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Introduction

Footwear in ancient Egypt was varied, ranging from simple, undecorated sandals to beautifully decorated open and closed shoes. Footwear was made of vegetable materials (such as palm leaf and grass), leather, wood or metal or a combination of several of these.

Open shoes are made of vegetable materials, predominantly palm leaf, but palm fibre and papyrus are also occasionally used. Thirty-two shoes have been studied. This represents part XII of the series on the technological aspects of footwear, as part of the Ancient Egyptian Footwear Project (AEFP); the publication of the footwear of Tutankhamun includes a detailed explanation of the project, the objective of the series as well as an annotated glossary (Veldmeijer in press [a]).

The category 'open shoes' within the group 'fibre shoes' can be divided in two types and four variants:

Group	Category	Type	Variant
Fibre shoes	Open shoe	Partial upper	Short toe
			Extended toe
		Full upper	Upright upper
			Flexible upper[1]

The classification is mainly based on the shape of the upper as well as the presence or absence of an extended toe. The shape of the sole has not been used in classification, because they are, with few exceptions, the same. The shoes of the type 'partial upper' has an upper that does not run along the entire perimeter, but rather ends at either side of the pointed, upwards curled tip of the toe (Figs. 1–2). This type can be further divided in two variants: the short-toed-shoes have a short, slightly upwards curled toe (Fig. 1). The second variant, however, has a large extended toe that curls backwards to the back straps where it is secured together with the front strap (Fig. 2). The other type of fibre open shoes has an upper that runs along the entire sandal's edge (Fig. 6). Again we distinguish two variants: in the shoes presented here, the upper is relatively low but inflexible. It stands, therefore, upright. The second variant has a flexible upper that covers the sides of the foot, but these are not among the presented material (see Veldmeijer in press [d]). Note that one of the shoes (Ashmolean Museum 1956.120) comes very close to the 'flexible upper'-variant.

The descriptions are kept as general as possible and therefore the reader is referred to Table 1 for details. However, as in fibre sewn-edge plaited sandals (Veldmeijer in press [e]), albeit to more limited extend, there are exceptions in general layout. These small differences

[1] Shoes with flexible upper are not discussed in the present paper..

might be an indication of different sandal-makers or workshops and/or be an indication of regional preferences. Whenever necessary to enhance clarity of the text, the specimens will be named rather than that the text relies on reference to the table.

Sole: Partial upper shoes[2]

The heel of the variant with a short toe (Fig. 1) is rounded, from which the width at both sides does not (or only slightly, but, if so, continuously) increase towards the front. In other words, there is no constricted waist. It ends in a pointed toe, which is slightly off centre but too little to be able to recognise, in most cases, for which foot the shoe is meant. In general the sole is rather short and wide, but Oriental Institute E 7189 is rather elongated. Moreover, the sides of the sole do not increase in width equally: one side is more distinctly curved than the other. Usually, this is the lateral side, but here it is not exactly certain which side it is: the shape of the sole suggests that is was meant for the left foot but the position of the front strap, slightly off centre as to fit better between the first and second toe, suggests a right shoe. Seemingly, this is a mistake of the sandal-maker. British Museum EA 4460 shows a comparable condition. The pair British Museum EA 4459 shows a slightly constricted waist. The pair Leiden AU 10 (Fig. 1 [b]) has an even more distinctly constricted 'waist', even though the constriction is more or less halfway the length of the sole, rather than more towards the heel as is usually the case. British Museum EA 36201 has a highly shaped sole. Here, the lateral side shows a distinct curvature of the front half, resulting in a sole that indicates for which foot the shoe was meant (swayed).

The shape of the sole of the variant with an extended toe (Fig. 2) is largely comparable, save for the toe-part. However, a squarish heel is sometimes seen (for example in Leiden AU 11/12 in Fig. 2 [e]).[3] Several examples are more elongated in shape, of which British Museum EA 55410 (Fig. 2 [d]) and Hildesheim 1646 are the best examples. The toe itself might continuously decrease in width[4] or continues from the tip of the sole proper as a narrow 'rod'.[5]

It is often not possible to determine how many midsoles there are due to the completeness of the specimens, but the presence of at least one midsole is observed in all but two shoes: Ashmolean Museum 1887.2721 most likely had no midsole and the presence of (a) midsole(s) is uncertain in British Museum EA 36204. The soles are made of an 'over one, under one' plaited fabric (*cf.* Veldmeijer 2008/2009b) of palm leaf, which might be folded several times, depending on how thick the sole needed to be (Fig. 2 [c]). This plaited fabric, the folded element of which might be smaller than the width of the sole proper, usually only makes up the mid- and treadsoles: often, the insole is an additional layer that is manufactured in a decorative fashion. Thus an aesthetic effect is created that obscures the plaited fabric as well as the stitching of the lower sole layers (see below). Only decoratively 'plaited' fabrics are seen

[2] 'Decorative layer' refers to a layer that obscures the main layer of the upper.

[3] But also Hildesheim 1646, Ashmolean Museum 1887.2721, Egyptian Museum SR 5234.

[4] Ashmolean Museum 1887.2721, Leiden AU 11/12, Turin 6509.

[5] Egyptian Museum SR 5234, Egyptian Museum JE 30606, Turin 6510, British Museum EA 55410, British Museum EA 4464, Hildesheim 1646.

in this type, besides the 'over one, under one' fabric of which the other sole layers are made as well (Fig. 3).[6]

The treadsole might have lengthwise running rows of stitching (Fig. 4 [a]), but others are without. Stitching of the sole is done to further secure the sole layers and hence make them stronger against wear. However, the prime reason for sewing the entire sole, as is seen in some, might offer better resistance against wear rather than further secure the sole layers. These stitches are applied to at least the treadsole and one of the midsoles, but in all cases in which it could be observed, the stitching secures *all* midsoles; the above-mentioned decorative insole is added to obscure the stitching (and plaited sole layers?). The quantity of stitching varies.[7] The rows start at the heel, run towards the toe and stop short of the tip of the sole proper in some examples.[8] In the extended toe variant, sewing is less often seen.[9] They all terminate shortly before the toe starts to extend. The addition of braids along the perimeter is seen only ones in the partial upper type: Leiden AU 10 (short toe variant, Fig. 1 [b]). Another type of reinforcement is seen in British Museum EA 36203 (Fig. 1 [d]): a woven or twined layer made of zS_2 string is covered with a black substance that is most likely 'melted' leather,[10] which is secured to the ventral surface of the plaited 'treadsole'. Remnants of leather can also be seen at the ventral surface of the treadsole in Egyptian Museum JE 30606. Judging the black discouloration of large part of the rest of the sole, it might have had a leather treadsole.

The ventral side of the tip of the short toe shoes might be decorated too.[11] It is seen more often in the extended toe variants,[12] which is understandable as with these backwards curled toes the ventral surface is one of the first things one would see when looking down.

