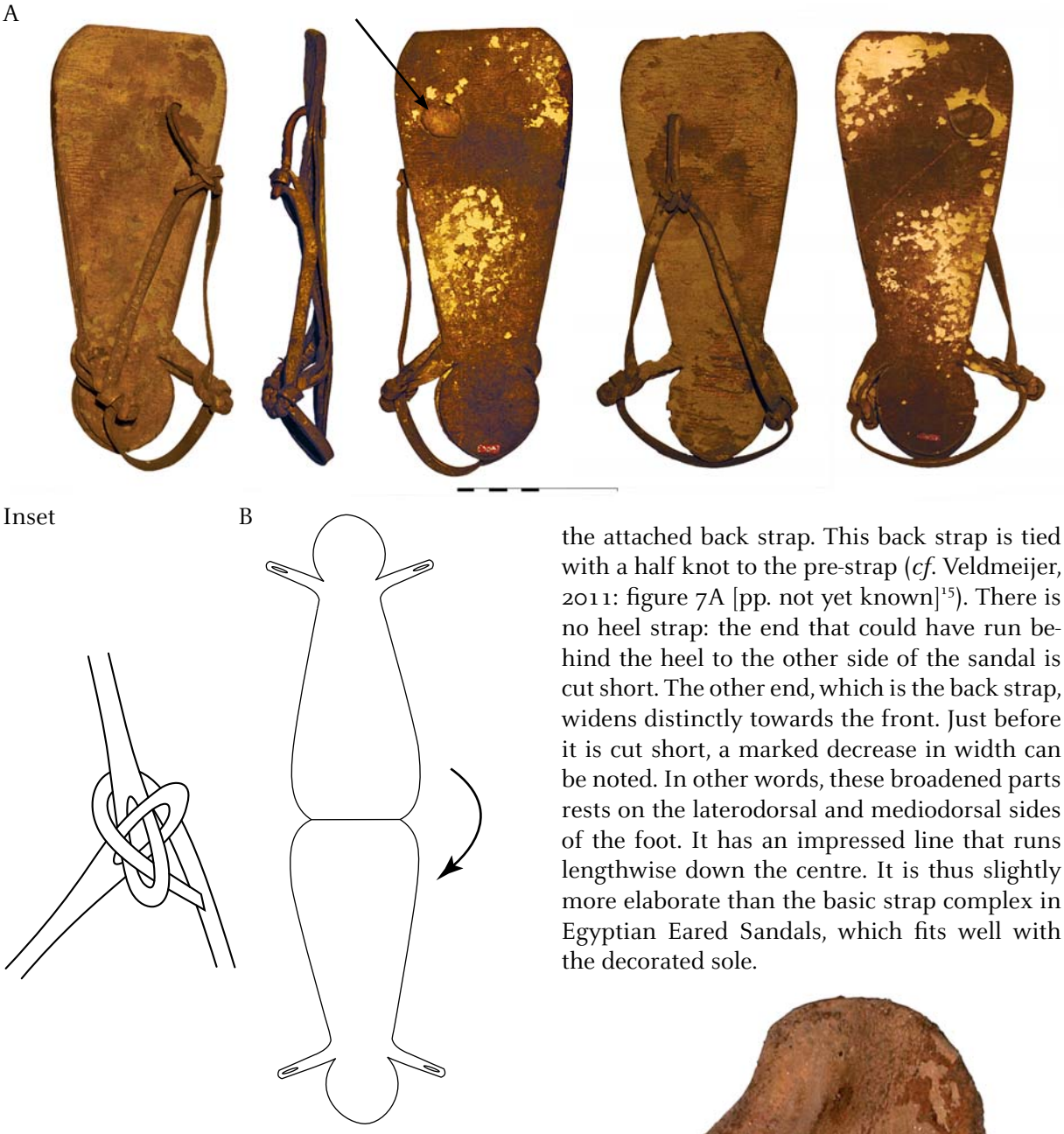

Figure 4. S.14043 from Gebelein. A) Pair of sandals in dorsal, ventral and medial view (left and right sandal respectively). The sole is folded at the front, creating two sole layers (figure B; not to scale). The arrow in A) points to the button. Scale bar is 50 mm. Inset: the attachment of the front- and back straps. Not to scale. Photography and drawings by E. Endenburg/A.J. Veldmeijer. Courtesy of Museo Egizio, Turin.

front strap was attached to the back strap either by looping or tying. British Museum EA 4377 and 4378 (figure 6) are not only special because of the decoration on the dorsal surface of the sole and the cladding of the pre-strap, which is very rare in sandals with a single-layer sole (note that the terminal end of the cladding is stitched through the sole) but also because of the attached back strap. This back strap is tied with a half knot to the pre-strap (*cf.* Veldmeijer, 2011: figure 7A [pp. not yet known][15]). There is no heel strap: the end that could have run behind the heel to the other side of the sandal is cut short. The other end, which is the back strap, widens distinctly towards the front. Just before it is cut short, a marked decrease in width can be noted. In other words, these broadened parts rests on the laterodorsal and mediodorsal sides of the foot. It has an impressed line that runs lengthwise down the centre. It is thus slightly more elaborate than the basic strap complex in Egyptian Eared Sandals, which fits well with the decorated sole.

Figure 5. EA 63216, detail of the ventral surface showing the coil that prevents the front strap from slipping through the hole in the sole. Scale bar is 50 mm. Photography by Adri 't Hooft Photographic Services. Courtesy of the British Museum, London.

Figure 6. The pair EA 4377 (dorsal and ventral view) and EA 4378 (dorsal and ventral view) is extraordinary because of the decoration of the sole as well as the construction of the strap complex. The arrow points to the stitch of the cladding through the sole. Scale bar is 50 mm. Photography by Adri 't Hooft Photographic Services. Courtesy of the British Museum, London.

The pre-straps in Petrie Museum of Egyptian Archaeology UCL UC 28346ii (figure 3) are also extraordinary: in contrast to the usual oval pre-straps that are relatively long and have a slit at the terminal end to which the back- and heel straps are secured, here the entire inner surface of the pre-strap is cut away and the slit is thus not limited to the terminal end. Museo Egizio S. 14043 (figure 4) has an intact strap complex, showing that the back- and heel strap is simply wrapped around the pre-strap (not uncommon; for another example see Veldmeijer, 2009a: 2-5). The front strap is folded lengthwise, starting immediately after the slits in its dorsal end. This end is pulled through the hole in the terminal end of the medial back strap and tied together with the terminal end of the lateral back strap (figure 4, inset). Securing the back straps to the front strap was carried out in several ways, although the described method is the most often seen. It is not difficult to imagine that, occasionally, it slipped and the owner him- or herself had to retie it on the spot, which might have been done in a different way altogether. A strap complex such as discussed for Museo Egizio S. 14043 is referred to in table 1 as 'plain'.

Nubian Eared Sandals

The subcategory Nubian Eared Sandals (table 1, 2) is divided in two types, based on two important features: the use of either a double or a single front strap. The Double Front Strap Type has been proven to be a Nubian (or even African) tradition that was never adapted by indigenous Egyptians (Adams, 2005: figure 61, plate 25; Adams & Adams, 1998: 62-64; Veldmeijer, 2006/2007: 73; 2008/2009a: 111-112; 2008/2009b: 131). Nubian Single Front Strap sandals, despite a comparable front strap to Egyptian sandals, also differ from the Egyptian Eared Sandal in that they show a kind of decoration that has not been noted in Egyptian Eared Sandals. A good example is the Single Front Strap Type from Adindan (Williams, 1983: 71-75). Another diagnostic feature is their context from ancient Nubia or Nubian cultural remains in Egypt, as opposed to native Egyptian contexts. In general, one can say that more footwear from well excavated contexts is known from Nubia[16] than from Egypt.

Double Front Strap Type

The Double Front Strap Type always has a straight sole, a rounded heel and a highly constricted waist from which oval pre-straps pro-

Figure 7. 20-1458, pair of Nubian Eared Sandals of the Double Front Strap Type, Single Sole Layer Variant. Kerma. Probably hippopotamus skin. Scale bar is 50 mm. Photography by E. Endenburg/A.J. Veldmeijer. Courtesy of the Museum of Fine Arts, Boston.

trude. These are comparable to Egyptian Eared Sandals. Towards the front, the width increases and ends in a rounded, symmetrical toe part (sometimes slightly a-symmetrical, for example the extraordinary pair of sandals in the Museum of Fine Arts Boston, 20-1458; figure 7). There are two variants: those with one sole layer and those with multiple sole layers (represented by only one example, figure 10). Several sandals belonging to this Double Front Strap Type are extraordinary and will, therefore, be discussed in more detail below.

