

Copper and Trade in the South–Eastern Mediterranean

Trade routes of the Near East in Antiquity

Edited by

Karolina Rosińska-Balik
Agnieszka Ochał-Czarnowicz
Marcin Czarnowicz
Joanna Dębowska-Ludwin



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Adzes in the Early Dynastic Period and the Old Kingdom

Martin Odler

Abstract: *This paper examines adzes in written and iconographic sources, together with archaeological material from the Predynastic period to the end of the Old Kingdom in ancient Egypt. Four emic categories of ancient Egyptian adzes, ḥn.t, msḥt.jw nw3 are dšr.t are defined. The relationship between the tools, model tools and their expression of social status and social relations is herein studied in detail. It is argued that Old Kingdom models are multi-layered symbols of the patron-craftsman dependence. The adzes and model adze blades are products of attached craft specialization and indicate a high level of standardization.*

Keywords: adze; morphology and chronology; Early Dynastic period; Old Kingdom; archaeological semiotics; attached craft specialisation

<i>In memoriam</i> Ján Midžiak the first Slovak Egyptologist
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Introduction

Adzes were among the most preferred tools of ancient Egyptian craftsmen. They were used for cutting and planing of the surface of wood and stone. An adze is one of the basic forms of tool, with “*cutting edge perpendicular to the long axis of the shaft*” (BARHAM 2013, 182). In the classification of LEROI-GOURHAN (1943, 48-50, 58) an adze is a tool of “*percussion oblique lancée*” – “*sidelong percussion by a blow*”. The experiments of STOCKS (2003) provided some interesting practical conclusions about the efficiency of the tool materials. Copper alloy tools (such as adzes) were effective in the working of wood, soft limestone, red sandstone, gypsum and soapstone, i.e. the materials with a hardness equal to or less than Degree 3 on the Mohs scale. Other stones are worked more effectively with flint and chert tools.

Ancient Egyptian adzes have been studied as tools from the point of view of typology and chronology (PETRIE 1917, 16-17, Pls XV-XVII) and their distinction from axes (KÜHNERT-EGGEBRECHT 1969, 7-8), from the point of view of iconography and use (DRENKHAN 1976, 118-119). Yet there is no monograph or longer paper focused on Ancient Egyptian adzes only. There are even some incorrect determinations of adze blades in the Early Dynastic and Old Kingdom archaeological material. Adze blades have been called spatulas (e. g. in KREJČÍ ET AL. 2008, 125); broad chisels (WEEKS 1994, 80) or chisels

(MESSIHA & MESSIHA 1964, 214, KROEPER & WILDUNG 2000, 114-121; DREYER 2006, 109, Abb. 16b; KREJČÍ ET AL. 2008, 123). Old Kingdom model tools are determined as surgical tools by Egyptian archaeologists.¹ Among these alleged “surgical tools”, which are simply common Old Kingdom model tool blades, are also adze blades.

All of these determinations are unfounded and I will use available sources in the semiotic triangle of meaning to define securely the name and shape of the adze blade and haft in ancient Egyptian material culture. It will be done in order to prevent further incorrect determinations of the object and to correctly interpret a selected group of artefacts and their iconographic representations in Egyptian art and script. This paper is focused on adzes in the Predynastic, Early Dynastic period and the Old Kingdom. The determination of these adzes will serve for a detailed evaluation and explanation of all available sources in these periods.

Semiotic Definition of an Adze

Ancient Egyptian evidence could be in some cases ordered into the semiotic triangle of meaning, where the identity of the referent (object), its symbol or representation (model or depiction) and the reference – the name of the artefact could be matched.² This is particularly useful in the study of material culture and in the correct determination of artefacts. Explanation of their cultural context, which

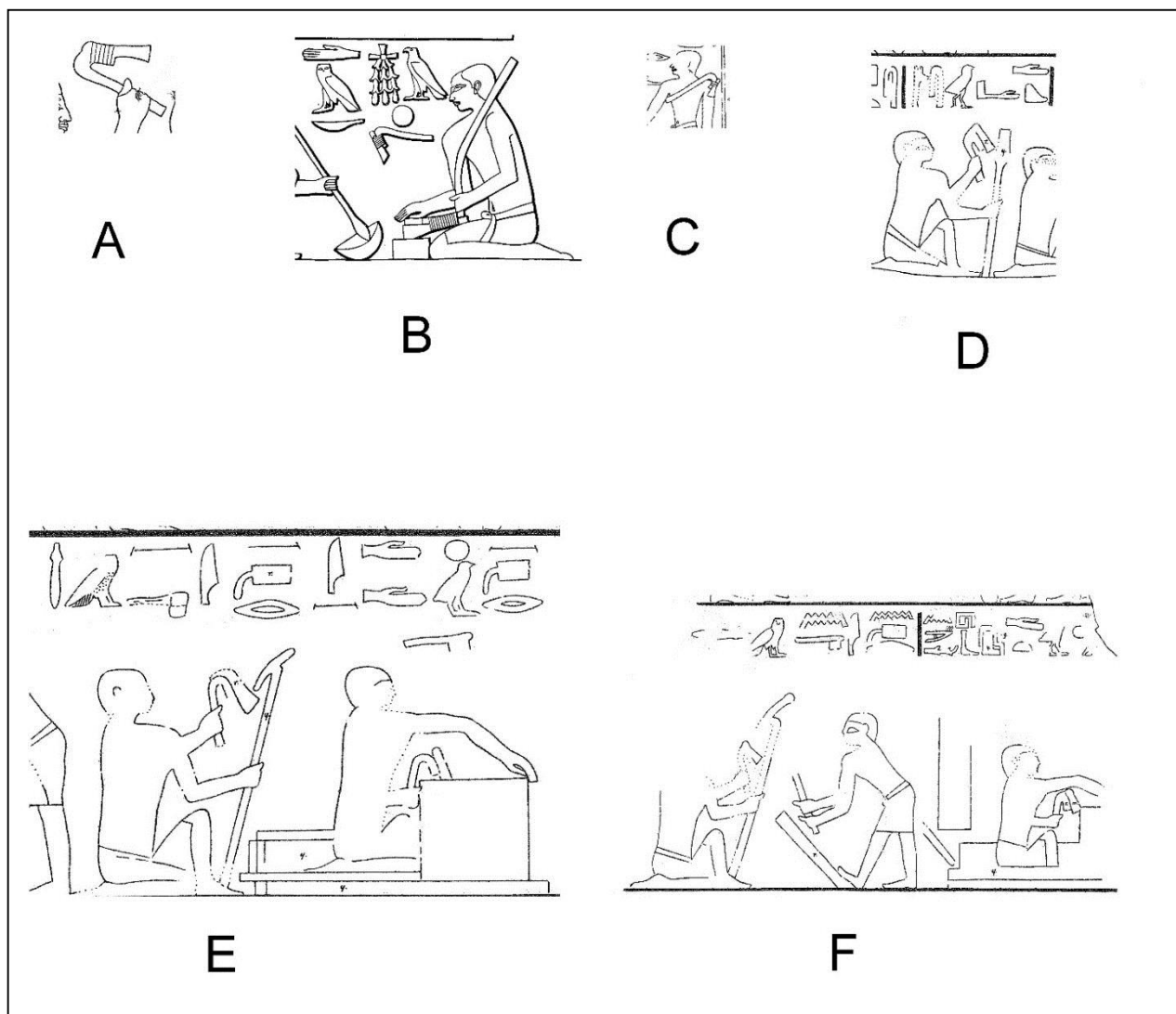


Figure 1. Compound depictions of adzes from the Old Kingdom: 1.A. sculptsors' workshop (see Table 2, Scene 18, detail); 1.B. metalworkers' workshop, sharpening of the *mshtjw* adze (after Table 2, Scene 23, detail); 1.C. carpenter Qar in the tomb of Ihy (after Table 2, Scene no. 24, detail); 1.D. shipwrights' workshop, planing of the mast (after Table 2, Scene no. 32, detail); 1.E. carpenters' workshop, planing of the was-scepter and carrying chair (after Table 2, Scene no. 29, detail); 1.F. carpenters' workshop, planing of the was-scepter and carrying chair (after Table 2, Scene no. 31, detail)

could be aptly called the semiosis of an artefact, will be developed later in this paper on the example of adzes in the Early Dynastic period and the Old Kingdom. Thus, it will focus only on a selected chronological range in the Egyptian culture in order to avoid anachronistic conclusions. The form and the contents of the words changes through time, but it could be argued and it will be demonstrated that in the case of tools the name and the concepts behind the tool change more slowly than the archaeological typology of the tool. The relation of the written and iconographic sources to the archaeological material could be thus established, if the sources are present.

Old Kingdom artists/craftsmen could choose between the profile depiction of a whole object, or the profile depiction of a haft and the frontal depiction of an adze blade. The identity of the artefact parts, copper blade and wooden haft, is proven by these compound depictions of adzes in

the Old Kingdom iconography and palaeography (Fig. 1).³ The metal objects, often incorrectly determined in the past, are adze blades.

Three-dimensional examples of adzes in ancient Egyptian art are even rarer, except for Dynasty 3 statue of Ankhua, discussed later. The First Intermediate period and the Middle Kingdom wooden and copper model carpenter workshops also contained adzes, e.g. the workshop model found in the tomb of Meketre in Thebes (WINLOCK 1955, Pls 68-69). These models are, however, beyond the chronological scope of this article, as are the ubiquitous complete adzes and adze models found in the foundation deposits from the Middle Kingdom onwards (WEINSTEIN 1973). SCHÄFER (2002, 107, Fig. 62-63) in his fundamental work about ancient Egyptian art cited one Middle Kingdom example of the compound depiction of adze (called by him mistakenly as "hoe"). It has to be shown, however, that Old Kingdom sources alone provide

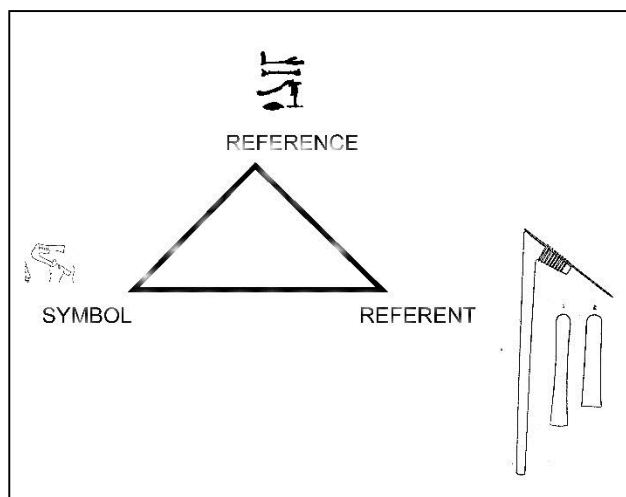


Figure 2. Semiotic triangle with a possible definition of *an.t* adzes (triangle after ECO 1979, 59, adzes after EMERY 1949, Fig. 19, depiction of adze from the Scene no. 18 in Table 2, the hieroglyphs after no. iv, Table 1; drawn by M. Odler)

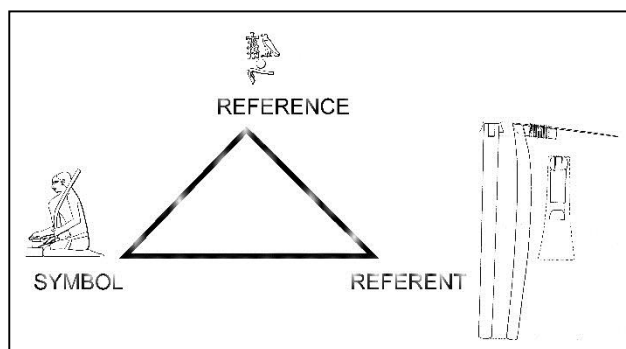


Figure 3. Semiotic triangle with a definition of *msht.jw* adzes (triangle after ECO 1979, 59, adzes after EMERY 1949, Fig. 20, depiction of adze and hieroglyphs after Table 2, Scene 23; drawn by M. Odler)

the definition of an adze and that a secure determination of Old Kingdom adze blades and hafts is possible.

Detailed determinations and definitions of the emic categories are limited by the available sources. There are four terms for adzes in Early Dynastic and Old Kingdom sources. The most common word is *an.t* (Fig. 2; HANNIG 2003, 271). It is most probably the most frequent adze blade with rounded butt, present also by the compound depictions in iconographic sources and hieroglyphic signs. However, there is only a single depiction of the adze, named *an.t* with phonetic complements, in Meir, where the adze is depicted only from the profile (Table 2, Scene No. 30).⁴

The situation is slightly better in the case of the term *msht.jw*. The word *msht.jw* was included in the offering list of the tools on the sarcophagus of Prince Minkhaf. One scene from the causeway of the pyramid of Wenis (Table 2, Scene No. 23), where the sharpened adze blade has a distinctly flat butt, enables a hypothesis that the word *msht.jw* denoted in the ancient Egyptian language an adze blade with a flat or very slightly curved butt. It is therefore, besides *an.t*, another term of the original emic classification of the ancient Egyptian craftsmen (Fig. 3).

The shape of hafts of both emic categories is different too and was perceived by the Old Kingdom Egyptians, what can be discerned on the determinatives on the sarcophagus of Minkhaf (Fig. 4.iii, ix). This term also has specific religious connotations, as it was used as well for the constellation of *Ursa maior*, which according to the Old Kingdom Egyptians was the celestial adze (HANNIG 2003, 564).⁵ This term is translated and interpreted incorrectly by MARAVELIA (2006, 510) as «la Hache» – «the Axe».

The second term with religious connotations is *nw3*, an adze of the god Upuaut, used in the Opening of the Mouth ritual (HANNIG 2003, 605). There are two *loci* in the Pyramid texts. One has to probably be read as *nw3-(Wp-w3.wt?)* – *msht.jw*, (later shortened to *nw3* in the ancient Egyptian language), another as *nw3* (Table 1, Nos xi, xv). The available sources from the Early Dynastic period and the Old Kingdom and their wider social context will be discussed in detail in following chapters.

Big shipwright adze was most probably called *dšr.t* in the Old Kingdom. This interpretation was proposed by JONES (1986, with references) on the basis of inscriptions in Old Kingdom shipwright scenes and this is thus the fourth term used for adzes in this period, named – according to Jones – metaphorically after the similarity of this tool shape to the flamingo.

Written Sources

Written sources, which have preserved the name of an adze, are mostly so called offering lists, specific listings of funerary offerings for the deceased (BARTA 1963). Copper tools were a marginal part of these lists; there are only four examples left (Table 1, Nos i-iv; Fig. 4). The offering lists contained mostly food and beverages.

The earliest list with tools was found in Helwan, carved on a funerary relief slab made of white limestone. It belonged to carpenter Wabkhenemu and is dated to Dynasty 3 (Table 1, No. i). This is the only evidence of a possible direct connection between the profession of the tomb owner and the listed offerings. However, there are other funerary slabs of sculptors and carpenters in Helwan and none of them contained tools. This slab is the only evidence of tool names for the Early Dynastic period. The name of the adze is amended because some of the signs were erased on the surface, and only a sign for the copper/metal, part of the sign *ṛ* and the determinative (most probably an adze blade, according to the photograph the butt ending is unclear) are preserved.