The edge in partial upper shoes is in construction the same as seen in sewn-edge plaited sandals (Veldmeijer in press [e]) and sewn sandals (Veldmeijer in press [a]; in press [b]). Such an edge consists of a row, or several, of cores along the perimeter of the sole that sandwich the sole. The cores are secured with strips of palm leaf (Fig. 5 [a]). An edge consists of one core in the short toe as well as the extended toe variant, but with few exceptions: the well made short toe shoe British Museum EA 36204, and the extended toe shoe Turin 6509 has an edge that consists of two cores (but in Turin 6509 only until the start of the extended toe, Fig. 2 [a]).[13] In contrast to the edges in sewn sandals, they are often rather coarsely made and in all cases substantial thicker. Occasionally, the edge is reinforced with stitches at right angle

[6] Extended toe variant, see Fig. 2 [a]: Egyptian Museum SR 5234 and JE 30606, Ashmolean Museum 1887.2721, Leiden AU 11/12; Fig. 2 [b]: Turin 6509, Hildesheim 1646; Fig. 2 [c]: British Museum EA 4464, British Museum EA 55410, Turin 6510.

[7] British Museum EA 4460 has only one row lengthwise through the centre; British Museum EA 4463 (Fig. 1 [c]) has two additional rows at the sides of the sole just inside the attachment of the edge; Ashmolean Museum 1922.85 has five rows, British Museum EA 4461 seven and British Museum EA 4459 even more (possibly nine).

[8] British Museum EA 4459, British Museum EA 4460, British Museum EA 4463, Berlin AM 6992.

[9] Only seen in Turin 6510 (which might have five rows, Fig. 2 [d]), British Museum EA 55410 (three rows, Fig. 2 [d]) and Hildesheim 1646 (five rows).

[10] In moist condition, cured leather and rawhide, turns into a resinous mass, usually referred to as 'melting.'

[11] Present in the short toe variants Ashmolean Museum 1922.85 and British Museum EA 36204.

[12] Ashmolean Museum 1887.2721, Leiden AU.11/12, Turin 6509, British Museum EA 55410.

[13] The unidentifiable shoe British Museum EA 26930 has a two-core edge too.

(arrows in Fig. 1 [c], 2 [a]), which is inserted between the two cores that sandwich the sole. The type of stitching is comparable to those that are used for the stitching of the sole (Fig. 4 [a]).

Sole: Full upper shoes (upright upper variant)

The shape as well as the construction (including the edge) of the sole in full upper open shoes (Fig. 6) is comparable to the majority of the partial upper type (rounded heel, slightly but continuously increasing in width towards the front), but more often the sole is more distinctly shaped. Several shoes have a distinct waist but are still symmetrical in the longitudinal plane (straight sole).[14] Others are even more distinctly shaped and can be referred to as 'swayed'.[15] Remarkable is the curvature of the entire sole seen in British Museum EA 4462 (Fig. 6 [b]). Such an overall curvature in the longitudinal plane is sometimes seen in leather sandals, especially those from Amarna (Veldmeijer in press [c]). It has been suggested that this would be a feature of preservation, but the fact that they all curve towards the medial side and is extremely rare outside Amarna, seems to point to a deliberate shape (Veldmeijer 2009a, 4). British Museum EA 4462 (Fig. 6 [b]) supports this suggestion.

The soles are in their overall construction comparable to the soles of the partial upper type (see above). Decorative insoles are present in all examples and consist either of a finer and more elaborately plaited layer[16] or transversely placed strips (Fig. 7).[17]

More often, the treadsole has additional elements to reinforce the sole. These might be braids that are attached along the perimeter and lengthwise down the centre.[18] One specimen[19] has only stitching through the soles, and three specimens have an entire sole of woven palm leaf strings.[20] In addition to this layer, a leather layer is seen in British Museum EA 4462 (Fig. 6 [b]), the edges of which have been sewn with the strings of the woven layer of strings.

All shoes have reinforcement stitching at right angle to the sole's edge, which are the same type of stitching as seen in the partial upper type (Fig. 4 [a]). However, in Liverpool 1969.112.21 a different type of stitching is used (Fig. 4 [b]). In sewn-edge plaited sandals, all but one sandal with reinforcement at its sole's edge has stitches as seen in Fig. 4 [a], but sandal Berlin AM 3324 has the same type of stitching as in Liverpool 1969.112.21 (Veldmeijer in press [e]).

[14] Leiden 1942.12.3/4, British Museum EA 68227, Petrie Museum UC 30839, Petrie Museum UC 30544 and Liverpool 1969.112.41.

[15] National Museums of Scotland 1956.120, British Museum EA 36217, British Museum EA 4462.

[16] National Museums of Scotland1956.120, British Museum EA 4462, British Museum EA 68227, British Museum EA 36217, 1942.12.3/4.

[17] Berlin AM 18448, Petrie Museum UC 30839 and possibly Petrie Museum 30544.

[18] Leiden 1942.12.3/4 (two braids lengthwise down the centre), British Museum EA 68227 (four braids lengthwise down the centre, Fig. 6 [c]).

[19] Berlin AM 18448.

[20] National Museums of Scotland 1956.120, British Museum EA 36217, Petrie Museum UC 30544.

Upper: Partial upper shoes

In the partial upper type, the upper does not run along the entire perimeter, but rather ends at either side of the pointed, curled tip of the toe. Here, the height of the upper decreases and thus fits roughly the height of the curled toe in the short toe variant. Although the upper never falls over the ankle, there is some variation in height (Table 1): the height of the upper in Ashmolean Museum 1886.366, for example, is limited whereas in other examples, such as Berlin AM 6992 (Fig. 1 [a]), it is much higher and must have extended almost to the ankle. It is, as with the identification of the sole layers, often not possible to be exact on the number of layers of which the upper is made. However, examples of which there are only two layers are rare. Usually, the strength of the upper is obtained by a plaited strip, which might be folded as to create a double or triple layer. The inside might be clad with a separate layer, most often consisting of vertical strips. Usually the outer layer is decorative and, again, separated from the rest of the layers but in some specimens this outer layer is of the same construction as the inner layer. In several examples the main plaited layer is also the outer layer,[21] but in others an additional plaited layer, less coarse, is added.[22] Most often seen, however, is a woven fabric of very narrow strips in a diagonal pattern (Fig. 5 [b]). The upper in the short toe variant Ashmolean Museum 1886.366 consists only of the plaited fabric. The outer layer is plaited in overlap in short toe shoe Ashmolean Museum 1922.85, as is sometimes seen with the insole as well (Fig. 3 [a]).

The extended toe variants Ashmolean Museum 1887.2721 and British Museum EA 4464 (Fig. 2 [c]) have an additional, woven outer layer, but no additional inner layer; shoes Turin 6510 (Fig. 2 [b]) and Hildesheim 1646 have an additional inner layer of vertical strips but no additional outer layer. A fabric in overlap is seen in British Museum EA 55410 (Fig. 2 [d]). Another exception on the usual composition of the upper is British Museum EA 36204, which has a layer of vertical strips between the main plaited fabric and the decorative, woven outer layer.

