The history of conifers in Egypt, part I: Mediterranean cypress (*Cupressus sempervirens* L., Cupressaceae)

Victoria Asensi Amorós

Xylodata SARL
4, Place Violet
75015 Paris, France

E-mail: victoria.asensi@free.fr

Abstract. The article describes archaeological remains of *Cupressus* sp. and *Cupressus sempervirens* found in Egypt and discusses their wider environment, namely, the Middle East and the Mediterranean Basin, both regions accessible to the ancient Egyptians. The physical appearance of cypress wood, its anatomy, and its current and past uses are also reviewed. Archaeological data concerning made objects from the Predynastic period until the Islamic era are presented. Finally, the article also briefly mentions Egyptian iconography and epigraphy relating to cypress.

Keywords: cypress, wood anatomy, utilisation, Egypt

1. Introduction

While the current Egyptian indigenous flora comprises just a single species of conifer, *Juniperus phoenicea* L., which is present in the Sinai (Täckolm 1974: 50), several species of conifers have been identified from the archaeological record (i.e. fir, *Picea*; cedar, *Cedrus*; and pine, *Pinus*). It therefore seems helpful to launch a series of papers discussing these different species of conifers and presenting the current state of research into their roles in past Egyptian society. I am arbitrarily starting with the genus *Cupressus* (cypress) and the species *C. sempervirens* L., being the only *Cupressus* species that has been identified from archaeological contexts in Egypt.

In this paper, I will deal with archaeological objects only, and not with charcoal or other remains. I will start with an overview of the distribution and ecology of cypress, as well as macroscopic and microscopic descriptions of the timber and its uses. Next I will discuss published identifications (including my own unpublished ones), in the form of a chronological catalogue. Epigraphic and iconographic data are also included. Unless otherwise stated, the listed identifications refer to *Cupressus* sp.

2. Distribution, Ecology, and Description

The genus *Cupressus* is represented by around 20 species distributed throughout the temperate zone in North America, Asia, and the Mediterranean region. The common species in the Mediterranean basin is *Cupressus sempervirens,* with the variety *pyramidalis* distributed as far as Asia Minor. The large-crowned variety (var. *horizontalis*), which is frequently admixed to stands of the var. *pyramidalis*, grows in Cyrenaica (eastern Libya), Greece, Cyprus, Rhodes,[1] Turkey, Syria, Iran, and Iraq.[2] In Syria and in Lebanon, this species is present in some localities, alone or in association with *Pinus brutia* Ten. (Turkish

1 In Cyprus, this species is very common in the dense forests in the mountains in the north of the island; in the Aegean islands, it appears in Kos, Rhodes, Karpathos, Samos, and Crete. In Crete, it is very well represented in the association *Cupressus-Acer orientalis*, up to an altitude of 1600 m (Paraskevopolou 1991: 195).

2 Being a characteristic tree of the forest and maquis, *Cupressus sempervirens* var. *horizontalis* is distributed as far south as Iran, in the mixed forests of *Acer monspessulanum* L., *Quercus iberica* M. Bieb., *Crataegus monogyna* Jacq., *Cerasus microcarpa* Bois., and *Carpinus orientalis* Mill. In Turkey, this species is confined to south-west Anatolia, where it is found along with *Pinus brutia* Ten. and *P. nigra* J. F. Arnold or in forests of *Cedrus* (Sherif & el-Taife 1986: 17; Zohary 1973: 347).

pine). In Palestine, there is a small patch of cypress forest.[3] The discovery of fossil cypress pollen in the mountains of Judea seems to suggest a wider distribution of these species in the past (Zohary 1973: 347).

From a palaeobotanical point of view, the original range of distribution of the Mediterranean cypress is still a matter of discussion. Certain scholars argue that its origin may be in Asia and that it disseminated from there during the Tertian era, eventually encompassing the whole Mediterranean area (Meiggs 1985: 46).

Cypresses are in general medium-sized trees and shrubs, but some individual trees can reach up to 30–40 m in height. *Cupressus sempervirens* may reach heights of 20–30 m and diameters up to 0.80 m at the base of the trunk. The trunk is frequently fluted, twisted, and knotty (Collardet & Besset 1988: 210). The leaves are small and opposite, generally with a longitudinal groove on the external face and with a blunt tip. The leaves often bear a dorsal resinous gland. The infl rescence is monoecious; the brown female cones are globose, subglobose, or ovoid, ranging from 2 to 4 cm in diameter (Sherif & el-Taife 1986: 16).