Two other lists are dated to Dynasty 4. A loose limestone block from the tomb of Isi was found (Table 1, No. ii). The tomb has not been located; it could be situated either in Giza or in Saqqara (JØRGENSEN 1996, 48-49). Isi was *jm.j-ṛṛ pr-hd* – «overseer of the Treasury», a place, where copper, among other materials, could be stockpiled in the Old Kingdom by the royal administration (STRUDWICK 1985, 284; EICHLER 1993, 281-284; DESPLANCQUES

No.	Site	Source	Transliteration	Translation	Reference
i	Helwan	The slab stela of Wabkhenemu	<i>ʕ(n.t)</i>	adze	KÖHLER & JONES 2009, 46, 148-149
ii	Giza/ Saqqara	Loose block from the tomb of Isi	<i>ʕn.t 1000</i>	one thousand adzes	MOGENSEN 1930, 89-90, Pl. XCIII: A 672; JØRGENSEN 1996, 51
iii	Giza	The sarcophagus of Minkhaf	<i>ʕn.t 1000</i>	one thousand adzes	SMITH 1933, 153-154. Pl. XXIV
iv	Giza	The tomb of Kaiemankh	<i>ʕn.t 1000</i>	one thousand adzes	Table 2, Scene No. 28
v	Meir	Tomb-Chapel A, no. 2, Room A: North wall, west end, register 4	<i>dm ʕn.t</i>	the sharpening of an adze	Table 2, Scene No. 30
vi	Saqqara	Chapel	<i>ndr m ʕnt/msht.jw</i>	the planing with adze	Table 2, Scene No. 17
vii	Saqqara	Texts of the pyramid of Wenis, PT (Sp 258) 311c	<i>nw.tj</i>	Unis will spend the day and night pacifying the two (contestants with) adzes in Hermopolis.	HANNIG 2003, 271; ALLEN 2005, 48; CARRIER 2009-2010, 126-127
viii	Saqqara	Texts of the pyramid of Teti, PT (Sp 258) 311c	<i>nw.tj</i>	This Teti will spend the day and night with this Teti releasing the two (contestants with) adzes in Hermopolis.	ALLEN 2005, 79
ix	Giza	The sarcophagus of Minkhaf	<i>msht.jw 1000</i>	one thousand adzes	SMITH 1933, 153-154. Pl. XXIV
x	Saqqara	Causeway of the pyramid of Wenis	<i>dm msht.jw</i>	the sharpening of an adze	Table 2, Scene No. 23
xi	Saqqara	Texts of the pyramid of Wenis, PT (Sp 21) 13c	<i>nw3-(Wp-w3.wt?)-msht.jw</i>	adze	HANNIG 2003, 564, 605
xii	Saqqara	Texts of the pyramid of Pepy II, PT (Sp 21) 13c	<i>nw3-(Wp-w3.wt?)-msht.jw</i>	Horus has parted your mouth for you and parted your eyes for you with the god's booth adze, with the Great of Magic adze with which the mouth of every god of the Nile Valley has been parted.	ALLEN 2005, 261, N299; CARRIER 2009-2010, 1244-1245
xiii	Saqqara	Texts of the pyramid of Pepy II, PT (Sp 21), 14a	<i>msht.jw</i>	Ho, Pepi Neferkare!] Your mouth has been parted with Anubis's adze, the metal Striker that parted the mouth of the gods.	ALLEN 2005, 252; CARRIER 2009-2010, 1246-1247
xiv	Saqqara	Texts of the pyramid of Merenre, PT (Sp 619), 1747a	<i>Nw3 wr</i>	Raise yourself, Nemtiemzaf Merenre! Raise yourself, you of the great adze!	SETHE 1910, 419, 1747a; ALLEN 2005, 325; CARRIER 2009-2010, 2088-2089
xv	Saqqara	Texts of the pyramid of Pepy II, PT (Sp 619), 1747a	<i>Nw3 wr</i>	great adze	SETHE 1910, 419, 1747a
xvi	Saqqara	Texts of the pyramid of Pepy I, PT (Sp 540), 1329c	<i>dw3-Wr</i>	Your mouth has been parted by the great one of the morning in the Enclosure of God.	SETHE 1910, 237, 1329c; ALLEN 2005, 171

Table 1. List of written sources containing adzes from the Early Dynastic period and the Old Kingdom

2006). This is a possible indirect connection to the copper tools in the offering list.⁶

The granite sarcophagus of Prince Minkhaf was found in the northern shaft of Mastaba G 7430+7440 and it contains the offering list on the outer side. The tools are chiselled out on the northern outer wall, in the third column (Table 1, Nos iii, ix). Among them are 1000 *msht.jw*-adzes⁷ and 1000 *ʕn.t*-adzes. The tool offerings might be associated with the title of Minkhaf “overseer of all works of the king”, which was the highest title in the hierarchy of the titles connected with the work for the king (KREJČÍ 2000) and this could be a connection to the tool offerings.⁸

Tomb G 4561 of Kaiemankh is situated in Giza, in the Western cemetery. It is usually dated to Dynasty 6, but KANAWATI (2001, 15-18) has argued for the dating of the

tomb to Dynasty 5, most probably in the reign of Djedkare Isesi. This tomb had a painted burial chamber, and among the motives on the west wall are the magazines belonging to the owner of the tomb (KANAWATI 2001, 38-41). One of the depicted magazines contained tools, among them “1000 adzes”, together with precious oils, incense and furniture (Table 1, No. iv). These magazines were set in the Afterlife, their structure and contents were based on the real magazines.⁹ Two titles of the tomb owner are again connected with the treasury, *shd jrj(w)-iht (nt) pr-hd* – «superintendent of custodians of property of the treasury» and *shd pr-hd* – «superintendent of the treasury».

The names of adzes were inscribed in the workshop scenes (Table 1, Nos v-vi); in Meir (tomb of Pepyankh) and Saqqara (the tomb of Ty and the causeway of the Wenis

pyramid). They have preserved both terms for adzes, *ʿn.t* and *msht.jw*. The signs in the tomb of Ty are traditionally read *ʿn.t*, but without a phonetic complement, the reading *msht.jw* is as well possible. The sharpening of an adze in Tomb of Mereruka (KANAWATI ET AL. 2010, Pl. 74) is too fragmentary to provide certain reading.

The *loci* in the Pyramid Texts, containing adzes, have in some cases uncertain reading. The words in Spell 21, Verse 13c are to be read *nw3-(Wp-w3.wt) - msht.jw bi3*, «metal adze», the adze is perhaps described by two names (Table 1, No. xi, xii). The *locus* was transcribed incorrectly by CARRIER (2009-2010, 1244-1245). The *locus* in Verse 14a in this spell (Table 1, No. xiii) has to be read as *m Stš (n) msht.jw bi3* – «by the metal adze of Seth» and is again transcribed incorrectly by CARRIER (2009-2010, 1246-1247).

The words in Spell 258 in the pyramid of Wenis (Table 1, No. vii) were written as two adze-signs with a stroke. They could be read as logograms, either as *ʿn.wt* or as *msht.jw* (Sp 258, 311c; SETHE 1908, 169). The text in the pyramid of Teti (Table 1, No. viii) was frequently read *nw.tj* because of the phonetic complements *nw* and *t*, but this passage could be as well read as *ʿn.wt* «adzes».

The adze in Spell 619, in the pyramid of Merenre (Table 1, No. xv), is named as *nw3* and the Great Adze probably refers to the constellation *Ursa maior*. This could also be the meaning of the *locus* in Spell 540, where the words *dw3-Wr* «Great One of the morning» are interpreted by ALLEN (2005, 171) as referring to an adze.

An adze is the only artisan tool attested in the Old Kingdom version of the Opening of Mouth ritual in these texts. The emic categories of *nw3* and *msht.jw* are sometimes interchangeable or named at once. New Kingdom lists of this ritual include more artisan tools (BARTA 1963, 129-134) and part of the ritual is an activity of craftsmen (THEIS 2011, 88-89). It is most probably later addition; tools appear in foundation deposits, connected with the Opening of Mouth of buildings, only from Dynasty 11 (WEINSTEIN 1973) and it will be argued that a connection to artisan work is more probable in the case of the Old Kingdom model adze blades in the burial equipment.

Iconographic and Palaeographic Sources

The Iconography of Adzes

Iconographic sources of working with adzes were collected by DRENKHAHN (1976, 118-119). She has concentrated on the tools used and objects worked and I will not repeat the information available in her work, but there were also some archaeological issues of the topic left untouched.¹⁰

Adzes have appeared in the workshops of carpenters, shipwrights, and sculptors (Table 2). Most frequently they appear in the carpenter workshops (14 scenes from Dynasty 4 to Dynasty 6), in the scenes from ship building (8 scenes from Dynasty 4 to Dynasty 6). Scenes Nos 4 and 10 were found without inscriptions and it is unclear if the objects worked are made of stone or wood. The context of the workshop is missing on the loose block, Scene No. 34.

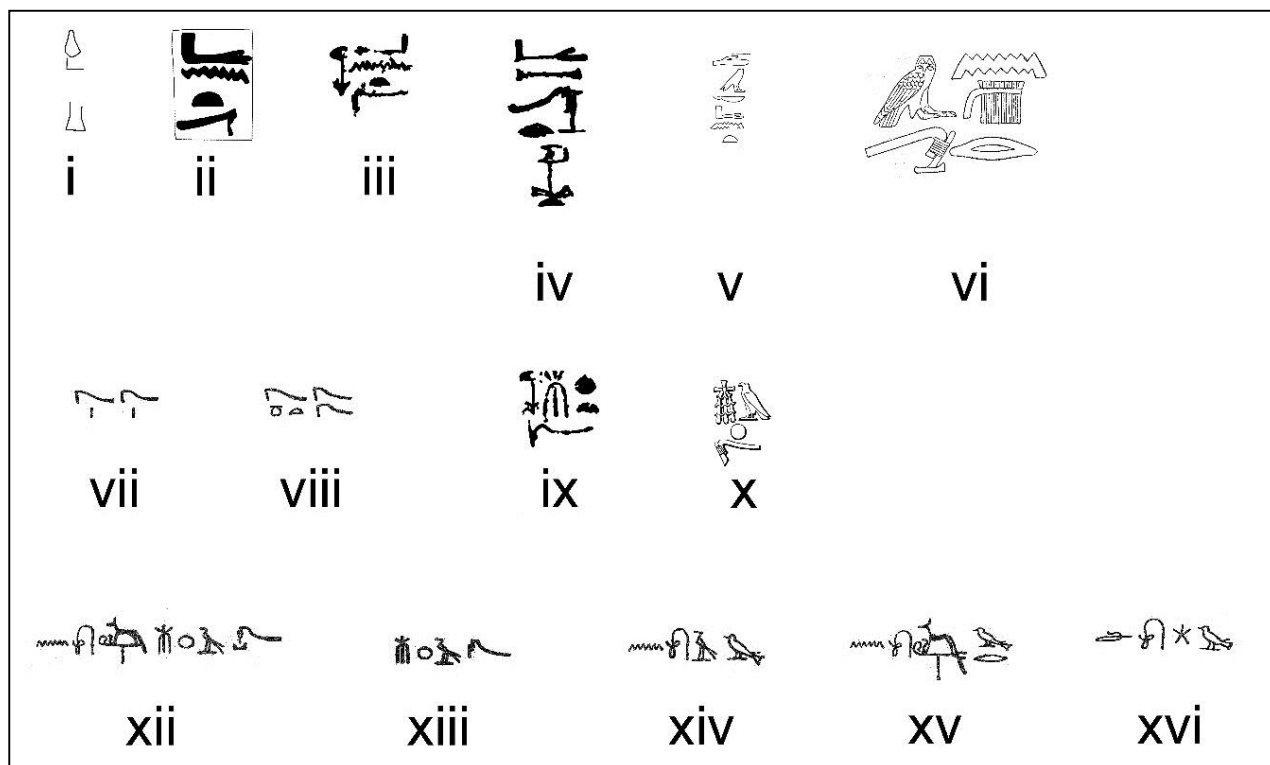


Figure 4. Adzes in written sources (the sources of drawings are listed in the Table 1; drawn by M. Odler, M. Kobierská)

Adzes rarely appear in the scenes from the sculptors' workshops (2 scenes from Dynasty 5 tombs of Ptahshepses and Ty),¹¹ lumberjack work (Table 2, Scene No. 9 from slightly earlier period in Dynasty 5, but the tree trunk or wood-working is also part of the ship building scenes in Nos 17, 22, 28) and the workshop of the spear- and bow-makers (Table 2, Scene No. 21 from Dynasty 5).

Adzes are depicted either from a profile or less frequently as a compound depiction, when the artists distinguished the blades, binding and haft; in one case, the binding was depicted with some kind of adhesive (Table 2, Scene No. 30). Adzes are depicted as compound or profile objects even in a single tomb (e.g. in the tomb of Ty, Table 2, Scenes Nos 17-19; Fig. 1A) and, again in Scene No. 30, the three adze representations are slightly different: one has a profile depiction with the distinction of the blade, binding, some kind of adhesive and haft, while another adze is a profile depiction with a distinction of the parts and the last one is depicted as a contour drawing only.

Egyptian artists sometimes made clear the size differences of adzes, beginning with small tools held in one hand, while other hand held the worked object (e.g. in Scene No. 20, but examples are numerous) and ending with large adzes of shipwrights, held in both hands and used to plane the boards of ships (e.g. in the early Dynasty 4 tombs in Meydum, Table 2, Scenes Nos 1 and 2). This is connected with the posture of the depicted craftsmen, who could be either standing (first depicted in Meydum, Table 2, Scene No. 1), kneeling (for the first time depicted in Meydum, Table 2, Scene No. 2), or crouching (for the first time depicted in Giza, Table 2, Scene No. 4). The adzes were usually depicted as held in the right hand; the only frequent exception is the sharpening of the blade, when the adze is held in the left hand while the main action was performed with the right hand (e. g. in Table 2, scene No. 23; Fig. 1B).

Working with an adze is denoted by the verb *nDr* (HANNIG 2003, 689) and a few complementing words, describing either the tool used or the object worked. The objects made and their accompanying texts were examined in detail by DRENKHAN (1976, 97-127).

The frequency of the adze depictions might be loosely connected with their use in real life and corroborates the results of the experiments of Stocks, that adzes were used primarily for soft materials, i.e. mainly wood¹² (most frequently in the scenes with carpenters and shipwrights, Scene No. 17 contained 16 adzes, Scene No. 22 from the weapon workshop contained 12 adzes). This frequency is perhaps rather associated with the choice of the artist and most scenes include one, two or three adzes. Adzes were not an obligatory part of the workshop scenes; there are examples of carpenter and shipwright scenes representing only the use of axes and chisels (Tomb of Khuenre - HAMPSON 2012, Figs 3-4). The absence of adzes was again probably caused by the intention of the artist and the selection of the suitable elements from the possible

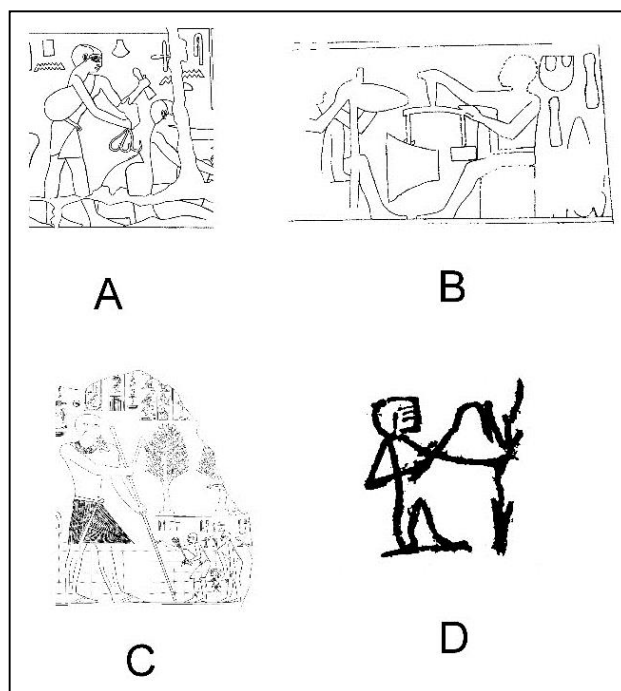


Figure 5. Peculiar depictions of adzes in Old Kingdom iconographic sources: 5.A. market scene with an exchange of an adze blade and a bundle of fish-hooks (see Table 2, Scene No. 15, detail); 5.B. metallurgists' workshop with its products, an axe blade and two adze blades (see Table 2, Scene No. 23, detail); 5.C. king Sahure using an adze (see Table 2, Scene No. 5, detail); 5.D. painted sketch of a lumberjack using an adze (see Table 2, Scene No. 28, detail)

repertoire and content of the workshop scene. The craftsman painted in the burial chamber of Kaiemankh (Table 2, Scene No. 23; Fig. 3D) reveals how Old Kingdom artists were capable of sketching an action with a few strokes of the brush. The scenes in the tombs were at least initially based on the observation of real craftsmen in action.