The edge of the upper in all specimens is the same: at the ventral and dorsal edges, the layers are sandwiched with cores that are secured by sewing with palm leaf strips; in this, it is comparable to the construction of the soles (Fig. 5 [a]). The upper is attached to the sole by running stitches that are usually small at the upper and long at the sole (Fig. 5 [c]). They insert into the corner of the upper's edge as well as the inner corner of the sole's edge. Ashmolean Museum 1888.366 has, at the heel, several additional stitches vertical to the sole and upper (*cf.* the full upper shoes Berlin AM 18448 in Fig. 6 [a]). An exception to this sole/upper construction is shoe Turin 6510 (Fig. 2 [b]) which shows closely-spaced stitching that might be of the same type as those that are used to sew the sole layers (Fig. 4 [a]).

[21] Short toe variant: Leiden AU 10, British Museum EA 4459, British Museum EA 4463 (Fig. 1 [c]), all of which have a vertical strip inner layer.

[22] Short toe variant: British Museum EA 4460 and British Museum EA 36203 (Fig. 1[d]), the latter of which has a comparable inner layer.

Upper: Full upper shoes (upright upper variant)

A reference to the partial upper shoes can be made for the construction of the upper in the full upper shoes, except for one feature: the upper runs along the entire perimeter, the two ends of which meet and are secured in overlap with vertical stitches through all layers. If the upper has decorative layers at one or both sides, the overlap is obscured and hence the overlap could not be determined. The extent of this overlap varies from relatively small[23] to examples in which the overlap continues after being secured, resulting in an extra layer at the medial side.[24] The height of the upper varies from very low[25] to relatively high.[26]

The upper shows many variations. In Leiden 1942.12.3/4 it is plaited, but although the pattern is the same as the insole ('over two, under two, shift one'), for the upper, narrower strips of palm leaf are used. Both, insole and upper, however, differ from the main plaited fabric of the sole ('over one, under one'). In National Museums of Scotland 1956.120 and British Museum EA 36217 (Fig. 6 [d]) it is made of decorative plaited fabric ('over two, under two, shift one') that is the same as the insole. The upper in Berlin AM 18448 (Fig. 6 [a]) equals the sole's fabric and has no separate decorative layers. A plaited decorative outer layer is seen in British Museum EA 4462 ('over two, under two, shift one', Fig. 6 [b]); the plaiting is the same as for the insole but done with narrower strips. The inner layer, however, is the same as the insole. British Museum EA 68227 (Fig. 6 [c]), Petrie Museum UC 30544, Petrie Museum UC 30839 and Liverpool 1969.112.41 have decorative inner and outer layers of vertically placed strips, the main layers, however, being of plaited 'over one, under one' fabric.

The dorsal and ventral edges of the upper are made with cores at both sides of the fabric and sewn, but in some examples, the dorsal edge (and not the ventral edge) is wrapped with a strip of palm leaf without a core (and in Leiden 1942.12.3/4 only includes some fibres but not a real core). In all these cases, the upper are made of a plaited fabric of intended height, showing a finished edge rather than being cut to the required height.

Also the way the upper is attached to the sole is comparable to partial upper shoes. In British Museum EA 4463 (Fig. 1 [c]), British Museum EA 36217 (Fig. 6 [d]), Berlin AM 18448 (Fig. 6 [a]) and National Museums of Scotland 1956.120 (Fig. 6A), however, the upper is secured with stitches vertical to the upper and sole. Perhaps this is related to the cordage sole, which was attached before the upper and sewing in the usual way was made impossible, although this does not explain the choice of the stitching for Berlin AM 18448 as this shoe is without a cordage sole layer.

Strap complex: Partial Upper Shoes

The strap complex is much comparable to those described for sewn-edge plaited sandals (Veldmeijer in press [e]) to which the reader is referred for a detailed description. Here,

[23] For example National Museums of Scotland 1956.120.

[24] Such as British Museum EA 36217.

[25] For example, Liverpool 1969.112.41.

[26] British Museum EA 36217.

emphasis is on additional information that is relevant to the different kind of footwear (sandals versus shoes).

The front strap is inserted slightly off centre but two examples of shoes of which the sole is (slightly) swayed, show that this is done erroneously.[27] The back straps are attached to the sole, outside the upper, and run over the upper inwards. The front strap is attached in the middle of the back strap. Usually the back straps are tied to the sole's edge, simply by wrapping the cladding around (Veldmeijer in press [a], fig. 3.6), but in Hildesheim 1646, the cores of the straps are inserted *in* the sole, shortly inside the edge proper. Some extra attention might be given to the way of tying the back straps to the sole,[28] but this is rare. In the extended toe shoes, the tip of the toe is usually tied to the front strap, and the front strap to the back strap. Due to the fact that most shoes have intact straps, it is difficult to ascertain whether the front strap was pulled through the back strap as seen in sewn-edge plaited sandals (Veldmeijer in press [e]), but seemingly, usually it was not.

Strap complex: Full upper shoes (upright upper variant)

The front strap, consisting of a core that is clad, is attached to the back strap (with the same composition) by looping the core around it and secure it with the cladding. This contrasts to the common construction in sewn-edge plaited sandals, where the core of the front strap is inserted through the back strap (Veldmeijer in press [e]). There are several exceptions to this construction. Petrie Museum UC 30544 has a strap complex made of (cabled?) string, but still the front strap is looped around the back strap. The cores of the strap complex in National Museums of Scotland 1956.120 consist of loosely s-spun palm fibre around which palm leaf strips are plaited as cladding (mostly lost). The construction is an exception for another reason as the front strap is not attached to the back strap but runs diagonally over the upper and are themselves secured to the sole (sometimes referred to as 'Y' binding as opposed to the usual 'T' binding). The construction is often seen in fibre, composite sandals.

Production and material[29]

The sequence of production does not show surprises. The sole is made first after which the upper is added. Lastly, the strap complex is added and, if there is an extended toe, secured to it.

Identification of the exact species of the material is forthcoming[30] but the majority of the specimens consist of palm leaf. Many of the full upper shoes, however, are made with a different type of vegetable material, which is much thicker and woodier. On the basis of comparison with other objects, this might be reed.

[27] British Museum EA 4460 and Oriental Institute E 7189.

[28] Egyptian Museum SR 5234 and Egyptian Museum JE 30606.

[29] For the preparation of the material, the reader is referred to Veldmeijer (in press [b]) and references therein, as the preparation for sewn sandals is comparable to that for those discussed here.

[30] Cartwright *et al.* (forthcoming).