Nubian Eared Sandals show more variation in straps than Egyptian Eared Sandals, although we should bear in mind that the Nubian archaeological record has produced relatively more sandals and in better condition and thus allow better identification and reconstruction. Straps as described above for Museo Egizio S. 14043 are seen, for example, in Metropolitan Museum of Art New York 13.4000 (figure 8) although the sole and thus the pre-strap consists of only one layer. The double front strap is different from the most common construction used for Classic Nubian Sandals (Regular Types I & II,[17] see Veldmeijer, In preparation a); on the basis of the one surviving front strap still *in situ* in the sandal, there were two front straps both of which were comparable to the one seen in Museo Egizio S. 14043 (figure 4). The back straps were secured (probably a Regular Type III strap complex) to them, but how exactly cannot be established anymore.

The most extraordinary strap complexes, however, can be found in the sandals from Adindan (figure 9, inset). Although the front strap is comparable to the one described for Museo Egizio S. 14043 (figure 4, inset), the back straps are made by a simple though ingenious and highly decorative technique. The pre-strap integral with the treadsole is pulled through a slit in the pre-strap integral with the insole. This is followed by the opposite movement: the pre-strap of the insole is pulled through a slit in the pre-strap of the treadsole. Repeating this sequence results in a decorative strip. This technique, referred to as 'slit-and-pull' is very well known as a means to create decorative strips of leather and is found often in sandals (Junker, 1925: 21, Blatt 1, Abb. 3; Williams, 1983: 71-75, figure 7; see also Veldmeijer, 2011: figure 8 [pp. numbers not yet known] for other examples, although not made from pre-straps).[18]

The pre- and back strap construction in Oriental Institute Museum Chicago E 23230 also differs from the basic construction: the pre-strap is a long, slender strip of leather that is folded and to which the back strap is knotted with, most likely, a mesh knot (*cf.* Veldmeijer, 2011: figure 7D [pp. not yet known]). It would be tempting to suggests that this is a repair after one of the leather edges of the pre-strap was

Figure 8. Pair 13.4000 in dorsal and ventral view respectively. The double front strap seemingly consists of two elements that are both comparable to the front strap seen in Museo Egizo S. 14043 (figure 4). In this, the strap complex differs from other examples of sandals with a double front strap. Scale bar is 50 mm. Photography by E. Endenburg/A.J. Veldmeijer. Courtesy of the Metropolitan Museum of Art, New York.

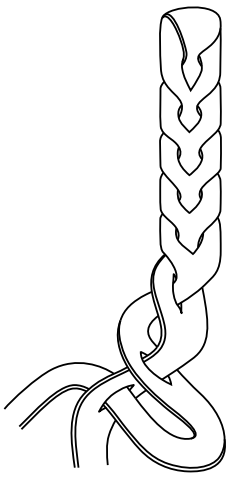

Figure 9. Nubian Eared Sandal, Single Front Strap Type, Variant Multiple Sole Layers, Swayed Subvariant, E 23283, from Adindan. Note the strange position of the front strap in relation to the shape of the sole. Dorsal and ventral surface. Scale bar is 50 mm. Photography by E. Endenburg/A.J. Veldmeijer. Courtesy of the Oriental Institute Museum, Chicago.

broken, but the construction is visible at either side, making it much more plausible that it was an original, intended feature. Moreover, it is integral to the leather of the sole rather than added after a period of use.

As mentioned previously, several Nubian Eared Sandals are remarkable and therefore need individual attention. The sandal from Qasr Ibrim (27067/A5; figure 10) is extraordinary because of the way it was made: the quality of craftsmanship is unparalleled in Eared Sandals. The nicely-cut sole layers (showing a high degree of symmetry) show a subtle curvature to the edge: a rounded heel that is narrower than the widest part of the front half, a delicately constricted waist from which the ears protrude and a continuously, but again very regularly increasing width towards the front,

Figure 10. Nubian Eared Sandal, Double Front Strap Type, Variant Multiple Sole Layers, 27067/A5, from Qasr Ibrim. Indication of scale: the length of the sandal is 247 mm. Photography by P.J. Rose. Courtesy of the Egypt Exploration Society.

ending in a rounded toe part. The edge of the sole is elevated, resulting in a clear ridge. Immediately inside the ridge is a row of running stitches of leather, which are evenly but shortly spaced: the inter-stitch space is approximately the same size as the length of the stitches. It secures the treadsole and insole, which have a perfect fit. The insole is further enhanced with what seems to be impressed line decoration (arrow). Although at the opposite side a band of red is just visible (figure 10, detail), it is likely that the entire surface was stained red and the band appears pronounced due to the impressed line decoration. The double front strap indicates its Nubian origin. A large part of the back strap survives but too little is preserved to identify its relation to the front strap. It is not clear if there was a heel strap, but most likely there was, as parallels suggest (for example Metropolitan Museum of Art New York 13.4000 seen in figure 8). The pre-strap itself seems to be a long strip that was cut from one of the sole layers (probably the insole) and secured to the other sole layer.[19]

The shape of Museum of Fine Arts Boston 20-1458 pair (figure 7; according to the museum's archive the pair was excavated from Kerma) is slightly more pronounced compared to other Eared Sandals. Moreover, the left and right sandals differ considerably in that the shape of the sole of one is more pronounced that in the other. However these differences are not what make the sandals extraordinary: the material itself is exceptional. Although a detailed analysis is scheduled for the future, macroscopic examination suggests that hippopotamus skin is the most likely material, which makes it the only record of footwear made with this type of skin in the AEFP database thus far. The leather is stained red.

Single Front Strap Type

The Single Front Strap Type can also be divided in Single Sole and Multiple Sole Variants; the soles in the former are always straight but the soles in the latter can be further differentiated into straight and swayed (table 2, figure 9). This type of Nubian Eared Sandal is predominantly represented by the finds from Adindan (Williams, 1983: 71-75). The ratio between the width of the heel and the width of the front is more pronounced than in the Egyptian Eared Sandals. Decoration of the Single Front Strap Type consists of lines that follow the sole's edge and diagonal lines across the dorsal surface of the sole (figure 11) but the sandals from Adin-

dan show, if decorated, multiple impressed lines around the edge as well as transversely from side to side (figure 12). This only occurs in the sandals with multiple sole layers.

Exceptions

There are several sandals that are slightly different from the Eared Sandals as described above. Represented by two examples (Elephantine El-077, described in detail below, and Oriental Institute Museum Chicago E 23167), the sandals have the pre-straps cut out of the heel rather than the front part of the sandal. This results in 'ears' that are directed towards the front of the sandal, rather than towards the back.

El-77 (figure 13) is a pair of sandals, one partially on top of the other.[20] Despite their fragile condition and the fact that they are stuck together, they are largely complete. The rounded heel is constricted, forming a waist that is less distinct than usually seen in Eared Sandals. The width increases towards the front at both sides. The sandals have a rounded toe part, and due to its symmetry lengthwise, the sandal is straight. The straps, consisting of strips of leather, are oddly attached to the pre-strap, and are seemingly only looped around one of the edges rather than hitched.[21] There is a layer of cloth visible at the stone and at the front of the sandals it seems to be sandwiched by them. Parts of the straps might have been wrapped with it. The edge of the sandal is elevated and two impressed lines run along the entire edge.

The pair of sandals Museo Egizio S. 294/01 & 02, dated to the Naqada I period (obtained by Schiaparelli in Egypt in 1900-1901, see Bergamini, 1988: 36[22]), also shows some extraordinary features (figure 14A). Again, the pre-straps (which are lost, but small remnants are still visible) are cut from the leather of the heel. The heel itself is rounded and the waist is distinctly constricted. Towards the front, the width increases first in a diagonal line after which it continues to form a rounded toe part. A comparable shape is seen in Classic Nubian Sandals (Veldmeijer, In preparation a). At one side, there is a small protruding element, which is an integral part of the edge. It is clearly torn off. It must have been part of the strap complex, the exact construction of which cannot now be identified and hence the sandals cannot be classified within the Eared Sandals. It is certain that there was no front strap: there is no evidence of a hole

Figure 11. Nubian Eared Sandal, Single Front Strap Type, Variant Single Sole Layers, Straight Subvariant, 25-3-468, from Kerma, in dorsal and ventral view. Scale bar is 50 mm. Photography by E. Endenburg/A.J. Veldmeijer. Courtesy of the Museum of Fine Arts, Boston.