Scene No. 28 is interesting from another point as well. The wall inscription has a title "*whr(.t) hr h'w*" – «The shipyard and the fleet» and contains a list of ships with unrealistic numbers. Under the list are the sketches of a metalworker and two lumberjacks/carpenters. The scene is accompanied with an inscription "*hmw.t n(j)t K3=i-k3*" (sic!) – «the workshop of Kaiemankh». The sketches thus depict the shipyard of Kaiemankh with professions needed to build ships. This whole scene had meaning for the Afterlife and ship-building is even included in the later Coffin Texts (MATHIEU 2006, 157-159). But the concept was based on the attached craft specialization in real life and adzes as tools were part of this context. A thousand adzes in his magazine are in all probability destined for this shipyard in the Afterlife and other tasks for craftsmen. There are some peculiar depictions of adzes in the Old Kingdom sources (Fig. 5). The scenes from the metallurgical workshops also often contained their products (SCHEEL 1985), most frequently vessels.

Scene no.	Structure	Site	Dating	Dating Linacre College, Oxford (2006)	Craft	Location in tomb	Bibliography
1	Tomb of Atet	Meydum		Dynasty IV, Middle Snefru	shipwrights	south wall of the niche, registers 1-2	PETRIE 1892, 26-27, Pl. xxv; HARPUR 2001, 87- 88, 93, 201, Fig. 87, Pl. 36.
2	Tomb of Rahotep	Meydum		Dynasty IV, Late Snefru	shipwrights	east wall of the hall, register 1	PETRIE 1892, 23, 37, Pl. xi; HARPUR 2001, 102, 113, 206-208, Fig. 94, Pls 44, 47-49
3	Tomb of Khuenre MQ 1	Giza	Dynasty 4, late [HAMPSON]	Dynasty IV, Menkaure	carpenters	chapel, east wall, register 5	HAMPSON 2012, fig. 6-8
4	G 7530 tomb of Meresankh III	Giza	4th Dynasty, the reign of Khafre [CALLENDER]	Dynasty IV, Shepseskaf	stoneworkers? , carpenters	Main Room, east wall, register 4	DUNHAM & SIMPSON 1974, 12, Pls iii, v, Fig. 5
5	Pyramid complex of Sahure	Abusir	Dynasty 5, the reign of Sahure			SC/south/2003/0 7	AWADY 2009, 160-161, pl. 5
6	Pyramid complex of Sahure	Abusir	Dynasty 5, the reign of Sahure			SC/south/2003/0 6	AWADY 2009, 172, Pl. 6
7	Tomb of Sekhemkara	Giza		Dynasty V, Sahure	shipwrights	first room in the chapel, southern wall, register 1	HASSAN 1943, 103-123, Fig. 57
8	Tomb of Tepemankh	Saqqara		Dynasty V, Neferefre to Neuserre?	carpenters	corridor, east wall	SMITH 1942, 516-517, fig. 6
9	Tomb of Nefer and Kahai	Saqqara		Dynasty V, Neuserre	lumberjacks	chapel, east wall, register 3-4	MOUSSA & ALTENMÜLLER 1971, 27, Pl. 20-21; LASHIEN 2013, 37, Pls 35-36, 83
10	Tomb of Khafkhufu II (G 7150)	Giza		Dynasty V, Neuserre		chapel reliefs, west wall, register 4	SIMPSON 1978, 26, Pl. xlv, Fig. 50
11	Tomb of Ptahshepses	Abusir	Dynasty 5, latter part of the reign of Niuserre [KREJČÍ]	Dynasty V, Neuserre to Menkauhor	sculptors	room 4, east wall, register 1	VERNER 1986, 47-51, Ph. 41-42, Pl. 26
12	Tomb of Ptahshepses	Abusir	Dynasty 5, latter part of the reign of Niuserre [KREJČÍ]	Dynasty V, Neuserre to Menkauhor	carpenters	room 4, east wall, register 4	VERNER 1986, 59, ph. 41, 43, pl. 28
13	Tomb G6020 of Iymery	Giza		Dynasty V, Neuserre	carpenters	first chamber, south wall, registers 1-2	WEEKS 1994, 33-35, fig. 30
14	Tomb of Niankhnun and Khnumhotep	Saqqara		Dynasty V, Late Neuserre to Menkauhor	shipwrights	"Torraum", north wall, register 2	MOUSSA & ALTENMÜLLER 1977, 27, Pls 18-23
15	Tomb of Niankhnun and Khnumhotep	Saqqara		Dynasty V, Late Neuserre to Menkauhor	market scene	"Torraum", north wall, lower relief field, registers 2- 4	MOUSSA & ALTENMÜLLER 1977, 81-85, Taf. 24, 27
16	Tomb G8882 of Wepemnefret	Giza	Dynasty 5, middle to late [PORTER - Moss]	Dynasty V, Neuserre to Djedkare?	carpenters	chapel, eastern wall, register 3	HASSAN 1936, 195-197, Fig. 219
17	Tomb of Ty	Saqqara		Dynasty V, Menkauhor to Early Djedkare	shipwrights	chapel, east wall	WILD 1953, Pls xcvi-xcvii, cxxxviii-cxxxix
18	Tomb of Ty	Saqqara		Dynasty V, Menkauhor to Early Djedkare	sculptors	chapel, south wall	WILD 1966, Pls cxlvi, clxxiii-clxxiv

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19	Tomb of Ty	Saqqara		Dynasty V, Menkauhor to Early Djedkare	carpenters	chapel, south wall	WILD 1966, Pls cxlvi, clxxiv
20	Tomb of Kaemrehu	Giza	Dynasty 5, the reign of Niuserre [SCHEEL]	Dynasty V, Djedkare	carpenters	wall D, register 4	MOGENSEN 1921, 39-40, Fig. 38, Pl. viii
21	Tomb of Khunes	Zawyet el-Maiyetin		Dynasty V, Djedkare to Unis?	weapon makers		LEPSIUS 1902, Abb. 108
22	Tomb of Khunes	Zawyet el-Maiyetin		Dynasty V, Djedkare to Unis?	shipwrights		LEPSIUS 1902, Abb. 108
23	Causeway of the pyramid of Wenis	Saqqara	Dynasty 5, the reign of Wenis		metalworkers	loose block	HASSAN 1938, Pl. XCVI
24	Tomb of Ihy (Idut)	Saqqara		Dynasty V, Unis, re-used Dynasty VI, Teti to Early Pepy I?	carpenters	room VIII, west wall, register 1	KANAWATI & ABDER-RAZIQ 2003, 51, Pl. 61
25	Tomb of Inti	Deshasheh	Dynasty 6 [SCHEEL]	Dynasty V, Unis to Dynasty VI, Teti?	metalworkers	east wall, southern half, register 3	PETRIE 1898, 8, Pl. XIII; SCHEEL 1985, 121; KANAWATI & MCFARLANE 1993
26	Tomb of Mereruka	Saqqara		Dynasty VI, Middle Teti	shipwrights	room A13, north wall, west of statue niche, east section, register 1	KANAWATI ET AL. 2010, Pl. 74; DUELL 1938, Pl. 152
27	Tomb of Mereruka	Saqqara		Dynasty VI, Middle Teti	carpenters	room A3, east wall, register 3	KANAWATI ET AL. 2010, Pl. 74; DUELL 1938, Pls 29-31
28	Tomb of Kaiemankh	Giza	Dynasty 6 [JUNKER], Dynasty 5, the reign of Djedkare	Dynasty VI, Teti	shipwrights	burial chamber, west wall	JUNKER 1940, Taf. IX-X
29	Tomb of Ibi	Deir el-Gebrawi	Dynasty 6, the reign of Pepy II [SCHEEL]	Dynasty VI, Pepy II, Years 1-17	carpenters	chapel, north wall, east side, register 2	DAVIES 1902, 19, Pls xiii, xiv
30	Tomb of Pepiankh, called Heny, The Black	Meir	Dynasty 6, the reign of Pepy II or later [SCHEEL]	Dynasty VI, Pepy II, Years 1-54	carpenters	Tomb-Chapel A, no. 2, Room A: north wall, west end, registers 2-5	BLACKMAN & APTED 1953, 27-28, Pls. xviii-xix
31	Tomb of Djau, called Semai	Deir el-Gebrawi	Dynasty 6, middle, the reign of Pepy II or later [SCHEEL]	Dynasty VI, Pepy II, Years 18-34	carpenters	chapel, north wall, east side, registers 2-4	DAVIES 1902, 10-11, Pl. x
32	Tomb of Djau, called Semai	Deir el-Gebrawi	Dynasty 6, middle, the reign of Pepy II or later [SCHEEL]	Dynasty VI, Pepy II, Years 18-34	shipwrights	chapel, north wall, east side, register 5	DAVIES 1902, 11, Pl. x
33	Tomb of Kahep/Tjeti-Iker	Hawawish	Dynasty 6, about the middle of Pepy II's reign or slightly later [KANAWATI]	Dynasty VI, Pepy II, Years 35-85	carpenters	chapel, south wall, west of entrance, register 2	KANAWATI 1980, 21, Pls 2, 6, fig. 9
34	Tomb of Ptahshepses	Abusir	Dynasty 5-6			loose block	VACHALA 2004, Fragment F138
35	Tomb of Horemhab	Saqqara		Dynasty V-VI	carpenters	loose block	HARPUR 1996, 88-89, pl. 95 - OK 43-45

Table 2. List of workshop and other scenes depicting adzes in the Old Kingdom buildings

There is only one case of a workshop with the metal blades of adzes. It was found in Tomb of Inti in Deshasheh (Table 2, Scene No. 25; Fig. 3B). It contains two blades of necked adzes with rounded butts, one axe blade (discussed by DAVIES 1987, 42) and some more partly damaged and undeterminable representations of objects. The metal vessel is being weighed on the scales in the left part of the scene. This is the only iconographic evidence that adze blades were produced in the same workshops as other tools and vessels. The scene from the metallurgical workshop in the tomb of Serefkai might also contain an adze blade (under the depiction of a metal mirror), but this representation is not very clear and probably rendered incorrectly by the draughtsman (DAVIES 1902, Pl. IV, Register 3).

King Sahure used an adze for the scraping of the bark of a precious tree imported from Punt (Table 2, Scene No. 5; Fig. 3C). One of his unnamed courtiers with the title *smr w^ctj* «sole companion» is standing under the tree and catching the resin drops from the tree with his right hand. The adze is held by the same courtier, now kneeling, in the following scene (Table 2, Scene No. 6).

The adze blade is a part of the market scene transaction in the scene from the tomb of Niankhnum and Khnumhotep in Saqqara (Table 2, Scene No. 15; Fig. 3A). The person is trying to exchange an adze blade and a bundle of three copper fish-hooks, and is denoted by the hieroglyphic sign *hm(.t)* – «metal», which could be read either as an identification of material or as an identification of craftsman, *hm(.tj)* – «metalworker» (HANNIG 2003, 414). Copper is very rare in Old Kingdom market scenes. Apart from this example there are only two more Old Kingdom scenes of the metal objects, in Saqqara, in the tomb of Kagemni, where metal mirror is exchanged (BISSING 1905, Taf. XXIII) and in Abusir, in the tomb of Fetekty (BÁRTA 1998; 2001, Fig. 3.17, west wall). These are the only hints from the Old Kingdom that (parts of) copper artefacts might have been included in the exchange network of the markets.

The tomb of Ihy in Saqqara was later reused by Idut/Seshseshet (KANAWATI & ABDEL-RAZIQ 2003). There are, however, remains of the original scenes in the tomb, e.g. in Room VIII, on the west wall, where *jm.j-r^c fnh(w) w^cbt mhnk=f mr(jj)=f K^cr* – «the overseer of the carpenters of the workshop, his intimate, his beloved, Kar», a person close to the original owner of the tomb, Ihy, is depicted. The carpenter is depicted with an adze on his left shoulder, displayed with a compound depiction of the blade, haft and binding (Table 2, Scene No. 24; Fig. 1C). The professions using adzes might have been depicted with their most important tool and this is a later example of the iconographic pattern, vividly personalised in the Early Dynastic statue of Ankhu.

An Adze in the Statuary

The most interesting depiction of an adze in ancient Egyptian art from the Early Dynastic period has to be discussed separately. It is a red granite statue of Ankhu,



Figure 6. A compound depiction of an adze in a hieroglyphic inscription on the southern wall of the chapel of the Tomb of Inti (Abusir South) (photo by K. Voděra)

dated to Dynasty 3 (SPENCER 1980, 13). Ankhu is shown seated upon a stool and holds an adze in left hand, placed over his shoulder. The adze is rendered with the blade, binding and the haft. Above the left knee on the kilt is a hieroglyphic inscription, reading: *bd.t(y) / (i)r(.y) (i)h(.t) (n)sw / mdh(.w) sm3(.w) / n^ch-w^c(.w)*. The inscription was translated in the corpus of Dynasty 3 inscriptions as: «metalworker / property custodian of the king / shipwright of cmA-ships / Ankhu» (KAHL ET AL. 1995, 222-223). The title property custodian of the king is the most important in this set; it indicates that Ankhu was a courtier at royal court (BÁRTA 1999, 82, 88). He must have resided somewhere in the Memphite area, however, the red granite was imported from Aswan quarries at the 1st Cataract. It was a material of elite significance, provided by the king himself or the royal administration. The adze should be a symbol of the most important profession of Ankhu. The statue belongs to the pre-canonical Egyptian style of statues and the occurrence of work tools is later very rare. The statue shows clearly that the social status of some craftsmen could be rather high in the early Egyptian society (KÖHLER 2008, 392).

The Palaeography of Adzes

The hieroglyphic signs U19, U20 and U21 of Gardiner's hieroglyphic Sign List depict adzes. The signs U19 and U20 have the phonetic value *nw*, interpreted by Gardiner as originating from the dual *nw.tj*: «two adzes» (GARDINER 1969, 518). The sign U21 is an «adze at work on a block of wood», used as a determinative of the word *stp* «to cut up» and by homophony it became a sign with the phonetic value *stp* (GARDINER 1969, 518). These signs were sometimes in the Old Kingdom sources interchanged.

Early Dynastic palaeography was examined in great detail in a monograph published by REGULSKI (2010). The sign U20 appeared for the first time in the reign of Djer, the sign U21 in the reign of Semerkhet,¹³ both in Dynasty 1 (REGULSKI 2010, 195-196, 656). The adze blade of the sign U21 became a distinct part of the sign in Dynasty 2 hieroglyphs. The adze sign is a part of the writing of the title *mdh.w mdh.w^w nsw.t* «chief carpenter of the king» (REGULSKI 2010, 190-191 with further references), e.g. on

the wooden label from the reign of Den (SPENCER 1980, Cat. No. 459, 64, Pl. 49).