The fragment of a sandal[31] or open shoe[32] in the Louvre is made of date palm (*Phoenix dactylifera*; Montembault 2000, 33) whereas two pairs of partial upper, open shoes with a short toe[33] in the Louvre are made of dom palm leaf (*Hyphaene thebaica*; Montembault type B (N 1306, N 1308 = E 2568); cf. British Museum EA 4463, Fig. 1 [c]) and one pair is made of date palm leaf (Montembault type B [N 1314]). Teeter (2003, 110) identified the material of the pair Oriental Institute E 7189 erroneously as palm fibre and reed. According to Gourlay (1981a, 61–2; 1981b, 55–6), the shoes from Deir el-Medinah, which are the extended-toe variant, are made of palm leaf - but the species has not been mentioned - and papyrus. According to the records of the Petrie Museum, the full upper shoe Petrie Museum 30839 is made of dom palm leaf (outer layer of the upper), papyrus (*Cyperus papyrus*; inner layer of the upper) and date palm leaf (wood strips, but it is uncertain what is meant with this). A pair of partial upper shoes with a short toe from the Rafalovitch collection is reported as being made of 'rush' (Berlev and Hodjash 1998, 151) but most likely this is wrong: 'rush' is often used to indicate vegetable matter.

Wear and repair

The contrast in wear between the shoes is large. Some do not show wear at all, such as Egyptian Museum SR 5234 and Hildesheim 1646, whereas others are entirely worn, such as Petrie UC 30839. Generally, the wear in the partial upper, and of these more specifically the extended toe variant, is nearly absent. The shoes show the usual spots of wear: the heel (especially the thick sole's edge) and at the ball of the foot. Wear that is more specific for these fibre shoes is the rubbing of the inner layer of the upper including the edge (a good example is Berlin AM 6992 in Fig. 1 [a]), but is rare nonetheless. A nice example of wear can be seen in Leiden AU 10, where the owner walked, with its heel, on the upper (especially evident at the right shoe) due to which the upper is pushed towards the sole. The ventral surface of this shoe also shows almost entirely worn-through braids. In British Museum EA 4464 (Fig. 2 [c]) and Liverpool 1969.112.41, the entire treadsole is worn away although the upper, including the straps and extended toe, are complete (save for holes in the heel). Extensive wear of the ventral surface of the treadsole is also visible in British Museum EA 4459, but here the upper too has suffered. One shoe shows a very characteristic wear pattern of the sewing that is comparable to the worn through leather thongs that are sewn through plaited fabric in the so-called 'leather reinforced plaited sandals' from Qasr Ibrim (Veldmeijer 2008/2009a). The lack of the leather treadsole in Egyptian Museum JE 30606 might be because it is worn away, but this seems unlikely because the rest of the shoe does not show wear at all. Possibly, the attachment has come loose, or the leather was taken away to be used for something else. In some shoes, dirt still adheres to the sole, which is a clear sign that the shoe has been worn. However, more difficult to explain is the difference in wear in, for example, the pair of shoes Leiden 1942.12.3/4: the degree of wear of the left shoe is much more distinct at the sole as

[31] See Type A3 in Veldmeijer (in press [e]).

[32] See Fig. 2 [b].

[33] See Fig. 1.

well as the upper. Possibly, the owner produced much more pressure on the left shoe, perhaps because he or she either dragged his/her left leg or limped.

The strap complex is often damaged but usually remnants are still present, which suggest that, by comparison with for example the papyrus strap complex in sewn sandals, it is much stronger. This, as well as the absence of wear in some other shoes, despite the fact that straps might be broken or torn due to use, shows that footwear made of vegetable materials are quite tough and resilient.

Comparison and discussion

Comparison with other fibre shoes is limited as there are no other fibre open shoes (except for the variant flexible upper of the full upper shoes, see below). As is explained elsewhere (Veldmeijer in press [f]), the shape of the upper in partial upper shoes compares with those in leather open shoes or the open shoes of Tutankhamun that are made of a variety of materials (Veldmeijer in press [a]). In Tutankhamun's shoes, however, the upper does not run all the way to the tip of the sole, but terminates distinctly posterior to it.

Comparison with fibre sandals is more illuminating and reveals a close relation with sewn-edge sandals to such an extent that we can conclude that the shoes are based on these sandals: the material, the construction of the sole (including the occasional presence of a decorative insole), the construction of the edge and the strap complex all are generally similar.

The partial upper shoes of the extended toe variant show two distinctly different extended toes: in one group, they decrease in width continuously, resulting in a triangular tip. The toe in the other group abruptly decreases in width and continues as a narrow 'rod' towards the attachment with the back straps. These different shoes can be linked with B4 and B3 sewn-edge plaited sandals respectively, in which the extended toe shows a similar layout. The two pairs British Museum EA 55410 (Fig. 2 [d]) and British Museum EA 55411 (Veldmeijer in press [e]: Fig. 8 [c]) are the same, except that pair British Museum EA 55410 has an additional upper; the other pair are sandals.

Full upper shoes with an upright upper also show a remarkable comparison with some types of sewn-edge plaited sandals. The soles of sandals D1 and D2 compares with the shoe's soles in their shape and construction, including the occasional presence of braids at the ventral surface of the treadsole. These shoes differ from those with a flexible upper (see Veldmeijer in press [d]) in the fact that the upper is inflexible and stands upright, hence the name. The upper in the other variant is flexible and closely encloses the foot but not entirely: the dorsal surface of the foot remains bare. Moreover, the upper usually is stitched on top of the sole and the sole itself might be made of plaited palm fibre or even the more comparable plaited palm leaf fabric, but always without a sewn edge. Equally, the dorsal and ventral sides of the upper in the type with a flexible upper are always without a sewn edge.

Sewn sandals show features seen in fibre open shoes too (Veldmeijer in press [a]; in press [b]), but this is limited to the sewn edge and, as explained, the occasional use of papyrus straps. The use of isolated strips of vegetable materials is also seen in the soles of fibre composite sandals, as is the use of braids at the ventral surface of the treadsole.[34]

[34] See above for more differences between the sewn-edge plaited sandals and fibre composite sandals.

There is a distinct difference in refinement of the manufacturing technology: some shoes (and almost all full upper ones) have coarse, thick and heavily reinforced soles, which clearly suggests that they were made to be used intensively and/or were made to withstand great forces. Others, however, are far more delicate, suggesting they were made for a different purpose. This might be a reflection of status,[35] but in order to confirm or reject this conclusion, more research on the context is needed.