A remarkable species of cypress was discovered in 1924 in the Tassili Mountains in the Sahara (Camus 1926: 39). *Cupressus dupreziana* Camus is very closely related to *C. sempervirens*, but with a subdistichous branching pattern and small cones. Th s species is drought-resistant and grows very quickly in fresh soils. Another species that is highly resistant to drought is *C. atlantica* Gaussen. It is very common in the Moroccan forest (Callen 1976: 294, 310).

2.1 Cypress wood

Cypress wood is yellow-brown, sometimes tinged with pink. The sapwood is whitish, not very distinct, and narrow. The transition between early wood and late wood is gradual. The grain is straight to irregular, its texture fi e and even. Resin canals may be present, appearing as occasional brown streaks. Cypress wood is not very resinous, and it is less odorous than cedar wood. It is light and tender, with little to moderate volume shrinkage. The wood is of excellent quality and offers good natural durability even though its mechanical strength is low to medium. It is easily worked and polished, resists decay in water, and is not attacked by insects.

Nowadays, because of its durability and water resistance, it is employed in construction, in exterior and interior cabinet work, as well as in situations where the wood is in direct contact with the ground. It is also used for furniture and decoration, including wood turning. Because of its very good acoustic properties, it is also used for the bodies of string-instruments (Collardet & Besset 1988: 210; Garcia Esteban et al. 1996: 184).

2.2 Cypress wood anatomy

The growth rings are distinct, with a gradual transition from early to late wood (Fig. 1). Tracheids with uniseriate (rarely biseriate) bordered pits are confi ed to the radial and the tangential walls in late wood. The pit apertures in early wood are rounded to slightly elliptical. The axial parenchyma is scarce, diffuse to banded, with smooth to faintly nodular end walls.

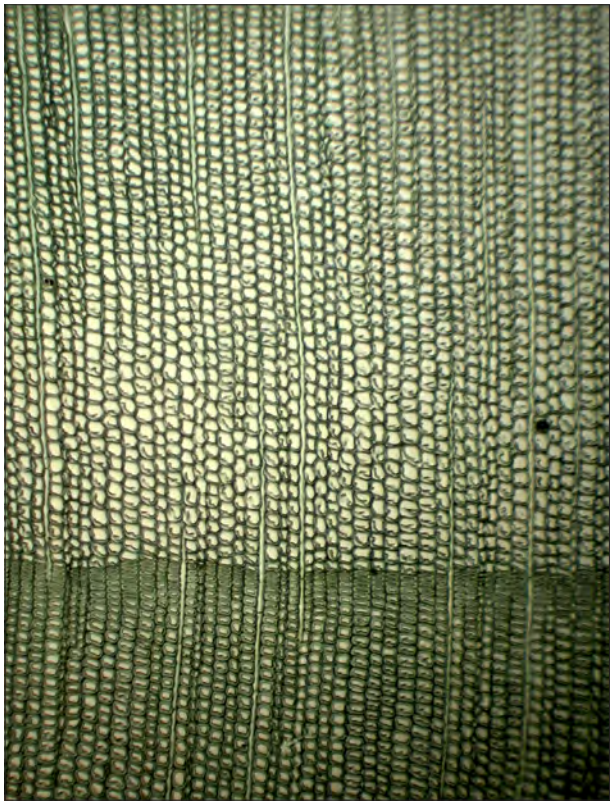

Figure 1. Transverse section, *Cupressus sempervirens.*

The rays are exclusively uniseriate, only rarely biseriate, 1–20 (30) cells high. Ray parenchyma cells have thin and smooth end walls (Fig. 2). Between 2 and 4 pits are found per cross fi ld; these are cupressoid, with elliptical to slit-like apertures (Fig. 3). Resin ducts are absent.