The palaeography of Dynasty 4 has been published as well with reference to the signs U19/U20 and U21 (SCHWEITZER 2005, 436). The most elaborate forms of U21 are shown from a profile, e.g. in the tomb of Rahotep

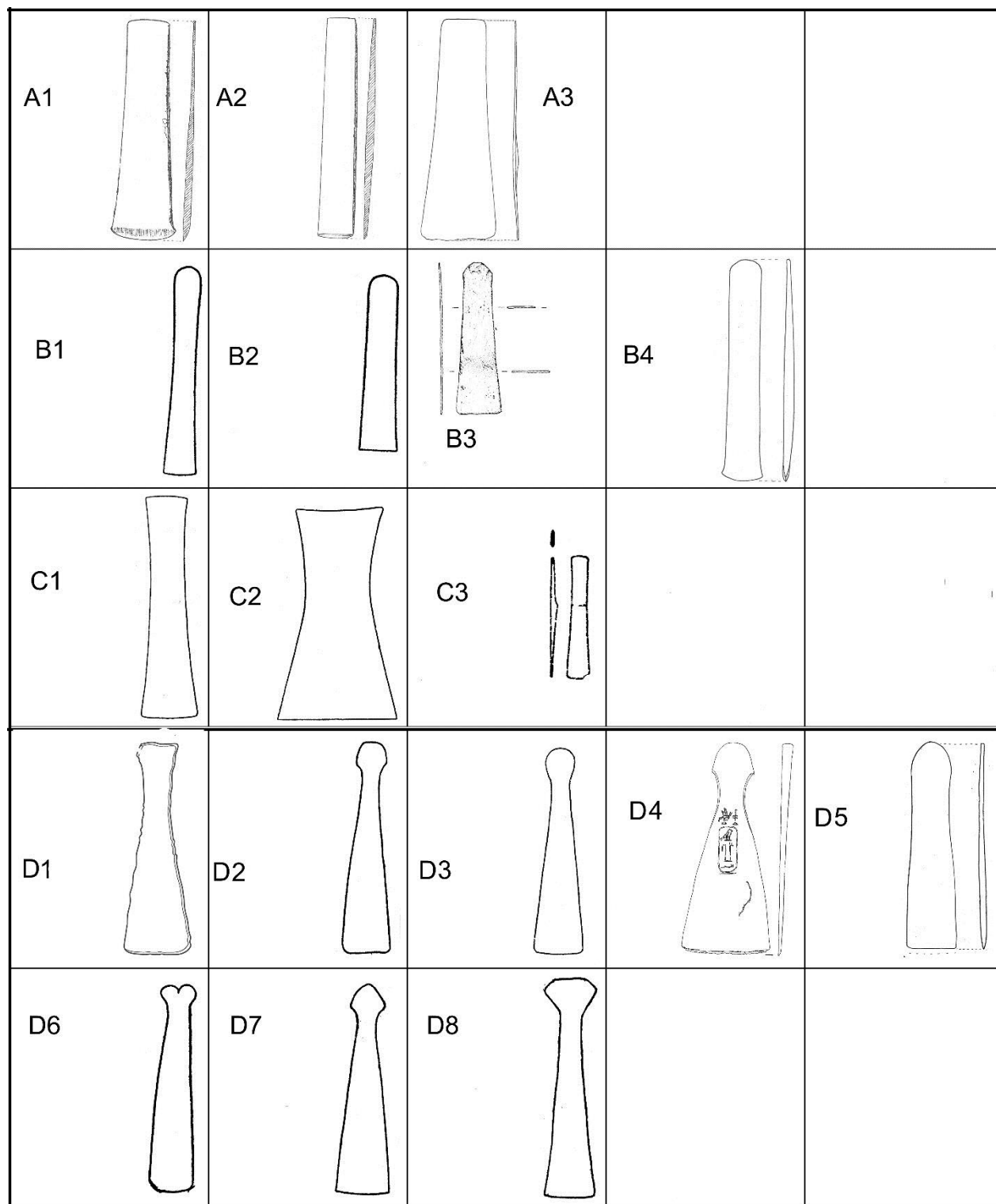


Figure 7. Tentative typology of the adzes in the Predynastic and Early Dynastic period and in the Old Kingdom (drawing without scale; prepared by M. Odler). Variants A1, A2 after PETRIE & QUIBELL (1896, Pl. LXV); Variant A3 after PETRIE (1914, Pl. III: 7); Variants B1, B2 after EMERY (1949, Fig. 19); Variant B3 after DREYER ET AL. (2006, Abb. 16 b); Variant B4 after KLASSENS (1960, Fig. 22); Variants C1 and C2 after EMERY (1949, Fig. 21); Variant C3 after HASSAN (1941, Fig. 217); Variant D1 after BARTA ET AL. (2009, Fig. 6.3.120: 3); Variants D2, D3, D7, D8, D9 after FIRTH & GUNN (1926, Figs. 14, 17); Variant D4 after EA66207, courtesy of the Trustees of the British Museum, drawn by M. Odler, V. Uramová; Variant D5 after GARSTANG (1903, Pl. XXIII: 33)

(HARPUR 2001, Fig. 94) and the tomb of Meresankh III (DUNHAM & SIMPSON 1976, Fig. 6). Palaeography in Dynasties 5 and 6 is a rather demanding task, because the hieroglyphs were not yet fully standardized and many peculiar and regional forms occur. Even the palaeographies of single tombs are published. On the other hand, this non-canonical approach caused that the signs themselves could be important iconographic sources, if they were rendered by proper documentation. Hieroglyphic signs of adzes appeared e.g. in the tomb of Ptahhetep in Saqqara (DAVIES 1900, 30, Pl. XIII, Figs 273, 277, 279) together with adze hafts (ibid., Pl. XIII, Fig. 276). The homophony of the words “adze” and “nail” in Old Egyptian (*ḥn.t*) was probably the reason for this, being that the word “nail” had a determinative depicting an adze (HANNIG 2003, 271). The adze blade was tripled in the Old Kingdom hieroglyphs for the plural word and pun *ḥn.wt* «nails, claws» (DAVIES 1900, 30, Pl. XIII). Adze signs, single and tripled, are in photographs and detailed drawings rendered in the publication of the tomb of Niankhnum and Khnumhotep (MOUSSA & ALTENMÜLLER 1977); the adzes are depicted in profile. The artist in the late Dynasty 6 Tomb of Inti in Abusir South had interchanged the sing U21 for U19 and used a compound depiction of an adze (Fig. 5).

The Artefacts

An Introduction to a Tentative Typology

One important remark has to be expressed before the types are discussed. The quality of the information in excavation reports of Egyptian sites is uneven and the reports rarely offer at least partially sufficient variables describing the artefacts. It could be demonstrated with the example of the Giza reports. JUNKER (1929) published in the first volume of Giza report one plate with copper artefacts, without the data on their provenances. Later reports often contain the drawings and photographs of material at least in the selection, but the published data of the provenances are sometimes unreliable.¹⁴ Deposits found by Hassan are published often *in extenso*, but the reduced scale of the drawings makes the finer details unclear. The shapes of incomplete objects are completed on the basis of one preserved example (cf. Fig. 8.j). Reisner published drawings with scale in his reports, and a later series of monographs on Giza Mastabas offers a substantial amount of data (sometimes incomplete); but complete original documentation can now be accessed online through the Giza Archives.

In comparison with other sites, Old Kingdom metal artefacts have been published in an exemplary way in the excavation reports from Balat (VALLOGGIA 1986; 1998; MINAULT-GOUT & DELEUZE 1992; CASTEL ET AL. 2001; CASTEL & PANTALACCI 2005). Verbal and metric description, drawings and photographs were in the earlier reports (VALLOGGIA 1986; 1998) complemented with the data on the chemical composition of some artefacts (WUTTMANN 1986; 1992).

The examination of adzes and other copper objects has been realized by the author of this paper with funding from the project of the Grant Agency of Charles University (Project No. 526112). The scope of the project is limited in time (from the Predynastic period to the end of Middle Kingdom) and is focused on the artefacts from documented archaeological contexts. The documentation has so far included some of the largest collections of Ancient Egyptian copper artefacts in Europe.¹⁵

The typology of the artefacts is thus dependent on the quality and detail of original publications, and is also limited by the current scope of the project and already documented artefacts, studied in more detail. The typological determination of some artefacts might be changed in the future, according to the availability of the artefacts or the original documentation. Therefore, in the following text, I will focus on the most important assemblages with a selective use of the information from other archaeological contexts. The coefficients of variation and other basic statistical methods will be used to characterize some assemblages, in order to examine the plausibility of defined types and variants.

A detailed documentation of the artefacts is also needed because metal artefacts are products of attached craft specialization in ancient Egyptian society (BRUMFIEL & EARLE 1987, 5-9), where the metal ore was provided from abroad and the metal artefacts were made by the application of specialized craft skills and knowledge (SCHEEL 1985). The coefficients of variation could corroborate the assumption of the specialized products (EERKENS & BETTINGER 2001; WARDEN 2013, 88-89), as well as other methods of quantitative statistical analysis (VAN POOL & LEONARD 2011).

The Tentative Typology of Adzes

The documentation of artefacts will lead in the future to a mathematical description and definition of the types and variants. This is a preliminary and tentative typology based on the documentation of the artefacts as well as published information (Fig. 7).¹⁶

Adze blades were made of copper-base slabs or sheets. Type A of adze blades is a plain adze with a flat butt, appearing in the Predynastic period. The butt is flat or slightly curved, with a sharp division between the butt and sides of the adze. The cutting edge is on the wider side of the artefact, mostly with a single-bevelled edge. Variant A1 has inclining sides, the blade is wider than the butt, Variant A2 has roughly straight sides, Variant A3 has inclining sides, the blade is wider than the butt and there is a distinct “step” in the profile.

Type B of adze blades, plain adzes with rounded butts, appeared in the Early Dynastic period. The butt is rounded and gently expanding up to the cutting edge. The cutting edge is on the wider side of the artefact. The artefact has no apparent neck, but the sides are convex and narrowing in the middle part of the blade. Variants B1 and B2 are ased on the types defined by Emery, Variant B3 are copper

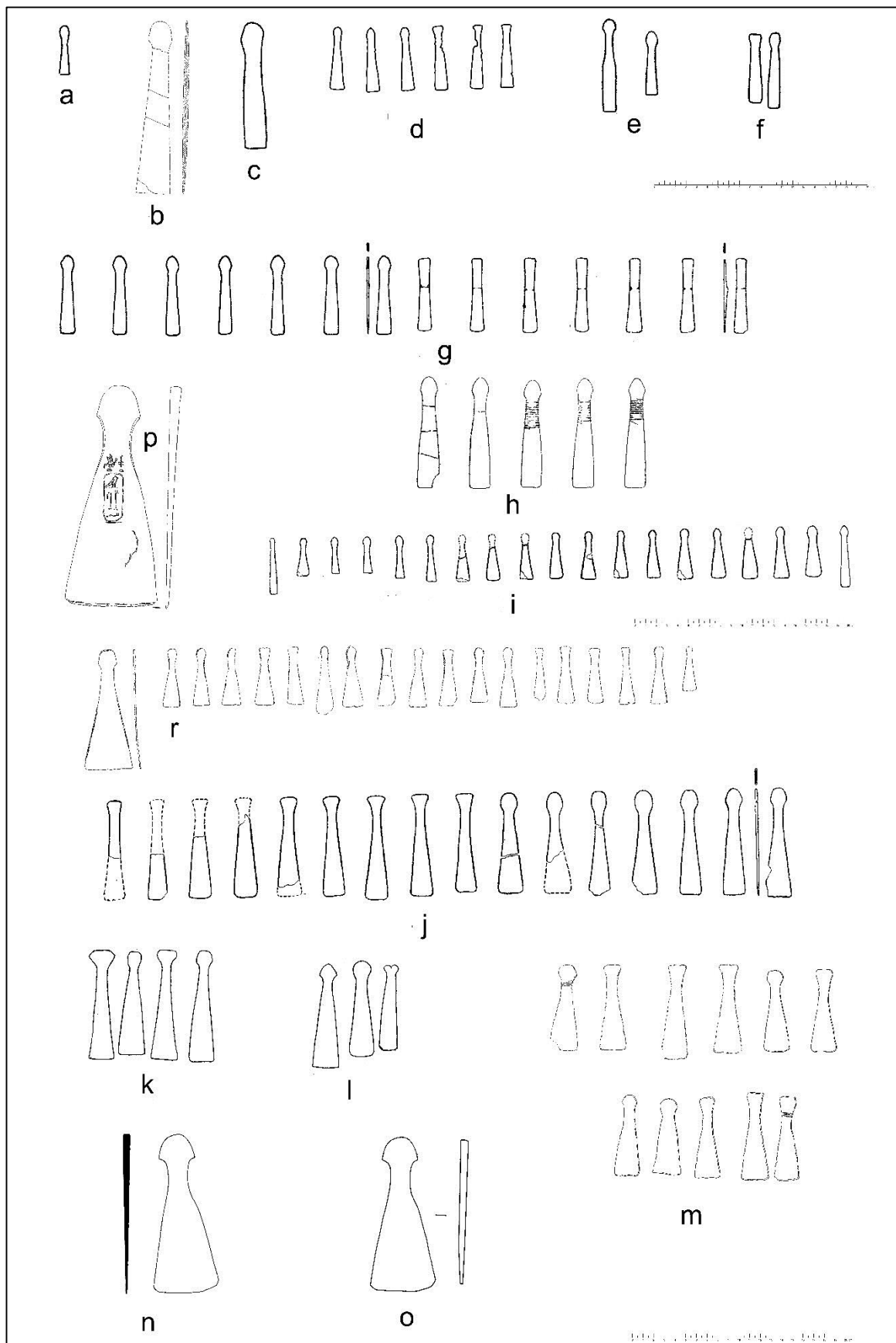


Figure 8. Comparison of selected adze blades from the Old Kingdom (the sources of drawings are listed in Table 3, drawn by M. Odler, M. Kobierská). The adze blades under letter r are drawings of artefacts in the British Museum, inv. nos EA58548 (biggest adze blade) and EA58550_63-80 (smaller adze blades), courtesy of the Trustees of the British Museum, drawn by M. Odler, V. Uramová. The scale has length 20cm

sheet models of the previous variants and Variant B4 has rather straight sides and a rounded butt.

Type C of adze blade, adzes with flat butts and neck in the middle, also appeared in the Early Dynastic period. The butt is flat or very slightly curved; the concave shape of the sides creates the narrowest part in the middle of the artefact. Variants C1 and C2 are based on the definitions of Emery, while Variant C3 is a rare Old Kingdom example of the type with a step similar to Variant A3.

Type D of adze blades, necked adzes with butt, appeared in Dynasty 3 and continued even after the end of Old Kingdom. The butt is rounded and gently expanding up to the cutting edge. There is an apparent neck in one third of the length of the artefact, composed of the two concave sides of the adze. The cutting edge is on the wider side of the artefact. The variants are determined on the basis of the shape of their butts. Variant D1 has flat or slightly convex butt end, Variant D2 has faceted butt. Variant D3 has rounded adze butt and Variant D4 has semi-circular or semi-elliptical connection between the butt corners. Variant D5 is an early form of the necked adze blades from Dynasty 3. Variant D6 has two lobes on the butt; Variant D7 has an angled connection between the butt corners. Variant D8 is a flattened version of Variant D2. The shape of butt has not changed significantly in the Old Kingdom, but the blades widened through time. But it seems that there was no evolution of shapes during the Old Kingdom in one single direction.

Prehistory of an Egyptian Adze

Possible adze blades are present in the lithic assemblages in Egypt and Sudan from the Neolithic period on (HUZAYYIN 1937, 210-211). In the Sudanese Mesolithic and Neolithic, a peculiar shape called a “gauge” and so called axes might have been used as adzes (KOBUSIEWICZ 2011, 285-289, Figs 10-12).¹⁷

The earliest appearance of copper adzes has been dated to Stage IId1 of the Naqada culture, in the cemetery of Naqada (Table 3, No. 1; this adze is now in the Ashmolean Museum, inv. no. 1895.969). Adzes have been found in several archaeological contexts of the Naqada culture, including graves in Abusir el-Melek (BAUMGARTEL 1960, 12), Naqada (BAUMGARTEL 1970, Pls II, XVII, XXVIII), Tarkhan (Table 3, No. 3; PETRIE ET AL. 1913, 23, 9, pl. IV: 12), a settlement in Adaima (NEEDLER 1984, 282, Cat. No. 182) and an unknown context, reportedly from Qena (now in the Ashmolean Museum; CROWFOOT-PAYNE 1993, 147, Fig. 59: 1218).¹⁸ The latest finds of Predynastic adzes are from the cemetery of Minshat Abu Omar in the Eastern Delta, in Grave 173, dated to Dynasty 0 (Table 3, No. 4) and from Tell el-Farkha, Grave 91 (Table 3, No. 5). As was already analysed by ANFINSET (2010, Fig. 6.30), adzes are most frequent in the Naqada cemetery and thus probably indicate the centre of the attached craft specialization in that time. Adzes at other sites are rather marginal finds with respect to their number. A scepter from Tomb U-j in Abydos was interpreted as a ceremonial adze (WENGROW 2006, 202), a comparison with Old Kingdom parallels

might point rather to *hk3*-scepter (BOLSHAKOV 2005, 23-28).