The lack of reliable dates of the material presented here makes any statement on the development in time suggestive. Many specimens, mainly the full upper types but also some of the partial upper types with extended toes, are tentatively dated somewhere after the pharaonic era without being based on empirical data. Moreover, if one or two shoes have been dated to a certain era beyond any doubt, it still does not mean that *all* of these shoes belong *only* to that era: before the age of industrialisation, fashion did exist but was of a different nature and footwear types existed for a much longer period of time. For example, the well-dated sewn sandals were, largely unaltered, used at least from Dynasties 18–21 (*i.e.* 500 years), although it should be noted that these particular fibre sandals were clearly a status symbol (Veldmeijer in press [a]). Dating on the basis of 2-dimensional art[36] has proven of limited value for sandals, but this is even worse for shoes: depictions of Egyptians wearing shoes are extremely rare.[37] Moreover, problems arise with matching the depicted footwear with the archaeological record: according to Van Driel-Murray (2000, 315), the big increase of the toe to such an extend that the toe is secured to the back strap, became popular somewhere after Dynasty 22, but the archaeological record suggests that these extended toes started to occur much earlier (see below). Possibly, *depicting* such footwear in 2-dimensional became popular after Dynasty 22, which might indicate a change in status of this particular type of footwear. Moreover, footwear with a large, backwards curled toe is also seen in leather shoes and sandals and these are dated to Dynasty 18 (Montembault 2000, 205) and later (Van Driel-Murray 2000, 315–16; Veldmeijer 2009c, 16–17).

As explained, the shoes are based on sandals and, fortunately, these are slightly better dated. This suggests that the partial upper shoes with a short toe are of pharaonic date, possibly emerging for the first time in the New Kingdom. At least some of the extended toe variant can be dated to the same era (New Kingdom), judging the dating of the sandals on which they are based. This is supported by the finds from Deir el-Medinah, which are firmly dated to Dynasties 18–20. When they exactly came into use is as yet unknown, but possibly the shoes are older: as explained elsewhere (Veldmeijer 2009d, 4–6), Petrie has found leather open shoes at Kahun that *might* be dated to the Middle Kingdom (Petrie 1890, 28).

Several of the full upper type are dated and point to the Late Period. It is, however, not clear when they emerged and how long they were in use. Interestingly, shoe Liverpool 1956.120 and the shoes from Douch (Dunand 1992, pl. 90 [1, 2-4]) are more or less intermediate between the shoe with upright full upper and the shoes with a flexible upper. Unfortunately, the context is disturbed, leading to uncertain date, but for one a Roman date is suggested (Dunand 1992, 33). If these shoes are indeed younger than those presented here, but older

[35] *Cf.* sewn sandals in Veldmeijer (in press [a]; in press [b]).

[36] For example, Alfano 1987. Iconography is beyond the scope of the present paper and will be dealt with in a later phase of the AEFP. But see Veldmeijer (in press [a]).

[37] An explanation for this absence for leather shoes might be related to chariotry, see Veldmeijer (2009b).

than the ones from Ismant el-Kharab (3rd-4th century AD) mentioned by Bowen (2002, 101) and Qasr Ibrim, which are dated to 400 AD or later, it might be that the flexible upper shoes evolved from the upright upper shoes (see also Veldmeijer in press [d]).

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I am grateful to the Supreme Council of Antiquities, Zahi Hawass and Wafaa el-Saddik for permission to access the footwear collection in the Egyptian Museum Cairo. I thank the authorities of the Egyptian Museum Cairo (Mokhtar Abdu, Nariman Abd El Fatah Azab, Ibrahim Abdel Gwad, Samaa Ahmed Ali, Abeia Elshamy, Hala Hassan, Nesma Ismail, Zienab Tawfik) for their kind help. I also thank the authorities of the various other collections, which allowed me to study the material under their care: Ägyptisches Museum und Papyrussammlung (Berlin), Ashmolean Museum (Oxford), British Museum (London), Metropolitan Museum of Art (New York), Museo Egizio (Turin), Museum of Fine Arts (Boston), National Museum of Antiquities (Leiden), National Museums of Scotland (Edinburgh), Oriental Institute Museum (Chicago), Petrie Museum of Egyptian Archaeology (UCL, London), Roemer- und Pelizaeus-Museum (Hildesheim), Sammlung des Ägyptologischen Instituts der Universität (Heidelberg), and the World Museum (Liverpool). The Netherlands-Flemish Institute Cairo (NVIC) is acknowledged for their invaluable help. I am indebted to many people for their kind help and collaboration in various ways: Julie Anderson, Celine Beauchamp, Giovanni Bergamini, Tony Brandon, Gary Brown, Caroline R. Cartwright, Alan J. Clapham, Ashley Cooke, Subhadra Das, Denise Doxey, Dina Faltings, Claudia Farias, Klaus Finneiser, Elizabeth Goring, Fredrik Hagen, Hugh Kilmister, Nicole Kloth, Lesley-Ann Liddiard, Barbara Magen, Frank Marohn, Stephen Quirke, Maarten J. Raven, Bettina Schmitz, Jeffrey Spencer, Raymond D. Tindel, Eleni Vassilika and Helen Whitehouse. Furthermore, I thank Adri 't Hooft and Erno Endenburg for the photography. Endenburg is also thanked for his technical drawings and assistance in the field. I am grateful to Carol van Driel-Murray for useful discussions on footwear. I thank the British Museum and Vivian Davies for financially supporting the photographing of the footwear collection in the British Museum. The Michela Schiff Giorgini Foundation, The Netherlands Organization for Scientific Research (NWO) and Fam. J. Endenburg (Texel, The Netherlands) has partially funded this research.

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Table 1: Summary of the most important features and measurements of fibre open shoes.
Measurements taken from a photograph
* Average measurements
All measurements are of the shoes as preserved. In pairs, measurements are taken of the best preserved one. Measurements of the waist have not been included, unless the specimen's waist is (distinctly) constricted. Since the shoes do not have a constricted waist, the measurement of the width of the shoe at the attachment of the back straps is referred to as 'waist'; it includes the attachment of the back strap. The width at the front is measured at the end of the upper. The height of the anterior part of the upper is measured just before it tapers into the pointed front end. In Type C, the upper is of the same height throughout.

Shoe	Provenance	Date	Orientation	Sole length	Sole width (front)	Sole width (waist)	Sole width (heel)	Sole width (strips insole)	Sole width (strips treadsole)	Sole thickness	Insole decorated?	Midsole layers	Treadsole reinforced?	Sewn edge rows	Reinforced?	Upper height	Upper length	Upper width strips (outer layer)	Upper width strips (inner layer)	Layers	Outer layer decorated?	Strap complex diameter	Back strap diameter	Front strap diameter	Remarks
Partial upper, extended toe																									
Ashmolean Museum 1887.2721	-	-	Right	370	80		62.5	app. 18	18	5.7	Y	-	N	1	N	38.5	-	2	15.5 (avg)	2	Y	-	5.1	-	-
British Museum EA 4464	-	-	Pair	960	6.4		88.2	16	16	app. 9.4	Y	3	Y?	1	N	68	655	2	-	4	Y	-	8.5	-	Measurements of the left shoe. Treadsole largely lost. Length of the front strap slit: app. 100.
British Museum EA 55410	-	Roman?	Pair	575	87.5		68.8	17 (avg)	18	6	Y	1?	Y	1	N	-	-	-	-	2?	Y	5.5	-	-	Decorated cover of dorsal surface toe area. Measurements of the left shoe. Length sole until start extended toe: app. 320.
Egyptian Museum SR 5234 (13/1/26/5)	-	-	Pair	480	57.8		71.4	app. 18.5	11.2-19	5.8	Y	1+	N	1	N	14.8-40	-	2	-	3?	Y	4	-	-	Measurements of right shoe. In pristine condition: no damage/wear. Note the textile remains, which seems accidental.