The wood anatomy of *Cupressus* is very similar to that of *Juniperus* sp., but ray height and frequency (smaller in height, but more numerous in *Juniperus* sp.) and tangen-

3 Especially Gilead, in the hills of Edom.

Figure 2. Tangential section, *Cupressus sempervirens.*

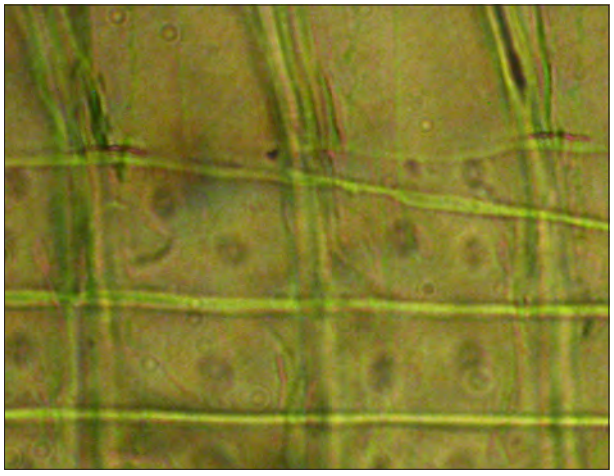

Figure 3. Radial section, *Cupressus sempervirens.*

tial cell walls (nodular in *Juniperus* sp., smooth or rarely nodular in *Cupressus* sp.) can help in distinguishing between these two genera.

2.3 Archaeological Data

See Appendix 1 (at the end of this chapter) for an overview of archaeological fi ds of *Cupressus* wood in Egypt.

3. Epigraphy and iconography

Charpentier (1981: paragraph 268) mentions this species under the generic term 'conifer' (*š*). It is acknowledged that, in the current state of research, the meanings of the different hieroglyphic names of the conifers are uncertain. However, for Bardinet, the word *mrw* (which is commonly thought to designate the cedar) would be the name for the cypress (for the cedar, he proposes the terms *snḏm* and *ssnḏm*). His arguments are: the red colour of *mrw* wood, its high frequency in shipbuilding, and the fact that it is a tree from the west and from Lebanon (Bardinet 2008: 73-84). It is true that the identifi ations made don't allow, in general, confi mation or rebuttal of the use of *Cupressus sempervirens*, or of another species. We must not forget that the softwood species most widely identifi d is the cedar, including in shipbuilding (the latter not being the case for cypress wood); also, cypress wood is less colourful than cedar, allowing rather clear distinction. Because of its location of origin, cedar could maybe be excluded: Morocco is generally regarded by Egyptologists as being too far away as a source for wood for ancient Egypt, but other coniferous species are very well possible.

4. Uses in Antiquity

The archaeological evidence presented suggests that cypress was used as an architectural material since the Predynastic period. Starting in the Old Kingdom, it was also used for making statues. Boxes and coffins are recorded since the Middle Kingdom. Two identifi ations seem particularly interesting: the small piece found in the abdominal mummy of Ramses II and a Nilometer base from the Byzantine Period. The fi st can be explained for its antiseptic properties and the second for its water resistance.

According to Lagriffe (1967: 67) cypress was used in the Kyphi composition. However, according to Baumann (1960: 88), who studied the Ebers Papyrus, which mentions the Kyphi composition, in this case cypress was confused with *Cyperus papyrus* L. (!). The medical use of cypress is at least confi med for modern Egypt: around 1940, an infusion of cypress cones was employed in Egypt as an ailment for diabetes and rheumatism (Täckholm et al. 1941: 64).

The Greeks and Romans used cypress for shipbuilding (although Theophrastus does not mention it being used

for this purpose[4]). While Alexander the Great, shortly before his death, was preparing a military expedition against Arabia, he made use of cypress (and ship owners) of Cilicia, Phoenicia, and Cyprus, as well as those that had been introduced to Babylon. And when Ptolemy wanted to build a fl et after the death of Alexander, he exercised strict control over the cypress and cedar forests of the mountains of Lebanon (Meiggs 1985: 134). The use of this species in the classical world seems to be well documented, for example, in the construction of monumental gates at the Parthenon, the temple of Epidaurus, and the basilicas of St. Peter and St. Sabina in Rome, and in its use (similar to that of cedar) by the Greeks for making chests, boxes, and coffins (Paraskevopoulou 1991: 165). The ashes of Athenians who had died during the fi st year of the Peloponnesian War were placed in cypress coffins (Meiggs 1985: 294), and this species has the reputation as having been used in the construction of the cross of Christ.[5]

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4 Theophrastus, 2003, V.7.1: 'The ship timbers are, in short, fi , pine and cedar'. In V.3.5, it is stated that the statues offered to the gods were made of juniper, cypress, jujube, boxwood, and olive roots for the smaller ones.