Figure 12. Nubian Eared Sandal, Single Front Strap Type, Variant Multiple Sole Layers, Straight Subvariant, E 23908, from Adindan. Dorsal and ventral view. Scale bar is 50 mm. Photography by E. Endenburg/A.J. Veldmeijer. Courtesy of the Oriental Institute Museum, Chicago.

through which the front strap would have been pulled. Possibly, the sandals had comparable straps to those reported by Van Driel-Murray (2000: 312; see also Bergamini, 1988: 21; figure 14B).[23] The technology might have come from abroad (parallels to Gebelein's Predynastic sandals,[24] according to Van Driel-Murray, 2000: 312: "may point to a common footwear tradition in the Levant and Egypt for a short time in the Chalcolithic/Early Bronze Age"), and never been adopted en masse by the Egyptians, as is evidenced by the total lack of this technology in other finds. In Museo Egizio S. 294/01 & 02 not only the thickness of the leather, but also the incised lines along the perimeter as well as the diagonal lines (forming diamonds) in the centre are remarkable. Comparable decoration is well known in Nubian sandals (Veldmeijer, In preparation a; Williams, 1983: 71-75) and is therefore another indication of the similarities between Predynastic Egyptians and the later Nubian groups. The Museum of Fine Arts Boston houses sandals (the pairs 72.4765/72.4766 and 72.4767/72.4768) that have a comparable strap complex to the predynastic Gebelein sandal mentioned above. The double front strap, however, indicates that these sandals are Nubian in origin, further supporting the link between Predynastic and Nubian leatherworking traditions (Van Driel-Murray, 2000: 309).[25]

▼ Figure 13. Pair of sandals el-077 from Elephantine in dorsal view. Photography E. Endenburg/A.J. Veldmeijer. Courtesy of the German Archaeological Institute Mission to Elephantine.

Figure 14. Examples of sandals with integral straps. ◀ A) Pair S. 294.01 & 02 (Naqada I; 4300-3700 BC) possible had a comparable strap complex as other sandals from Gebelein, seen in B; ▲ B) The Predynastic sandals, possibly from Gebelein, described by Van Driel-Murray (2000: 312). Courtesy of Museo Egizio, Turin.

Another remarkable pair of sandals is housed in the Museo Egizio in Turin (S. 14043; figure 4), from an unknown tomb at Gebelein ("*Necropoli Nord, Tomba grande*"). It has been dated to the Old Kingdom (5th Dynasty). The two sole layers are cut from one sheet of fairly thick leather and folded at the toe (figure 4B). The front strap, which is inserted through both layers and secured at the ventral surface of the treadsole by a button, loosely keep the layers together. The back- and heel straps are hitched to the pre-straps and further secure the two layers. Williams (1983: 72) interprets the folding of the sole at the front as a characteristic of the C-group Nubians (but see above for the problems regarding the Adindan finds).

Revision: the Amarna Finds

The ongoing nature of the AEFP allows the revision of previous work as well as the addition of information to published finds, which will be presented in detail in the final analysis of the archaeological part of the Project (Veldmeijer, In preparation b). One remarkable observation, however, is of importance to the topic of the present paper. At time of publishing the leather finds from Amarna in 2010, the category, type and variant were not indicated because the study of comparable material was not regarded as sufficiently adequate to allow for careful consideration of these traits (Veldmeijer, 2010b: 24). Having done so now, however, it is clear that many of the finds from Amarna are Egyptian Eared Sandals of the Swayed Type and the Multiple Sole Layers Variant (table 3),[26] which is a type that is rare elsewhere (*cf.* table 1).

Note on Iconography

As explained in the introduction, this is not the place to discuss footwear iconography in detail – a large-scale research is in progress as Phase II of the AEFP. However, a note on the leatherwork scenes from the New Kingdom related to the production of sandals is relevant here. The scenes, when depicting the manufacture of recognisable sandals,[27] show an Eared Sandal of the Straight Sole Type and Single Sole Layer Variant. It is remarkable that this type of sandal is shown in representations of sandal manufacturing, because the archaeological record of this type is rather scanty. If we assume, as argued elsewhere (Veldmeijer, 2010a: 206-207),

that the artist portrayed the depiction of items that were characteristic of the group as a whole (here leather Eared Sandal of the Straight Sole Type as representative of the group 'leather sandals') and hence recognisable to as many people as possible, then this type of sandal might not have been rare at all but, instead, a common commodity. Moreover, the manufacturing of Eared Sandals might have been shown because it was the easiest type to depict: the manufacturing of Composite Sandals, for example, is too complicated to show as it consists of many more stages.

Possibly sandals were usually worn out beyond repair and hence the majority never entered the archaeological record in a recognisable form. The fact that the sandals in two-dimensional art consist of only one sole layer and that the fragments available for study often shows signs of (severe) wear, supports this suggestion. The use of just one sole layer might also be an important reason that the archaeological record is so scanty.

Discussion

For archaeological specimens, identification of skin type is often not possible on the basis of the pattern of the grain surface, despite the fact that this pattern is unique in each group of animals. The problems of identification are due to the poor condition of much of the material. However, several of the Adindan sandals were sufficiently well preserved to study the pattern of the grain surface, clearly pointing to the use of cattle hide, as did the hairs that were still present in some specimens (Williams, 1983: 68). Even if definite identification is not possible, a tentative suggestion can be made on the basis of thickness: the relative thickness of a sandal's sole usually points to the use of cattle skin, with a rare exception of the possible use of hippopotamus skin for some Nubian sandals.[28] Skin processing was limited to curing, as vegetable tanning was unknown until it was introduced much later (Van Driel-Murray, 200: 233, 305).[29]

Eared Sandals are very simple from a constructional point of view, but it is easy to make them more elaborate on the basis of a sole with ~~integral~~ pre-straps and narrow strips of leather as straps, be it with double front strap or single front strap. Multiple sole layers, sometimes further secured by stitching, besides securing the sole layers with the straps, as well as (elaborate) decoration (mainly Nubian sandals and limited to incised decoration) are common. The concept of the integral pre-straps is seen in many different types of sandals of roughly comparable date (sandals with comparable construction are still used today, for example in Ethiopia, Epple, 2008: esp. the figure on p. 141) but also in several examples of open shoes. Pre-straps are always of more or less comparable shape, but some exceptions show square pre-straps, such as ÄM AM 054a from Amarna (Veldmeijer, 2010b: 64-68). Based on this principle are the two sandals in which the pre-straps are cut from the edge of the heel: was this a mistake of the sandal-makers? Integral pre-straps are also seen in other sandals, but here the straps are enlarged and form (large) protrusions at the heel of the sandal (Classic Nubian Sandals).

The occurrence of the Swayed Type, Multiple Sole Layers Variant from Amarna indicates that, at least partly (for some types of footwear; other types seem to have been far more universal), shape and manufacturing techniques of footwear were strongly locally determined.[30]

Separate traditions on a wider geographic scale are also evident from the two categories of Leather Eared Sandals: Nubian and Egyptian, hence the classification. Note that here too there are also differences between sites: in Adindan, for example, Eared Sandals, Single Front Strap Type[31] are far more abundant than in Gebel Adda. This might be largely due to chronological differences as the finds from Adindan are dated to much earlier periods. However, in Kerma, the double front strap was by far the most common type of strap complex (Reisner, 1923: 306-307; Williams, 1983: 75) suggesting that it was a local preference rather than a chronological difference.[32]

Two categories of leather sandals occur most commonly on Nubian sites: Nubian Eared Sandals, discussed in the present paper, and Classic Nubian Sandals (Veldmeijer, In preparation a). This does not mean, however, that comparable footwear ~~does~~ not occur elsewhere, but it is comparatively rare and not always as obvious to identify. However, there seem to be some clear examples of Egyptian Eared Sandals (Straight Type and Single Sole Layer Variant)

from Nubian contexts, such as one from Kerma (British Museum EA 55441; figure 2[33]) and one published by Dunham, also from Kerma (1982: pl. XXXIXa).

There is no indication that these sandals had a special status, although this might have been different for the sandals found in Kerma as they were seemingly an import, thus giving a certain status to them.

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Notes

1 See below.

2 For more information on the AEFP, see www.leatherandshoes.nl.

3 Footwear typology will be discussed in detail in the final analysis of phase I of the AEFP (the archaeology).

4 The shape of the pre-strap also differs as does the position of the pre-straps (in several examples the pre-straps are situated at the heel, see below), but these differences are either minor, or exceptional and occur in all types and variants.

5 Several sandals are discussed below in which the pre-straps are also cut from the heel, but not from the entire circumference.

6 The cladding of one of the pre-straps has nothing to do with securing the two straps.

7 Many of these sandals, excavated from various sites, have been published (for example Williams, 1983: 71-75, pl. 107-108; 1991: 152-154, pl. 78-79). A detailed comparison and analysis of them will be presented in the Gebel Adda publication.