Adzes have been found outside of the coffin at the north end (Tarkhan, Grave 37), in front of the head of the deceased (Tell el-Farkha), in front of the head of the deceased, eastwards from the head (Minshat Abu Omar), clutched in the hand of the deceased (Abusir el-Melek, Grave 14 q9) and in an intact jar in a settlement (Adaima). There is no information about the position of the adze in Grave 30 in Hierakonpolis, but the artefact had the marks of binding to a handle (QUIBELL 1902, 26, pl. XLVIIIb). The adzes in graves were in the close proximity of the body, possibly the tool used by the buried person, and the adze from Tell el-Farkha is described as “used”. Another possible explanation is the interment of any tool not usable at the time of burial. Each of these objects was valuable and it is probable, that the object biographies are different in every case, the chronological connection between the metal objects and other artefacts in the burial equipment might be loose. All preserved adzes belong to Type 1, either Variant 1 or Variant 2, Variant 3 was found in Tarkhan (Grave 1933). Flaring of the edge is scarce; it is present on adze blades from Minshat Abu Omar, Naqada (Grave 39) and Adaima. The length of complete blades is in the range from 143 to 235mm.

Another corpus of copper adzes comes from Nubia, from the graves of the A-group. There were some discussions in the past about the chronological position of the A group, but C₁₄ data from terminal A-group graves corroborate its dating to the 4th Millennium BC (STEVENSON 2012). Larger copper objects appear in the Classic to Terminal A-group and were thus contemporary to the use of copper on a larger scale in the Naqada culture. Adzes have been found in ten archaeological contexts, at the sites of Qustul (two adzes in one grave; Table 3, No. 6), Sayala (three adzes in one grave; Table 3, No. 7), Koshtamna (FIRTH 1912, 191-192, 194, fig. 69; pl. 38, c, 1, 8), Kubaniya (JUNKER 1919, 116, Taf. XXXIX), Halfa Degheim (two adzes in two graves; (NORDSTRÖM 1972, 199-200, 206, Pl. 106: 28-A1, 113: 47-2), Faras (GRIFFITH 1921, 9-10), Debeira (NORDSTRÖM 1972, 154-155, Pls 73: 9, 10; 193: 1), cemetery No. 205 from the survey of Emery (EMERY & KIRWAN 1935, 353, fig. 348: 1) and the settlement of Meris Markos. They have been found associated in the graves of one or two adult individuals, in three cases determined as male (in Halfa Degheim and Cemetery 205).

Adzes have been found over the head, edge pointing behind it (Faras, Grave 11), behind the head (Debeira), in front of the head (Koshtamna, Grave 647 - FIRTH 1912, 191-192, fig. 169; pl. 38, c, 1),¹⁹ near the hands of the deceased (Cemetery 205, Halfa Degheim - Grave 47) and near the chest (Halfa Degheim – Grave 28, Burial A). Adze blade has been found in the settlement of Meris Markos over the Fireplace No. 306 (REISNER 1910, 216, pl. 65b6). Finds from Qustul and Sayala remained in robbed tombs. Junker does not provide information about the position of the blade in Kubaniya in Grave P193. All preserved adze blades belong to Type A, either Variant A1 or Variant A2. Except of one adze blade from Qustul all had edge without

No.	Site	Feature	Owner	Dating [author]	Number of adzes	Variants	Reference	Fig. 8
1	Naqada	Grave 39		Naqada IId1 [Crowfoot-Payne]	1	A1	CROWFOOT-PAYNE 1992, 188; 1993, 146-147, Fig. 59: 1217	
2	Tarkhan	Grave 1015		SD 77 [Petrie], Dynasty 1 [adze morphology, Variant B2]	2	A1, B2	PETRIE ET AL. 1913, 23, 8, pl. V: 26-8, VI: 7-9	
3	Tarkhan	Grave 1933		SD 78 [Petrie]	1	A3	PETRIE 1914, 9, pl. I, III: 7	
4	Minshat Abu Omar	Grave 173		Dynasty 0, MAO III [Kroeper - Wildung]	1	A2	KROEPER & WILDUNG 2000, 114-121	
5	Tell el-Farkha	Grave 91		Dynasty 0, Naqada IIIB [Czarnowicz]	1	A2	CZARNOWICZ 2012a, 345, Fig. 2: 2	
6	Qustul	Grave W 11		transition to late group A [Williams]	2	A1, A2	WILLIAMS 1989, 39, 63, fig. 27c-f, pl. 36a-d, 37a-d	
7	Sayala	Cemetery 137, Grave 1		A group	3	A1	FIRTH 1927, 207-8, pl. 22: b 8-10	
8	Saqqara	Tomb 3471	<i>sbk-htp ?</i>	Dynasty 1, the reign of Djer [Emery]	160	A1, B1, B2, C1, C2	EMERY 1949, 18-57	
9	Abydos	Tomb of Khasekhemwy	<i>h^c-sh^m-wj</i>	Dynasty 2, the reign of Khasekhemwy	unknown	A1, B3	PETRIE 1901, 12-13, 28, 38-40, pl. XLV: 65-80; pl. IXA	
10	Bet Khallaf	Tomb K1	unknown	Dynasty 3, the reign of Djoser [Garstang]	11	A1, B2, D5	GARSTANG 1903, 10, pl. XVI	
11	Bet Khallaf	Tomb K4	unknown	Dynasty 3, the reign of Djoser [Garstang]	1	D5	GARSTANG 1902, 18, pl. XXIII: 33	
12	Giza	G 4610	unknown	Dynasty 4, the reign of Khufu - Khafre [Reisner, János]; Dynasty 5-6 [types of models]	1	D3	REISNER 1942, 521, fig. 323	a
13	Giza	G 7530-7540	<i>mr=s-^cnh</i>	Dynasty 4, the reign of Khafre [Callender]	1	D4	DUNHAM & SIMPSON 1974, 23, Fig. 16b	b
14	Giza	G 4140	<i>mrt-it.s</i>	Dynasty 4, middle or late [Reisner]	1	D2	REISNER 1942, 464, fig. 279, pl. 58f	c
15	Giza	G 8250	unknown princess	Dynasty 4, end [Porter - Moss]	8	D1, D2, D3	HASSAN 1953, 5, pl. VI: B	d
16	Giza	G 8620	<i>hnmw-b3=f</i>	Dynasty 4, middle to end or beginning of Dynasty 5 [Porter - Moss]	unknown	D2, D6	HASSAN 1953, 9, pls IX: A, X, XI	
17	Giza	Mastaba of Shaft 559	unknown, boy about 12 years old	Dynasty 5, middle or end [Hassan], Dynasty 5, middle [Dulíková]	14	C3, D8	HASSAN 1941, 240-244, fig. 217, pl. LXVI-LXVII	g
18	Giza	G 4631	<i>nm-sdr-k3</i>	Dynasty 5 [Porter - Moss]	2	D3, D4	REISNER 1942, 497, fig. 304a; pl. 64f	e
19	Giza	Tomb D20, shaft 1	<i>tp-m-^cnh</i>	Dynasties 5-6 [Porter - Moss]; Dynasty 5, late [Spiekermann]; Dynasty 5, middle [Dulíková]	6	D2	STEINDORFF & HÖLSCHER 1991, 31-32; SPIEKERMANN & KAMPP-SEYFRIED 2003, 29, 37, Abb. 18; LEMBKE & SCHMITZ 2011, 172, 066 I	
20	Saqqara	Burial chamber of Ptahshepses	<i>pth-špss</i>	Dynasty 5, the reign of Wenis [Brunton]	2 or more	D2, D3	BRUNTON 1947, 132, Pl. XVI	
21	Abydos	Tomb 918	unknown	Dynasty 5, the reign of Wenis [sealing]	19	D1, D2, D4, D6	FRANKFORT 1930, 216-217	r
22	Edfu	Mastaba XII	unknown	Dynasty 5 [Alliot]	unknown	D4	ALLIOT 1933, Fig. 81, pl. XXXV: 2	
23	Giza	Tomb D208, Shaft 9	<i>spquse qf nfr-ihj</i>	Dynasty 5, the reign of Niuserre [Steindorff]; 5th-6th Dynasties 5-6 [PM]; Dynasty 5, late or early 6 [Spiekermann]	1	D1	STEINDORFF & HÖLSCHER 1991, 10; LEMBKE & SCHMITZ 2011, 192, 109 I	
24	Giza	G 4520	<i>hwfw-^cnh</i>	Dynasty 5, the reign of Userkaf [Reisner - Smith] or end [Baer]; Dynasty 5, late [Dulíková]	2	D1, D3	REISNER 1942, 507, fig. 310, pl. 69e	f

25	Abu Rawash	Tomb H1	unknown	Dynasties 5-6 [Porter - Moss]	2	D1, D2	BISSON DE LA ROQUE 1924, 61, pl. XIII: 160	
26	Giza	G 8402, Mastaba of Shaft 648	unknown	Dynasties 5-6	5	D8	HASSAN 1941, 234, fig. 208	h
27	Giza	G 5070, Shaft 316	unknown, probably spouse of the tomb owner	Dynasty 6 [Junker]	2	D3	JUNKER 1944, 58-60, Abb. 24	
28	Giza	G 8656	<i>ššmw</i>	Dynasty 6 [Porter - Moss]	20	D1, D2, D3, D7	HASSAN 1941, 92, fig. 76-77, 82	i
29	Saqqara	Tomb of Kagemni	<i>k3(=j)-gm(j).n=j</i>	Dynasty 6, the reign of Teti, beginning [Dulíková]	4	D2, D8	FIRTH & GUNN 1926, 22, fig. 17	k
30	Saqqara	Tomb of Neferseshemra	<i>nfr-ššm-r^c - šši</i>	Dynasty 6, the reign of Teti, beginning - end [Dulíková]	3	D3, D6, D7	FIRTH & GUNN 1926, 19, fig. 14	l
31	Giza	G 8640	<i>ḥh-h3=f-k3r</i>	Dynasty 6 [Porter - Moss], Dynasty 6, the reign of Teti - Pepy I [Dulíková]	16	D1, D2, D3, D4	HASSAN 1941, 137-142, fig. 118, pl. XLIV	j
32	Abusir	AS 17, Tomb of Qar Jr.	<i>k^cr</i>	Dynasty 6, the reign of Pepy II [Bárta]	22	D1, D2, D3	BÁRTA ET AL. 2009, Figs 6.3.120-121	m
33	Balat	Tomb of Imapepi	<i>im3-ppi</i>	Dynasty 6, the reign of Pepy II [Minault-Gout – Deleuze]	1	D4	MINAULT-GOUT & DELEUZE 1992, 116, pl. 41	n
34	Balat	Tomb of Khentika, burial chamber of Desheru	<i>hnt-k3</i>	Dynasty 6, the reign of Pepy II [Castel – Pantalacci – Cherpion]	1	D4	CASTEL ET AL. 2001, 48-51, 198, fig. 33, 124	o

Table 3. Selection of archaeological contexts with adzes from the Predynastic and Early Dynastic period and from the Old Kingdom

distinct flaring and except of an adze from Faras all had curved blade. An adze blade from Kubaniya is a massive example of Variant A2; length/width ratio enables to include this artefact among adze blades. The length of complete blades is in the range from 100 to 170mm.

The A-group was probably a semi-sedentary pastoral society, and only the graves from cemeteries Qustul and Sayala could be labelled as the graves of the elite. The adzes are again positioned in the proximity of the body in the cases of preserved graves. Recent studies of the A-group material are lacking the archaeometallurgical aspect (TADMOR 2002; ROY 2011, 278-279). The exemption is a monograph by ANFINSET (2010, 155-165), trace elements and lead isotope analyses were, however, inconclusive about the origin of analysed artefacts.

Early Dynastic Adzes

Adzes in Dynasties 1 and 2

Adzes datable to the Early Dynastic period have been found in more than 40 archaeological contexts. The finds from Dynasties 1 and 2 are concentrated around the centres of the early Egyptian state, near This (royal tombs in Abydos) and Memphis (tombs of high officials in Saqqara) and also centres of attached craft specialisation in the period. They have been found either in the magazines of the large tombs or in the so called subsidiary graves.²⁰

Adzes have also been found at the Early Dynastic cemeteries in Abu Rawash, Giza, Helwan (SAAD 1947, 27, pl. XVIIa), Tarkhan and in unknown context in Hamra Dom (BAUMGARTEL 1960, 12, Pl. I, 7). The adze from Grave U74 in Diospolis Parva was found in the middle of a robbed grave and its morphology (Variant B2) enables to date the object into Dynasty 1 (PETRIE 1901, 36, pl. VII).

The royal tombs in Abydos were heavily looted and only remains of the original burial equipment have been found there, e.g. a wooden adze haft and an adze blade in the tomb of Anedjib (PETRIE 1901, 36, pl. XLII: 37, 74). Adzes have been found in the subsidiary graves of the royal enclosures in North Abydos (PETRIE 1925, pl. IV: 5, 7-8, pl. XX), four graves were undisturbed according to Petrie: Graves 387 and 420 near the funerary enclosure of Djer and Graves 601 and 712 near the funerary enclosure of Djet. Five adzes from the subsidiary graves were inscribed (PETRIE 1925, Pl. III: 1-5), the inscriptions are interpreted as personal names. One adze from subsidiary grave 461 of the funerary enclosure of Djer was moreover inscribed with a serekh of Djer (PETRIE 1925, pl. IV: 8). The adze from subsidiary Grave 387 of the funerary enclosure of Djet was inscribed with a serekh of this king (University College, UC.16175). Other adzes and parts of adzes have been preserved in the magazines of mastabas in Saqqara, e.g. Tomb 3504 (EMERY 1954, 60, 61, figs 74-76) and Tomb 3506 (EMERY 1958, 50). A large mastaba in Abu Rawash contained adzes and other tools as well

(MONTET 1938, 20-21; 1946, 193, pl. X), and a wooden adze haft was found in Mastaba 2050 in Tarkhan (PETRIE 1914, 6, pl. III: 5). An adze from Mastaba T is probably an Old Kingdom intrusion, according to the form drawn on the plate (PETRIE 1907, 8, pl. VI E).

Adzes in lesser graves have been found in Saqqara, in a small travertine vessel behind the head of the deceased and inside a wooden coffin (subsidiary grave J in Tomb 3503). Adzes have been found in Giza, one in front of the arms and another vertically between the knees (subsidiary grave No. 13 of Mastaba V, Dynasty 1 - PETRIE 1907, 5-6, pl. III A, VI A). Adzes in Tarkhan have been found in the southern end of the grave with a so called flaying knife (PETRIE ET AL. 1913, 13, 23, pl. V: 15), behind the head with a chisel (Table 3, No. 2), inside the northern end of the coffin, together with an axe and chisel (PETRIE ET AL. 1913, 11, 23, pl. V: 25), and to the north-east from the remains of the burial (PETRIE ET AL. 1913, 9, 23, pl. V: 29). Copper tools in Grave 387 of the funerary enclosure of Djed have been found “between the heel and pelvis of the contracted body” (PETRIE 1925, 5).