5 With four other species, including cedar (Baumann 1960: 89).

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Appendix 1

Overview of archaeological fi ds of *Cupressus* wood in Egypt.

Period	Date	Original location	Category	Item	Details	Current location
Prehistoric period						
		Badari	funerary object	several small pieces of worked wood	Identified as ypress or juniper (*Juniperus* sp.) (Brunton & Caton-Thompson 1928: 62 = Lucas 1989: 430 = Hartung 2001: 314 = Gale et al., 2000: 350).*	T4606; T3284
Predynastic Period (Naqada II–III)						
			architectural element	stake	(Dietrich 202: 517)	Adaïma, 1001/14.1
Old Kingdom						
	2033 cal BC	upper chamber, south pyramid of Snefru, Dahshur	architectural element	beam (?)	Made from *Cupressus* cf. *sempervirens;* a piece of wood removed for radiocarbon dating; although the report does not mention the object type (Barker et al. 1971: 160), it indicates that the samples were collected by Fakhry; in Fakhry's book (1959: 52), we find a me tion of cedar beams without mention of analysis of wood (it could be a visual identific tion).	British Museum, London, BM 325
	4802 ± 210 cal BP	tomb of Snefru, south pyramid of Snefru, Dahshur	architectural element	beam (?)	A piece of wood removed for radiocarbon dating, referred to as 'cypress wood' by Sloley (1953: 115), citing the work of Braidwood et al. (1951: 53), without mentioning the object type, just the age.	
			statue	statue of Cheikh el-Beled	Statue made from *Cupressus sempervirens,* with the hand stick in tamarisk wood (Luqma 2002: 84-85). Before its scientific ide tific tion, this statue was referred to as sycamore fig ood by Liphschitz (1998: 267), following the identific tion by Donadoni (1969: 38); sycamore fig ood is, however, a totally different kind of wood, which cannot be mistaken for cypress.	Cairo Museum
	3rd Dynasty	Degrees pyramid, Saqqara	funerary object	coffi	Made of *Cupressus* sp. and of several elements (juniper, *Juniperus* sp.; jujube, *Ziziphus* sp.; cedar, *Cedrus* sp.; and Aleppo pine, *Pinus halepensis*), found in the Lauer excavations (Lucas 1936: 4 = Täckholm et al. 1941: 74 = Lucas 1989: 429, 440 = Gale et al. 2000: 352). Identific tions made by Dr. L. Chalk of the Imperial Forestry Institute at Oxford, who states that one piece of the coffin W.60) is probably *Cupressus* and another piece (W.752) must be *Juniperus* rather than a cypress.	
Middle Kingdom						
		Lahun	funerary object	coffin l	Made from *Cupressus sempervirens* (Lucas 1989: 430 = Gale et al. 2000: 350).	