8 This was not observed by the author during his hands-on study of the objects in the Oriental Institute Museum, Chicago, but this might be due to the condition of the material.

9 The construction as described by Junker (1925: 20, Blatt 1, Abb. 4) for sandals from Ermenne and to which Williams refers seems, however, an original construction. A sandal in the Louvre collection (Montembault, 2000: 64, 106), albeit of a different type (Leather Composite Sandal), is also a repair (Veldmeijer, 2009a: 22).

10 An enlarged terminal end of the front strap is situated at the ventral surface of the (tread)sole to prevent the strap from slipping through the hole. An alternative to the button is a simple (overhand) knot.

11 The pair in the British Museum, EA 4377 & 4378, is an exception.

12 Two examples (unprovenanced/undated and without inventory numbers) are housed in Museo Egizio in Turin, but are not further discussed.

13 The additional layers are suggested by stitch holes and sometimes even remnants of the stitching itself.

14 Note that this sandal is exceptional in other respects also.

15 More on knots in ancient Egypt, see Veldmeijer (2006).

16 A drawback is that in the Kerma reports the sandals are not described and it is thus often not clear what kind of sandal was recovered (more on this in the forthcoming final analysis on the archaeology of footwear).

17 The only difference between the strap complexes of the Regular Types I, II and III is that in the Regular Type I, the back strap is *looped* around the front strap; in Type II, the back strap is *hitched* to the front strap and in Type III, the back strap is *pulled through* slits in the ends of the front strap and tied. In this last type, the double front strap is pulled through the holes in the sole opposite to those in Type I and II, viz. the ends are on the dorsal surface of the sole rather than secured at the ventral surface.

18 See above for explanation of the additional heel in Oriental Institute Museum Chicago E 23369.

19 The sandal has been studied, but only prior to cleaning; the dirt has prohibited clear vision.

20 I am grateful to Stephan Seidlmayer for allowing me to read his draft on this on other leather finds.

21 See above for more examples of this looping of the back straps to the pre-straps.

22 The owner is thought to have been a warrior rather than hunter because of the weapons among the tomb goods.

23 According to Van Driel-Murray (2000: 312) these have no parallels with finds from later periods but

do have parallels from Naqada-I finds (*cf.* Petrie, 1901: pl. X). Van Driel-Murray refers to a pair of ivory model sandals of which the "ragged outline" suggests a similar construction. Though the protruding lateral edge of the right sandal might suggest this, the left sandal does not have a comparable edge. It seems, therefore, that this has nothing to do with the actual construction, but rather is damage or a coincidental feature. The decorative design is, on the other hand, comparable, but these designs were rather common (see below).

24 The dating of Schiaparelli's finds at Gebelein is, at best, problematic (*cf.* Van Driel-Murray, 2000 regarding the Predynastic layers) and its occupation ran from Predynastic to Roman times.

25 The sandals will be discussed in detail elsewhere (Veldmeijer, In preparation b).

26 See the final analysis for details of each individual find.

27 If the craftsman works on a strap, it is not always possible to recognisable what kind of strap and of what type of sandal he is working on.

28 See also Van Driel-Murray (2000: 302).

29 According toVeldmeijer (2010b: 18) "it has been suggested (Veldmeijer & Endenburg, 2007: 36; Friedman, 2007: 60) that tanning might have been used by Nubian groups on the basis of a field test of remnants of loincloth from Hierakonpolis. These results need to be verified by proper chemical analyses (Veldmeijer, 2007b: 24; 2008a: 3). The predominant skin processing technique in Pharaonic Egypt is oil curing. The use of alum and minerals in making skins durable is ambiguous (Van Driel-Murray, 2000: 303-304)."

30 For Amarna this is also supported by the longitudinal overall curvature (Veldmeijer, 2010b: 24).

31 Probably also in Ermenne, which are more similar in dating to Adindan than Gebel Adda.

32 But see Veldmeijer (In preparation a) for a detailed analysis. Note that the single front strap was also found (*cf.* Dunham, 1982). Unfortunately, only three sandals are depicted. Although it is perhaps plausible to assume that all sandals are Eared Sandals, it is not certain whether they are of the Single or Double Front Strap Variant, except for in the case of the illustrated sandals.

33 According to Derek Welsby from Tumulus K III in the eastern cemetery at Kerma. With thanks to Elizabeth O'Connell.

Cited Literature

Adams, W.Y. 2005. The West Bank Survey from Faras to Gemai. 2. Sites of Meroitic and Ballaña Age. – Oxford, British Archaeological Reports (Sudan Archaeological Research Society Publication 13).

Adams, W.Y. & N.K. Adams. 1998. Kulubnarti II. The Artifactual Remains. – London, The Sudan Archaeological Research Society.

Bergamini, G. 1988. Religious and Funerary Practices in Egypt Prior to the Pharaohs. In: Donadoni Roveri, A.M. 1988. Egyptian Civilization. Religious Beliefs. – Milan, Electa Spa: 20-37.

Davies, N. de G. 1943. The Tomb of Rekhmi-Re at Thebes. Volume I & II. – New York, The Metropolitan Museum of Art (Publications of the Metropolitan Museum of Art, Egyptian Expedition 11).

Driel-Murray, van, C. 2000. Leatherwork and Skin Products. In: Nicholson, P.T. & I. Shaw. Eds. 2000. Ancient Egyptian Materials and Technology. – Cambridge, Cambridge University Press: 299-319.

Dunham, D. With contributions by S. D'Auria. 1982. Excavations at Kerma. Part VI. – Boston, Museum of Fine Arts Boston.

Epple, S. 2008. Weiche Fuße oder harte Sohlen? Fußbekleiding, Fußschmuck und barfuß laufen in Äthiopien. In: Roder, H. Ed. 2008. Schuhtick. Von kalten Fußen und heißen Sohlen. – Mainz am Rhein, Philippe von Zabern: 139-146.

Friedman, R. 2007. The Nubian Cemetery at Hierakonpolis, Egypt. Results of the 2007 Season. – Sudan & Nubia 11: 57-62.

Goubitz, O., C. van Driel-Murray & W. Groenman-van Waateringe. Eds. 2001. Stepping through Time. Archaeological Footwear from Prehistoric Times until 1800. – Zwolle, Stichting Promotie Archeologie.

Junker, H. 1925. Ermenne. Bericht über die Grabungen der Akademie der wissenschaften in Wien auf den Friedhöfen von Ermenne (Nubien) im Winter 1911/12. – Wien/Leipzig, Hölder-Pichler-Temsky A.-G. (Akademie der Wissenschaften in Wien. Philosophisch-historische Klasse. Denkschriften 67, Band 1. Abhandlung).

Montembault, V. 2000. Catalogue des chaussures de l'antiquité Égyptienne. – Paris, Musée du Louvre.

Petrie, W.M.F. 1901. Diospolis Parva. – Londen, Egypt Exploration Society.

Reisner, G.A. Excavations at Kerma. Volume 2. Parts IV-V. – Cambridge, Peabody Museum of Harvard University (Harvard African Studies. Volume VI).

Veldmeijer, A.J. 2006. Knots, Archaeologically Encountered: a Case Study of the Material from the Ptolemaic and Roman Harbour at Berenike (Egyptian Red Sea Coast). – Studien zur Altagyptischen Kultur 35: 337-366.

Veldmeijer, A.J. 2006/2007. Studies of Ancient Egyptian Footwear. Technological Aspects. Part I. Cordage Footwear from Qasr Ibrim. – Jaarberichten Ex Oriente Lux: 61-75.

Veldmeijer, A.J. 2008/2009a. Studies of Ancient Egyptian Footwear. Technological Aspects. Part III. Leather or String Reinforced Plaited Sandals from Qasr Ibrim. – Jaarberichten Ex Oriente Lux 41: 105-126.

Veldmeijer, A.J. 2008/2009b. Studies of Ancient Egyptian Footwear. Technological Aspects. Part IV. Plain Plaited Sandals from Qasr Ibrim. – Jaarberichten Ex Oriente Lux 41: 127-150.

Veldmeijer, A.J. 2009a. Studies of Ancient Egyptian Footwear. Technological Aspects. Part X. Leather Composite Sandals. – PalArch's Journal of Archaeology of Egypt/Egyptology 6, 9: 1-27.

Veldmeijer, A.J. 2009b. Studies of Ancient Egyptian Footwear. Technological Aspects. Part XVI: Additional Pair of Leather Open Shoes. – Journal of the American Research Centre in Egypt: 233-245.