The most important corpus of Early Dynastic adzes was found in Tomb 3471, situated in Northern Saqqara. It was excavated by Walter Bryan Emery in the 1930's (Table 3, No. 8). The tomb of unknown owner is datable to the reign of king Djed from Dynasty 1. Room S of the tomb superstructure contained intentionally burnt funerary equipment, including five basket-work boxes lying on the floor of the room. Box 2 contained saws, knives and adzes, which were at the time of publication called “hoes” by Emery. However, the construction of the tool strongly resembles that of other adzes and these so called hoes should be objects with a similar purpose. The total number of adzes found was 160, including 62 “hoes”. Complete examples had either traces of cord binding or traces of leather throngs for the attachment of copper blades. Only one adze from the deposit was inscribed, with a name Sebek-hotep, which could be the name of the tomb owner (EMERY 1949, 32).

Emery created a typology and published the data, which is possible to be processed further. His Type 1 of adzes consists of 80 artefacts, with lengths ranging from 152 to 200mm. The coefficient of variation is 11.4%. However, over 70% of the lengths fall into an interval of 200-240mm and the CV could be lowered by the omission of the outliers. Emery's Type 2 includes 20 adze blades with lengths ranging from 134 to 190mm; the coefficient of variation is almost 8%. We do not have any chemical analyses of the assemblage; it could be the result of the work of several craftsmen or workshops, trying to create one or two templates. The result of their work is fairly regular, i.e. the product of specialized work. We have to rely on these data published by Emery without the refining of the published variants. From the distributions of the lengths and the length/width ratios it could be supposed, that two types defined by Emery are partly overlapping.

A peculiar archaeological context was preserved in the tomb of Khasekhemwy, the last king of Dynasty 2. The

collapsed wall opposing Chamber 21 of his tomb in Abydos preserved part of the copper burial equipment of the king (Table 3, No. 9). According to the counts of Petrie, the number of the finds was based on a multiplication of the number 4 and there were 64 “adzes and chisels” altogether (PETRIE 1901, 28). The adze blades here were cut out of copper sheet,²¹ and they are clearly models of the real objects. These adze models are included in the collections of some world museums, artefacts in the British Museum were published by SPENCER (1980, Cat. Nos 622-627); an adze blade, incorrectly determined as a chisel, was published by KUHN (2012, 117-119, Abb. 4) and another, similar to the A1 adze variant by TEETER (2011, 246). Two more adze blades have been found in the tomb of Khasekhemwy and they seem to be made of sheet, too (DREYER ET AL. 2003, 116, Taf. 24g). I may add to this two adze blades made of copper sheet in the collection of the Louvre, from the excavations of Amélinau (Inventory Nos NCP 0509, NCP 0510). An adze blade model made of copper sheet was even found in the tomb of an earlier ruler, Peribsen (DREYER ET AL. 2006, 108-110, Abb. 16b). Copper sheet models, published by QUIBELL (1905, 282), might be chronologically close to this context. The Dynasty 3 Egyptians then returned to real adzes.

Adzes in Dynasty 3

Burial contexts from Dynasty 3 are scarce; and even lesser number of them contained copper objects. The most important corpus was found in Bet Khallaf in Upper Egypt, north-westwards from Abydos (Table 3, Nos 10, 11). Copper adzes were found in the large mud-brick Mastaba 1 (a deposit of copper artefacts on the lower side of the stairs leading to the burial chamber) and Mastaba 4 (only one adze blade). According to the size of the adze blades, they were probably real tools. The corpus from Mastaba 1 is larger, containing 11 adze blades and dated by the clay sealings to the reign of Djoser Netjery-khet. Adzes of Type D5 with slightly articulated neck appear and the development continues to necked adze blades.

Only some adze blades found in the Netjery-khet complex in Saqqara can be dated on typological grounds to Dynasty 3; an adze blade from the shaft to the south-east of the Step pyramid (FIRTH & QUIBELL 1935 124, fig. 12: 5-7, pl. 93: 3) and an assemblage from the substructure of the pyramid (LAUER 1936, 232, pl. XCVI: 4). Another adze blade datable to Dynasty 3 was found by Morgan in es-Siba'ya in Upper Egypt, in a small hoard of copper objects (NEEDLER 1984, 282, Cat. No. 183).

One adze blade from Nubia can be dated on the typological grounds to Dynasty 3; an adze from Grave 190 in Shelal (REISNER 1910, 50-1, pl. 65 b 8-9; WILLIAMS 1989, 124). The chronological position of an adze from Grave 1 in Naga Wadi is unclear. It seems from the published photograph that it is more similar to an adze with a rounded butt from Dynasty 1 (FIRTH 1927, 214, pl. 22: b2). A second artefact from this grave, similar to that of an adze, could be a flat chisel, as well (ibid., pl. 22: b1).



Figure 9. Adze blade wrapped in a layer of textile and two cross-cut chisels with remains of wooden handles. Tomb of Qar Jr. in Abusir South (Find No. 62/HH/2000) (photo by K. Voděra)

It seems that copper tools were, in the Early Dynastic period gender-specified for men (kings, high officials and craftsmen). WENGROW (2006, 243-244) sees Early Dynastic tombs as “a transformation of the extended household” and as model estates of the deceased, source of production and life in general. Copper tools as a means of production are an indispensable part of this mansion for the Afterlife. The burial and tomb equipment thus mirrored the property of the tomb owner. Solitary finds of adze blades might point rather to the personal use of the tools by craftsmen (DAVIS 1983), the royal *serekhs* could denote either the owner or the donor of the artefact (but these inscriptions are scarce). We do not know either who provided the copper from which these tools were made or who was the “owner” of the tools and their material (most probably king and royal administration in both cases). The copper was most probably gained from Dynasty 1 on by military campaigns as well as expeditions; the earliest written evidence is from the reign of Den in Dynasty 1 (TALLET 2010).

Old Kingdom Adzes

Adzes in Dynasty 4

Adzes from Dynasty 4 have most frequently been found in Giza and one example has been found in Meydum; both

sites were the main cemeteries of the elite of the contemporary Egyptian society, residing in the capital of Memphis. Among these contexts are two undisturbed burials, in Tomb G 8620 belonging to the son of Rakhef, Khnumbaf (Table 3, No. 16; the model tools were found in the eastern part of the burial chamber, together with copper vessels and limestone canopic jars) and in the tomb of an unknown princess (Table 3, No. 15; eastern part of the burial chamber). One adze blade of unknown provenance bears the name of king Snofru (PETRIE 1917, 16, Pl. XVII: 76). This adze blade was published again by ROWE (1936, 285, Fig. 5) and the inscription translated as “The Crew, ‘Beloved-is-the-White-Crown-of-Senefereu’ ‘Craftsmen [Gang]’”. This 21cm long adze is probably a real adze used by workmen of the king Snofru. From Dynasty 4 onwards, all other adzes are called conventionally “models” in the excavation reports and other literature, but this determination could not be valid in all cases. This issue will be addressed later in the text.

The data on the size of the complete adze blades are scarce; the biggest adze blade was found in the burial chamber of queen Meresankh III (Table 3, No. 13; Fig. 8b) with a length of 160mm. The adze from the tomb of princess Meretites was 115mm long (Table 3, No. 14; Fig. 8c). The adze blades from the tomb of unknown princess are added on Fig. 8d, their size is lesser. The first adze on this figure (from the context Table 3, No. 12) should be most

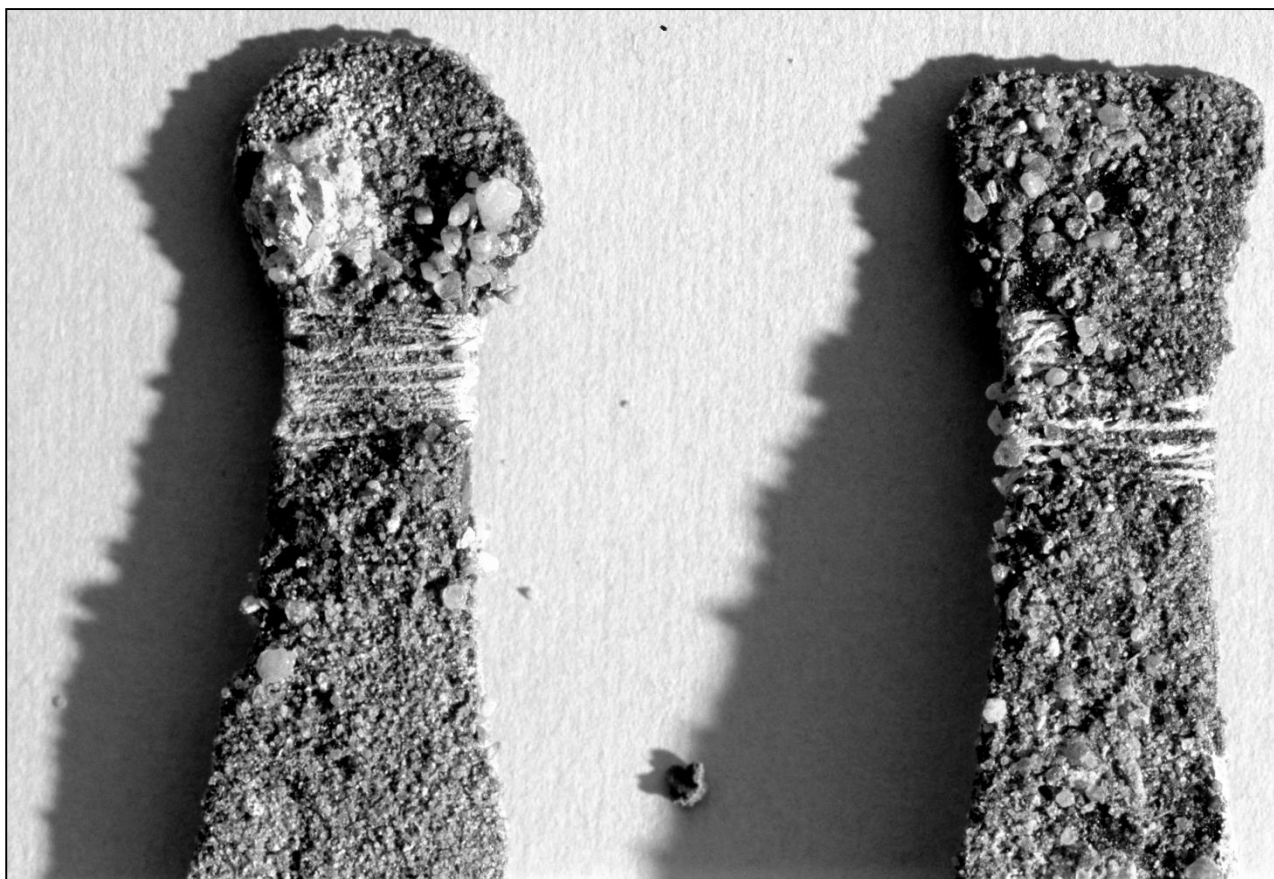


Figure 10. The detail of adze blade binding from Tomb of Qar Jr. in Abusir South (Find No. 62/HH/2000) (photo by K. Voděra)

probably dated into Dynasties 5-6, these types of models appear later in the Old Kingdom.

Adzes in Dynasty 5

Model adze blades have been found in the burials at the Memphite necropoleis, in Abu Rawash, Abusir, Giza and Saqqara; two assemblages have been found at the so called provincial cemeteries in Abydos and Edfu. Undisturbed archaeological contexts come from Giza: Tomb D20, Shaft 1, the burial of Tepemankh (Table 3, No. 19; northern end of the burial chamber, northwards in front of the sarcophagus), Tomb D208, Shaft 9, the burial of the wife of the tomb owner, Nefer-ihy (Table 3, No. 23; models on the eastern side of the sarcophagus), Shaft 559, burial of a young boy (Table 3, No. 17; eastwards from the body, out of the wooden coffin); Saqqara (Table 3, No. 20; near the sarcophagus), Abu Rawash (Table 3, No. 25; eastwards from the body on a layer of debris), Edfu (Table 3, No. 22; in the north-western corner of the sarcophagus) and Abydos (Table 3, No. 21; along the eastern side of the burial chamber). There is no single rule as to the placement of the model tools, but the position of them to the east of the body and sarcophagus occurs more frequently as a continuing custom.

Only some publications enable one to determine the exact number of adzes present. The burial chamber of Shaft 1 in Giza Tomb D20 included six adze blades and Shaft 9 of Tomb D208 had only one adze blade. The burial

equipment in Shaft 559 contained 14 adze blades; the Abydos context contained 19 adze blades. There is thus no single rule for the number of adze blades in graves as well. The published and studied adze blades revealed no traces of wooden hafting. More elaborately hafted model tools appeared in Dynasty 5, the remains of which have been found by Borchardt in tombs of the high officials of king Niuserre in Abusir (BORCHARDT 1907, 129-30, Abb. 109). Tomb 918 in Abydos provided two general size categories of adze blades; this is most probably a reflection of the different size categories of the adzes in the already mentioned iconographic sources based on the differences in the real life. Eight complete adze blades of a lesser category have a mean length 54.1mm and a coefficient of variation of 3%. They seem to be products of a single production event and are highly standardized (Fig. 8.r).

The data on the sizes of the complete adze blades are scarce; the longest adzes in Dynasty 5 (apart from the biggest adze in the Abydos context with a length 113mm) were found in Abusir, in the tomb of the prince Nakhtsare and the pyramid of the queen Lepsius No. 24. Both contexts from the royal necropolis were dated to the reign of Niuserre (KREJČÍ ET AL. 2008, 60, 125, figs 3.45–3.46, 4.85a). The available data are too sporadic to draw detailed conclusions, regional differences seem to occur. The adzes from disturbed archaeological contexts might belong to different size categories of adzes, thus complicating the interpretation of the size differences.

The biggest preserved Old Kingdom adze blade was published by JAMES (1961, 37-38, Pl. XII; now in the British Museum, inv. no. EA66207; Fig. 8p). The adze belongs to Variant D4 and on one face of the tool is chiselled out the name of the king Userkaf. The blade has the length of 209mm and width of 87mm. The blade edge is single bevelled and without distinct flaring. The interpretation of the inscription is unclear; it could denote either the owner of the artefact or the donor (examples of inscriptions with clearly expressed purpose of donation are much later, datable to the New Kingdom – DAVIES 1987, 51). It is interesting, that this adze had rather wide blade, which is a feature present on models only in late Dynasty 6. Two more adzes and three cross-cut chisels, together with adze EA66207, were published by KAPLONY (1965, 34, Taf. VII). Closer inspection of the inscriptions on the cross-cut chisels in the British Museum (Fig. 8r; inv. nos EA66208, EA66209) by the author revealed that they have been rather incised, not chiselled out, and they might be modern forgeries (inscribed on real ancient Egyptian artefacts). The form of adzes nos 79 and 80 is not found in Old Kingdom archaeological contexts and they are most probably again with cartouches of Userkaf forged in modern times.

The looters of the tomb of Weserkafankh in Abusir left only wooden hafts and handles of the artefacts. On a photograph published by BORCHARDT (1907, 114-115, Abb. 94) two types of adze hafts are present. One appears to be rounded, while another one has a flat rectangular/square section. The second one appears to be a

model of the *nw3-(msht.jw)* adze blade and could be perhaps connected to the Opening of the Mouth set rather than to the model tools assemblage. But our knowledge is limited and these two haft types could reflect the emic difference between *n.t* and *msht.jw* adzes as well.

Adzes in Dynasty 6

Dynasty 6 model adze blades have been found at the Memphite necropoleis, in Saqqara mostly in the pyramid cemetery of Teti (FIRTH & GUNN 1926), in Abusir South, in the tombs of the family of vizier Qar (BÁRTA ET AL. 2009), and in Giza. Provincial finds come from the sites of Bubastis (EL-SAWI 1979, 72-73, figs 146, 148), Lahun – Bashkatib (PETRIE ET AL. 1923, 25, pl. XLVII: 6-7), Zarabi (PETRIE 1907, 10, VII D), and Qubbet el-Hawa (EDEL ET AL. 2008, Abb. 24); the most important contexts from late Dynasty 6 are from Balat and Abusir South.²² A real adze have been published by KAPLONY (1965, 36-39, Abb. 90, Taf. IX: 90), inscribed with a cartouche of king Userkare together with a name of one of the units of workers under this king.