Period	Date	Original location	Category	Item	Details	Current location
		courtyard temple of Niouserrê, Abusir el-Meleq	funerary object	coffin of at-nefer	Made from *Cupressus sempervirens*: 'Koniferenholz, Abusir, bei der Pyramide des Neuserre, 5. Dyn. Grabung Borchardt 1903, det. Grosser: *Cupressus* spec. (Zipresse)'. Excavations Deutschen Orient Gesellschaft 1902, Bremen B 937, Übersee-Museum. Identific tion Grosser; CAA Martin 1991: 1). Germer (1988: 55) indicates a sample of cypress wood preserved in Berlin Museum (Ägyptisches Museum Berlin, n° S.Schweinfurth. 144). It may be a sample, not well dated, originating from the coffin o Sat-nefer.	Bremen B 937, Übersee-Museum
New Kingdom						
		tomb of Tutankhamun (Tomb 62), Valley of the Kings	funerary object	third coffin wo pieces)	Two fragments of the third coffin o Tutankhamun. Boodle (1933: 30) cites two pieces from 'Third outermost coffin'.	Royal Botanic Gardens, Kew, 253
	18th Dynasty, end of	Ramesseum, Tomb in the North Processional way	funerary object/ furniture?	fragmentary box	(Asensi Amorós 2002: 275)	J""IV/A =APO.CN 01. To01
		tomb of Ramses II	funerary object	small, cube-shaped piece of wood	Abdominal filling of the mum y (Plu 1985: 167-168).	Cairo Museum
			funerary object	shabty (small statue figu e of a funerary servant)	(Gale et al. 2000: 351)	Ashmolean Museum, Oxford, 1891.215a-b
		temple at Timna, Sinai, Wadi Arabah	worked wood	fragment of charcoal	(Werker 1988: 232)	
		tomb of Neferkhawt, Thebes, el-Asasif MMA 729	furniture	box	A small jewellery box of Rennofer (wife of Neferkhawt) with a lid in tamarisk and boxwood inlays (Hayes 1935: 29 = Lucas 1989: 429 = Gale et al. 2000: 337) (http://www.metmuseum.org/collections, last accessed in 2012); Hayes (1935: 29) states that the wood was identified by Professor S. J. Record of Yale University School of Forestry.	Metropolitan Museum of Art, New York, MMA 35.3.79
	18th Dynasty, early	tomb of Hatnefer and Ramose (below TT 71), Thebes, Sheikh Abd el-Qurna	funerary object	canopic box of Hatnofer	Hayes (1959: 226-227) says that the box is made of cypress, with a boxwood stick to close the two compartments that open into its upper part; the online database notes only wood (http://www.metmuseum.org/collections, last accessed in 2014).	Metropolitan Museum of Art, MMA 36.3.53
	18th Dynasty	tomb of Senenmut (TT71), Thebes, Sheikh Abd el-Qurna	weapons	bow	Found below entrance , deposit of hunting weapons, MMA 1935–1936; the online database notes the wood as 'conifer, cypress' (http://www.metmuseum.org/collections, last accessed in 2014).	Metropolitan Museum of Art, MMA 36.3.211
	18th Dynasty	tomb of Senenmut (TT71), Sheikh Abd el-Qurna	furniture	jewellery box	Small box said to be made from cypress wood, containing two compartments and decorated with boxwood inlays (Roehring 2002: 29) (http://www.metmuseum.org/collections, last accessed in 2014).	Metropolitan Museum of Art, MMA 36.3.199
	18th Dynasty, early	tomb of Hatnefer and Ramose (below TT 71), Thebes, Sheikh Abd el-Qurna	furniture	chair	Hatnefer chair, with boxwood and ebony inlays (Lansing & Hayes 1937: 13 = Roehring 2002: 32) (http://www.metmuseum.org/collections, last accessed in 2014).	Metropolitan Museum of Art, MMA 36.3.152

Appendix 1 continued

Period	Date	Original location	Category	Item	Details	Current location
Third Intermediate Period						
		Ramesseum, Tombs on the Sanctuary	funerary object	fragments of coffi	Several fragments of cedar coffin with fragments of cypress or juniper (Asensi Amorós 2003a: 117-118).*	Ramesseum, P.T 5/III; P.T 12; P.T 4/IV
Third Intermediate Period–Late Period						
	25th–26th Dynasty	pyramid of Menkaure, Giza	funerary object	coffin	The online database notes ' Wooden anthropoid coffin, estored from fragments, made to contain the body of King Menkaure (Mycerinus) of the Fourth Dynasty' (http://www.britishmuseum.org/research/collection_online, last accessed in 2014). The coffin is onstructed from several different kinds of wood. The larger components are all of juniper and fi . Local timbers (sycamore fig and tamarisk) were used to make some of the dowels and tenons with which the planks are joined together. The coffin as not part of the original funerary equipment of Menkaure, but was made for a later restoration of his burial, as indicated by both stylistic and epigraphic evidence. However, Strudwick (2006: 264) indicates the use of cypress instead of fir and jun - per for the coffin, and wels made of *Ficus sycomorus* and *Tamarix*.	British Museum, BM 6647
Late Period						
	26th Dynasty	Deir el-Bahari	funerary object	coffi of Tabatha, daughter of Petamûn	Catalogued as sycamore fig ood, but subsequent analyses clearly showed that it was cypress (Engelbach 1931: 144 = Täckholm et al. 1941: 74 = Lucas 1989: 430).	Cairo Museum, 41059
Ptolemaic Period						
	4th cent. BC	Abusir el-Meleq	funerary object	coffin	*Cupressus* or *Juniperus* sp. (Wittmack 1910: 185 = Täckholm et al. 1941: 74-75 = Lucas 1989: 430 = Gale et al. 2000: 351)*	
			statue	cat statue	*Cupressus sempervirens* (Asensi Amorós, 2003: 185)	Museum of Mediterranean Archaeology, Marseille, AM 738
Graeco-Roman Period						
	1st cent. AD	funerary monument of Padykam, Hermopolis Magna (Tuna el-Gebel)	funerary object	coffin of Dho y, father of Padykam, scribe of Khemenou	*Cupressus sempervirens* (Zidan et al. 2006: 28)	
		Saqqara	funerary object	coffin	*Cupressus sempervirens* (Asensi Amorós 2003: 186)	Museum of Mediterranean Archaeology, AM 264
		Thebes (?)	funerary object	mummy label	*Cupressus sempervirens* (Asensi Amorós 2003: 18)	Museum of Mediterranean Archaeology, AM 122
			funerary object	coffin	Cupressaceae; Killen (1980: 7) notes a coffin of the aeco-Roman period collected in Egypt by Schweinfurth in 1884 and reported to be in the collections of Kew Museum (elements 1 and 4 in *Ficus sycomorus*, element 2 in *Abies*, element 3 in Cupressaceae, Davies 1995: 151); in my opinion, it could be the same specimen cited before from Abusir el-Meleq and dated to the Ptolemaic period.*	Royal Botanic Gardens, 30.1894/1.2.3.4