Veldmeijer, A.J. With contributions by A.J. Clapham, E. Endenburg, A. Gräzer, F. Hagen, J.A. Harrell, M.H. Kriek, P.T. Nicholson, J.M. Ogden & G. Vogelsang-Eastwood. 2010a. Tutankhamun's Footwear. Studies of Ancient Egyptian Footwear. – Norg, DrukWare (republished in 2011 by Sidestone Press).

Veldmeijer, A.J. 2010b. Amarna's Leatherwork. Part I. Preliminary Analysis and Catalogue. – Norg, DrukWare (republished in 2011 by Sidestone Press).

Veldmeijer, A.J. 2011. Sandals, Shoes and Other Leatherwork from the Coptic Monastery Deir el-Bachit. – Leiden, Sidestone Press.

Veldmeijer, A.J. Submitted. Studies of Ancient Egyptian Footwear. Technological Aspects. Part XIII. Side-Covering, Leather Sandals.

Veldmeijer, A.J. In Preparation a. The Gebel Adda Leatherwork in the Royal Ontario Museum.

Veldmeijer, A.J. In Preparation b. The Ancient Egyptian Footwear Project. Phase I: Archaeology. Final Analysis.

Veldmeijer, A.J. & E. Endenburg. 2007. Amarna Leatherwork in Berlin. – Egyptian Archaeology 31: 36-37.

Williams, B. 1983. Excavations Between Abu Simbel and the Sudan Frontier. Part V: C-Group, Pan Grave, and Kerma Remains at Adindan Cemeteries T, K, U, and J. – Chicago, The Oriental Institute of the University of Chicago (The University of Chicago Oriental Institute Nubian Expedition Volume).

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Collection/Site	Identification	Provenance	Date	Subcategory	Type	Variant	Subvariant
British Museum London	EA 41674	Deir el-Bahari, Temple of Mentohotep	11th Dynasty(?)	Egyptian Eared Sandal	Straight	Single Sole Layer	n/a
British Museum London	EA 4377 & 4378 (pair)	?	?	Egyptian Eared Sandal	Swayed	Single Sole Layer	n/a
British Museum London	EA 4380	?	?	Egyptian Eared Sandal	Straight	Multiple Sole layers(?)	n/a
British Museum London	EA 4381	?	?	Egyptian Eared Sandal	Straight	Single Sole Layer	n/a
British Museum London	EA 55441	Kerma (see text)	Classique Kerma	Egyptian Eared Sandal	Straight	Single Sole Layer	n/a
British Museum London	EA 63215	El-Mustagidda, Grave 3120	Pan-Grave (about 1640-1532 BC)	Nubian Eared Sandal	Single Front Strap	Single Sole Layer	Swayed
British Museum London	EA 63216	El-Mustagidda, Grave 3120	Pan-Grave (about 1640-1532 BC)	Nubian Eared Sandal	Single Front Strap	Single Sole Layer	Swayed
Elephantine	El-077	11401-B Ne15	?	Eared Sandals	Not classified	Not classified	Not classified
Museo Egizio Turin	S 14043.01 & 02	Gebelein, Necropoli Nord, Tomba grande	5th Dynasty	Eared Sandals	Not classified	Not classified	Not classified
Museo Egizio Turin	S 8637 & 8638	Deir el-Medinah, Tomb of Kha (TT 8)	New Kingdom: Amenhotep II/III	Egyptian Eared Sandal	Straight	Single Sole Layer(?)	n/a
Museo Egizio Turin	S. 294.01 & 02	?	Naqada I (4300-3700 BC)	Not classified	Not classified	Not classified	Not classified
Museum of Fine Arts Boston	13-4000a, b	Kerma	Kerma (about 2100-1550 BC)	Nubian Eared Sandal	Double Front Strap	Single Sole Layer	Straight
Museum of Fine Arts Boston	15-3-468 (pair)	Kerma, K1074	Kerma (about 2100-1550 BC)	Nubian Eared Sandal	Single Front Strap	Single Sole Layer	Straight
Museum of Fine Arts Boston	15-3-470	Kerma, K1072	Kerma (about 2100-1550 BC)	Nubian Eared Sandal	Single Front Strap(?)	Single Sole Layer	Straight
Museum of Fine Arts Boston	16-4-1600	Kerma, KN 188x	Early Kerma Period (2400-2050 BC)	Egyptian Eared Sandal	Straight	Single Sole Layer	n/a
Museum of Fine Arts Boston	20-1458a, b	Kerma, K-1088-13	Kerma (about 2100-1550 BC)	Nubian Eared Sandal	Double Front Strap	Single Sole Layer	Straight
Oriental Institute Museum Chicago	E 21542 (several sandals)	Qustul	C-group (late Third to mid-second millennium BC)	Nubian Eared Sandals	Double Front Strap	Multiple Sole layers	Straight

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Collection/Site	Identification	Provenance	Date	Subcategory	Type	Variant	Subvariant
Oriental Institute Museum Chicago	E 23167	Adindan	New Kingdom	Nubian Eared Sandal	?	Single Sole Layer(?)	Straight(?)
Oriental Institute Museum Chicago	E 23230 (two sandals)	Adindan	C-group (late Third to mid-second millennium BC)	Nubian Eared Sandals	Single Front Strap(?)	Single Sole Layer(?)	Swayed/Straight (see remarks)
Oriental Institute Museum Chicago	E 23278 (pair and other 3 fragments)	Adindan	C-group (late Third to mid-second millennium BC)	Nubian Eared Sandals	Single Front Strap	Single Sole Layer	Straight
Oriental Institute Museum Chicago	E 23283 (pair)	Adindan, T 115	C-group (late Third to mid-second millennium BC)	Nubian Eared Sandals	Single Front Strap	Multiple Sole layers	Swayed
Oriental Institute Museum Chicago	E 23286 (pair)	Adindan	C-group (late Third to mid-second millennium BC)	Nubian Eared Sandals	Single Front Strap	Multiple Sole layers	Straight
Oriental Institute Museum Chicago	E 23331a, b (pair)	Adindan	C-group (late Third to mid-second millennium BC)	Nubian Eared Sandals	Single Front Strap	Multiple Sole layers	Straight
Oriental Institute Museum Chicago	E 23369	Adindan, T179	C-group IB/IIA (Williams, 1983: 10)	Nubian Eared Sandals	Double Front Strap	Single Sole Layer	n/a
Oriental Institute Museum Chicago	E 23394a, b (pair)	Adindan	C-group (late Third to mid-second millennium BC)	Nubian Eared Sandals	Single Front Strap	Multiple Sole layers	Straight
Oriental Institute Museum Chicago	E 23408a, b (pair)	Adindan	C-group (late Third to mid-second millennium BC)	Nubian Eared Sandals	Single Front Strap	Multiple Sole layers	Straight
Oriental Institute Museum Chicago	E 23411 (pair)	Adindan	C-group (late Third to mid-second millennium BC)	Nubian Eared Sandals	Single Front Strap	Single Sole Layer	Straight
Oriental Institute Museum Chicago	E 23908a, b (pair)	Adindan	C-group (late Third to mid-second millennium BC)	Nubian Eared Sandals	Single Front Strap	Multiple Sole layers	Straight
Oriental Institute Museum Chicago	E 23909a, b (pair)	Adindan	C-group (late Third to mid-second millennium BC)	Nubian Eared Sandals	Single Front Strap	Single Sole Layer(?)	Straight(?)
Oriental Institute Museum Chicago	E 30092	Adindan, T 59	C-group E. III (Williams, 1983: 10)	Nubian Eared Sandals	Single Front Strap	Single Sole Layer	Swayed