Shoe	Provenance	Date	Orientation	Sole length	Sole width (front)	Sole width (waist)	Sole width (heel)	Sole width (strips insole)	Sole width (strips treadsole)	Sole thickness	Insole decorated?	Midsole layers	Treadsole reinforced?	Sewn edge rows	Reinforced?	Upper height	Upper length	Upper width strips (outer layer)	Upper width strips (inner layer)	Layers	Outer layer decorated?	Strap complex diameter	Back strap diameter	Front strap diameter	Remarks
Egyptian Museum JE 30606 (SR 5204)	Thebes	-	Pair	530	88.4		75.6	10.6-18.9	9.9-18.9	5.9	Y	1?	N	1	N	52.7	-	2	-	3?	Y	4.5	-	-	Measurements of right shoe. Remnant of leather at the treadsole of the right: additional sole layer? Regarding the width of the strips of the insole: measured at the curled toe, where the strips are widest; measurements of the strips of the sole proper not possible due to the intact upper. Measurements without the overlap (see text). Regarding sole thickness: the measurements include the edge, which is slightly thicker than the rest of the sole.
Turin 6509	-	-	Left	845	11.4		93.5	7.7-18.5	10.4-22.6	46.5	Y	At least 1	N	2	Y	38.5	-	1.5	11.7	3	Y	8	-	-	Note the decorated cover of the dorsal surface of the curled toe.
Turin 6510	-	-	Pair	-	73.9		68.6	7-15.4	-	14.9	Y	At least 1	Y	1	Y	36	-	10.4-17	-	3	N	-	-	-	Note the low upper.
Leiden AU 11 & 12	-	-	Pair	530	91.5		69	11-25	12.5-20	9.5	Y	At least 1	N	1	N	39	-	2.5	15	4	Y	-	-	-	Measurements or the right shoe. Additional number: E20bis Mon. E.XI.34. Decorated cover of dorsal surface toe (cf. insole).
Hildesheim 1646	-	-	Pair	530	101.2		83.9	9.8-15.5	17.0-22.5	6	Y	At least 1	Y	1	N	49.5	-	6.6-15	16	3?	N	6.2	-	-	Measurements of the right shoe. Length sole app. 280. Back straps inserted in sole.

Shoe	Provenance	Date	Orientation	Sole length	Sole width (front)	Sole width (waist)	Sole width (heel)	Sole width (strips insole)	Sole width (strips treadsole)	Sole thickness	Insole decorated?	Midsole layers	Treadsole reinforced?	Sewn edge rows	Reinforced?	Upper height	Upper length	Upper width strips (outer layer)	Upper width strips (inner layer)	Layers	Outer layer decorated?	Strap complex diameter	Back strap diameter	Front strap diameter	Remarks
Partial upper, short toe																									
Berlin 6992.1	Thebes?	-	Left	165	60		58.2	app. 10.5	10.5	6.9	N?	1?	Y	1	N	app. 45	-	2	14.5	4	Y	-	-	-	Measurements of the height of the heel includes the sole. Much worn. Additional number: Z-346.
Berlin 6992.2	Thebes?	-	Right?	app. 275	-		-	app. 10.5	app. 10.5	-	Y	-	-	-	-	40	-	2	14.5	4	Y	-	-	-	Part of upper. Orientation on acceptance it is indeed a pair with 6992.1. Z-346.
Ashmolean Museum 1922.85	-	-	Left	330	100.6		72.8	17	18	6.6	Y	1+	Y	1	Y	52	-	app. 12-22	-	2	Y	-	-	-	Measurements of the height of the heel includes the sole. The curled toe is covered.
British Museum EA 4459	-	-	Pair	290	100.6		72.7	11.5	-	9.2	Y		Y	1?	Y	41.5	-	24	app. 11-23	5?	N	-	6.6	-	Measurements of the left shoe. Treadsole largely lost. Slightly shaped sole. Much damaged and worn. At least several midsole layers.
British Museum EA 4460	-	-	See remarks	270	84.9		69.3	3.5	11.5	9.2	Y	3+	Y	1	Y	44	-	3.5	-	5	Y	-	5	-	Slightly worn. Position front strap suggests right, but shape sole suggests left: mistake?
British Museum EA 4461	-	-	Left	270	92		85.2	10	app. 10	8.5	Y	3+	Y	1	Y	47.5	-	9.5-21.7	-	5?	Y	-	7.8	-	Much damaged. Slightly worn?
British Museum EA 4463	-	New Kingdom?	Right	260	81.4		61.8	12 (avg)	19	6	Y	1+	Y	1	Y	37	-	12	-	3?	N	-	4.5	5	Lining of upper much worn due to use. Upper secured with stitches at right angle to sole. Measurement height of the heel of the upper is excluding the sole. Dirt adheres to treadsole.

Shoe	Provenance	Date	Orientation	Sole length	Sole width (front)	Sole width (waist)	Sole width (heel)	Sole width (strips insole)	Sole width (strips treadsole)	Sole thickness	Insole decorated?	Midsole layers	Treadsole reinforced?	Sewn edge rows	Reinforced?	Upper height	Upper length	Upper width strips (outer layer)	Upper width strips (inner layer)	Layers	Outer layer decorated?	Strap complex diameter	Back strap diameter	Front strap diameter	Remarks
British Museum EA 36203	-	New Kingdom?	Right	235	62		48.5	4.5	-	6	Y	2?		-	-	34	-	3.3	3.3	3?	N	-	-	6.3	All layers of the upper are made of the same fabric.
British Museum EA 36204	-	-	Pair	340	94.5	72	69	18.5	16	8.1	Y	?	Y	2	Y	33	-	1	9	4	Y	-	-	-	Highly shaped sole. Well made.
Leiden AU 10	-	-	Pair	220	73	66	69	15.5	8	10.5	Y	At least 1	Y	1	Y	28	-	6-9	app. 12	3?	N	6	-	-	Additional number: E23 Mm. E.XI. 37. LA119a. Unclear how often the plaited fabric of the sole is folded. Plaited fabric of upper folded lengthwise at least once. Worn and repaired.
National Museums of Scotland 1886.366	-	-	Left	300	92	-	80	10-16	app. 10	12	Y	At least 1	Y	1	Y	47	-	9.3-12	9.3-12	2	N	-	-	-	Upper is very low. Measurement of the height of the heel including the sole.
Oriental Institute 7189	Fayum	Ptolemaic-Roman	See remarks	335	73.6	-	89.3	19.8-24.5	9-17.7	-	Y	At least 1	N	1	Y	-	-	2 (warps and wefts)	app. 17	2	Y	-	3.2	-	The toe is missing: classification uncertain but likely. The shape of the sole seems to indicate left but position of the front strap right.
Full upper																									
Berlin AM 18448	Elephantine	-	Right	143	61.1	-	52	app. 14	10.5	5.9	Y	1?	Y	1	Y?	35.8	-	app. 10	-	2	N	-	5	-	Upper secured with stitches at right angle to sole.