Undisturbed archaeological contexts were found in Balat, in the tomb of the oasis governor Medunefer, in his burial chamber (VALLOGGIA 1986, 125-127; in a box southernmost in the burial chamber) and in the north-eastern storage room of tomb (ibid., 125-127) and burial chamber, most probably belonging to oasis governor Desheru, son of the governor Khentika and main owner of the tomb (Table 3, No. 34; Fig. 8o; adze blade was found

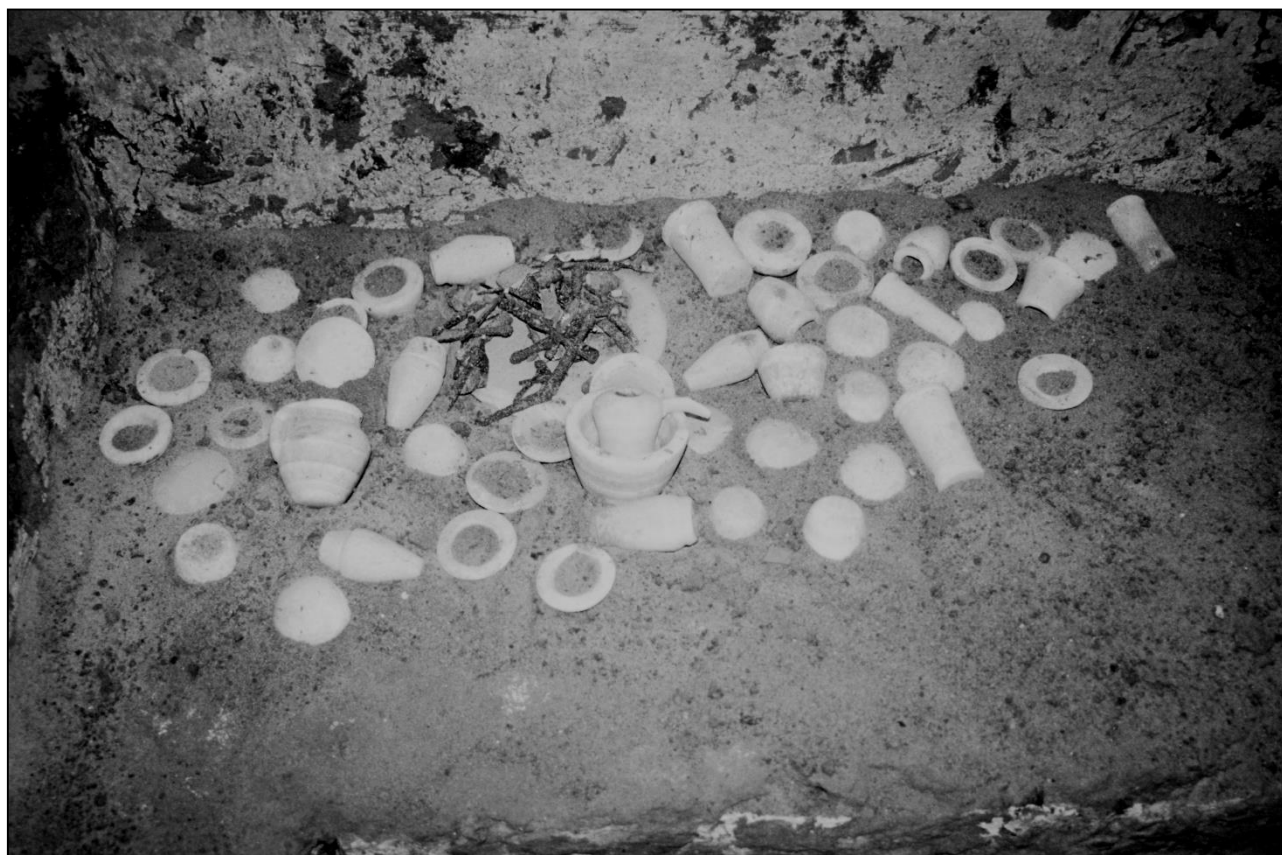


Figure 11. Copper model tools found together with limestone model vessels in the burial chamber of Tomb AS 29, Shaft 2 in Abusir South. (photo by K. Smoláriková)

together with mirror and other artefacts on the lid of wooden coffin), in Giza: Tomb G 8640 (Table 3, No. 28; eastwards from the sarcophagus), Tomb G 8656 (Table 3, No. 25; in the north-eastern corner of the burial chamber) and Tomb G 5070, Shaft 316 (JUNKER 1944, 58-60, Abb. 24; in the southern part of the burial chamber, partly under travertine vessels); and in Saqqara (Grave No. 240 in the mastaba of Kaemnesut - FIRTH & GUNN 1926, 33, figs 35, 38; eastwards from the body). The tomb of Medunefer contained nine adze blades in burial chamber and six adze blades in the north-eastern storage room. The undisturbed context in the tomb of Khentika contained only one adze blade, as well as the far more humble grave in the tomb of Kaemnesut. The chamber of Ankhhaf contained 16 adze blades (Fig. 8j), the chamber of Seshemu 20 adze blades (Fig. 8i) and Shaft 316 only two adze blades. Again there is no single rule for the number of adze blades in a burial; the model tools were, however, often deposited on the eastern side of the sarcophagus. Only the adzes in the burial chamber of Seshemu had two (or even three) size categories of adze blades, analogical to Tomb 918 in Abydos.

The majority of the published adze blades revealed no traces of wooden hafting. Wooden hafting of the adzes was again present in the burial equipment of the royal entourage. The wooden hafts were found in the burial chamber of the pyramid of the Queen of the West, one of the lesser pyramids in the complex of Pepy I (LECLANT & CLERC 1990, 364-365, fig. 37). The copper blades were stolen by tomb robbers, the wooden hafts appear in two forms, what most probably shows the emic difference between *n.t* and *msht.jw* adzes.

The assemblages from the Teti pyramid cemetery have not been published in sufficient detail and there is almost no information about the hafting of the adzes. In this cemetery some new variants of model adze blades were introduced, Variants D6, D7 and D8 in the tomb of Neferseshemre (Table 3, No. 30) and Kagemni (Table 3, No. 29). The copper model tools in some contexts were gilded according to the excavators (e.g. the tools in the tomb of the vizier Ankhmahor - FIRTH & GUNN 1926, 18, Fig. 11).

One of the largest deposits of copper model tools comes from the site of Abusir, from the tomb complex of vizier Qar and his family (BÁRTA 2006; BÁRTA ET AL. 2009). In the burial chamber of Qar Jr. a deposit of copper model tools was found, eastwards from the sarcophagus, in its original location (but the tomb was disturbed). Four lumps of tools had been joined together by siliceous accretions and more than 2.5kg of copper objects were found altogether. The deposit contained, among other tool types, 67 necked adze blades (selection on Fig. 8m). The model adze blades were either wrapped in linen separately (Fig. 10), or bound by cord, again separately or into bundles with five adzes pieces (Fig. 9). Another set of copper tools was found in the burial chamber of Shaft A of the tomb of Inti, belonging to Inti Pepyankh, relative of the family of Qar. The model tools were deposited eastwards from the sarcophagus, near the limestone model vessels. The deposit of copper tools contained one large lump of tools, including adzes, and also small bundles of model tools.²³ There were two general size categories of adze blades present in the Tomb of Inti; the lesser one was probably made of copper sheet.

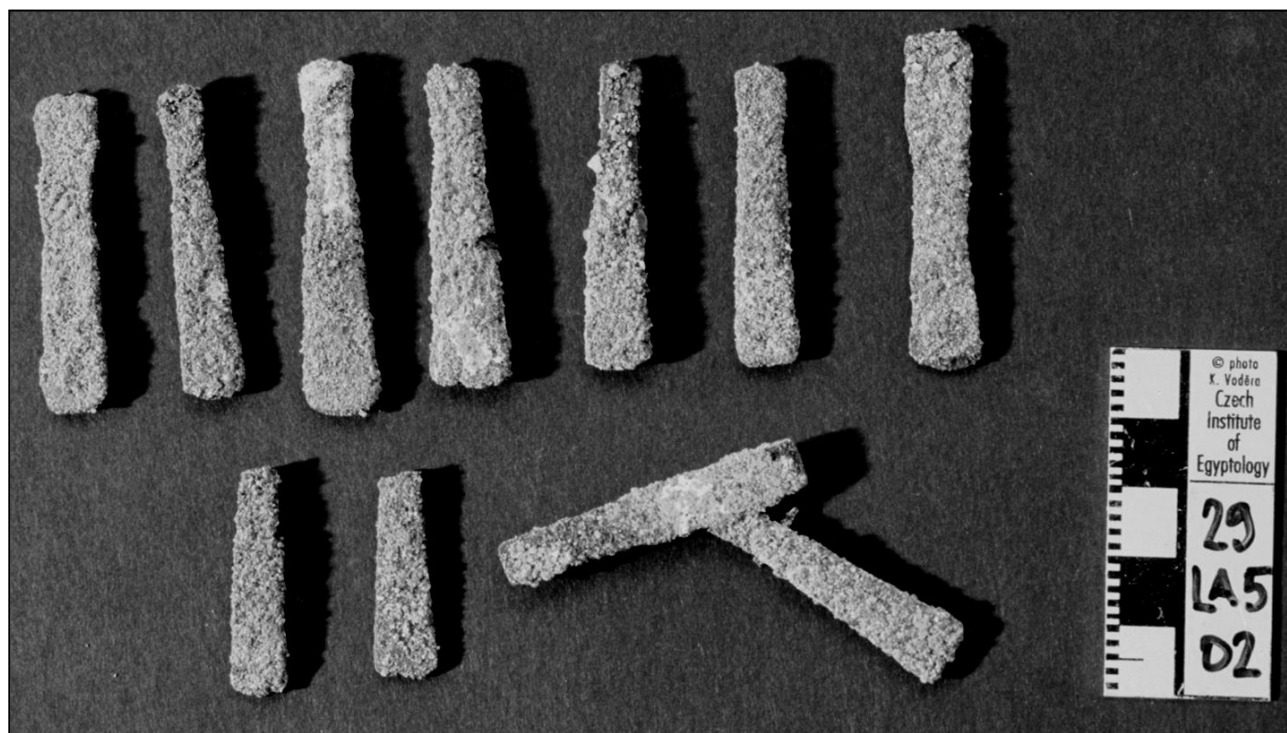


Figure 12. Adze blades of Variant D1 from Tomb AS 29, Shaft 2 in Abusir South (Find No. 29/LA5A/2002) (photo by K. Voděra)



Figure 13. Adze blades of Variants D1 and D3 from Tomb AS 29, Shaft 2 in Abusir South (Find No. 29/LA5A/2002) (photo by K. Voděra)

The less elaborate mud-brick tombs of the so called “middle class” of the Old Kingdom society were excavated in the middle part of the Abusir necropolis, near the so called Lake of Abusir.²⁴ The tombs consisted of mud-brick superstructure with offering niches and limestone offering tables embedded in front of them. The substructure was hewn into the tafl bedrock. A set of copper model tools was found in the burial chamber of Tomb AS 29 (Lake of Abusir Tomb 5-A, Shaft 2), including 19 adze blades (Fig. 11). The tomb owner is unknown. The social rank of the owner could be roughly estimated by the tomb architecture. 17 adze blades were complete, eight of them were of Variant D1, with a mean of length of 58.6mm and a coefficient of variation of 6.8% (Fig. 12). Another nine blades were of Variants D2 and D3, and their mean length was 48.3mm and the coefficient of variation was 9.8% (Fig. 13). The adze blades in this context seem to be rather standardized products and the results of one or two production events (moulding into one or two moulds?).

The data on the size of complete adze blades are again scarce; the longest are adze blades from Balat (length about 150mm), followed by the adzes from the tomb of Inti in Abusir (length about 100mm). The contexts are from late Dynasty 6. The governors of Balat had a higher social status than Inti; but data are again too scarce to define the connection between this social status and the size of artefacts in detail. The sizes of adzes and occurrence of types and variants could be compared on Fig. 8h-m. The blade width was larger in late Dynasty 6. This enables to date the contexts from Qubbet el-Hawa and Bubastis in the roughly contemporary time.

Adzes in the Old Kingdom: a Summary

From Dynasty 4 onwards adzes were one of the indispensable parts of the model tool assemblages in burial equipment of the Old Kingdom. They were used together with model axe blades, chisels and saw blades, either with wooden model handles and hafts or bound up with thread into bundles and without handles or hafts, thus probably imitating the mode of the storage of real adze blades in the magazines of royal and private estates. The binding threads on the adze blades were situated on the neck (Fig. 8h, 8m) or near the blade edge (MESSIHA & MESSIHA 1964, Fig. 5). It may be mentioned here that there is an apparent discrepancy in the evidence. At least two hundred Old Kingdom burial contexts have contained copper model tools and only three offering lists have included them. This is a good instance of the different evidence provided by archaeological and written sources. The main morphological difference in the Old Kingdom assemblages is among the adzes with a flat butt (Variant D1) and the variants with rounded, semi-circular and semi-elliptical butts. This difference could be based on the emic categories of *ḥn.t* (perhaps the adzes with rounded butts) and *msht.jw* (probably Variant D1). This could be observed in some of the preserved adze assemblages on Fig. 8 (contexts d, f, g, j, k, m), other assemblages are less clear in this regard, and no single habit/approach seems to exist.

Towards a Semiosis of an Adze in the Early Dynastic Period and the Old Kingdom

Adzes in the Context of the Attached Craft Specialization

WILSON (1947, 238-243) collected Old Kingdom texts where the tomb-owners claimed to have made the craft works or whole tombs which must have been done by craftsmen. Similar list on tomb building was compiled by MÜLLER-WOLLERMANN (1985, 142-144). The craftsmen were “paid” with “bread and beer” and other commodities (WILSON 1947, 243-245) and this satisfied both patron and employer. Copper is mentioned in two cases, but one cannot discern from these texts in what form was provided (MÜLLER-WOLLERMANN 1985, 147). DRENKHAHN (1976, 133-161) divided the Old Kingdom craftsmen according to the sources to craftsmen in the service of “private” households, in the “state” royal service and hired workers, coming probably from the pyramid towns of the ruler (after Helck). She thus concluded as well, that the work had a dependent character in the ancient Egypt. There had to be a commissioner of the artisan work (state, king, private person) who not only commissioned the work but also provided the necessary material and then paid for the work. The adzes with names of Snofru and Userkare might be interpreted as real adzes of the real workshop groups, denoting the owner of the metal part of the tool.

The interpretation of the meaning of model tools is based on some already mentioned written sources. One line of research has interpreted model tools to be symbols of the property of the household of the tomb owner. Artisan tools were destined to be used in the Afterlife by the workers of the tomb owner household (BRUNTON 1927, 60; KEES 1956, 127, 211) or by the model workers in the tomb in the First Intermediate period and Middle Kingdom (ENGELBACH 1946, 125). According to another line of interpretation, model tools reflected the provisioning of the craftsmen working on the tomb of the owner and benefactor of the work (JUNKER 1940, 72-73; EYRE 1987, 13; BÁRTA ET AL. 2009, 305-306).

Written and iconographic sources about adzes, together with the archaeological material, corroborate the conclusion that the ownership of the tools (and their copper blades as the most valuable parts) was on the side of the patron, either royal (“state”) or “private” head of the household. This ownership is reflected in the model tool assemblages in the burial equipment of Old Kingdom elite burials. Iconographic evidence shows that these tools were used in the working of wood and soft stone.