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Collection/Site	Identification	Provenance	Date	Subcategory	Type	Variant	Subvariant
Oriental Institute Museum Chicago	E 30099	Adindan, T 66(2, 3)	Pan Grave or C-group III (Williams, 1983: 10)	Nubian Eared Sandals(?)	Single Front Strap(?)	Single Sole Layer(?)	?
Oriental Institute Museum Chicago	E 30102	Adindan, T 68(6)	C-group IIA Unspec. (Williams, 1983: 10)	Nubian Eared Sandals	Single Front Strap	Single Sole Layer	Straight
Oriental Institute Museum Chicago	E 30103	Adindan, T 71(2)	C-group E. III? (Williams, 1983: 10)	Nubian Eared Sandals	Single Front Strap	Single Sole Layer	Swayed(?)
Oriental Institute Museum Chicago	E 30108	Adindan, T 83(2)	C-group IIA Unspec. (Williams, 1983: 10)	Nubian Eared Sandals	Single Front Strap	Single Sole Layer	?
Oriental Institute Museum Chicago	E 30112 (pair)	Adindan, T 85(2)	C-group L. III (Williams, 1983: 10)	Nubian Eared Sandals	Single Front Strap	Single Sole Layer	?
Oriental Institute Museum Chicago	E 30120 (pair)	Adindan, T 95(4)	C-group IIA Unspec. (Williams, 1983: 10)	Nubian Eared Sandals	Single Front Strap(?)	Single Sole Layer	Straight(?)
Oriental Institute Museum Chicago	E 30126	Adindan, T 98(1)	C-group IB/IIA (Williams, 1983: 10)	Nubian Eared Sandals	Single Front Strap	Single Sole Layer	Straight
Oriental Institute Museum Chicago	E 30131 (pair)	Adindan, T 105(3)	C-group IB (Williams, 1983: 10)	Nubian Eared Sandals	Single Front Strap	Multiple Sole layers	Swayed(?)
Oriental Institute Museum Chicago	E 30136 (pair)	Adindan, T 122(2)	C-group IIA-B (Williams, 1983: 10)	Nubian Eared Sandals	Single Front Strap(?)	Multiple Sole layers(?)	?
Oriental Institute Museum Chicago	E 30161	Adindan, T 147(3)	C-group IIA-B (Williams, 1983: 10)	Nubian Eared Sandals(?)	Single Front Strap	Single Sole Layer(?)	?
Oriental Institute Museum Chicago	E 30167 (pair)	Adindan, T 164(1)	C-group L. III (Williams, 1983: 10)	Nubian Eared Sandals	Single Front Strap	Single Sole Layer(?)	Straight
Oriental Institute Museum Chicago	E 30188 (pair?)	Adindan, T 204(1)	C-group L. IIA (Williams, 1983: 10)	Nubian Eared Sandals	?	Single Sole Layer(?)	?
Oriental Institute Museum Chicago	E 30197b	Adindan, T 211(6, 7)	C-group IB/IIA (Williams, 1983: 10)	Nubian Eared Sandals	Single Front Strap	Single Sole Layer	Straight
Oriental Institute Museum Chicago	E 30221a, b	Adindan, T 235(5A)	C-group E. IIA (Williams, 1983: 10)	Nubian Eared Sandals	Single Front Strap	Multiple Sole layers	Swayed
Oriental Institute Museum Chicago	E 30225	Adindan, T 242(2)	C-group L. III (Williams, 1983: 10)	Nubian Eared Sandals	Double Front Strap	Multiple Sole layers	Straight
Oriental Institute Museum Chicago	E 30226 (pair?)	Adindan, T 244(2)	C-group IIA Unspec. (Williams, 1983: 10)	Nubian Eared Sandals	Double Front Strap	Multiple Sole layers	Straight
Oriental Institute Museum Chicago	E 30227	Adindan, T 245(2)	C-group IB/IIA (Williams, 1983: 10)	Nubian Eared Sandals	Double Front Strap	Single Sole Layer(?)	Straight

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Collection/Site	Identification	Provenance	Date	Subcategory	Type	Variant	Subvariant
Oriental Institute Museum Chicago	E 30234	Adindan, T 256(1)	C-group IIA Unspec. (Williams, 1983: 10)	Nubian Eared Sandals	?	Multiple Sole layers	?
Oriental Institute Museum Chicago	E 30237	Adindan, T 257(4)	C-group L. IIA (Williams, 1983: 10)	Nubian Eared Sandals(?)	Single Front Strap	Single Sole Layer	Straight
Oriental Institute Museum Chicago	E 30238	Adindan, T 258(1)	C-group IB/IIA (Williams, 1983: 10)	Nubian Eared Sandals	Single Front Strap(?)	Single Sole Layer(?)	Straight(?)
Oriental Institute Museum Chicago	E 30239	Adindan, T 261(1)	C-group IB/IIA (Williams, 1983: 10)	Nubian Eared Sandals	Single Front Strap(?)	Single Sole Layer(?)	?
Petrie Museum of Egyptian Archaeology UCL	UC28346ii	?	?	Egyptian Eared Sandal	Swayed	Single Sole Layer	n/a
Petrie Museum of Egyptian Archaeology UCL	UC71415	?	Roman	Egyptian Eared Sandal	Straight	Multiple Sole layers	n/a
Qasr Ibrim	27067/A5	27067	Third Intermediate Period/25th Dynasty	Nubian Eared Sandal	Double Front Strap	Multiple Sole layers	Straight

Table 1, part I. Leather Eared Sandals (sorted by collection/site) showing current location or site (1st column), the identification number(s) (2nd column), provenance (3rd column), date (4th column), typology (5th to 8th column).

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Collection/Site	Identification	Number Sole Layers	Sole Measurements	Sole Decoration	Strap Complex Front Strap	Strap Complex Back Strap	Strap Complex Measurements	Remarks
British Museum London	EA 41674	1	(Right sandal) L: 215. W heel: 51.5. W front: 86.8. T: 6	No	Plain	Plain	D front: 5.5. W back: 6.3	Van Driel-Murray (2000: 313-314). Written at ventral surface sole: "1905 10-14 39" and "1905 10-14 40".
British Museum London	EA 4377 & 4378 (pair)	1	(Left sandal; 4378). L: 305. W heel: 86. W waist constriction: 84.5. W front: 115. T: 5.2	Impressed circles, arcs and chevrons	Not preserved, except button fastening	See text	W (max.) straps: 34	Cladding of the pre-strap, which is rare in Eared Sandals. The waist is much less pronounced than usually seen.
British Museum London	EA 4380	1	L (longest fragment): 205. W heel: 68. W front: 112.T: 2.3	No	Not preserved	Not preserved	-	Hard and brittle. Not entirely sure about presence of treadsole.
British Museum London	EA 4381	1	L: 230. W heel: 53 (reconstructed). W front: 91. T: 3.8	No	Not preserved	Not preserved	-	Repaired with cardboard-like material.
British Museum London	EA 55441	1	(Right sandal). L (left, reconstructed): 240. W heel: 75.4. W front: 95.3. T 4	No	Not preserved	Plain	W pre-straps: 14.5; W back: 10.8	Wear patterns. Note distinct differences in size and shape between left and right sandal.
British Museum London	EA 63215	1	(Right sandal). L: 240. W heel: 73.5. W front: 100. T: 3.6	Lightly coloured perimeter	Plain	Plain	W front: 12.3	The front strap of the right one has been glued at the insertion. Ventral surface of sole is beige and different from dorsal surface. Still some hair attached to dorsal surface.
British Museum London	EA 63216	1	(Left sandal). L: 240. W heel: 72.6. W front: 87.2. W waist: 58.7. T 3.5	-	Not preserved, except coiled fastening	Not preserved	D front strap: 10.8	Cloth adhires to ventral surface of the sole; seems not to be an original part.

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Collection/Site	Identification	Number Sole Layers	Sole Measurements	Sole Decoration	Strap Complex Front Strap	Strap Complex Back Strap	Strap Complex Measurements	Remarks
Elephantine	El-077	1	L: 270. W heel: 79.6. W waist: 70. W front: 127.8	Double impressed line at perimeter	Plain(?)	Plain	W: 14.5	See text.
Museo Egizio Turin	S 14043.01 & 02	2	L: 270. W heel: 60.2. W waist: 43.2. W front: 118.2. T one layer: 2.7	No	Plain	Plain	W back strap: 7.9. W heel strap: 9.0	Folded at toe (see text).
Museo Egizio Turin	S 8637 & 8638	1	(Measurements of S 8638) L: 220. W heel: 78.7. W waist: 57.5. W front: 93.8. T: 4.2	No	Plain	Plain(?)	W front: 14.9	Fragile condition prohibited detailed research: number of sole layers uncertain.
Museo Egizio Turin	S. 294.01 & 02	1	In showcase: could not be openened	Incised horizontal, vertical and diagonal lines, forming 'X' motifs.	None	?	In showcase: could not be openened	See text.
Museum of Fine Arts Boston	13-4000a, b	1	L: 270. W heel: 75.4. W waist: 61.1. W front: 120.6. T: 7.6. W heel- and back strap: 11.6	-	Plain, double (see text)	Plain	D front strap: 6.6	-
Museum of Fine Arts Boston	15-3-468 (pair)	1	L: 272. W heel: 79. W waist: 60.6. W front: 99.6. T: 4.3	Perimeter and diagonal lines	Not preserved	Plain, but see remarks	-	Some parts of the remains of 15-3-469 fits the smallest of the two described here. Women sandals according to archive. Pre- and back strap coarsely made.
Museum of Fine Arts Boston	15-3-470	1	L: 305. W heel: 85. W waist: 60. W front: 127.5. T: 6	No	Not preserved, except button fastening	Not preserved	-	Second front strap button: part of other sandal or part fastening of the other part of a double front strap, invisible due to the dirt adhering?