Period	Date	Original location	Category	Item	Details	Current location
Roman Period						
			funerary object	two mummy labels	(Davies 1995: 151)	British Museum; inventory numbers not cited
			architectural element	ornamental frame and plank in a construction	(Vermeeren, this volume)	
Roman or Byzantine Periods						
	300–700 AD	Abu Sha'ar (Red Sea)	worked wood	two pieces of worked wood	*Cupressus sempervirens* (El Hadidi & El Fayoumi 1996: 25, 28-29)	Cairo University Herbarium, UH-10-As.90 75.ii; UH As.90-10-166
	300–700 AD	Abu Sha'ar (Red Sea)	worked wood, furniture	several fragments of a box	*Cupressus sempervirens* (El Hadidi & El Fayoumi 1996: 22)	Cairo University Herbarium, UH As.90-10-25.i
Byzantine Period						
	end 5th cent.	Cairo	architectural element	nilometer base	*Cupressus sempervirens* is listed as having been used, along with pine, gum arabic (*Acacia nilotica* (L.) Willd. Ex Del.), the sycamore fi , and probably the juniper (Täckholm et al. 1941: 75 = Lucas 1989: 430-431).	
Islamic Period						
	11th cent.	Egypt	architectural element	decorative element of a molding framing	*Cupressus sempervirens* (Anglade 1988: 59; catalogue number 32)	Musée du Louvre, Paris, 4062
	mid-12th cent.	Egypt	architectural element	arch, fragment	*Cupressus sempervirens* (Anglade 1988: 74; catalogue number 45)	Musée du Louvre, 6348
		Cairo, Fostat, Istabl Antar, Excavations R. Gayraud (IFAO)	worked wood	three fragments of worked wood	work in progress for IFAO, identific - tions Asensi Amorós	Fostat, Istabl Antar, 891-1, 11001-1a 11001-1b
		Cairo, Fostat, Istabl Antar, Excavations R. Gayraud (IFAO)	architectural element	3 balusters	work in progress for IFAO, identific - tions Asensi Amorós	Fostat, Istabl Antar, 1005-4, 10500-4, 10201-6
		Cairo, Fostat, Istabl Antar, Excavations R. Gayraud (IFAO)	weaving or furniture element	needle or instrument (kohl stick?)	work in progress for IFAO, identific - tions Asensi Amorós	Fostat, Istabl Antar, 6660-2
		Cairo, Fostat, Istabl Antar, Excavations R. Gayraud (IFAO)	weaving element	spindle shaft	work in progress for IFAO, identific - tions Asensi Amorós	Fostat, Istabl Antar, 11516-1
		Cairo, Fostat, Istabl Antar, Excavations R. Gayraud (IFAO)	architectural element		work in progress for IFAO, identific - tions Asensi Amorós	Fostat, Istabl Antar, 1199-1
		Cairo, Fostat, Istabl Antar, Excavations R. Gayraud (IFAO)	writing material	writing board (?)	work in progress for IFAO, identific - tions Asensi Amorós	Fostat, Istabl Antar, 10966-1

* indicates doubtful occurrence