If Old Kingdom adzes are models of real adzes (which will be discussed in the following chapter), then in Pierce’s classification of signs they are icons, “*signs that refer to an object by virtue of its characteristics*” (PREUCEL 2010, 56) and symbols, as well as being associated in the society with a type of social relationship between the patron and the employed craftsman. In the trichotomies of Pierce, they are most probably examples of rhematic iconic legisigns (PREUCEL 2010, 58). It is quite possible that both fundamental lines of interpretation are correct and the

meaning of the artefacts was multi-faceted with many possible explanations. The emic ancient Egyptian interpretation of the material culture should not be exceptional from the complementary character of the ancient Egyptian logic (HORNUNG 1973, 237-238).

Control of the Amount of Copper

Model tools are supposed to be a cheaper solution to that of real tools in the tombs of the Early Dynastic period (GRAJETZKI 2003, 19). This was indeed true with respect to the amount of metal. However, the metallographic analyses of the artefacts (MADDIN ET AL. 1984) have shown that the copper model tools, including adzes, were repeatedly annealed and hammered into the desired shapes after the moulding and that their production was a time-consuming issue as well, even in the case of those adze blades without proper wooden model hafts. More metallographic analyses of the preserved artefacts are needed for better founded conclusions on the *chaîne opératoire* of the Old Kingdom metallurgists.

Iconographic evidence shows that the amount of metal used (gold, copper, etc.) was controlled by the administration in the Old Kingdom (EYRE 1987, 13). The original weights are impossible to measure, because they have changed over time in the post-depositional history of the artefacts. Differences can be found, however, in other metric properties of the artefacts (Fig. 8). Size categorization of the adzes was present in iconographic sources and thus reflected size differences of the real adzes.²⁵ The available data on the copper adze blades demonstrate further differences in the size, dependent on the social status of the owner – objects in the burials of the royal entourage are bigger, even more elaborate (in the case of complete models with wooden hafts) than the objects in other burial chambers with persons of lesser status. The dimensions of model adzes also probably depended on the site of the burial and the locally available products for funerary equipment. There are synchronic and diachronic differences in the model tool assemblages with respect to their sizes and their categorization. Detailed conclusions will be based on analyses of a larger amount of data.²⁶ There is as well scarce evidence that copper parts of the tools could enter exchange through the market (Table 2, Scene No. 15 in the tomb of Niankhnum and Khnumhotep; Fig 5A) or could be deposited in the burial equipment by the son of deceased.²⁷

Analyses of the Old Kingdom beer jars and bread moulds (WARDEN 2013) have shown that pottery is standardized in synchronic single events (primary contexts from one tomb), but the dimensions are rather diverse in the diachronic perspective. Copper model tools are the products of the attached craft specialists; they are mostly preserved in contexts connected with single events (burials). Adze blades show the ability of the ancient Egyptian metalworkers to produce fairly standardized artefacts. The control of the amount of copper might be thus reflected in the Old Kingdom metal material culture. This possible evidence of a more tight control of a rather precious material does not go against the model of the

informal, self-structured system (WARDEN 2013, 245-268), which is more likely to explain the economy of the Old Kingdom as a whole.

Determination of Models

One more issue has to be addressed. Old Kingdom adzes have traditionally been determined as models, images and symbols of real adzes, which do not have the right size, but they maintain the proportions of real adzes. Some bigger finds of adzes, e.g. from the contexts of the burials of the royal family could have been used as real adzes, and this can also be said of lesser adzes, perhaps apt for use in fine wood work. The determination between models and real adzes is therefore unclear. Real adze blade is depicted on Fig. 8p and thus can be compared with dimensions of Old Kingdom “model” adzes. If we look at adzes in the contemporary Levant (MIRON 1992, *passim*), they have similar dimensions to Old Kingdom “model” adze blades, and they were determined as “real” adze blades.²⁸

There are only a few adzes that have been analysed for their chemical composition. WUTTMANN (1986, Tab. 3) lists five examples from this period (Nos 11, 12, 52, 171 – this one is model adze blade analyzed by MADDIN ET AL. 1984), with a copper content over 99%. A similar composition was found in one late Dynasty 6 adze from Balat (WUTTMANN 1986, Tab. 2). An A-group adze from Faras is made of arsenical copper, as well as the adzes from the Abydos subsidiary graves O.31, 387 and 461 (SPENCER 1980, 88) and one adze from Naqada (MCKERRELL 1993). Arsenic was added to increase the hardness of the tools and this trait could distinguish the real tool blades from the model blades. A copper sheet model of an adze blade in the tomb of Khasekhemwy was as well made from almost pure copper (SPENCER 1980, 88). Unique is an adze blade from Grave 39 in Naqada, it was made of silver (BAUMGARTEL 1960, 8; now in University College, UC.5477). It has a distinct flaring of the blade and these traits might indicate foreign origin of the object.

The traces of adze blades on the surface of artefacts might be misinterpreted as the traces of flat chisels and we probably cannot discern the traces of both tool classes with sufficient certainty. Hints are provided by iconographic sources, but tools had apparently versatile uses. PETRIE (1901, 13) has described marks interpreted by him as adze working traces on the stones in the central chamber of the Tomb of Khasekhemwy in Abydos. The magnifying glass did not reveal any traces of copper; Petrie assumed that traces were of adzes with stone blades.

Adzes in Early Dynastic and Predynastic Graves

There are no written or iconographic sources (except for the hieroglyphic signs) on adzes in Dynasties 1 and 2 and before. The morphological and metric comparison to later, better determined artefacts enables one to ascertain with sufficient accuracy the adzes among the copper artefacts of these periods. An emic difference between *n.t* and *msht.jw* adzes seems to already be reflected in the context from Tomb 3471 in Saqqara, where adzes with rounded

butts appear together with adzes with flat butts (called hoes by Emery). Copper sheet models of Dynasty 2 had discernible butts of both categories as well.

Adzes appear in four main types of archaeological contexts: the magazines of large tombs, the subsidiary graves of large tombs and royal funerary enclosures and in tombs without a connection to a larger feature. The adzes in the magazines appear to be precursors of the habit of model tools inclusion in the Old Kingdom burial equipment and are among the material symbols of the wealth and power of the tomb-owner, either king or high official. Copper sheet models were used in Dynasty 2 contexts (and for these the sign classification in the system of Pierce is certainly valid), but Dynasty 3 Egyptians returned to real blades. Adzes in subsidiary and other graves are most probably tools used by the persons buried inside the tomb and seem to indicate different type of connection, expressed e.g. by the statue of Ankhua and the offering list of Wabkhenemu, where the tool equipment could be connected to the profession of the tomb or grave owner.²⁹

Adzes in the Ancient Near East

Adzes have been far better studied in other roughly contemporary cultures and regions, e.g. in the Near East in general (omitting Egypt and Sudan) (DESHAYES 1960, 51-84), in the Levant (MIRON 1992, *passim*), the 2nd Millennium Anatolia (ERKANAL 1977), Mesopotamia (HAUPTMANN & PERNICKA 2004), Bronze Age Crete (EVELY 1995, 62-76), and Iran (TALLON 1987, 157-167). Early Bronze Age adzes in the Near East are as well simple blades with similar morphology to Egyptian adzes. In the 3rd Millennium BC the hoe/adze with a socketed blade also appeared in Iran and Mesopotamia (TALLON 1987, 172-197; EVELY 1995, 62), but the ancient Egyptians never preferred this technological solution.³⁰

Tools in iconographic sources in the Near East are scarce, but the adzes depicted are very similar to the representations of Egyptian adzes (TALLON 1987, Figs 16-17). Model tools also appeared in other ancient cultures and quotes about an “utterly Egyptian practice” (SWAIN 1995, 37) are partly unfounded. Two sets of model tools have been found e.g. in the graves dated to the 2nd Millennium BC in Ur by MOOREY (1994, 262).

Possible sources of Early Dynastic and Old Kingdom copper have been discussed by SOWADA (2009, 185-188) and are located in Nubia, the Eastern Desert, Sinai, and in the Wadi Arabah (now in Jordan).³¹ However, lead isotope analyses of Old Kingdom objects are lacking, and these need to be done together with an evaluation of the types and variants of the objects, in order to understand not only the origin of the raw material, but the relations between objects.

Clay casting moulds for objects similar to Old Kingdom model adzes were found at the EBA site of Khirbet Hamra Ifdan in Jordan (LEVY ET AL. 2002). They are called by the

excavator axe moulds (LEVY 2007, Fig. 7.3). The origin of Old Kingdom model adzes from the EBA Southern Levant has already been proposed by BÁRTA (2006, 62). Lead isotope analyses of Old Kingdom copper model tools, especially adzes, are needed to confirm this hypothesis. Some of the moulds have a distinct flaring of the edges which is absent on the Old Kingdom model adze blades. We know, however, that at least some of the adze blades were, after the casting, hammered and re-shaped. Adzes (or axes, we do not know about the mode of hafting of these Levantine objects) with and without a flaring of the edge appear as well in EBA Jordan (NIGRO 2010a, 73-74, 121-124) and the Levant in general (MIRON 1992); therefore Egypt should not be considered as the only or the main destination of the copper objects from the Wadi Arabah (as interpreted in BÁRTA 2011, 266).

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¹ E.g. EL-SAWI (1979, 72). This determination was criticised in Egyptian archaeology already by MESSIHA & MESSIHA (1964). The Old Kingdom model tools from the tomb of Qar, excavated by the Supreme Council of Antiquities in Saqqara, are labelled as “surgical tools” in the exhibition of the Imhotep Museum in Saqqara.

² I am referring to the form of the triangle published by OGDEN & RICHARDS in 1923 (cited after ECO 1979, 59-62). Pierce’s sign relation, on which this triangle was based, is described by PREUCEL (2010, 54-56, Fig. 3.2).

³ Scene E is problematic, as it seems that the draughtsman has completed an unclear depiction with a dashed line in place of the butt. The man on the right side has a compound depiction of an adze.

⁴ The nails or claws (*nwt*) were inscribed as tripled adze blades with what appears to be rounded butts in the tomb of Ptahhetep in Saqqara (DAVIES 1900, 30, Pl. XIII).

⁵ This connotation gradually lost its meaning in the Middle Kingdom, when the term for the constellation was determined by the sign of the bovine leg (ROTH 1993, 69-70, Figs 9-10; GORDON & SCHWABE 1998, 467-469; HANNIG 2006, 1137; MARAVELIA 2006, 451).

⁶ There is, however, no direct written evidence about the stockpiling of copper in *pr hꜥ* (literally “white house”/“house of silver”) during the Old Kingdom (DESPLANCQUES 2006, 193-216).

⁷ The translation of STRUDWICK (2005, 430) as “*mesekhtyu*-hooks”, which followed the original interpretation of Smith, is incorrect.

⁸ The lexical semantics of the word *kꜣt* is, however, wider, including all sorts of work (STRUDWICK 1985, 244-249).

⁹ The archive of Dynasty 6 town Balat in Western Desert contained the registers of “tools, weapons”, among other stored objects (PANTALACCI 2013, 213).

¹⁰ Completeness of references was attempted, but there might be some scenes or loose blocks omitted.

¹¹ Completeness of references was attempted, but there might be some scenes or loose blocks omitted.

¹² Discussed by EATON-KRAUSS (1984, 48-49).

¹³ This sign might appear as well on stela 277, found near the tomb of Den (MARTIN 2011, 184-185), and on stela 208 (*ibid.*, 148-149) both with a reading “*mdh*” (?) – “carpenter”.

¹⁴ ANTJE SPIEKERMANN, pers. comm.

¹⁵ The British Museum, the Ashmolean Museum, Louvre, Roemer-Pelizaeus Museum in Hildesheim, Ägyptisches Museum der Universität Leipzig, Kunsthistorisches Museum Wien, National Museum in Warsaw and Náprstek Museum in Prague.

¹⁶ The typology of adzes was studied already by PETRIE (1917, 16-17, Pls XV-XVII) and in the Predynastic period by BAUMGARTEL (1960, 12-13, 15). Petrie was lacking in his typology better dated contexts from Dynasties 5-6.

¹⁷ Adzes are probably present also among “*schweren Arbeitsbeile*”, from the settlement excavations in Giza (KROMER 1978, 50-52, Taf. 15: 2, 15: 1), but dating of these artefacts is unclear.

¹⁸ Dating of the adzes from Hierakonpolis (QUIBELL 1902, 26, pl. XLVIIIb) is unclear.

¹⁹ This object could as well be a flat chisel; the butt seems to have a burr from the striking.

²⁰ Radiocarbon dates for many of these tombs have been published recently in DEE ET AL. (2013).

²¹ The analyses of one specimen showed that the sheet is made of almost pure copper (SPENCER 1980, 88).

²² The dating of context from el-Kab is unclear, might be from Dynasty 5 as well (QUIBELL 1898, 4, pl. XVIII: 56-65).

²³ The publication of the tomb of Inti is currently being prepared by the Czech Institute of Egyptology.

²⁴ The tombs are yet unpublished; there is only a preliminary report (BAREŠ ET AL. 2003, 155-159).

²⁵ Confirmed by the Middle Kingdom source, papyrus Reisner II – SIMPSON (1965, 26).

²⁶ The issue of the connection between the amount and the size of the copper objects and the social status of the tomb owners will be examined in a paper, prepared together with Veronika Duříková, a specialist on the Old Kingdom titulary.

²⁷ A copper axe deposited in the burial of his father by Sobekhotep (STRUDWICK 2005, 426). However, there was not any real copper axe blade found in the burial from the Old Kingdom yet, this could be a text from the First Intermediate period, when real axes in burial equipment start to occur (DAVIES 1987).

²⁸ TALLON (1987, 164-167) has distinguished in the material from Iran “lames miniatures” with length up to 150mm and supposed that they had different function than longer adze blades.

²⁹ On the other side, craftsmen were a marginal category of commemorated persons among the preserved Early Dynastic stelae from Abydos (MARTIN 2011): the stela of craftsman No. 268 and in all probability stelae 208 and 277 as well.

³⁰ A copper model of a socketed hoe is a very rare object in Egypt and in Abusir rather is a later intrusion than the artefact datable to Dynasty 5 (KREJČÍ ET AL. 2008, 187-188, Fig. 5.71).

³¹ Further information on the Eastern Desert and Sinai have been added recently (ABDEL-MONTELIB ET AL. 2012, KLEMM & KLEMM 2012; PFEIFFER 2013a).

ABBREVIATIONS

ÄA	Archäologischer Anzeiger	IAA	The Israel Antiquities Authority
AAAS	Annales archéologiques arabes syriennes	IEJ	Israel Exploration Journal
AAE	Arabian Archaeology and Epigraphy	IRAQ	Iraq, published by the British School of Archaeology in Iraq
ABSA	Annual of the British School at Athens	JEÄ	The Journal of Egyptian Archaeology
ACER	Australian Centre for Egyptology Studies	MÄS	Münchener Ägyptologische Studien
ADAJ	Annual of the Department of Antiquities of Jordan	MDAIK	Mitteilungen des Deutschen Archäologischen Instituts, Abteilung Kairo
AJA	American Journal of Archaeology	OLA	Orientalia Lovaniensia. Analecta
ARA	Annual Review of Anthropology	PAM	Polish Archaeology in the Mediterranean
ASAE	Annales du Service des antiquités de l'Égypte	PEQ	Palestine Exploration Quarterly
ASOR	American Schools of Oriental Research	UF	Ugarit Forschungen
AVDAIK	Archäologische Veröffentlichungen Deutsches Archäologisches Institut. Abteilung Kairo	SAAC	Studies in Ancient Art and Civilization
BAR	British Archaeological Reports	SAK	Studien zur Altägyptischen Kultur
BASOR	Bulletin of the American Schools of Oriental Research	TA	Journal of the Institute of Archaeology of Tel Aviv University.
FIFAO	Fouilles de l'Institut Français d'Archéologie Orientale	WA	World Archaeology
		ZÄS	Zeitschrift für ägyptische Sprache und Altertumskunde

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LMV = LEX METALLI VIPASCENSIS

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