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Collection/Site	Identification	Number Sole Layers	Sole Measurements	Sole Decoration	Strap Complex Front Strap	Strap Complex Back Strap	Strap Complex Measurements	Remarks
Museum of Fine Arts Boston	16-4-1600	1	(Right sandal). L: 223 (reconstructed). W heel: 74.6. W waist: approximately 57.5. W front: 92. T: 3	No	Only small fragment in situ.	Not preserved	-	-
Museum of Fine Arts Boston	20-1458a, b	1	L: 288. W heel: 89.2. W waist: 64.8. W front: 124.2. T: 13.9	-	Not preserved	Not preserved	Not preserved	Pair. Stained red? Very thick. Probably hippopotamus skin.
Oriental Institute Museum Chicago	E 21542 (several sandals)	2	(Two front parts) L: 138 & 143. W: 104.8. T: 6.2. (Part with strap) L: 62.8. W: 59.1	No	Not preserved	Plain(?)		Fragmented. Only one front part shows evidence of double front strap: not a pair.
Oriental Institute Museum Chicago	E 23167	1(?)	L: 168. W heel: 70. W waist: 42.5. W front: 72. T: 3.2	No(?)	Not preserved	Not preserved	-	Fragment and badly preserved. Note strange position of the pre-strap (at heel).
Oriental Institute Museum Chicago	E 23230 (two sandals)	1	(Largest sandal, right?) L: 205. W waist: 53. W front: 106. (Smallest sandal, left?) L: 155. W back: 67.2. W front: 100	No	Not preserved	Plain	-	Knotted pre-strap/back strap construction (see text).
Oriental Institute Museum Chicago	E 23278 (pair and other 3 fragments)	1	(Left sandal) L: 175. W heel: 90. W front: 120. T: 4.2. (Right Sandal) L: 200. W back: 95. W front: 120	No	Not preserved, except button fastening	Plain	D front: 6.8	Size other fragments: 100 x 105; 80 105; 75 x 120; 125 x 150. Note the thick edge.

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Collection/Site	Identification	Number Sole Layers	Sole Measurements	Sole Decoration	Strap Complex Front Strap	Strap Complex Back Strap	Strap Complex Measurements	Remarks
Oriental Institute Museum Chicago	E 23283 (pair)	2	(Left sandal) L: 215. W heel: 51.5. W waist: 47.5. W front: 95. T: 4.4	No	Plain	Slit-and-pull	-	The museum database mentions painted decoration, but nothing is visible (anymore?). Williams (1983). Note strange position of the front strap.
Oriental Institute Museum Chicago	E 23286 (pair)	2	(Left sandal) L: 245. W heel: 56. W waist: 29.4. W front: 102.2. T: 3.8	Perimeter and transverse lines	Not preserved	Slit-and-pull	-	The museum database mentions yellow and violet painting, but is worn off surface. Williams (1983).
Oriental Institute Museum Chicago	E 23331a, b (pair)	2	(Right sandal) L: 250 (reconstructed). W heel: 68.3. W waist: 59. W front: 106.5. T: 4.8 (left sandal)	Perimeter and transverse lines	Plain	Slit-and-Pull	-	Williams (1983: fig. 7)
Oriental Institute Museum Chicago	E 23369	1	L: 235. W heel: 61. W front: 108.7. T front: 5.8. T heel: 4.5	No	Plain	Not preserved, see remarks	W front: 8.7	Originally one sole layer, but additional repair of heel.
Oriental Institute Museum Chicago	E 23394a, b (pair)	2	(Right sandal) L: 235 (reconstructed). W heel: 57.8. W waist: 44. W front (left): 103.5. T: 5.8	Perimeter and transverse lines	Not preserved	Slit-and-pull (see remarks)	-	The pre-strap, pulled through a hole in the insole, probably repair (*cf.* E 23283). Williams (1983: pl. 108C).
Oriental Institute Museum Chicago	E 23408a, b (pair)	2	(Left sandal) L: 160. W back: 68. W front: 105.7. T: 6.3. (Right Sandal) L: 150. W back: 67.7. W front: 97.5	Perimeter and transverse lines	Not preserved	Not preserved	Not preserved	-

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Collection/Site	Identification	Number Sole Layers	Sole Measurements	Sole Decoration	Strap Complex Front Strap	Strap Complex Back Strap	Strap Complex Measurements	Remarks
Oriental Institute Museum Chicago	E 23411 (pair)	1	(Left sandal) L: 140. W heel: 40.8. W waist: 40. W front: 65.3. T: 2.9. (Right Sandal) W heel: 38.5. W waist: 38. W front: 61.4	No	Not preserved	Plain	W pre-strap: 14.2	Child's sandal. Unique shape of pre-strap within the finds from Adindan (but seen more often in Eared Sandals).
Oriental Institute Museum Chicago	E 23908a, b (pair)	2	L: 235 (reconstructed). W heel: 56.3. W waist: 34.4. W front: 99.5. T: 5.5	Perimeter and transverse lines	Not preserved, except button fastening	Slit-and-pull	-	-
Oriental Institute Museum Chicago	E 23909a, b (pair)	1(?)	(Fragment b) L: 198. W back: 60. W front: 102. T: 3.2	Perimeter and transverse lines	Plain	Slit-and-pull	-	Fragments of straps registerred as "b".
Oriental Institute Museum Chicago	E 30092	1	L: 170. W: 95.7. T: 3.7	No	Plain	Not preserved	-	Fragments.
Oriental Institute Museum Chicago	E 30099	1(?)	(Largest piece) L: 130. W: 90. T: 2.7	No	Plain	Not preserved	-	Fragments. Associated are fragments of garments. Apparently from "above the bones".
Oriental Institute Museum Chicago	E 30102	1	Various	No	Not preserved	Plain(?)	-	Several fragments, including one with repair patch. Not sure if all fragments belong to noted type.
Oriental Institute Museum Chicago	E 30103	1	Various	No	Plain	Not preserved	-	Several fragments of at least two sandals.
Oriental Institute Museum Chicago	E 30108	1	Various	No	Plain	Not preserved		Several fragments. Associated are fragments of garments.

Collection/Site	Identification	Number Sole Layers	Sole Measurements	Sole Decoration	Strap Complex Front Strap	Strap Complex Back Strap	Strap Complex Measurements	Remarks
Oriental Institute Museum Chicago	E 30112 (pair)	1	L: 130 & 150. W: 68 & 73	No	Plain	Not preserved	-	Fragmented.
Oriental Institute Museum Chicago	E 30120 (pair)	1	L: 180. W heel: 70.8. W waist: 62.6. W front: 58.2	No	Not preserved	Plain	-	Fragmented.
Oriental Institute Museum Chicago	E 30126	1	L: 205. W heel: 67. W waist: appr. 58. W front: 95. T: 4.4	No	Plain	Plain(?)	D front: 5.5	-
Oriental Institute Museum Chicago	E 30131 (pair)	2	(Left sandal, front part) L: 175. W back: 105. W front: 114.4. T: 5. (Left Sandal, centre part) L: 130. W: 80-101.8. (Right Sandal) L: 220. W back: 81.5. W front: 125 (reconstructed)	No	Plain	Not preserved	-	Several fragments of a pair.
Oriental Institute Museum Chicago	E 30136 (pair)	2(?)	(Right sandal) L: 155. W max.: 84.5. (Left sandal) L: 175. W max: 86.6. T: 3.3	No	Plain(?)	Not preserved	-	Several fragments including from strap complex.
Oriental Institute Museum Chicago	E 30161	1(?)	Various	No	Plain	Plain	-	Several fragments including from strap complex. No in situ straps, but isolated ones suggest Eared Sandals (hence "?").
Oriental Institute Museum Chicago	E 30167 (pair)	1(?)	L: 125 & 190. W: 100 & 101. T: 2.5	No	Plain(?)	Not preserved	-	Front parts of pair.