Shoe	Provenance	Date	Orientation	Sole length	Sole width (front)	Sole width (waist)	Sole width (heel)	Sole width (strips insole)	Sole width (strips treadsole)	Sole thickness	Insole decorated?	Midsole layers	Treadsole reinforced?	Sewn edge rows	Reinforced?	Upper height	Upper length	Upper width strips (outer layer)	Upper width strips (inner layer)	Layers	Outer layer decorated?	Strap complex diameter	Back strap diameter	Front strap diameter	Remarks
British Museum EA 4462	-	-	Left	225	70	-	47.7	5.5	-	16.2	Y	2?		?	-	41	-	3.5	app. 5	2	N	-	7	-	Fabric of insole comparable to lining of upper but strips are wider. Treadsole covered with leather. Diameter of strings treadsole: app. 3.5/5.2 but badly visible due to black substance that covers the sole.
British Museum EA 36217	-	-	Pair	130	49.2	-	37.6	2.5	-	5.7	Y	2?		0?	-	26.6	-	2.3	2.3	2	N	2.8	-		Treadsole is woven cordage. Edge sole obscured by treadsole. Back straps insert between upper and treadsole (perhaps also insole?). Upper secured with stitches at right angle to sole.
British Museum EA 68227	Saqqara	-	Left	320	124	104	93	7.5	-	14.1	Y	1?		1	Y?	33.5	-	10	10	3	Y	-	6.3	11	Reinforcement of the treadsole with braids; no stitching. Dirt at treadsole. Slightly worn.
Leiden F 1942/ 12.3 & 4	-	-	Pair	273	103.2	-	85.5	5.5-11.3	22	11.2	Y	1		1	Y	36-41	-	3	15	2	N	4.9	-	-	Measurements of the right shoe. The treadsole is reinforced with braids, not with sewing. Note the thick edge.
National Museums of Scotland 1956.120	-	Late Period?	Left	265	70	-	54	-	-	12.8	Y	At least 1		?	?	51	-	-	-	2?	N	-	-	2.7/2	Treadsole is woven cordage. Upper secured with stitches at right angle to sole. Height of the heel is including the sole. Note the square, slightly notched front. 'Y'-strap.

Shoe	Provenance	Date	Orientation	Sole length	Sole width (front)	Sole width (waist)	Sole width (heel)	Sole width (strips insole)	Sole width (strips treadsole)	Sole thickness	Insole decorated?	Midsole layers	Treadsole reinforced?	Sewn edge rows	Reinforced?	Upper height	Upper length	Upper width strips (outer layer)	Upper width strips (inner layer)	Layers	Outer layer decorated?	Strap complex diameter	Back strap diameter	Front strap diameter	Remarks
Petrie UC 30544	-	Dynasty 30 /Ptolemaic	Left	315	114	-	109	-	-	-		1?	Y	1	Y	app. 40	-	-	-	3	Y	-	6.4/ 3.6	10.7/ 4.1	Straps made of cordage; cordage treadsole. Note waddle of palm fibre at heel, sewn with strips, as repair.
Petrie UC 30839	Saqqara II. Sector I. Temple debris (according to label)	Late Period	?	330	app. 97	-	85	-	-	-	Y	1?	Y?	1	Y	app. 40	-	app. 15	app. 15	3	Y	app. 5	-	-	Much worn. Back straps inserted in sole. Width strips sole layers not measurable.
Liverpool 1969.112.41	Saqqara	Late Period	Left	300	117.5	-	92	-	-	12.8	Y	At least 1	Y	1	Y	36.8	-	3.5	3.5	3	Y	-	4.3	-	Worn.
Inidentifiable																									
Berlin AM 26551	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42.4	160	-	-	-	-	-	-	-	Piece of upper. Thickness upper: 7.1.
British Museum EA 26930	-	-	Left	240	99.8	-	78.2	15	20	6.4	Y	At least 1	Y	2	Y	39.4	-	12	10	2	Y	-	-	app. 4	Tip of toe is missing.



Fig.1 [a]: Partial upper, short toe. Left shoe Berlin AM 6992.1 in lateral, dorsal, medial and ventral view respectively. Note the decorative outer layer of the upper as well as the reinforcement stitches on the sole. Photography by E. Endenburg. Courtesy of the Ägyptisches Museum und Papyrussammlung Berlin. Scale bar in cm.



Fig.1 [b]: Partial upper, short toe. The pair Leiden AU 10 in dorsal and ventral view respectively. Note the folding of the heel as well as the heavily reinforced ventral surface of the sole. Photography by E. Endenburg. Courtesy of the National Museum of Antiquities, Leiden. Scale bar in cm.



Fig. 1[c]: Partial upper, short toe. Right shoe British Museum EA 4463 in ventral, dorsal and lateral view respectively. The arrow points to the reinforcement stitches of the edge. Photography by A. 't Hooft. Courtesy of the British Museum, London. Scale bar in cm.



Fig. 1 [d]: Partial upper, short toe. Right shoe British Museum EA 36203 in ventral view to show the cordage treadsole that is covered with 'melted' leather(?). Photography by A. 't Hooft. Courtesy of the British Museum, London. Scale bar in cm.



Fig. 2 [a]: Partial upper, extended toe. Left shoe Turin 6509 in dorsal, medial and anterior views respectively. Note the reinforcing stitches on the edge. Photography by E. Endenburg. Courtesy of the Museo Egizio, Turin. Scale bar in cm.



Fig. 2 [b]: Partial upper, extended toe. The pair Museo Egizio 6510 in dorsal view, the left one in lateral and anterior view. Photography by E. Endenburg. Courtesy of the Museo Egizio, Turin. Scale bar in cm.



Fig. 2 [c]: Partial upper, extended toe. The pair British Museum EA 4464 in dorsal and ventral view respectively. Photography by A. 't Hooft. Courtesy of the British Museum, London.



Fig. 2 [d]: Partial upper, extended toe. The pair British Museum EA 55410 in dorsal and ventral view respectively. Photography by A. 't Hooft. Courtesy of the British Museum, London. Scale bar in cm.



Fig. 2[e]: Partial upper, extended toe. Leiden AU 11/12 in dorsal view. Courtesy of the National Museum of Antiquities, Leiden. Photographyby E. Endenburg. Scale bar in cm.