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Collection/Site	Identification	Number Sole Layers	Sole Measurements	Sole Decoration	Strap Complex Front Strap	Strap Complex Back Strap	Strap Complex Measurements	Remarks
Oriental Institute Museum Chicago	E 30188 (pair?)	1(?)	Various	No	Plain	Plain		Various fragments.
Oriental Institute Museum Chicago	E 30197b	1	L: 245. W heel: 76. W waist: 68.7. W front: 115.5. T: 3.2	No	Not preserved	Not preserved	-	Includes several fragments. The accompanying label states it is '30197b' but the museum archive only mentions the presence of '30197a'.
Oriental Institute Museum Chicago	E 30221a, b	2	L: 133 & 170. W 103-108 (back part) & 99.4 (front). T: 4.6 & 5.4	Perimeter and transverse lines	Plain	Slit-and-pull(?)	-	Size small fragment: 63.5 x 67. Williams (1983: pl. 108).
Oriental Institute Museum Chicago	E 30225	2	(Most complete sandal) L: 170. W back: 62. W front: 97. T: 5.8	Perimeter and transverse lines	Not preserved	Not preserved	-	Fragments.
Oriental Institute Museum Chicago	E 30226 (pair?)	2	L: 125. W back: 87. W front: 108.8. T: 4.1	Perimeter and transverse lines	Not preserved	Slit-and-pull	-	Fragmented. Measurements of biggest fragment.
Oriental Institute Museum Chicago	E 30227	1(?)	(Most complete sandal) L: 235. W heel: 78. W front: 115. T: 3.2	No	Not preserved	Not preserved	-	Fragments
Oriental Institute Museum Chicago	E 30234	2	Various	Perimeter and transverse lines	Plain	Not preserved	-	Various fragments.
Oriental Institute Museum Chicago	E 30237	1(?)	(Right sandal) L: 180 (left one: 135). W: 105. T: 3.2	No	Not preserved, except button fastening	Not preserved	-	Fragments.

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Collection/Site	Identification	Number Sole Layers	Sole Measurements	Sole Decoration	Strap Complex Front Strap	Strap Complex Back Strap	Strap Complex Measurements	Remarks
Oriental Institute Museum Chicago	E 30238	1(?)	7.5 x 180; 80 x 150; 87 x 120; 93 x 225 (two pieces of one sandal).	No	Not preserved	Plain(?)	-	Various fragments of at least three sandals, one of which must have been a child's sandal.
Oriental Institute Museum Chicago	E 30239	1(?)	(Largest fragment) L: 226. W back: 95. W front: 113. T: 2.5	No	Plain	Plain	-	Various fragments.
Petrie Museum of Egyptian Archaeology UCL	UC28346ii	1	L: 270. W heel: 75.3. W front: 100. T: 2.8	-	Not preserved	Not preserved	-	-
Petrie Museum of Egyptian Archaeology UCL	UC71415	2	L: 245. W heel: 72.3. W front: 97.5. T: 7.2	Incised horizontal, vertical and diagonal lines, forming 'X' motifs.	Plain(?)	The ears of both sole layers are attached to each other.		-
Qasr Ibrim	27067/A5	2	L: 247. W max: 93. W over pre-strap: 111	Impressed lines along perimeter	Not preserved	Plain	-	See text.

Table 1, part II. Leather Eared Sandals (sorted by collection/site) showing summary of the technological details of the sole, including measurements (10th to 13th column) and the strap complex, also including measurements (14th to 16th column) and additional information in the last column. Abbreviations: D=diameter; L=length; T=thickness; W=width; N/A=not applicable.

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Subcategory	General traits	Type	Variant	Subvariant
Egyptian Eared Sandals	Rounded heel; Highly constricted waist; Decoration is rare and if present, simple; Integrally cut pre-straps; Rounded front; Single front strap	Straight Sole	Single Sole Layer (figure 2)	None
			Multiple Sole Layers	
		Swayed Sole	Single Sole Layer (figure 2)	None
			Multiple Sole Layers (mainly Amarna)	
Nubian Eared Sandals	Straight sole; swayed soles exceptional; Rounded heel; Highly constricted waist; Sole might have elaborate decoration; Integrally cut pre-straps; Rounded front	Double Front Strap	Single Sole Layer (figure 4)	None
			Multiple Sole Layer (figure 5)	None
		Single Front Strap	Single Sole Layer (figure 7, 8)	None
			Multiple Sole Layers	Swayed (figure 6)
				Straight

Table 2. Summary of the most important characters of Leather Eared Sandals.

Specialist Number	Category	Type	Variant
ÄM AM 002	Egyptian Eared Sandal	Swayed	Multiple Sole layers
ÄM AM 006a, c	Egyptian Eared Sandal	Swayed	Multiple Sole layers
ÄM AM 008b & c	Indetermined	Indetermined	Indetermined
ÄM AM 009	Egyptian Eared Sandal	Swayed	Multiple Sole Layers
ÄM AM 010	Egyptian Eared Sandal	Swayed	Multiple Sole Layers
ÄM AM 014a, b(?), d	Egyptian Eared Sandal	Swayed	Multiple Sole Layers
ÄM AM 017a	Egyptian Eared Sandal	Swayed	Multiple Sole Layers
ÄM AM 017b, d, h, i	Indetermined	Composite Sandal?	Indetermined
ÄM AM 020c-e, h, i, l	Indetermined	Indetermined	Indetermined
ÄM AM 023	Indetermined	Indetermined	Indetermined
ÄM AM 025	Indetermined	Indetermined	Indetermined
ÄM AM 027a - c	Indetermined	Indetermined	Indetermined
ÄM AM 028b	Indetermined	Indetermined	Indetermined
ÄM AM 030a, b	Egyptian Eared Sandal	Swayed	Multiple Sole Layers
ÄM AM 030d, e, f, i	Indetermined	Indetermined	Indetermined
ÄM AM 033	Indetermined	Indetermined	Indetermined
ÄM AM 036a-m	Indetermined	Indetermined	Indetermined
ÄM AM 037a-c	Indetermined	Indetermined	Indetermined
ÄM AM 046a	Egyptian Eared Sandal	?	Multiple Sole Layers
ÄM AM 046b	Indetermined	Indetermined	Indetermined
ÄM AM 046c	Egyptian Eared Sandal	Swayed	Multiple Sole Layers
ÄM AM 054a, c, d	Differen type, yet to be determined	Indetermined	Indetermined
ÄM AM 054e	Indetermined	Indetermined	Indetermined
ÄM AM 056a, c, d(?)	Egyptian Eared Sandal	Swayed	Multiple Sole Layers
ÄM AM 056b	Egyptian Eared Sandal	Swayed	Single Sole Layer
ÄM AM 056c	Indetermined	Indetermined	Indetermined
ÄM AM 056e-m	Indetermined	Indetermined	Indetermined
ÄM AM 058b	Indetermined	Indetermined	Indetermined
ÄM AM 058b	Egyptian Eared Sandal	?	Multiple Sole Layers
ÄM AM 059	Egyptian Eared Sandal	Swayed	Multiple Sole Layers
ÄM AM 060 (?)	Egyptian Eared Sandal	Swayed	Multiple Sole Layers
ÄM AM 061a, b	Indetermined	Indetermined	Indetermined
ÄM AM 064a, b	Indetermined	Indetermined	Indetermined
ÄM AM 065a, b	Indetermined	If 065a & b belong together, then they should be classed as Classic II, Multiple Sole Layers.	Indetermined
ÄM AM 066a, b	Indetermined	Indetermined	Indetermined
ÄM AM 068a	Egyptian Eared Sandal	Swayed	Multiple Sole Layers
ÄM AM 068b, f, g	Indetermined	Indetermined	Indetermined
ÄM AM 069b, d, g	Indetermined	Indetermined	Indetermined
ÄM AM 071a, c	Indetermined	Indetermined	Indetermined
TA AM 004	Egyptian Eared Sandal	Straight	Multiple Sole Layers
TA AM 006	Indetermined	Indetermined	Indetermined
TA AM 007	Egyptian Eared Sandal	Straight	Multiple Sole Layers

Specialist Number	Category	Type	Variant
TA AM 13	Indetermined	Indetermined	Indetermined
TA AM 025	Indetermined	Indetermined	Indetermined
TA AM 043	Indetermined	Indetermined	Indetermined
TA AM 048	Indetermined	Indetermined	Indetermined
TA AM 049	Indetermined	Indetermined	Indetermined
TA AM 055	Indetermined	Indetermined	Indetermined
TA AM 078	Indetermined	Indetermined	Indetermined
TA AM 099	Egyptian Eared Sandal(?)	Indetermined	Indetermined
TA AM 102	Indetermined	Indetermined	Indetermined
TA AM 107	Indetermined	Indetermined	Indetermined
TA AM 111	Indetermined	Indetermined	Indetermined
TA AM 112	Indetermined	Indetermined	Indetermined
TA AM 116c	Indetermined	Indetermined	Indetermined
TA AM 128	Certainly not Eared Sandal	Indetermined	Indetermined
TA AM 158	Indetermined	Indetermined	Indetermined
TA AM 160	Composite Sandal	Indetermined	Indetermined
Indetermined			
22/120	Differen type, yet to be determined	Indetermined	Indetermined
22/119	Composite Sandal	Indetermined	Indetermined
22/105	Egyptian Eared Sandal	Swayed	Multiple Sole Layers

Table 3. Identification of the sandal fragments from Amarna.