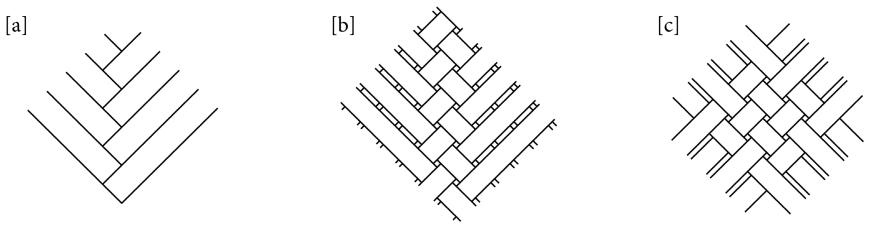


Fig. 3: The different decorative insoles in the partial upper open shoes in sequence of number of occurrence.
[a] The strips are positioned at each half of the length of the sandal diagonally and run over each other in the middle (see fig. 2 [d])
[b] As [a] but here the strips are plaited ones, forming a decorative pattern lengthwise down the centre (see fig. 2 [a]).
[c] Plaited 'over one, under one' fabric (see fig. 2 [c]). Sometimes this plaiting is done diagonally rather than at right angle (see fig. 2 [b]). Not to scale. Drawings by E. Endenburg.

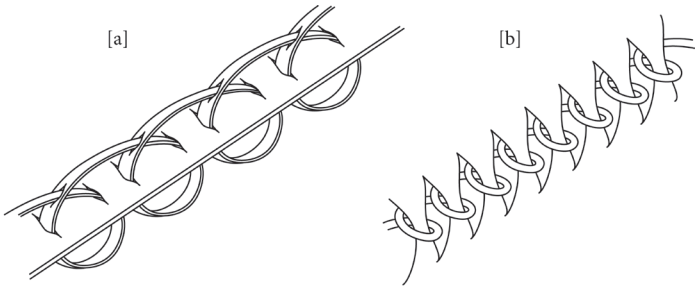


Fig. 4: Stitching in fibre open shoes.
[a] The stitches that are used for sewing the sole as well as for reinforcement of the edge in fibre open shoes are the same as used for this purpose in sewn-edge plaited sandals.
[b] Liverpool 1969.112.41; another type of stitches are used to reinforce the edge, though noted only in this example
Not to scale. Drawing by E. Endenburg/A.J. Veldmeijer.

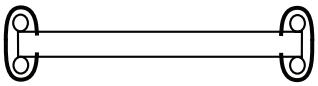


Fig. 5 [a]: The edge of the sole in fibre open shoes consist of two cores that sandwich the sole and is secured by sewing with a palm leaf strip. Sometimes a second core is attached. Cf. sewn sandals. The edges of the upper is in most specimens constructed as the sole's edge.

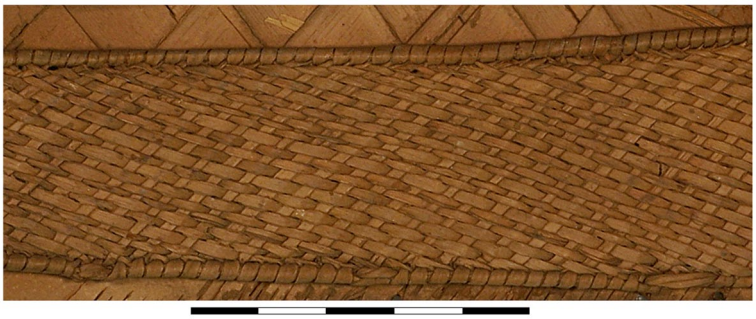


Fig. 5 [b]: Often the outer layer of the upper in partial upper shoes is decoratively woven. Detail of Oriental Institute E7189. Photography by E. Endenburg. Courtesy of the Oriental Institute Museum Chicago. Scale bar is 10 mm.

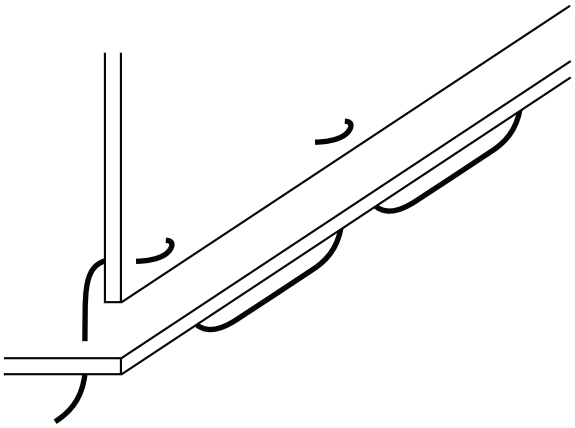


Fig. 5 [c]: The upper is attached to the sole with running stitches. Usually these appear short at the upper but long at the ventral surface of the treadsole. Not to scale. Drawing by E. Endenburg/A.J. Veldmeijer.



Fig. 6 [a]: Full, upright upper. Right shoe Berlin AM 18448 in medial, dorsal, lateral, ventral and posterior view respectively. Note the way that the upper is attached to the sole (arrow); in contrast to the usual construction, here it is only secured with stitches at right angle (cf. Fig. 5 [c]). Photography by E. Endenburg. Courtesy of the Ägyptisches Museum und Papyrussammlung Berlin. Scale bar in cm.



Fig. 6 [b]: Full, upright upper. Left shoe British Museum EA 4462 in dorsal and ventral view respectively. Note the curvature and the additional leather layer. Photography by A. 't Hooft. Courtesy of the British Museum, London. Scale bar in cm.



Fig. 6 [c]: Full, upright upper. Left shoe British Museum EA 68227 in dorsal and ventral view respectively. Note the braids at the treadsole. Photography by A. 't Hooft. Courtesy of the British Museum, London. Scale bar in cm.



Fig. 6 [d]: Full, upright upper. Pair British Museum EA 36217 in ventral view to show the cordage treadsole. Photography by A. 't Hooft. Courtesy of the British Museum, London. Scale bar in cm.

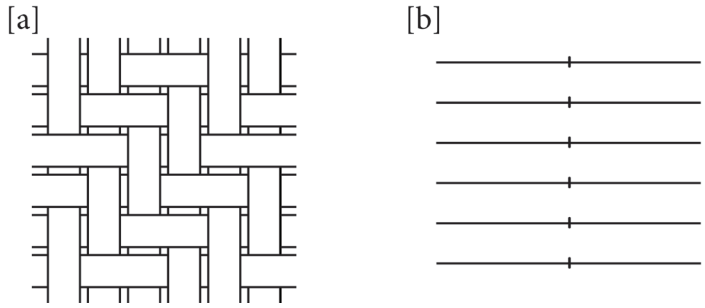


Fig. 7: Decorative insole in full upper open shoes.
[a] Elaborately plaited 'over two, under two, shift one' fabric (see Fig. 6 [b]).
[b] Transversely placed strips, which are secured with tiny stitches at the edge (see Fig. 6 [a]). Here, the strips slightly overlap. Not to scale. Drawings by E. Endenburg.